FIRST FIVE-YEAR REVIEW REPORT FOR
INDUSTRI-PLEX SUPERFUND SITE
WOBURN, MIDDLESEX COUNTY, MASSACHUSETTS

Prepared by

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Date

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LIST OF ABBREVIATIONS & ACRONYMS

ADAFs	Age Dependant Potency Adjustment Factors
ALM	Adult Lead Methodology
ARAR	Applicable or Relevant and Appropriate Requirement
BACT	Best Available Control Technology
BERA	Baseline Ecological Risk Assessment
BLL	Blood Lead Level
CBCA	Cranberry Bog Conservation Area
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CMR	Code of Massachusetts Regulations
COPC	Contaminant of Potential Concern
EA	Endangerment Assessment
EHP	East Hide Pile
EPA	United States Environmental Protection Agency
EPC	Exposure Point Concentration
ERA	Ecological Risk Assessment
ESD	Explanation of Significant Differences
FEMA	Federal Emergency Management Agency
FS	Feasibility Study
FYR	Five-Year Review
GSIP	Groundwater and Surface Water Investigation Plan
HBHA	Halls Brook Holding Area
HDPE	High-density polyethylene
HHRA	Human Health Risk Assessment
HI	Hazard Index
ICs	Institutional Controls
IEUBK	Integrated Exposure Uptake Biokinetic Model
IRIS	Integrated Risk Information System
LSP	Lower South Pond
MassDEP	Massachusetts Department of Environmental Protection
mg/kg	Milligram Per Kilogram
MGL	Massachusetts General Law
MMOA	Mutagenic Mode of Action
MSGRP	Multiple Source Groundwater Response Plan
NAAQS	National Ambient Air Quality Standards
NAUL	Notice of Activity and Use Limitation
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NOAEL	No Observed Adverse Effects Level
NPL	National Priorities List
NRWQC	National Recommended Water Quality Criteria
O&M	Operation and Maintenance
OLEM	Office of Land and Emergency Management
OSWER	Office of Solid Waste and Emergency Response
OU	Operable Unit
PAHs	Polycyclic Aromatic Hydrocarbons
PDI	Pre-Design Investigation
PFAS	Per- and Polyfluoroalkyl Substances
PFBS	Perfluorobutanesulfonic Acid

PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctanesulfonic Acid or Perfluorooctane Sulfonate
PPRTV	Provisional Peer Reviewed Toxicity Value
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RD/RA	Remedial Design/Remedial Action
RfD	Reference Dose
RI	Remedial Investigation
ROD	Record of Decision
RPFs	Relative Potency Factors
RSLs	Regional Screening Levels
ROW	Right of Way
SLERA	Screening-level Ecological Risk Assessment
SLs	Screening Levels
TBC	To be considereds
TCE	Trichloroethene
TOU	Thermal Oxidation Unit
USC	United States Code
UU/UE	Unlimited Use and Unrestricted Exposure
VISL	Vapor Intrusion Screening Level
VOC	Volatile Organic Compound
WHP	West Hide Pile

I. INTRODUCTION

The purpose of a Five-Year Review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in five-year review reports such as this one. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) is preparing this five-year review pursuant to Section 121 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. § 9621, consistent with the National Contingency Plan (NCP)(40 CFR Section 300.430(f)(4)(ii)), and considering EPA policy.

This is the first FYR for the Industri-Plex Superfund Site ("the site"). The triggering action for this statutory review is the on-site mobilization start date of the OU2 remedial action. The FYR has been prepared due to the fact that hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure (UU/UE).

The site consists of two Operable Units (OUs), both of which will be addressed in this FYR. OU1 (soil remedy) primarily addresses soil, groundwater (interim/hot spot action only), on-site sediment, and a remedy to address nuisance air emissions from one hide pile. OU2 addresses remaining long-term groundwater, soil, sediment and surface water contamination. Note that OU2 incorporates the downstream surface water and sediment from the neighboring Wells G&H Superfund Site (Aberjona River Study) known as Wells G&H OU3, as Industri-plex OU1 contaminants impact the OU3 Aberjona River Study area within the connected water bodies.

The Industri-Plex Superfund Site FYR was led by Joseph LeMay of EPA, Remedial Project Manager for the Industri-Plex site, with support from AECOM, contractor to EPA Region 1. The review began on 11/26/2018.

Site Background

The Industri-Plex Superfund Site is a former chemical and glue manufacturing facility that impacted over 150 acres of land (see Figures A-1 through A-3 in Appendix G) in Woburn, Massachusetts. Industri-Plex was used for manufacturing chemicals such as lead-arsenic insecticides, acetic acid, and sulfuric acid for local textile, leather, and paper manufacturing industries from 1853 to 1931. Chemicals manufactured by other industries at the site include phenol, benzene, and toluene. Industri-Plex was also used to manufacture glue from raw animal hide and chrome-tanned hide wastes from 1934 to 1969. The by-products and residues from these industries caused the soils within the site to become contaminated with elevated levels of metals, such as arsenic, lead and chromium. During the 1970s, the site was re-developed for other industrial uses. Excavations uncovered and mixed industrial by-products and wastes accumulated over 130 years. During the late 1960s and 1970s, commercial land development caused the residues from animal hide wastes and chemical wastes to be consolidated into waste piles, buried, and used to fill in adjacent wetlands. The excavation and disturbance of the animal hide wastes during this development caused significant releases of obnoxious odors *(e.g.*, hydrogen sulfide) into the atmosphere and impacting the municipality and nearby towns. Burying of wastes extended to many later-developed commercial properties adjacent to the main manufacturing areas. Many of the animal hide piles and lagoons on-site were leaching toxic metals into the environment. In the 1980s, the site contained streams and ponds, a warehouse and office buildings, remnant manufacturing buildings, and hide waste deposits buried on the site. Animal hide residues are found on approximately 20 acres of the site in four different piles (see Figure A-1 in Appendix G). Portions of the animal hide piles sloughed off, causing the release of hydrogen sulfide gases to the atmosphere and toxic metals to surrounding wetlands. Residences are located within 1,000 feet of the site, and more than 34,000 people live within 3 miles of the site. Many properties on the site have been redeveloped, and redevelopment opportunities continue for various properties at the site in accordance with land use restrictions/institutional controls overseen by EPA and the Commonwealth of Massachusetts, through its Department of Environmental Protection (MassDEP). Arsenic contamination has leached from groundwater to the site surface water bodies (streams and ponds) which flow to the Aberjona River. Arsenic discharges were found to contaminate the sediment bed and migrate further downstream through Woburn. In addition to arsenic, groundwater is also contaminated with ammonia, benzene, and other compounds discharging into nearby surface water bodies (*e.g.*, Halls Brook Holding Area Pond).

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: Industri-Plex Superfund Site		
EPA ID: MAD076580950		
Region: 1	**State:** MA	**City/County:** Woburn/Middlesex
SITE STATUS		
NPL Status: Final		
Multiple OUs? Yes	**Has the site achieved construction completion?** Yes	
REVIEW STATUS		
Lead agency: EPA ***[If "Other Federal Agency", enter Agency name]*:**		
Author name (Federal or State Project Manager): Joseph LeMay		
Author affiliation: EPA Region 1		
Review period: 11/26/2018 - 9/11/2019		
Dates of site inspections: 12/1/2018, 12/21/18, 2/16/2019, and 3/5/2019		
Type of review: Statutory		
Review number: 1		
Triggering action date: 9/11/2014		
Due date *(five years after triggering action date)*: 9/11/2019		

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

The OU1 Remedial Investigation (RI; Stauffer, 1984) showed that contaminants related to soils and sediments at OU1 included metals, primarily arsenic, lead, and chromium. Primary human health receptors included industrial workers. Areas of contaminated soils had been exposed at the surface, which allowed individuals and animals to come into direct contact with the contaminants. In addition, there were numerous odor complaints and violations, primarily related to the release of hydrogen sulfide gas. Groundwater contaminants of concern included benzene and toluene.

The OU2 (including Wells G&H OU3) RI (Tetra Tech NUS, 2005a) evaluated soil, sediment, groundwater, and surface water contamination and risks along the Halls Brook Holding Area (HBHA) and Aberjona River from the Industri-Plex site to the Mystic Lakes in Arlington. Since the Aberjona River flows through an urban area that includes residential, commercial, recreational, and industrial properties, the study area was divided into reaches so that appropriate human health and ecological risk evaluations could be conducted based on the unique exposure hazards at each area. These reaches are shown in Figure A-4 in Appendix G. The following summarizes the baseline risks posed to the public and environment:

- arsenic and benzene (as well as ammonia) plumes beneath the OU1 boundary (groundwater) may cause future health risks to people who might come in contact with the water (future industrial/ commercial/ construction worker) within Reach 0;
- arsenic and benzene (as well as ammonia) plumes from OU1 contribute to significant environmental risks in the HBHA Pond sediment and deep surface water within Reach 0;
- high concentrations of arsenic in both surface and deep soils in the Former Mishawum Lake Bed area may cause future health risk to a day care child and construction worker who could come in contact with the soils within Reach 0;
- high concentrations of arsenic in shoreline sediments in three distinct areas along the Wells G&H Wetland and Cranberry Bog Conservation Area (CBCA) present a current and/or future health risk to people recreating along the shoreline (east side of the 38-acre Wells G&H wetland within Reach 1 near former production well H, west side of the 38-acre Wells G&H wetland within Reach 1 near the railroad tracks and Olympia Source Area Property, and west-central area of the CBCA within upper Reach 2); and
- high concentrations of arsenic in deeper interior wetland sediments presents a future risk to people who might come in contact with the sediments (future dredger/ construction worker) within Reaches 0 and 1.

Response Actions

In 1981, the EPA installed 10,000 feet of fence to restrict site access. Extensive damage to the main areas of the fence occurred and required repair. Areas of the fence requiring repairs were identified by the EPA, and work to re-secure the site was undertaken in 1986. Warning signs also were posted.

The September 30, 1986 OU1 Record of Decision (ROD) presented the following remedial objectives used to develop remedial alternatives:

- Protection of the public health and surface waters from direct contact exposure to soils/sludges contaminated with elevated levels of arsenic, lead, and chromium.
- Protection of the public health, welfare and environment from the contaminated soils, odors, and leachate in or emanating from the East Hide Pile (EHP).
- Protection of the public health and environment from groundwater contaminated with benzene and toluene.

The 1986 OU1 remedy included the following:

- Design and construct permeable caps over approximately 105 acres of soils and sediments contaminated with lead, arsenic, and chromium in excess of levels of 300 milligrams per kilogram (mg/kg), 600 mg/kg, and 1000 mg/kg, respectively. The permeable caps may consist of various designed covers containing 16 inches of clean fill and a geotextile fabric placed over the contaminated soils and sediments[1], as well as equivalent covers such as concrete foundations or bituminous parking lots. This portion of the remedy serves to prevent physical contact with the contaminated soils and sediments, including the West, East-Central and South Hide Piles.
- Design and construct an impermeable cap over the approximately 5-acre EHP, and gas collection and thermal oxidation unit (TOU) treatment system. This portion of the remedy serves to prevent the

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[1] Note that the ROD specified the use of 30 inches of clean fill material. EPA later approved an alternative cover design which incorporated the use of a geotextile to reduce the amount of imported fill and minimize impacts to local grades.

infiltration of water through the hide pile, and prevent the release of hydrogen sulfide gas into the atmosphere.

- Design and construct an interim groundwater treatment system to treat groundwater hot spots contaminated with toluene and benzene. This interim system was to be designed to reduce the concentration of the hot spot by eighty percent and limit contamination migration off-site. This interim remedy concept was later abandoned in favor of an overall site-wide groundwater intercept and treatment system, which was later abandoned due to technical impracticability (with Site-wide groundwater addressed under OU2 instead).
- Conduct a Groundwater and Surface Water Investigation Plan (GSIP) to evaluate the degree of groundwater and surface water contamination from the site.
- Design and implement Institutional Controls (ICs) for the site which will restrict future land use. The purpose of the ICs is to preserve the effectiveness of the remedy, so that human health and the environment remains protected, and allows each property owner the fullest possible use of their property.

In a Consent Decree (CD) which was entered in 1989, the Settling Defendants agreed to perform the remedial design/remedial action (RD/RA) for OU1.

Following preparation of the GSIP, EPA performed a Multiple Source Groundwater Response Plan (MSGRP) investigation to evaluate groundwater and surface water impacts to the Aberjona River and develop a comprehensive response. The comprehensive response incorporated the surface water and sediment investigation associated with downstream Wells G&H OU3 – Aberjona River Study. The response was established in the January 31, 2006 Industri-plex OU2 ROD.

The OU2 ROD presented the following remedial objectives used to develop remedial alternatives:

- Within the Northern Study Area from (including) Industri-Plex OU1 to Interstate 95, prevent or mitigate the potential future exposure of workers via ingestion, dermal contact, and/or inhalation to concentrations of arsenic, benzene, ammonia, trichloroethene, 1,2-dichloroethane, and naphthalene in groundwater that may present a human health cancer risk in excess of 10^{-4} and target organ Hazard Index >1, so that the excess cancer risk attributable to this medium is within the range of 10^{-4} to 10^{-6} and the non-cancer Hazard Index does not exceed one.
- Within the Wells G&H Wetland and CBCA, reduce the current and future potential exposure of recreational adults and children via ingestion and dermal contact to concentrations of arsenic and benzo(a)pyrene in near-shore sediment that may present a human health cancer risk in excess of 10^{-4} and target organ Hazard Index >1, so that the excess cancer risk attributable to this medium is within the range of 10^{-4} to 10^{-6} and the non-cancer Hazard Index does not exceed one.
- Within the HBHA Wetland and Wells G&H Wetland, prevent or mitigate the potential future exposure of workers via ingestion and dermal contact to concentrations of arsenic in deeper (interior) sediment that may present a human health target cancer risk in excess of 10^{-4} and target organ Hazard Index >1, so that the excess cancer risk attributable to this medium is within the range of 10^{-4} to 10^{-6} and the non-cancer Hazard Index does not exceed one.
- Within the Former Mishawum Lake bed area, prevent or mitigate the potential future exposure of workers via ingestion and dermal contact to concentrations of arsenic in subsurface soil that may present a human health cancer risk in excess of 10^{-4} and target organ Hazard Index >1, so that the excess cancer risk attributable to this medium is within the range of 10^{-4} to 10^{-6} and the non-cancer Hazard Index does not exceed one.
- Within the Former Mishawum Lake bed area, prevent the potential future exposure of children via ingestion and dermal contact to concentrations of arsenic in surface and subsurface soil that may present a human health cancer risk in excess of 10^{-4} and target organ Hazard Index >1 such that the cancer risk attributable to this medium is within the range of 10^{-4} to 10^{-6} and the non-cancer Hazard Index does not exceed one.

- Prevent or minimize the exposure of benthic invertebrates and aquatic life to levels of arsenic, benzene, and ammonia in surface water, which are present as a result of groundwater discharge, in excess of applicable or relevant and appropriate requirements (ARARs) or benchmarks for the protection of aquatic life.
- Reduce the exposure of benthic invertebrates to levels of arsenic indicative of impairment in HBHA Pond sediment.
- Provide an alternate habitat to replace the lost wetland and floodplain functions and values associated with portions of the HBHA Pond used as a component of the remedy.
- Minimize, to the extent practicable, the migration of soluble and particulate arsenic during storm events to downstream depositional areas.

The OU2 remedy included the following:

- Dredging and off-site disposal of contaminated sediments in the southern portion of the HBHA Pond; dredging and off-site disposal of contaminated near shore sediments at the Wells G&H Wetland and CBCA; and restoration of all disturbed areas. This component addressed sediments posing unacceptable human health risks for near shore sediments and unacceptable ecological risks for the southern portion of HBHA Pond.
- Use of the northern portion of HBHA Pond as a sediment retention area (primary and secondary treatment cells) to intercept contaminated groundwater plumes (including arsenic, benzene, ammonia, 1,2-dichloroethane, trichloroethene, naphthalene) from OU1, treat/sequester contaminants of concern (including arsenic, benzene, ammonia), and minimize downstream migration of contaminants (including arsenic, benzene, ammonia). The primary treatment cell intercepts the contaminated groundwater plumes discharging in the HBHA Pond. The effluent from northern portion of the HBHA Pond (secondary treatment cell outlet) serves as the surface water compliance boundary, and achieves National Recommended Water Quality Criteria (NRWQC) standards. Sediments which accumulate in the northern portion of the HBHA Pond will be periodically dredged and sent off-site for disposal. Portions of storm water from Halls Brook, which may interfere with the natural treatment processes occurring within the northern portion of the HBHA Pond, have been diverted to the southern portion of HBHA Pond.
- If necessary, *In-situ* Enhanced Bioremediation of contaminated groundwater plumes (*e.g.*, benzene) at the West Hide Pile (WHP) following a comprehensive localized ecological and human health risk assessment for sediments in the adjacent Lower South Pond sediments.
- Depending on the final design of the HBHA Pond remedy and, if necessary, construction of an impermeable cap to line stream channels (*e.g.,* New Boston Street Drainway), prevent the discharge of contaminated groundwater plumes, contamination of stream sediments, downstream migration of contaminants of concern, and potential impacts to other components of the selected remedy.
- Construction of a permeable cap to prevent contaminated soil erosion, downstream migration of contaminants of concern, and potential impacts to other components of the selected remedy.
- Establishing institutional controls to restrict contact with soils, groundwater, or deeper interior wetland sediments with concentrations above cleanup levels and protect the remedy.
- Construction of compensatory wetlands for any loss of wetland and floodplain functions and values associated with the selected remedy (*e.g.,* northern portion of HBHA Pond, Halls Brook storm water by-pass, capped stream channels) nearby in the watershed.
- Long-term monitoring of the groundwater, surface water, and sediments, and periodic Five-year Reviews of the remedy.

In a CD which was entered on November 24, 2008, the Settling Defendants agreed to perform the RD/RA for OU2.

Cleanup levels for OU1 soil were established in the 1986 ROD to be protective of industrial workers (residential uses at the site to be prohibited through ICs): arsenic - 300 mg/kg; lead – 600 mg/kg; and chromium – 1,000 mg/kg. Cleanup levels were developed in the 1985 Feasibility Study (FS) for OU1 (Stauffer, 1985). While the levels noted above were determined via an Endangerment Assessment (EA) in the FS to be protective of site workers, arsenic had initially been set at 1,000 mg/kg, but through a study attached to the FS, was reduced to 300 mg/kg to protect vegetation which was needed to reduce runoff to surface water. These soil cleanup levels were also applied to OU1 sediments.

Cleanup levels for OU1 groundwater were established in the 1986 ROD and set at drinking water standards. In 1997, based on a Groundwater Use and Value Determination performed by MassDEP (see Appendix C), the Industri-Plex aquifer was determined to be a Non-Potential Drinking Water Source Area. Therefore, the drinking water standards established for groundwater in the OU1 ROD were determined to no longer be applicable. New risk based groundwater cleanup levels were then established in the OU2 ROD.

Cleanup levels for groundwater, soil, and sediment originally presented in the 2006 OU2 ROD are included in Tables L-1 through L-4 in Appendix C. Surface water cleanup levels in the 2006 ROD were defined for arsenic (150 µg/L), benzene (46 µg/L), and ammonia (temperature and pH dependent; NRWQC standard from the OU2 ROD), measured at the compliance point of the HBHA Pond remedy (*i.e.*, outlet of the secondary treatment cell). The ammonia cleanup standard changes based on temperature and pH, and is evaluated both on a 30-day and 4-day rolling average.

On September 11, 2014, EPA prepared an Explanation of Significant Difference (ESD) relative to the 2006 OU2 ROD. The ESD created a benzene sediment cleanup action level (1.290 mg/kg), and required sediments in the Lower South Pond (LSP) above the action level to be removed and disposed off-site, and all disturbed areas restored. This action abated ecological and human health risks associated with contaminated sediments in the LSP and obviated the need to implement the Enhanced *In-situ* Bioremediation of WHP groundwater component of the OU2 remedy.

Beginning in May 2014, remedial activites were conducted to prevent arsenic contaminated groundwater originating from the EHP from discharging into an adjacent stream and re-contaminating previously remediated stream sediments. Work included the lining of the stream channel with an impervious high-density polyethylene (HDPE) liner and rerouting surface water drainage discharge points away from the impacted stream. Work was completed in multiple phases from 2014 through 2017.

On June 14, 2018, EPA prepared an ESD relative to the 1986 OU1 ROD. The ESD documented that residential use is acceptable on two OU1 properties (120 Commerce Way and 200 Presidential Way) which under the 1986 OU1 ROD were to be restricted from any residential development through implementation of ICs. The developers for these two properties collected data and prepared baseline risk assessments assessing potential future residential use on each of the properties. Based on the risk assessment conducted for the 200 Presidential Way property, it was determined that no CERCLA risk was present (no CERCLA restrictions required). At the 120 Commerce Way property, residential use was determined to be permissible with conditions (*e.g.*, prevent exposure to deeper subsurface soil and contaminated groundwater), and also a requirement to install vapor mitigation system beneath occupied building spaces. A Notice of Activity and Use Limitation (NAUL) was recorded as the IC on the property that incorporates the site restrictions and site management requirements to permit the residential use. The NAULs are State property notice documents issued under the authority of the Massachusetts Contingency Plan, 310 CMR 40.000, giving the State the authority to oversee and enforce the NAUL restrictions.

Status of Implementation

The OU1 Settling Defendants began designing the OU1 cleanup remedies in 1989:

- 1992 - Design of the permeable and impermeable cap finalized and interim groundwater treatment system design completed;
- 1993 - Construction of the permeable and impermeable cap began and groundwater treatment system design altered;

- 1994 – Pilot air sparging operated and failed to meet design standards;
- 1999 to 2004 - The Settling Defendants completed Final GSIP sample collection and analysis; and
- 2005 – OU1 Operation and maintenance (O&M) activites in place;

As of September 30, 2008, the Settling Defendants documented the completion of the soil, sediment and air portions of the OU1 remedial action through the preparation of a Master Cover Certification Report, as well as 34 property-specific Cover Certification Reports within OU1. NAULs either have been recorded or are in progress to satisfy the OU1 ROD IC requirements (see below and Appendix H).

In 2011, sediment samples were collected in the drainage swale located to the south of the EHP. Arsenic was detected above the OU1 cleanup standard (300 mg/kg). The source of the arsenic was determined to be groundwater discharge into the swale (Cornerstone, 2013). Following sediment removal to address the elevated arsenic concentrations, an impermeable barrier was installed in 2014 to prevent any continued discharge of arsenic-impacted groundwater into the swale (Haley & Aldrich, 2017c). The overall design modification and construction for this portion of the drainage swale by the East Hide Pile was completed in 2017.

It should be noted that due to odor complaints received from occupants of a building adjacent to the East Central Hide Pile, indoor air and sub-slab soil gas monitoring was performed in 2014 to evaluate potential hydrogen sulfide and methane concerns (Geosyntec, 2015). A determination was made which concluded that workers were not at risk.

In 2005, EPA prepared baseline risk assessments covering site-related metals and organics contamination in groundwater, surface water, and sediments posed by the contamination from the Industri-Plex Site to Route 128, which were documented in the March 2005 Industri-Plex OU2 (including Wells G&H OU3) MSGRP RI (Tetra Tech NUS, 2005a).

OU2 cleanup was implemented in three phases by the OU2 Settling Defendants based upon the following approved remedial designs:

- 2014 OU2 100% Remedial Design for LSP (adjacent to WHP) (Haley & Aldrich, 2014);
- 2015 OU2 100% Remedial Design Part 1 (HBHA Pond Remedy Structural Components including capping Area 6 north of HBHA Pond, and Dredging Restoration of Wells G&H and CBCA Wetlands, Draft ICs Plan) (Haley & Aldrich, 2015b); and
- 2016 OU2 100% Remedial Design Part 2 (HBHA Pond Remedy Non-Structural Components such as secondary treatment cell dredging, aeration zone and settling zone, and mitigation of lost wetland and flood storage functions and values) (Haley & Aldrich, 2016). Based on the use of the entire HBHA Pond as part of the remedy, mitigation measures were implemented to compensate for the lost wetland and floodplain function and values. Mitigation measures included establishing a compensatory wetland at 32 Cabot Road in Woburn and construction of a fish ladder at Center Falls Dam downstream on the Aberjona River in Winchester, Massachusetts (to increase migatory fish habitat within the waterway).

In 2017, OU2 cleanup construction was completed, with closeout reports submitted on September 18, 2015 for LSP (Haley & Aldrich, 2015a) and September 22, 2017 for the rest of OU2 (Haley & Aldrich, 2017a), including wetland mitigation. After the final OU2 closeout report submission in September 2017, the OU2 remedy shakedown period of approximately 12 months began in October 2017.

Submission of monthly monitoring/progress reports began in approximately 2005 for OU1 and November 2016 for OU2 (de maximis, 2016-2019). These reports include summaries of O&M and monitoring performed during the previous month.

IC Summary Table

Due to the number of lots requiring ICs at both OU1 and OU2, IC summary tables have been provided in Appendix H. Some lots have had ICs implemented already, with many more in progress.

The requirements of the ICs define the restricted and unrestricted activities, depending on the class of land, as defined by the OU1 and OU2 remedies. The ICs include periodic inspections of the remedy (*e.g.*, protective covers) to ensure they remain in good condition. The ICs also include Work Protocols (Exhibit I) which outlines specific work practices and requirements to perform work involving the disturbance of the remedy, including submittal of a work plan (*e.g.*, describing how contaminated groundwater and soil/sediment would be safely managed and disposed, workers protected, remedy maintained/re-instated, etc.) to EPA and MassDEP[2] for review and approval prior to performing the work. Depending on the complexity of the work and the contractor's experience working on this site, EPA determines how much oversight is needed. Notwithstanding, there have been instances where property owners or their tenants have conducted intrusive work without notification, where property owners have been required by EPA to comply with the ICs/Consent Decree. The ICs also require the property owner to provide EPA and MassDEP with copies of any building permits issued from the City of Woburn. In addition to ongoing attempts to re-educate the property owners as to the IC requirements, it has been suggested through the FYR interview process that an "EPA check box" be added to the City's permit applications to flag any work within the site boundaries.

Systems Operations/Operation & Maintenance

The O&M phase of the project began in 2005 for OU1 and in 2017 for OU2 (plan approved in June 2016 as part [Appendix F] of the Remedial Design; Haley & Aldrich, 2016).

For OU1, this phase entails:

- inspection (annual) and maintence of all capped areas (engineered constructed caps as well as equivalent cover caps);
- operations and maintenance of the TOU to control fugitive emissions from the EHP; and
- inspection (annual) and maintenance of the vegetated and armored surfaces in wetlands and streams.

For OU2, this phase entails:

- inspection (annual) and maintenance of the vegetated and armored surfaces;
- inspection (annual) and monitoring of steel sheeting and reinforced concrete structures;
- operations and maintenance of Halls Brook bypass flow control systems (annual inspection);
- operations and maintenance of in-pond treatment system blowers, flow controls, and other mechanical systems (monthly inspection);
- operations and maintenance of surface water flow monitoring instrumentation and sampling equipment (bi-weekly inspection);
- surface water monitoring (assess remedy performance and monitor downstream impacts; generally monthly);
- groundwater monitoring (monitor hydraulic gradients, evaluate and verify the continued appropriateness of the required institutional controls; quarterly for first 3 years, then biannual for years 4 to 10); and
- additional monitoring (sediment sampling [every five years], chemocline monitoring [every 6 hours], and sediment accumulation monitoring [every five years]).

The Settling Defendants are performing the required O&M activities.

O&M activities have generally been performed as expected in the O&M plan. OU2 wetland mitigation monitoring was initiated in 2017 (first report submitted in 2018) and the Center Falls Dam Fish Ladder is also

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[2] The NAULs are State property notice documents issued under the authority of the Massachusetts Contingency Plan, 310 CMR 40.000, giving the State the authority to oversee and enforce the NAUL restrictions.

monitored annually (first report submitted in 2018). To date, the initial date of additional sediment and sediment accumulation monitoring (beyond that performed during the remedial action) has not been established. OU1 has annual TOU stack testing and annual physical inspections of all properties requiring a cap.

As noted in the site inspection below, there are items to be addressed as part of O&M, such as OU1 cover maintenance.

III. PROGRESS SINCE THE LAST REVIEW

This is the first five-year review for the Industri-Plex Superfund Site. Therefore, there are no previous protectiveness determinations/statements, nor issues/recommendations.

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Involvement & Site Interviews

A public notice was made available by an EPA press release titled "EPA begins 14 reviews of Massachusetts Superfund site cleanups this year" which included the announcement that EPA was beginning a five-year review on the Industri-Plex Superfund Site during the current fiscal year, on 2/21/2019, and inviting the public to submit any comments to EPA. The results of the review and the report will be made available at the site information repository located at the Woburn Public Library located at 45 Pleasant Street, Woburn, MA and on EPA's website at https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0100580.

During the FYR process, interviews were conducted to document any perceived problems or successes with the remedy that has been implemented to date. Interviews were performed between April 5 and April 24, 2019 with the local citizens' group, MassDEP and the OU1 and OU2 Settling Defendants' site coordinators. Results of these interviews are summarized in Appendix E.

Data Review

OU1 Soil:
Historical analytical results of soil samples collected across OU1 are found in the Pre-Design Investigation Task S-1 Extent of Hazardous Substances in Soils Supplemental Report (Golder, 1991). These data are included in Appendix D. Additional samples were collected in 2017 at 120 Commerce Way and 200 Presidential Way to support additional risk evaluations performed on those properties (Haley & Aldrich, 2017b; Sanborn Head, 2018). Data for those two properties are also included in Appendix D. Covers are in place and remain protective. Periodic site cover inspections may identify properties where normal maintenance activites are necessary to ensure the covers remain in good condition. Several properties are in need of some normal maintenance (see Site Inspection below). Where necessary, EPA may notify property owners of the need for normal maintenance activities on their property. ICs are in place on some properties and in progress on others. On some properties, minor disturbances of the cover inconsistent with the Consent Decree and ICs have occasionally occurred at the site, resulting in EPA notifying the property owner to implement corrective measures. Some examples of these disturbances and corrective measures include, but are not limited to, 2013 Cover Repair Work Plan associated with Utility Pole Guy Wire Anchors along Boston Edison Right of Way (ROW), and 2019 Cover Repair Work Plan associated with Utility Poles along Massachustts Bay Transit Authority ROW. Similar to the work performed prior to the 2018 ESD, any future evaluations necessary for a change in site use would require additional sampling and a risk assessment. The majority of OU1 properties are landscaped, maintained, and/or paved (Class C and D Land, as shown on Figure "Locus" in Appendix G). Discussion related to ecological habitat areas remaining outside covered areas (Class B and A Lands), as shown on Figure "Locus" in Appendix G) is presented in Section V.

OU2 HBHA Pond Sediment:
Appendix D contains sediment analytical results for confirmatory samples collected during the remedial action in the secondary treatment cell (*i.e.*, aeration and settling zones) of the HBHA Pond part of the remedy, including a figure presenting locations sampled. As discussed in the Construction Completion Report (de maximis, 2017), record/confirmatory samples were collected from the excavation floor. The maximum detected arsenic concentration was 130 mg/kg, which is well below the ecological-based cleanup level of 273 mg/kg.

OU2 Wells G&H Wetland and CBCA Sediment:
Appendix D contains sediment analytical results for confirmatory samples collected during the remedial action in the Wells G&H Wetland (East and West) and CBCA, including figures presenting locations sampled. As discussed in the Construction Completion Report (de maximis, 2017), record/confirmatory samples were collected from the excavation floor.

In the CBCA, excavations initially occurred 1 to 2 ft below the original sediment/water interface. Confirmatory samples were collected and checked against the human health-based arsenic cleanup standard (230 mg/kg). If exceedances were found, excavation continued. The maximum concentration of arsenic in the remaining sediments was 150 mg/kg. Following completion of excavation, sediment was restored to its original elevation using clean material.

In the Wells G&H Wetland west, excavations initially occurred 1.5 to 2 ft below the original sediment/water interface. Confirmatory samples were collected and checked against the human health-based arsenic (300 mg/kg) and benzo(a)pyrene (4.9 mg/kg) cleanup levels. If exceedances were found, excavation continued. The maximum concentration of arsenic in the remaining sediments was 230 mg/kg and the maximum concentration of benzo(a)pyrene was 0.72 mg/kg. Following completion of excavation, sediment was restored to its original elevation using clean material.

In the Wells G&H Wetland East, excavations in four areas initially occurred 1 to 2.5 ft below the original sediment/water interface. Confirmatory samples were collected and checked against the human health-based arsenic (300 mg/kg) and benzo(a)pyrene (4.9 mg/kg) cleanup levels. If exceedances were found, excavation continued. The maximum concentration of benzo(a)pyrene in the remaining sediments was 0.78 mg/kg. The maximum concentration of arsenic in the remaining sediments was 280 mg/kg except for one small area with a concentration of 430 mg/kg at a depth of 4.5 feet below the sediment/water interface, which will be incorporated into the ICs. Following completion of excavation, sediment was restored to its original elevation using clean material.

OU2 Lower South Pond Sediment:
Appendix D contains sediment analytical results for confirmatory samples collected during the remedial action in the Lower South Pond, including a figure presenting locations sampled. As discussed in the Close-Out Report (Haley & Aldrich, 2015), record/confirmatory samples were collected from both the excavation floor and excavation sidewalls and compared to the ecological-based benzene cleanup level (1.29 mg/kg). The maximum concentration of benzene in the remaining sediments was 0.58 mg/kg. Following completion of excavation, sediment was restored to its original elevation using clean material.

OU2 Soil:
PDI-12A of the Remedial Design, Part 2 (Haley & Aldrich, 2016) presents soil sample results used to define the extent of IC restrictions required in the area of the Former Mishawum Lake Bed. Appendix D contains these results, which show locations exceeding the arsenic cleanup level of 50 mg/kg to address future health risk to a day care child and construction worker.

OU2 Surface Water:
Appendix D contains surface water analytical results for monitoring performed in and around HBHA Pond since the close-out report in Sepember 2017, including a figure presenting locations sampled. While the point of

compliance is the outlet of the secondary treatment cell at HBHA Pond Outlet (SW-02-TT), other locations are also monitored to evaluate concentrations at inputs to the pond and at various stages throughout the pond, as well as downstream conditions.

Regarding the point of compliance, results since the 2017 close-out report show benzene and arsenic consistently below cleanup levels (46 µg/L and 150 µg/L, respectively). As noted earlier, the ammonia results are evaluated by comparison to the NRWQC OU2 remedy standard, which is temperature and pH-dependent, using both a 30-day and 4-day rolling average. As can be seen in the Appendix D data, during the shake down period there were three elevated levels of ammonia observed for the 30-day rolling average during the winter 2017-2018 from mid-December 2017 through mid-January 2018. The monitoring frequency has been increased during the fall and winter periods, and no elevated levels of the 30-day rolling average have been observed since winter 2017-2018. No elevated levels of 4-day rolling average have been observed since the close-out report. Since the 2006 ROD was issued, the NRWQC for ammonia has since been updated. Further discussion regarding use of the most recent NRWQC standard is presented in Section V below.

OU2 Groundwater:
Per the O&M plan, subsets of monitoring wells (covering both OU1 and OU2 areas) are sampled quarterly and semi-annually. Appendix D contains monitoring results for events which occurred beginning in November 2017, including a figure presenting locations sampled. Various wells were monitored for subsets of parameters which have cleanup levels (ammonia, arsenic, 1,2-dichloroethane, benzene, naphthalene, and trichloroethene). Of the monitoring which has been performed, 1,2-dichloroethane was not detected and trichloroethene was detected in one monitoring round at a level below the OU2 cleanup level (1 µg/L). Other parameters showed continued exceedances of OU2 cleanup levels. Note that the groundwater cleanup levels for each of the volatile analytes are at or below levels currently considered protective with respect to the vapor intrusion pathway. Only one cleanup level (for benzene) is set at a risk level ($2x10^{-6}$) above the lower value in EPA's target risk range of 10^{-6} to 10^{-4}, but still within the acceptable range. Additional discussion of the vapor intrusion pathway is presented in Section V.

Site Inspection

The inspection of the site was conducted on 12/01/2018 (OU1 undeveloped properties (*e.g.*, hide piles), by Gordon Bullard of Twin Lights Associates, LLC (subcontractor to AECOM) and Todd Majer of de maximis, inc. (site manger for the OU1 Settling Defendants); on 12/21/2018 (OU1 developed properties) by Gordon Bullard; on 2/16/2019 (OU2 soil and pond remedies), by Gordon Bullard; and on 3/5/2019 (OU1 and OU2 mechanical components of treatment systems) by Gordon Bullard and a representative of de maximis, inc. In addition, Jennifer Doyle-Breen of AECOM and Settling Defendants' contractor, Robert Hartzel of Comprehensive Environmental Inc., had completed recent inspections of all OU2 wetland mitigation areas on October 9, 2018. The purpose of the inspections was to assess the protectiveness of the remedy. Photos taken during the inspections are included in Appendix B.

For OU-1, a walkover was performed at each property to evaluate cover conditions and if any changes to land use were observed. Appendix B contains an inspection summary, noting which properties show the need for further cover evaluation and/or maintenance. Of the 46 properties inspected, 15 indicated the need for normal maintenance to maintain the cover in good condition. An additional walk-through of the thermal oxidation unit did not show any significant issues.

For OU-2, an inspection was performed around the HBHA Pond and associated drainage ways. An additional walk-through of the treatment building did not show any significant issues. Appendix B contains an inspection summary.

V. TECHNICAL ASSESSMENT

QUESTION A: Is the remedy functioning as intended by the decision documents?

Question A Summary:

OU1

Yes. The review of documents, monitoring data, and the results of site inspections indicate that the cover component of the remedy has been designed and constructed as intended in the ROD. The gas collection and treatement system has been desgned, constructed and is performing as intended in the ROD (*i.e.*, to control nuisance odors emanating from the EHP). ICs, as required under the ROD, have been established at some of the properties and appear to generally be working correctly (see earlier discussion related to IC Status).

The site inspection showed that maintenance is required on some of the covers to maintain the effectiveness of the remedy in the future. This is typically identified in the annual inspection and report submitted by the OU1 Settling Defendants. Maintenance items are addressed following notification to the individual property owners.[3]

As noted above, minor disturbances of the protective cover have occasionally occurred at the site, resulting in the property owners implementing corrective measures on their properties. These corrective actions serve as examples that the remedy and ICs have been effective at the site.

OU2

Yes. The review of documents, monitoring data, and the results of site inspections indicate that the soil/sediment removal components of the remedy have been designed and implemented as intended in the ROD. The HBHA Pond treatment cells also were designed and constructed as intended in the ROD and appear to be removing ammonia and sequestering groundwater contaminants as intended. Impermeable covers were also designed and constructed as intended in the ROD. ICs, as required under the ROD, have not been established yet.

Monthly reports show that the O&M is working in a manner that will continue to maintain the effectiveness of the remedy.

The first Wetlands Mitigation Monitoring Report (CEI, 2018) shows that the three wetland mitigation areas are progressing towards achieving performance standards. Future wetland monitoring will continue annually per the O&M plan for the first 3 years after construction and then annually until performance standards are achieved, and thereafter as part of future five-year reviews.

The first Center Falls Dam Fish Passage Report (Normandeau, 2018) shows that the fish ladder is working well, as approximately 109,000 herrings were observed successfully migrating up the fish ladder in 2018. Per the O&M plan, this monitoring will be performed annually for the first five years and then in years 10 and 15.

QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

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[3] Under the terms of the OU1 CD the OU1 Settling Defendants are responsible to maintain the effectiveness of the Remedial Action as required under the Operation and Maintenance Plan approved or developed by EPA pursuant to this Consent Decree and the Statement of Work (SOW). Landowners are responsible for normal O&M of surface features on top of the remedial components on their properties (*i.e.*, maintaining existing parking lots over remedy caps, mowing).

Question B Summary:

No. There have been changes in exposure assumptions, risk assessment methodologies, and toxicity values since the OU1 and OU2 RODs were issued, however the RAOs selected for the site are still valid. The changes as described below do not affect the protectiveness of the remedy because current and future exposures to remaining site contamination (following site remedial actions, such as sediment excavation, which achieved cleanup levels) are being prevented by the engineered controls, and will be strengthened by the existing and planned institutional controls prohibiting activities that could jeapordize public health and the environment.

Changes in ARARs and To Be Considered (TBCs) Guidance Standards

A review of ARARs was performed to check the impact on the remedy protectiveness due to any changes in standards that were identified in the OU1 and OU2 RODs and 2014 ESD for OU2, new promulgated standards, and/or changes in TBCs. This review is provided separately for OU1 and OU2.

OU1

The 1986 ROD did not include detailed ARARs tables for the selected remedy, as is the standard in more recent RODs; however, ARARs and TBCs were discussed in the text of the ROD. Cleanup levels for OU1 soil were established based on site-specific risk based values developed using TBC guidances and a discussion of any changes to toxicity values and/or risk assessment guidance is provided below. Cleanup levels for OU1 groundwater were based on drinking water standards and are no longer considered applicable, since MassDEP determined that the Industri-Plex aquifer was a Non-Potential Drinking Water Aquifer (see Appendix C). Risk-based groundwater cleanup levels for non-drinking water were later established in the OU2 ROD (replacing the drinking water cleanup standards in the OU1 ROD) as discussed below. Remedial action was also required due to air emissions from the EHP, which contained hydrogen sulfide gas, creating a substantial odor problem. The Massachusetts Air Pollution Control Regulations (310 CMR 7.00), and specifically 310 CMR 7.09, were identified as Relevant and Appropriate in the 1986 ROD because of the requirement that nuisance odors are not permitted to exist, and that every reasonable appropriate control technology be used to prevent the release of nuisance odors.

Regulatory requirements that remain ARARs for the ongoing inspection and maintenance of all capped areas (permeable and impermeable caps as well as equivalent covers) and inspection and maintenance of the vegetated and armored surfaces in wetlands and streams include:

- RCRA Closure and Post-Closure Requirements, 40 CFR Part 264, Subpart G;
- RCRA Closure and Post-Closure Requirements for Landfills, 40 CFR Part 264.310 (relevant to maintenance of the EHP cap);
- Clean Water Act Chapter 404(b)(l) Guidelines for Specification of Disposal Sites for Dredged or Fill Material;
- Massachusetts Hazardous Waste Regulation, Post-Closure (portions of 310 CMR 590 and 30.633(2)(a), (e), and (h)); and
- Massachusetts Wetlands Protection Act and Regulations, MGL c. 131 Ch. 40, 310 CMR 10.00.

Regulatory requirements that remain ARARs for the air emission component of the remedy, which involves ongoing O&M of the thermal oxidation unit to control fugitive emissions from the EHP, include:

- National Ambient Air Quality Standards (NAAQS);
- Massachusetts Air Pollution Control Regulations (310 CMR 7.00); and
- Massachusetts Hazardous Waste Regulation, 310 CMR 30.602(6) (minimize odors), 310 CMR 30.633(2)(g) (maintain gas collection and control systems).

The OU1 Remedial Design (Golder, 1992) stated that odors from the EHP will be controlled with a thermal oxidation flare and an odor air quality standard set to comply with 310 CMR 7.09 was determined in the "Pre-Design Investigation Task A-1, Baseline Air Survey, Interim Final Report" (Golder, 1991) with the point of compliance at the north fenceline. The thermal oxidation flare was determined to meet the Best Available Control Technology (BACT) for attaining the NAAQS in ambient air.

OU2

The 2006 ROD for OU2 (including Wells G&H Superfund Site OU3, Aberjona River Study Area) identified ARARs and TBCs for the selected remedy. In 2014, an ESD was prepared to add an ecological remedial goal for benzene in sediments for the LSP adjacent to the WHP and add the dredging and off-site disposal of LSP sediments exceeding the new benzene cleanup level, with restoration of disturbed areas to a native wetland habitat. ARARs specific to the LSP sediments remediation were provided in tables in Attachment 2 of the ESD.

The 2014 ESD (Attachment 3) also provided updated ARARs tables for the OU2 remedy from what was included in the 2006 ROD. The ESD updated a number of federal and state ARARs cited in the 2006 ROD that either have been eliminated, modified, or otherwise changed from when the 2006 ROD was issued. The revised ARARs tables also cite a number of additional standards not identified in the 2006 ROD, including federal wetland, floodplain, and storm water standards. Tables documenting the review of each ARARs, using the regulations and requirement synopses listed in Attachment 3 of the ESD as a basis, are included as Table F-1 in Appendix F. The evaluation included a determination of whether the requirement is currently ARAR or TBC and whether the requirements have been met.

It is noted that the cleanup level for ammonia in surface water, as cited in the 2006 ROD and 2014 ESD, was based on the 1999 NRWQC-CCC for Fish Early Life Stages Present (value to be adjusted for temperature & pH in accordance with EPA's 1999 Update of Ambient Water Quality Criteria for Ammonia; dated December 1999; EPA Document No. EPQ-822-R-99-014). The NRWQC for ammonia was updated in 2009 and again in 2013 (USEPA, 2013) to reflect new data on sensitive freshwater mussels and snails. The applicability of the revised 2013 NRWQC and the potential need to revise the OU2 remedy discharge standard for ammonia concentrations at the point of compliance to maintain the protectiveness of the remedy should be re-evaluated during the next five-year review period.

Review of any changes in toxicity values and benchmarks and risk assessment guidance identified as TBCs in the decision documents are discussed below for human health and ecological risks.

Review of Human Health Risk Assessment. The human health risk assessments (HHRAs) for the site (an EA for OU1 in the 1985 FS [Stauffer, 1985] and the HHRA in the OU2 RI [Tetra Tech NUS, 2005a]) were conducted using methodology which would partially comply with current EPA risk assessment guidance. A supplemental technical memorandum was produced in 2005 (Tetra Tech NUS, 2005b) which evaluated ammonia data and concluded that ammonia detected in groundwater also caused an unacceptable risk at the site. Note also that there was sub-slab soil gas sample collection performed during the OU2 RI phase to evaluate the potential for vapor intrusion (see additional discussion below).

The primary discrepancies between current guidance and previous guidance, and requiring re-evaluation during this five-year review, exist in the areas of toxicity values and risk assessment methods (primarily exposure parameter assumptions). The following section provides an evaluation of the changes that have occurred since 1985 and 2005, and their impact on the protectiveness of the remedy.

Human Health Changes in Toxicity and Other Contaminant Characteristics

Toxicity values have changed since the 1985 EA and 2005 HHRA were performed for the Industri-Plex site. While some of these changes would potentially increase the cancer risk and non-cancer hazard associated with the exposures to soil, sediment and groundwater evaluated, these toxicity changes do not affect the current protectiveness of the remedy, because engineered controls are in place, the groundwater is currently not being used, and ICs will prevent exposures to residual soil, sediment, and groundwater. During the time that ICs are not in place, as discussed earlier, work plans are typically submitted to EPA for review to establish means and methods for preventing exposures and maintaining the remedy.

- **2011 TCE** cancer and non-cancer toxicity values

On September 28, 2011, EPA finalized the December 2009 revised toxicity values for trichloroethene (TCE). The new values indicate that TCE is more toxic from both cancer and non-cancer health effects. These toxicity changes would result in increased non-cancer hazard and cancer risk from exposure to TCE. TCE is now considered to be carcinogenic by a mutagenic mode of action (MMOA); therefore, cancer risks must be evaluated for different human developmental stages using age-dependent potency adjustment factors (ADAFs) for different age groups. At the Industri-Plex site, there is a risk-based cleanup level for TCE for non-drinking water groundwater (1 µg/L; protective of future industrial and/or car wash workers). As the cleanup level is designed to protect an adult, the MMOA has no impact on the risk/cleanup level. There is no current exposure to site-impacted groundwater and institutional controls will prevent future exposures once implemented until cleanup levels have been achieved. During the time that ICs are not in place, as discussed earlier, work plans are typically submitted to EPA for review to establish means and methods for preventing exposures to groundwater. Therefore, the protectiveness of the remedy is not affected by this change to the toxicity values. However, future decision document updates should include evaluation to determine if the cleanup level should be updated for this analyte.

- **2017 Ammonia** non-cancer toxicity value

In June 2017, EPA revised the non-cancer inhalation reference concentration (RfC) for ammonia based on an updated Integrated Risk Information System (IRIS) value. The revised value indicates that ammonia is less toxic from non-cancer health effects. This change would result in decreased non-cancer hazard from inhalation exposure to ammonia. At the Industri-Plex site, there is a risk-based cleanup level for ammonia in groundwater (4,000 µg/L; protective of a future car wash worker). There is no current exposure to site-impacted groundwater and institutional controls will prevent future exposures once implemented until cleanup levels have been achieved. Therefore, the protectiveness of the remedy is not affected by this change to the toxicity value. During the time that ICs are not in place, as discussed earlier, work plans are typically submitted to EPA for review to establish means and methods for preventing exposures to groundwater. However, future decision document updates should include evaluation to determine if the cleanup level should be updated for this analyte. Ammonia is evaluated for vapor intrusion impacts below.

- **2016 Lead** in soil cleanups

EPA’s 2016 OLEM memorandum "Updated Scientific Considerations for Lead in Soil Cleanups" (Office of Land and Emergency Management [OLEM] Directive 9200.2-167) indicates that adverse health effects are associated with blood lead levels (BLLs) at less than 10 µg/dL. The memo mentioned that several studies have observed “clear evidence of cognitive function decrements in young children with mean or group BLLs between 2 and 8 µg/dL.” Any soil screening, action or cleanup level developed based on previous BLL of 10 µg/dL may not be protective.

EPA’s approach to evaluate potential lead risks is to limit exposure to residential and commercial soil lead levels such that a typical (or hypothetical) child or group of similarly exposed children would have an estimated risk of no more than 5% of the population exceeding a 5 µg/dL BLL. This is based on evidence indicating cognitive impacts at BLLs below 10 µg/dL. Additionally, this approach aligns with the Lead Technical Review Workgroup’s current support for using a BLL of 5 µg/dL as the level of concern in the Integrated Exposure Uptake Biokinetic Model (IEUBK) and Adult Lead Methodology (ALM). A target BLL of 5 µg/dL reflects current scientific literature on lead toxicology and epidemiology that provides evidence that the adverse health effects of lead exposure do not have a threshold.

EPA's 2017 OLEM memorandum "Transmittal of Update to the Adult Lead Methodology's Default Baseline Blood Lead Concentration and Geometric Standard Deviation Parameters" (OLEM Directive 9285.6-56) provides updates on the default baseline blood lead concentration and default geometric standard deviation input parameters for the Adult Lead Methodology. These updates are based on the analysis of the NHANES 2009-2014 data, with recommended updated values for baseline blood lead concentration being 0.6 µg/dL and geometric standard deviation being 1.8.

Using updated default IEUBK and ALM parameters at a target BLL of 5 µg/dL, site-specific lead soil screening levels (SLs) of 200 mg/kg and 1,000 mg/kg are developed for residential and commercial/industrial exposures, respectively.

As presented above, the cleanup level for OU1 soil (600 mg/kg) was established to protect industrial workers. As the paragraph above sets a lead soil SL at 1,000 mg/kg for commercial/industrial exposures, the existing cleanup level remains protective of industrial workers. This update to the Region 1 lead strategy would not impact the current protectiveness of the remedy. If land use or site conditions were to change in the future, lead may need to be re-evaluated. As noted below under ***Changes in Exposure Pathways/Assumptions,*** land use changes were evaluated for two properties associated with OU1 where individual baseline risk assessments were performed to assess future residential purposes including the updated default IEUBK and ALM parameters and 2017 OLEM memorandum. The land use change for these two properties was documented in the 2018 ESD.

For OU2, lead was a COPC in two areas of the site (near HBHA Pond and in the area of the former Mishawum Lake), with a maximum average lead concentration of approximately 1200 mg/kg (Tetra Tech NUS, 2005a). Based on the site-specific time-weighted exposure point concentrations developed for a residential child (140 mg/kg) and the adult exposure frequency presented in Tetra Tech NUS, 2005a, use of a target BLL of 5 µg/dL and updated ALM parameters still results in less than 5% exceedance of that target BLL.

- **2017 Polycyclic Aromatic Hydrocarbons (PAHs)** cancer and non-cancer toxicity values

On January 19, 2017, EPA issued revised (less carcinogenic) cancer toxicity values and new non-cancer toxicity values for benzo(a)pyrene. Benzo(a)pyrene did not have non-cancer toxicity values prior to January 19, 2017. Benzo(a)pyrene is now considered to be carcinogenic by a mutagenic mode of action; therefore, cancer risks must be evaluated for different human developmental stages using ADAFs for different age groups. The cancer potency of other carcinogenic PAHs is adjusted by the use of relative potency factors (RPFs), which are expressed relative to the potency of benzo(a)pyrene. The non-cancer effects of benzo(a)pyrene were not evaluated in the past due to the absence of non-cancer values. At the Industri-Plex site, there was a risk-based sediment cleanup levels for benzo(a)pyrene at the Wells G&H Wetland, set at a cancer risk of $1\text{x}10^{-5}$ (see Appendix C). The remedy performed at the Wells G&H Wetland achieved these cleanup levels. Using the current toxicity values, the cleanup levels would be higher for the same risk level. Therefore, these changes do not affect the protectiveness of the remedy.

- **Hexavalent Chromium**

Hexavalent chromium has been determined to exist at the site. The 2005 HHRA (Tetra Tech NUS, 2005a) performed chromium speciation which concluded that 2% of total chromium in soils existed in the hexavalent state. While this study was performed on the OU2 soil, the origination of the hexavalent chromium is assumed to be from the OU1 historical operations. The OU1 cover material maintains protectiveness in these areas. The toxicity of hexavalent chromium has changed since the 1985 OU1 EA and the 2005 OU2 HHRA. The current oral slope factor, as used in the EPA Regional Screening Level (RSL) table is 0.5 mg/kg-day^{-1}. A review of the soil exposure point concentrations (EPCs) in the 2005 OU2 HHRA shows a maximum of 23 mg/kg, which is below a current residential RSL set at 10^{-4} cancer risk (30 mg/kg). All receptors evaluated in the 2005 OU2 HHRA are less conservative than a residential exposure. Therefore, this change does not affect the protectiveness of the remedy.

- **2016 PFOA/PFOS[4] non-cancer toxicity values**

In May 2016, EPA issued final lifetime drinking water health advisories for perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS), which identified a chronic oral reference dose (RfD) of 2E-05 mg/kg-day for PFOA and PFOS (USEPA, 2016a and USEPA, 2016b). These RfD values should be used when evaluating potential risks from ingestion of contaminated groundwater at Superfund sites where PFOA and PFOS might be present based on site history. Considering the disposal activities at the Site (*e.g.*, glue manufacturing operations), PFOA and PFOS should be evaluated further at the Site. Potential estimated health risks from PFOA and PFOS, if identified, would likely increase total site risks due to groundwater exposure. Further evaluation of potential risks from exposure to PFOA and PFOS in other media at the Site might be needed based on site conditions and can also affect total site risks. There is no current exposure to site-impacted groundwater and institutional controls will prevent future exposures once implemented until cleanup levels have been achieved. Therefore, the protectiveness of the remedy is not affected by this change to the toxicity values.

- **2014 PFBS[5] non-cancer toxicity value**

Perfluorobutanesulfonic acid (PFBS) has a chronic oral RfD of 2E-02 mg/kg-day based on an EPA Provisional Peer Reviewed Toxicity Value (PPRTV) (USEPA, 2014d). This RfD value should be used when evaluating potential risks from ingestion of contaminated groundwater at Superfund sites where PFBS might be present based on site history. Considering the variety of disposal activities at the Site (e.g., glue manufacturing operations), PFBS should be evaluated further at the Site. Potential estimated health risks from PFBS, if identified, would likely increase total site risks due to groundwater exposure. Further evaluation of potential risks from exposure to PFBS in other media at the Site might be needed based on site conditions and can also affect total site risks. There is no current exposure to site-impacted groundwater, and institutional controls will prevent future exposures once implemented until cleanup levels have been achieved. Therefore, the protectiveness of the remedy is not affected by this change to the toxicity values.

Sampling for PFAS in groundwater has not yet been done at the site, but is being recommended by the next FYR period. As noted above, these new toxicity values do not affect the current protectiveness of the remedy.

Although calculated risks for the site may differ from those previously estimated, slightly higher for some contaminants and slightly lower for others, the revised toxicity values discussed in this section are not expected to affect the protectiveness of the remedy.

Human Health Changes in Risk Assessment Methods

There have also been multiple changes to EPA's risk assessment methodologies since the 2005 risk assessment. As noted above, engineered controls are in place, the groundwater is currently not being used, and institutional controls will prevent exposures. During the time that ICs are not in place, as discussed earlier, work plans are typically submitted to EPA for review to establish means and methods for preventing exposures to residual soil, sediment, and groundwater among other work protocols. Therefore, changes in methodologies do not affect the current protectiveness of the remedy for the site. It should be noted that current methodologies were used during evaluations prepared as part of the 2018 OU1 ESD.

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[4] PFOA and PFOS are Per-and Polyfluoroalkyl Substances (PFAS).

[5] PFBS is a PFAS.

- **2014 OSWER Directive Determining Groundwater Exposure Point Concentrations, Supplemental Guidance**

In 2014, EPA finalized a Directive to determine groundwater EPCs. https://www.epa.gov/sites/production/files/2015-11/documents/OSWER-Directive-9283-1-42-GWEPC-2014.pdf. This Directive provides recommendations to develop groundwater EPCs. The recommendations to calculate the 95% UCL of the arithmetic mean concentration for each contaminant from wells within the core/center of the plume, using the statistical software ProUCL could result in lower groundwater EPCs than the maximum concentrations routinely used for EPCs as past practice in risk assessment, leading to changes in groundwater risk screening and evaluation. In general, this approach could result in slightly lower risk or higher screening levels (USEPA, 2014b). With the elevated levels of groundwater contamination detected at the Industri-Plex site, this change would not have resulted in a different risk management decision at the site. However, it may be appropriate to utilize these recommendations during any future evaluations performed as concentrations decrease and the site approaches closure.

- **2014 OSWER Directive on the Update of Standard Default Exposure Factors**

In 2014, EPA finalized a Directive to update standard default exposure factors and frequently asked questions associated with these updates. https://www.epa.gov/sites/production/files/2015-11/documents/oswer_directive_9200.1-120_exposurefactors_corrected2.pdf (USEPA, 2014c). Many of these exposure factors differ from those used in the risk assessment supporting the 1985 EA and the 2006 ROD. These changes in general would result in a slight decrease of the risk estimates for most chemicals. With respect to the five risk-based performance standards developed in the 2006 ROD, these changes, along with the toxicity changes noted above, would result in differences, were they developed today. It may be appropriate to review the performance standards as concentrations decrease and the site approaches closure.

Note that a site-specific study was performed to determine a relative bioavailability of arsenic in sediments in the Aberjona River (Casteel, et al., 2002). This site-specific value was used to quantify sediment ingestion risks at the site.

There is no current exposure to site contaminants in soil and groundwater, and institutional controls will prevent future exposures once implemented until cleanup levels have been achieved. Therefore, the protectiveness of the remedy is not affected by this change to the standard default exposure factors. However, future decision document updates should include updates to performance standards, as appropriate.

- **2018 EPA VISL Calculator**

In February 2018, EPA launched an online Vapor Intrusion Screening Level (VISL) calculator which can be used to obtain risk-based screening level concentrations for groundwater, sub-slab soil gas, and indoor air. The VISL calculator uses the same database as the Regional Screening Levels (RSLs) for toxicity values and physiochemical parameters and is automatically updated during the semi-annual RSL updates. Please see the User's Guide for further details on how to use the VISL calculator. https://www.epa.gov/vaporintrusion/vapor-intrusion-screening-level-calculator.

The 2005 HHRA evaluated vapor intrusion for occupied buildings at the site using sub-slab soil gas data. This evaluation was performed by modeling indoor air concentrations from soil gas concentrations for seven buildings. In addition, as noted earlier, odors were detected in a building neighboring the East Central Hide Pile and a study was performed related to gas migration (Geosyntec, 2015). While these studies did not indicate a vapor intrusion/gas migration concern, these studies were property-specific and the conclusions should not be extrapolated to all properties on the site. In addition, ammonia was not included in the evaluation.

Using the VISL calculator, recent groundwater results (November 2018) were evaluated (see Appendix D for data). The maximum ammonia detection (453,000 µg/L) was below the target groundwater concentration (792,000 µg/L) set at a Hazard Index (HI) = 1 and risk level of 10^{-6}. Of the four volatile organic compounds (VOCs) analyzed, only benzene (maximum detection of 43,000 µg/L) and TCE (0.44 µg/L) were detected in that round of monitoring. Naphthalene was detected in a previous round (May 2018) at a maximum of 68 µg/L. Benzene shows an exceedance of its target groundwater concentration (138 µg/L) set at an HI = 1 and risk level of 10^{-4}. Both benzene and naphthalene showed an exceedance of target groundwater concentrations (2 µg/L and 5 µg/L, respectively) set at an HI = 1 and risk level of 10^{-6}. These results show that the vapor intrusion pathway may be of concern, and should be evaluated. Concerns of methane and hydrogen sulfide (both of which are hide pile-related) migration to indoor air should also be evaluated further.

EPA updates RSL tables twice a year and the most current ones are available at the EPA Regional Screening Levels web page (https://www.epa.gov/risk/regional-screening-levels-rsls), updated November 2018.

Changes in Exposure Pathways/Assumptions

In general, there have been no changes to the exposure pathways evaluated in the 1985 EA and the 2005 HHRA. As noted above, there have been changes to exposure parameters, but these do not affect the protectiveness of the remedy. However, for the 2018 OU1 ESD issued to address two specific OU1 properties (120 Commerce Way and 200 Presidential Way), individual baseline risk assessments were performed related to use of the commercial parcels for residential purposes. Any future requests related to a different land use would be required to perform similar evaluations.

Review of Ecological Risk Assessment. As described under the Response Actions, 1986 ROD selected a remedy for OU1 that included construction of caps over soil and sediment exceeding cleanup levels and remedies to address groundwater contamination. This remedy was designed to remove exposures to soils and sediments based on risks to human health. A formal ecological risk assessment was not conducted for OU1 using the methodology that would generally comply with current EPA risk assessment guidance. The 1986 ROD required remedies to cover or remove soils with concentrations of arsenic, lead, and chromium exceeding 300 mg/kg, 600 mg/kg and 1,000 mg/kg, respectively, based on protection of human receptors (workers). As part of this five year review, EPA re-evaluated the historical soil and sediment data associated with OU1 and determined that no further ecological risk evaluation is necessary. EPA’s evaluation is documented in an April 15, 2019 memorandum to the file, and can be found in Appendix I.

The MSGRP RI Study Area in OU2, addressed in the MSGRP RI, included the area from the Wilmington/Woburn town line south to I-95 (Northern Study Area) and from I-95 south to, and including, the Mystic Lakes (Southern Study Area) (See Figure 1-1 in Appendix G). The Southern Study Area encompassed the Wells G&H site (OU3) and the Aberjona River study area south of the Wells G&H site to the Mystic Lakes. The separate baseline risk assessments which were completed for the Northern Study Area and the Southern Study Area were combined and refined into a comprehensive risk evaluation for the Industri-Plex site and the entire Aberjona River in the comprehensive MSGRP RI (Tetra Tech NUS, 2005a) for OU2.

A Screening-Level Ecological Risk Assessment (SLERA) of data collected from the Southern Study Area was documented in the Baseline Ecological Risk Assessment (BERA) for Wells G&H OU3 (M&E, 2004). During this screening-level effort, COPCs were selected and carried forward for quantitative evaluation in the 2004 BERA. The MSGRP RI presented this screening for the Southern Study area as well as selection of COPCs for the Northern Study Area. The BERA for the Northern Study Area was included in the MSGRP RI as Appendix 7. Note that OU2 incorporates the downstream surface water and sediment from Wells G&H OU3 (Aberjona River Study) as there is an overlap of contamination in the connected water bodies.

The following sections review the protectiveness of the remedies implemented at the Industri-plex site relative to ecological exposures initially evaluated in the risk evaluations described above.

Identification of Chemicals of Concern

The 2005 BERA (MSGRP RI) was conducted using methodology that would generally comply with current EPA risk assessment guidance. The combined BERA concluded there were unacceptable ecological risks from exposure of arsenic in sediment of HBHA Pond, and benzene, arsenic and ammonia in deep surface water of HBHA Pond. The 2006 OU2 ROD documents these results and the cleanup levels established based on the BERA. In addition, data collection completed as part of Pre-Design Investigations (PDIs) for the West Hide Pile recorded high levels of benzene in Lower South Pond sediment samples, and no cleanup level was available from the previous site assessments. Consequently, the 2014 OU2 ESD developed a benzene sediment cleanup action level (1.290 mg/kg) to protect ecological receptors, and required sediments in the LSP above the action level to be removed.

Standards review (eco-specific)

The primary discrepancies between current guidance and previous guidance exist in the areas of benchmarks and toxicity values utilized. There are also minor differences in the recommended toxicity testing approaches and in the factors used in wildlife modeling. Since the risk evaluation performed in 2005 and the OU2 ESD in 2014, there have not been any significant changes in recommended ecological benchmarks utilized for sediment or soil, and only a limited number of changes in NRWQC values for surface water. The NRWQC changes include new standards for aluminum, cadmium, selenium, and ammonia. The only newly promulgated standard, relevant to the site ecological risk assessment (ERA), which bears on the protectiveness of the remedy is the current NRWQC for ammonia (USEPA, 2013). Otherwise, a review of the standards indicates there are no other newly promulgated standards, relevant to the site, which bear on the protectiveness of the remedy. Exceedances of water quality criteria related to compliance monitoring are discussed below.

Changes in Exposure Pathways

Ecological routes of exposure have been changed by implementation of the remedy. In OU1, construction of over 100 acres of cap has reduced exposure and eliminated pathways for exposure to ecological receptors throughout OU1. In OU2, the use of the entire HBHA Pond as part of the remedy (primary and secondary treatment cells) eliminated the pathway for aquatic exposure, as this area is no longer expected to function as aquatic habitat. The loss of aquatic habitat resulting from the remedy was compensated by a comprehensive wetland mitigation program implemented as part of the remedy elsewhere in the watershed. In addition, excavation of contaminated sediments above site-specific cleanup levels in LSP (benzene) reduced the potential for exposure to aquatic life. The removal of contaminants from this area has contributed to the reduction in exposure and increased effectiveness of the remedy.

Expected Progress Towards Meeting RAOs

The remedial actions which have taken place at the site have addressed current human health and ecological risks at the site. ICs still require implementation for maintaining future protectiveness. The following paragraphs discuss the residual chemicals at the site following remedial actions taken to date. These residuals are evaluated regarding achieving goals put forth in the RAOs.

OU1 Soil. As stated earlier, the lead cleanup level remains protective of industrial workers. Comparison of the arsenic and chromium cleanup levels (300 mg/kg and 1000 mg/kg, respectively) to current human health risk screening levels (using updated toxicity values and current methods) found in the RSL tables, show that the residual soil cancer risk for a worker exposure is $1x10^{-4}$ for arsenic, which is within EPA's target risk range of 10^{-4} to 10^{-6}. Both arsenic and chromium are below their respective non-cancer screening levels (set at a hazard index of 1). Therefore, the cleanup levels remain protective. As discussed earlier, site-specific chromium speciation performed at OU2 concluded that 2% of the chromium is hexavalent chromium. If applying this percentage to OU1 when looking at the cleanup level (so 20 mg/kg as hexavalent chromium), this would result in an incremental cancer risk of $3x10^{-6}$, which would not push the total cancer risk beyond EPA's target risk range of

10^{-4} to 10^{-6}. In addition, any future evaluations necessary for a change in site use would require additional sampling and a risk assessment similar to the work performed under the 2018 ESD.

OU2 Soil. A cleanup level was set for arsenic (50 mg/kg set at a cancer risk of $4x10^{-5}$) to establish extent of ICs for protection of a day care child. By comparison, the current residential risk screening level at a cancer risk of $1x10^{-4}$ is 68 mg/kg. Therefore, even if the existing cleanup level were used for residential purposes (more conservative than a day care child), it would be within EPA's target risk range of 10^{-4} to 10^{-6}.

OU2 Sediment. Based on changes to exposure parameters and toxicity values discussed earlier, sediment cleanup levels developed to protect human health remain protective, as parameters and toxicity values applied previously were ultimately more conservative than current ones.

As presented in the data review section, confirmatory samples collected for comparison to human health cleanup goals in the Wells G&H wetland and CBCA sediment, although not subject to an ecological cleanup level, generally had sediment arsenic concentrations below the ecological sediment cleanup level of 273 mg/kg. Two surficial sediment samples collected in the Wells G&H east wetland showed detections (280 mg/kg) slightly above the ecological value. All surficial sediment samples were below the human health cleanup levels set for the wetland sediment remedial action, thereby demonstrating compliance with RAOs.

Record/confirmatory samples collected in LSP, were compared to the ecological-based cleanup level for benzene (1.29 mg/kg) and showed a maximum concentration of 0.58 mg/kg, demonstrating compliance with RAOs.

OU2 Surface Water. Cleanup levels for the protection of ecological receptors were established in the 2006 ROD for arsenic, benzene, and ammonia in the surface water at the outlet of HBHA Pond. Surface water sampling conducted since remedial system closeout report indicated no excedences of arsenic or benzene surface water cleanup levels (see Appendix D). Sampling at the compliance point at the outlet of HBHA Pond showed minor elevated levels of the selected cleanup level for ammonia (30-day running average) during the shakedown period in winter 2017-2018, above the chronic NRWQC clean up standard (set in the 2006 ROD). No exceedances of the ammonia 30-day running average have been observed since the winter 2017-2018 shakedown. All measured ammonia concentrations were below the 4-day average for all monitoring performed since the closeout report. Thus, the surface water results demonstrate the effectiveness of the remedy toward reducing the contaminant levels and compliance with surface water cleanup levels as set in the 2006 ROD.

However, in 2009 and again in 2013, the NRWQC for ammonia was updated. The 2013 update reflects new data on sensitive freshwater mussels and snails. The applicability of the revised 2013 NRWQC and the potential need to revise the OU2 remedy discharge standard for ammonia concentrations at the point of compliance to maintain the protectiveness of the remedy should be re-evaluated during the next five-year review period.

QUESTION C: Has any **other** information come to light that could call into question the protectiveness of the remedy?

No other information has come to light that could call into question the protectiveness of the remedy.

VI. ISSUES/RECOMMENDATIONS

Issues/Recommendations
OU(s) without Issues/Recommendations Identified in the Five-Year Review:
None

Issues and Recommendations Identified in the Five-Year Review:

<table>
<tr><td rowspan="3">OU(s): OU1, OU2</td><td colspan="4">Issue Category: Institutional Controls</td></tr>
<tr><td colspan="4">Issue: Institutional controls restricting inappropriate land uses and protecting the remedy components need to be established on OU1 and OU2 properties.</td></tr>
<tr><td colspan="4">Recommendation: Discussions between EPA, MassDEP, Settling Defendants, and the property owners are ongoing. Upon completion of discussions between the parties, institutional controls should be established.</td></tr>
<tr><td>Affect Current Protectiveness</td><td>Affect Future Protectiveness</td><td>Party Responsible</td><td>Oversight Party</td><td>Milestone Date</td></tr>
<tr><td>No</td><td>Yes</td><td>Settling Defendants</td><td>EPA/State</td><td>12/31/2020</td></tr>
</table>

<table>
<tr><td rowspan="3">OU(s): OU2</td><td colspan="4">Issue Category: Remedy Performance</td></tr>
<tr><td colspan="4">Issue: The NRWQC for ammonia has been updated since the 2006 ROD.</td></tr>
<tr><td colspan="4">Recommendation: Evaluate whether the revised 2013 NRWQC calls for a change to the discharge standards in the OU2 ROD for ammonia concentrations at the point of compliance to maintain the protectiveness of the remedy.</td></tr>
<tr><td>Affect Current Protectiveness</td><td>Affect Future Protectiveness</td><td>Party Responsible</td><td>Oversight Party</td><td>Milestone Date</td></tr>
<tr><td>No</td><td>Yes</td><td>Settling Defendants</td><td>EPA</td><td>5/31/2024</td></tr>
</table>

<table>
<tr><td rowspan="3">OU(s): OU2</td><td colspan="4">Issue Category: Remedy Performance</td></tr>
<tr><td colspan="4">Issue: Groundwater exceedances of VISLs (<i>e.g.</i>, benzene, trichloroethene, naphthalene) show that the vapor intrusion pathway may be of concern. Migration of methane and hydrogen sulfide to nearby buildings may also be of concern.</td></tr>
<tr><td colspan="4">Recommendation: Evaluate the potential for vapor intrusion from groundwater contaminants to pose an unacceptable risk and the potential for migration of methane and hydrogen sulfide from animal hide residue/remnants to nearby buildings posing an explosive hazard or risk.</td></tr>
<tr><th>Affect Current Protectiveness</th><th>Affect Future Protectiveness</th><th>Party Responsible</th><th>Oversight Party</th><th>Milestone Date</th></tr>
<tr><td>No</td><td>Yes</td><td>Settling Defendants</td><td>EPA</td><td>5/31/2024</td></tr>
</table>

<table>
<tr><td rowspan="3">OU(s): OU2</td><td colspan="4">Issue Category: Other (PFAS)</td></tr>
<tr><td colspan="4">Issue: Groundwater monitoring has not included analysis for PFAS, so it is unclear if these chemicals are contaminants of potential concern at the site.</td></tr>
<tr><td colspan="4">Recommendation: Include analysis for PFAS in an upcoming groundwater monitoring event to determine if these compounds are contmainants of potential concern at the site.</td></tr>
<tr><th>Affect Current Protectiveness</th><th>Affect Future Protectiveness</th><th>Party Responsible</th><th>Oversight Party</th><th>Milestone Date</th></tr>
<tr><td>No</td><td>Yes</td><td>Settling Defendants</td><td>EPA</td><td>12/31/2020</td></tr>
</table>

VII. PROTECTIVNESS STATEMENT

Protectiveness Statement(s)	
Operable Unit: OU1	*Protectiveness Determination:* Short-term Protective

Protectiveness Statement:
The remedy at OU1 currently protects human health and the environment, as exposure pathways that could result in unacceptable risks are being controlled. Soils and waste are covered, there is no current use of groundwater, and some institutional controls are in place. Operation and Maintenance activities are in place to ensure that the covers and associated components of the remedy remain in good condition. Annual inspections must continue to be conducted to ensure that deficiencies are noted and corrected. However, in order for the remedy to be protective in the long-term, additional institutional controls will be created and recorded to restrict inappropriate land uses (including use of groundwater) and protect the components of the remedy. .

Protectiveness Statement(s)	
Operable Unit: OU2	*Protectiveness Determination:* Short-term Protective

Protectiveness Statement:
The remedy at OU2 currently protects human health and the environment, as exposure pathways that could result in unacceptable risks are being controlled. The water treatment remedy is active and meeting treatment standards. There is no current use of groundwater. Operations and Maintenance activities have been initiated and will ensure that the components of the remedy remain in good condition. In addition, monitoring of groundwater and surface water will continue to assess the continued protectiveness of the water treatement remedy. However, in order for the remedy to be protective in the long-term: institutional controls will be created and recorded to restrict inappropriate land uses (including use of groundwater) and protect the components of the remedy; an evaluation of whether the revised 2013 NRWQC for ammonia changes the discharge standards will be performed; an evaluation of the potential for vapor intrusion from groundwater contaminants and methane and hydrogen sulfide gases will be performed; and analyze for PFAS in upcoming monitoring will be performed to determine if PFAS are COPCs.

Sitewide Protectiveness Statement

Protectiveness Determination:
Short-term Protective

Protectiveness Statement:
The remedies at the Industri-Plex site currently protect human health and the environment, as exposure pathways that could result in unacceptable risks are being controlled. However, in order for the remedy to be protective in the long-term: institutional controls will be created and recorded to restrict inappropriate land uses (including use of groundwater) and protect the components of the remedy; an evaluation of whether the revised 2013 NRWQC for ammonia changes the discharge standards will be performed; an evaluation of the potential for vapor intrusion from groundwater contaminants and methane and hydrogen sulfide gases will be performed; and analyze for PFAS in upcoming monitoring will be performed to determine if PFAS are COPCs.

VIII. NEXT REVIEW

The next five-year review report for the Industri-Plex Superfund Site is required five years from the completion date of this review.

Appendix A
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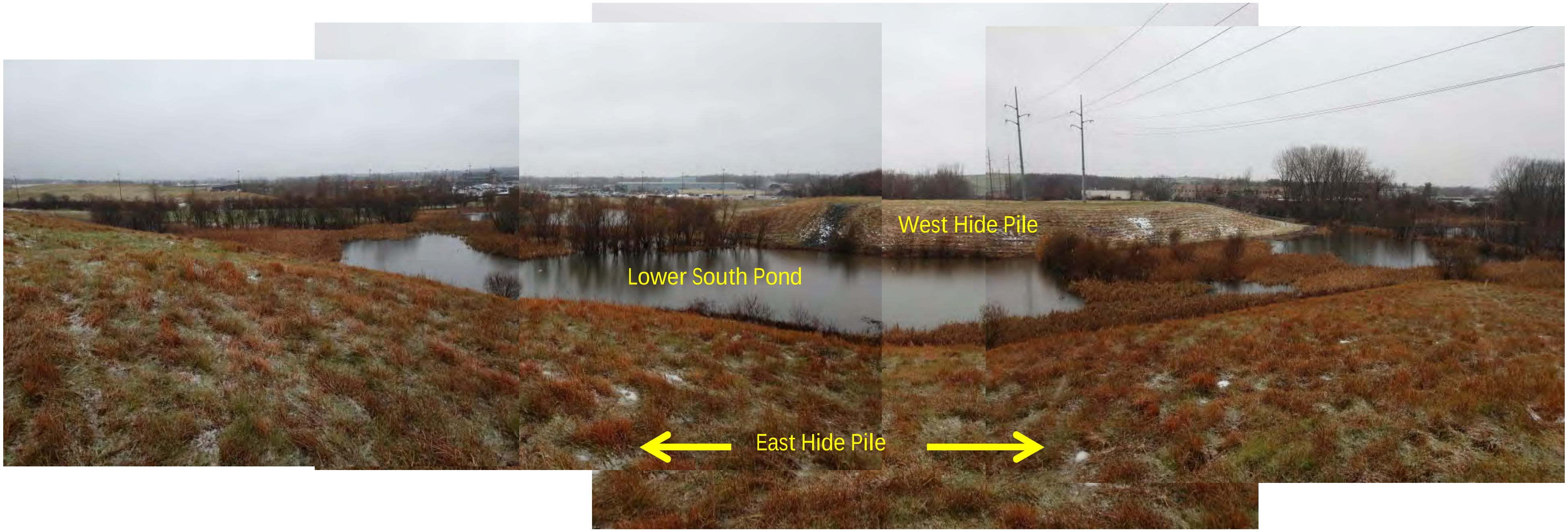
Appendix B
Site Walkover Photos and Inspection Summary

B.1 – Site Walkover Photos

OU1

On East Hide Pile facing west. All surfaces in view are engineered permeable cover systems.



OU1

West Hide Pile armored slope drain on eastern slope.

OU1

East Hide Pile northern edge and tow of slope. New section of replacement fencing recently installed.

OU1

East Central Hide Pile base facing west. Created Wetland in the background. Recent maintenance/supplemental plantings in the foreground.

OU1

Southern edge of East Central Hide Pile. Small area with minor differential settlement.

OU1

Boston Edison (NSTAR) Right of Way – typical engineered gravel cover system.

OU1

East Drainage Ditch – typical armored drainage channel. Note vegetation in channel being maintained by property owner.

OU1

On South Hide Pile facing west. Atlantic Avenue Drainway in foreground, adjacent to the Regional Transportation Center detention basin.

OU1

Typical armored drainage channel – shown is Atlantic Avenue Drainway. HBHA Pond is in the background.

OU1

Typical surface water monitoring/gauging/sample station–shown is Atlantic Avenue Drainway.

OU1

Typical paved equivalent cover in good condition. Shown is New Boston Street, parking area at 217 New Boston street. Also grassed area shown is typical engineered permeable cover system in good condition.

OU1

Examples of stressed paved equivalent cover. Noted is alligator cracking, delamination, and potholes developing. Repairs are scheduled. (Note that no underlying contaminated soils were exposed)

OU1

Example of stressed paved equivalent cover with delamination of previous overlay repair. Damage caused by lack of adequate structural base layers under the original paved surfaces. (Note that no underlying contaminated soils were exposed)

OU1

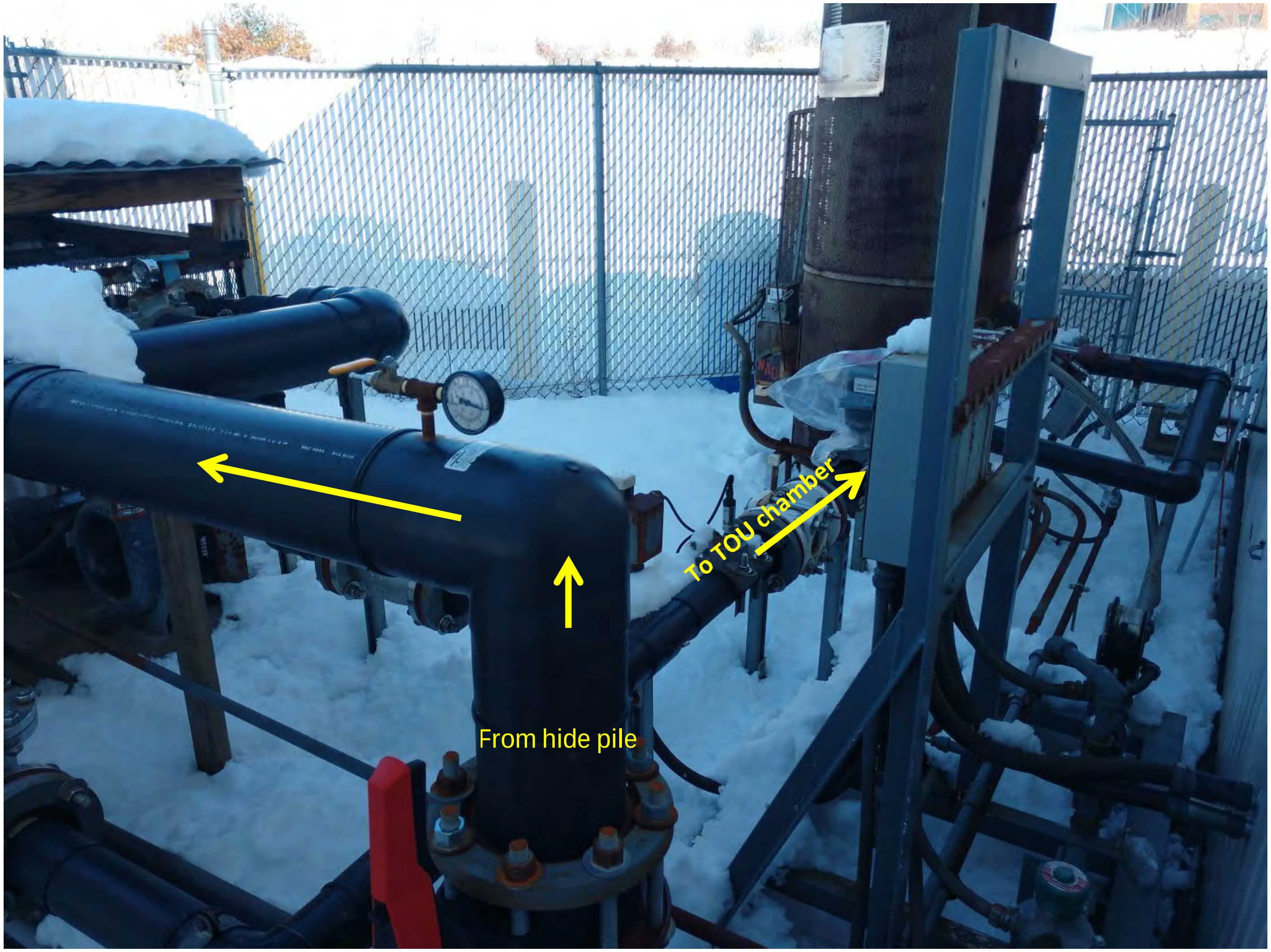
Example of ongoing owner maintenance and repair of stressed paved equivalent cover. Shown are examples of crack sealing and patches.

OU1

Air Remedy - Thermal Oxidation Unit - exterior

OU1

Air Remedy - Thermal Oxidation Unit - exterior



OU1

Air Remedy - Thermal Oxidation Unit – interior - controls

OU2

Halls Brook Storm By-Pass structure

OU2

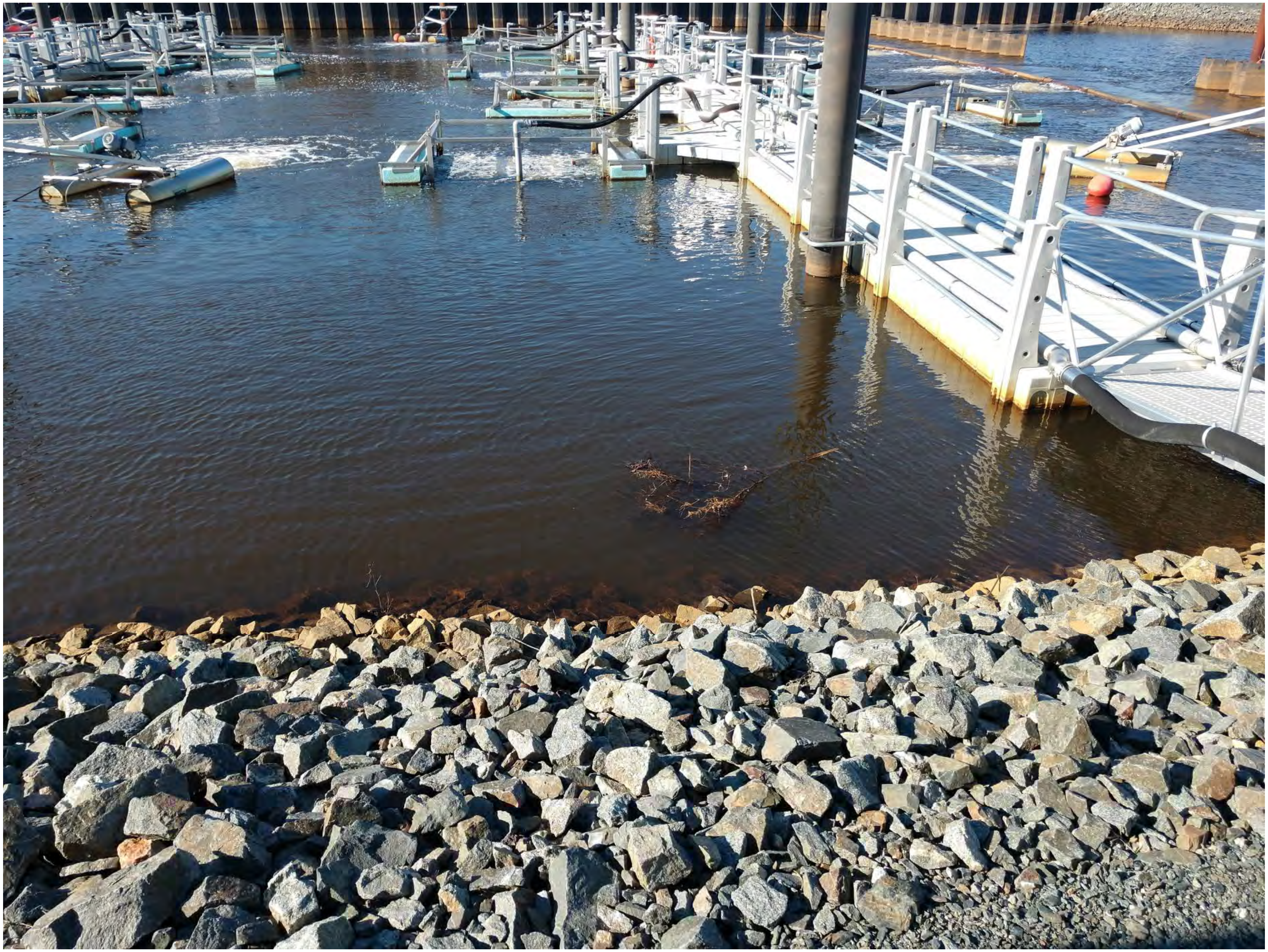
Halls Brook Storm By-Pass structure – additional views

OU2

Halls Brook Holding Area Pond Outlet Structure

OU2

Webitat Biological Treatment Units in the Secondary treatment cell of the HBHA Pond.

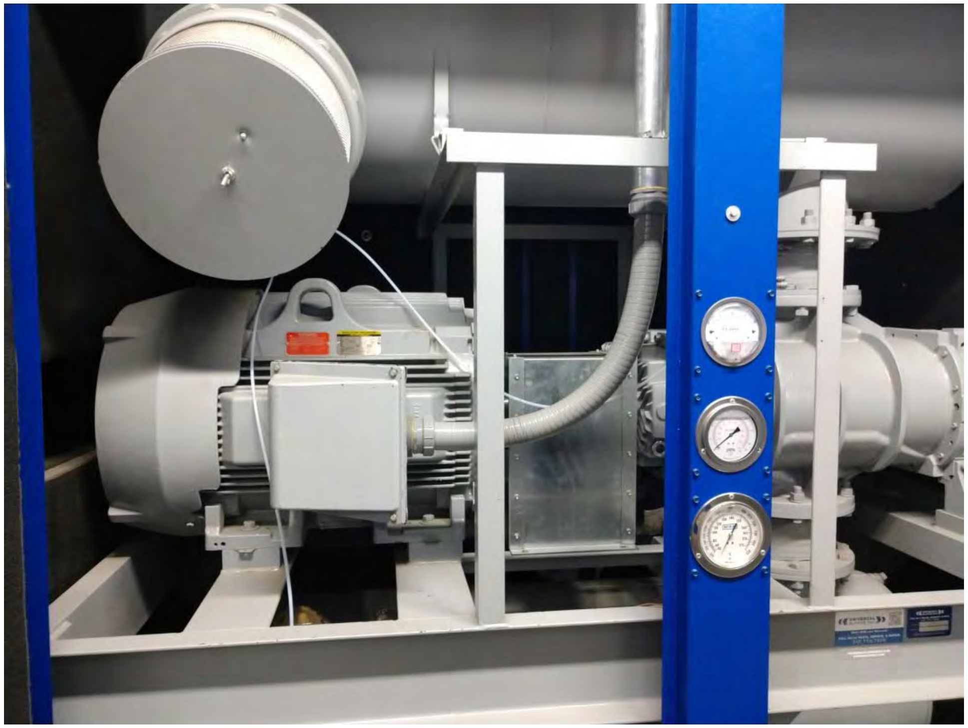


OU2

Webitat Biological Treatment Units in the Secondary treatment cell of the HBHA Pond – additional views

OU2

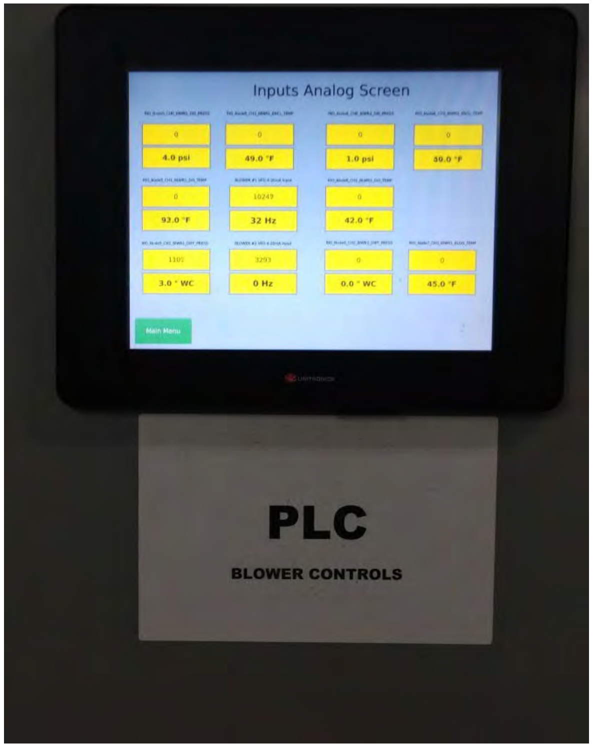
Webitat Biological Treatment Units Blowers and Control Systems



Webitat Biological Treatment Units Blowers and Control Systems - continued

OU2

Webitat Biological Treatment Units Blowers and Control Systems - continued



OU2

Typical soil remedy engineered cover system – shown is the northwestern bank of the HBHA Pond looking south.

OU2

Typical Long-term Groundwater Monitoring Well Installation

B.2 – Inspection Summary

Summary of Observations
Industri-Plex Site Properties
December 2018

Property Address	Tax Map ID	IC LOT #	Cert. Dwgs No.'s	Property Owner Listed on Certification Drawings	Assessor Owner Information as of 1/17/2019	Class C-Permeable Eng Cover	Class C-Permeable Eqv Cover	Class D-Permeable Eng Cover	Class D-Imper-meable Eng Cover	Summary of Observations	Notes
229 & 231 New Boston Street	formerly Tax Map 4-7-9, now changed to 9-2-1?	IC-1	A11-A15	Koster Revocable Trust	BUILDING SUBDIVIDED INTO TWO INDUSTRIAL CONDOS: **1) #229 OWNED BY:** 225-231 NEW BOSTON ST, LLC; PO BOX 42 217 NEW BOSTON ST WOBURN, MA 01801 **2) #231 OWNED BY:** ERNEST G. MOORE TRUST & KATHLEEN ANN MOORE TRUSTEE 1 GARDEN STREET WOBURN, MA 01801	●	●			🟡	Normal Maintenance needed (loading dock trench/storm drain). Equivalent-cover pavement is degrading (i.e. alligator cracking, delamination, seam cracking, etc.) No exposed underlying soils observed.
225 & 227 New Boston Street	Tax Map 9-2-1	IC-2	A16-A20	Koster Revocable Trust	BUILDING SUBDIVIDED INTO TWO INDUSTRIAL CONDOS - **BOTH OWNED BY** 225-231 NEW BOSTON ST, LLC PO BOX 42 217 NEW BOSTON ST WOBURN, MA 01801	●	●			🔴	Normal Maintenance needed (loading dock trench/storm drain). Equivalent-cover pavement is degrading (i.e. alligator cracking, delamination, seam cracking, many large potholes, etc.) Possible exposed underlying soils observed. Damaged guardrail post adjacent to loading dock has damaged the pavement. Encroachment of southern parking area onto the adjacent lot that created a cover modification (see also IC-3)
223 Rear New Boston Street (empty lot)	Tax Map 9-2-3	IC-3	A21-A25	Aero Realty Trust	ZAYKA NICHOLAS, TRUSTEE; AERO REALTY TRUST, 223 NEW BOSTON ST. WOBURN, MA 01801	●	●			🔴	Normal maintenance needed (vehicle rutting) and restoration of cap thickness; damaged /missing asphalt curbing. Engineered cover geotextile is not exposed. Significant cover modification on the northern property line where the adjacent property (IC-2) has extended its pavement approx. 25 feet over the engineered permeable cover.
223 New Boston Street	Tax Map 9-2-4	IC-4	A26-A30	Aero Realty Trust	ZAYKA NICHOLAS, TRUSTEE; AERO REALTY TRUST, 223 NEW BOSTON ST. WOBURN, MA 01801	●	●			🟢	No issues noted. (Note pothole formed at the corner of the parking lot on the street (City of Woburn property) Maintenance needed (loading dock trench/storm drain). Engineered
219 New Boston Street	Tax Map 9-2-5	IC-5	A31-A35	Koster Nominee Trust	BUILDING SUBDIVIDED INTO TWO INDUSTRIAL CONDOS (#219A AND 219B) - **BOTH OWNED BY:** 217-219 NEW BOSTON ST, LLC; 217 NEW BOSTON ST, WOBURN, MA 01801 - LAND SHARED???	●	●			🟡	Normal Maintenance needed. Equivalent-cover pavement is degrading (i.e. alligator cracking, delamination, seam cracking, etc.) No exposed underlying soils observed.
217 New Boston Street	Tax Map 9-2-6	IC-6	A36-A40	Koster Revocable Trust	BUILDING OR PROPERTY SUBDIVIDED INTO TWO INDUSTRIAL CONDOS (#217 AND 217R) - **1) #217 OWNED BY:** RGK REALTY, LLC 217 NEW BOSTON ST WOBURN, MA 01801 **2) #217R OWNED BY** 217-219 NEW BOSTON ST, LLC; 217 NEW BOSTON ST, WOBURN, MA 01801 - LAND SHARED???	●	●			🟡	Normal Maintenance needed. Equivalent-cover pavement is degrading (i.e. alligator cracking, delamination, seam cracking, etc.) No exposed underlying soils observed.
211 New Boston Street	Tax Map 9-2-7	IC-7	A41-A45	Stephen & Adeline Dagata	211 NEW BOSTON LLC 65 BURLINGTON ST WOBURN, MA 01801	●	●			🟢	No issues observed with property; and/or regular maintenance occurs.
New Boston Street (fka Boston Edison Company)	Tax Map 9-2-8	IC-8	A46-A53	BECO	BOSTON EDISON CO PROPERTY TAX DEPT PO BOX 270 HARTFORD, CT 06141-0270	●				🟢	No issues observed with property; and/or regular maintenance occurs.
Merrimac Street (fka Boston Edison Company)	Tax Map 9-7-3	IC-9	A54-A58	BECO	BOSTON EDISON CO PROPERTY TAX DEPT PO BOX 270 HARTFORD, CT 06141-0270	●				🔴	Engineered permeable cover system appears to have lost some stone cover (i.e. sand/gravel exposed, which may have reduced cover thickness to <16 inches. Heavy construction vehicles being parked on top of the cap from adjacent property (ASI Paving). Exposed & torn geotextile protruding from the soil along the Merrimac Street entrance

Summary of Observations
Industri-Plex Site Properties
December 2018

Property Address	Tax Map ID	IC LOT #	Cert. Dwgs No.'s	Property Owner Listed on Certification Drawings	Assessor Owner Information as of 1/17/2019	Class C-Permeable Eng Cover	Class C-Permeable Eqv Cover	Class D-Permeable Eng Cover	Class D-Imper-meable Eng Cover	Summary of Observations	Notes
Merrimac Street (fka Boston Edison Company)	Tax Map 9-1-5	IC-10	A59-A63	BECO	CITY OF WOBURN 10 COMMON ST WOBURN, MA 01801	●				🟡	Normal Maintenance needed . Engineered-cover soils damaged by heavy vehicle rutting as the vehicles turn into the Waste Management parking lot on the adjacent property. (IC-11). Geotextile has not been exposed or damaged.
204 Merrimac Street	Tax Map 9-1-6	IC-11	A64-A68	Positive Start Realty Inc.	POSTIVE START REALTY INC. 16 EATON ST WOBURN, MA 01801	●	●			🟡	Normal Maintenance needed . Engineered-cover soils damaged by heavy vehicle rutting as the vehicles turn into the Waste Management parking lot on the adjacent property. (IC-11). Geotextile has not been exposed or damaged. Also Equivalent-cover pavement is degrading (i.e. alligator cracking, delamination, seam cracking, etc.) No exposed underlying soils observed.
225 Merrimac Street - Parcel 1	Tax Map 9-1-7	IC-12	A69-A73	PX Realty Trust	PX REALTY TRUST & LORENA O'NEILL 2904 APPALOOSA TRAIL WELLINGTON, FL 33414	●	●			🟡	Normal Maintenance needed . Equivalent-cover pavement is degrading (i.e. alligator cracking, delamination, seam cracking, etc.) No exposed underlying soils observed.
216 New Boston Street - Parcel 2	Tax Map 9-1-8	IC-13	A74-A87	PX Realty Trust	PX REALTY TRUST & LORENA O'NEILL 2904 APPALOOSA TRAIL WELLINGTON, FL 33414	●	●			🟡	Normal Maintenance needed . Equivalent-cover pavement is degrading (i.e. alligator cracking, delamination, seam cracking, etc.) No exposed underlying soils observed.
210 New Boston Street (fka PEBCO Company)	Tax Map 9-7-4	IC-14	A88-A92	WJP Realty Trust	ISABELLA B, LLC 210 NEW BOSTON ST WOBURN, MA 01801	●	●			🔴	Normal Maintenance needed. Some minor Equivalent-cover pavement is degrading (i.e. alligator cracking cracking, etc.) No exposed underlying soils observed. Restoration needed for trench drain leading to the detention basin, which has been filled-in with gravel and iron grates removed.
Commuter Rail ROW Woburn, MA - Lowell Line	Tax Map 31-2-2	IC-15	A93-A100	MBTA	MBTA 45 HIGH STREET BOSTON, MA 02110	●				🟢	No issues observed with property; and/or regular maintenance occurs. (Note that safety fencing to prevent access to tracks has been vandalized to allow pedestrian cut-through, which is an ongoing problem)
Commerce Way (fka Boston Edison Company)	Tax Map 15-1-11	IC-16	A101-108	BECO	BOSTON EDISON CO PROPERTY TAX DEPT PO BOX 270 HARTFORD, CT 06141-0270	●				🟡	No issues observed with property; and/or regular maintenance occurs. Yellow due to cap restoration required following installation of the air sparge system wells. SDs are scheduling this work
41 Atlantic Avenue	Tax Map 10-1-8	IC-17	B11-B15	Atlantic Avenue Associates, Inc.	ATLANTIC AVE ASSOCIATES INC C/O DAVID A WELLES 474 CYPRESS GREEN CIRCLE WELLINGTON, FL 33414	●	●	●		🟢	No issues observed with property; and/or regular maintenance occurs.
20 Atlantic Avenue (fka Winter Hill Storehouse Inc)	Tax Map 10-1-5	IC-18	B16-B20	Atlantic Avenue Realty Trust	20 ATLANTIC AVE REALTY TRUST C/O DAVID T VINING, TRUSTEE 20 ATLANTIC AVE WOBURN, MA 01801	●	●			🟢	No issues observed with property; and/or regular maintenance occurs.
10 Atlantic Avenue (fka Atlantic Aveunue Trust)	Tax Map 10-1-4	IC-19	B21-B25	Mid A Terrace, LLC	NEW MID A TERRACE TENJ LLC, C/O HOWLAND DEVELOPMENT CO., 155 WEST STREET, WILMINGTON, MA 01887	●	●			🔴	Normal Maintenance needed. Equivalent-cover pavement is degrading (i.e. alligator cracking, delamination, seam cracking, etc.) No exposed underlying soils observed. Cover modification made where planter beds along the western side of the building have been paved over.
120 Commerce Way	Tax Map 10-1-3	IC-20	B26-B30	Nodraer Realty Corp	NODRAER RALTY TRUST C/O 120 COMMERCE APARTMENTS LLC 250 GIBRALTAR RD 3W HORSHAM, PA 19044	●				🟢	No issues observed with property; and/or regular maintenance occurs.
130 Commerce Way	Tax Map 10-1-10	IC-21	B31-B35	Sunder K & Hiro K. Ganglani	GANGLANI PROPERTIES, LLC; 130 COMMERCE WAY WOBURN, MA 01801	●	●	●		🟡	Normal Maintenance needed. Equivalent-cover pavement is degrading (i.e. alligator cracking, delamination, seam cracking, etc.) No exposed underlying soils observed. Southern concrete walkway-equivalent cover section has settled and is cracked/broken
ECHP Commerce Way - behind Ganglani **(AKA 132 COMMERCE WAY)**	Tax Map 10-1-11	IC-22	C11-C18	Chestnut Hill Realty Trust	INDUSTRIPLEX WOBURN LLC 450 MONTBROOK LN KNOXVILLE, TN 37919	●		●		🟢	No issues observed with property; and/or regular maintenance occurs.

Summary of Observations
Industri-Plex Site Properties
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ECHP - Chestnut Hill Realty - Atlantic Ave Frontage **(AKA 39 ATLANTIC AVE)**	Tax Map 10-1-9	IC-23	C11-C18	Chestnut Hill Realty Trust	INDUSTRIPLEX WOBURN LLC 450 MONTBROOK LN KNOXVILLE, TN 37919	●		●		🟢	No issues observed with property; and/or regular maintenance occurs.
ECHP & Created Wetlands **(AKA 134 COMMERCE WAY)**	Tax Map 10-1-12	IC-24	C11-C18	Chestnut Hill Realty Trust	INDUSTRIPLEX WOBURN LLC 450 MONTBROOK LN KNOXVILLE, TN 37919	●		●		🟢	No issues observed with property; and/or regular maintenance occurs.
Lot 5-C Commerce Way - area on east side of Commerce across from ECHP	Tax Map 10-1-17	IC-25	C19-C23	City of Woburn	CITY OF WOBURN 10 COMMON ST WOBURN, MA 01801	●		●		🟢	No issues observed with property; and/or regular maintenance occurs.
See IC-28 for Tax Map 5-1-1 (315 New Boston Street - Parcel C - East & West Hide Piles & Wetlands)	Tax Map 5-1-1	IC-26 (see IC-28)	C29-C48	Resources for Responsible Site Management Inc.	RESOURCES FOR RESPONSIBLE SITE MANAGEMENT TRUST PO BOX 487 CHESTNUT HILL, MA 02467	●		●	●	🟢	No issues observed with property; and/or regular maintenance occurs.
South of RTC Exit Road - adjacent to ECHP and CW **(AKA LOT 1-B)**	Tax Map 5-1-3	IC-27	C24-C28	Resources for Responsible Site Management Inc.	RESOURCES FOR RESPONSIBLE SITE MANAGEMENT TRUST PO BOX 487 CHESTNUT HILL, MA 02467	●		●		🟢	No issues observed with property; and/or regular maintenance occurs.
315 New Boston Street - Parcel C - East & West Hide Piles & Wetlands	Tax Map 5-1-1	IC-28	C29-C33 (C29-C48)	Resources for Responsible Site Management Inc.	RESOURCES FOR RESPONSIBLE SITE MANAGEMENT TRUST PO BOX 487 CHESTNUT HILL, MA 02467	●		●	●	🟢	No issues observed with property; and/or regular maintenance occurs.
Near Boston Street Rear (fka Dundee Park Properties)	Tax Map 4-7-1	IC-29	C49-C55	Tabby Associates, LLC	WOBURN ASSESOR OFFICE SHOWS TABBY ASSOCIATES LLC BUT REGISTRY OF DEEDS SHOWS PROPERTY WAS CONVEYED TO CUSTODIAL TRUST ON 12/8/2012	●		●	●	🟢	No issues observed with property; and/or regular maintenance occurs.
30 Atlantic Avenue - South Hide Pile & Detention Basin (fka Woburn Industrial Associates Inc)	Tax Map 10-1-6	IC-30	C56-C62	Resources for Responsible Site Management Inc.	RESOURCES FOR RESPONSIBLE SITE MANAGEMENT TRUST PO BOX 487 CHESTNUT HILL, MA 02467	●	●	●		🟢	No issues observed with property; and/or regular maintenance occurs.
RTC, 100 Atlantic Avenue (See RTC CCR)	Tax Map 10-1-7	IC-31	Separate Dwg set	RTC REALTY TRUST	RTC REALTY TRUST C/O JOHN HEMPHILL TRUSTEE; C/O MASS.PORT AUTHORITY ONE HARBORSIDE DRIVE, SUITE 200S EAST BOSTON, MA 02128	●	●			🟢	Normal Maintenance needed. Engineered -cover pavement has some minor degradation (i.e. alligator cracking, delamination, seam cracking, etc.). This property has extensive cover thickness and there is no exposed underlying soils observed.
New Boston Street **Rear**	Tax Map 9-2-2	IC-32	NA - NO COVER	NA - NO COVER	JOHN HEMPHILL C/O MASS.PORT AUTHORITY ONE HARBORSIDE DRIVE, SUITE 200S EAST BOSTON, MA 02128					🟢	No Cover or ICs exist a this property other than groundwater restrictions.
236 Presidential Way **(ADDRESS IS 235 PRESDIENTIAL WAY)**	Tax Map 5-1-9	IC-33	NA - NO COVER	NA - NO COVER	PRESIDENTIAL WAY WOBURN LLC C/O RAYTHEON CO PO BOX 56607 ATLANTA, GA 30343					🟢	No Cover or ICs exist a this property other than groundwater restrictions.
225 Presidential Way	Tax Map 5-1-8	IC-34	NA - NO COVER	NA - NO COVER	PRESIDENTIAL WAY WOBURN LLC C/O RAYTHEON CO PO BOX 56607 ATLANTA, GA 30343					🟢	No Cover or ICs exist a this property other than groundwater restrictions.
Presidential Way **(listed as 150 Presdential Way)**	Tax Map 5-4-3	IC-35	NA - NO COVER	NA - NO COVER	WOBURN MCB II LLC C/O EASTPORT REAL ESTATE 107 AUDUBON RD STE 2-3-1 WAKEFIELD, MA 01880					🟢	No Cover or ICs exist a this property other than groundwater restrictions.
200 Presidential Way	Tax Map 5-4-2	IC-36	NA - NO COVER	NA - NO COVER	300 METRONORTH CORP CTR LLC C/O NATIONAL DEVELOPMENT 2310 WASHINGTON ST NEWTON LOWER FALLS, MA 02462					🟢	No Cover or ICs exist a this property other than groundwater restrictions.
Presidential Way **(LOT 2-L)**	Tax Map 5-4-6	IC-37	NA - NO COVER	NA - NO COVER	300 METRONORTH CORP CTR LLC C/O NATIONAL DEVELOPMENT 2310 WASHINGTON ST NEWTON LOWER FALLS, MA 02462					🟢	No Cover or ICs exist a this property other than groundwater restrictions.

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Industri-Plex Site Properties
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300 Presidential Way	Tax Map 5-4-4	IC-38	NA - NO COVER	NA - NO COVER	METRONORTH HOTEL, LLC C/O RESIDENCE INN 1 POST OFFICE SQ SUITE 3100 ATTN: LYNN YAGER BOSTON, MA 02109					🟢	No Cover or ICs exist a this property other than groundwater restrictions.
400 Presidential Way	Tax Map 5-4-5	IC-39	NA - NO COVER	NA - NO COVER	TOLLESON ONE LLC 21000 SOUTH WILMINGTON AVE CARSON, CA 90810					🟢	No Cover or ICs exist a this property other than groundwater restrictions.
101 Commerce Way	Tax Map 10-1-16	IC-40	NA - NO COVER	NA - NO COVER	DAYTON HUDSON CORPORATION C/O TARGET CORP T-1266 PROP TAX DEPT /TPN 0950 PO BOX 9456 MINNEAPOLIS, MN 55440-9456					🟢	No Cover or ICs exist a this property other than groundwater restrictions.
112 Commerce Way (fka Pacer Headquarters, Inc.) **ADDRESS is 134 COMMERCE WAY**	Tax Map 10-1-2	IC -41	B-36-B40	Pacer Headquarters, Inc.	IT 112 COMMERCE WAY LLC ATTN: INTEGRATED PROPERTIES PO BOX 988 SUDBURY, MA 01776	●				🟢	No issues observed with property; and/or regular maintenance occurs.
103 Commerce Way	Tax Map 10-1-19	IC -42	NA - NO COVER	NA - NO COVER	SUN METRONORTH LLC C/O SUN LIFE ASSURANCE CO OF CANADA 1 SUN LIFE EXEC PARK SC-1303 WELLESLEY HILLS, MA 02481					🟢	No Cover or ICs exist a this property other than groundwater restrictions.
99 Commerce Way	Tax Map 10-1-20	IC -43	NA - NO COVER	NA - NO COVER	SUN METRONORTH LLC C/O SUN LIFE ASSURANCE CO OF CANADA 1 SUN LIFE EXEC PARK SC-1303 WELLESLEY HILLS, MA 02481					🟢	No Cover or ICs exist a this property other than groundwater restrictions.
Commerce Way LOT 2	Tax Map 10-1-18	IC -44	NA - NO COVER	NA - NO COVER	CITY OF WOBURN 10 COMMON ST WOBURN, MA 01801					🟢	No Cover or ICs exist a this property other than groundwater restrictions.
EHP, WHP Lot 4 Commerce Way - Western Barrel Commerce Way Extension (See RTC CCR)	Tax Map 5-1-1	IC-45	C29-C33 WHP; C34-C39 Wetland 1C; C40-C48 EHP	Resources for Responsible Site Management Inc.	RESOURCES FOR RESPONSIBLE SITE MANAGEMENT TRUST PO BOX 487 CHESTNUT HILL, MA 02467	●		●		🟢	No issues observed with property; and/or regular maintenance occurs.
Woburn ROW/Roads	Roadways	IC-46	A7-A10, B6-B10, C7-C10	City of Woburn	CITY OF WOBURN 10 COMMON ST WOBURN, MA 01801	●	●	●		🟡	Normal Maintenance needed. Numerous road sections where Equivalent-cover pavement is degrading (i.e. alligator cracking, delamination, seam cracking, etc.) No exposed underlying soils observed as of December 2018; however winter stresses may cause potholes and exposures. Commerce Way southbound section has reoccurring settlement problem.

🟢	No issues observed with propeorty; and/or regular maintenance occurs.
🔴	Issues observed that require normal maintenance.
🟡	Minor issues observed that can be address through regular maintenance.

Five-Year Review Site Inspection Checklist

(Working document for site inspection. Information may be completed by hand and attached to the Five-Year Review report as supporting documentation of site status. "N/A" refers to "not applicable.")

I. SITE INFORMATION

Site name: Industri-plex	**Date(s) of inspection: 12/01/18 and 12/21/18 (OU1), 2/16/19 (OU2); 3/5/19 (OU1 and OU2 mechanical)**
Location and Region: Woburn, MA Region I	**EPA ID:** MAD076580950
Agency, office, or company leading the five-year review: EPA-Region 1	**Weather/temperature:** **2/16/2019 40°F, sunny**

Remedy Includes: (Check all that apply)

☒ Landfill cover/containment
☒ Access controls
☒ Institutional controls
☐ Groundwater pump and treatment
☒ Surface water collection and treatment
☐ Monitored natural attenuation
☐ Groundwater containment
☐ Vertical barrier walls
☒ Other: Groundwater treatment via discharge to the HBHA Pond where natural processes sequester arsenic and biological processes treat ammonia and benzene (OU2); landfill gas collection and thermal oxidation treatment of off-gas (OU1)

Attachments: ☐ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** ____________________ ____________________ ____________
Name Title Date
Interviewed ☐ at site ☐ at office ☐ by phone Phone no. ____________
Problems, suggestions; ☐ Report attached ____
____

2. **O&M staff** ____________________ ____________________ ____________
Name Title Date
Interviewed ☐ at site ☐ at office ☐ by phone Phone no. ____________
Problems, suggestions; ☐ Report attached ____
____

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency ______________________________
Contact ______________________________ ___________________ ________ ____________
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached ____
____

Agency ______________________________
Contact ______________________________ ___________________ ________ ____________
Name Title Date Phone no.
Problems; suggestions; ☐G Report attached ____
____

Agency ______________________________
Contact ______________________________ ___________________ ________ ____________
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached ____
____

Agency ______________________________
Contact ______________________________ ___________________ ________ ____________
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached ____
____

4. **Other interviews** (optional) ☐ Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**
☒ O&M manual ☒ Readily available ☒ Up to date ☐ N/A
☒ As-built drawings ☒ Readily available ☒ Up to date ☐ N/A
☒ Maintenance logs ☒ Readily available ☒ Up to date ☐ N/A
Remarks

2. **Site-Specific Health and Safety Plan** ☒ Readily available ☒ Up to date ☐ N/A
Contingency plan/emergency response plan ☐ Readily available ☐ Up to date ☒ N/A
Remarks

3. **O&M and OSHA Training Records** ☐ Readily available ☐ Up to date ☒ N/A
Remarks

4. **Permits and Service Agreements**
Air discharge permit ☐ Readily available ☐ Up to date ☒ N/A
Effluent discharge ☐ Readily available ☐ Up to date ☒ N/A
Waste disposal, POTW ☐ Readily available ☐ Up to date ☒ N/A
Other permits__________________ ☐ Readily available ☐ Up to date ☒ N/A
Remarks

5. **Gas Generation Records** ☒ Readily available ☒ Up to date ☐ N/A
Remarks: Operational/inspection reports for the TOU are prepared for each run. Off-gas compliance monitoring is limited to monitoring temperature to verify destruction, in accordance with the CAM Rule. Annual stack testing is up to date.

6. **Settlement Monument Records** ☐ Readily available ☐ Up to date ☒ N/A
Remarks

7. **Groundwater Monitoring Records** ☒ Readily available ☒ Up to date ☐ N/A
Remarks: Long-term Monitoring Plan is in the beginning stages following EPA approval of the OU2 RA. The SDs have maintained monthly, quarterly, and annual sampling in accordance with the RD and RA.

8. **Leachate Extraction Records** ☐ Readily available ☐ Up to date ☒ N/A
Remarks

9. **Discharge Compliance Records**
☒ Air ☒ Readily available ☒ Up to date ☐ N/A
☒ Water (effluent) ☒ Readily available ☒ Up to date ☐ N/A
Remarks: Operation of the TOU applies the CAM Rule for system compliance monitoring based on minimum destruction temperature. Annual stack testing is up to date.

10. **Daily Access/Security Logs** ☐ Readily available ☐ Up to date ☒ N/A
Remark: Access to the site is not restricted.

IV. O&M COSTS

1. **O&M Organization**

☐ State in-house ☐ Contractor for State
☐ PRP in-house ☒ Contractor for PRP
☐ Federal Facility in-house ☐ Contractor for Federal Facility
☐ Other______________________________

2. **O&M Cost Records**

☐ Readily available ☐ Up to date
☐ Funding mechanism/agreement in place
Original O&M cost estimate____________________ Breakdown attached

Total annual cost by year for review period if available

From__________ To__________ ____________________ G Breakdown attached
Date Date Total cost
From__________ To__________ ____________________ G Breakdown attached
Date Date Total cost
From__________ To__________ ____________________ G Breakdown attached
Date Date Total cost
From__________ To__________ ____________________ G Breakdown attached
Date Date Total cost
From__________ To__________ ____________________ G Breakdown attached
Date Date Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons: ______________________________

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ☐ Gates secured ☒ N/A

Remarks: Hide piles are partially fenced to discourage ATV vehicle access from some points, but site access is generally unrestricted.

B. Other Access Restrictions

1. **Signs and other security measures** ☐Location shown on site map ☒ N/A

Remarks______________________________

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ☐ Yes ☒ No ☐ N/A
Site conditions imply ICs not being fully enforced ☐ Yes ☒ No ☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by): Self-reporting, drive by, and annual inspections
Frequency: OU1: Formal annual inspections; TOU system operation varies but generally bi-weekly. OU2: Minimum weekly inspections of the OU2 treatment system.
Responsible party/agency: de maximis, inc. via contract to Industri-plex Site Remedial Trust (ISRT)

Contact	Todd Majer	Project Manager	NA	978-875-0635
	Name	Title	Date	Phone no.

Reporting is up-to-date ☒Yes ☐No ☐N/A
Reports are verified by the lead agency ☒Yes ☐ No ☐N/A

Specific requirements in deed or decision documents have been met ☒Yes ☐ No ☐N/A
Violations have been reported ☒Yes ☐No ☐N/A
Other problems or suggestions:

2. **Adequacy** ☒ ICs are adequate ☐ ICs are inadequate ☐ N/A
Remarks

D. General

1. **Vandalism/trespassing** ☐Location shown on site map ☒ No vandalism evident
Remarks

2. **Land use changes on site** ☒N/A
Remarks

3. **Land use changes off site** ☒ N/A
Remarks

VI. GENERAL SITE CONDITIONS

A. Roads ☒ Applicable ☐N/A

1. **Roads damaged** ☐ Location shown on site map ☒ Roads adequate ☐N/A
Remarks: Ongoing maintenance being performed by the City of Woburn to repair paved equivalent cover on public roads (e.g., pothole repair, crack sealing, weathered pavement replacement, etc.).

B. Other Site Conditions

Remarks: Overall, the site is in good condition. Properties with weathered and eroding paved equivalent cover require ongoing maintenance.

VII. LANDFILL COVERS ☒ Applicable ☐ N/A

A. Landfill Surface (Hide Piles)

1. **Settlement** (Low spots) ☐ Location shown on site map ☐ Settlement not evident
Areal extent 400Sqft________ Depth: 6” – 12”
Remarks: Very small settlement area along southern toe of ECHP adjacent to Ganglani property

2. **Cracks** ☐ Location shown on site map ☒ Cracking not evident
Lengths____________ Widths___________ Depths__________
Remarks____
____

3. **Erosion** ☐ Location shown on site map ☒ Erosion not evident
Areal extent______________ Depth____________
Remarks____
____

4. **Holes** ☐ Location shown on site map ☒ Holes not evident
Areal extent______________ Depth____________
Remarks____
____

5. **Vegetative Cover** ☒ Grass ☒ Cover properly established ☐ No signs of stress
☒ Trees/Shrubs
Remarks: ISRT has an effective and ongoing program for mowing, invasive species control, and large tree removal. Some sections of the northwestern slope of EHP requires revegetation due to stress caused by terracing/rutting of the mowing tractor on the steeper slope.

6. **Alternative Cover (armored rock, concrete, etc.)** ☐ N/A
Remarks: All armored areas in slope drains and drainage swales are intact and functioning as designed.

7. **Bulges** ☐ Location shown on site map ☒ Bulges not evident
Areal extent______________ Height____________
Remarks____
____

8. **Wet Areas/Water Damage** ☒ Wet areas/water damage not evident
☐ Wet areas ☐ Location shown on site map Areal extent______________
☐ Ponding ☐ Location shown on site map Areal extent______________
☐ Seeps ☐ Location shown on site map Areal extent______________
☐ Soft subgrade ☐ Location shown on site map Areal extent______________
Remarks____
____

9. **Slope Instability** ☐ Slides ☐ Location shown on site map ☒ No evidence of slope instability
Areal extent______________
Remarks____
____

B. Benches ☐ Applicable ☒ N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** ☐ Location shown on site map ☒ N/A or okay
Remarks____
____

2. **Bench Breached** ☐ Location shown on site map ☒ N/A or okay
Remarks____
____

3. **Bench Overtopped** ☐ Location shown on site map ☒ N/A or okay
Remarks____
____

C. Letdown Channels ☒ Applicable ☐ N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** ☐ Location shown on site map ☒ No evidence of settlement
Areal extent______________ Depth____________
Remarks____
____

2. **Material Degradation** ☐ Location shown on site map ☒ No evidence of degradation
Material type_______________ Areal extent_____________
Remarks____
____

3. **Erosion** ☐ Location shown on site map ☒ No evidence of erosion
Areal extent______________ Depth____________
Remarks____
____

4. **Undercutting** ☐ Location shown on site map ☒ No evidence of undercutting
Areal extent______________ Depth____________
Remarks____
____

5. **Obstructions** Type_____________________ ☒ No obstructions
☐ Location shown on site map Areal extent______________
Size____________
Remarks____
____

6. **Excessive Vegetative Growth** Type____________________
☒ No evidence of excessive growth
☒ Vegetation in channels does not obstruct flow
☐ Location shown on site map Areal extent______________
Remarks: Ongoing maintenance for vegetation removal is being conducted by ISRT contractor and individual property owners where applicable
____

D. Cover Penetrations ☐ Applicable ☒ N/A

1. **Gas Vents** ☐ Active ☐ Passive
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance
☒ N/A
Remarks____
____

2. **Gas Monitoring Probes**
Properly secured/locked Functioning Routinely sampled Good condition
Evidence of leakage at penetration Needs Maintenance X N/A
Remarks____
____

3. **Monitoring Wells** (within surface area of landfill)
☒ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks____
____

4. **Leachate Extraction Wells**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☒ N/A
Remarks____
____

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed ☒ N/A
Remarks____
____

E. Gas Collection and Treatment ☒ Applicable ☐ N/A

1. **Gas Treatment Facilities**
☐ Flaring ☒ Thermal destruction ☐ Collection for reuse
☐ Good condition ☐ Needs Maintenance
Remarks: The TOU system and controls are operational, but outdated. Critical replacement parts (e.g. igniter) and analog controls are difficult to find, which historically has caused the system to be shut down for extended periods. The ISRT is evaluating a new/replacement TOU system with digital controls and automation.

2. **Gas Collection Wells, Manifolds and Piping**
☒ Good condition ☐ Needs Maintenance
Remarks: All gas collection piping and manifolds are buried and not visible for inspection. There is no indication of blockage.

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
☐ Good condition ☐ Needs Maintenance ☒ N/A
Remarks____

F. Cover Drainage Layer ☒ Applicable ☐ N/A

1. **Outlet Pipes Inspected** ☐ Functioning ☒ N/A
Remarks:____

2. **Outlet Rock Inspected** ☒ Functioning ☐ N/A
Remarks: Hide pile toe drains do not show evidence of damage or piping.

G. Detention/Sedimentation Ponds ☒ Applicable ☐ N/A

1. **Siltation** Areal extent______________ Depth____________ ☒ N/A
☒ Siltation not evident
Remarks____

2. **Erosion** Areal extent______________ Depth____________
☒ Erosion not evident
Remarks____

3. **Outlet Works** ☐ Functioning ☒ N/A
Remarks____

4. **Dam** ☐ Functioning ☒ N/A
Remarks____

H. Retaining Walls ☐ Applicable ☒ N/A

1. **Deformations** ☐ Location shown on site map ☒ Deformation not evident
Horizontal displacement____________ Vertical displacement_______________
Rotational displacement____________
Remarks____

2. **Degradation** Location shown on site map ☒ Degradation not evident
Remarks____

I. Perimeter Ditches/Off-Site Discharge ☒ Applicable ☐ N/A

1. **Siltation** ☐ Location shown on site map ☒ Siltation not evident
Areal extent______________ Depth___________
Remarks: Siltation is noted in the base of all channels and limited to deposition in the voids of the rock channel base. This does not obstruct flow but serves as a substrate for vegetation, which is controlled through periodic maintenance and removal.

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A
☒ Vegetation does not impede flow
Areal extent______________ Type____________
Remarks: As noted above, ongoing/routine maintenance of drainage channels maintain flows

3. **Erosion** ☐ Location shown on site map ☒ Erosion not evident
Areal extent______________ Depth____________
Remarks____

4. **Discharge Structure** ☒ Functioning ☐N/A
Remarks: Headwalls, discharge aprons, culverts, and flow control structures are all functioning and in good repair

VIII. VERTICAL BARRIER WALLS ☒Applicable ☐ N/A

1. **Settlement** ☐ Location shown on site map ☒Settlement not evident
Areal extent______________ Depth____________
Remarks____

2. **Performance Monitoring** Type of monitoring ☒adjacent groundwater wells and in-pond sediment
☐ Performance not monitored
☒Frequency: Varies - quarterly (yrs 1-4), biannual (yrs 4-10), annual(>10 years) ☐Evidence of breaching ☐ Head differential ☐NA
Remarks: Groundwater flow barrier installed at the toe of the WHP eastern slope to protect the Lower South Pond from benzene discharges. Monitoring will begin as part of the Long-term Monitoring Plan.

IX. GROUNDWATER/SURFACE WATER REMEDIES ☒Applicable ☐ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines ☐ Applicable ☒ N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
☐ Good condition ☐All required wells properly operating ☐Needs Maintenance ☒ N/A
Remarks____

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
☐ Good condition ☐ Needs Maintenance ☒ N/A
Remarks____

3. **Spare Parts and Equipment**
☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
Remarks____

B. Surface Water Collection Structures, Pumps, and Pipelines ☒ Applicable ☐ N/A

1. **Collection Structures, Pumps, and Electrical**
☒ Good condition ☐ Needs Maintenance
Remarks____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
☒ Good condition ☐ Needs Maintenance
Remarks____

3. **Spare Parts and Equipment**
☒ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
Remarks____

C. Treatment System (OU2) ☒ Applicable ☐ N/A

1. **Treatment Train** (Check components that apply)
☐ Metals removal ☐ Oil/water separation ☒ Bioremediation
☐ Air stripping ☐ Carbon adsorbers
☐ Filters____
☐ Additive (*e.g.*, chelation agent, flocculent)________________________
☐ Others____
☒ Good condition ☐ Needs Maintenance
☒ Sampling ports properly marked and functional
☒ Sampling/maintenance log displayed and up to date
☒ Equipment properly identified
☒ Quantity of groundwater treated annually_(not measured)_________
☒ Quantity of surface water treated annually (not measured)_______
Remarks Bioremediation applies to in-pond Webitat bio-net and aeration system to treat ammonia
____

2. **Electrical Enclosures and Panels** (properly rated and functional)
☐ N/A ☒ Good condition ☐ Needs Maintenance
Remarks____
____

3. **Tanks, Vaults, Storage Vessels**
☒ N/A ☐ Good condition ☐ Proper secondary containment ☐ Needs Maintenance
Remarks____
____

4. **Discharge Structure and Appurtenances**
☐ N/A ☒ Good condition ☐ Needs Maintenance
Remarks____
____

5. **Treatment Building(s)**
☐ N/A ☒ Good condition (esp. roof and doorways) ☐ Needs repair
☒ Chemicals and equipment properly stored
Remarks____
____

6. **Monitoring Wells** (pump and treatment remedy)
☒ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition
☒ All required wells located ☐ Needs Maintenance ☐ N/A
Remarks: All wells have been recently installed

D. Monitoring Data

1. Monitoring Data
☒ Is routinely submitted on time ☒ Is of acceptable quality

2. Monitoring data suggests:
☒ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
☒Properly secured/locked ☒Functioning ☒Routinely sampled ☒ Good condition
☒All required wells located ☐ Needs Maintenance ☐ N/A
Remarks____
____

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

There are no other remedies not discussed above.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

<u>OU1:</u> The primary goal of the OU1 remedy was to construct a cap (new construction as well as utilizing existing "equivalent cover" features, such as building slabs, existing paved surfaces, etc. to prevent contact with underlying soils contaminated with arsenic, lead, and chromium. Groundwater contamination issues were later addressed under OU2. The majority of the 37 properties that comprise the Industri-plex site are occupied by active commercial businesses and public roads. The cover systems at these locations are generally in good condition; however, the "paved equivalent cover" systems are weathered pavement and require ongoing repair and maintenance. When properly maintained, these paved surfaces serve as an effective cap over the contaminated soils. The undeveloped properties (e.g., hide piles) have an engineered/constructed cover system. All of the engineered cover systems are in excellent condition. In addition, the ISRT has a regular and robust inspection and maintenance program for vegetation control and drainway maintenance.

With regards to the air remedy, the TOU system is very near the end of its service life. Replacement parts are very difficult to obtain and in some cases, have taken several weeks to be custom made. The ISRT is currently evaluating newer replacement digital technology that includes remote telemetry monitoring and controls. While still being a thermal destruction system, the newer technology should require less maintenance, less hands-on operation, and significantly reduce system failures and downtime.

<u>OU2</u>: The primary goal of the OU2 remedy is to capture site contaminated groundwater as it discharges into the Halls Brook Holding Area (HBHA) Pond so that natural attenuation processes (chemical and biological) can sequester arsenic contaminants and reduce benzene concentrations. In addition, ammonia discharges are being treated with an in-situ biological treatment process in a downstream area also within the HBHA pond. All components of the remedy have been effective in reducing downstream migration of groundwater contaminants and functioning as designed as demonstrated by data collected at the remedy compliance point (i.e., the outlet of the HBHA Pond).

Another aspect of the remedy was capping contaminated soils around the northern banks of the HBHA Pond. Utilizing the same cap design as the OU1 soil remedy, this capping system is functioning as designed and is an effective remedy to prevent contact with underlying lead-contaminated soils.

Finally, the groundwater barrier installed at the base of the West Hide Pile to prevent benzene-contaminated groundwater from discharging to Lower South Pond sediments is also functioning as designed.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

<u>OU1:</u> The cover systems require ongoing maintenance in order to remain protective. Weathered "equivalent cover" systems require more frequent inspections and maintenance than the engineered cover systems. Absent the individual owners conducting their own annual or other periodic inspections, the ISRT also conducts annual inspections on all properties. These inspections provide a detailed record of the condition of the cover systems and can trigger repairs, as well as serve as an effective planning tool for scheduled maintenance.

With regards to the air remedy and the TOU system, as noted above, the current (and original) installed system is due to be replaced. The ISRT is currently evaluating replacement systems.

<u>OU2:</u> Having been recently constructed, the groundwater/surface water remedy is in excellent condition and is functioning as designed. The ISRT is conducting routine and frequent systems maintenance including on all mechanical systems. No O&M or long-term concerns were noted at this time.

C.	**Early Indicators of Potential Remedy Problems**
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future. **OU1:** As the asphalt paved "equivalent cover" systems continue to weather and degrade, more frequent inspections and maintenance will be required to protect the integrity of the cover system. Inspections will serve as the vanguard to ensure that maintenance and repairs are implemented quickly. **OU2:** There are no concerns at this time.
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. **OU1:** An engineering evaluation of the current condition of the paved equivalent cover systems should be performed and include projections as to the remaining effective service life of the current cap. In addition, this evaluation should include recommendations and alternatives for scheduled repair and replacement. **OU2:** Opportunities for the optimization of the in-situ HBHA Pond treatment system are always being evaluated based on the surface water data collected from throughout the HBHA Pond (upstream, midstream treatment, and downstream discharge). This ongoing evaluation will help to ensure that the remedy remains protective.

Appendix C
Cleanup Levels and Groundwater Use and Value Determination

Appendix C.1
Cleanup Levels from 2006 OU2 ROD

Table L-1: Groundwater Performance Standards

Carcinogenic Chemical of Concern	Cancer Classification	Performance Standards (ug/L)	Basis	RME Risk
Benzene	A	4	risk	1E-05
1,2-Dichloroethane	B2	2	risk	1E-05
Trichloroethene	C-B2	1	risk	3E-05
Arsenic	A	150	risk	4E-05
			Sum of Carcinogenic Risk:	9E-05

Non-Carcinogenic Chemical of Concern	Target Endpoint	Performance Standards (ug/L)	Basis	RME Hazard Quotient
Benzene	immune system	4	risk	0.1
Ammonia	respiratory	4000	HQ	1
1,2-Dichloroethane	kidney	2	risk	0.3
Trichloroethene	liver	1	risk	0.02
Naphthalene	general toxicity	5	HQ	1
Arsenic	skin	150	risk	0.3
			General Toxicity Hazard Index:	1
			Liver Hazard Index:	0.02
			Kidney Hazard Index:	0.3
			Immune System Hazard Index:	0.1
			Respiratory Hazard Index	1
			Skin Hazard Index:	0.3

Key

HQ = Hazard Quotient

Table L-2: Soil Cleanup Standards for the Protection of Day Care Child Direct Contact Exposures

Former Mishawum Lake Bed Area

Carcinogenic Chemical of Concern	Cancer Classification	Cleanup Standard (mg/kg)	Basis	RME Risk
Arsenic	A	50	HQ	4E-05
			Sum of Carcinogenic Risk:	4E-05
Non-Carcinogenic Chemical of Concern	**Target Endpoint**	**Cleanup Standard (mg/kg)**	**Basis**	**RME Hazard Quotient**
Arsenic	skin	50	HQ	1
			Liver Hazard Index:	1

Key

HQ = Hazard Quotient

Table L-3: FORMULA AND ASSUMPTIONS
ARSENIC SOIL CLEANUP STANDARD GOAL

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface and Subsurface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion/Dermal	Day Care Child	Young Child (ages 1-6)	Former Mishawum Lake Bed Area	IR	Ingestion Rate of Soil	200	mg/day	USEPA, 1997	Preliminary Remediation Goal (PRG) non-cancer = $\frac{\text{THI x RfD/RBA x BW x AT-N}}{\text{ED x EF x CF x [IR + (SA x AF x DAF)]}}$
				FI	Fraction Ingested	1	unitless	Prof. Judgement	
				EF	Exposure Frequency	150	days/year	USEPA, 1994	
				ED	Exposure Duration	6	years	USEPA, 1994	
				BW	Body Weight	15	kg	USEPA, 1997	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1989	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				SA	Skin Surface Area Available for Contact	2,800	cm^2	USEPA, 2004	
				AF	Skin Adherence Factor	0.2	mg/cm^2-day	USEPA, 2004	
				DAF	Arsenic Dermal Absorption Factor	0.03	- -	- -	
				RfD	Arsenic Oral Reference Dose	3E-04	mg/kg-day	- -	
				THI	Target Hazard Index	1	- -	- -	
				RBA (1)	Relative Bioavailability of Arsenic	site-specific	- -	- -	

References:

USEPA, 1989 - *Risk assessment guidance for Superfund. Volume I: Human health evaluation manual. Part A.* Interim Final. EPA/540/1-89/002. December 1989.

USEPA, 1994 - *Risk updates, no. 2.* USEPA Region I. August 1994.

USEPA, 1997 - *Exposure factors handbook.* Office of Research and Development. Washington, D.C. August 1997.

USEPA, 2004 - *Risk assessment guidance for Superfund Volume I: Human health evaluation manual (Part E, Supplemental guidance for dermal risk assessment), Final.* Office of Superfund Remediation and Technology Innovation. Washington, D.C. EPA/540/R/99/005

(1) Two different site-specific RBAs would be experimentally determined; one for surface soils and one for surface soils.

Table L-4: Sediment Cleanup Standards for the Protection of Recreational and Dredging Worker Direct Contact Exposures

Cranberry Bog Conservation Area: CB-03

Carcinogenic Chemical of Concern	Cancer Classification	Cleanup Standard (mg/kg)	Basis	RME Risk
Arsenic	A	230	HQ	6E-05
			Sum of Carcinogenic Risk:	6E-05

Non-Carcinogenic Chemical of Concern	Target Endpoint	Cleanup Standard (mg/kg)	Basis	RME Hazard Quotient
Arsenic	skin	230	HQ	1
			Skin Hazard Index:	1

Wells G&H Wetland: WH, NT-3, 13/TT-27

Carcinogenic Chemical of Concern	Cancer Classification	Cleanup Standards (mg/kg)	Basis	RME Risk
Benzo(a)pyrene	B2	4.9	background	1E-05
Arsenic	A	300	HQ	6E-05
			Sum of Carcinogenic Risk:	7E-05

Non-Carcinogenic Chemical of Concern	Target Endpoint	Cleanup Standard (mg/kg)	Basis	RME Hazard Quotient
Arsenic	skin	300	HQ	1
			Skin Hazard Index:	1

Sediment Cores: SC02, SC05, SC06, and SC08

Carcinogenic Chemical of Concern	Cancer Classification	Cleanup Standard (mg/kg)	Basis	RME Risk
Arsenic	A	300	risk	1E-05
			Sum of Carcinogenic Risk:	1E-05

Non-Carcinogenic Chemical of Concern	Target Endpoint	Cleanup Standard (mg/kg)	Basis	RME Hazard Quotient
Arsenic	skin	300	risk	0.8
			Skin Hazard Index:	0.8

Key

HQ = Hazard Quotient

Appendix C.2
Groundwater Use and Value Determinations

SITE 3-1731-02
BREAK 3 11
OTHER

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
ONE WINTER STREET, BOSTON, MA 02108 617-292-5500

ARGEO PAUL CELLUCCI
Governor

TRUDY COXE
Secretary

DAVID B. STRUHS
Commissioner

August 26, 1997

Mr. Daniel Coughlin, Chief
Massachusetts Superfund Section
USEPA
JFK Federal Building, HBO
Boston, MA 02203

Dear Dan:

Enclosed please find the Groundwater Use and Value Determination prepared by DEP for the Industri-Plex site. This first Use and Value Determination conducted by DEP, pursuant to the recently finalized Guidance developed by EPA, was done as a pilot in anticipation of the signing of a Memorandum of Agreement between the two agencies.

In determining the use and value of the groundwater in the vicinity of the Industri-Plex site, we referred to the aquifer classification contained in the Massachusetts Contingency Plan. As we have discussed, the classification in the MCP gives consideration to all of the eight factors contained in the Use and Value Guidance. Enclosed with the Use and Value Determination is a copy of the GIS map used to determine the aquifer classification. This map provides a variety of information, including the USGS yield classification, the presence of public water supplies and zones of protection, surface water bodies, wetlands and protected open space areas.

I trust you will find this example of how we will conduct Use and Value Determinations under the MOA acceptable. If so, I believe we are ready to finalize the MOA and begin implementing these determinations on other NPL sites. The most recent version of the MOA was drafted by Bill Walsh-Rogalski of your office. I have included a copy of the comments we submitted on that draft. If you are satisfied with the Industri-Plex example, please send us a final version of the MOA for review and signature.

If I can be of any further assistance on this, please do not hesitate to call me at 292-5697.

Very truly yours,

Jay Naparstek

Jay Naparstek, Chief
Federal Sites Section

DEP on the World Wide Web: http://www.magnet.state.ma.us/dep
Printed on Recycled Paper

GROUNDWATER USE AND VALUE DETERMINATION PILOT
Industri-Plex Superfund Site

August, 1997

Consistent with the Environmental Protection Agency's (EPA) 1996 Final Ground Water Use and Value Determination Guidance, the Department has developed a "Use and Value Determination" of the groundwater impacted by the Industri-Plex Superfund Site (the "Site"). The purpose of the Use and Value Determination is to identify whether the aquifer at the site should be considered of "High, Medium", or "Low" use and value. In the development of its Determination, the Department has applied the criteria for groundwater classification as promulgated in the Massachusetts Contingency Plan (MCP). The classification contained in the MCP considers criteria similar to those recommended in the Use and Value Guidance. The Department's recommendation supports a low use and value for the Study Area groundwater. An explanation for the determination is outlined below.

The Industri-Plex Superfund Site (the "Site") covers approximately 245 acres of land in Woburn, Massachusetts. Contamination at the Site includes soils containing arsenic, chromium, lead, and odorous tannery wastes; and groundwater and surface water containing heavy metals and volatile organics. The soil remedy is nearly complete, but the groundwater and surface water at the site are still under investigation. For the purposes of this Determination, the groundwater under evaluation is defined as the extent of the Groundwater/Surface Water Investigation Plan (GSIP), which includes and expands upon the boundaries for the soil remedy (See Figure A, the "Study Area").

The aquifer underlying much of the Study Area is classified as medium or high yield by the United States Geological Survey (USGS). Portions of the north, southeast and southwest regions of the Area are classified as low yield. Despite the medium/high yield classification of a significant portion of the aquifer, the Department has classified the Study Area as a Non-Potential Drinking Water Source Area because of its concentrated industrial development. More specifically, the Study Area aquifer is classified as both GW-2 and GW-3 (see description below). Table 1 reviews the Study Area with respect to the eight factors contained in the Use and Value guidance.

There are no public or private wells in the Study Area. However, the southern border at Route 128 is the edge of the Wells G + H Interim Wellhead Protection Area (IWPA). Wells G + H are inactive, but are still considered a public drinking water supply. The medium and low yield portions of the Area aquifer flow into this IWPA. Study Area groundwater must meet drinking water standards (the GW-1 classification) before entering the IWPA.

For the purposes of the risk assessment of the Study Area groundwater, the Department defines a GW-2 classification as areas where there is a potential for migration of vapors from groundwater to occupied structures. The classification applies to locations where groundwater has an average annual depth of 15 feet or less and where there is an occupied building or structure within a 30 foot surface radius of that groundwater. The GW-3 designation considers the impacts and risks associated with the discharge of groundwater to surface water and therefore applies to all groundwater. Considering these classifications, the groundwater risk evaluation for the Industri-Plex site should include, but is not limited to, the following:

Human Health: a) vapor seepage into buildings,
b) use of the water in industrial processes,
c) excavation into groundwater (i.e., worker exposure),
d) discharge into surface water (and the consequential effects of the discharge--i.e., wading scenarios, recreation, fishing).
Ecological: a) effects on the biota that make up the benthic community,
b) effects on the biota that feed on or in the benthic community, and on up the food chain, as determined by the substance's persistence and ability to bioaccumulate.

In light of the use and value factors and similar criteria established in the MCP that were examined in this determination, the Department supports a low use and value for the Study Area aquifer. The Department welcomes the opportunity to participate in this new approach to evaluating groundwater, which furthers the goal of making more consistent and realistic remedial groundwater decisions at Superfund sites.

TABLE 1
INDUSTRI-PLEX SITE GROUNDWATER USE AND VALUE DETERMINATION PILOT
August, 1997

USE AND VALUE FACTORS	INDUSTRI-PLEX SITE: #3-1731 SITE-SPECIFIC DETERMINATION
Quantity	-Medium/High Yield, small portions Low Yield -Medium/High Yield covers entire south-western portion of the OU-1 portion of the site, and three quarters of the Groundwater/ Surface Water Study Area down to Route 128.
Quality	-Elevated levels of total magnesium, calcium, sodium, and iron and other metals in Study Area groundwater. Site groundwater contaminants include volatile organics (primarily benzene and toluene), and metals (primarily arsenic and chromium).
Current Public Drinking Water Supply	-No Wellhead Protection Area within the Study Area, but the study area borders the Wells G & H IWPA to the south. -Horne Pond wells supplemented by MWRA water are supplied by town for drinking water. -It is not a sole Source Aquifer.
Current Private Drinking Water Supply	-No known private drinking water supplies in the Study Area.
Likelihood and Identification of Future Drinking Water Use	-Study Area groundwater is designated by the State as a Non-Potential Drinking Water Source Area. -Study Area is highly urbanized: industrial and commercial development, with some residential at southeast. -Not designated by the Town as an area for future drinking. -No known Activity and Use Limitations on the Study Area properties.
Other Current or Reasonable Expected Ground Water Use(s) in Review Area	-Several groundwater wells in the area are used for non-potable activities such as irrigation. -In the future, possible increase in production well use, and use of well water for irrigation.
Ecological Value	-Groundwater discharge to Halls Brook, Halls Brook Holding Area, and the Aberjona River.
Public Opinion	-Public comment occurs during the promulgation of MCP regulations, and under CERCLA will occur during the Record of Decision process. -No known petition in process for a change in groundwater classification in the Study Area. Would expect substantial opposition to possible use as a water supply.

MA DEP - Bureau of Waste Site Cleanup

SITE NAME:
Industriplex\ \42 31 07n 71 08 29sw

FIGURE A: STUDY AREA

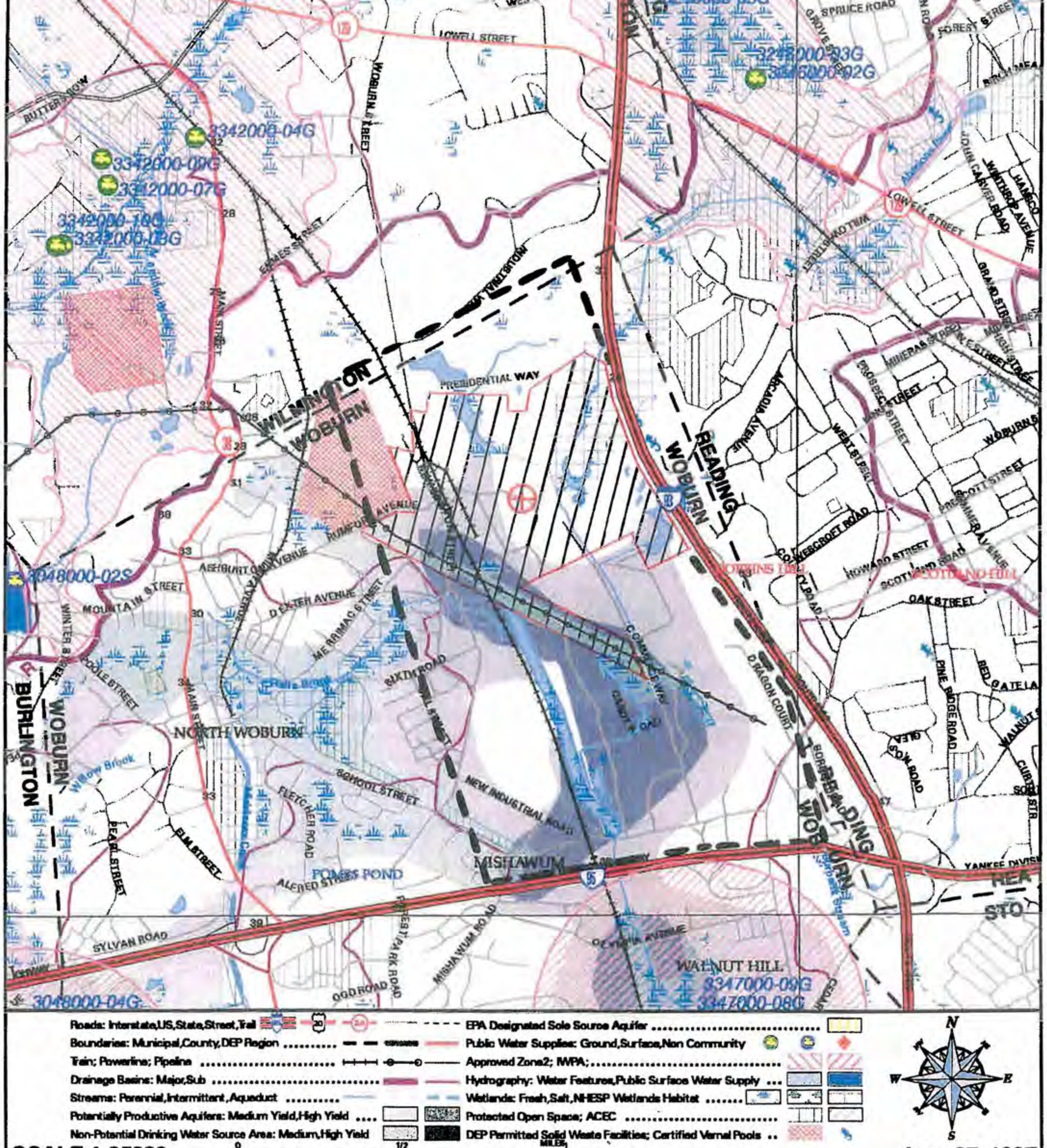
STUDY AREA ▬ ▬

INDUSTRI-PLEX SITE ▨

Site Location

The information shown on this map is the best available at the date of printing. Please refer to the data source descriptions document.

Massachusetts Executive Office of Environmental Affairs - 1997



SCALE 1:25000

0 1/2 1 MILES
0 1/2 1 2 3 KILOMETERS

June 27, 1997

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
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ROBERT W. GOLLEDGE, Jr.
Commissioner

June 21, 2004

Robert Cianciarulo, Chief
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U.S. EPA Region I
JFK Federal Building
Boston, MA 02203

RE: Groundwater Use and Value Determination
Wells G + H Superfund Site (MAD #980732168, RTN#3-0479)

Dear Mr. Cianciarulo:

Enclosed please find the Groundwater Use and Value Determination prepared by the Department (DEP) for the Wells G + H Superfund Site (the Site). This Determination was conducted by the DEP pursuant to the Memorandum of Agreement (1998) between the U.S. Environmental Protection Agency and the DEP.

In determining the use and value of the groundwater in the vicinity of the Wells G + H Site, we referred to the aquifer classification system in the Massachusetts Contingency Plan (MCP). The classification in the MCP gives consideration to all of the factors in the Use and Value Guidance. Enclosed with the Use and Value Determination is a copy of the GIS map used to determine the aquifer classification. This map provides a variety of information, including the USGS yield classification, the presence of public water supplies and zones of protection, surface water bodies, wetlands, protected open space areas, and drainage basin boundaries.

If you have any questions regarding this letter, please don't hesitate to contact me at 617-654-6651.

Sincerely,

Richard Chalpin
Assistant Commissioner, Bureau of Waste Site Cleanup

cc. Joe LeMay, EPA
Anna Mayor, MADEP
Gordon Bullard, TTNUS
enclosure

GROUNDWATER USE AND VALUE DETERMINATION
Wells G + H Superfund Site
Woburn, MA

June 2004

Consistent with the Environmental Protection Agency's (EPA) 1996 Final Ground Water Use and Value Determination Guidance, the Department has developed a "Use and Value Determination" of the groundwater beneath the Wells G + H Superfund Site (the "Site"). The purpose of the Use and Value Determination is to identify whether the aquifer at the site should be considered of "High", "Medium", or "Low" use and value. In the development of its Determination, the Department has applied the criteria for groundwater classification as promulgated in the Massachusetts Contingency Plan (MCP). The classification contained in the MCP considers criteria similar to those recommended in the Use and Value Guidance as agreed to in the Memorandum of Agreement (MOA) between EPA and DEP. The Department's recommendation supports a medium use and value for the Site Area groundwater. A brief background of the Site, an explanation for the determination, and a table listing the criteria that facilitated the determination are outlined below.

The Site covers approximately 330 acres in eastern Woburn, Massachusetts. The Site is bounded by Route 128/95 to the north, Route 93 to the east, the Boston and Maine railroad to the west, and Salem Street to the south. The groundwater under evaluation for this determination is within the boundaries of the Site as shown on the attached Figure.

The Site is almost entirely within the Interim Wellhead Protection Area (IWPA) of the two municipal wells G + H. The two wells reside near the center of the Site as shown on the Figure. The aquifer within the Site is classified as medium and high yield by the United States Geological Survey (USGS). Combined, the wells had a pumping capacity of approximately 1.73 million gallons of water per day (MGD). Wells G + H were shut down in May of 1979 when high levels of chlorinated organics were discovered in both wells. Since that date the wells have not been used. However, the City has not formally abandoned the wells in accordance with the DEP's regulations; therefore, at this time the DEP Drinking Water Program has classified the wells as inactive.

Approximately two thirds of the water currently used by the City is from seven groundwater wells in a separate aquifer under Horn Pond, and the remainder is supplied by the Massachusetts Water Resources Authority. There have been problems with TCE contamination from an unknown source in the aquifer at Horn Pond, as well as bacterial contamination from a nearby Combined Sewage Overflow (CSO), but these have been stabilized and controlled. City engineers have indicated to the DEP's Drinking Water Program that the stability of the current water supply and the expression of public opinion against the use of the G + H wells for drinking has meant that the likelihood of using the inactive wells in the near future is very low. However, they have also expressed to DEP that they do not want to eliminate the possible future use of the resource. Water usage has increased tenfold since the City's water system became operational in 1873, and is now at least 6 million gallons of water per day.

With regard to the cleanup of the Site, an intensive remedial investigation was conducted through the 1980s following the shut down of the wells. A Record of Decision issued by EPA in September of 1989 required the remediation of the sources of the contamination to the wells, and the investigation of the Central Area groundwater and the Aberjona River. To date, contaminated soil at the Site has been remediated at three of the source areas known as Wildwood Conservation Trust (also known as Beatrice Food Corporation), New England Plastics, Inc., and W.R. Grace. Contaminated soils remain at the Unifirst Corporation and the Olympia Nominee Trust properties. The remaining contaminants include chlorinated organics, heavy metals, polychlorinated biphenyls (PCBs), and other wastes.

The investigation of the Aberjona River, which flows through the center of the site, has indicated that contaminants are present in both sediment and surface water. The sediment of the Aberjona River contains elevated levels of metals including arsenic, chromium, mercury, copper and lead, volatile and semi-volatile organics, pesticides, and PCBs. The surface water contains volatile organics, pesticides, semi-volatile organics, and metals. The groundwater within the Central Area, i.e., the area downgradient of the source area properties, contains a broad mix of inorganic and organic contaminants, including nitrates, sodium, chloride, barium, arsenic, chromium and lead, chlorinated organics consisting primarily of trichloroethylene and tetrachloroethylene, other volatile organics, poly-aromatic hydrocarbons (PAHs), and other semi-volatile organic compounds.

Because the Site is within the IWPA of a current drinking water supply, and also because the aquifer is medium and high yield, the Site Area aquifer is classified under the MCP as GW-1 meaning a current or potential drinking water source area. The one-mile diameter IWPA default zone supercedes any of the areas excluded as non-drinking water source areas under the MCP. The GW-2 classification applies to areas where there is potential migration of vapors from groundwater to occupied structures; specifically, where groundwater has an average annual depth of 15 feet or less and where the structure is within a 30 foot surface radius of that groundwater. Since much of the site is developed with commercial, industrial and residential structures, GW-2 potentially applies to the majority of the aquifer. An exception to the developed areas is the land surrounding the wells owned by the City that is vacant. Potential uses for this land are being examined under a Superfund Redevelopment Grant by the EPA. So far all of the plans created under the grant have included various scenarios of recreational use.

Lastly, at a minimum, all groundwater is considered as GW-3, which considers the ecological and human health impacts and risks associated with the discharge of groundwater to surface water. The aquifer discharges into the Aberjona River and its associated wetlands.

Considering these classifications, exposure scenarios for the groundwater risk evaluation should include, but not be limited to: ingestion and exposures from other domestic uses; inhalation of vapors from seepage into buildings; use of the water in industrial processes and other potential exposures to the use of the water in industrial and residential activities; worker exposure during excavation into groundwater; and exposures resulting from discharge to surface water.

Overall, the aquifer has significant current ecological value for its contribution to the River and the associated wetlands; however, the groundwater and the sediment of the River and its wetlands are contaminated. The full ecological value of the groundwater won't be realized until it and the sediment of the area have been remediated, which is most likely several years away. Its potential human value is significant, but only in the far future. In light of these and other criteria established in the MCP that were examined in this determination, the Department supports a medium use and value for the Site Area aquifer.

Groundwater Use and Value Considerations				
Factors	High	Medium	Low	Comments
1. Quantity	X			Aquifer is high-yield (1.75 million gal/day) The aquifer is alluvial, highly porous sand and gravel.
2. Quality			X	Aquifer is contaminated throughout (upper aquifer into the bedrock) with a broad variety of contaminants above drinking water standards. Many of the contaminants are organic and volatile and therefore are expected to eventually breakdown or volatilize upon eventually reaching surface water. Main sources of anthropogenic contamination of the aquifer appear to have been identified, and most are being or have been removed.
3. Current Public Water Supply Systems		X		There are two public supply wells on site. Both are inactive due to the presence of contamination. The City uses groundwater from another aquifer (Horn Pond Aquifer) and supplements the lost supply from Wells G&H with MWRA water. The City experiences regular water shortages and voluntary and required reduction efforts during the summer months.
4. Current Private Drinking Water Supply Wells			X	No known private drinking water wells within the study area. The City does not allow private wells to be tied into the municipal drinking water system at any point.
5. Likelihood and I.D. of Future Drinking Water Use		X		There are no other potential water supply development areas in the City that we are aware of. It is unlikely that the Wells G&H will be used in the near future, but possibly in the longer term as demand increases.
6. Other Current or reasonable Expected Groundwater Use(s) in Review Area		X		There are industrial wells used for processing and irrigation, and commercial wells also used for irrigation in the area. It is reasonable to expect similar uses to continue.
7. Ecological Value	X			Groundwater in the study area discharges directly to the Aberjona River.
8. Public Opinion		X		Public opinion has been opposed to utilizing the Wells G&H for water supply. The City has expressed an interest in having the source available for the future.

MA DEP - Bureau of Waste Site Cleanup

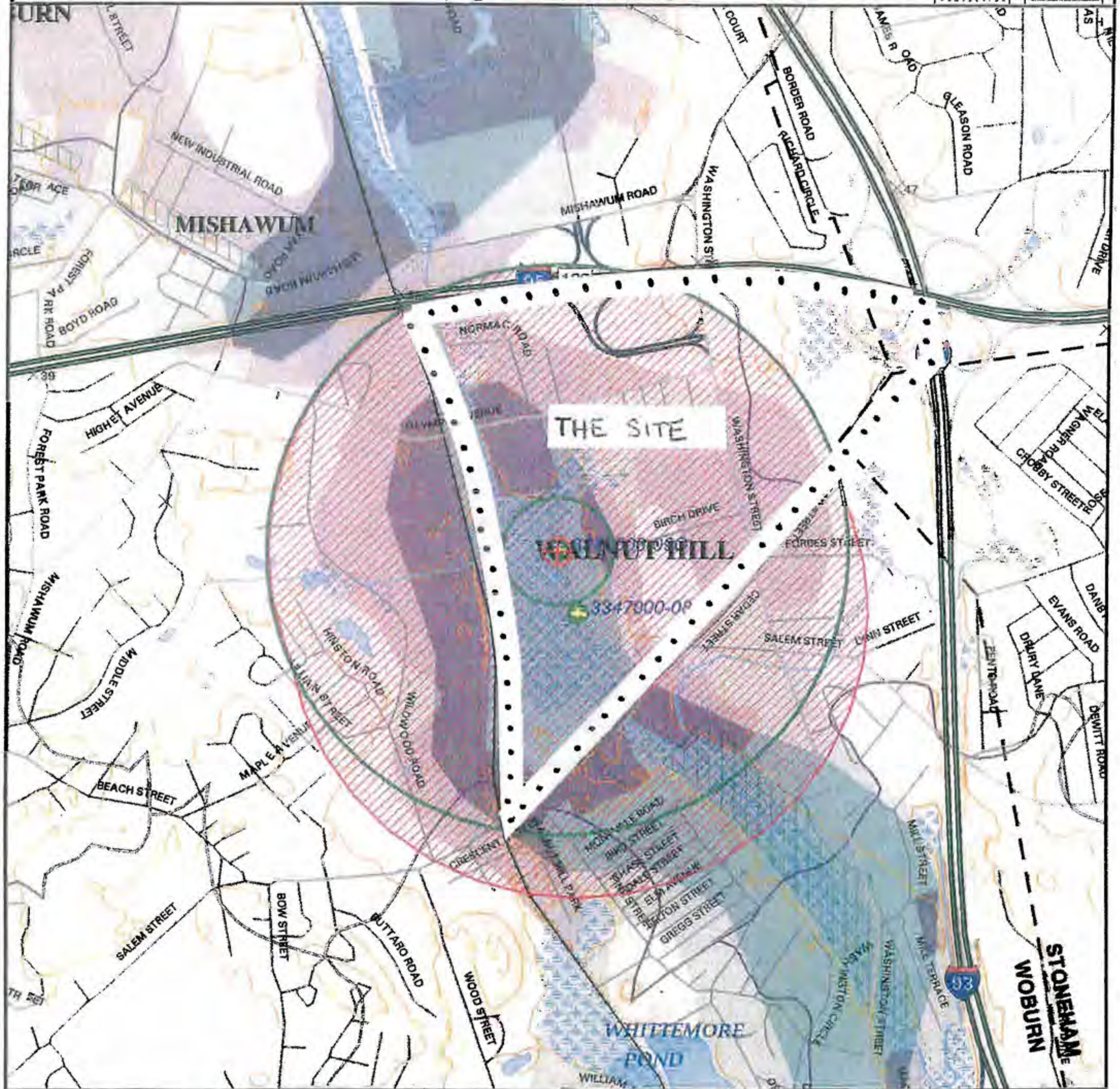
Site Scoring Map: 500 feet & 0.5 Mile Radii

SITE NAME:

Wells G and H Superfund Site RTN 3-0479
Aberjona River Valley
Woburn
916205n 230325ew

MASSGIS Massachusetts Geographic Information System

Massachusetts Executive Office of Environmental Affairs - 2003



Roads: Ltd Access, Divided, Other Highway, Maj Rds, Street, Trail

Boundaries: Town, County, DEP Region; Train; Powerline; Pipeline; Aqueduct

Basins: Major, Sub; Streams: Perennial, Intermittent, Man Made Shore, Dams

Potentially Productive Aquifers: Medium,High Yield .... ☐ ▨

Non-Potential Drinking Water Source Area: Medium,High Yield ▨ ■

EPA Sole Source Aquifer; FEMA 100-year floodplain ...... ☐ ▨

PWS: Ground,Surface,Emergency Surface,Non Community ● ● ● ●

Approved Zone2; IWPA; Surface Water Supply Zone A ▨ ▨ ☐

Hydrography: Water Features,Public Surface Water Supply ... ▨ ■

Wetlands: Fresh,Salt,NHESP Wetlands Habitat .... ☐ ☐ ☐

Protected Open Space; ACEC .... ▥ ☐

DEP Permitted Solid Waste Facilities; Certified Vernal Pools .. ▨ ●

N
W E
S

SCALE 1:15000

0 1/2 MILES

0 1/2 KILOMETERS

August 05, 2003

Appendix D
Data

D.1 OU1 Soil Data
D.2 OU2 HBHA Pond Sediment Data
D.3 OU2 Wells G&H Wetland and CBCA Sediment Data
D.4 OU2 Lower South Pond Sediment Data
D.5 OU2 Soil Data
D.6 OU2 Surface Water Data
D.7 OU2 Groundwater Data

Appendix D.1
OU1 Soil Data

6.4

Golder Associates Inc.
CONSULTING ENGINEERS

Center
Industri Plex
6.4
OU 01

SDMS DocID 000230844

SDMS #230844

PRE-DESIGN INVESTIGATION
TASK S-1
EXTENT OF HAZARDOUS SUBSTANCES IN SOILS SUPPLEMENTAL REPORT

INDUSTRI-PLEX SITE
WOBURN, MASSACHUSETTS

Prepared for:

Industri-Plex Site Remedial Trust
800 North Lindbergh Boulevard
St. Louis, Missouri 63167

DISTRIBUTION:

8 Copies - Industri-Plex Site Remedial Trust
6 Copies - U.S. Environmental Protection Agency
1 Copy - Massachusetts Dept. of Environmental Protection
1 Copy - NUS Corporation
2 Copies - Golder Associates Inc.

January 1991

Project No.: 893-6255

Golder Associates Inc.
CONSULTING ENGINEERS

January 16, 1991 Project No. 893-6255

United States Environmental Protection Agency, Region 1
J.F.K. Federal Building, HRS-CAN-3
Boston, Massachusetts 02203-2211

Attn: Joseph DeCola, Remedial Project Manager

RE: INDUSTRI-PLEX SITE PRE-DESIGN INVESTIGATION
TASK S-1 DETERMINE EXTENT OF HAZARDOUS SUBSTANCES IN
SOILS, SUPPLEMENTAL REPORT

Gentlemen:

On behalf of the Industri-Plex Site Remedial Trust, we are submitting the attached Hazardous Substances in Soils Supplemental Report for the Industri-Plex Site in Woburn, Massachusetts. This report is being submitted in accordance with the Pre-Design Work Plan (PDI) Task S-1 reporting requirements (PDI Sections 3.2.3.5 and 3.8.1.1.1, p. 37 and 126), and the September 1990 Task S-1 Interim Final Report (Section 8, p. 31).

Please contact us if you have any questions.

Very truly yours,

GOLDER ASSOCIATES INC.

Kenneth R. Moser

Kenneth R. Moser, Associate
Project Manager

RMG/JWV:rmg
C:6255S1bCL

cc: J. Naparstek, MDEP
A. Ostrofsky, NUS
D. L. Baumgartner, ISRT
W. L. Smull, ISRT

GOLDER ASSOCIATES INC. • 20000 HORIZON WAY, SUITE 500, MT. LAUREL, NEW JERSEY 08054 • TELEPHONE (609) 273-1110 • FACSIMILE (609) 273-0778

OFFICES IN UNITED STATES • CANADA • UNITED KINGDOM • SWEDEN • ITALY • AUSTRALIA

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1.0 INTRODUCTION

This report is submitted in fulfillment of the Supplemental Report deliverable as specified in Section 8 (p. 31) of the Industri-Plex Site Pre-Design Investigation (PDI) Task S-1 Interim Final Report (Golder Associates, 1990). The purpose of this report is to present the results of PDI Task S-1 data collection activities for secondary soil borings which were proposed in the PDI Task S-1 Interim Final Report (referred to as "the Interim Final Report" below).

Section 2 of this report presents a summary of the findings of Task S-1 as of September 1990 (the Interim Final Report). Section 3 presents the method of investigation. Section 4 presents and discusses the results, except for Data Quality Objectives which are discussed in Section 5. A summary is presented in Section 6, and references are given in Section 7. The proposed locations of the secondary boreholes (as presented in the Interim Final Report) are given in Appendix A. Secondary borehole logs are included in Appendix B, Chain-of-Custody Forms are included in Appendix C, and Data Assessment Forms are included in Appendix D. A summary table is included in Appendix E which presents the arsenic, lead, chromium, and hide residue results for all PDI Task S-1 analyses, and the on-site soil sample results from the Phase 1 and Phase 2 Remedial Investigations. These results are also presented on Figure 1.

2.0 SUMMARY OF PDI TASK S-1 INTERIM FINAL REPORT

The objective of PDI Task S-1 is to define areas of the site containing Hazardous Substances at or above Consent Decree action levels, as well as areas above background levels but below action levels. This objective was addressed by reviewing the data generated during the Remedial Investigation (RI), identifying data gaps, and executing a sampling and analysis program to address those data needs. Soil Data Needs were categorized and designated Soil Data Needs Nos. 1, 2a, 2b, 2c, 2d, 3, and 4. These data needs and the decision process for addressing them are given in the Task S-1 Interim Final Report (Golder Associates Inc., 1990a).

Soil Data Needs 1, 2b, 2d, 3, and 4 were satisfied by the Task S-1 results as of September 1990, but additional samples were needed to completely satisfy Soil Data Needs 2a and 2c. The Interim Final Report included tables and figures summarizing the task results as of September 1990, and proposed 34 additional secondary soil borings to satisfy Soil Data Needs 2a and 2c. These samples were located in both on- and off-site areas and are shown in Appendix A. The on-site samples were located north of the East and West Hide Piles, north of the East-Central Hide Pile, south of the South Hide Pile, and along Boston Edison Right of Way No. 9. The off-site samples are located along the western edge of the site, and along the MBTA rail line.

3.0 METHOD OF INVESTIGATION

3.1 Field Methods

Samples for analysis of arsenic, lead, chromium, and hide residue were collected in accordance with Golder Associates Standard Operating Procedures (SOPs) given in the Pre-Design Work Plan (PDWP, Golder Associates Inc., 1989a) and the Field Sampling Plan (FSP, Golder Associates Inc., 1989b). A small track-mounted drill rig was used to collect most soil samples using a split spoon sampler. A stainless steel hand auger was also used at some locations. These samplers were decontaminated between each sampling interval within a borehole in accordance with the Golder Associates SOP "Sampling Surface Soils for Chemical Analysis" which is included in the FSP. This procedure includes an Alconox wash, tap water rinse, distilled water rinse, trace metal analysis-grade nitric acid rinse, and a final distilled water rinse. Split spoon refusal occurred at less than 36 inches in three of the boreholes (134, 167, 170). Samples for arsenic, lead, and chromium analysis were transferred from the sampler to the sample jar using a disposable plastic spoon. Any remaining sample was placed in air-tight plastic bags and labelled with a waterproof marker for hide residue analysis. Sample containers, sample preservation, and holding times are given in Table 1.

The recovered soils were described and documented on borehole logs which are given in Appendix B. Chain of custody forms (given in Appendix C) were used to document each sample submitted to the laboratory for analysis. Chain of custody procedures outlined in the Quality Assurance Project Plan (QAPjP, Golder Associates Inc., 1989c) were followed.

Field QA/QC procedures included adherence to SOPs and collection of equipment rinsate blank, field duplicate, and matrix spike/matrix spike duplicate (MS/MSD) samples. Sample locations were documented in the field with a wooden stake labelled with the PDI task number and borehole number. The sample locations were surveyed by SAIC Engineering Inc. of Lakeville, Massachusetts. The surveyed sample locations are shown on Figure 1.

3.2 Laboratory Methods

Samples were analyzed by Radian Corporation (Sacramento, CA) in accordance with the methods listed in Table 1. Arsenic, lead, and chromium were analyzed by SW-846 methods. Laboratory QA/QC procedures are discussed in the QAPjP and include use of standard operating procedures for sample analysis, data reduction, and reporting, and specifications for instrument calibration, method blanks, and laboratory control samples.

Microscopy for identification of hide residue was performed by Golder Associates in accordance with "Procedure for Laboratory Identification of Hide Residue in Soil" given in the Interim Final Report (Golder Associates Inc., 1990a). This procedure involved inspection of both moist and oven-dried samples for the presence of hair fibers, which were used as indicators of the presence of hide residue. It was determined that hair fibers could be distinguished from fine roots more reliably in the oven-dried samples. Therefore, the moist microscopy results were not used. Notations of the presence of hide residue on the field borehole log were also used to identify their extent, but field notations on borehole logs could be rejected based upon the results of microscopy. Over five percent of the samples were checked by a second microscopist, including all samples in which the first microscopist identified hair fibers. If the duplicate result differed from the primary result, the sample was examined by a third microscopist whose result was considered to be conclusive.

4.0 RESULTS AND DISCUSSION

The results of arsenic, lead, chromium, and hide residue analysis for the 34 secondary borings are presented in Table 2. Hide residue was detected in several samples for which arsenic, lead, and chromium were below Consent Decree action levels, especially in the Boston Edison Right of Way No. 9. This was also found to be the case for other previously reported PDI samples in the Boston Edison Right of Way No. 9. The extent of Hazardous Substances above Consent Decree action levels, hide piles as shown in the Consent Decree, and hide residue detected in borehole samples within 36 inches of the ground surface, are shown on Figure 1. These limits will be used during Remedial Design to define the extent of remedial measures for soil including Institutional Controls, the permeable cap, and alternative remedies defined in the Consent Decree for developed areas (such as asphalt paving or excavation/consolidation).

Hide residue and/or arsenic, lead, or chromium above Consent Decree action levels were detected in several of the off-site secondary borings, and in many of the on-site secondary borings along the Boston Edison Right of Way No. 9. Arsenic, lead, or chromium were detected above Consent Decree action levels in areas west of the site and along the MBTA rail line south of the site.

Samples from most of the secondary boreholes contained arsenic, lead, and/or chromium above background levels. Figure 2 shows the areas where arsenic, lead, and chromium occur above background levels, but below Consent Decree action levels, based upon the new data from the secondary boreholes. It also shows areas where hide residue was detected, but Hazardous Substances were not detected above Consent Decree action levels.

5.0 DATA QUALITY OBJECTIVES

Field duplicate, matrix spike, matrix spike duplicate, and equipment rinsate blank samples were used to assess data quality. QA/QC data for these samples were compared to data acceptance criteria presented in the QAPjP. The total number of primary and QC samples collected during the secondary boring program are given in Table 3. The arsenic, lead, and chromium data were found to be precise, accurate, representative, comparable and complete (see Appendix D).

The precision of the data for the secondary borehole program were found to be sufficient to support Remedial Design. Over 94 percent of the field duplicates were found to be within the control limits for precision specified in the QAPjP. However, only 70 percent of the matrix spike/matrix spike duplicate pairs had RPDs within the control limit. The percent of the MS/MSD pairs with RPDs within control limits by metal are as follows: arsenic=78 percent, lead=75 percent, and chromium=60 percent. Therefore, an overall assessment of precision indicates that the arsenic and lead data are precise, but the chromium data should be evaluated on a case-by-case basis for each borehole. If a specific part of the site with the same soil type collected on the same day had acceptable MS/MSD RPDs, then those data were considered to be precise. For example, the chromium results for borings 167-169 are all from the same part of the site and the MS/MSD RPD for a sample from boring 169 was within the control limits. At borehole 166, the MS/MSD RPD is not within control limits, but the sample was collected at the site boundary, such that soils will be remediated up to the site boundary. Evaluation of all the chromium data using this approach indicate that the precision of the data is sufficient to support Remedial Design.

The accuracy of the data from the secondary borehole program were found to be sufficient to support Remedial Design. The percent of the MS/MSD samples with recoveries within the control limits by metal were as follows: arsenic=67 percent, lead=88 percent, and chromium=50 percent. Therefore, the lead data are accurate, but the arsenic and chromium data need to be evaluated on a case-by-case basis for each borehole as was done for chromium precision above. For example, one can conclude that the chromium concentrations are below Consent Decree action levels in the sample from borehole 169 because the primary sample result is below Consent Decree action levels and the chromium percent recoveries in MS/MSD samples at borehole 169 were all greater than 100 percent. Such an evaluation indicates that the accuracy of the arsenic and chromium data is sufficient to support Remedial Design.

The data are considered representative because approved standard operating procedures were used in the field and laboratory, and action levels based upon equipment rinsate blanks (16 ppm for arsenic and 1.6 ppm for chromium) are well below background concentrations (arsenic=25 ppm, lead=85 ppm, chromium=23 ppm) determined in the Interim Final Report. The data are comparable to RI data (Stauffer Chemical Company, 1983, 1984) because both investigations used standard EPA methods which are accepted as providing valid data. Data completeness for the secondary boring program is over 97 percent.

Field duplicate, MS/MSD, and equipment rinsate blank samples were collected at a rate of at least 1 per 20 primary samples. All samples were analyzed within the specified holding times.

6.0 SUMMARY

The objective of Task S-1 was to define the extent of Hazardous Substances at or above Consent Decree action levels, as well as areas above background levels but below action levels. This objective was addressed by reviewing the data generated during the RI, identifying data needs, and executing a sampling and analysis program to address those data needs. Because the data needs were not satisfied by the initial Task S-1 analyses, a program of secondary boreholes was necessary.

Figures 1 and 2 present all the results of PDI Task S-1. The on-site extent of Hazardous Substances have been defined in sufficient detail to support Remedial Design. Arsenic, lead, chromium, and/or hide residue also occur south of the site along the MBTA rail line and west of the site. A table summarizing the arsenic, lead, chromium and hide residue results for all PDI borings, and all on-site RI borings is given in Appendix E.

7.0 REFERENCES

Golder Associates Inc., 1989a. Pre-Design Work Plan, Revision 1, Industri-Plex Site, Woburn, MA, December 1989.

Golder Associates Inc., 1989b. Pre-Design Field Sampling Plan, Revision 1, Industri-Plex Site, Woburn, MA, December 1989.

Golder Associates Inc., 1989c. Pre-Design Quality Assurance Project Plan, Revision 1, Industri-Plex Site, Woburn, MA, December 1989.

Golder Associates Inc., 1990a. Pre-Design Investigation Task S-1, Extent of Hazardous Substances in Soils, Interim Final Report, Industri-Plex Site, Woburn, MA, September 1990.

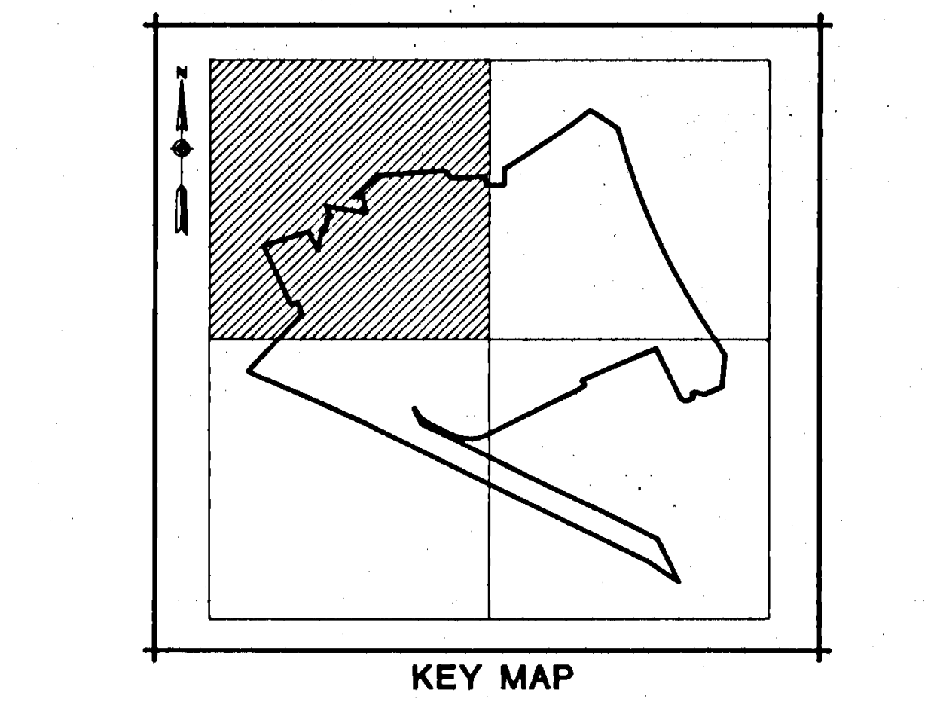
Golder Associates Inc., 1990b. Pre-Design Investigation Task S-2, Stability of Hide Piles, Interim Final Report, Industri-Plex Site, Woburn, MA, September 1990.

Golder Associates Inc., 1990c. Pre-Design Investigation Task S-4, Foundation Data, Interim Final Report, Industri-Plex Site, Woburn MA, September 1990.

Golder Assoicates Inc., 1990d. Pre-Design Investigation Task GW-1, Plume Delineation, Phase 1 Interim Report, Industri-Plex Site, Woburn, MA, prepared by Roux Associates, Inc., Huntington, NY, August 1990.

Stauffer Chemical Company, 1983. Woburn Environmental Studies Phase 1 Report, Environmental Assessments, Industri-Plex Site, Woburn, MA, April 1983.

Stauffer Chemical Company, 1984. Woburn Environmental Studies Phase 2 Report, Industri-Plex Site, Woburn, MA.



KEY MAP

LEGEND

○	RI OR PDI BORING OR TEST PIT WITH As, Pb AND/OR Cr CONCENTRATION LEVELS BELOW CONSENT DECREE ACTION LEVELS. DATA AVAILABLE FOR ONLY ONE SOIL HORIZON WITHIN 36 INCHES OF GROUND SURFACE
⊗	RI OR PDI BORING OR TEST PIT WITH As, Pb AND/OR Cr CONCENTRATION LEVELS BELOW CONSENT DECREE ACTION LEVELS. DATA AVAILABLE FOR MULTIPLE SOIL HORIZON WITHIN 36 INCHES OF GROUND SURFACE
●	RI OR PDI BORING OR TEST PIT WITH As, Pb AND/OR Cr CONCENTRATION LEVELS AT OR ABOVE CONSENT DECREE ACTION LEVELS. DATA AVAILABLE AT ONE OR MORE SOIL HORIZONS WITHIN 36 INCHES OF GROUND SURFACE
□	RI BORING OR TEST PIT LOG CHECKED FOR HIDE RESIDUE. As, Pb AND Cr DATA ONLY AVAILABLE FOR DEPTHS GREATER THAN 36 INCHES OF GROUND SURFACE
☒	RI OR PDI BORING OR TEST PIT LOG THAT WAS CHECKED FOR HIDE RESIDUE, BUT WAS NOT SAMPLED FOR As, Pb OR Cr
▨	HIDE PILES BASED ON CONSENT DECREE
▧	HIDE RESIDUE PRESENT BASED ON RI AND/OR PDI DATA
━━━	SITE BOUNDARY
───	LIMIT OF SOILS WITH As, Pb AND/OR Cr CONCENTRATIONS AT OR ABOVE CONSENT DECREE ACTION LEVELS AND/OR HIDE RESIDUE AND HIDE PILES
-·-·-·-	STREAMS AND WATERCOURSES

NOTES

1.) RI DATA FROM DIGITAL FILE PROVIDED BY U.S. EPA REGION I, PHASE I RI REPORT AND PHASE II RI REPORT (STAUFFER, 1983 AND 1984). PRE-DESIGN INVESTIGATION DATA FROM PDI TASK S-1, TASK S-2, TASK S-4 AND TASK GW-1 INTERIM FINAL REPORTS (GOLDER ASSOCIATES, 1990a, 1990b, 1990c AND 1990d).

2.) PROPERTY BOUNDARY AND PDI BORING AND TEST PIT LOCATION SURVEY PERFORMED BY SAIC ENGINEERING INC., APRIL 1990.

3.) RI BORING AND TEST PIT LOCATIONS TAKEN FROM PHASE I AND PHASE II RI DRAWINGS (STAUFFER, 1983 AND 1984).

JAN 16 1991

100 0 100 200
scale feet

REV	DATE	DESCRIPTION	DR BY	RVW BY

SCALE: AS SHOWN

PROJECT No. 893-6255

DES BY	RMG	01/08/91
DR BY	JSG	01/08/91
CHK BY	RMG	01/16/91
RVW BY		1/16/91

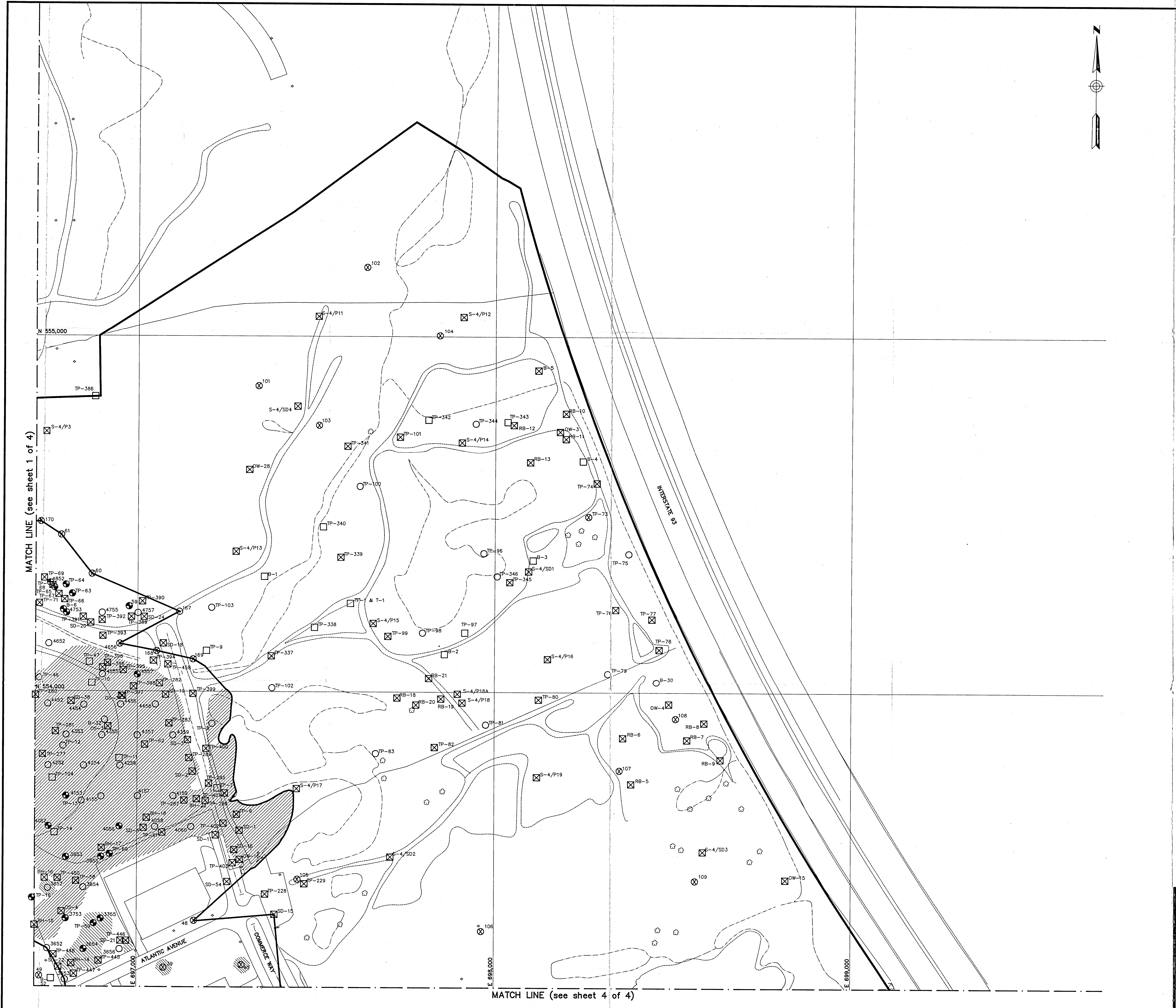
PROJECT:
INDUSTRI-PLEX SITE REMEDIAL TRUST
WOBURN, MASSACHUSETTS

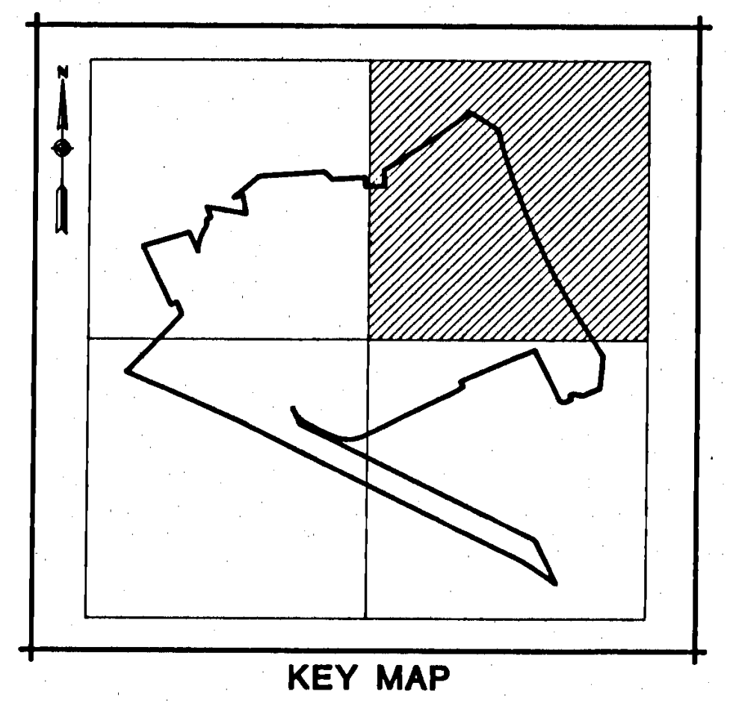
SHEET TITLE: RESULTS OF SOIL
As, Pb, Cr AND HIDE RESIDUE
ANALYSES

Golder Associates
Mt. Laurel, New Jersey

SHEET 1 OF 4
DRAWING No. MA01-423

FIGURE 1





KEY MAP

LEGEND

○	RI OR PDI BORING OR TEST PIT WITH As, Pb AND/OR Cr CONCENTRATION LEVELS BELOW CONSENT DECREE ACTION LEVELS. DATA AVAILABLE FOR ONLY ONE SOIL HORIZON WITHIN 36 INCHES OF GROUND SURFACE
⊗	RI OR PDI BORING OR TEST PIT WITH As, Pb AND/OR Cr CONCENTRATION LEVELS BELOW CONSENT DECREE ACTION LEVELS. DATA AVAILABLE FOR MULTIPLE SOIL HORIZON WITHIN 36 INCHES OF GROUND SURFACE
●	RI OR PDI BORING OR TEST PIT WITH As, Pb AND/OR Cr CONCENTRATION LEVELS AT OR ABOVE CONSENT DECREE ACTION LEVELS. DATA AVAILABLE AT ONE OR MORE SOIL HORIZONS WITHIN 36 INCHES OF GROUND SURFACE
☐	RI BORING OR TEST PIT LOG CHECKED FOR HIDE RESIDUE. As, Pb AND Cr DATA ONLY AVAILABLE FOR DEPTHS GREATER THAN 36 INCHES OF GROUND SURFACE
☒	RI OR PDI BORING OR TEST PIT LOG THAT WAS CHECKED FOR HIDE RESIDUE, BUT WAS NOT SAMPLED FOR As, Pb OR Cr
▨	HIDE PILES BASED ON CONSENT DECREE
▨	HIDE RESIDUE PRESENT BASED ON RI AND/OR PDI DATA
━	SITE BOUNDARY
━	LIMIT OF SOILS WITH As, Pb AND/OR Cr CONCENTRATIONS AT OR ABOVE CONSENT DECREE ACTION LEVELS AND/OR HIDE RESIDUE AND HIDE PILES
-·-·-	STREAMS AND WATERCOURSES

NOTES

1.) RI DATA FROM DIGITAL FILE PROVIDED BY U.S. EPA REGION I, PHASE I RI REPORT AND PHASE II RI REPORT (STAUFFER, 1983 AND 1984). PRE-DESIGN INVESTIGATION DATA FROM PDI TASK S-1, TASK S-2, TASK S-4 AND TASK GW-1 INTERIM FINAL REPORTS (GOLDER ASSOCIATES, 1990a, 1990b, 1990c AND 1990d).

2.) PROPERTY BOUNDARY AND PDI BORING AND TEST PIT LOCATION SURVEY PERFORMED BY SAIC ENGINEERING INC., APRIL 1990.

3.) RI BORING AND TEST PIT LOCATIONS TAKEN FROM PHASE I AND PHASE II RI DRAWINGS (STAUFFER, 1983 AND 1984).

100 0 100 200
scale feet

JAN 16 1991

REV	DATE	DESCRIPTION	DR BY	RVW BY

SCALE: AS SHOWN
PROJECT No. 893-6255

DES BY	RMG	01/09/91
DR BY	JSG	01/09/91
CHK BY	RMG	01/16/91
RVW BY		1/16/91

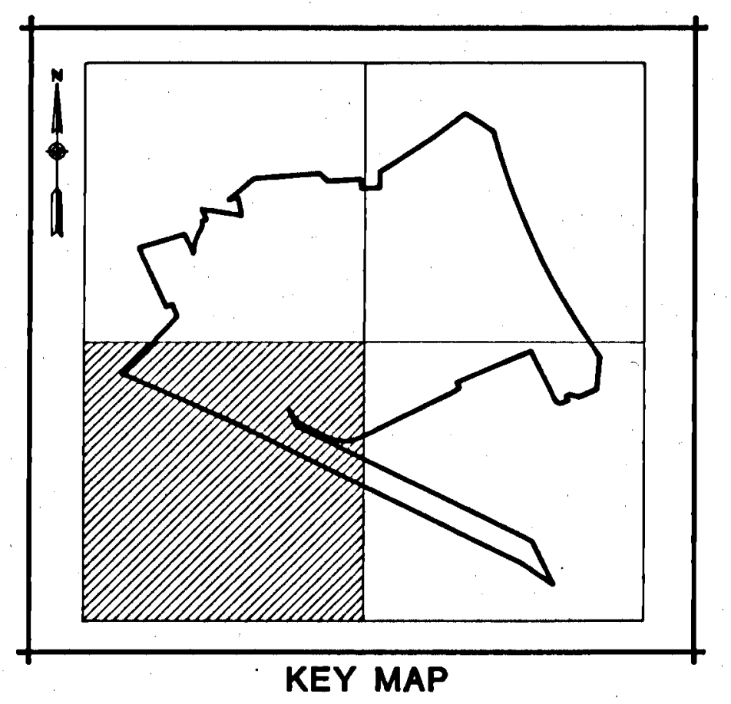
PROJECT:
INDUSTRI-PLEX SITE REMEDIAL TRUST
WOBURN, MASSACHUSETTS

SHEET TITLE:
RESULTS OF SOIL
As, Pb, Cr AND HIDE RESIDUE
ANALYSES

Golder Associates
Mt. Laurel, New Jersey

SHEET 2 OF 4
DRAWING No. MA01-424

FIGURE 1



KEY MAP

LEGEND

○	RI OR PDI BORING OR TEST PIT WITH As, Pb AND/OR Cr CONCENTRATION LEVELS BELOW CONSENT DECREE ACTION LEVELS. DATA AVAILABLE FOR ONLY ONE SOIL HORIZON WITHIN 36 INCHES OF GROUND SURFACE
⊗	RI OR PDI BORING OR TEST PIT WITH As, Pb AND/OR Cr CONCENTRATION LEVELS BELOW CONSENT DECREE ACTION LEVELS. DATA AVAILABLE FOR MULTIPLE SOIL HORIZON WITHIN 36 INCHES OF GROUND SURFACE
◕	RI OR PDI BORING OR TEST PIT WITH As, Pb AND/OR Cr CONCENTRATION LEVELS AT OR ABOVE CONSENT DECREE ACTION LEVELS. DATA AVAILABLE AT ONE OR MORE SOIL HORIZONS WITHIN 36 INCHES OF GROUND SURFACE
☐	RI BORING OR TEST PIT LOG CHECKED FOR HIDE RESIDUE. As, Pb AND Cr DATA ONLY AVAILABLE FOR DEPTHS GREATER THAN 36 INCHES OF GROUND SURFACE
☒	RI OR PDI BORING OR TEST PIT LOG THAT WAS CHECKED FOR HIDE RESIDUE, BUT WAS NOT SAMPLED FOR As, Pb OR Cr
▨	HIDE PILES BASED ON CONSENT DECREE
▧	HIDE RESIDUE PRESENT BASED ON RI AND/OR PDI DATA
━	SITE BOUNDARY
━	LIMIT OF SOILS WITH As, Pb AND/OR Cr CONCENTRATIONS AT OR ABOVE CONSENT DECREE ACTION LEVELS AND/OR HIDE RESIDUE AND HIDE PILES
—·—·—	STREAMS AND WATERCOURSES

NOTES

1.) RI DATA FROM DIGITAL FILE PROVIDED BY U.S. EPA REGION I, PHASE I RI REPORT AND PHASE II RI REPORT (STAUFFER, 1983 AND 1984). PRE-DESIGN INVESTIGATION DATA FROM PDI TASK S-1, TASK S-2, TASK S-4 AND TASK GW-1 INTERIM FINAL REPORTS (GOLDER ASSOCIATES, 1990a, 1990b, 1990c AND 1990d).

2.) PROPERTY BOUNDARY AND PDI BORING AND TEST PIT LOCATION SURVEY PERFORMED BY SAIC ENGINEERING INC., APRIL 1990.

3.) RI BORING AND TEST PIT LOCATIONS TAKEN FROM PHASE I AND PHASE II RI DRAWINGS (STAUFFER, 1983 AND 1984).

JAN 16 1991

100 0 100 200
scale feet

REV	DATE	DESCRIPTION	DR BY	RVW BY

SCALE: AS SHOWN
PROJECT No. 893-6255

DES BY	RMG	01/08/91
DR BY	JSG	01/08/91
CHK BY	RMG	01/16/91
RVW BY		1/16/91

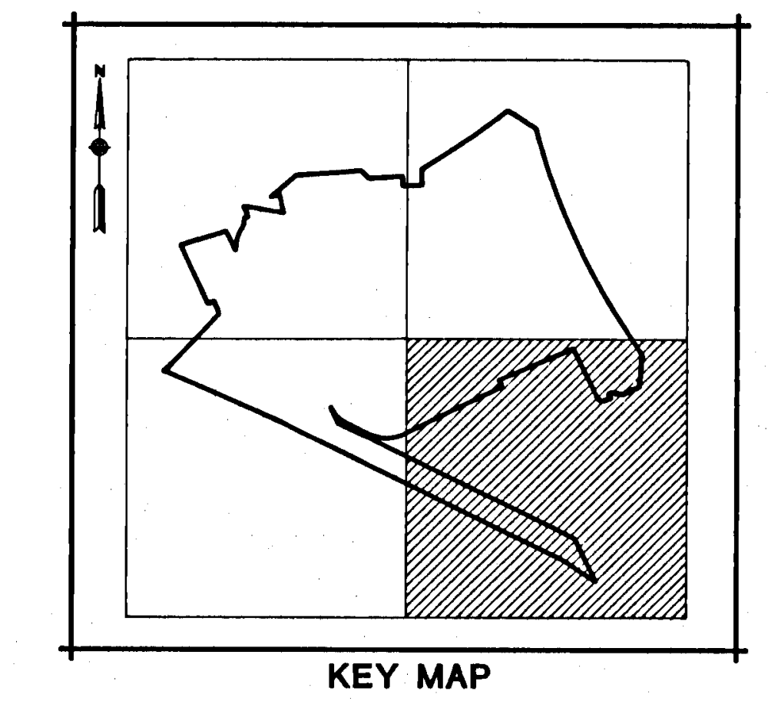
PROJECT:
INDUSTRI-PLEX SITE REMEDIAL TRUST
WOBURN, MASSACHUSETTS

SHEET TITLE:
RESULTS OF SOIL As, Pb, Cr AND HIDE RESIDUE ANALYSES

Golder Associates
Mt. Laurel, New Jersey

SHEET 3 OF 4
DRAWING No. MA01-425

FIGURE 1


KEY MAP

LEGEND

○	RI OR PDI BORING OR TEST PIT WITH As, Pb AND/OR Cr CONCENTRATION LEVELS BELOW CONSENT DECREE ACTION LEVELS. DATA AVAILABLE FOR ONLY ONE SOIL HORIZON WITHIN 36 INCHES OF GROUND SURFACE
⊗	RI OR PDI BORING OR TEST PIT WITH As, Pb AND/OR Cr CONCENTRATION LEVELS BELOW CONSENT DECREE ACTION LEVELS. DATA AVAILABLE FOR MULTIPLE SOIL HORIZON WITHIN 36 INCHES OF GROUND SURFACE
◕	RI OR PDI BORING OR TEST PIT WITH As, Pb AND/OR Cr CONCENTRATION LEVELS AT OR ABOVE CONSENT DECREE ACTION LEVELS. DATA AVAILABLE AT ONE OR MORE SOIL HORIZONS WITHIN 36 INCHES OF GROUND SURFACE
☐	RI BORING OR TEST PIT LOG CHECKED FOR HIDE RESIDUE. As, Pb AND Cr DATA ONLY AVAILABLE FOR DEPTHS GREATER THAN 36 INCHES OF GROUND SURFACE
☒	RI OR PDI BORING OR TEST PIT LOG THAT WAS CHECKED FOR HIDE RESIDUE, BUT WAS NOT SAMPLED FOR As, Pb OR Cr
▨	HIDE PILES BASED ON CONSENT DECREE
▧	HIDE RESIDUE PRESENT BASED ON RI AND/OR PDI DATA
━━	SITE BOUNDARY
──	LIMIT OF SOILS WITH As, Pb AND/OR Cr CONCENTRATIONS AT OR ABOVE CONSENT DECREE ACTION LEVELS AND/OR HIDE RESIDUE AND HIDE PILES
-·-·-·-	STREAMS AND WATERCOURSES

NOTES

1.) RI DATA FROM DIGITAL FILE PROVIDED BY U.S. EPA REGION I, PHASE I RI REPORT AND PHASE II RI REPORT (STAUFFER, 1983 AND 1984). PRE-DESIGN INVESTIGATION DATA FROM PDI TASK S-1, TASK S-2, TASK S-4 AND TASK GW-1 INTERIM FINAL REPORTS (GOLDER ASSOCIATES, 1990a, 1990b, 1990c AND 1990d).

2.) PROPERTY BOUNDARY AND PDI BORING AND TEST PIT LOCATION SURVEY PERFORMED BY SAIC ENGINEERING INC., APRIL 1990.

3.) RI BORING AND TEST PIT LOCATIONS TAKEN FROM PHASE I AND PHASE II RI DRAWINGS (STAUFFER, 1983 AND 1984).

100 0 100 200
scale feet

JAN 16 1991

REV	DATE	DESCRIPTION	DR BY	RVW BY

SCALE:	AS SHOWN	
PROJECT No.	893-6255	
DES BY	RMG	01/08/91
DR BY	JSG	01/08/91
CHK BY	RMG	01/16/91
RVW BY		1/16/91

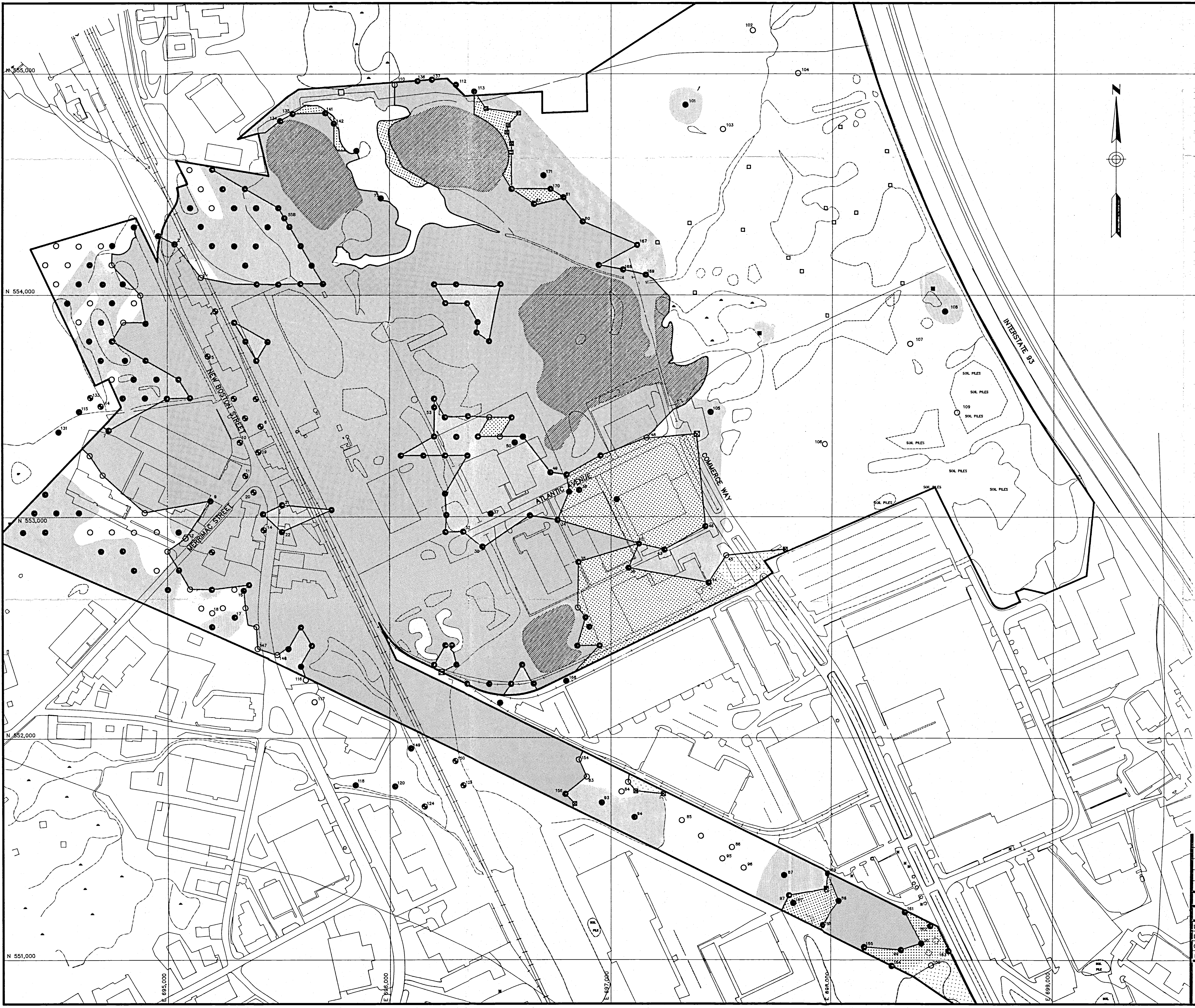
PROJECT:
INDUSTRI-PLEX SITE REMEDIAL TRUST
WOBURN, MASSACHUSETTS

SHEET TITLE:
RESULTS OF SOIL
As, Pb, Cr AND HIDE RESIDUE
ANALYSES

Golder Associates
Mt. Laurel, New Jersey

SHEET 4 OF 4
DRAWING No. MA01-426

FIGURE 1



LEGEND

○ □	ARSENIC, LEAD OR CHROMIUM BELOW BACKGROUND CONCENTRATIONS
● ■	ARSENIC, LEAD OR CHROMIUM AT OR ABOVE BACKGROUND CONCENTRATIONS BUT LESS THAN CONSENT DECREE ACTION LEVELS
⊕	ARSENIC, LEAD OR CHROMIUM PRESENT AT OR ABOVE CONSENT DECREE ACTION LEVELS AT ONE OR MORE HORIZIONS WITHIN 36 INCHES OF GROUND SURFACE IN DEVELOPED PORTIONS OF THE SITE AND OFF-SITE AREAS
☒	TEST PIT NOT ANALYZED FOR ARSENIC, LEAD OR CHROMIUM
▒	AREAS WHERE ARSENIC, LEAD OR CHROMIUM ARE AT OR ABOVE CONSENT DECREE ACTION LEVELS WITHIN 36 INCHES OF THE GROUND SURFACE
▨	HIDE PILES BASED ON CONSENT DECREE
░	AREAS WHERE ARSENIC, LEAD OR CHROMIUM ARE BELOW CONSENT DECREE ACTION LEVELS BUT ARE AT OR ABOVE BACKGROUND CONCENTRATIONS AND HIDE RESIDUE IS PRESENT WITHIN 36 INCHES OF THE GROUND SURFACE
▒	AREAS WHERE ARSENIC, LEAD OR CHROMIUM ARE BELOW CONSENT DECREE ACTION LEVELS BUT ARE AT OR ABOVE BACKGROUND CONCENTRATIONS AND HIDE RESIDUE IS NOT PRESENT WITHIN 36 INCHES OF THE GROUND SURFACE
░	AREAS WHERE ARSENIC, LEAD OR CHROMIUM ARE BELOW BACKGROUND CONCENTRATIONS AND HIDE RESIDUE IS PRESENT WITHIN 36 INCHES OF THE GROUND SURFACE
□	AREAS WHERE ARSENIC, LEAD OR CHROMIUM ARE BELOW BACKGROUND CONCENTRATIONS AND HIDE RESIDUE IS NOT PRESENT WITHIN 36" OF THE GROUND SURFACE
━	SITE BOUNDARY
─	PRELIMINARY LIMIT OF SOILS CONTAINING HIDE RESIDUE AND/OR As, Pb, AND Cr AT OR ABOVE CONSENT DECREE ACTION LEVELS
┄	SOIL PILES
┄	STREAMS OR WATERCOURSES
⌃	MARSH

NOTES

1.) RI DATA FROM DIGITAL FILE PROVIDED BY U.S. EPA REGION I, PHASE I RI REPORT AND PHASE II RI REPORT (STAUFFER, 1983 AND 1984). PRE-DESIGN INVESTIGATION DATA FROM PDI TASK S-1, TASK S-2, TASK S-4 AND TASK GW-1 INTERIM FINAL REPORTS (GOLDER ASSOCIATES, 1990a, 1990b, 1990c AND 1990d).

2.) PROPERTY BOUNDARY AND PDI BORING AND TEST PIT LOCATION SURVEY PERFORMED BY SAIC ENGINEERING INC., APRIL 1990.

3.) RI BORING AND TEST PIT LOCATIONS TAKEN FROM PHASE I AND PHASE II RI DRAWINGS (STAUFFER, 1983 AND 1984).

4.) NUMBERED SYMBOLS ARE PRE-DESIGN INVESTIGATION BORINGS. ALL OTHER SYMBOLS ARE RI BORINGS AND TEST PITS.

200 0 200 400
scale feet

JAN 16 1991

REV	DATE	DESCRIPTION	DR BY	RVW BY

SCALE: AS SHOWN
PROJECT No. 893-6255

DES BY	RMG	01/10/91
DR BY	JSG	01/10/91
CHK BY	RMF	01/16/91
RVW BY		1/16/91

PROJECT:
INDUSTRI-PLEX SITE REMEDIAL TRUST
WOBURN, MASSACHUSETTS

SHEET TITLE:
SUMMARY OF PDI TASK S-1
RESULTS FOR As, Pb, Cr
AND HIDE RESIDUE

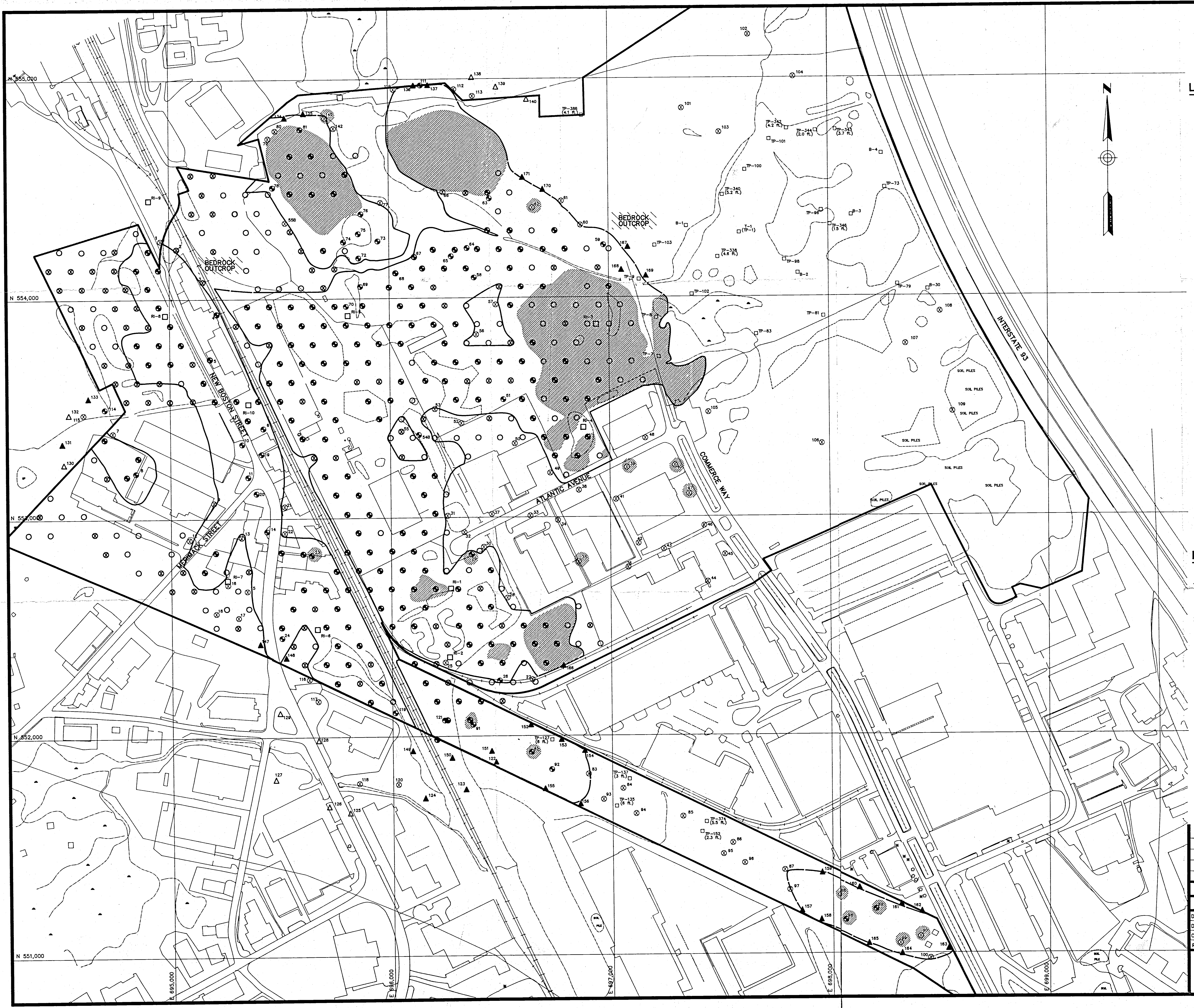
Golder Associates
Mt. Laurel, New Jersey

SHEET 1 OF 1
DRAWING No. MA01-427

FIGURE 2

APPENDIX A

PROPOSED TASK S-1 SECONDARY BOREHOLE LOCATIONS



JAN 16 1991

LEGEND

□	As, Pb AND Cr CONCENTRATIONS BELOW CONSENT DECREE ACTION LEVELS, DATA FROM RI BORINGS AND TEST PITS (DEPTH GIVEN IN PARENTHESES WHEN DOCUMENTED)
○	As, Pb AND Cr CONCENTRATIONS BELOW CONSENT DECREE ACTION LEVELS, RI DATA AVAILABLE FOR 6–12 INCH SOIL HORIZON ONLY.
⊗	As, Pb AND Cr CONCENTRATIONS BELOW CONSENT DECREE ACTION LEVELS, DATA AVAILABLE FOR MULTIPLE SOIL HORIZIONS WITHIN 36 INCHES OF GROUND SURFACE
●	As, Pb AND Cr AT OR ABOVE CONSENT DECREE ACTION LEVELS AT ANY SOIL HORIZON WITHIN 36 INCHES OF GROUND SURFACE.
▲	PROPOSED SECONDARY PRE–DESIGN BORING FOR As, Pb, Cr AND HIDE RESIDUE ANALYSIS
△	SECONDARY PRE–DESIGN BORINGS SHOWN IN PDI WORK PLAN FIGURES 10A AND 10B WHICH ARE NOT REQUIRED.
▨	HIDE RESIDUE PRESENT BASED ON RI DATA AND PDI DATA (IDENTIFIES HIDE PILES AND HIDE RESIDUE PRESENT AT SAMPLE LOCATIONS)
━	SITE BOUNDARY
─	PRELIMINARY LIMIT OF SOILS CONTAINING HIDE RESIDUE AND/OR As, Pb, AND Cr AT OR ABOVE CONSENT DECREE ACTION LEVELS (DASHED WHERE INFERRED PENDING RESULTS OF SECONDARY BORINGS)
------	SOIL PILES
------	STREAMS OR WATERCOURSES
⁎	MARSH

NOTES

1.) RI DATA WEST AND NORTH OF COMMERCE WAY FROM DIGITAL FILE PROVIDED BY U.S. EPA REGION I. RI DATA IN BOSTON EDISON RIGHT OF WAY No.9 AND NORTHEAST OF COMMERCE WAY FROM RI PLATES (STAUFFER, 1983 AND 1984).

2.) CIRCULAR AND TRIANGULAR SYMBOLS WITH LOCATION NUMBERS ARE PRE–DESIGN INVESTIGATION BORINGS. ALL OTHER SYMBOLS REPRESENT RI SAMPLES.

REV	DATE	DESCRIPTION	DR BY	RVW BY

SCALE: AS SHOWN

PROJECT No. 893–6255

DES BY	RAC	07/13/90
DR BY	JSG	07/20/90
CHK BY	RMG	09/18/90
RVW BY		9/18/90

PROJECT:
INDUSTRI-PLEX SITE REMEDIAL TRUST
WOBURN, MASSACHUSETTS

SHEET TITLE:
SAMPLE LOCATIONS AND
SUMMARY OF As, Pb, Cr AND
HIDE RESIDUE DATA

Golder Associates
Mt. Laurel, New Jersey

SHEET 1 OF 1
DRAWING No. MA01–100

FIGURE 10

APPENDIX B

BOREHOLE LOGS

BOREHOLE LOG S-1/122

PROJECT: Industri-Plex Site Pre-Design Investigation **DATE:** 11/7/90
SURFACE ELEV: 66.29 **DATUM:** MSL
DRILLING METHOD: Split Spoon **LOCATION:** N551918 E696478

SAMPLE LOCATION		DEPTH INCHES	SOIL DESCRIPTION
		2.0	0"-6" Loose dark brown to black f-m SAND and SILT with organic material (grass, roots).
4	1	4.0	
		6.0	
			6"-36" Compact light brown to brown to m-c SAND and GRAVEL trace cobbles.
		8.0	
10		10.0	
	2	12.0	
		14.0	
23		16.0	
		18.0	
		20.0	
17		22.0	
		24.0	
	3	26.0	
20		28.0	
		30.0	
		32.0	
19		34.0	
		36.0	

Job No. 893-6255 **GOLDER ASSOCIATES INC.** **Logged:** C. Agoglia
Checked: K. Moser

BOREHOLE LOG S-1/123

PROJECT: Industri-Plex Site Pre-Design Investigation **DATE:** 11/6/90
SURFACE ELEV: 64.39 **DATUM:** MSL
DRILLING METHOD: Split Spoon **LOCATION:** N551785 E696332

SAMPLE LOCATION		DEPTH INCHES	SOIL DESCRIPTION
		2.0	0"-18" Compact dark brown to black m-c SAND and GRAVEL some silt.
20	1	4.0	
		6.0	
		8.0	
15		10.0	
	2	12.0	
		14.0	
40		16.0	
		18.0	18" to 36" Compact dark reddish brown m SAND and SILT some gravel 1 to 5 cm in diameter.
		20.0	
50		22.0	
		24.0	
	3	26.0	
33		28.0	
		30.0	
		32.0	
38		34.0	
		36.0	

Job No. 893-6255 **GOLDER ASSOCIATES INC.** **Logged:** C. Agoglia
Checked: K. Moser

BOREHOLE LOG S-1/124

PROJECT: Industri-Plex Site Pre-Design Investigation **DATE:** 11/8/90
SURFACE ELEV: 59.99 **DATUM:** MSL
DRILLING METHOD: Hand Auger **LOCATION:** N551690 E696156

SAMPLE LOCATION	DEPTH INCHES	SOIL DESCRIPTION
	2.0	0"-36" Loose dark brown to black f-m SILT and SAND with some organic material (roots, grass, wood) in various stages of decomposition.
	4.0	
	6.0	
	8.0	
	10.0	
	12.0	
	14.0	
	16.0	
	18.0	
	20.0	
	22.0	
	24.0	
	26.0	
	28.0	
	30.0	
	32.0	
	34.0	
	36.0	

Job No. 893-6255 **GOLDER ASSOCIATES INC.** **Logged:** C. Agoglia
Checked: K. Moser

BOREHOLE LOG S-1/131

PROJECT: Industri-Plex Site Pre-Design Investigation **DATE:** 11/7/90
SURFACE ELEV: 80.29 **DATUM:** MSL
DRILLING METHOD: Split Spoon **LOCATION:** N553382 E694511

SAMPLE LOCATION		DEPTH INCHES	SOIL DESCRIPTION
			0"-36" Compact dark brown m-c SAND and SILT some m-c gravel (fill).
		2.0	
12	1	4.0	
		6.0	
		8.0	
20		10.0	
	2	12.0	
		14.0	
22		16.0	
		18.0	
		20.0	
20		22.0	
		24.0	
			24"-36" Brick and Concrete fragments observed.
	3	26.0	
30		28.0	
		30.0	
		32.0	
18		34.0	
		36.0	

Job No. 893-6255 **GOLDER ASSOCIATES INC.** **Logged:** C. Agoglia
Checked: K. Moser

BOREHOLE LOG S-1/133

PROJECT: Industri-Plex Site Pre-Design Investigation **DATE:** 11/7/90
SURFACE ELEV: 69.89 **DATUM:** MSL
DRILLING METHOD: Split Spoon **LOCATION:** N553540 E694655

SAMPLE LOCATION		DEPTH INCHES	SOIL DESCRIPTION
			0"-36" Compact dark brown to black SILT and c SAND with concrete, brick glass, and plastic fragments. Moist organic material (roots, grass) observed to a depth of 18 inches.
		2.0	
12	1	4.0	
		6.0	
		8.0	
14		10.0	
	2	12.0	
		14.0	
28		16.0	
		18.0	
		20.0	
30		22.0	
		24.0	
	3	26.0	
36		28.0	
		30.0	
		32.0	
38		34.0	
		36.0	

Job No. 893-6255 **GOLDER ASSOCIATES INC.** **Logged:** C. Agoglia
Checked: K. Moser

BOREHOLE LOG S-1/134

PROJECT: Industri-Plex Site Pre-Design Investigation **DATE:** 11/8/90
SURFACE ELEV: 76.40 **DATUM:** MSL
DRILLING METHOD: Hand Auger **LOCATION:** N554788 E695507

SAMPLE LOCATION	DEPTH INCHES	SOIL DESCRIPTION
		0"-7" Loose black f SILT and SAND with organic material (roots, grass).
	2.0	
	4.0	
	6.0	
	8.0	7"-14" Loose light brown m-c SAND and SILT.
	10.0	
	12.0	
	14.0	
		14"-18" Loose brown SILT some f-m sand.
	16.0	
	18.0	
		18" Refusal Bedrock or Rubble.
	20.0	
	22.0	
	24.0	
	26.0	
	28.0	
	30.0	
	32.0	
	34.0	
	36.0	

Job No. 893-6255 **GOLDER ASSOCIATES INC.** **Logged:** C. Agoglia
Checked: K. Moser

BOREHOLE LOG S-1/135

PROJECT: Industri-Plex Site Pre-Design Investigation **DATE:** 11/8/90
SURFACE ELEV: 71.30 **DATUM:** MSL
DRILLING METHOD: Hand Auger **LOCATION:** N554820 E695563

SAMPLE LOCATION	DEPTH INCHES	SOIL DESCRIPTION
		0"-6" Black SILT some f SAND with organic material (grass, roots).
	2.0	
	4.0	
	6.0	6"-36" Loose to compact light brown to brown to fmc SAND and SILT.
	8.0	11" Water encountered
	10.0	
	12.0	
	14.0	
	16.0	
	18.0	
	20.0	
	22.0	
	24.0	
	26.0	
	28.0	
	30.0	
	32.0	
	34.0	
	36.0	

Job No. 893-6255 **GOLDER ASSOCIATES INC.** **Logged:** C. Agoglia
Checked: K. Moser

BOREHOLE LOG S-1/136

PROJECT: Industri-Plex Site Pre-Design Investigation **DATE:** 11/8/90
SURFACE ELEV: 74.55 **DATUM:** MSL
DRILLING METHOD: Split Spoon **LOCATION:** N554968 E696126

SAMPLE LOCATION		DEPTH INCHES	SOIL DESCRIPTION
		2.0	0"-5" Loose black SILT little f sand trace c gravel with organic material (roots, grass).
13	1	4.0	
		6.0	5"-16" Compact brown m-c SAND little silt.
		8.0	
18		10.0	
	2	12.0	
		14.0	
49		16.0	16"-36" Compact light brown fmc SAND trace silt.
		18.0	
		20.0	
8		22.0	
		24.0	
	3	26.0	
13		28.0	
		30.0	
		32.0	
22		34.0	
		36.0	

Job No. 893-6255 **GOLDER ASSOCIATES INC.** **Logged:** C. Agoglia
Checked: K. Moser

BOREHOLE LOG S-1/137

PROJECT: Industri-Plex Site Pre-Design Investigation **DATE:** 11/8/90
SURFACE ELEV: 74.85 **DATUM:** MSL
DRILLING METHOD: Split Spoon **LOCATION:** N554975 E696191

SAMPLE LOCATION		DEPTH INCHES	SOIL DESCRIPTION
			0"-19" Loose black SILT and f SAND with organic material (roots, grass) trace fine gravel.
		2.0	
4	1	4.0	
		6.0	
		8.0	
10		10.0	
	2	12.0	
		14.0	
23		16.0	
		18.0	
		20.0	19"-36" Compact brown fmc SAND trace silt.
17		22.0	
		24.0	
	3	26.0	
20		28.0	
		30.0	
		32.0	
19		34.0	
		36.0	

Job No. 893-6255 **GOLDER ASSOCIATES INC.** **Logged:** C. Agoglia
Checked: K. Moser

BOREHOLE LOG S-1/147

PROJECT: Industri-Plex Site Pre-Design Investigation **DATE:** 11/7/90
SURFACE ELEV: 63.75 **DATUM:** MSL
DRILLING METHOD: Split Spoon **LOCATION:** N552402 E695405

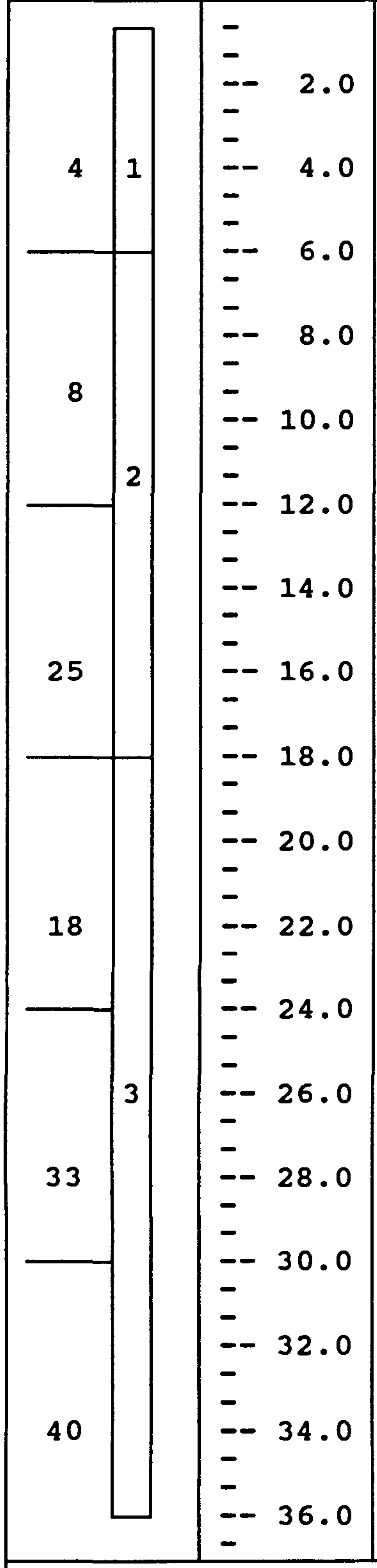
SAMPLE LOCATION		DEPTH INCHES	SOIL DESCRIPTION
			0"-36" Compact light to dark brown m-c SAND little silt trace c gravel. Organic material (grass, roots) observed to a depth of 30 inches. Gravel size increases with depth.
		2.0	
5	1	4.0	
		6.0	
		8.0	
19		10.0	
	2	12.0	
		14.0	
14		16.0	
		18.0	With the split spoon removed and the borehole to a depth of 18 inches, an HNu reading of 15 ppm at ground surface was recorded.
		20.0	
15		22.0	
		24.0	
	3	26.0	
27		28.0	
		30.0	
		32.0	
83		34.0	
		36.0	After removing the second split spoon, an HNu reading of 10 ppm was recorded at ground surface.

Job No. 893-6255 **GOLDER ASSOCIATES INC.** **Logged:** C. Agoglia
Checked: K. Moser

BOREHOLE LOG S-1/148

PROJECT: Industri-Plex Site Pre-Design Investigation **DATE:** 11/7/90
SURFACE ELEV: 65.15 **DATUM:** MSL
DRILLING METHOD: Split Spoon **LOCATION:** N552373 E695494

SAMPLE LOCATION	DEPTH INCHES	SOIL DESCRIPTION



0"-36" Loose light to dark brown m-c SAND, little silt trace m-c gravel. Organic material (grass, roots) observed to a depth of 24 inches.

Job No. 893-6255 **GOLDER ASSOCIATES INC.** **Logged:** C. Agoglia
Checked: K. Moser

BOREHOLE LOG S-1/149

PROJECT: Industri-Plex Site Pre-Design Investigation **DATE:** 11/8/90
SURFACE ELEV: 62.29 **DATUM:** MSL
DRILLING METHOD: Hand Auger **LOCATION:** N551952 E696095

SAMPLE LOCATION	DEPTH INCHES	SOIL DESCRIPTION
		0"-2" Loose black f-m SILT and SAND with some organic material (roots, grass).
	2.0	
		2"-24" Loose brown fmc SAND, little silt occasional layers (1-2 cm thick) of organic material (roots, grass).
1	4.0	
	6.0	
	8.0	
	10.0	
2	12.0	
	14.0	
	16.0	
	18.0	
	20.0	
	22.0	
	24.0	
		24"-36" Loose black f-m SILT and SAND with some organic material (roots, grass).
3	26.0	
	28.0	
	30.0	
	32.0	
	34.0	
	36.0	

Job No. 893-6255 **GOLDER ASSOCIATES INC.** **Logged:** C. Agoglia
Checked: K. Moser

BOREHOLE LOG S-1/150

PROJECT: Industri-Plex Site Pre-Design Investigation **DATE:** 11/6/90
SURFACE ELEV: 63.39 **DATUM:** MSL
DRILLING METHOD: Split Spoon **LOCATION:** N551895 E696295

SAMPLE LOCATION		DEPTH INCHES	SOIL DESCRIPTION
		2.0	0"-36" Loose to compact brown to dark brown m-c SAND some silt with little c gravel. Organic Material observed to a depth of 28 inches.
6	1	4.0	
		6.0	
		8.0	
6		10.0	
	2	12.0	
		14.0	
13		16.0	
		18.0	
		20.0	
11		22.0	
		24.0	
	3	26.0	
6		28.0	
		30.0	
		32.0	
9		34.0	
		36.0	

Job No. 893-6255 **GOLDER ASSOCIATES INC.** **Logged:** C. Agoglia
Checked: K. Moser

BOREHOLE LOG S-1/151

PROJECT: Industri-Plex Site Pre-Design Investigation **DATE:** 11/7/90
SURFACE ELEV: 61.79 **DATUM:** MSL
DRILLING METHOD: Split Spoon **LOCATION:** N551968 E696434

SAMPLE LOCATION		DEPTH INCHES	SOIL DESCRIPTION	
			0"-4"	Compact dark brown to black SAND and SILT with organic material (roots, grass).
		2.0		
11	1	4.0	4"-15"	Compact light brown to brown m-c SAND some coarse gravel trace silt.
		6.0		
		8.0		
23		10.0		
	2	12.0		
		14.0	15"-36"	Compact light brown to brown m-c SAND and GRAVEL 1 to 5 cm in diameter trace cobbles.
51		16.0		
		18.0		
		20.0		
56		22.0		
		24.0		
	3	26.0		
49		28.0		
		30.0		
		32.0		
43		34.0		
		36.0		

Job No. 893-6255 **GOLDER ASSOCIATES INC.** **Logged:** C. Agoglia
Checked: K. Moser

BOREHOLE LOG S-1/152

PROJECT: Industri-Plex Site Pre-Design Investigation **DATE:** 11/6/90
SURFACE ELEV: 67.65 **DATUM:** MSL
DRILLING METHOD: Split Spoon **LOCATION:** N552010 E696607

SAMPLE LOCATION		DEPTH INCHES	SOIL DESCRIPTION
		2.0	0"-11" Loose to compact brown m-c SAND with little silt. Organic material (grass, roots) present.
4	1	4.0	
		6.0	
		8.0	
3			
		10.0	
	2		11"-24" Loose to compact light brown to brown m-c SAND trace silt occasional organics (roots).
		12.0	
		14.0	
4		16.0	
		18.0	
		20.0	
3		22.0	
		24.0	At approximately 24", compact dark brown m-c SAND with little silt and lamae (.5 to 1mm thick) of light brown fine silt and sand.
	3	26.0	
8		28.0	
		30.0	
		32.0	
6		34.0	
		36.0	

Job No. 893-6255 **GOLDER ASSOCIATES INC.** **Logged:** C. Agoglia
Checked: K. Moser

BOREHOLE LOG S-1/153

PROJECT: Industri-Plex Site Pre-Design Investigation **DATE:** 11/6/90
SURFACE ELEV: 64.95 **DATUM:** MSL
DRILLING METHOD: Split Spoon **LOCATION:** N551959 E696799

SAMPLE LOCATION		DEPTH INCHES	SOIL DESCRIPTION
			0"-36" Loose to compact m-c SAND.
		2.0	
4	1	4.0	
		6.0	
		8.0	
4		10.0	
	2	12.0	
		14.0	
7		16.0	
		18.0	
		20.0	At approximately 20" rock fragments 1 to 3 cm in in diameter observed (quartz, plagioclase).
9		22.0	
		24.0	
	3	26.0	
17		28.0	
		30.0	
		32.0	
22		34.0	
		36.0	

Job No. 893-6255 **GOLDER ASSOCIATES INC.** **Logged:** C. Agoglia
Checked: K. Moser

BOREHOLE LOG S-1/154

PROJECT: Industri-Plex Site Pre-Design Investigation **DATE:** 11/6/90
SURFACE ELEV: 67.15 **DATUM:** MSL
DRILLING METHOD: Split Spoon **LOCATION:** N551902 E696856

SAMPLE LOCATION		DEPTH INCHES	SOIL DESCRIPTION
			0"-8" Loose dark brown to black f-m SAND with some silt and organic material (grass, roots).
		2.0	
4	1	4.0	
		6.0	
		8.0	
10			8"-10" Black SILT trace fine sand with organics (roots, wood, etc.)
		10.0	10"-36" Compact light brown to gray fine SAND some silt with black laminae .5 to 1 mm thick of silt and some fine sand.
	2		
		12.0	
		14.0	
23		16.0	
		18.0	
		20.0	
17		22.0	
		24.0	
	3	26.0	
20		28.0	
		30.0	
		32.0	
19		34.0	
		36.0	

Job No. 893-6255 **GOLDER ASSOCIATES INC.** **Logged:** C. Agoglia
Checked: K. Moser

BOREHOLE LOG S-1/155

PROJECT: Industri-Plex Site Pre-Design Investigation **DATE:** 11/6/90
SURFACE ELEV: 66.60 **DATUM:** MSL
DRILLING METHOD: Split Spoon **LOCATION:** N551786 E696671

SAMPLE LOCATION		DEPTH INCHES	SOIL DESCRIPTION
			0"-17" Compact brown to dark brown m-c SAND some silt with brick and rock fragments.
		2.0	
6	1	4.0	
		6.0	
		8.0	
11			
		10.0	
	2		
		12.0	
		14.0	
17		16.0	
			17"-36" Compact brown m-c SAND some to little silt with laminae .5 to 1 cm thick of light brown fine sand and silt.
		18.0	
		20.0	
19		22.0	
		24.0	
	3	26.0	
23		28.0	
		30.0	
		32.0	
25		34.0	
		36.0	

Job No. 893-6255 **GOLDER ASSOCIATES INC.** **Logged:** C. Agoglia
Checked: K. Moser

BOREHOLE LOG S-1/156

PROJECT: Industri-Plex Site Pre-Design Investigation **DATE:** 11/6/90
SURFACE ELEV: 67.70 **DATUM:** MSL
DRILLING METHOD: Split Spoon **LOCATION:** N551746 E696795

SAMPLE LOCATION		DEPTH INCHES		SOIL DESCRIPTION
			0"-36"	Compact dark brown to black f-m SAND and SILT with occasional angular rock fragments 1cm to 3cm in diameter. Organic material (roots, grass) observed to a depth of 16 inches.
		2.0		
9	1	4.0		
		6.0		
		8.0		
9		10.0		
	2	12.0		
		14.0		
14		16.0		
		18.0		
		20.0		
11		22.0		
		24.0		
	3	26.0		
10		28.0		
		30.0		
		32.0		
13		34.0		
		36.0		

Job No. 893-6255 **GOLDER ASSOCIATES INC.** **Logged:** C. Agoglia
Checked: K. Moser

BOREHOLE LOG S-1/157

PROJECT: Industri-Plex Site Pre-Design Investigation **DATE:** 11/6/90
SURFACE ELEV: 70.86 **DATUM:** MSL
DRILLING METHOD: Split Spoon **LOCATION:** N551255 E697821

SAMPLE LOCATION		DEPTH INCHES	SOIL DESCRIPTION	
		2.0	0"-16"	Loose dark brown to black f-m SAND and SILT with organic material (grass, roots)
2	1	4.0		
		6.0		
		8.0		
3		10.0		
	2	12.0		
		14.0		
5		16.0	16"-26"	Compact light brown to brown fmc SAND little silt HNu Reading 4 ppm at 18 inches
		18.0		
		20.0		
7		22.0		
		24.0		
	3	26.0	26"-36"	Compact dark brown to black m SAND and SILT
11		28.0		
		30.0		
		32.0		
11		34.0		
		36.0		

Job No. 893-6255 **GOLDER ASSOCIATES INC.** **Logged:** C. Agoglia
Checked: K. Moser

BOREHOLE LOG S-1/158

PROJECT: Industri-Plex Site Pre-Design Investigation **DATE:** 11/5/90
SURFACE ELEV: 69.46 **DATUM:** MSL
DRILLING METHOD: Split Spoon **LOCATION:** N551156 E697955

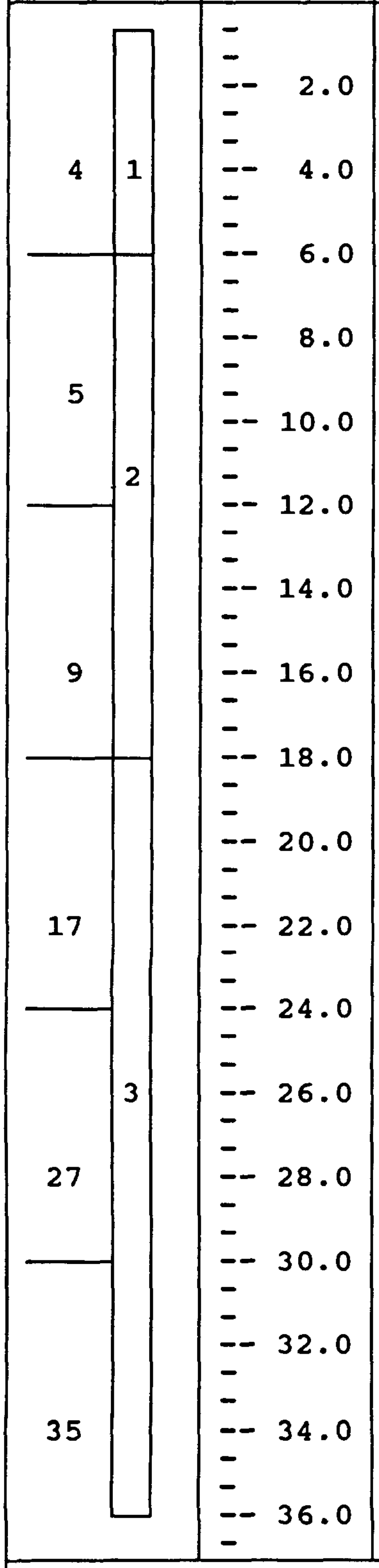
SAMPLE LOCATION		DEPTH INCHES	SOIL DESCRIPTION
			0"-12" Loose to compact dark brown fmc SAND little silt trace flakes of mica some organic matter (roots, grass)
		2.0	
3	1	4.0	
		6.0	
		8.0	
4		10.0	
	2	12.0	
			12"-36" Loose to compact dark brown fmc SAND little Silt tract flakes of bica occasional clumps of light brown fine sand and silt.
		14.0	
4		16.0	
		18.0	
		20.0	
4		22.0	
		24.0	At 24" The clumps of f SAND and silt are not present.
	3	26.0	
6		28.0	
		30.0	
		32.0	
9		34.0	
		36.0	

Job No. 893-6255 **GOLDER ASSOCIATES INC.** **Logged:** C. Agoglia
Checked: K. Moser

BOREHOLE LOG S-1/159

PROJECT: Industri-Plex Site Pre-Design Investigation **DATE:** 11/6/90
SURFACE ELEV: 64.06 **DATUM:** MSL
DRILLING METHOD: Split Spoon **LOCATION:** N551391 E697982

SAMPLE LOCATION	DEPTH INCHES	SOIL DESCRIPTION



0"-22" Compact dark brown f-m SAND and SILT some m gravel subrounded

22"-36" Compact light brown m-c SAND and m-c GRAVEL (quartz) little silt

Job No. 893-6255 **GOLDER ASSOCIATES INC.** **Logged:** C. Agoglia
Checked: K. Moser

BOREHOLE LOG S-1/160

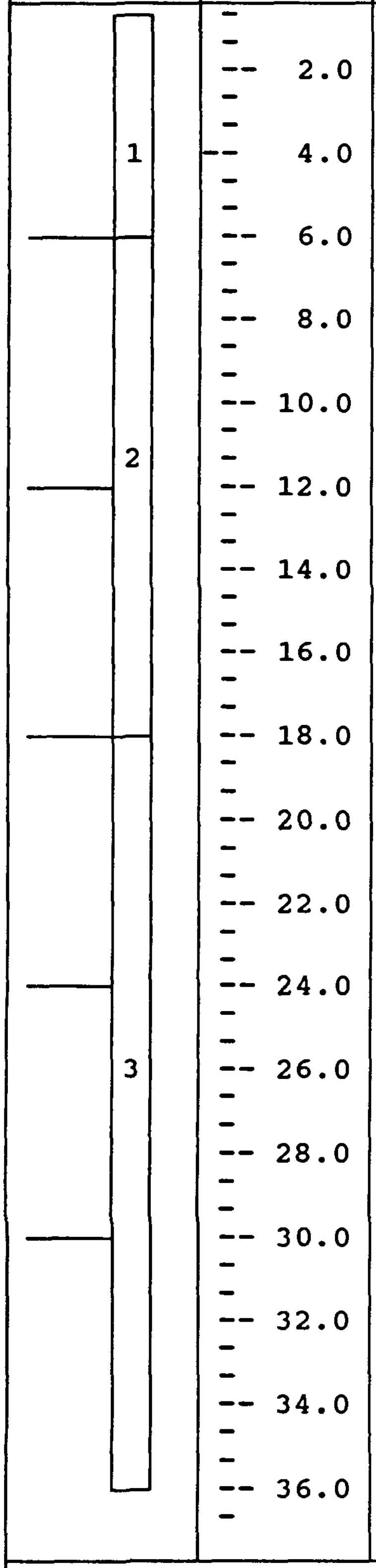
PROJECT: Industri-Plex Site Pre-Design Investigation **DATE:** 11/6/90
SURFACE ELEV: 62.96 **DATUM:** MSL
DRILLING METHOD: Split Spoon **LOCATION:** N551303 E698146

SAMPLE LOCATION		DEPTH INCHES	SOIL DESCRIPTION
		2.0	0"-12" Compact brown f-m SAND and SILT with organic material (grass,roots) and mica flakes
5	1	4.0	
		6.0	
		8.0	
7		10.0	
	2	12.0	12"-21" Compact dark brown to dark reddish brown m-c SAND and SILT with occasional m-c gravel quartz and hornblende
		14.0	
7		16.0	
		18.0	
		20.0	
8		22.0	At 21 inches dark reddish brown m-c SAND and SILT with laminae of light brown f-m sand (approx .5 cm thick)
		24.0	
	3	26.0	
6		28.0	
		30.0	
		32.0	
8		34.0	
		36.0	

Job No. 893-6255 **GOLDER ASSOCIATES INC.** **Logged:** C. Agoglia
Checked: K. Moser

BOREHOLE LOG S-1/161

PROJECT: Industri-Plex Site Pre-Design Investigation **DATE:** 11/5/90
SURFACE ELEV: 61.66 **DATUM:** MSL
DRILLING METHOD: Hand Auger **LOCATION:** N551214 E698334

SAMPLE LOCATION	DEPTH INCHES	SOIL DESCRIPTION
		0"-36" Dark brown to black m-c SAND and SILT with organic material (roots, grass) occasional angular quartz fragments .5 to 1 mm in diameter

Job No. 893-6255 **GOLDER ASSOCIATES INC.** **Logged:** C. Agoglia
Checked: K. Moser

BOREHOLE LOG S-1/162

PROJECT: Industri-Plex Site Pre-Design Investigation **DATE:** 11/7/90
SURFACE ELEV: 60.36 **DATUM:** MSL
DRILLING METHOD: Split Spoon **LOCATION:** N551152 E698448

SAMPLE LOCATION	DEPTH INCHES	SOIL DESCRIPTION
		0"-2" Loose black f SAND and SILT with organic material (roots, grass)
	2.0	2"-12" Loose dark brown f-m SAND, little silt with reddish brown laminae. Occasional angular quartz grain .5 to 1 mm in diameter
1	4.0	
	6.0	
	8.0	
	10.0	
2	12.0	12"-30" Loose dark reddish brown m-c SAND little silt. Coarse black hair 1-3 cm long.
	14.0	
	16.0	
	18.0	
	20.0	
	22.0	
	24.0	
3	26.0	
	28.0	
	30.0	Hand Auger Refusal at 30 inches
	32.0	
	34.0	
	36.0	

Job No. 893-6255 **GOLDER ASSOCIATES INC.** **Logged:** C. Agoglia
Checked: K. Moser

BOREHOLE LOG S-1/163

PROJECT: Industri-Plex Site Pre-Design Investigation **DATE:** 11/6/90
SURFACE ELEV: 59.96 **DATUM:** MSL
DRILLING METHOD: Split Spoon **LOCATION:** N551040 E698532

SAMPLE LOCATION		DEPTH INCHES	SOIL DESCRIPTION	
			0"-14"	Loose to compact dark brown f-m-c SAND with some silt and organic material, (grass, roots)
		2.0		
4	1	4.0		
		6.0		
		8.0		
8				
		10.0		
	2			
		12.0		
		14.0	14"-30"	Compact light brown m-c SAND little silt with occasional subrounded quartz pebbles .5 to 3 cm in diameter
15		16.0		
		18.0		
		20.0		
17		22.0		
		24.0		
	3	26.0		
35		28.0		
		30.0	30"-36"	Compact black m SAND and SILT like material (Coal Fines) with coarse black hair observed. Hydrocarbon and decaying organic odor observed.
		32.0		
30		34.0		
		36.0		

Job No. 893-6255 **GOLDER ASSOCIATES INC.** **Logged:** C. Agoglia
Checked: K. Moser

BOREHOLE LOG S-1/164

PROJECT: Industri-Plex Site Pre-Design Investigation **DATE:** 11/5/90
SURFACE ELEV: 61.69 **DATUM:** MSL
DRILLING METHOD: Split Spoon **LOCATION:** N550974 E698275

SAMPLE LOCATION		DEPTH INCHES	SOIL DESCRIPTION	
			0"-12"	Loose brown f-m SAND and SILT with some organic material. Moist
		2.0		
1	1	4.0		
		6.0		
		8.0		
3				
		10.0		
	2			
		12.0		
			12"-24"	Loose dark brown m SAND and SILT (angular quartz grains) trace mica flakes. Hair observed - light brown coarse hair.
		14.0		
3		16.0		
		18.0		
		20.0		
6		22.0		
		24.0		
			24"-28"	Loose dark brown f-m SAND little silt light brown mottling
	3	26.0		
4		28.0		
			28"-36"	Loose black SILT or coal fines.
		30.0		
		32.0		
1		34.0		
		36.0		

Job No. 893-6255 **GOLDER ASSOCIATES INC.** **Logged:** C. Agoglia
Checked: K. Moser

BOREHOLE LOG S-1/165

PROJECT: Industri-Plex Site Pre-Design Investigation **DATE:** 11/5/90
SURFACE ELEV: 64.89 **DATUM:** MSL
DRILLING METHOD: Split Spoon **LOCATION:** N551057 E698150

SAMPLE LOCATION		DEPTH INCHES	SOIL DESCRIPTION
			0"-12" Loose dark brown to black f SAND and SILT with organic material (humas).
		2.0	
1	1	4.0	
		6.0	
		8.0	
1		10.0	
	2	12.0	12"-24" Loose light brown f-m SAND little silt, fine laminae (black and brown). Small white worms observed, alive.
		14.0	
1		16.0	
		18.0	
		20.0	
2		22.0	
		24.0	24"-36" Loose to compact light to dark brown m-c SAND little silt, gray and black, laminae with reddish brown staining.
	3	26.0	
3		28.0	
		30.0	
		32.0	
3		34.0	
		36.0	

Job No. 893-6255 **GOLDER ASSOCIATES INC.** **Logged:** C. Agoglia
Checked: K. Moser

BOREHOLE LOG S-1/166

PROJECT: Industri-Plex Site Pre-Design Investigation **DATE:** 11/6/90
SURFACE ELEV: 60.56 **DATUM:** MSL
DRILLING METHOD: Split Spoon **LOCATION:** N552257 E696798

SAMPLE LOCATION		DEPTH INCHES	SOIL DESCRIPTION
			0"-36" Light brown m-c SAND trace silt and mica flakes organic material, (roots, grass) observed to a depth of 12 inches.
		2.0	
3	1	4.0	
		6.0	
		8.0	
5		10.0	
	2	12.0	
		14.0	
9		16.0	
		18.0	
		20.0	
6		22.0	
		24.0	
	3	26.0	
13		28.0	
		30.0	
		32.0	
11		34.0	
		36.0	

Job No. 893-6255 **GOLDER ASSOCIATES INC.** **Logged:** C. Agoglia
Checked: K. Moser

BOREHOLE LOG S-1/167

PROJECT: Industri-Plex Site Pre-Design Investigation **DATE:** 11/7/90
SURFACE ELEV: 75.48 **DATUM:** MSL
DRILLING METHOD: Split Spoon **LOCATION:** N554225 E697117

SAMPLE LOCATION	DEPTH INCHES	SOIL DESCRIPTION
	2.0	0"-8" Loose brown m-c SAND little silt trace c gravel
38 1	4.0	
	6.0	
	8.0	Refusal at 8" Bedrock
	10.0	
2		
	12.0	
	14.0	
	16.0	
	18.0	
	20.0	
	22.0	
	24.0	
3	26.0	
	28.0	
	30.0	
	32.0	
	34.0	
	36.0	

Job No. 893-6255 **GOLDER ASSOCIATES INC.** **Logged:** C. Agoglia
Checked: K. Moser

BOREHOLE LOG S-1/168

PROJECT: Industri-Plex Site Pre-Design Investigation **DATE:** 11/8/90
SURFACE ELEV: 73.00 **DATUM:** MSL
DRILLING METHOD: Split Spoon **LOCATION:** N554115 E697053

SAMPLE LOCATION		DEPTH INCHES	SOIL DESCRIPTION
			0-5" Loose dark brown f-m SAND and SILT some m-c gravel
		2.0	
14	1	4.0	
		6.0	5"-36" Compact gray to dark gray f SAND and SILT some f-m-c gravel
		8.0	
30		10.0	
	2	12.0	
		14.0	
46		16.0	
		18.0	
		20.0	
19		22.0	
		24.0	
	3	26.0	
33		28.0	
		30.0	
		32.0	
33		34.0	
		36.0	

Job No. 893-6255 **GOLDER ASSOCIATES INC.** **Logged:** C. Agoglia
Checked: K. Moser

BOREHOLE LOG S-1/169

PROJECT: Industri-Plex Site Pre-Design Investigation **DATE:** 11/7/90
SURFACE ELEV: 69.68 **DATUM:** MSL
DRILLING METHOD: Split Spoon **LOCATION:** N554092 E697156

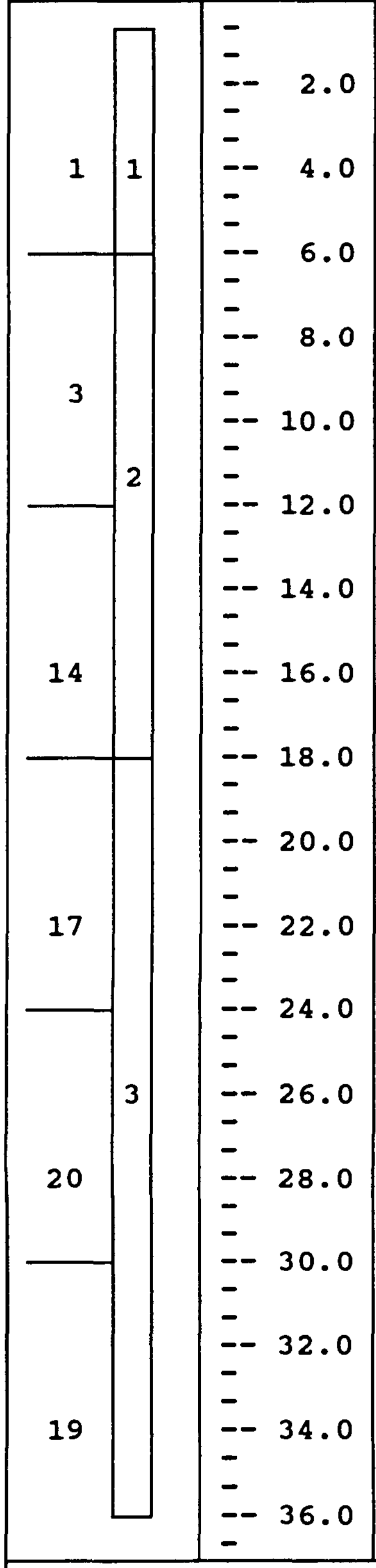
SAMPLE LOCATION		DEPTH INCHES	SOIL DESCRIPTION
		2.0	0"-9" Loose dark brown to gray m-c SAND and SILT some m-c gravel
11	1	4.0	
		6.0	
		8.0	
21		10.0	9"-30" Compact dark reddish brown c SAND and m-c gravel some silt
	2	12.0	
		14.0	
29		16.0	
		18.0	
		20.0	
78		22.0	
		24.0	
	3	26.0	
51		28.0	
		30.0	Refusal at 30" Bedrock
		32.0	
		34.0	
		36.0	

Job No. 893-6255 **GOLDER ASSOCIATES INC.** **Logged:** C. Agoglia
Checked: K. Moser

BOREHOLE LOG S-1/170

PROJECT: Industri-Plex Site Pre-Design Investigation **DATE:** 11/8/90
SURFACE ELEV: 108.48 **DATUM:** MSL
DRILLING METHOD: Split Spoon **LOCATION:** N554478 E696727

SAMPLE LOCATION | DEPTH INCHES | SOIL DESCRIPTION



0"-7" Loose dark brown f SILT and SAND some organic material (roots and grass

7"-20" Loose to compact brown SILT and f SAND trace m-c gravel

At 20" Refusal (Bedrock)

Job No. 893-6255 **GOLDER ASSOCIATES INC.** **Logged:** C. Agoglia
Checked: K. Moser

BOREHOLE LOG S-1/171

PROJECT: Industri-Plex Site Pre-Design Investigation **DATE:** 11/8/90
SURFACE ELEV: 112.90 **DATUM:** MSL
DRILLING METHOD: Split Spoon **LOCATION:** N554541 E696695

SAMPLE LOCATION		DEPTH INCHES	SOIL DESCRIPTION
		2.0	0"-3" Loose black SILT some f sand with organic material (grass,roots)
6	1	4.0	3"-19" Loose to compact brown f-m SAND some silt trace f gravel trace organics (roots)
		6.0	
		8.0	
18		10.0	
	2	12.0	
		14.0	
13		16.0	
		18.0	
		20.0	
9		22.0	19"-36" Compact light brown f-m SAND some SILT little f gravel
		24.0	
	3	26.0	
14		28.0	
		30.0	
		32.0	
14		34.0	
		36.0	

Job No. 893-6255 **GOLDER ASSOCIATES INC.** **Logged:** C. Agoglia
Checked: K. Moser

APPENDIX C

CHAIN OF CUSTODY FORMS

RADIAN
CORPORATION

Chain of Custody Record

Page 1 of 2

PROJECT ISRT

SITE ISRT Woburn, MA

COLLECTED BY *(Signature)*

FIELD SAMPLE I.D.	SAMPLE MATRIX	DATE/TIME	NO. OF CONTAINERS	ANALYSES Total Ar, Pb, Cr (SW846)									REMARKS	SAM ID NO. *(for lab use only)*
IP/S-1/164/006/1/2/1	Soil	11/5/90 / 1150	1	1										
IP/S-1/164/018/1/2/1	Soil	11/5/90 / 1150	1	1										
IP/S-1/164/036/1/2/1	Soil	11/5/90 / 1150	1	1										
IP/S-1/161/006/1/2/1	Soil	11/5/90 / 1510	1	1										
IP/S-1/161/018/1/2/1	Soil	11/5/90 / 1510	1	1										
IP/S-1/161/036/1/2/1	Soil	11/5/90 / 1510	1	1										
IP/S-1/162/006/1/2/1	Soil	11/5/90 / 1430	1	1										
IP/S-1/162/018/1/2/1	Soil	11/5/90 / 1430	1	1										
IP/S-1/162/036/1/2/1	Soil	11/5/90 / 1430	1	1										

REMARKS

RELINQUISHED BY: DATE TIME

RECEIVED BY:	DATE	TIME	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	DATE	TIME	RELINQUISHED BY:	DATE	TIME
	11/5/90	0800		11/5/90	1730						

LAB USE ONLY

RECEIVED FOR LABORATORY BY:	DATE	TIME	AIRBILL NO.	OPENED BY:	DATE	TIME	TEMP°C	SEAL #	CONDITION
ML Buehler	11/06/90	9:45	8717191 943	ML Buehler	11/6/90	10:00	6°C		Good

REMARKS

4-88-30337

RADIAN
CORPORATION

SD11C31

Chain of Custody Record

Page 1 of 3

PROJECT ISRT

SITE ISRT Woburn MA

COLLECTED BY (Signature) Christopher Ayoglia

FIELD SAMPLE I.D.	SAMPLE MATRIX	DATE/TIME	NO. OF CONTAINERS	ANALYSES								REMARKS	SAM ID NO. (for lab use only)
				Total/Ar, Pb, Cr by SW846									
IP/S-1/155/006/1/2/1	Soil	11/6/90/1338	1	1									
IP/S-1/155/018/1/2/1	Soil	" "	1	1									
IP/S-1/155/036/1/2/1	Soil	" "	1	1									
IP/S-1/150/006/1/2/1	Soil	" /1445	1	1									
IP/S-1/150/018/1/2/1	Soil	" "	1	1									
IP/S-1/150/036/1/2/1	Soil	" "	1	1									
IP/S-1/156/006/1/2/1	Soil	" /1310	1	1									
IP/S-1/156/018/1/2/1	Soil	" "	1	1									
IP/S-1/156/036/1/2/1	Soil	" "	1	1									

REMARKS

RELINQUISHED BY:	DATE	TIME

RECEIVED BY:	DATE	TIME	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	DATE	TIME	RELINQUISHED BY:	DATE	TIME
Christopher Ayoglia	11/6/90	0700	Christopher Ayoglia	11/6/90	1800						

LAB USE ONLY

RECEIVED FOR LABORATORY BY:	DATE	TIME	AIRBILL NO.	OPENED BY:	DATE	TIME	TEMP°C	SEAL #	CONDITION
	11/7	10:15	87719 1980		11/7	10:15	4°C	Yes	INTACT

REMARKS:

4-88-30337

RADIAN
CORPORATION

30110351

Chain of Custody Record

Page 3 of 3

PROJECT ISRT

SITE ISRT Woburn, MA

COLLECTED BY (Signature) Christopher Ayoglia

FIELD SAMPLE I.D.	SAMPLE MATRIX	DATE/TIME	NO. OF CONTAINERS	Total As, Pb, Cr by SW846								REMARKS	SAM ID NO. (for lab use only)
IP/S-1/166/006/1/2/1	Soil	11/6/90/1420	1										
IP/S-1/166/018/1/2/1	"	" "	1										
IP/S-1/166/036/1/2/1	"	" "	1										
IP/S-1/166/006/1/2/MS	"	" "	1										
IP/K-1/166/018/1/2/MS	"	" "	1									ON HOLD	
IP/K-1/166/036/1/2/MS	"	" "	1										
IP/S-1/166/006/1/2/~~MSD~~ N	"	" "	1										
IP/S-1/166/018/1/2/~~MSD~~ N	"	" "	1									ON HOLD	
IP/S-1/166/036/1/2/~~MSD~~ N	"	" "	1										

REMARKS

RELINQUISHED BY:	DATE	TIME

RECEIVED BY:	DATE	TIME	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	DATE	TIME	RELINQUISHED BY:	DATE	TIME
Christopher Ayoglia	11/6/90	0700	Christopher Ayoglia	11/6/90	1800						

LAB USE ONLY

RECEIVED FOR LABORATORY BY:	DATE	TIME	AIRBILL NO.	OPENED BY:	DATE	TIME	TEMP°C	SEAL #	CONDITION
	11/7	10:15	87719 1980		11/7	10:15	4°C	YES	INTACT

REMARKS

4-88-30337

RADIAN CORPORATION

S011032

Chain of Custody Record

Page 1 of 3

PROJECT ISRT

SITE ISRT Woburn, MA

COLLECTED BY (Signature) Christopher Agoglia

FIELD SAMPLE I.D.	SAMPLE MATRIX	DATE/TIME	NO. OF CONTAINERS	ANALYSES								REMARKS	SAM ID NO. (for lab use only)
				Total Ar, Pb, Cr by SW846									
IP/S-1/160/006/1/2/1	Soil	11/6/90/1030	1	1									
IP/S-1/160/018/1/2/1	"	" "	1	1									
IP/S-1/160/036/1/2/1	"	" "	1	1									
IP/S-1/159/006/1/2/1	"	11/6/90/1015	1	1									
IP/S-1/159/018/1/2/1	"	" "	1	1									
IP/S-1/159/036/1/2/1	"	" "	1	1									
IP/S-1/163/006/1/2/1	"	11/6/90 0920	1	1									
IP/S-1/163/018/1/2/1	"	" "	1	1									
IP/S-1/163/036/1/2/1	"	" "	1	1									

REMARKS

RELINQUISHED BY:	DATE	TIME

RECEIVED BY:	DATE	TIME	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	DATE	TIME	RELINQUISHED BY:	DATE	TIME
Christopher Agoglia	11/6/90	0700	Christopher Agoglia	11/6/90	1800						

LAB USE ONLY

RECEIVED FOR LABORATORY BY:	DATE	TIME	AIRBILL NO.	OPENED BY:	DATE	TIME	TEMP°C	SEAL #	CONDITION
	11/07	10:15	871719 1980		11/07	1015	4°C	YES	INTACT

REMARKS:

4-88-30337

RADIAN
CORPORATION

S011032

Chain of Custody Record

Page 3 of 3

PROJECT: ISRT

SITE: ISRT Woburn MA

COLLECTED BY (Signature): Christopher Ogaglin

FIELD SAMPLE I.D.	SAMPLE MATRIX	DATE/TIME	NO. OF CONTAINERS	ANALYSES Total/As, Pb, Cr by SW846								REMARKS	SAM ID NO. (for lab use only)
IP/S-1/123/006/1/2/M	Soil	11/6/90/1520										ON HOLD	
IP/S-1/123/018/1/2/M	Soil	" "											
IP/S-1/123/036/1/2/M	Soil	" "										ON HOLD	
IP/S-1/123/006/1/2/N	Soil	" "										ON HOLD	
IP/S-1/123/018/1/2/N	Soil	" "											
IP/S-1/123/036/1/2/N	Soil	" "										ON HOLD	
IP/S-1/110/000/2/2/EB	water	11/6/90/1630											
IP/S-1/111/000/2/2/EB	water	11/6/90/0920											

REMARKS:

RELINQUISHED BY: DATE: TIME:

RECEIVED BY:	DATE	TIME	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	DATE	TIME	RELINQUISHED BY:	DATE	TIME
Christopher Ogaglin	11/6/90	0700	Christopher Ogaglin	11/6/90	0700						

LAB USE ONLY

RECEIVED FOR LABORATORY BY:	DATE	TIME	AIRBILL NO.	OPENED BY:	DATE	TIME	TEMP°C	SEAL #	CONDITION
	11/7	10:15	871719 1980		11/7	10:15	4°C	YES	INTACT

REMARKS:

4-88-30337

RADIAN
CORPORATION

501,042

Chain of Custody Record

Page 2 of 4

PROJECT ISRT

SITE ISRT Woburn MA

COLLECTED BY *(Signature)*

ANALYSES

FIELD SAMPLE I.D.	SAMPLE MATRIX	DATE/TIME	NO. OF CONTAINERS	Total As, Pb, Cr by Sw 3050								REMARKS	SAM ID NO. *(for lab use only)*
CA IP/S-1/169/006/1/M/1	Soil	11/7/90 1440	1	1									
CA IP/S-1/169/006/1/N/1	Soil	" "	1	1									
IP/S-1/169/018/1/2/1	Soil	" "	1	1									
IP/S-1/169/036/1/2/1	Soil	" "	1	1								I.D on sample has '030' not	'036'
IP/S-1/133/006/1/2/1	Soil	" 1320	1	1									
IP/S-1/133/018/1/2/1	Soil	" 1320	1	1									
IP/S-1/133/036/1/2/1	Soil	" "	1	1									
IP/S1/131/006/1/2/1	Soil	" 1230	1	1									
IP/S-1/131/018/1/2/1	Soil	"	1	1									

REMARKS

RELINQUISHED BY:	DATE	TIME

RECEIVED BY:	DATE	TIME	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	DATE	TIME	RELINQUISHED BY:	DATE	TIME
Christopher Meagher	11/7/90	0700	Christopher Meagher	11/7/90	1730						

LAB USE ONLY

RECEIVED FOR LABORATORY BY:	DATE	TIME	AIRBILL NO.	OPENED BY:	DATE	TIME	TEMP°C	SEAL #	CONDITION
	11/8	1:10	87171919		11/8	610	5°	YES	INTACT

REMARKS

4-88-30337

RADIAN CORPORATION

SC:10:2

Chain of Custody Record

Page 4 of 4

PROJECT ISRT

SITE ISRT Woburn MA

COLLECTED BY (Signature) Christopher Ayoglia

FIELD SAMPLE I.D.	SAMPLE MATRIX	DATE/TIME	NO. OF CONTAINERS	ANALYSES: Total As, Pb, G by SW846								REMARKS	SAM ID NO. (for lab use only)
IP/S-1/147/036/1/1	Soil	11/7/90/1057	1	1									
IP/S-1/EB113/000/2/2/1	Water	11/7/90/1030	1	1									
IP/S-1/EB112/000/2/2/1	Water	11/7/90/0800	1	1									
IP/S-1/EB114/001/2/2/1	Water	11/7/90/1520	1	1									

REMARKS

RELINQUISHED BY: DATE TIME

RECEIVED BY:	DATE	TIME	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	DATE	TIME	RELINQUISHED BY:	DATE	TIME
Christopher Ayoglia	11/7/90	0700	Christopher Ayoglia	11/7/90	1730						

LAB USE ONLY

RECEIVED FOR LABORATORY BY:	DATE	TIME	AIRBILL NO.	OPENED BY:	DATE	TIME	TEMP°C	SEAL #	CONDITION
	11/8	1:20	9717191791		11/8	1:10	5°C	YES	INTACT

REMARKS

4-88-30337

RADIAN CORPORATION

SM 1655

Chain of Custody Record

Page 1 of 4

PROJECT
ISRT

SITE
ISRT Woburn MA

COLLECTED BY (Signature)
Christopher Agoglia

FIELD SAMPLE I.D.	SAMPLE MATRIX	DATE/TIME	NO. OF CONTAINERS	ANALYSES Total As, Pb, Cr by SW 846								REMARKS	SAM ID NO. (for lab use only)
IP/S-1/168/006/1/2/1	Soil	11/8/90/0750	1	1									
IP/S-1/168/018/1/2/1	"	" "	1	1									
IP/S-1/168/036/1/2/1	"	" "	1	1									
IP/S-1/124/006/1/2/1	"	" 1530	1	1									
IP/S-1/124/018/1/2/1	"	" "	1	1									
IP/S-1/124/036/1/2/1	"	" "	1	1									
IP/S-1/149/006/1/2/1	"	11/8/90 1600	1	1									
IP/S-1/149/018/1/2/1	"	" "	1	1									
IP/S-1/149/036/1/2/1	"	" "	1	1									

REMARKS

RECEIVED BY:	DATE	TIME	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	DATE	TIME	RELINQUISHED BY:	DATE	TIME
Christopher Agoglia	11/8/90	0700	Christopher Agoglia	11/8/90	1800						
									RELINQUISHED BY:	DATE	TIME

LAB USE ONLY

RECEIVED FOR LABORATORY BY:	DATE	TIME	AIRBILL NO.	OPENED BY	DATE	TIME	TEMP°C	SEAL #	CONDITION
	11/9	10:30			11/9	1030	5°	YES	INTACT

REMARKS

4-88-30337

AIR BILL # 8717192035, 8717192002

RADIAN CORPORATION

59114-7

Chain of Custody Record

Page 3 of 4

PROJECT: ISRT

SITE: ISRT Woburn MA

COLLECTED BY (Signature): Christopher Agaglia

FIELD SAMPLE I.D.	SAMPLE MATRIX	DATE/TIME	NO. OF CONTAINERS	ANALYSES: Total As, Pb, Cr by SW846								REMARKS	SAM ID NO. (for lab use only)
FP/S-1/171/036/1/D/1	Soil	11/8/90/ 1100	1	1									
FP/S-1/171/036/1/N/1	"	" "	1	1									
FP/S-1/171/036/1/M/1	"	" "	1	1									
FP/S-1/170/006/1/2/1	"	11/8/90/0845	1	1									
FP/S-1/170/018/1/2/1	"	" "	1	1									
FP/S-1/135/006/1/N/1	"	11/8/90/0950	1	1									
FP/S-1/135/006/1/M/1	"	" "	1	1									
FP/S-1/135/006/1/D/1	"	" "	1	1									
FP/S-1/135/006/1/2/1	"	" "	1	1									

REMARKS:

RELINQUISHED BY:	DATE	TIME

RECEIVED BY:	DATE	TIME	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	DATE	TIME	RELINQUISHED BY:	DATE	TIME
Christopher Agaglia	11/8/90	0700	Christopher Agaglia	11/8/90	1800						

LAB USE ONLY

RECEIVED FOR LABORATORY BY:	DATE	TIME	AIRBILL NO.	OPENED BY:	DATE	TIME	TEMP°C	SEAL #	CONDITION
	11/9	1030			11/9	1030	5°	YES	INTACT

REMARKS:

4-88-30337

APPENDIX D

DATA ASSESSMENT FORMS

INDUSTRI-PLEX PRE-DESIGN INVESTIGATION

ASSESSMENT OF OVERALL DATA QUALITY FOR TASK S-1

SECONDARY BORINGS

PERFORMED BY: Bob Glazier DATE: 1-9-91

	YES/NO/NA
1. Were the QAPjP, laboratory reports, and field documentation available to support data assessment procedures?	yes
2. Precision:	
Are DCS RPD within control limits?	yes
Are lab duplicate RPD within control limits?	NA
Are field duplicate RPD within control limits?	yes (94% in-control)
Are MS/MSD RPD within control limits?	yes*(70% in-control)

Overall assessment of precision *The following summarizes MS/MSD RPDs by metal: As=78%, Pb=75%, Cr=60% in-control. Therefore, As and Pb precision is acceptable. Cr field duplicate precision acceptable, but MS/MSD RPDs evaluated case-by-case for each borehole.

3. Accuracy:	
Is absolute recovery within control limits for DCS?	yes
Is relative recovery within control limits for MS/MSD?	no*

Overall assessment of accuracy MS/MSD recovery by metal is as follows: As=67% Pb=88%, Cr=50% in-control. Lead accuracy acceptable. As and Cr accuracy evaluated on a case-by-case basis for each borehole.

4. Representativeness:	
Were procedures in the FSP followed?	yes
If not, were procedural variations approved and documented?	NA
Were sample preservation procedures given in the FSP followed?	yes
Were data reported in the proper units?	yes
Was blank contamination not evident or well documented at low levels?	yes
Were field duplicates within control limits?	yes

Overall assessment of representativeness The data are considered to be representative of site conditions.

INDUSTRI-PLEX PRE-DESIGN INVESTIGATION

ASSESSMENT OF LABORATORY PERFORMANCE
FOR TASK 5-1 (8936255.35)

LABORATORY: Radian - Sacramento

REPORT # 50-11-026

VALIDATED BY: Lori Anne Hendel

DATE: 910102

		YES/NO/NA
1.	Release authorization with signature present?	yes
2.	Sample identification summary/description present?	yes
3.	Analytical results present, including:	
	correct units?	yes
	detection limits?	yes
	method used?	yes
	date sampled?	yes
	date received?	yes
	date prepared?	yes
	date analyzed?	yes
	dilutions noted?	no *
4.	Holding times met?	yes
5.	Lab duplicate RPDs within control limits (35%)?	N/A
	Field duplicate RPDs within control limits (50%)?	N/A
6.	MS/MSD % recoveries within control limits (75-125%)?	N/A
7.	MS/MSD RPDs within control limits (50%)?	N/A
8.	Duplicate control sample (DCS) accuracy within given control limits (80-120%)?	yes
9.	DCS precision within given control limits (20%)?	yes
10.	Method blanks "clean"?	yes
11.	Chain-of-Custody present and complete with signatures and dates?	yes
12.	Name of analyst/~~supervisor~~ given? Initials	yes
13.	Procedural deviations noted?	N/A
14.	QC procedures given?	N/A

LAHendel 910102 + 910105

INDUSTRI-PLEX PRE-DESIGN INVESTIGATION

ASSESSMENT OF LABORATORY PERFORMANCE
FOR TASK 5-1 (893-6255.35)

LABORATORY: Radian-Sacramento REPORT # 50-11-031

VALIDATED BY: Lori Anne Hendel DATE: 910102

	YES/NO/NA
1. Release authorization with signature present?	yes
2. Sample identification summary/description present?	yes‡
3. Analytical results present, including:	
correct units?	yes
detection limits?	yes
method used?	yes
date sampled?	yes
date received?	yes
date prepared?	yes
date analyzed?	yes
dilutions noted?	no ‡‡
4. Holding times met?	yes
5. Lab duplicate RPDs within control limits (35%)?	N/A
Field duplicate RPDs within control limits (50%)?	N/A
6. MS/MSD % recoveries within control limits (75-125%)?	no*
7. MS/MSD RPDs within control limits (50%)?	no*
8. Duplicate control sample (DCS) accuracy within given control limits (80-120%)?	yes
9. DCS precision within given control limits (20%)?	yes
10. Method blanks "clean"?	yes
11. Chain-of-Custody present and complete with signatures and dates?	yes
12. Name of analyst/~~supervisor~~ given? Initials	yes
13. Procedural deviations noted?	NA
14. QC procedures given?	NA

Lori Anne Hendel
910102+910105

INDUSTRI-PLEX PRE-DESIGN INVESTIGATION

ASSESSMENT OF LABORATORY PERFORMANCE FOR TASK 5-1 (893-6255.35)

LABORATORY: Radian - Sacramento REPORT # 50-11-032

VALIDATED BY: Lori Anne Hendel DATE: 910102

		YES/NO/NA
1.	Release authorization with signature present?	yes
2.	Sample identification summary/description present?	yes
3.	Analytical results present, including:	
	correct units?	yes
	detection limits?	yes
	method used?	yes
	date sampled?	yes
	date received?	yes
	date prepared?	yes
	date analyzed?	yes
	dilutions noted?	no +
4.	Holding times met?	yes
5.	Lab duplicate RPDs within control limits (35%)?	N/A
	Field duplicate RPDs within control limits (50%)?	no *
6.	MS/MSD % recoveries within control limits (75-125%)?	no**
7.	MS/MSD RPDs within control limits (50%)?	no**
8.	Duplicate control sample (DCS) accuracy within given control limits (80-120%)?	yes
9.	DCS precision within given control limits (20%)?	yes
10.	Method blanks "clean"?	yes
11.	Chain-of-Custody present and complete with signatures and dates?	yes
12.	Name of analyst/~~supervisor~~ given? Initials	yes
13.	Procedural deviations noted?	no***
14.	QC procedures given?	N/A

LAHendel
910102+910105

INDUSTRI-PLEX PRE-DESIGN INVESTIGATION

ASSESSMENT OF LABORATORY PERFORMANCE
FOR TASK 5-1 (893-6255.35)

LABORATORY: Radian-Sacramento REPORT # S0-11-042

VALIDATED BY: Lori Anne Hendel DATE: 910102

	YES/NO/NA
1. Release authorization with signature present?	yes
2. Sample identification summary/description present?	yes ‡
3. Analytical results present, including:	
correct units?	yes
detection limits?	yes
method used?	yes
date sampled?	yes
date received?	yes
date prepared?	yes
date analyzed?	yes
dilutions noted?	no ‡‡
4. Holding times met?	yes
5. Lab duplicate RPDs within control limits (35%)?	N/A
Field duplicate RPDs within control limits (50%)?	no *
6. MS/MSD % recoveries within control limits (75-125%)?	no **
7. MS/MSD RPDs within control limits (50%)?	no **
8. Duplicate control sample (DCS) accuracy within given control limits (80-120%)?	yes
9. DCS precision within given control limits (20%)?	yes
10. Method blanks "clean"?	yes
11. Chain-of-Custody present and complete with signatures and dates?	yes
12. Name of analyst/~~supervisor~~ given? Initials	yes
13. Procedural deviations noted?	N/A
14. QC procedures given?	N/A

Lori Anne Hendel
910102 + 910105

INDUSTRI-PLEX PRE-DESIGN INVESTIGATION

ASSESSMENT OF LABORATORY PERFORMANCE
FOR TASK S-1 (893-6255.35)

LABORATORY: RADIAN - SACRAMENTO

REPORT # 50-11-055

VALIDATED BY: Lori Anne Hendel

DATE: 910102

		YES/NO/NA
1.	Release authorization with signature present?	yes
2.	Sample identification summary/description present?	yes
3.	Analytical results present, including:	
	correct units?	yes
	detection limits?	yes
	method used?	yes
	date sampled?	yes
	date received?	yes
	date prepared?	yes
	date analyzed?	yes
	dilutions noted?	no ‡
4.	Holding times met?	yes
5.	Lab duplicate RPDs within control limits (35%)?	N/A
	Field duplicate RPDs within control limits (50%)?	no*
6.	MS/MSD % recoveries within control limits (75-125%)?	no**
7.	MS/MSD RPDs within control limits (50%)?	no**
8.	Duplicate control sample (DCS) accuracy within given control limits (80-120%)?	yes
9.	DCS precision within given control limits (20%)?	yes
10.	Method blanks "clean"?	yes
11.	Chain-of-Custody present and complete with signatures and dates?	yes
12.	Name of analyst/~~supervisor~~ given? Initials	yes
13.	Procedural deviations noted?	N/A
14.	QC procedures given?	N/A

Lori Anne Hendel
910102 + 910105

INDUSTRI-PLEX PRE-DESIGN INVESTIGATION

ASSESSMENT OF FIELD PERFORMANCE
FOR TASK S-1
Secondary Boreholes

SAMPLER/ORGANIZATION: Cindy Yates / Golder Associates REPORT # SO-11-026

VALIDATED BY: Bob Glazier DATE: 1-9-91

	YES/NO/NA
1. Does field documentation include:	
date/time samples collected?	yes
sample location?	yes
name of sampler?	yes
field measurements?	NA
sampling method?	yes
instruments/methods for field measurements?	NA
calibration/maintenance of field instruments?	NA
sampling containers used (COC*)?	yes *
sample preservation procedures (see COC*)?	yes *
Chain-of-Custody procedures?	yes
field quality control procedures?	yes
2. Were procedures in the Field Sampling Plan followed?	yes
If not, were procedural variances approved and documented?	NA
3. Was contamination of field blank samples not evident, or well documented at low levels?	yes
4. Are field duplicates within control limits?	yes

5. Comments: * sample containers/preservatives listed on sample Integrity Data Sheets

* Chain-of-Custody Form

C:6255:FPFORM

INDUSTRI-PLEX PRE-DESIGN INVESTIGATION

ASSESSMENT OF FIELD PERFORMANCE
FOR TASK S-1
Secondary Boreholes

SAMPLER/ORGANIZATION: Cindy Yates / Golder Associates REPORT # SO-11-031

VALIDATED BY: Bob Glazier DATE: 1-9-91

	YES/NO/NA
1. Does field documentation include:	
date/time samples collected?	yes
sample location?	yes
name of sampler?	yes
field measurements?	NA
sampling method?	yes
instruments/methods for field measurements?	NA
calibration/maintenance of field instruments?	NA
sampling containers used (COC*)?	yes *
sample preservation procedures (see COC*)?	yes *
Chain-of-Custody procedures?	yes
field quality control procedures?	yes
2. Were procedures in the Field Sampling Plan followed?	yes
If not, were procedural variances approved and documented?	NA
3. Was contamination of field blank samples not evident, or well documented at low levels?	yes
4. Are field duplicates within control limits?	yes

5. Comments: * Sample containers/preservatives listed on Sample Integrity Data Sheets

* Chain-of-Custody Form

C:6255:FPFORM

INDUSTRI-PLEX PRE-DESIGN INVESTIGATION

ASSESSMENT OF FIELD PERFORMANCE
FOR TASK S-1
Secondary Borings

SAMPLER/ORGANIZATION: Chris Agoglia/ Golder Associates REPORT # SO-11-055

VALIDATED BY: Bob Glazier DATE: 1-9-91

	YES/NO/NA
1. Does field documentation include:	
date/time samples collected?	yes
sample location?	yes
name of sampler?	yes
field measurements?	NA
sampling method?	yes
instruments/methods for field measurements?	NA
calibration/maintenance of field instruments?	NA
sampling containers used (COC*)?	yes*
sample preservation procedures (see COC*)?	yes *
Chain-of-Custody procedures?	yes
field quality control procedures?	yes
2. Were procedures in the Field Sampling Plan followed?	yes
If not, were procedural variances approved and documented?	NA
3. Was contamination of field blank samples not evident, or well documented at low levels?	yes
4. Are field duplicates within control limits?	yes

5. Comments: * Sample containers/preservatives listed on Sample Integrity Data Sheets

* Chain-of-Custody Form

C:6255:FPFORM

APPENDIX E

SUMMARY OF PRE-DESIGN INVESTIGATION RESULTS AND ON-SITE REMEDIAL INVESTIGATION RESULTS

SUMMARY OF SOIL SAMPLE ANALYSES

Pre-Design Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
1	006	35.5	289	39.9	No
1	018	52.1	156	9.0	No
1	030	23.2	6.9	7.5	No
2	006	23.8	355	19.5	No
2	018	72.5	165	14.6	No
2	036	9.4	54.6	16.3	No
3	006	6.9	47.6	19.7	No
4	006	49.6	453	17.4	No
4	018	104	475	17.2	No
4	018	102	687	9.3	No
4	027	183	585	6.1	No
5	006	35.2	126	17.4	No
5	018	233	705	16.9	No
5	030	215	951	13.3	No
6	006	40.1	246	9.9	No
6	018	74.4	486	6.2	No
6	026	114	611	11.5	No
7	006	9.7	253	125	No
7	018	12.3	63.9	26.0	No
7	029	6.4	202	10.0	No
8	006	12.7	1150	50.1	No
8	018	42.8	12900	12.2	No
8	027	268	1650	9.5	No
9	006	11.4	42.0	29.5	No

SUMMARY OF SOIL SAMPLE ANALYSES

Pre-Design Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
16	024	3.1	Not Detected	5.6	No
16	024	5.2	Not Detected	5.1	No
17	006	11.3	32.5	24.2	No
17	018	3.2	Not Detected	4.5	No
17	026	3.6	Not Detected	5.2	No
18	006	5.0	25.3	12.2	No
18	018	3.2	16.6	8.3	No
18	026	6.4	51.6	10.5	No
19	006	13.9	60.0	16.3	No
19	018	28.2	25.1	12.4	No
19	018	25.8	15.6	11.9	No
19	032	1110	1100	27.3	No
20	006	7.4	115	26.8	No
20	018	11.0	124	13.4	No
20	028	10.3	210	9.6	No
20	030	130	1390	7.8	No
21	006	9.0	130	18.1	No
21	018	70.6	253	19.4	No
21	018	118	267	15.9	No
21	030	64.5	409	35.3	Not Tested
22	006	136	336	24.7	No
22	018	179	347	118	No
22	036	89.2	298	22.6	No
23	006	256	646	76.6	No

SUMMARY OF SOIL SAMPLE ANALYSES

Pre-Design Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
32	006	43.0	82.4	235	No
32	011	88.8	120	275	No
33	006	7.6	121	111	No
33	018	10.3	28.2	50.8	No
33	024	9.5	87.5	58.0	No
34	006	5.4	11.5	36.7	No
34	018	18.8	76.9	148	No
34	024	11.7	29.9	129	No
35	006	24.4	76.3	88.8	No
35	018	39.8	131	218	Yes
35	032	8.2	24.3	57.4	Yes
36	006	43.5	132	251	No
36	018	18.8	96.0	281	No
36	024	24.6	94.6	267	No
37	006	53.9	133	115	No
37	006	46.2	160	139	No
38	006	69.2	94.9	116	No
38	018	17.4	191	213	Yes
38	019	6.4	Not Detected	10.1	No
39	006	7.2	11.4	275	No
39	018	9.7	Not Detected	276	No
39	030	3.9	Not Detected	34.9	Yes
40	006	11.7	29.0	702	No
40	018	11.8	21.1	473	No

SUMMARY OF SOIL SAMPLE ANALYSES

Pre-Design Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
48	024	5.6	7.4	4.3	No
49	006	11.3	36.4	15.8	No
49	018	2.5	Not Detected	10.6	No
49	032	11.6	12.6	132	No
50	006	7.4	105	122	No
50	018	8.1	85.9	111	No
50	034	1.2	8.8	10.9	No
51	006	143	1080	17.6	No
51	018	283	1560	58.6	No
51	018	423	501	20.3	No
51	020	254	1920	263	No
52	006	40.3	256	62.8	No
52	018	206	322	11.1	No
52	025	119	242	10.7	No
53	006	138	220	63.1	No
53	018	16.4	72.2	36.7	No
53	024	2.0	7.1	47.4	No
54B	006	242	4130	76.9	No
54B	018	35.9	135	26.4	No
54B	018	763	1960	54.8	No
54B	036	359	775	7.5	No
55	006	21.3	232	112	No
55	018	10.6	35.1	41.7	No
55	036	27.8	201	471	No

SUMMARY OF SOIL SAMPLE ANALYSES

Pre-Design Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
63	018	47.2	1890	8.7	No
63	036	3.2	11.7	6.7	No
64	006	114	1370	8400	No
64	018	6.6	26.3	21.1	No
64	024	6.3	12.3	4.7	No
65	006	385	3320	2870	No
65	014	20.2	3020	188	No
65	015	154	3610	192	No
65	018	513	2140	70.1	No
65	025	88.0	36.1	9.3	No
66	006	12.3	54.0	88.8	No
66	018	7.7	14.3	18.1	No
66	026	3.7	9.2	6.9	No
67	006	473	2730	33.5	No
68	006	706	6050	39.5	No
69	006	76.1	888	170	No
69	018	55.1	211	831	No
69	031	118	933	675	No
70	006	209	693	32.7	No
70	018	4.7	18.0	15.1	No
72	006	24.3	77.9	17.7	No
72	018	146	354	31.0	No
72	020	523	6300	7.7	No
73	006	1240	8000	5.7	No

SUMMARY OF SOIL SAMPLE ANALYSES

Pre-Design Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
83	018	8.8	16.0	14.7	No
83	018	7.0	19.1	11.8	No
83	032	4.4	Not Detected	7.6	No
84	006	6.3	11.2	7.5	No
84	018	7.4	Not Detected	6.3	No
84	033	4.2	6.3	5.9	No
85	006	7.8	Not Detected	13.4	No
85	018	7.3	8.8	8.6	No
85	024	10.3	13.0	6.9	No
86	006	11.0	11.9	10.2	No
86	012	8.2	7.3	9.4	No
86	036	6.5	15.5	15.2	No
87	006	8.4	Not Detected	22.7	No
87	010	6.9	9.9	24.4	No
87	036	7.8	Not Detected	19.5	No
88	006	9.2	18.4	277	No
88	006	24.1	13.5	275	No
88	018	26.0	99.1	931	Yes
88	036	9.2	10.8	315	No
89	006	37.4	125	447	No
89	018	35.5	238	755	Yes
89	019	37.0	133	615	No
89	030	34.8	183	765	No
89	030	53.4	145	1040	Yes

SUMMARY OF SOIL SAMPLE ANALYSES

Pre-Design Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
98	006	14.4	82.5	1410	No
98	018	15.3	65.2	314	Yes
98	020	24.8	49.0	822	Yes
98	036	53.0	42.9	1540	Yes
99	006	7.4	14.9	142	Yes
99	015	10.3	28.7	386	Yes
99	036	4.5	11.5	141	Yes
100	006	12.2	41.8	11.8	No
100	018	Not Detected	Not Detected	Not Detected	No
100	036	Not Detected	Not Detected	Not Detected	No
101	006	11.0	145	10.1	No
101	018	2.4	Not Detected	6.3	No
101	027	2.7	Not Detected	5.6	No
102	006	23.8	21.0	4.0	No
102	018	2.2	Not Detected	5.6	No
102	036	1.5	6.6	6.4	No
103	006	6.1	15.8	5.6	No
103	018	1.7	Not Detected	5.8	No
103	023	3.9	Not Detected	5.5	No
104	006	6.5	28.8	6.1	No
104	018	2.7	Not Detected	6.2	No
104	036	2.4	Not Detected	5.5	No
105	006	20.0	54.1	264	No
105	018	21.0	64.2	240	No

SUMMARY OF SOIL SAMPLE ANALYSES

Pre-Design Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
115	006	5.8	36.8	32.0	No
115	018	Not Detected	Not Detected	2.3	No
115	020	Not Detected	Not Detected	6.5	No
116	006	2.8	9.0	13.7	No
116	018	3.0	Not Detected	11.7	No
116	026	6.9	29.8	9.2	No
117	006	3.2	Not Detected	15.1	No
117	018	5.3	Not Detected	9.7	No
117	022	5.9	6.3	21.3	No
118	006	7.6	66.5	115	No
118	018	2.1	19.4	13.8	No
118	024	7.1	49.9	136	No
119	006	135	240	1070	No
119	006	219	199	702	No
119	018	2.7	Not Detected	33.3	No
119	024	1.7	7.9	23.3	No
120	005	15.1	41.4	80.9	No
120	006	46.5	226	23.7	No
120	016	28.3	135	89.4	No
121	006	492	1750	3270	No
121	018	821	4090	63.8	No
121	022	1420	9110	21.4	No
122	006	4.8	30	31	No
122	018	16	12	11	No

SUMMARY OF SOIL SAMPLE ANALYSES

Pre-Design Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
137	006	3.3	Not Detected	3.4	Yes
137	018	6.8	280	26	No
137	036	5.5	400	19	No
141	006	51.4	214	74.2	Yes
141	018	55.7	143	24.5	No
141	036	56.1	111	57.5	No
142	006	71.4	232	31.9	No
142	018	54.9	145	51.9	No
142	036	71.9	202	111	No
143	006	4.4	51.9	15.2	Not Applicable
143	012	3.8	61.3	14.6	Not Applicable
143	018	4.4	85.2	27.3	Not Applicable
143	027	4.7	85.8	17.0	Not Applicable
143	036	4.3	50.3	14.0	Not Applicable
144	006	28.3	23.0	22.8	Not Applicable
144	012	33.4	22.5	20.7	Not Applicable
144	018	10.7	9.2	13.3	Not Applicable
144	027	14.6	7.6	14.8	Not Applicable
144	036	16.3	63.8	26.1	Not Applicable
145	006	14.1	19.6	16.8	Not Applicable
145	012	23.8	18.3	25.6	Not Applicable
145	018	1.6	Not Detected	7.8	Not Applicable
145	027	1.3	Not Detected	8.3	Not Applicable
145	036	3.4	Not Detected	8.9	Not Applicable

SUMMARY OF SOIL SAMPLE ANALYSES

Pre-Design Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
152	006	47	100	310	Yes
152	018	28	54	120	Yes
152	036	54	100	230	No
153	006	1.9	Not Detected	4.6	No
153	018	2.4	Not Detected	5.0	No
153	036	3.6	7.1	9.6	No
154	006	Not Detected	10	12	No
154	018	Not Detected	Not Detected	5.4	No
154	036	Not Detected	Not Detected	5.4	No
155	006	67	190	1200	No
155	018	51	140	1500	Yes
155	036	12	26	1300	Yes
156	006	Not Detected	540	160	No
156	018	120	500	780	No
156	036	23	530	370	No
157	006	3.5	Not Detected	22	No
157	018	5.1	Not Detected	11	No
157	036	8.6	13	80	Yes
158	006	6.1	15	34	No
158	018	8.2	15	57	No
158	036	7.9	16	50	No
159	006	8.9	24	59	No
159	018	14	19	47	No
159	036	12	23	73	No

SUMMARY OF SOIL SAMPLE ANALYSES

Pre-Design Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
166	018	7.8	8.2	25	No
166	036	5.8	Not Detected	16	No
167	006	9.4	11	16	No
168	006	9.5	74	120	No
168	018	1.9	12	32	No
168	036	2.4	21	42	No
169	006	1.9	13	40	No
169	006	2.0	14	40	No
169	018	11	31	25	No
169	030	2.2	21	12	No
170	006	23	410	24	No
170	018	Not Detected	22	34	No
171	006	12	290	30	No
171	018	4.4	22	17	No
171	036	3.3	12	18	No
171	036	3.0	8.1	13	No
ATB-1	0-096	Not Tested	Not Tested	Not Tested	No
ATB-4	0-594	Not Tested	Not Tested	Not Tested	No
ATB-7	0-168	Not Tested	Not Tested	Not Tested	No
ATB-18	0-318	Not Tested	Not Tested	Not Tested	No
RB-1	0-024	Not Tested	Not Tested	Not Tested	No
RB-1	060-084	Not Tested	Not Tested	Not Tested	Yes
RB-1	120-336	Not Tested	Not Tested	Not Tested	No
RB-2	0-126	Not Tested	Not Tested	Not Tested	No

SUMMARY OF SOIL SAMPLE ANALYSES

Pre-Design Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
S-2/3	060-170	Not Tested	Not Tested	Not Tested	No
S-2/4	0-042	Not Tested	Not Tested	Not Tested	No
S-2/4	042-090	Not Tested	Not Tested	Not Tested	Yes
S-2/5	0-126	Not Tested	Not Tested	Not Tested	No
S-2/5	126-127	Not Tested	Not Tested	Not Tested	Yes
S-2/6	0-024	Not Tested	Not Tested	Not Tested	Yes
S-2/6	024-168	Not Tested	Not Tested	Not Tested	No
S-2/7	0-204	Not Tested	Not Tested	Not Tested	No
S-2/8	0-101	Not Tested	Not Tested	Not Tested	No
S-2/9	0-408	Not Tested	Not Tested	Not Tested	Yes
S-2/9	408-480	Not Tested	Not Tested	Not Tested	No
S-2/10	0-462	Not Tested	Not Tested	Not Tested	Yes
S-2/10	462-486	Not Tested	Not Tested	Not Tested	No
S-2/11	0-192	Not Tested	Not Tested	Not Tested	Yes
S-2/11	192-264	Not Tested	Not Tested	Not Tested	No
S-2/12	0-443	Not Tested	Not Tested	Not Tested	Yes
S-2/12	443-448	Not Tested	Not Tested	Not Tested	No
S-2/13	0-434	Not Tested	Not Tested	Not Tested	Yes
S-2/14	0-100	Not Tested	Not Tested	Not Tested	No
S-2/15	0-120	Not Tested	Not Tested	Not Tested	Yes
S-2/15	120-204	Not Tested	Not Tested	Not Tested	No
S-2/16	0-204	Not Tested	Not Tested	Not Tested	No
S-2/17	0-204	Not Tested	Not Tested	Not Tested	No
S-4/P1	0-018	Not Tested	Not Tested	Not Tested	No

SUMMARY OF SOIL SAMPLE ANALYSES

Pre-Design Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
S-4/SD-3	0-333	Not Tested	Not Tested	Not Tested	No
S-4/SD-4	0-204	Not Tested	Not Tested	Not Tested	No
S-4/T-1	0-042	Not Tested	Not Tested	Not Tested	No
S-4/T-2	0-048	Not Tested	Not Tested	Not Tested	No
S-4/T-3	0-192	Not Tested	Not Tested	Not Tested	No
S-4/T-4	0-402	Not Tested	Not Tested	Not Tested	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
2141	012	84.00	2110.00	12.10	No
2141	036	391.00	9240.00	Not Detected	No
2141	060	96.00	Not Detected	1.90	No
2242	0-090	Not Tested	Not Tested	Not Tested	No
2242	012	118.00	710.00	855.00	No
2242	036	513.00	2380.00	188.00	No
2242	060	25.00	390.00	67.00	No
2242	180-204	Not Tested	Not Tested	Not Tested	No
2244	012	493.00	2400.00	1680.00	No
2244	060	525.00	1330.00	5630.00	No
2244	084	1490.00	2600.00	6950.00	Yes
2244	132	Not Detected	Not Detected	21.30	No
2244	144-168	Not Tested	Not Tested	Not Tested	No
2335	0-048	Not Tested	Not Tested	Not Tested	No
2335	012	167.00	530.00	1670.00	No
2337	0-042	Not Tested	Not Tested	Not Tested	No
2337	012	67.00	230.00	284.00	No
2341	0-096	Not Tested	Not Tested	Not Tested	No
2341	012	454.00	1640.00	7710.00	No
2341	036	364.00	3100.00	356.00	No
2341	060	405.00	5400.00	182.00	No
2343	012	188.00	690.00	3920.00	No
2343	063	Not Detected	Not Detected	114.00	No
2345	0-066	Not Tested	Not Tested	Not Tested	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
2444	084	11.00	Not Detected	10.00	No
2446	0-168	Not Tested	Not Tested	Not Tested	No
2446	012	30.00	140.00	351.00	No
2446	060	Not Detected	Not Detected	10.70	No
2446	108	14.00	Not Detected	9.60	No
2446	180-204	Not Tested	Not Tested	Not Tested	No
2448	012	9.00	60.00	496.00	No
2448	048-120	Not Tested	Not Tested	Not Tested	No
2448	060	Not Detected	Not Detected	14.30	No
2448	084	30.00	Not Detected	58.80	No
2450	0-120	Not Tested	Not Tested	Not Tested	No
2450	012	5.00	Not Detected	124.00	No
2450	060	5.00	Not Detected	16.90	No
2450	084	37.00	70.00	60.90	No
2529	0-048	Not Tested	Not Tested	Not Tested	No
2529	012	Not Detected	Not Detected	4.80	No
2529	036	Not Detected	Not Detected	0.80	No
2531	012	419.00	1100.00	6730.00	No
2533	012	682.00	990.00	5250.00	No
2535	0-048	Not Tested	Not Tested	Not Tested	No
2535	012	115.00	480.00	631.00	No
2535	036	3.00	20.00	23.70	No
2539	012	680.00	6420.00	136.00	No
2539	036	263.00	6800.00	Not Detected	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
2630	012	34.00	Not Detected	13.00	No
2632	012	353.00	1100.00	2330.00	No
2634	0-096	Not Tested	Not Tested	Not Tested	No
2634	012	179.00	10300.00	1400.00	No
2634	060	464.00	11500.00	6.90	No
2640	006	302.00	805.00	25400.00	No
2642	0-072	Not Tested	Not Tested	Not Tested	No
2642	012	15.00	Not Detected	186.00	No
2642	036	17.00	Not Detected	345.00	No
2642	060	Not Detected	Not Detected	95.40	No
2644	012	351.00	1930.00	280.00	No
2644	060	3500.00	6500.00	63.00	No
2644	108	2690.00	4100.00	35.90	No
2646	012	661.00	3000.00	3690.00	No
2646	024-048	Not Tested	Not Tested	Not Tested	No
2646	060	622.00	1620.00	2630.00	Yes
2646	102	262.00	660.00	336.00	Yes
2646	108-120	Not Tested	Not Tested	Not Tested	No
2648	012	207.00	500.00	2180.00	No
2648	072	111.00	1590.00	15.70	No
2648	126	100.00	50.00	10.20	No
2648	192	Not Detected	Not Detected	3.30	No
2650	012	159.00	1270.00	18300.00	No
2650	072	5.00	Not Detected	15.30	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
2727	012	1060.00	1320.00	7.80	No
2727	012	1500.00	3570.00	4.00	No
2727	036	1970.00	2900.00	10.30	No
2727	036	11200.00	3000.00	10.40	No
2727	060	2760.00	8880.00	20.00	No
2727	060	930.00	210.00	20.00	No
2729	0-072	Not Tested	Not Tested	Not Tested	No
2729	012	22.00	170.00	3.20	No
2729	036	55.00	270.00	5.30	No
2731	0-048	Not Tested	Not Tested	Not Tested	No
2731	012	791.00	11000.00	6.80	No
2731	036	671.00	100.00	5.90	No
2731	060	357.00	960.00	2350.00	Yes
2733	0-096	Not Tested	Not Tested	Not Tested	No
2733	012	255.00	7050.00	37.30	No
2733	036	189.00	8430.00	122.00	No
2733	060	726.00	5000.00	637.00	No
2737	0-130	Not Tested	Not Tested	Not Tested	No
2737	012	148.00	1740.00	31.30	No
2737	036	485.00	15600.00	Not Detected	No
2737	060	1070.00	25100.00	Not Detected	No
2737	084	910.00	25800.00	Not Detected	No
2739	003	200.00	963.00	21300.00	Yes
2741	0-096	Not Tested	Not Tested	Not Tested	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
2751	378	3.00	Not Detected	1.70	No
2753	012	43.00	350.00	134.00	No
2753	060-084	Not Tested	Not Tested	Not Tested	Yes
2753	120-144	Not Tested	Not Tested	Not Tested	Yes
2753	192	349.00	60.00	2.80	No
2753	240-264	Not Tested	Not Tested	Not Tested	No
2753	303	71.00	Not Detected	Not Detected	No
2753	309	Not Detected	Not Detected	5.20	No
2755	0-072	Not Tested	Not Tested	Not Tested	No
2755	012	12.00	Not Detected	78.20	No
2755	036	8.00	Not Detected	2.20	No
2755	054	6.00	Not Detected	11.50	No
2820	009	Not Detected	Not Detected	9.90	No
2820	024-072	Not Tested	Not Tested	Not Tested	No
2820	036	Not Detected	Not Detected	14.80	No
2822	0-048	Not Tested	Not Tested	Not Tested	No
2822	012	1.00	Not Detected	5.30	No
2822	012	3.00	Not Detected	1.00	No
2824	0-048	Not Tested	Not Tested	Not Tested	No
2824	012	3.00	30.00	7.30	No
2828	0-120	Not Tested	Not Tested	Not Tested	No
2828	012	219.00	1100.00	13.80	No
2828	012	230.00	21700.00	30.00	No
2828	036	1160.00	4600.00	4.20	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
2840	036	355.00	1840.00	57.20	No
2840	060	569.00	2700.00	328.00	No
2844	0-096	Not Tested	Not Tested	Not Tested	No
2844	012	336.00	9690.00	26.80	No
2844	036	302.00	8850.00	83.90	No
2844	060	375.00	2500.00	88.50	No
2844	084	2080.00	12600.00	31.50	No
2846	012	21.00	120.00	860.00	No
2846	036	18.00	110.00	1500.00	Yes
2846	060	20.00	140.00	1290.00	Yes
2846	084	151.00	1510.00	2860.00	No
2846	108	28.00	440.00	721.00	Yes
2846	120-144	Not Tested	Not Tested	Not Tested	No
2848	012	Not Detected	Not Detected	21.10	No
2848	120-144	Not Tested	Not Tested	Not Tested	No
2854	0-072	Not Tested	Not Tested	Not Tested	No
2854	012	Not Detected	Not Detected	5.90	No
2917	0-096	Not Tested	Not Tested	Not Tested	No
2917	012	18.00	130.00	5.10	No
2917	036	7.00	50.00	5.20	No
2917	060	Not Detected	10.00	6.50	No
2917	084	Not Detected	Not Detected	9.60	No
2919	0-037	Not Tested	Not Tested	Not Tested	No
2919	012	4.00	Not Detected	8.10	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
2937	012	921.00	8700.00	120.00	No
2937	036	667.00	7800.00	1.60	No
2937	084	2800.00	3300.00	176.00	No
2939	0-096	Not Tested	Not Tested	Not Tested	No
2939	012	595.00	820.00	24.10	No
2939	036	64.00	2100.00	Not Detected	No
2939	060	1690.00	6700.00	186.00	No
2939	084	385.00	1910.00	28.00	No
2941	012	384.00	2700.00	72.80	No
2941	048-108	Not Tested	Not Tested	Not Tested	Yes
2941	060	411.00	5600.00	1170.00	Yes
2941	102	668.00	440.00	2290.00	Yes
2941	114	340.00	Not Detected	15.50	No
2943	0-120	Not Tested	Not Tested	Not Tested	No
2943	012	2320.00	33900.00	236.00	No
2943	060	260.00	1070.00	11.60	No
2943	084	6230.00	23800.00	44.10	No
2945	0-096	Not Tested	Not Tested	Not Tested	No
2945	012	57.00	390.00	224.00	No
2945	036	50.00	440.00	225.00	No
2945	060	384.00	Not Detected	58.60	No
2947	0-048	Not Tested	Not Tested	Not Tested	No
2947	012	Not Detected	Not Detected	5.50	No
3014	0-024	Not Tested	Not Tested	Not Tested	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
3036	0-120	Not Tested	Not Tested	Not Tested	No
3036	012	194.00	1890.00	393.00	No
3036	060	339.00	530.00	20.30	No
3036	084	726.00	2900.00	11.10	No
3036	108	1110.00	390.00	61.00	No
3038	0-096	Not Tested	Not Tested	Not Tested	No
3038	012	97.00	966.00	233.00	No
3038	036	132.00	5300.00	26.60	No
3038	084	4630.00	26800.00	38.00	No
3040	0-096	Not Tested	Not Tested	Not Tested	No
3040	012	231.00	2130.00	155.00	No
3040	036	269.00	5900.00	18.70	No
3040	060	105.00	3200.00	13.70	No
3042	0-096	Not Tested	Not Tested	Not Tested	No
3042	012	63.00	240.00	127.00	No
3042	060	22.00	Not Detected	31.90	No
3042	078	543.00	1400.00	58.40	No
3044	0-024	Not Tested	Not Tested	Not Tested	No
3044	012	157.00	190.00	79.50	No
3044	048-080	Not Tested	Not Tested	Not Tested	No
3044	060	90.00	160.00	6.40	No
3044	076	35.00	100.00	8.20	No
3046	0-096	Not Tested	Not Tested	Not Tested	No
3046	012	746.00	1190.00	64.70	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
3135	036	770.00	2160.00	3.60	No
3135	060	501.00	430.00	5.00	No
3135	084	970.00	1450.00	34.20	No
3137	0-088	Not Tested	Not Tested	Not Tested	No
3137	012	98.00	1250.00	75.80	No
3137	036	36.00	580.00	80.90	No
3137	060	12.00	210.00	149.00	No
3137	078	185.00	210.00	576.00	No
3137	108-126	Not Tested	Not Tested	Not Tested	No
3139	004	292.00	1710.00	96.00	No
3145	0-048	Not Tested	Not Tested	Not Tested	No
3145	012	49.00	280.00	412.00	No
3204	0-030	Not Tested	Not Tested	Not Tested	No
3204	012	Not Detected	Not Detected	62.60	No
3204	048-059	Not Tested	Not Tested	Not Tested	No
3206	012	Not Detected	Not Detected	25.50	No
3210	0-054	Not Tested	Not Tested	Not Tested	No
3210	012	3.00	Not Detected	18.40	No
3210	036	Not Detected	Not Detected	12.00	No
3212	008	4.00	80.00	11.00	No
3214	009	Not Detected	Not Detected	22.10	No
3216	005	Not Detected	Not Detected	18.40	No
3218	012	Not Detected	Not Detected	36.10	No
3218	024-036	Not Tested	Not Tested	Not Tested	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
3333	012	258.00	2700.00	11.20	No
3333	036	26.00	410.00	Not Detected	No
3333	060	106.00	410.00	Not Detected	No
3333	084	61.00	170.00	35.50	No
3333	096-118	Not Tested	Not Tested	Not Tested	No
3335	012	137.00	4600.00	14.10	No
3335	036	62.00	Not Detected	Not Detected	No
3335	060	133.00	180.00	Not Detected	No
3335	084	152.00	712.00	91.40	No
3341	012	69.00	1360.00	117.00	No
3341	035	206.00	140.00	18.80	No
3343	002	Not Detected	30.00	66.80	No
3406	012	6.00	Not Detected	28.30	No
3406	024-042	Not Tested	Not Tested	Not Tested	No
3406	048-072	Not Tested	Not Tested	Not Tested	No
3432	012	52.00	170.00	28.90	No
3432	036	59.00	855.00	Not Detected	No
3432	060	118.00	1070.00	1.80	No
3432	084	534.00	550.00	Not Detected	No
3432	096-120	Not Tested	Not Tested	Not Tested	No
3434	012	3160.00	16100.00	21.00	No
3434	036	886.00	7820.00	3.90	No
3434	060	12.00	310.00	Not Detected	No
3434	084	3100.00	3700.00	28.60	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
3539	060	226.00	620.00	7.10	No
3539	084	54.00	Not Detected	3.40	No
3539	108	50.00	Not Detected	18.40	No
3541	012	193.00	805.00	16.60	No
3541	036	79.00	220.00	15.60	No
3541	048-056	Not Tested	Not Tested	Not Tested	No
3553	012	5.00	Not Detected	403.00	No
3553	024-048	Not Tested	Not Tested	Not Tested	No
3610	006	Not Detected	Not Detected	19.80	No
3610	060	Not Detected	Not Detected	2.60	No
3610	072-114	Not Tested	Not Tested	Not Tested	No
3610	128	Not Detected	Not Detected	13.00	No
3610	168-174	Not Tested	Not Tested	Not Tested	No
3612	003	4.00	40.00	20.60	No
3612	060	Not Detected	Not Detected	2.50	No
3612	072-096	Not Tested	Not Tested	Not Tested	No
3614	012	107.00	2900.00	13.00	No
3614	042	634.00	13100.00	Not Detected	No
3614	066	133.00	2040.00	Not Detected	No
3614	078-102	Not Tested	Not Tested	Not Tested	No
3630	012	101.00	290.00	27.40	No
3630	036	220.00	300.00	1.90	No
3630	060	77.00	210.00	6.80	No
3632	012	Not Detected	70.00	377.00	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
3729	036	Not Detected	190.00	0.80	No
3729	060	5.00	30.00	4.70	No
3729	072-096	Not Tested	Not Tested	Not Tested	No
3731	010	51.00	200.00	48.10	No
3731	036	24.00	884.00	1.60	No
3731	048-072	Not Tested	Not Tested	Not Tested	No
3737	012	192.00	550.00	35.90	No
3737	036	207.00	815.00	21.00	No
3737	060	65.00	250.00	31.80	No
3737	072-096	Not Tested	Not Tested	Not Tested	No
3739	012	97.00	560.00	30.60	No
3739	036	2780.00	914.00	20.40	No
3739	060	653.00	1870.00	10.70	No
3741	012	Not Detected	Not Detected	56.90	No
3741	024-072	Not Tested	Not Tested	Not Tested	No
3743	007	Not Detected	Not Detected	28.50	No
3745	004	Not Detected	Not Detected	54.10	No
3747	0-018	Not Tested	Not Tested	Not Tested	No
3747	012	Not Detected	Not Detected	22.10	No
3747	024-032	Not Tested	Not Tested	Not Tested	No
3749	0-036	Not Tested	Not Tested	Not Tested	No
3749	012	Not Detected	Not Detected	38.80	No
3751	0-024	Not Tested	Not Tested	Not Tested	Yes
3751	012	7.00	Not Detected	1940.00	Yes

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
3836	012	44.00	665.00	34.70	No
3836	030	59.00	1140.00	19.10	No
3836	060	136.00	5300.00	16.70	No
3836	084	102.00	8210.00	42.80	No
3838	0-090	Not Tested	Not Tested	Not Tested	No
3838	012	52.00	320.00	103.00	No
3838	036	141.00	320.00	15.00	No
3838	060	198.00	420.00	63.20	No
3840	0-096	Not Tested	Not Tested	Not Tested	No
3840	012	163.00	550.00	53.40	No
3840	036	132.00	450.00	28.40	No
3840	060	58.00	320.00	37.50	No
3842	0-006	Not Tested	Not Tested	Not Tested	No
3842	004	Not Detected	Not Detected	43.70	No
3844	0-006	Not Tested	Not Tested	Not Tested	No
3844	002	Not Detected	Not Detected	42.50	No
3846	0-036	Not Tested	Not Tested	Not Tested	No
3846	012	6.00	130.00	377.00	No
3846	036	Not Detected	Not Detected	262.00	No
3848	0-085	Not Tested	Not Tested	Not Tested	No
3848	012	Not Detected	Not Detected	144.00	No
3848	060	Not Detected	20.00	41.40	No
3850	0-104	Not Tested	Not Tested	Not Tested	No
3850	012	Not Detected	30.00	291.00	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
3913	072	Not Detected	Not Detected	11.20	No
3915	0-084	Not Tested	Not Tested	Not Tested	No
3915	012	Not Detected	220.00	42.00	No
3915	036	Not Detected	40.00	24.90	No
3917	0-072	Not Tested	Not Tested	Not Tested	No
3917	012	Not Detected	40.00	30.00	No
3917	036	1.00	60.00	18.80	No
3917	060	Not Detected	40.00	19.60	No
3919	0-048	Not Tested	Not Tested	Not Tested	No
3919	012	19.00	210.00	79.00	No
3919	036	Not Detected	30.00	38.00	No
3921	0-096	Not Tested	Not Tested	Not Tested	No
3921	012	211.00	750.00	2190.00	No
3921	036	94.00	380.00	658.00	No
3921	060	418.00	1070.00	130.00	No
3923	0-072	Not Tested	Not Tested	Not Tested	No
3923	012	436.00	715.00	16.70	No
3923	036	2990.00	190.00	7.90	No
3925	0-072	Not Tested	Not Tested	Not Tested	No
3925	012	502.00	2020.00	16.10	No
3925	036	9.00	Not Detected	4.70	No
3927	0-120	Not Tested	Not Tested	Not Tested	No
3927	012	64.00	1620.00	24.20	No
3927	036	77.00	2050.00	25.80	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
3939	060	261.00	200.00	31.10	No
3941	0-007	Not Tested	Not Tested	Not Tested	No
3941	002	Not Detected	Not Detected	55.40	No
3943	0-072	Not Tested	Not Tested	Not Tested	No
3943	012	100.00	350.00	194.00	No
3943	036	205.00	660.00	89.90	No
3945	0-072	Not Tested	Not Tested	Not Tested	No
3945	012	146.00	1720.00	241.00	No
3945	036	8.00	Not Detected	6.80	No
3949	0-048	Not Tested	Not Tested	Not Tested	No
3949	012	Not Detected	10.00	121.00	No
3951	0-024	Not Tested	Not Tested	Not Tested	No
3951	012	Not Detected	Not Detected	712.00	No
3951	024-127	Not Tested	Not Tested	Not Tested	Yes
3951	072	Not Detected	30.00	5880.00	Yes
3951	120	Not Detected	Not Detected	2800.00	Yes
3953	0-024	Not Tested	Not Tested	Not Tested	No
3953	012	11.00	110.00	12400.00	No
3953	024-072	Not Tested	Not Tested	Not Tested	Yes
3953	060	6.00	Not Detected	20300.00	Yes
3953	072-109	Not Tested	Not Tested	Not Tested	No
3953	102	Not Detected	Not Detected	151.00	No
3955	0-024	Not Tested	Not Tested	Not Tested	No
3955	012	25.00	530.00	2900.00	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
4028	036	72.00	Not Detected	3.20	No
4028	060	69.00	200.00	8.90	No
4028	084	106.00	110.00	25.00	No
4030	012	67.00	520.00	142.00	No
4030	036	54.00	3000.00	0.80	No
4030	060	40.00	2600.00	0.90	No
4030	084	Not Detected	Not Detected	Not Detected	No
4034	0-096	Not Tested	Not Tested	Not Tested	No
4034	012	16.00	120.00	219.00	No
4034	036	126.00	460.00	26.80	No
4034	060	224.00	390.00	21.70	No
4036	0-096	Not Tested	Not Tested	Not Tested	No
4036	012	Not Detected	70.00	53.00	No
4036	036	72.00	340.00	Not Detected	No
4036	060	129.00	Not Detected	4.80	No
4038	012	88.00	340.00	16.80	No
4038	036	387.00	1200.00	5.10	No
4038	060	222.00	60.00	17.20	No
4038	084	4.00	Not Detected	Not Detected	No
4040	018	89.00	1910.00	42.80	No
4040	066	Not Detected	Not Detected	5.30	No
4040	099	Not Tested	Not Tested	Not Tested	No
4040	126	Not Detected	Not Detected	10.10	No
4042	0-072	Not Tested	Not Tested	Not Tested	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
4058	048-072	Not Tested	Not Tested	Not Tested	No
4058	108	Not Detected	Not Detected	29.90	Yes
4058	120-168	Not Tested	Not Tested	Not Tested	Yes
4058	174	Not Detected	Not Detected	570.00	No
4058	180-192	Not Tested	Not Tested	Not Tested	No
4060	012	20.00	Not Detected	515.00	No
4060	060-084	Not Tested	Not Tested	Not Tested	No
4060	132	5.00	Not Detected	190.00	No
4060	144-192	Not Tested	Not Tested	Not Tested	Yes
4060	186	Not Detected	Not Detected	232.00	Yes
4060	192-204	Not Tested	Not Tested	Not Tested	No
4111	012	2.00	Not Detected	17.60	No
4111	027	8.00	120.00	16.90	No
4113	006	Not Detected	100.00	20.70	No
4113	020	Not Detected	40.00	70.10	No
4113	048-072	Not Tested	Not Tested	Not Tested	No
4115	007	26.00	200.00	32.00	No
4117	0-072	Not Tested	Not Tested	Not Tested	No
4117	012	43.00	1200.00	1150.00	No
4117	036	177.00	2970.00	7700.00	No
4119	012	188.00	372.00	101.00	No
4119	036	21.00	60.00	13.60	No
4125	012	64.00	300.00	20.50	No
4127	0-120	Not Tested	Not Tested	Not Tested	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
4141	036	385.00	Not Detected	3.50	No
4141	060	806.00	1420.00	15.20	No
4143	0-072	Not Tested	Not Tested	Not Tested	No
4143	012	162.00	4100.00	69.10	No
4143	036	455.00	Not Detected	4.80	No
4145	0-049	Not Tested	Not Tested	Not Tested	No
4145	012	44.00	340.00	1360.00	No
4145	036	220.00	4200.00	11.60	No
4147	0-072	Not Tested	Not Tested	Not Tested	No
4147	012	23.00	200.00	8280.00	No
4147	036	Not Detected	Not Detected	125.00	No
4149	0-048	Not Tested	Not Tested	Not Tested	Yes
4149	012	6.00	200.00	16500.00	Yes
4149	060	Not Detected	Not Detected	48.90	No
4149	102-120	Not Tested	Not Tested	Not Tested	No
4151	012	Not Detected	Not Detected	10.50	No
4151	060-084	Not Tested	Not Tested	Not Tested	No
4151	084-240	Not Tested	Not Tested	Not Tested	Yes
4151	132	7.00	400.00	3840.00	Yes
4151	192	Not Detected	Not Detected	2630.00	Yes
4153	012	5.00	30.00	3470.00	No
4153	072	Not Detected	Not Detected	23.00	No
4155	0-030	Not Tested	Not Tested	Not Tested	No
4155	012	12.00	120.00	932.00	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
4226	060	Not Detected	Not Detected	38.10	No
4228	012	103.00	2110.00	653.00	No
4228	048-095	Not Tested	Not Tested	Not Tested	No
4228	060	Not Detected	Not Detected	14.20	No
4230	0-096	Not Tested	Not Tested	Not Tested	No
4230	012	45.00	642.00	175.00	No
4230	036	23.00	1230.00	16.60	No
4230	060	24.00	1540.00	8.50	No
4232	0-096	Not Tested	Not Tested	Not Tested	No
4232	012	50.00	Not Detected	198.00	No
4232	036	169.00	1360.00	12.70	No
4232	060	87.00	Not Detected	8.30	No
4234	0-096	Not Tested	Not Tested	Not Tested	No
4234	012	88.00	1010.00	86.50	No
4234	036	78.00	520.00	13.60	No
4234	060	20.00	Not Detected	16.40	No
4236	0-096	Not Tested	Not Tested	Not Tested	No
4236	012	678.00	2600.00	196.00	No
4236	036	793.00	2100.00	18.00	No
4236	060	216.00	898.00	155.00	No
4238	0-072	Not Tested	Not Tested	Not Tested	No
4238	012	485.00	8480.00	Not Detected	No
4238	036	362.00	12000.00	41.20	No
4238	054	Not Detected	Not Detected	210.00	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
4254	186	Not Detected	Not Detected	146.00	No
4254	196	Not Detected	Not Detected	32.10	No
4256	0-252	Not Tested	Not Tested	Not Tested	Yes
4256	012	Not Detected	Not Detected	29.50	Yes
4256	132	Not Detected	50.00	1390.00	Yes
4256	252	Not Detected	Not Detected	300.00	Yes
4309	012	1.00	Not Detected	11.90	No
4309	036	Not Detected	Not Detected	3.00	No
4311	012	Not Detected	Not Detected	56.00	No
4311	048-072	Not Tested	Not Tested	Not Tested	No
4313	0-072	Not Tested	Not Tested	Not Tested	No
4313	012	Not Detected	Not Detected	22.70	No
4313	036	4.00	Not Detected	7.60	No
4315	0-072	Not Tested	Not Tested	Not Tested	No
4315	012	6.00	Not Detected	19.00	No
4315	036	8.00	Not Detected	169.00	No
4317	0-072	Not Tested	Not Tested	Not Tested	No
4317	012	95.00	650.00	4.90	No
4317	036	64.00	510.00	1.60	No
4323	0-095	Not Tested	Not Tested	Not Tested	No
4323	012	105.00	290.00	30.90	No
4323	036	3.00	30.00	15.10	No
4323	060	Not Detected	Not Detected	8.40	No
4323	060	57.00	Not Detected	38.00	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
4337	012	335.00	1870.00	62.60	No
4337	036	625.00	3000.00	73.90	No
4337	060	Not Detected	460.00	136.00	No
4337	084	Not Detected	Not Detected	3.00	No
4339	0-096	Not Tested	Not Tested	Not Tested	No
4339	012	732.00	5100.00	4.20	No
4339	036	1080.00	15100.00	2.90	No
4339	060	11.00	Not Detected	2.90	No
4341	012	280.00	2290.00	29.30	No
4341	036	90.00	961.00	19.40	No
4341	060	Not Detected	Not Detected	3.80	No
4343	012	314.00	7340.00	19.20	No
4343	030	128.00	Not Detected	13.00	No
4345	0-048	Not Tested	Not Tested	Not Tested	No
4345	012	9.00	170.00	45.00	No
4347	012	9.00	Not Detected	358.00	No
4347	060	82.00	650.00	548.00	No
4347	108	36.00	350.00	232.00	No
4347	120-133	Not Tested	Not Tested	Not Tested	No
4351	012	9.00	Not Detected	134.00	No
4351	024-264	Not Tested	Not Tested	Not Tested	Yes
4351	132	Not Detected	Not Detected	2430.00	Yes
4351	246	Not Detected	Not Detected	267.00	Yes
4353	012	20.00	40.00	706.00	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
4414	0-072	Not Tested	Not Tested	Not Tested	No
4414	012	2.00	Not Detected	11.70	No
4414	036	3.00	Not Detected	10.30	No
4416	012	114.00	1400.00	48.00	No
4416	036	60.00	610.00	11.40	No
4424	012	173.00	710.00	13.40	No
4424	036	8.00	Not Detected	8.50	No
4426	012	87.00	Not Detected	87.10	No
4426	036	255.00	1590.00	15.70	No
4426	060	Not Detected	Not Detected	61.80	No
4428	0-096	Not Tested	Not Tested	Not Tested	No
4428	012	364.00	4200.00	43.30	No
4428	036	5130.00	8930.00	11.60	No
4428	060	615.00	Not Detected	2.30	No
4430	0-096	Not Tested	Not Tested	Not Tested	No
4430	012	Not Detected	Not Detected	36.60	No
4430	036	1110.00	8460.00	15.90	No
4430	060	4260.00	18300.00	14.20	No
4432	0-072	Not Tested	Not Tested	Not Tested	No
4432	012	159.00	610.00	1080.00	No
4432	036	6.00	Not Detected	22.40	No
4434	005	532.00	1900.00	23.40	No
4438	0-096	Not Tested	Not Tested	Not Tested	No
4438	012	303.00	620.00	21.20	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
4452	312	341.00	1160.00	3290.00	Yes
4454	012	37.00	Not Detected	70.80	No
4454	060-084	Not Tested	Not Tested	Not Tested	No
4454	084-180	Not Tested	Not Tested	Not Tested	Yes
4454	132	11.00	130.00	2970.00	Yes
4454	180	Not Detected	Not Detected	64.20	No
4454	180-198	Not Tested	Not Tested	Not Tested	No
4456	012	9.00	Not Detected	114.00	No
4456	024-132	Not Tested	Not Tested	Not Tested	Yes
4456	072	10.00	Not Detected	2040.00	Yes
4456	132	7.00	Not Detected	699.00	Yes
4456	192	Not Detected	Not Detected	631.00	No
4458	0-120	Not Tested	Not Tested	Not Tested	Yes
4458	012	24.00	110.00	259.00	Yes
4458	132	73.00	530.00	823.00	No
4458	144-220	Not Tested	Not Tested	Not Tested	Yes
4458	252	3.00	60.00	40.70	No
4458	300-306	Not Tested	Not Tested	Not Tested	No
4507	012	Not Detected	Not Detected	14.70	No
4507	036	Not Detected	Not Detected	5.10	No
4509	0-072	Not Tested	Not Tested	Not Tested	No
4509	012	3.00	Not Detected	87.00	No
4509	036	Not Detected	Not Detected	11.50	No
4512	001	7.00	Not Detected	46.00	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
4537	060	636.00	710.00	32.50	No
4537	084	703.00	580.00	169.00	No
4539	012	980.00	1730.00	16.70	No
4539	036	806.00	975.00	25.00	No
4539	060	378.00	360.00	45.40	No
4541	012	Not Detected	Not Detected	34.90	No
4541	036	80.00	150.00	83.10	No
4541	060	189.00	2100.00	19.00	No
4541	078	Not Detected	Not Detected	14.00	No
4543	002	49.00	570.00	507.00	No
4547	0-096	Not Tested	Not Tested	Not Tested	No
4547	012	32.00	140.00	306.00	No
4547	036	52.00	300.00	711.00	No
4547	060	226.00	480.00	511.00	No
4549	012	42.00	1330.00	1090.00	No
4549	072	67.00	1340.00	7.50	No
4549	132	45.00	2330.00	13.20	No
4551	012	8.00	Not Detected	1020.00	Yes
4551	072	92.00	1630.00	15000.00	No
4551	132	54.00	700.00	32200.00	No
4551	180-204	Not Tested	Not Tested	Not Tested	No
4555	012	26.00	100.00	575.00	No
4555	060-084	Not Tested	Not Tested	Not Tested	No
4555	084-192	Not Tested	Not Tested	Not Tested	Yes

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
4616	0-072	Not Tested	Not Tested	Not Tested	No
4616	012	353.00	5400.00	2.90	No
4616	036	1140.00	2130.00	4.40	No
4622	004	14.00	160.00	134.00	No
4624	0-036	Not Tested	Not Tested	Not Tested	No
4624	012	154.00	450.00	8.10	No
4626	004	54.00	150.00	141.00	No
4628	002	28.00	Not Detected	27.70	No
4630	0-096	Not Tested	Not Tested	Not Tested	No
4630	012	63.00	Not Detected	171.00	No
4630	036	Not Detected	Not Detected	256.00	No
4630	060	59.00	20.00	10.80	No
4632	0-096	Not Tested	Not Tested	Not Tested	No
4632	012	87.00	Not Detected	41.20	No
4632	036	55.00	Not Detected	46.20	No
4632	060	Not Detected	Not Detected	205.00	No
4640	012	231.00	1620.00	29.90	No
4640	060	452.00	230.00	40.20	No
4642	0-072	Not Tested	Not Tested	Not Tested	No
4642	012	72.00	3200.00	82.70	No
4642	036	1480.00	803.00	42.60	No
4644	012	133.00	2140.00	513.00	No
4644	036	264.00	4800.00	8.20	No
4644	054	147.00	2900.00	36.40	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
4715	0-096	Not Tested	Not Tested	Not Tested	No
4715	012	637.00	2700.00	15.70	No
4715	036	588.00	2900.00	7.70	No
4721	012	39.00	70.00	9.10	No
4721	030	Not Detected	Not Detected	10.10	No
4723	012	38.00	100.00	17.20	No
4725	012	21.00	Not Detected	29.60	No
4727	002	125.00	510.00	81.50	No
4729	012	Not Detected	Not Detected	301.00	No
4729	036	Not Detected	Not Detected	524.00	No
4731	012	Not Detected	260.00	190.00	No
4731	036	Not Detected	2070.00	137.00	No
4731	054	Not Detected	Not Detected	125.00	No
4731	066	11.00	Not Detected	2.00	No
4733	012	21.00	Not Detected	81.90	No
4741	0-036	Not Tested	Not Tested	Not Tested	No
4741	012	56.00	610.00	17.20	No
4743	012	249.00	1820.00	4600.00	No
4743	036	60.00	Not Detected	45.20	No
4745	0-072	Not Tested	Not Tested	Not Tested	No
4745	012	1160.00	1120.00	14.70	No
4745	036	652.00	8100.00	27.80	No
4747	012	728.00	7800.00	94.00	No
4747	048-096	Not Tested	Not Tested	Not Tested	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
4834	005	12.00	Not Detected	117.00	No
4846	0-048	Not Tested	Not Tested	Not Tested	No
4846	012	49.00	380.00	4910.00	No
4846	060	Not Detected	Not Detected	129.00	No
4846	072-096	Not Tested	Not Tested	Not Tested	No
4848	012	294.00	3700.00	25300.00	No
4848	036	309.00	4400.00	1720.00	No
4848	060	4.00	Not Detected	7.00	No
4850	0-048	Not Tested	Not Tested	Not Tested	No
4850	012	Not Detected	Not Detected	19.90	No
4852	0-048	Not Tested	Not Tested	Not Tested	No
4852	006	1200.00	20300.00	Not Detected	No
4919	012	42.00	170.00	10.80	No
4919	036	Not Detected	Not Detected	10.20	No
4921	0-060	Not Tested	Not Tested	Not Tested	No
4921	012	34.00	160.00	10.10	No
4921	036	Not Detected	Not Detected	3.80	No
4923	012	Not Detected	Not Detected	20.10	No
4925	0-037	Not Tested	Not Tested	Not Tested	No
4925	012	Not Detected	20.00	43.70	No
4927	006	Not Detected	Not Detected	37.20	No
4943	004	44.00	Not Detected	25.90	No
4945	005	10.00	Not Detected	2.40	No
4947	0-072	Not Tested	Not Tested	Not Tested	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
5044	060	Not Detected	Not Detected	1.60	No
5046	012	65.00	933.00	642.00	No
5046	036	Not Detected	Not Detected	6.60	No
5046	060	Not Detected	Not Detected	2.40	No
5048	0-037	Not Tested	Not Tested	Not Tested	No
5048	012	Not Detected	Not Detected	32.00	No
5119	0-072	Not Tested	Not Tested	Not Tested	No
5119	012	14.00	Not Detected	124.00	No
5119	036	4.00	Not Detected	4.00	No
5121	012	Not Detected	Not Detected	19.30	No
5121	028	Not Detected	Not Detected	19.00	No
5127	012	10.00	20.00	224.00	No
5129	012	18.00	140.00	100.00	No
5129	072	13.00	20.00	412.00	Yes
5129	132	12.00	60.00	415.00	Yes
5129	192	Not Detected	Not Detected	17.70	No
5129	240-246	Not Tested	Not Tested	Not Tested	No
5131	0-264	Not Tested	Not Tested	Not Tested	Yes
5131	012	58.00	320.00	1560.00	Yes
5131	132	12.00	140.00	1680.00	Yes
5131	252	Not Detected	Not Detected	50.40	Yes
5133	012	211.00	300.00	1970.00	Yes
5133	036	76.00	360.00	1150.00	Yes
5147	0-037	Not Tested	Not Tested	Not Tested	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
B-5	0-065	Not Tested	Not Tested	Not Tested	No
B-6	0-186	Not Tested	Not Tested	Not Tested	No
B-6	000	Not Detected	Not Detected	26.30	No
B-6	000	Not Detected	Not Detected	9.40	No
B-6	012	806.00	4516.00	280.00	No
B-7	0-096	Not Tested	Not Tested	Not Tested	No
B-7	000	124.00	1010.00	6300.00	No
B-7	000	13.00	Not Detected	6.10	No
B-7	036	39.00	225.00	68.00	No
B-8	0-096	Not Tested	Not Tested	Not Tested	No
B-8	012	3.00	11.00	Not Tested	No
B-9	0-096	Not Tested	Not Tested	Not Tested	No
B-9	012	118.00	86.00	637.00	No
B-9	036	12.00	Not Tested	16.00	No
B-10	0-024	Not Tested	Not Tested	Not Tested	No
B-10	024-048	Not Tested	Not Tested	Not Tested	Yes
B-10	048-070	Not Tested	Not Tested	Not Tested	No
B-10	065	126.00	100.00	2105.00	Yes
B-11	0-024	Not Tested	Not Tested	Not Tested	Yes
B-11	012	104.00	188.00	977.00	Yes
B-12	0-168	Not Tested	Not Tested	Not Tested	No
B-12	012	1026.00	8803.00	7.00	No
B-12	108	Not Tested	11.00	7.00	No
B-13	0-097	Not Tested	Not Tested	Not Tested	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
B-22	084	88.00	196.00	4956.00	Yes
B-22	107	5.00	8.00	216.00	No
B-22	120-184	Not Tested	Not Tested	Not Tested	No
B-22	176	5.00	12.00	42.00	No
B-23	0-152	Not Tested	Not Tested	Not Tested	No
B-23	000	119.00	Not Detected	3.60	No
B-23	012	237.00	445.00	1753.00	No
B-23	036	95.00	207.00	36.00	No
B-23	060	12.00	131.00	Not Tested	No
B-24	0-144	Not Tested	Not Tested	Not Tested	No
B-24	000	78.00	Not Detected	5.40	No
B-24	012	11.00	866.00	6.00	No
B-24	084	15.00	3800.00	16.00	No
B-25	0-144	Not Tested	Not Tested	Not Tested	No
B-25	000	790.00	1840.00	41.70	No
B-25	084	21.00	1875.00	135.00	No
B-26	0-186	Not Tested	Not Tested	Not Tested	No
B-26	000	24.00	Not Detected	12.40	No
B-26	000	292.00	5570.00	185.00	No
B-26	132	284.00	2018.00	202.00	No
B-27	0-348	Not Tested	Not Tested	Not Tested	Yes
B-27	000	14.00	Not Detected	16.10	No
B-27	000	21.00	60.00	115.00	No
B-27	060	64.00	555.00	4090.00	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
B-32	084	6.00	385.00	1619.00	No
B-35	0-168	Not Tested	Not Tested	Not Tested	No
B-35	000	38.00	Not Detected	2.50	No
B-35	012	1122.00	2857.00	42.00	No
B-35	028	133.00	1152.00	36.00	No
B-36	0-168	Not Tested	Not Tested	Not Tested	No
B-36	000	2070.00	Not Detected	5.90	No
B-36	012	1262.00	4660.00	10.00	No
B-36	036	1321.00	5849.00	Not Tested	No
B-36	060	1944.00	343.00	5.00	No
B-36	084	858.00	123.00	14.00	No
B-37	0-168	Not Tested	Not Tested	Not Tested	No
B-37	036	1500.00	540.00	30.00	No
B-37	108	204.00	1944.00	48.00	No
B-39	0-168	Not Tested	Not Tested	Not Tested	No
B-39	012	12.00	77.00	6.00	No
B-40	0-216	Not Tested	Not Tested	Not Tested	No
B-40	012	19.00	1010.00	10.00	No
B-40	036	Not Tested	5.00	7.00	No
B-40	060	Not Tested	6.00	7.00	No
B-41	0-168	Not Tested	Not Tested	Not Tested	No
B-41	000	52.00	Not Detected	6.30	No
B-41	012	101.00	465.00	25.00	No
B-41	036	250.00	570.00	28.00	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
B-49	006	21.00	606.00	27.00	No
B-50	0-072	Not Tested	Not Tested	Not Tested	No
B-50	012	19.00	190.00	15.00	No
B-50	032	Not Tested	10.00	21.00	No
B-51	0-024	Not Tested	Not Tested	Not Tested	No
B-51	000	Not Detected	Not Detected	70.70	No
B-51	024-054	Not Tested	Not Tested	Not Tested	Yes
B-51	028	19.00	90.00	78.00	No
B-52	0-216	Not Tested	Not Tested	Not Tested	No
B-52	060	9.00	5.00	6.00	No
B-52	132	10.00	5.00	7.00	No
B-52	180	10.00	Not Tested	9.00	No
B-53	0-192	Not Tested	Not Tested	Not Tested	No
B-53	012	410.00	1160.00	180.00	No
B-53	108	Not Tested	15.00	7.00	No
B-54	012	9.00	140.00	110.00	No
B-54	132	3.00	5.00	33.00	No
B-55	012	680.00	8200.00	12.00	No
B-55	060	782.00	871.00	22.00	No
B-55	132	73.00	27.00	19.00	No
B-56	000	45.00	Not Detected	5.60	No
B-56	036	8932.00	36408.00	68.00	No
B-56	084	1398.00	76.00	5.00	No
B-57	000	13.30	Not Detected	7.30	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
BH-9	024-180	Not Tested	Not Tested	Not Tested	Yes
BH-9	180-204	Not Tested	Not Tested	Not Tested	No
BH-9	240-264	Not Tested	Not Tested	Not Tested	No
BH-9	300-324	Not Tested	Not Tested	Not Tested	No
BH-9	360-372	Not Tested	Not Tested	Not Tested	No
BH-9	420-444	Not Tested	Not Tested	Not Tested	No
BH-9	480-492	Not Tested	Not Tested	Not Tested	No
BH-9	540-545	Not Tested	Not Tested	Not Tested	No
BH-10	0-024	Not Tested	Not Tested	Not Tested	No
BH-10	024-480	Not Tested	Not Tested	Not Tested	Yes
BH-11	0-024	Not Tested	Not Tested	Not Tested	No
BH-11	024-480	Not Tested	Not Tested	Not Tested	Yes
BH-12	0-024	Not Tested	Not Tested	Not Tested	No
BH-12	024-192	Not Tested	Not Tested	Not Tested	Yes
BH-12	192-204	Not Tested	Not Tested	Not Tested	No
BH-13	0-024	Not Tested	Not Tested	Not Tested	No
BH-13	024-174	Not Tested	Not Tested	Not Tested	Yes
BH-14	0-060	Not Tested	Not Tested	Not Tested	Yes
BH-14	060-084	Not Tested	Not Tested	Not Tested	No
BH-14	120-144	Not Tested	Not Tested	Not Tested	No
BH-14	180-204	Not Tested	Not Tested	Not Tested	No
BH-15	0-042	Not Tested	Not Tested	Not Tested	Yes
BH-15	042-180	Not Tested	Not Tested	Not Tested	No
BH-16	0-060	Not Tested	Not Tested	Not Tested	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
J/B-3	033	55.00	3000.00	16.00	No
J/B-5	054	74.00	470.00	1.00	No
J/B-6	014	42.00	470.00	12.00	No
J/B-9A	012	8.00	55.00	2.00	No
J/C-3	024	400.00	2100.00	450.00	No
J/D	000	100.00	440.00	650.00	No
J/E	000	29.00	370.00	310.00	No
J/GZ-1	024	64.00	210.00	3.00	No
J/GZ-1	078	65.00	860.00	64.00	No
J/GZ-1	104	57.00	16.00	19.00	No
J/GZ-1	132	25.00	120.00	2.00	No
J/GZ-2	024	160.00	5800.00	64.00	No
J/GZ-2	072	75.00	1100.00	360.00	No
J/GZ-2	192	13.00	15.00	6.00	No
J/GZ-4	045	620.00	870.00	15.00	No
J/GZ-5	024	270.00	14000.00	11.00	No
J/GZ-5	096	2600.00	1700.00	18.00	No
J/GZ-5	132	160.00	15.00	12.00	No
J/GZ-5	186	210.00	15.00	14.00	No
OS-1	0-120	Not Tested	Not Tested	Not Tested	No
OS-2	0-024	Not Tested	Not Tested	Not Tested	No
OS-2	120-144	Not Tested	Not Tested	Not Tested	No
OS-2	240-264	Not Tested	Not Tested	Not Tested	No
OS-3	0-024	Not Tested	Not Tested	Not Tested	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	**Sample Depth (Inches)**	**Arsenic (ppm)**	**Lead (ppm)**	**Chromium (ppm)**	**Was Hide Residue Detected?**
OW-10	0-330	Not Tested	Not Tested	Not Tested	No
OW-11	0-456	Not Tested	Not Tested	Not Tested	No
OW-12	0-582	Not Tested	Not Tested	Not Tested	No
OW-13	0-060	Not Tested	Not Tested	Not Tested	No
OW-13	060-078	Not Tested	Not Tested	Not Tested	Yes
OW-13	078-324	Not Tested	Not Tested	Not Tested	No
OW-14	0-438	Not Tested	Not Tested	Not Tested	No
OW-15	0-300	Not Tested	Not Tested	Not Tested	No
OW-16	0-408	Not Tested	Not Tested	Not Tested	No
OW-22	0-160	Not Tested	Not Tested	Not Tested	No
OW-23	0-324	Not Tested	Not Tested	Not Tested	No
OW-28	0-106	Not Tested	Not Tested	Not Tested	No
SD-1	0-168	Not Tested	Not Tested	Not Tested	No
SD-2	0-180	Not Tested	Not Tested	Not Tested	Yes
SD-3	0-024	Not Tested	Not Tested	Not Tested	No
SD-3	024-180	Not Tested	Not Tested	Not Tested	Yes
SD-3	138-144	Not Tested	Not Tested	Not Tested	Yes
SD-8	0-024	Not Tested	Not Tested	Not Tested	No
SD-8	060-084	Not Tested	Not Tested	Not Tested	No
SD-8	120-144	Not Tested	Not Tested	Not Tested	No
SD-8	180-204	Not Tested	Not Tested	Not Tested	No
SD-11	060-084	Not Tested	Not Tested	Not Tested	No
SD-11	120-144	Not Tested	Not Tested	Not Tested	No
SD-15	0-095	Not Tested	Not Tested	Not Tested	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
SD-23	180-186	Not Tested	Not Tested	Not Tested	No
SD-24	0-024	Not Tested	Not Tested	Not Tested	No
SD-24	060-078	Not Tested	Not Tested	Not Tested	No
SD-24	120-126	Not Tested	Not Tested	Not Tested	No
SD-26	0-024	Not Tested	Not Tested	Not Tested	No
SD-26	060-078	Not Tested	Not Tested	Not Tested	No
SD-26	120-138	Not Tested	Not Tested	Not Tested	No
SD-26	180-198	Not Tested	Not Tested	Not Tested	No
SD-28	0-012	Not Tested	Not Tested	Not Tested	No
SD-28	060-078	Not Tested	Not Tested	Not Tested	No
SD-28	120-138	Not Tested	Not Tested	Not Tested	No
SD-29	060-084	Not Tested	Not Tested	Not Tested	No
SD-29	120-144	Not Tested	Not Tested	Not Tested	No
SD-29	180-204	Not Tested	Not Tested	Not Tested	No
SD-30	060-084	Not Tested	Not Tested	Not Tested	No
SD-30	120-144	Not Tested	Not Tested	Not Tested	No
SD-30	216-240	Not Tested	Not Tested	Not Tested	No
SD-31	060-084	Not Tested	Not Tested	Not Tested	No
SD-31	120-138	Not Tested	Not Tested	Not Tested	No
SD-31	180-204	Not Tested	Not Tested	Not Tested	No
SD-33	060-073	Not Tested	Not Tested	Not Tested	No
SD-33	120-138	Not Tested	Not Tested	Not Tested	No
SD-33	180-204	Not Tested	Not Tested	Not Tested	No
SD-38	108-216	Not Tested	Not Tested	Not Tested	Yes

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
TP-10	120	8.00	396.00	15481.00	Yes
TP-10	Unknown	Not Tested	Not Tested	Not Tested	Yes
TP-10	Unknown	10.00	227.00	44444.00	Yes
TP-11	0-012	Not Tested	Not Tested	Not Tested	No
TP-11	012-108	Not Tested	Not Tested	Not Tested	Yes
TP-11	Unknown	7.00	15.00	180.00	No
TP-12	0-132	Not Tested	Not Tested	Not Tested	No
TP-12	024	7.00	30.00	248.00	No
TP-12	054	10.00	30.00	15.00	No
TP-13	0-066	Not Tested	Not Tested	Not Tested	No
TP-13	030	8.00	Not Tested	10.00	No
TP-14	0-072	Not Tested	Not Tested	Not Tested	No
TP-14	048	3.00	136.00	145455.00	Yes
TP-14	060	4.00	10.00	20.00	No
TP-15	0-012	Not Tested	Not Tested	Not Tested	No
TP-15	012-060	Not Tested	Not Tested	Not Tested	Yes
TP-15	036	5.00	59.00	248.00	Yes
TP-16	0-120	Not Tested	Not Tested	Not Tested	No
TP-16	012	Not Tested	253.00	12121.00	No
TP-16	Unknown	50.00	Not Tested	94.00	No
TP-17	0-084	Not Tested	Not Tested	Not Tested	No
TP-17	036	743.00	1881.00	15.00	No
TP-17	042	1100.00	10400.00	Not Tested	No
TP-17	Unknown	238.00	1832.00	104.00	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
TP-30	0-054	Not Tested	Not Tested	Not Tested	No
TP-30	024	16337.00	89109.00	Not Tested	No
TP-31	0-240	Not Tested	Not Tested	Not Tested	No
TP-31	030	175.00	320.00	110.00	No
TP-31	048	2050.00	5100.00	12.00	No
TP-32	0-018	Not Tested	Not Tested	Not Tested	No
TP-32	018-048	Not Tested	Not Tested	Not Tested	Yes
TP-32	024	129.00	376.00	64.00	Yes
TP-32	048-066	Not Tested	Not Tested	Not Tested	No
TP-33	0-078	Not Tested	Not Tested	Not Tested	No
TP-33	024	67.00	3088.00	20.00	No
TP-34	0-030	Not Tested	Not Tested	Not Tested	No
TP-35	0-084	Not Tested	Not Tested	Not Tested	No
TP-35	018	21.00	93.00	1111.00	Yes
TP-36	0-008	Not Tested	Not Tested	Not Tested	No
TP-36	008-062	Not Tested	Not Tested	Not Tested	Yes
TP-36	024	8.00	15.00	99.00	Yes
TP-36	062+	Not Tested	Not Tested	Not Tested	No
TP-37	0-108	Not Tested	Not Tested	Not Tested	No
TP-38	0-084	Not Tested	Not Tested	Not Tested	No
TP-38	018	594.00	14851.00	8.0	No
TP-39	0-054	Not Tested	Not Tested	Not Tested	No
TP-40	0-072	Not Tested	Not Tested	Not Tested	No
TP-40	036	5200.00	11000.00	105.00	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
TP-53	0-078	Not Tested	Not Tested	Not Tested	No
TP-54	0-060	Not Tested	Not Tested	Not Tested	No
TP-55	0-048	Not Tested	Not Tested	Not Tested	No
TP-56	0-048	Not Tested	Not Tested	Not Tested	No
TP-57	0-048	Not Tested	Not Tested	Not Tested	No
TP-57	033	1450.00	3100.00	13000.00	No
TP-58	0-006	Not Tested	Not Tested	Not Tested	No
TP-58	006-024	Not Tested	Not Tested	Not Tested	Yes
TP-59	0-002	Not Tested	Not Tested	Not Tested	No
TP-59	002-072	Not Tested	Not Tested	Not Tested	Yes
TP-59	024	8.00	14.00	1750.00	Yes
TP-60	0-007	Not Tested	Not Tested	Not Tested	No
TP-60	007-018	Not Tested	Not Tested	Not Tested	Yes
TP-60	010	59.00	88.00	4902.00	Yes
TP-61	0-018	Not Tested	Not Tested	Not Tested	No
TP-61	018-096	Not Tested	Not Tested	Not Tested	Yes
TP-62	0-024	Not Tested	Not Tested	Not Tested	Yes
TP-63	0-037	Not Tested	Not Tested	Not Tested	No
TP-63	012	1633.00	888.00	37.00	No
TP-63	031	5556.00	22222.00	Not Tested	No
TP-64	0-007	Not Tested	Not Tested	Not Tested	No
TP-64	005	7959.00	26531.00	Not Tested	No
TP-65	0-012	Not Tested	Not Tested	Not Tested	No
TP-65	004	1485.00	23762.00	Not Tested	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
TP-85	0-084	Not Tested	Not Tested	Not Tested	No
TP-85	024	675.00	1576.00	75.00	No
TP-85	066	594.00	158.00	Not Tested	Yes
TP-86	0-070	Not Tested	Not Tested	Not Tested	No
TP-86	018	1100.00	2600.00	100.00	No
TP-87	0-113	Not Tested	Not Tested	Not Tested	No
TP-87	018	588.00	13725.00	Not Tested	No
TP-88	0-072	Not Tested	Not Tested	Not Tested	No
TP-88	027	778.00	11111.00	Not Tested	No
TP-89	0-048	Not Tested	Not Tested	Not Tested	No
TP-89	032	941.00	1980.00	198.00	No
TP-89	048-091	Not Tested	Not Tested	Not Tested	Yes
TP-89	086	1414.00	7475.00	82.00	Yes
TP-89	091-096	Not Tested	Not Tested	Not Tested	No
TP-90	0-118	Not Tested	Not Tested	Not Tested	No
TP-91	0-072	Not Tested	Not Tested	Not Tested	No
TP-91	036	796.00	1692.00	14.00	No
TP-92	0-090	Not Tested	Not Tested	Not Tested	No
TP-93	0-092	Not Tested	Not Tested	Not Tested	No
TP-93	030	Not Tested	Not Tested	Not Tested	No
TP-94	0-090	Not Tested	Not Tested	Not Tested	No
TP-94	024	743.00	218.00	2178.00	No
TP-95	0-098	Not Tested	Not Tested	Not Tested	No
TP-95	010	727.00	1313.00	303.00	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
TP-107	022	290.00	1500.00	Not Tested	No
TP-107	034	639.00	567.00	Not Tested	No
TP-108	0-114	Not Tested	Not Tested	Not Tested	No
TP-108	024	120.00	550.00	Not Tested	No
TP-109	0-060	Not Tested	Not Tested	Not Tested	No
TP-110	0-084	Not Tested	Not Tested	Not Tested	No
TP-110	012	500.00	810.00	28.00	No
TP-110	Unknown	5.00	110.00	18.00	No
TP-111	0-060	Not Tested	Not Tested	Not Tested	No
TP-111	000	Not Tested	Not Tested	10.00	No
TP-112	0-078	Not Tested	Not Tested	Not Tested	No
TP-112	Unknown	75.00	480.00	2300.00	No
TP-112	Unknown	48.00	412.00	347.00	No
TP-113	0-060	Not Tested	Not Tested	Not Tested	No
TP-113	018	14141.00	8788.00	4343.00	No
TP-113	054	17000.00	160.00	7.00	No
TP-114	0-090	Not Tested	Not Tested	Not Tested	No
TP-114	012	12.00	55.00	7.00	No
TP-114	018	2400.00	4200.00	21.00	No
TP-115	0-096	Not Tested	Not Tested	Not Tested	No
TP-116	0-102	Not Tested	Not Tested	Not Tested	No
TP-122	0-114	Not Tested	Not Tested	Not Tested	No
TP-123	0-090	Not Tested	Not Tested	Not Tested	No
TP-124	0-096	Not Tested	Not Tested	Not Tested	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
TP-144	0-066	Not Tested	Not Tested	Not Tested	No
TP-144	066-114	Not Tested	Not Tested	Not Tested	Yes
TP-145	0-078	Not Tested	Not Tested	Not Tested	No
TP-145	078-114	Not Tested	Not Tested	Not Tested	Yes
TP-146	0-108	Not Tested	Not Tested	Not Tested	No
TP-147	0-078	Not Tested	Not Tested	Not Tested	No
TP-148	0-104	Not Tested	Not Tested	Not Tested	No
TP-149	0-114	Not Tested	Not Tested	Not Tested	No
TP-150	0-101	Not Tested	Not Tested	Not Tested	No
TP-151	0-076	Not Tested	Not Tested	Not Tested	No
TP-152	0-102	Not Tested	Not Tested	Not Tested	No
TP-153	0-102	Not Tested	Not Tested	Not Tested	No
TP-154	0-102	Not Tested	Not Tested	Not Tested	No
TP-155	0-090	Not Tested	Not Tested	Not Tested	No
TP-156	0-090	Not Tested	Not Tested	Not Tested	No
TP-158	0-090	Not Tested	Not Tested	Not Tested	No
TP-159	0-030	Not Tested	Not Tested	Not Tested	No
TP-160	0-090	Not Tested	Not Tested	Not Tested	No
TP-161	0-114	Not Tested	Not Tested	Not Tested	No
TP-162	0-084	Not Tested	Not Tested	Not Tested	No
TP-165	0-078	Not Tested	Not Tested	Not Tested	No
TP-166	0-006	Not Tested	Not Tested	Not Tested	No
TP-167	0-060	Not Tested	Not Tested	Not Tested	No
TP-167	060-096	Not Tested	Not Tested	Not Tested	Yes

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
TP-178	0-012	Not Tested	Not Tested	Not Tested	No
TP-178	012-120	Not Tested	Not Tested	Not Tested	Yes
TP-179	0-012	Not Tested	Not Tested	Not Tested	No
TP-179	012-118	Not Tested	Not Tested	Not Tested	Yes
TP-180	0-096	Not Tested	Not Tested	Not Tested	No
TP-180	096-120	Not Tested	Not Tested	Not Tested	Yes
TP-181	0-120	Not Tested	Not Tested	Not Tested	No
TP-182	0-018	Not Tested	Not Tested	Not Tested	No
TP-182	018-096	Not Tested	Not Tested	Not Tested	Yes
TP-183	0-012	Not Tested	Not Tested	Not Tested	No
TP-183	012-072	Not Tested	Not Tested	Not Tested	Yes
TP-183	072-084	Not Tested	Not Tested	Not Tested	No
TP-184	0-060	Not Tested	Not Tested	Not Tested	No
TP-185	0-024	Not Tested	Not Tested	Not Tested	No
TP-185	024-102	Not Tested	Not Tested	Not Tested	Yes
TP-186	0-060	Not Tested	Not Tested	Not Tested	No
TP-186	060-108	Not Tested	Not Tested	Not Tested	Yes
TP-186	108-114	Not Tested	Not Tested	Not Tested	No
TP-187	0-030	Not Tested	Not Tested	Not Tested	No
TP-187	030-036	Not Tested	Not Tested	Not Tested	Yes
TP-187	036-096	Not Tested	Not Tested	Not Tested	No
TP-188	0-096	Not Tested	Not Tested	Not Tested	No
TP-189	0-090	Not Tested	Not Tested	Not Tested	No
TP-190	0-072	Not Tested	Not Tested	Not Tested	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
TP-215	0-048	Not Tested	Not Tested	Not Tested	No
TP-216	0-030	Not Tested	Not Tested	Not Tested	No
TP-217	0-048	Not Tested	Not Tested	Not Tested	No
TP-218	0-078	Not Tested	Not Tested	Not Tested	No
TP-218	078-108	Not Tested	Not Tested	Not Tested	Yes
TP-219	0-108	Not Tested	Not Tested	Not Tested	No
TP-220	0-090	Not Tested	Not Tested	Not Tested	No
TP-221	0-084	Not Tested	Not Tested	Not Tested	No
TP-222	0-030	Not Tested	Not Tested	Not Tested	No
TP-223	0-024	Not Tested	Not Tested	Not Tested	No
TP-223	024-084	Not Tested	Not Tested	Not Tested	Yes
TP-223	084-108	Not Tested	Not Tested	Not Tested	No
TP-227	0-030	Not Tested	Not Tested	Not Tested	No
TP-227	030-036	Not Tested	Not Tested	Not Tested	Yes
TP-227	036-096	Not Tested	Not Tested	Not Tested	No
TP-228	0-066	Not Tested	Not Tested	Not Tested	No
TP-229	0-046	Not Tested	Not Tested	Not Tested	No
TP-230	0-036	Not Tested	Not Tested	Not Tested	No
TP-231	0-024	Not Tested	Not Tested	Not Tested	No
TP-231	024-036	Not Tested	Not Tested	Not Tested	Yes
TP-231	036-048	Not Tested	Not Tested	Not Tested	No
TP-232	0-042	Not Tested	Not Tested	Not Tested	No
TP-232	042-120	Not Tested	Not Tested	Not Tested	Yes
TP-233	0-048	Not Tested	Not Tested	Not Tested	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	**Sample Depth (Inches)**	**Arsenic (ppm)**	**Lead (ppm)**	**Chromium (ppm)**	**Was Hide Residue Detected?**
TP-254	0-108	Not Tested	Not Tested	Not Tested	No
TP-255	0-102	Not Tested	Not Tested	Not Tested	No
TP-256	0-096	Not Tested	Not Tested	Not Tested	No
TP-257	0-054	Not Tested	Not Tested	Not Tested	No
TP-258	0-060	Not Tested	Not Tested	Not Tested	No
TP-259	0-066	Not Tested	Not Tested	Not Tested	No
TP-260	0-060	Not Tested	Not Tested	Not Tested	No
TP-261	0-054	Not Tested	Not Tested	Not Tested	No
TP-262	0-054	Not Tested	Not Tested	Not Tested	No
TP-263	0-078	Not Tested	Not Tested	Not Tested	No
TP-264	0-078	Not Tested	Not Tested	Not Tested	No
TP-265	0-084	Not Tested	Not Tested	Not Tested	No
TP-266	0-006	Not Tested	Not Tested	Not Tested	No
TP-266	006-054	Not Tested	Not Tested	Not Tested	Yes
TP-266	054-072	Not Tested	Not Tested	Not Tested	No
TP-267	0-018	Not Tested	Not Tested	Not Tested	No
TP-267	018-090	Not Tested	Not Tested	Not Tested	Yes
TP-268	0-018	Not Tested	Not Tested	Not Tested	No
TP-268	018-102	Not Tested	Not Tested	Not Tested	Yes
TP-269	0-024	Not Tested	Not Tested	Not Tested	No
TP-269	024-078	Not Tested	Not Tested	Not Tested	Yes
TP-270	0-024	Not Tested	Not Tested	Not Tested	No
TP-270	024-078	Not Tested	Not Tested	Not Tested	Yes
TP-271	0-012	Not Tested	Not Tested	Not Tested	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
TP-286	0-036	Not Tested	Not Tested	Not Tested	No
TP-286	036-090	Not Tested	Not Tested	Not Tested	Yes
TP-287	0-108	Not Tested	Not Tested	Not Tested	No
TP-288	0-096	Not Tested	Not Tested	Not Tested	No
TP-289	0-094	Not Tested	Not Tested	Not Tested	No
TP-290	0-096	Not Tested	Not Tested	Not Tested	No
TP-291	0-084	Not Tested	Not Tested	Not Tested	No
TP-292	0-046	Not Tested	Not Tested	Not Tested	No
TP-293	0-042	Not Tested	Not Tested	Not Tested	No
TP-294	0-084	Not Tested	Not Tested	Not Tested	No
TP-295	0-090	Not Tested	Not Tested	Not Tested	No
TP-296	0-090	Not Tested	Not Tested	Not Tested	No
TP-297	0-024	Not Tested	Not Tested	Not Tested	No
TP-297	024-072	Not Tested	Not Tested	Not Tested	Yes
TP-297	072-096	Not Tested	Not Tested	Not Tested	No
TP-298	0-114	Not Tested	Not Tested	Not Tested	No
TP-299	0-102	Not Tested	Not Tested	Not Tested	No
TP-300	0-102	Not Tested	Not Tested	Not Tested	No
TP-301	0-084	Not Tested	Not Tested	Not Tested	No
TP-302	0-060	Not Tested	Not Tested	Not Tested	No
TP-303	0-096	Not Tested	Not Tested	Not Tested	No
TP-304	0-114	Not Tested	Not Tested	Not Tested	No
TP-305	0-102	Not Tested	Not Tested	Not Tested	No
TP-306	0-102	Not Tested	Not Tested	Not Tested	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
TP-325	042-102	Not Tested	Not Tested	Not Tested	Yes
TP-326	0-042	Not Tested	Not Tested	Not Tested	No
TP-326	042-096	Not Tested	Not Tested	Not Tested	Yes
TP-327	0-042	Not Tested	Not Tested	Not Tested	No
TP-327	042-114	Not Tested	Not Tested	Not Tested	Yes
TP-328	0-048	Not Tested	Not Tested	Not Tested	No
TP-328	048-090	Not Tested	Not Tested	Not Tested	Yes
TP-329	0-042	Not Tested	Not Tested	Not Tested	No
TP-329	042-096	Not Tested	Not Tested	Not Tested	Yes
TP-330	0-090	Not Tested	Not Tested	Not Tested	No
TP-331	0-090	Not Tested	Not Tested	Not Tested	No
TP-332	0-102	Not Tested	Not Tested	Not Tested	No
TP-333	0-096	Not Tested	Not Tested	Not Tested	No
TP-334	0-072	Not Tested	Not Tested	Not Tested	No
TP-334	072-096	Not Tested	Not Tested	Not Tested	Yes
TP-335	0-096	Not Tested	Not Tested	Not Tested	No
TP-336	0-096	Not Tested	Not Tested	Not Tested	No
TP-337	0-072	Not Tested	Not Tested	Not Tested	No
TP-338	055	Not Detected	13.00	Not Detected	No
TP-339	0-090	Not Tested	Not Tested	Not Tested	No
TP-340	0-078	Not Tested	Not Tested	Not Tested	No
TP-340	062	Not Detected	Not Detected	6.00	No
TP-341	0-090	Not Tested	Not Tested	Not Tested	No
TP-342	0-078	Not Tested	Not Tested	Not Tested	No

SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	Sample Depth (Inches)	Arsenic (ppm)	Lead (ppm)	Chromium (ppm)	Was Hide Residue Detected?
TP-365	0-084	Not Tested	Not Tested	Not Tested	No
TP-366	0-024	Not Tested	Not Tested	Not Tested	No
TP-367	0-084	Not Tested	Not Tested	Not Tested	No
TP-369	060	Not Detected	Not Detected	6.20	No
TP-370	0-060	Not Tested	Not Tested	Not Tested	No
TP-371	0-036	Not Tested	Not Tested	Not Tested	No
TP-372	0-060	Not Tested	Not Tested	Not Tested	No
TP-373	0-060	Not Tested	Not Tested	Not Tested	No
TP-374	066	4.00	Not Detected	5.50	No
TP-375	0-060	Not Tested	Not Tested	Not Tested	No
TP-376	0-084	Not Tested	Not Tested	Not Tested	No
TP-377	0-024	Not Tested	Not Tested	Not Tested	No
TP-377	024-030	Not Tested	Not Tested	Not Tested	Yes
TP-377	030-048	Not Tested	Not Tested	Not Tested	No
TP-378	0-072	Not Tested	Not Tested	Not Tested	No
TP-379	0-042	Not Tested	Not Tested	Not Tested	No
TP-380	0-046	Not Tested	Not Tested	Not Tested	No
TP-381	0-066	Not Tested	Not Tested	Not Tested	No
TP-381	056	5.00	Not Detected	10.30	No
TP-382	0-060	Not Tested	Not Tested	Not Tested	No
TP-383	0-054	Not Tested	Not Tested	Not Tested	No
TP-383	040	7.00	Not Detected	21.60	No
TP-386	0-054	Not Tested	Not Tested	Not Tested	No
TP-386	049	Not Detected	Not Detected	16.70	No

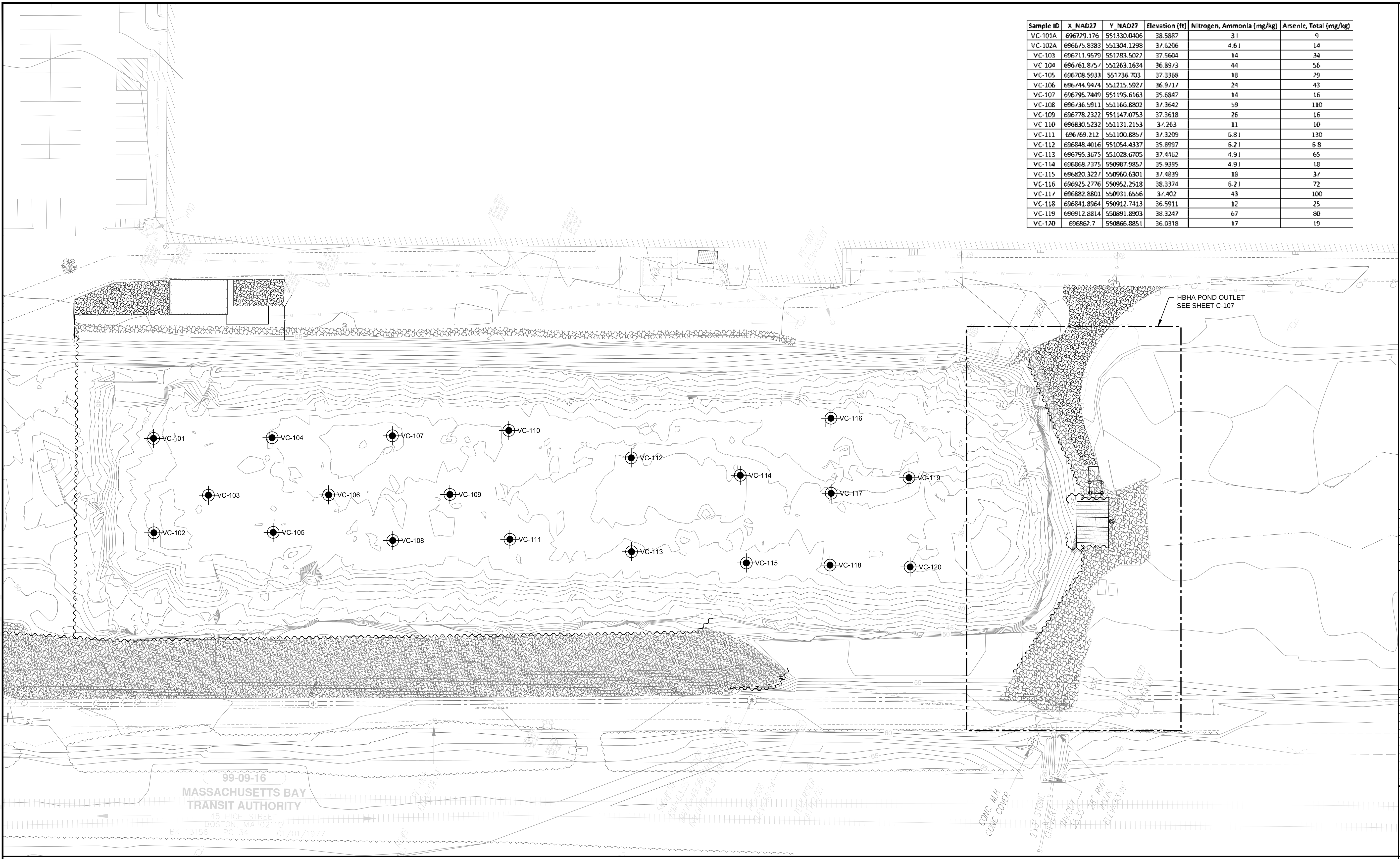
SUMMARY OF SOIL SAMPLE ANALYSES

Remedial Investigation - Borings and Test Pits

Borehole Number	**Sample Depth (Inches)**	**Arsenic (ppm)**	**Lead (ppm)**	**Chromium (ppm)**	**Was Hide Residue Detected?**
TP-420	024-096	Not Tested	Not Tested	Not Tested	Yes
TP-421	0-024	Not Tested	Not Tested	Not Tested	No
TP-421	024-096	Not Tested	Not Tested	Not Tested	Yes
TP-422	0-024	Not Tested	Not Tested	Not Tested	No
TP-422	024-096	Not Tested	Not Tested	Not Tested	Yes
TP-437	0-048	Not Tested	Not Tested	Not Tested	No
TP-438	0-072	Not Tested	Not Tested	Not Tested	No
TP-439	0-072	Not Tested	Not Tested	Not Tested	No
TP-440	0-048	Not Tested	Not Tested	Not Tested	No
TP-441	0-048	Not Tested	Not Tested	Not Tested	No
TP-442	0-048	Not Tested	Not Tested	Not Tested	No
TP-443	0-120	Not Tested	Not Tested	Not Tested	No
TP-444	0-084	Not Tested	Not Tested	Not Tested	No
TP-445	0-018	Not Tested	Not Tested	Not Tested	No
TP-445	018-024	Not Tested	Not Tested	Not Tested	Yes
TP-445	024-132	Not Tested	Not Tested	Not Tested	No
TP-446	0-012	Not Tested	Not Tested	Not Tested	No
TP-446	012-018	Not Tested	Not Tested	Not Tested	Yes
TP-446	018-084	Not Tested	Not Tested	Not Tested	No
TP-447	0-084	Not Tested	Not Tested	Not Tested	No
TP-448	0-060	Not Tested	Not Tested	Not Tested	No
TP-450	0-012	Not Tested	Not Tested	Not Tested	No
TP-450	012-126	Not Tested	Not Tested	Not Tested	Yes
TP-451	0-084	Not Tested	Not Tested	Not Tested	No

Appendix D.2
OU2 HBHA Pond Sediment Data

Sample ID	X_NAD27	Y_NAD27	Elevation (ft)	Nitrogen, Ammonia (mg/kg)	Arsenic, Total (mg/kg)
VC-101A	696729.176	551330.0406	38.5887	3 J	9
VC-102A	696675.8383	551304.1298	37.6206	4.6 J	14
VC-103	696711.9579	551283.5022	37.5604	14	34
VC-104	696761.8757	551263.1634	36.8973	44	56
VC-105	696708.5933	551236.703	37.3368	18	29
VC-106	696744.9474	551215.5927	36.9717	24	43
VC-107	696795.7449	551195.6163	35.6847	14	16
VC-108	696736.5911	551166.8802	37.3642	59	110
VC-109	696778.2322	551147.0753	37.3618	26	16
VC-110	696830.5232	551131.2153	37.263	11	10
VC-111	696769.212	551100.8857	37.3209	6.8 J	130
VC-112	696848.4016	551054.4337	35.8997	6.2 J	6.8
VC-113	696795.3675	551028.6705	37.4462	4.9 J	65
VC-114	696868.7375	550987.9857	35.9395	4.9 J	18
VC-115	696820.3227	550960.6301	37.4839	18	37
VC-116	696925.2776	550952.2518	38.3374	6.2 J	72
VC-117	696882.8801	550931.6556	37.402	43	100
VC-118	696841.8964	550912.7413	36.5911	12	25
VC-119	696912.8814	550891.8903	38.3247	67	80
VC-120	696862.7	550866.8851	36.0318	17	19



LEGEND

⊕ VC-101A	VIBRACORES PERFORMED BETWEEN THE PERIOD 12 JULY 2016 AND 11 AUGUST 2016.

0 30 60 90 120
SCALE IN FEET

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AS-BUILT DRAWINGS

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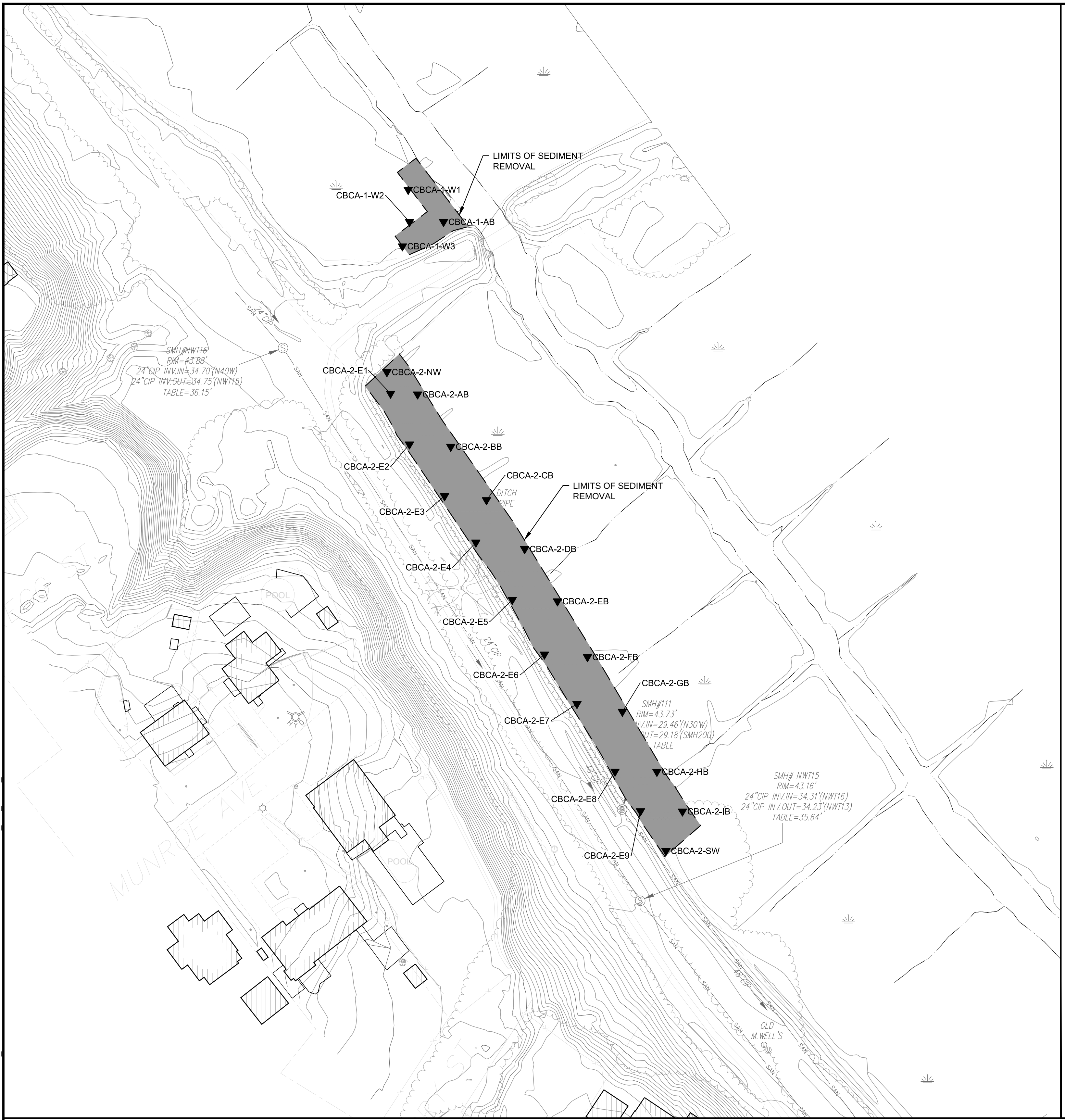
INDUSTRI-PLEX
OPERABLE UNIT 2
SUPERFUND SITE AS-BUILT
600-SERIES HBHA POND
DREDGE
WOBURN, MASSACHUSETTS

HBHA POND DREDGE PLAN AND VIBRACORE LOCATIONS

C-105

Appendix D.3
OU2 Wells G&H Wetland and CBCA Sediment Data



CONFIRMATORY SAMPLE LOCATIONS AND CONTAMINATION LEVELS:

Sample ID	X_NAD27	Y_NAD27	Elevation (ft)	Arsenic, mg/kg
CBCA-1-W1	701413.1948	542427.1537	38.0	150
CBCA-1-W2	701414.0195	542406.5481	38.0	27
CBCA-1-W3	701409.4839	542390.8879	37.9	15
CBCA-1-AB	701435.8658	542406.5481	37.1	15
CBCA-2-E1	701401.8596	542296.3759	37.5	29
CBCA-2-E2	701413.9989	542263.8219	37.5	35
CBCA-2-E3	701436.5087	542230.6079	37.5	56
CBCA-2-E4	701456.6067	542200.876	37.5	12
CBCA-2-E5	701479.938	542164.0804	37.5	16
CBCA-2-E6	701500.572	542128.9914	37.6	33
CBCA-2-E7	701521.4913	542097.3029	37.5	120
CBCA-2-E8	701545.877	542053.9104	37.5	19
CBCA-2-E9	701562.2233	542028.4642	37.5	26
CBCA-2-NW	701399.5283	542310.1608	37.7	6
CBCA-2-AB	701419.2109	542295.8833	37.7	0.55
CBCA-2-BB	701440.488	542262.3187	37.7	26
CBCA-2-CB	701463.4297	542228.0458	37.5	0.36
CBCA-2-DB	701487.9242	542196.6426	37.5	1.6
CBCA-2-EB	701508.9965	542163.1371	37.5	0.88
CBCA-2-FB	701528.2287	542127.3735	37.5	0.7
CBCA-2-GB	701550.6217	542092.302	37.5	26
CBCA-2-HB	701572.7655	542053.7713	37.5	16
CBCA-2-IB	701589.1469	542028.3202	37.5	40
CBCA-2-SW	701578.5698	542003.018	37.5	18

NOTES:

1. WETLAND SEDIMENT WAS EXCAVATED TO REMOVE SEDIMENT WITH CONCENTRATIONS OF ARSENIC ABOVE 230 MG/KG

LEGEND:

▼ WGHW-1-NW1	CONFIRMATORY SAMPLE LOCATION
▨	SEDIMENT REMOVAL AREAS

N

0 40 80 120 160
SCALE IN FEET

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AS-BUILT DRAWINGS

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Scale: SHOWN
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Stamp:

Rev.	Description	By	Date
A	RECORD SET	H&A	07/07/17

INDUSTRI-PLEX
OPERABLE UNIT 2
SUPERFUND SITE AS-BUILT
300-SERIES WELLS G&H
AND CBCA SEDIMENT
REMOVAL DESIGN
WOBURN, MASSACHUSETTS

CONFIRMATORY SEDIMENT SAMPLING LOCATIONS (CBCA AREA)

C-113

Sheet: 17 of 54

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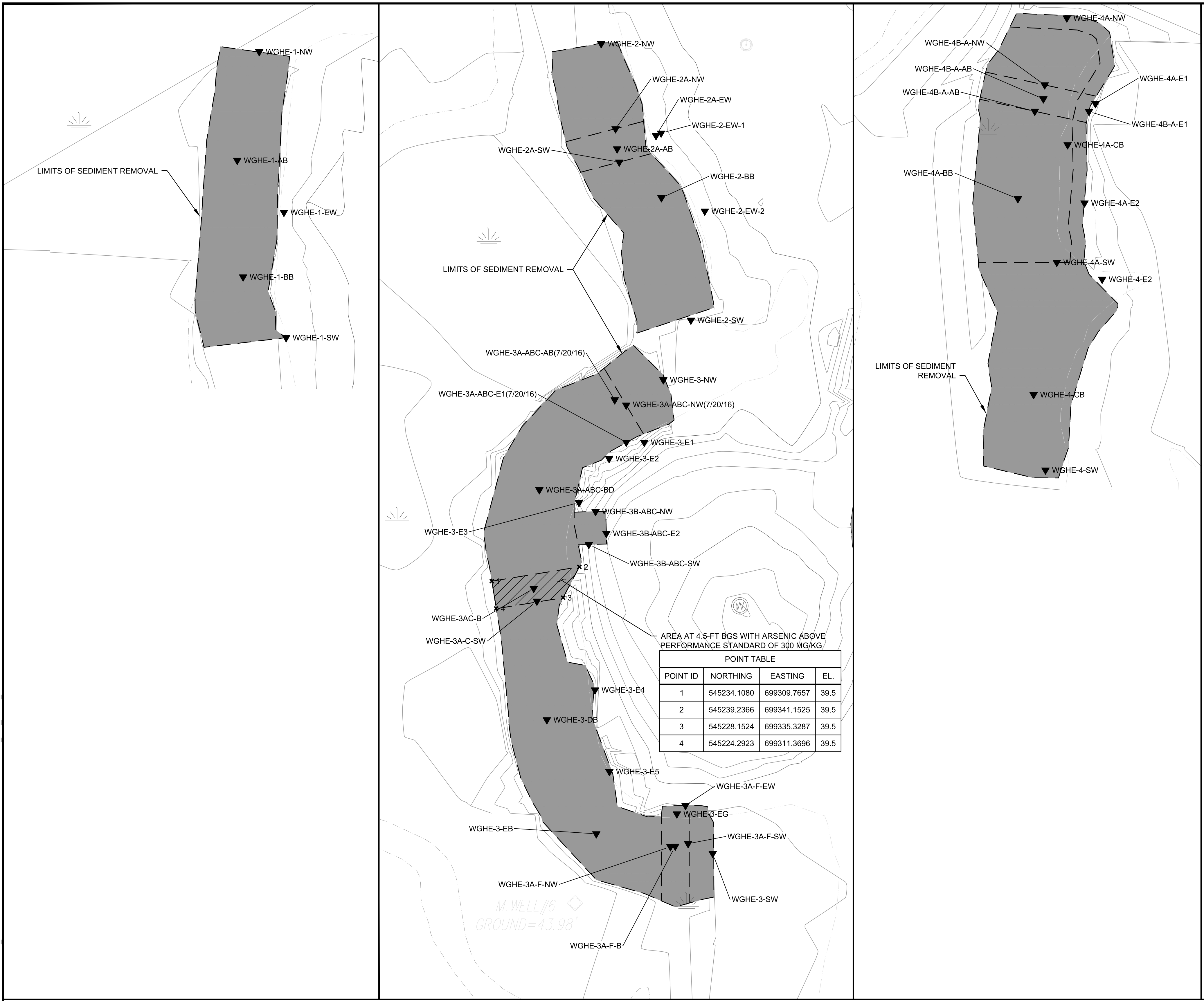


POINT TABLE

POINT ID	NORTHING	EASTING	EL.
1	545234.1080	699309.7657	39.5
2	545239.2366	699341.1525	39.5
3	545228.1524	699335.3287	39.5
4	545224.2923	699311.3696	39.5

CONFIRMATORY SAMPLE LOCATIONS AND CONTAMINATION LEVELS:

Sample ID	X_NAD27	Y_NAD27	Elevation (ft)	Arsenic, mg/kg	Benzo(a)Pyrene, ug/kg
WGHE-4B-A-NW	544989.7118	699390.4	37.5	2.5	<8.6
WGHE-4B-A-E1	544977.3119	699405.6	38	1.4	<8.3
WGHE-4B-A-AB	544979.8295	699388.8	37.5	3.2	<8.6
WGHE-1-AB	545561.411	699320.8	42	170	120
WGHE-1-BB	545519.554	699322.9	42	170	66
WGHE-1-EW	545542.723	699337.6	42.5	120	54
WGHE-1-NW	545600.395	699328.7	42.5	110	170
WGHE-1-SW	545497.767	699338.4	42.5	280	69
WGHE-2A-AB	545389.261	699354.7	41	55	<45
WGHE-2A-EW	545394.006	699368.7	41.5	5.1	<9.1
WGHE-2A-NW	545396.464	699354.2	41.5	12	<40
WGHE-2A-SW	545384.523	699355.5	41.5	11	<54
WGHE-2-BB	545371.71	699370.6	42	270	120
WGHE-2-NW	545427.025	699349	41.5	100	130
WGHE-2-SW	545327.77	699381.2	42.5	280	780
WGHE-3A-ABC-AB	545299.18	699353.8	39.368	3.4	<8.7
WGHE-3A-ABC-BB	545266.91	699326.8	39.5	160	<180
WGHE-3A-ABC-E1	545283.98	699358	39.956	2.1	<9.0
WGHE-3A-ABC-NW	545297.285	699358	40	2	<8.7
WGHE-3AC-B	545231.498	699324.8	39.5	430*	<27
WGHE-3A-C-SW	545226.923	699325.9	39.646	1.4	<11
WGHE-3A-F-B	545138.982	699375.6	40.5	1.4	<8.8
WGHE-3A-F-EW	545153.621	699379.2	41	1.5	<8.6
WGHE-3A-F-NW	545138.791	699373.9	41	2	<8.8
WGHE-3A-F-SW	545139.9	699380.2	41	1.9	<8.4
WGHE-3B-ABC-E2	545251.241	699350.8	40.5	38	<9.5
WGHE-3B-ABC-NW	545259.114	699347	40.5	46	<9.2
WGHE-3B-ABC-SW	545247.249	699344.6	40.5	38	<9.3
WGHE-3-DB	545184.362	699329.5	41.43	5.2	<9.3
WGHE-3-EB	545143.423	699347.3	41.384	250	<32
WGHE-3-SW	545136.348	699389	41.5	180	<49
WGHE-4B-A-AB	544979.093	699384.9	37.5	3.2	<8.6
WGHE-4A-BB	544943.999	699379.7	41	100	48
WGHE-4A-CB	544963.354	699397.5	41	140	24
WGHE-4A-E2	544942.463	699403.6	41.246	11	<8.6
WGHE-4A-E1	544978.106	699407.5	41.846	3.2	<8.6
WGHE-4A-NW	545008.866	699397.2	41.313	1000	440
WGHE-4A-SW	544921.165	699393.6	41.622	9.4	<10
WGHE-4-CB	544873.688	699385.3	41	100	<15
WGHE-4-SW	544846.6	699389.6	41.5	210	76
WGHE-3-E2	545278.101	699351.8	42.456	220	13
WGHE-3-E3	545262.326	699341	41.409	100	<8.8
WGHE-3-NW	545306.379	699371.3	41.528	190	<54
WGHE-2-EW-1	545394.916	699370.5	42.5	4.8	12
WGHE-3-E1	545283.921	699364.5	41.922	31	<8.5
WGHE-2-EW-2	545366.929	699386.2	42.5	100	140
WGHE-4-E2	544915.1	699409.9	41.5	13	<9.1
WGHE-3-E4	545195.078	699346.8	41.5	24	<8.5
WGHE-3-E5	545165.772	699351.9	41.5	170	<31
WGHE-3-E6	545150.573	699376.2	41.5	240	<41

* INDICATES SEDIMENT REMAINING HAS ARSENIC ABOVE 300 MG/KG

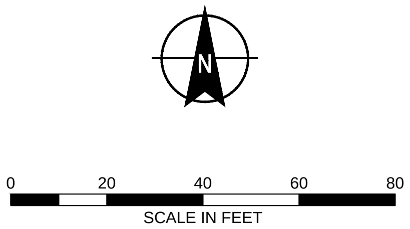
NOTES:

1. WETLAND SEDIMENT WAS EXCAVATED TO REMOVE SEDIMENT WITH CONCENTRATIONS OF ARSENIC ABOVE 300 MG/KG AND BENZO(A)PYRENE ABOVE 4.9 MG/KG.

Note that these values are incorrect; should be 26 for arsenic and <15 for benzo(a)pyrene

LEGEND:

▼ WGHW-1-NW1	CONFIRMATORY SAMPLE LOCATION
▨	SEDIMENT REMOVAL AREAS



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AS-BUILT DRAWINGS

Project No.: 130371_003
Scale: SHOWN
Date: 07-JULY-2017
Drawn By: ZGG
Designed By:
Checked By:
Approved By:
Stamp:

Rev.	Description	By	Date
A	RECORD SET	H&A	07/07/17

INDUSTRI-PLEX
OPERABLE UNIT 2
SUPERFUND SITE AS-BUILT
300-SERIES WELLS G&H
AND CBCA SEDIMENT
REMOVAL DESIGN
WOBURN, MASSACHUSETTS

CONFIRMATORY SEDIMENT SAMPLING LOCATIONS (WELLS G&H EAST AREA)

C-111

Sheet: 15 of 54

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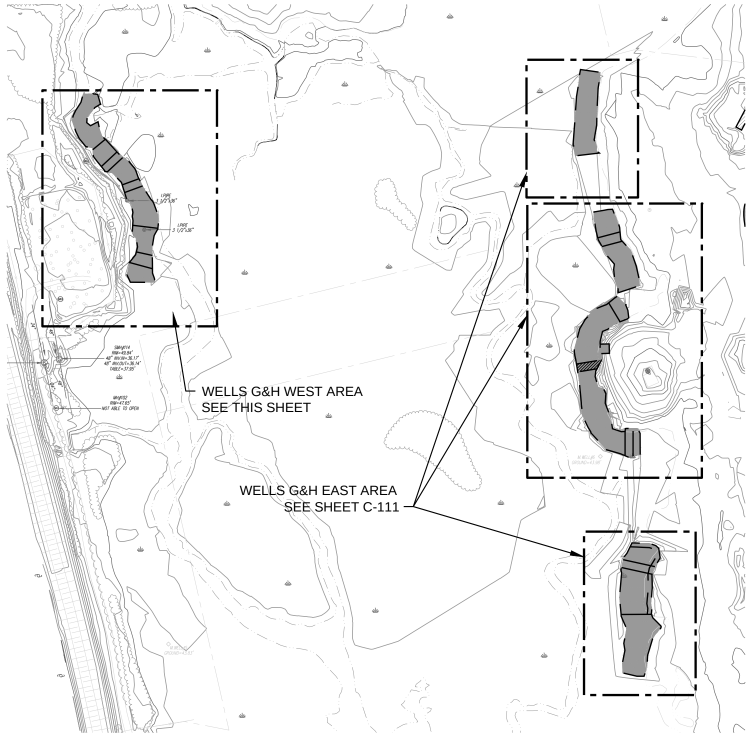


KEY PLAN

1"=120'

CONFIRMATORY SAMPLE LOCATIONS AND CONTAMINATION LEVELS:

Sample ID	X_NAD27	Y_NAD27	Elevation (ft)	Arsenic, mg/kg	Benzo(a)Pyrene, ug/kg
WGHW-1-NW1	698702.9456	545571.7616	43.5	42	270
WGHW-1-AB	698700.5262	545560.7418	43	72	720
WGHW-1-W1	698680.928	545545.061	43.5	10	<8.2
WGHW-2A-NW	698713.993	545509.2886	40	2	<8.4
WGHW-2A-AB-NW	698723.0041	545494.1615	38.5	2.5	<9.0
WGHW-2A-AB	698728.6628	545489.0948	38	5.8	<9.4
WGHW-2-W1	698715.9276	545480.8503	40	10	<0.09
WGHW-2A-W1	698718.06	545478.2335	38.5	5.3	<8.5
WGHW-2A-AB-SW	698733.3454	545483.5975	38.5	11	<9.2
WGHW-2A-SW	698753.6086	545457.7568	40	4.7	<8.2
WGHW-3A-A-NW	698756.745	545450.7844	38.5	9.7	<11
WGHW-3A-A-W1	698754.8213	545426.4017	38.5	3.3	<8.6
WGHW-3A-B-W2	698754.898	545416.7162	38.5	28	28
WGHW-3A-B-SW	698771.3526	545405.6064	38.5	1.2	<8.5
WGHW-3A-D-NW	698769.736	545372.0645	38.5	2.1	<8.1
WGHW-3A-D-W1	698754.9818	545365.993	38.5	18	13
WGHW-3-SW1	698779.7519	545357.729	39.5	130	110
WGHW-3A-D-SW	698766.2714	545356.5351	38.5	96	<53
WGHW-1-BB	698704.923	545527.518	43	180	160
WGHW-3A-AB	698756.88	545444.711	38	2.9	<22
WGHW-3-CB	698768.054	545388.163	39	190	72
WGHW-3A-DB	698765.692	545364.689	38	2.5	<8.1
WGHW-3-SW2	698757.082	545337.768	39.5	230	230
WGHW-3-W1	698751.79	545440.849	39	11	9.5
WGHW-3-W2	698752.52	545421.251	39	9	64
WGHW-3-W3	698756.504	545406.631	39	110	210
WGHW-3-W4	698756.778	545386.672	39	11	24

NOTES:

1. WETLAND SEDIMENT WAS EXCAVATED TO REMOVE SEDIMENT WITH CONCENTRATIONS OF ARSENIC ABOVE 300 MG/KG AND BENZO(A)PYRENE ABOVE 4.9 MG/KG.

LEGEND:

▼ WGHW-1-NW1 CONFIRMATORY SAMPLE LOCATION

▨ SEDIMENT REMOVAL AREAS

N

0 20 40 60 80
SCALE IN FEET

HALEY ALDRICH

HALEY & ALDRICH, INC.
465 Medford Street, Suite 2200
Boston, MA 02129-1400
Tel: 617.886.7400
Fax: 617.886.7600
www.haleyaldrich.com

AS-BUILT DRAWINGS

Project No.:	130371_003
Scale:	SHOWN
Date:	07-JULY-2017
Drawn By:	ZGG
Designed By:	
Checked By:	
Approved By:	
Stamp:	

Rev.	Description	By	Date
A	RECORD SET	H&A	07/07/17

INDUSTRI-PLEX
OPERABLE UNIT 2
SUPERFUND SITE AS-BUILT
300-SERIES WELLS G&H
AND CBCA SEDIMENT
REMOVAL DESIGN
WOBURN, MASSACHUSETTS

CONFIRMATORY
SEDIMENT
SAMPLING
LOCATIONS (WELLS
G&H WEST AREA)

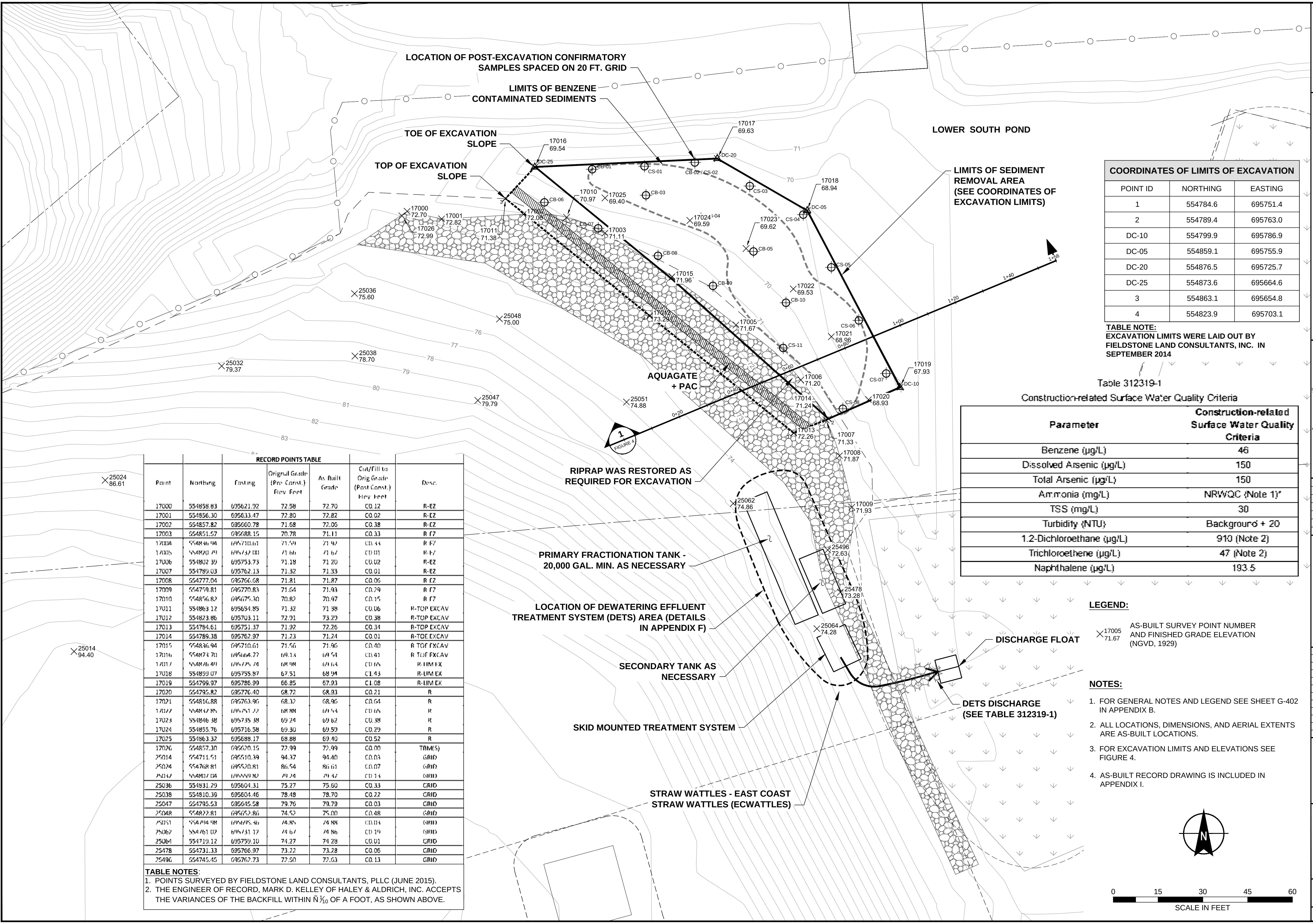
C-109

Sheet: 13 of 54

GARDNER, ZACHARY Printed: 7/7/2017 12:03 PM Layout: C-109
\\HALEYALDRICH.COM\SHARE\BOS_COMMON\130371_IPLEX OU-2\002 - COMPLETION REPORT\CAD\130371_002_C-100_C-200.DWG

Appendix D.4
OU2 Lower South Pond Sediment Data

HALEY ALDRICH
Haley & Aldrich, Inc.
465 Medford Street
Suite 2200
Boston, MA 02129-1400
Tel: 617.886.7400
www.haleyaldrich.com



RECORD POINTS TABLE

Point	Northing	Easting	Orignal Grade (Pre Const.) Elev. Feet	As Built Grade	Cut/Fill to Orig Grade (Post Const.) Elev. Feet	Desc.
17000	554858.83	695621.92	72.58	72.70	C0.12	R-EZ
17001	554856.30	695633.47	72.80	72.82	C0.02	R-EZ
17002	554857.82	695660.78	71.68	72.06	C0.38	R-EZ
17003	554851.57	695688.15	70.78	71.11	C0.33	R-EZ
17004	554836.94	695710.61	71.59	71.92	C0.33	R-EZ
17005	554820.79	695732.00	71.66	71.67	C0.01	R-EZ
17006	554802.39	695753.73	71.18	71.20	C0.02	R-EZ
17007	554789.03	695762.13	71.32	71.33	C0.01	R-EZ
17008	554777.04	695766.68	71.81	71.87	C0.06	R-EZ
17009	554759.81	695770.83	71.64	71.93	C0.29	R-EZ
17010	554856.82	695675.30	70.82	70.97	C0.15	R-EZ
17011	554863.12	695654.85	71.32	71.38	C0.06	R-TOP EXCAV
17012	554823.86	695703.11	72.91	73.29	C0.38	R-TOP EXCAV
17013	554784.61	695751.37	71.92	72.26	C0.34	R-TOP EXCAV
17014	554789.38	695762.97	71.23	71.24	C0.01	R-TOE EXCAV
17015	554836.94	695710.61	71.56	71.96	C0.40	R-TOE EXCAV
17016	554873.70	695664.77	69.13	69.54	C0.41	R-TOE EXCAV
17017	554876.49	695725.74	68.98	69.63	C0.65	R-LIM EX
17018	554859.07	695755.87	67.51	68.94	C1.43	R-LIM EX
17019	554799.97	695786.99	66.85	67.93	C1.08	R-LIM EX
17020	554795.82	695776.40	68.72	68.93	C0.21	R
17021	554816.88	695763.96	68.32	68.96	C0.64	R
17022	554842.85	695751.22	68.88	69.53	C0.65	R
17023	554846.38	695735.38	69.24	69.62	C0.38	R
17024	554855.76	695716.58	69.30	69.59	C0.29	R
17025	554863.32	695688.17	68.88	69.40	C0.52	R
17026	554857.30	695620.15	72.99	72.99	C0.00	TBM(S)
25014	554711.51	695510.39	94.37	94.40	C0.03	GRID
25024	554768.81	695520.81	86.54	86.61	C0.07	GRID
25032	554807.04	695559.82	79.24	79.37	C0.13	GRID
25036	554831.29	695604.31	75.27	75.60	C0.33	GRID
25038	554810.39	695604.46	78.48	78.70	C0.22	GRID
25047	554795.53	695645.58	79.76	79.79	C0.03	GRID
25048	554822.81	695652.86	74.52	75.00	C0.48	GRID
25051	554794.98	695695.46	74.85	74.88	C0.03	GRID
25062	554761.02	695731.12	74.67	74.86	C0.19	GRID
25064	554719.12	695759.10	74.27	74.28	C0.01	GRID
25478	554731.33	695766.97	73.22	73.28	C0.06	GRID
25496	554745.45	695762.73	72.50	72.63	C0.13	GRID

TABLE NOTES:
1. POINTS SURVEYED BY FIELDSTONE LAND CONSULTANTS, PLLC (JUNE 2015).
2. THE ENGINEER OF RECORD, MARK D. KELLEY OF HALEY & ALDRICH, INC. ACCEPTS THE VARIANCES OF THE BACKFILL WITHIN Ñ1⁄10 OF A FOOT, AS SHOWN ABOVE.

COORDINATES OF LIMITS OF EXCAVATION

POINT ID	NORTHING	EASTING
1	554784.6	695751.4
2	554789.4	695763.0
DC-10	554799.9	695786.9
DC-05	554859.1	695755.9
DC-20	554876.5	695725.7
DC-25	554873.6	695664.6
3	554863.1	695654.8
4	554823.9	695703.1

TABLE NOTE:
EXCAVATION LIMITS WERE LAID OUT BY FIELDSTONE LAND CONSULTANTS, INC. IN SEPTEMBER 2014

Table 312319-1

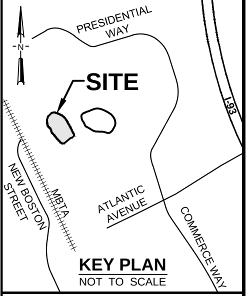
Construction-related Surface Water Quality Criteria

Parameter	Construction-related Surface Water Quality Criteria
Benzene (µg/L)	46
Dissolved Arsenic (µg/L)	150
Total Arsenic (µg/L)	150
Ammonia (mg/L)	NRWQC (Note 1)*
TSS (mg/L)	30
Turbidity (NTU)	Background + 20
1,2-Dichloroethane (µg/L)	910 (Note 2)
Trichloroethene (µg/L)	47 (Note 2)
Naphthalene (µg/L)	193.5

LEGEND:

×17005 71.67	AS-BUILT SURVEY POINT NUMBER AND FINISHED GRADE ELEVATION (NGVD, 1929)

NOTES:
1. FOR GENERAL NOTES AND LEGEND SEE SHEET G-402 IN APPENDIX B.
2. ALL LOCATIONS, DIMENSIONS, AND AERIAL EXTENTS ARE AS-BUILT LOCATIONS.
3. FOR EXCAVATION LIMITS AND ELEVATIONS SEE FIGURE 4.
4. AS-BUILT RECORD DRAWING IS INCLUDED IN APPENDIX I.



KEY PLAN
NOT TO SCALE

Project No.:	33020-224
Scale:	AS SHOWN
Date:	18-SEPT-2015
Drawn By:	SJL
Designed By:	LB,MK
Checked By:	TJH
Approved By:	MK
Stamp:	

Rev.	Description	By	Date

FINAL CLOSEOUT - LOWER SOUTH POND SEDIMENT ADJACENT TO WEST HIDE PILE
INDUSTRI-PLEX SUPERFUND SITE OPERABLE UNIT 2
WOBURN, MASSACHUSETTS
WEST HIDE PILE DESIGN

AS-BUILT SEDIMENT REMOVAL AND CONFIRMATORY SAMPLE LOCATION PLAN

FIGURE 3

CADD File Data:
Drawing Name: G:\33020\100\CAD\400 WEST HIDE PILE\33020-222_LSP-03.DWG
Operator Name: GARDNER, ZACHARY Layout: FIGURE 3 Plot Date: September 15, 2015

TABLE IV
CONFIRMATORY SEDIMENT SAMPLING RESULTS
LSP SEDIMENTS ADJACENT TO WHP REMEDIAL ACTION
INDUSTRIPLEX OU2, WOBURN, MASSACHUSETTS

Location	**Preliminary Remediation Goal**	**CB01**	**CB02**	**CB03**	**CB04**	**CB05**	**CB06**	**CB07**	**CB08**	**CS01**	**CS02**	**CS03**	**CS04**	**CS05**
Sample ID		**CB01-3.5**	**CB02-2.0**	**CB03**	**CB04**	**CB05**	**CB06**	**CB07**	**CB08**	**CS01-2.5**	**CS02**	**CS03**	**CS04**	**CS05**
Sample Date		**9/16/2014 15:50:00 PM**	**9/16/2014 16:10:00 PM**	**9/24/2014 1:30:00 PM**	**9/24/2014 1:35:00 PM**	**9/24/2014 1:40:00 PM**	**9/24/2014 1:45:00 PM**	**9/24/2014 1:50:00 PM**	**9/24/2014 1:55:00 PM**	**9/16/2014 16:00:00 PM**	**9/24/2014 1:10:00 PM**	**9/24/2014 1:15:00 PM**	**9/24/2014 1:20:00 PM**	**9/24/2014 1:25:00 PM**
Sample Depth		**3.5'**	**2.0'**	**-**	**-**	**-**	**-**	**-**	**-**	**2.5'**	**-**	**-**	**-**	**-**
Material Description		**Organic Peat. SILTY Sand**	**SAND**	**SAND**	**SAND**	**SAND**	**SAND**	**SAND**	**SAND**	**SAND**	**SAND**	**SAND**	**SAND**	**SAND**
Lab Sample ID		**L1421424-01**	**L1421424-02**	**L1422361-05**	**L1422361-06**	**L1422361-07**	**L1422361-08**	**L1422361-09**	**L1422361-10**	**L1421424-03**	**L1422361-01**	**L1422361-02**	**L1422361-03**	**L1422361-04**
VOCs (ug/kg)														
BENZENE	1290	16	ND	ND	ND	1.6	1.8	ND	1.5	ND	ND	ND	ND	ND
OTHERS (%)														
SOLIDS, TOTAL		27.1	85.1	79	94	90	84.9	80.9	85.4	88.2	62.8	93.9	88.2	93.5

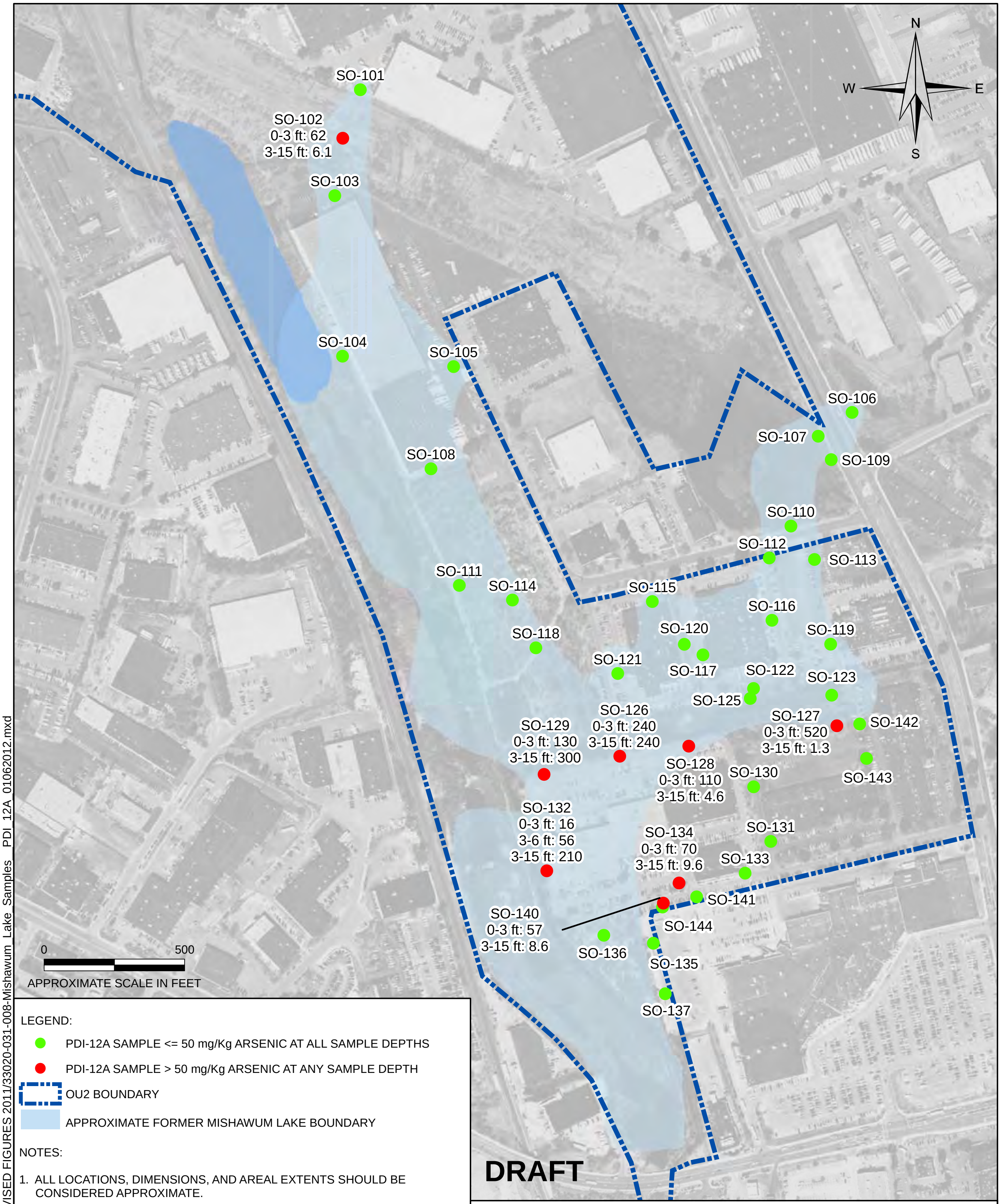
NOTES:
ND = Not Detected

TABLE IV
CONFIRMATORY SEDIMENT SAMPLING RESULTS
LSP SEDIMENTS ADJACENT TO WHP REMEDIAL ACTION
INDUSTRIPLEX OU2, WOBURN, MASSACHUSETTS

Location	**Preliminary Remediation Goal**	**CS06**	**CS07**	**CS08**	**CS09**	**CS10**	**CS11**
Sample ID		**CS06**	**CS07**	**CS08**	**CS09**	**CS10**	**CS11**
Sample Date		**9/24/2014 5:40:00 PM**	**9/24/2014 5:45:00 PM**	**9/24/2014 5:50:00 PM**	**9/24/2014 2:00:00 PM**	**9/24/2014 5:55:00 PM**	**9/24/2014 6:00:00 PM**
Sample Depth		**-**	**-**	**-**	**-**	**-**	**-**
Material Description		**SAND**	**SAND**	**SAND**	**SAND**	**SAND**	**SAND**
Lab Sample ID		**L1422393-01**	**L1422393-02**	**L1422393-03**	**L1422361-11**	**L1422393-04**	**L1422393-05**
VOCs (ug/kg)							
BENZENE	1290	ND	ND	9.5	58	ND	1.7
OTHERS (%)							
SOLIDS, TOTAL		86.7	92.7	91.3	89.8	82	88.5

NOTES:
ND = Not Detected

Appendix D.5
OU2 Soil Data



LEGEND:

- 🟢 PDI-12A SAMPLE <= 50 mg/Kg ARSENIC AT ALL SAMPLE DEPTHS
- 🔴 PDI-12A SAMPLE > 50 mg/Kg ARSENIC AT ANY SAMPLE DEPTH
- ▭ OU2 BOUNDARY
- 🟦 APPROXIMATE FORMER MISHAWUM LAKE BOUNDARY

NOTES:

1. ALL LOCATIONS, DIMENSIONS, AND AREAL EXTENTS SHOULD BE CONSIDERED APPROXIMATE.
2. 2008 30 CENTIMETER RESOLUTION COLOR ORTHOIMAGERY OBTAINED FROM THE OFFICE OF GEOGRAPHIC AND ENVIRONMENTAL INFORMATION (MassGIS),COMMONWEALTH OF MASSACHUSETTS EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS.
3. FORMER LAKE MISHAWUM APPROXIMATED FROM FIGURE BY TETRA TECH NUS, INC. DATED 14 MARCH 2005 TITLED "SOIL SAMPLING LOCATIONS - REACH 0", FIGURE 2-3a, MSGRP REMEDIAL INVESTIGATION REPORT.
4. PDI-12A DATA COLLECTED BY H&A FROM APRIL 2011 TO SEPT. 2011. RESULTS ARE POSTED ONLY AT EXPLORATION LOCATIONS WITH AT LEAST ONE EXCEEDANCE OF TOTAL ARSENIC, IN mg/Kg. RESULTS ARE SHOWN IN DEPTH ORDER AND WERE TAKEN FROM 0-3 FEET AND 3-15 FEET DEPTHS, UNLESS OTHERWISE NOTED.

HALEY& ALDRICH

30% REMEDIAL DESIGN
INDUSTRI-PLEX SITE OPERABLE UNIT 2
WOBURN, MASSACHUSETTS

PDI-12A FORMER LAKE MISHAWUM SOIL INVESTIGATION EXPLORATION PLAN

SCALE: AS SHOWN
APRIL 2012

FIGURE A12A-1

G:/33020/Global/GIS/Map Projects/REVISED FIGURES 2011/33020-031-008-Mishawum Lake Samples PDI 12A 01062012.mxd

TABLE A12A-I SUMMARY OF PDI-12A SOIL QUALITY DATA

DRAFT

30% REMEDIAL DESIGN
INDUSTRI-PLEX SITE OPERABLE UNIT 2
WOBURN, MASSACHUSETTS

LOCATION	FIELD SAMPLE ID	SAMPLE DATE	DEPTH (FT)	LAB SAMPLE ID	Arsenic, Total (mg/kg)
SO-101	SO-101-SO-01-051711	5/17/2011	0 - 3	L1106892-01	7.7
SO-101	SO-101-SO-02-051711	5/17/2011	3 - 15	L1106892-02	7.5
SO-102	SO-102-SO-01-051811	5/18/2011	0 - 3	L1106959-01	**62J**
SO-102	SO-102-SO-02-051811	5/18/2011	3 - 15	L1106959-02	6.1J
SO-103	SO-103-SO-01-041711	4/17/2011	0 - 3	L1105208-03	25
SO-103	SO-103-SO-02-041711	4/17/2011	3 - 15	L1105208-04	16
SO-104	SO-104-SO-01-041711	4/17/2011	0 - 3	L1105208-01	7.6
SO-104	SO-104-SO-02-041711	4/17/2011	3 - 10.5	L1105208-02	10
SO-104	SO-104-SO-03-041711	4/17/2011	10.5 - 16.5	L1106109-13	30
SO-105	SO-105-SO-01-041711	4/17/2011	0 - 3	L1105208-05	8.6
SO-105	SO-105-SO-02-041711	4/17/2011	3 - 15	L1105208-06	8.5
SO-106	SO-106-SO-01-051811	5/18/2011	0 - 3	L1106959-03	13J
SO-106	SO-106-SO-02-051811	5/18/2011	3 - 15	L1106959-04	15J
SO-107	SO-107-SO-01-042911	4/29/2011	0 - 3	L1105910-03	6.5
SO-107	SO-107-SO-02-042911	4/29/2011	3 - 15	L1105910-04	5.4
SO-108	SO-108-SO-01-043011	4/30/2011	0 - 3	L1106031-01	15
SO-108	SO-108-SO-02-043011	4/30/2011	3 - 14	L1106031-02	8.9
SO-108	SO-108-SO-03-043011	4/30/2011	14 - 15	L1106031-08	4.9
SO-109	SO-109-SO-01-042911	4/29/2011	0 - 3	L1105910-01	11
SO-109	SO-109-SO-02-042911	4/29/2011	3 - 14	L1105910-02	12
SO-109	SO-109-SO-03-042911	4/29/2011	14 - 15	L1106109-14	15
SO-110	SO-110-SO-01-042711	4/27/2011	0 - 3	L1105750-07	9.8
SO-110	SO-110-SO-02-042711	4/27/2011	3 - 15	L1105750-08	8
SO-111	SO-111-SO-01-041711	4/17/2011	0 - 3	L1105208-07	22
SO-111	SO-111-SO-02-041711	4/17/2011	3 - 7	L1105208-08	16
SO-111	SO-111-SO-03-043011	4/30/2011	7 - 15	L1106031-09	2.5
SO-112	SO-112-SO-01-050311	5/3/2011	0 - 3	L1106109-10	14
SO-112	SO-112-SO-02-050311	5/3/2011	3 - 15	L1106109-11	4.5
SO-113	SO-113-SO-01-050311	5/3/2011	0 - 3	L1106109-06	5
SO-113	SO-113-SO-02-050311	5/3/2011	3 - 15	L1106109-07	2.1
SO-114	SO-114-SO-01-043011	4/30/2011	0 - 3	L1106031-05	26
SO-114	SO-114-SO-02-043011	4/30/2011	3 - 15	L1106031-06	4.8
SO-115	SO-115-SO-01-042711	4/27/2011	0 - 3	L1105750-03	16
SO-115	SO-115-SO-02-042711	4/27/2011	3 - 15	L1105750-04	10
SO-116	SO-116-SO-01-050411	5/4/2011	0 - 3	L1106169-01	12
SO-116	SO-116-SO-02-050411	5/4/2011	3 - 15	L1106169-02	20
SO-116	0553-FD-001-050411	5/4/2011	3 - 15	L1106169-03	14
SO-117	SO-117-SO-01-042711	4/27/2011	0 - 3	L1105750-05	20
SO-117	SO-117-SO-02-042711	4/27/2011	3 - 15	L1105750-06	3.7
SO-118	SO-118-SO-01-043011	4/30/2011	0 - 3	L1106031-03	13
SO-118	SO-118-SO-02-043011	4/30/2011	3 - 15	L1106031-04	20
SO-119	SO-119-SO-01-050311	5/3/2011	0 - 3	L1106109-08	8.9
SO-119	SO-119-SO-02-050311	5/3/2011	3 - 15	L1106109-09	10
SO-120	SO-120-SO-01-050411	5/4/2011	0 - 3	L1106169-06	2.7
SO-120	SO-120-SO-02-050411	5/4/2011	3 - 15	L1106169-07	24
SO-121	SO-121-SO-01-042711	4/27/2011	0 - 3	L1105750-01	8.8
SO-121	SO-121-SO-02-042711	4/27/2011	3 - 15	L1105750-02	9.8
SO-122	SO-122-SO-01-050411	5/4/2011	0 - 3	L1106169-04	8
SO-122	SO-122-SO-02-050411	5/4/2011	3 - 15	L1106169-05	8
SO-123	SO-123-SO-01-052411	5/24/2011	0 - 3	L1107258-08	10
SO-123	SO-123-SO-02-052411	5/24/2011	3 - 15	L1107258-09	31
SO-125	SO-125-SO-01-052411	5/24/2011	0 - 3	L1107258-10	8.8
SO-125	SO-125-SO-02-052411	5/24/2011	3 - 15	L1107258-11	5.4
SO-126	SO-126-SO-01-050211	5/2/2011	0 - 3	L1106032-03	**240J**
SO-126	SO-126-SO-02-050211	5/2/2011	3 - 15	L1106032-04	**240J**
SO-127	SO-127-SO-01-052411	5/24/2011	0 - 3	L1107258-06	**520**
SO-127	SO-127-SO-02-052411	5/24/2011	3 - 15	L1107258-07	1.3
SO-128	SO-128-SO-01-050211	5/2/2011	0 - 3	L1106032-05	**110J**
SO-128	SO-128-SO-02-050211	5/2/2011	3 - 15	L1106032-06	4.6J
SO-129	SO-129-SO-01-050211	5/2/2011	0 - 3	L1106032-01	**130J**
SO-129	SO-129-SO-02-050211	5/2/2011	3 - 15	L1106032-02	**300J**
SO-130	SO-130-SO-01-052411	5/24/2011	0 - 3	L1107258-01	2.5
SO-130	SO-130-SO-02-052411	5/24/2011	3 - 15	L1107258-02	1.6
SO-130	0553-FD-001-052411	5/24/2011	3 - 15	L1107258-03	1.5
SO-131	SO-131-SO-01-052411	5/24/2011	0 - 3	L1107258-04	7.5
SO-131	SO-131-SO-02-052411	5/24/2011	3 - 15	L1107258-05	7.3
SO-132	SO-132-SO-01-050211	5/2/2011	0 - 3	L1106032-07	16J
SO-132	SO-132-SO-02-050211	5/2/2011	3 - 6	L1106032-08	**56J**
SO-132	SO-132-SO-03-050211	5/2/2011	6 - 15	L1106032-09	**210J**
SO-133	SO-133-SO-01-050311	5/3/2011	0 - 3	L1106109-04	13
SO-133	SO-133-SO-02-050311	5/3/2011	3 - 15	L1106109-05	6.2
SO-134	SO-134-SO-01-050311	5/3/2011	0 - 3	L1106109-01	**70**
SO-134	0553-FD-001-050311	5/3/2011	0 - 3	L1106109-02	**76**
SO-134	SO-134-SO-02-050311	5/3/2011	3 - 15	L1106109-03	9.6
SO-136	SO-136-SO-01-051611	5/16/2011	0 - 3	L1106834-01	11
SO-136	SO-136-SO-02-051611	5/16/2011	3 - 15	L1106834-02	5.1

NOTES:
1. VALIDATED DATA PRESENTED
2. ARSENIC, TOTAL CLEANUP STANDARD: 50 mg/kg
3. CLEANUP STANDARD EXCEEDANCES ARE **BOLD**
4. J QUALIFIER INDICATES ESTIMATED VALUE

TABLE A12A-I SUMMARY OF PDI-12A SOIL QUALITY DATA

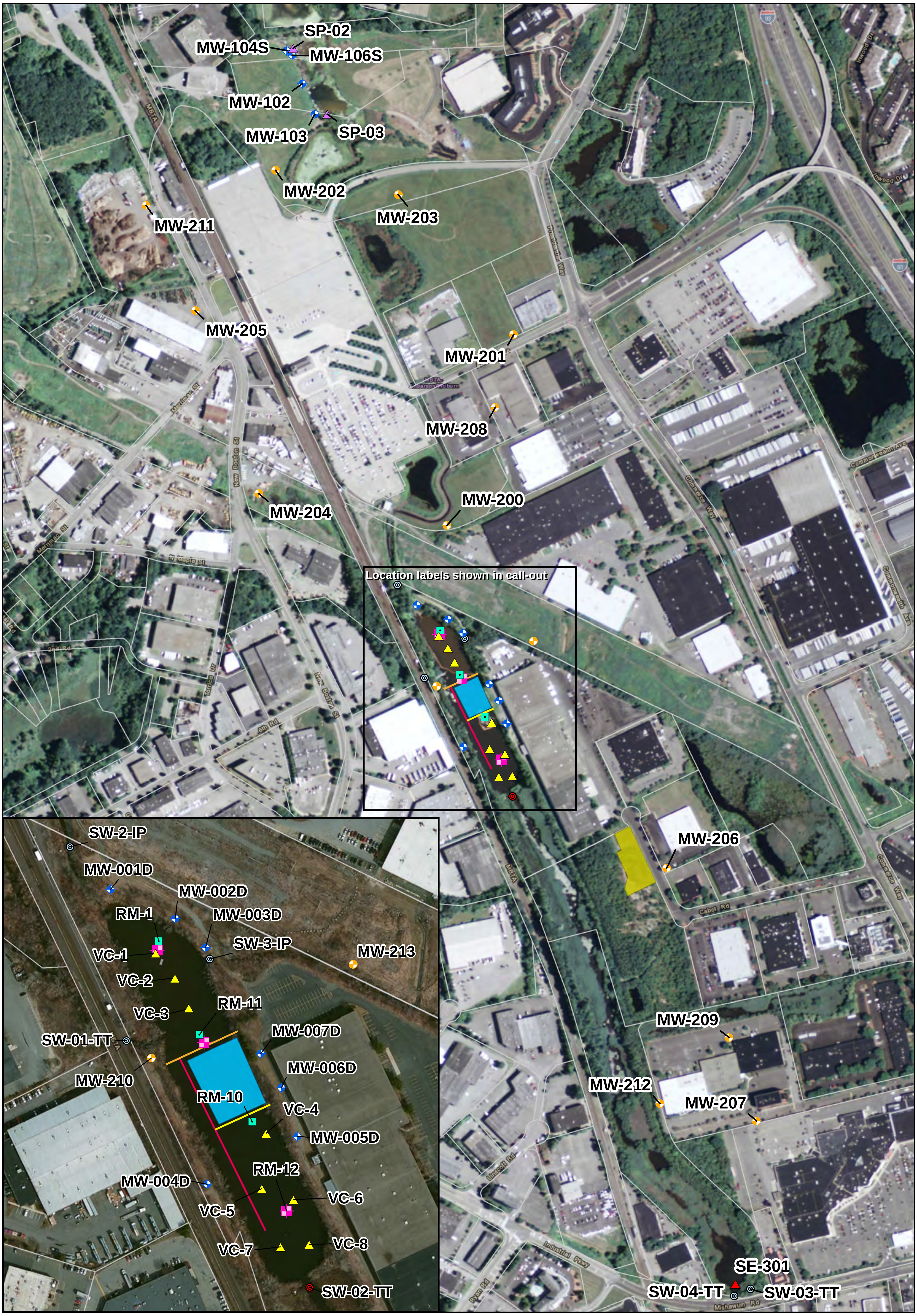
DRAFT

30% REMEDIAL DESIGN
INDUSTRI-PLEX SITE OPERABLE UNIT 2
WOBURN, MASSACHUSETTS

LOCATION	FIELD SAMPLE ID	SAMPLE DATE	DEPTH (FT)	LAB SAMPLE ID	Arsenic, Total (mg/kg)
SO-140	SO-140-SO-01-081911	8/19/2011	0 - 3	L1112900-01	**57**
SO-140	SO-140-SO-02-081911	8/19/2011	3 - 15	L1112900-02	8.6
SO-141	SO-141-SO-01-081911	8/19/2011	0 - 3	L1112900-03	13
SO-141	SO-141-SO-02-081911	8/19/2011	3 - 15	L1112900-04	5
SO-142	SO-142-SO-01-081611	8/16/2011	0 - 3	L1112581-01	5.6
SO-142	SO-142-SO-02-081611	8/16/2011	3 - 15	L1112581-02	8.5
SO-142	0553-FD-001-081611	8/16/2011	3 - 15	L1112581-03	13
SO-143	SO-143-SO-01-081611	8/16/2011	0 - 3	L1112581-04	1.4
SO-143	SO-143-SO-02-081611	8/16/2011	3 - 15	L1112581-05	2.2
SO-144	SO-144-SO-01-091911	9/19/2011	0 - 3	L1114818-01	26

NOTES:
1. VALIDATED DATA PRESENTED
2. ARSENIC, TOTAL CLEANUP STANDARD: 50 mg/kg
3. CLEANUP STANDARD EXCEEDANCES ARE **BOLD**
4. J QUALIFIER INDICATES ESTIMATED VALUE

Appendix D.6
OU2 Surface Water Data



Legend

- ● Proposed Monitoring Well
- ✦ Existing Monitoring Well
- ◉ Remedial Action Point of Compliance
- ◎ Surface Water Monitoring Station
- ▣ In-Pond Sampling Location
- ▲ Sediment Sample Compliance Location
- ▲ Sediment Accumulation Monitoring Location
- ▲ Proposed Sediment Sample below 2 feet
- ✚ Geochemical Profiling Station
- — Baffle
- — Cofferdam
- — Bypass
- 🟨 Future Dredging Laydown Area Easement
- 🟦 Aeration Zone
- ☐ Parcel Boundary

N

0 400 Feet

Projection: Lambert Conformal Conic
Coordinate System: MA State Plane (Mainland)
FIPS Zone: 2001
Units: US Feet
Datum: North American Datum (NAD) 83

Monitoring Locations North Portion of Site

Industri-Plex OU2
Woburn, Massachusetts

Project No.: 3204
Plot Date: 6/22/2016
Arc Operator: KEK
Reviewed by: TM

Figure 3-1

ddms
1217 Bandana Boulevard North
Saint Paul, Minnesota 55108
Main Phone: (651) 842-4224
www.ddmsinc.com

R:\Projects\DEF\demax-1547\3204-Industri-PlexOU2\DataAnalysis\GISData\Projects\EMP Figures\IndustriPlex Long-Term Monitoring N.mxd

SUMMARY OF LONG-TERM SURFACE WATER ANALYTICAL AND WATER QUALITY RESULTS

NINE SURFACE WATER MONITORING STATIONS

Table 1a
Operations, Maintenance and Monitoring
Monthly Baseflow Surface Water Results
SW-2-IP (Atlantic Ave Drainway)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Sample ID	Date	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Ammonia (mg/l)
SW-2-IP	10/12/16	0.003U	0.003U	0.045 J
	11/01/16	0.005	ND	ND
	12/01/16	ND	0.003	0.132
	01/05/17	ND	ND	0.123
	02/17/17	NS	NS	NS
	02/23/17	0.005	0.002 J	0.175
	03/09/17	ND	ND	0.046 J
	04/14/17	0.003	0.004	0.100
	05/11/17	ND	ND	0.058 J
	06/12/17	ND	ND	0.027
	07/06/17	0.002 J	0.005	0.065 J
	08/07/17	0.002	ND	0.035
	09/06/17	ND	0.003	0.136
	10/02/17	ND	ND	0.068
	11/06/17	ND	ND	0.051
	12/04/17	ND	ND	0.058 J

Notes

J = Analyte result is estimated

U = Analyte not detected above the laboratory reporting limit

ND = Non Detect

NS = Not Sampled

Table 1b
Operations, Maintenance and Monitoring
Baseflow Surface Water Results
SW-3-IP (Boston Edison Co. ROW)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Sample ID	Date	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Ammonia (mg/l)
SW-3-IP	10/12/16	NS	NS	NS
	11/01/16	NS	NS	NS
	12/01/16	NS	NS	NS
	01/05/17	NS	NS	NS
	02/17/17	NS	NS	NS
	02/23/17	NS	NS	NS
	03/09/17	NS	NS	NS
	04/14/17	0.013	0.008	13.7
	05/11/17	0.007	0.007	16.2
	06/12/17	NS	NS	NS
	07/06/17	NS	NS	NS
	08/07/17	NS	NS	NS
	09/06/17	NS	NS	NS
	10/02/17	NS	NS	NS
	11/06/17	NS	NS	NS
	12/04/17	NS	NS	NS

Notes

NS = Not Sampled (No Flow)

Table 1c
Operations, Maintenance Monitoring
Baseflow Surface Water Results
SW-01-TT (Halls Brook)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Sample ID	Date	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Ammonia (mg/l)
SW-01-TT	10/12/16	NS	NS	NS
	11/01/16	0.003	0.004	1.02
	12/01/16	0.002 J	0.002 J	0.37
	01/05/17	0.002 J	ND	1.10
	02/17/17	0.002 J	ND	1.41
	02/23/17	NS	NS	NS
	03/09/17	ND	ND	1.30
	04/14/17	0.003	0.003	0.92
	05/11/17	ND	ND	1.04
	06/12/17	ND	ND	1.28
	07/06/17	0.003	0.003 J	1.20
	08/07/17	0.002	0.003	0.38
	09/06/17	ND	0.003	0.15
	10/02/17	ND	0.003	0.12
	11/06/17	ND	ND	1.36
	12/04/17	0.002	ND	1.69

Notes

J = Analyte result is estimated
NS = Not Sampled
ND = Non Detect

Table 1d
Operations, Maintenance Monitoring
Baseflow Surface Water Results
Remote Station No. 1 (RM-1 Above Chemocline)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Sample ID	Date	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Iron (mg/l)	Ammonia (mg/l)	Nitrate (mg/l)
RM-1 (Above)	10/03/17	0.048	0.009	2.16	6.84	5.72
	11/07/17	0.193	0.076	21.70	61.70	0.13
	12/05/17	0.118	0.091	7.82	9.56	1.45

Notes
J = Analyte result is estimated
NS = Not Sampled
ND = Non Detect

Table 1e
Operations, Maintenance Monitoring
Baseflow Surface Water Results
Remote Station No. 1 (RM-1 Below Chemocline)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Sample ID	Date	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Iron (mg/l)	Ammonia (mg/l)	Nitrate (mg/l)
RM-1 (Below)	10/03/17	5.14	5.01	156	356	ND
	11/07/17	2.27	2.31	116	198	ND
	12/05/17	4.62	4.64	131	448	ND

Notes

J = Analyte result is estimated

NS = Not Sampled

ND = Non Detect

Table 1f

Operations, Maintenance Monitoring

Baseflow Surface Water Results

Remote Station No. 10 (RM-10)

Industri-plex Superfund Site Operable Unit 2

Woburn, Massachusetts

Sample ID	Date	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Iron (mg/l)	Ammonia (mg/l)	Nitrate (mg/l)
RM-10	10/03/17	0.024	0.006	1.02	3.18	7.60
	11/08/17	0.027	0.011	1.57	3.81	2.24
	12/05/17	0.029	0.023	1.47	6.71	1.81

Notes

J = Analyte result is estimated

NS = Not Sampled

ND = Non Detect

Table 1g
Operations, Maintenance and Monitoring
Baseflow/LTM Surface Water Results
Remote Station No. 11 (RM-11)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Sample ID	Date	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Iron (mg/l)	Ammonia (mg/l)	Nitrate (mg/l)
RM-11	10/12/16	0.013	0.004	0.84	1.54	0.488
	10/14/16	NS	NS	NS	10.00	NS
	10/18/17	NS	NS	NS	5.75	NS
	10/20/16	NS	NS	NS	12.00	NS
	10/25/16	NS	NS	NS	9.81	NS
	10/27/16	NS	NS	NS	7.84	NS
	11/01/16	0.036	0.013	1.40	7.28	0.726
	11/03/16	NS	NS	NS	24.30	NS
	11/08/16	NS	NS	NS	11.70	NS
	11/10/16	NS	NS	NS	11.90	NS
	11/15/16	NS	NS	NS	7.52	NS
	11/17/16	NS	NS	NS	5.22	NS
	11/22/16	NS	NS	NS	13.80	NS
	11/29/16	NS	NS	NS	19.80	NS
	12/01/16	0.011	0.007	0.89	2.29	0.402
	12/06/16	NS	NS	NS	4.12	NS
	12/09/16	NS	NS	NS	NS	NS
	12/13/16	NS	NS	NS	NS	NS
	12/14/16	NS	NS	NS	NS	NS
	12/20/16	NS	NS	NS	NS	NS
	12/29/16	NS	NS	NS	NS	NS
	01/05/17	0.014	0.013	0.96	3.07	0.838
	01/19/17	NS	NS	NS	NS	NS
	02/17/17	0.022	0.013	1.60	5.05	0.987
	02/23/17	NS	NS	NS	NS	NS
	03/09/17	0.028	0.018	1.30	6.05	1.16
	03/23/17	NS	NS	NS	NS	NS
	04/14/17	0.016	0.011	1.10	3.00	1.02

Table 1g
Operations, Maintenance and Monitoring
Baseflow/LTM Surface Water Results
Remote Station No. 11 (RM-11)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Sample ID	Date	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Iron (mg/l)	Ammonia (mg/l)	Nitrate (mg/l)
RM-11 ***Cont'd***	04/20/17	NS	NS	NS	3.91	NS
	05/11/17	0.015	0.015	1.52	4.43	1.14
	05/18/17	NS	NS	NS	3.75	NS
	06/12/17	0.022	0.013	1.77	4.07	1.26
	06/23/17	NS	NS	NS	4.49	NS
	07/06/17	0.038	0.013	2.07	4.49	2.90
	07/21/17	NS	NS	NS	4.29	NS
	08/07/17	0.033	0.01	1.65	4.88	3.45
	08/25/17	NS	NS	NS	4.95	NS
	09/06/17	0.026	0.008	1.11	5.60	5.28
	09/08/17	NS	NS	NS	2.88	NS
	09/15/17	NS	NS	NS	5.44	NS
	09/22/17	NS	NS	NS	5.57	NS
	09/28/17	NS	NS	NS	6.09	NS
	10/02/17	0.034	0.007	1.43	5.91	5.65
	10/13/17	NS	NS	NS	7.38	NS
	10/17/17	NS	NS	NS	6.91	NS
	10/20/17	NS	NS	NS	7.13	NS
	10/26/17	NS	NS	NS	3.27	NS
	10/30/17	NS	NS	NS	5.34	NS
	11/02/17	NS	NS	NS	3.92	NS
	11/06/17	0.033	0.014	1.45	5.83	1.85
	11/09/17	NS	NS	NS	5.82	NS
	11/14/17	NS	NS	NS	6.04	NS
	11/16/17	NS	NS	NS	9.22	NS
	11/28/17	NS	NS	NS	6.36	NS
	12/04/17	0.037	0.008	1.50	8.09	1.78
	12/12/17	NS	NS	NS	6.27	NS
	12/21/17	NS	NS	NS	NS	NS

Notes:
NS = Not Sample

Table 1h
Operations, Maintenance and Monitoring
Baseflow/LTM Surface Water Results
SW-02-TT (HBHA Pond Outlet)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Sample ID	Date	Benzene (ug/l)	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Iron (mg/l)	Ammonia (mg/l)	Nitrate (mg/l)
SW-02-TT	10/12/16	0.57	0.028	0.010	1.80	3.89	0.49
	10/14/16	NS	NS	NS	NS	5.81	NS
	10/18/17	NS	NS	NS	NS	6.90	NS
	10/20/16	NS	NS	NS	NS	7.00	NS
	10/25/16	NS	NS	NS	NS	6.02	NS
	10/27/16	NS	NS	NS	NS	7.84	NS
	11/01/16	ND	0.022	0.006	1.00	5.15	0.81
	11/03/16	NS	NS	NS	NS	3.42	NS
	11/08/16	NS	NS	NS	NS	8.70	NS
	11/10/16	NS	NS	NS	NS	8.90	NS
	11/15/16	NS	NS	NS	NS	10.40	NS
	11/17/16	NS	NS	NS	NS	2.90	NS
	11/22/16	NS	NS	NS	NS	10.40	NS
	11/29/16	NS	NS	NS	NS	10.80	NS
	12/01/16	ND	0.007	0.004	0.77	1.84	0.70
	12/06/16	NS	NS	NS	NS	6.08	NS
	12/09/16	NS	NS	NS	NS	5.63	NS
	12/13/16	NS	NS	NS	NS	8.15	NS
	12/14/16	NS	NS	NS	NS	7.24	NS
	12/20/16	NS	NS	NS	NS	6.76	NS
	12/29/16	NS	NS	NS	NS	6.22	NS
	01/05/17	0.57	0.021	0.013	1.10	2.84	0.72
	01/19/17	NS	NS	NS	NS	3.06	NS
	02/17/17	0.33 J	0.026	0.012	1.50	5.34	1.02
	02/23/17	NS	NS	NS	NS	3.58	NS
	03/09/17	0.20 J	0.026	0.011	1.40	5.76	1.08
	03/23/17	NS	NS	NS	NS	4.88	NS
	04/14/17	ND	0.017	0.011	1.10	2.71	1.05
	04/20/17	NS	NS	NS	NS	4.02	NS
	05/11/17	0.19 J	0.009	0.010	1.42	3.58	1.10
	05/18/17	NS	NS	NS	NS	2.90	NS
	06/12/17	ND	0.020	0.012	1.58	3.07	1.45

Table 1h
Operations, Maintenance and Monitoring
Baseflow/LTM Surface Water Results
SW-02-TT (HBHA Pond Outlet)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Sample ID	Date	Benzene (ug/l)	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Iron (mg/l)	Ammonia (mg/l)	Nitrate (mg/l)
SW-02-TT *Cont'd*	06/23/17	NS	NS	NS	NS	2.75	NS
	07/06/17	ND	0.024	0.014	1.36	2.44	2.47
	07/21/17	NS	NS	NS	NS	2.69	NS
	08/07/17	ND	0.020	0.009	0.84	3.11	4.16
	08/25/17	NS	NS	NS	NS	3.23	NS
	09/06/17	ND	0.016	0.007	0.61	4.52	8.26
	09/08/17	NS	NS	NS	NS	3.17	NS
	09/15/17	NS	NS	NS	NS	2.64	NS
	09/22/17	NS	NS	NS	NS	2.84	NS
	09/28/17	NS	NS	NS	NS	3.48	NS
	10/02/17	ND	0.019	0.006	0.704	2.80	8.58
	10/13/17	NS	NS	NS	NS	4.35	NS
	10/17/17	NS	NS	NS	NS	4.11	NS
	10/20/17	NS	NS	NS	NS	5.05	NS
	10/26/17	NS	NS	NS	NS	4.58	NS
	10/30/17	NS	NS	NS	NS	0.94	NS
	11/06/17	ND	0.018	0.009	1.13	2.96	1.90
	11/09/17	NS	NS	NS	NS	3.88	NS
	11/14/17	NS	NS	NS	NS	5.32	NS
	11/16/17	NS	NS	NS	NS	5.59	NS
	11/21/17	NS	NS	NS	NS	4.60	NS
	11/28/17	NS	NS	NS	NS	4.28	NS
	12/04/17	ND	0.027	0.007	1.27	6.39	1.68
	12/12/17	NS	NS	NS	NS	4.68	NS
	12/21/17	NS	NS	NS	NS	7.15	NS

Notes
ND = Non Detect
J = Analyte result is estimated

Table 1i

Operations, Maintenance and Monitoring

Baseflow Surface Water Results

SW-03-TT (Aberjona)

Industri-plex Superfund Site Operable Unit 2

Woburn, Massachusetts

Sample ID	Date	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Ammonia (mg/l)
SW-03-TT	10/12/16	0.007	0.004	0.80
	11/01/16	0.010	0.009	1.30
	12/01/16	0.005	0.005	0.18
	01/05/17	ND	0.004	0.50
	02/17/17	NS	NS	NS
	02/23/17	0.009	0.008	0.62
	03/09/17	0.004	0.004	1.23
	04/14/17	0.007	0.004	0.56
	05/11/17	0.005	0.004	0.73
	06/12/17	0.006	0.006	0.45
	07/06/17	0.009	0.007	0.36
	08/07/17	0.008	0.008	0.51
	09/06/17	0.008	0.005	1.75
	10/02/17	0.010	0.005	1.58
	11/06/17	0.007	0.008	1.42
	12/04/17	0.006	0.004	1.64

Notes

NS = Not Sampled

Table 1j
Operations, Maintenance and Monitoring
Baseflow/LTM Surface Water Results
SW-04-TT (HBHA Wetland Outlet)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Sample ID	Date	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Ammonia (mg/l)
SW-04-TT	10/12/16	0.013	0.004	4.38
	10/14/16	NS	NS	3.73
	10/18/17	NS	NS	4.70
	10/20/16	NS	NS	5.07
	10/25/16	NS	NS	4.11
	10/27/16	NS	NS	5.98
	11/01/16	0.015	0.012	3.92
	11/03/16	NS	NS	3.94
	11/08/16	NS	NS	6.78
	11/10/16	NS	NS	7.10
	11/15/16	NS	NS	10.10
	11/17/16	NS	NS	2.47
	11/22/16	NS	NS	8.02
	11/29/16	NS	NS	10.40
	12/01/16	0.010	0.004	2.95
	12/06/16	NS	NS	5.79
	12/09/16	NS	NS	5.30
	12/13/16	NS	NS	7.17
	12/14/16	NS	NS	7.42
	12/20/16	NS	NS	6.95
	12/29/16	NS	NS	5.77
	01/05/17	0.023	0.011	2.69
	01/19/17	NS	NS	3.32

Table 1j
Operations, Maintenance and Monitoring
Baseflow/LTM Surface Water Results
SW-04-TT (HBHA Wetland Outlet)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Sample ID	Date	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Ammonia (mg/l)
SW-04-TT *Cont'd*	02/17/17	0.032	0.01	5.37
	02/23/17	NS	NS	3.32
	03/09/17	0.024	0.009	5.18
	03/23/17	NS	NS	4.04
	04/14/17	0.016	0.008	2.53
	04/20/17	NS	NS	3.52
	05/11/17	0.011	0.012	2.80
	05/18/17	NS	NS	2.50
	06/12/17	0.015	0.013	2.62
	06/23/17	NS	NS	2.22
	07/06/17	0.019	0.011	1.48
	07/21/17	NS	NS	1.78
	08/07/17	0.006	0.005	1.04
	08/25/17	NS	NS	0.96
	09/06/17	0.007	0.004	1.63
	09/08/17	NS	NS	2.59
	09/15/17	NS	NS	0.49
	09/22/17	NS	NS	0.72
	09/28/17	NS	NS	0.79
	10/02/17	0.007	0.004	1.32
	10/13/17	NS	NS	1.97
	10/17/17	NS	NS	1.82
	10/20/17	NS	NS	1.97

Table 1j
Operations, Maintenance and Monitoring
Baseflow/LTM Surface Water Results
SW-04-TT (HBHA Wetland Outlet)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Sample ID	Date	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Ammonia (mg/l)
SW-04-TT *Cont'd*	10/26/17	NS	NS	4.02
	10/30/17	NS	NS	1.08
	11/02/17	NS	NS	1.20
	11/06/17	0.009	0.006	1.76
	11/09/17	NS	NS	2.89
	11/14/17	NS	NS	4.57
	11/16/17	NS	NS	4.95
	11/28/17	NS	NS	3.76
	12/04/17	0.017	0.006	5.42
	12/12/17	NS	NS	4.18
	12/21/17	NS	NS	6.81

Notes:

NS = Not Sample

Table 1k
Operations, Maintenance and Monitoring
Baseflow Surface Water Results
SW-05-TT (Salem Street)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Sample ID	Date	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Ammonia (mg/l)
SW-05-TT	10/12/16	0.018	0.004	2.48
	11/01/16	0.014	0.006	NS
	12/01/16	0.008	0.004	NS
	01/05/17	0.012	0.007	NS
	02/17/17	0.020	0.005	NS
	02/23/17	NS	NS	NS
	03/09/17	0.027	0.007	NS
	04/14/17	0.012	0.008	NS
	05/11/17	0.008	0.010	NS
	06/12/17	0.018	0.011	NS
	07/06/17	0.018	0.011	NS
	08/07/17	0.009	0.004	NS
	09/06/17	0.008	0.003	NS
	10/02/17	0.009	0.004	NS
	11/06/17	0.012	0.006	NS
	12/04/17	0.012	0.003	NS

Notes

NS = Not Sampled

Ammonia grab sample collected in error. Analysis not required per the June 2016, OM&M Plan.

Table 1l
Operations, Maintenance and Monitoring
Baseflow Surface Water Results
SW-06-TT (Montvale Ave)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Sample ID	Date	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Ammonia (mg/l)
SW-06-TT	10/12/16	0.008	0.0027J	1.83
	11/01/16	0.010	0.007	NS
	12/01/16	0.011	0.004	NS
	01/05/17	0.010	0.005	NS
	02/17/17	0.011	0.004	NS
	02/23/17	NS	NS	NS
	03/09/17	0.011	0.005	NS
	04/14/17	0.010	0.007	NS
	05/11/17	0.004	0.006	NS
	06/12/17	0.010	0.006	NS
	07/06/17	0.011	0.007	NS
	08/07/17	0.004	0.003	NS
	09/06/17	0.005	0.003	NS
	10/02/17	0.003	ND	NS
	11/06/17	0.006	0.004	NS
	12/04/17	0.009	0.002	NS

Notes

J = Analyte result is estimated

NS = Not Sampled

Ammonia grab sample collected in error. Analysis not required per the June 2016, OM&M Plan.

Table 1m
Operations, Maintenance and Monitoring
Baseflow Surface Water Results
SW-07-TT (Swanton Street)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Sample ID	Date	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Ammonia (mg/l)
SW-07-TT	10/12/16	0.007	0.002J	0.864
	11/01/16	0.008	0.006	NS
	12/01/16	0.010	0.003	NS
	01/05/17	0.004	0.0027J	NS
	02/17/17	NS	NS	NS
	02/23/17	0.009	0.008	NS
	03/09/17	0.009	0.006	NS
	04/14/17	0.004	0.005	NS
	05/11/17	0.005	0.008	NS
	06/12/17	0.010	0.005	NS
	07/06/17	0.011	0.005	NS
	08/07/17	0.004	0.003	NS
	09/06/17	0.003	0.003	NS
	10/02/17	0.006	ND	NS
	11/06/17	0.007	ND	NS
	12/04/17	0.004	ND	NS

Notes

J = Analyte result is estimated

NS = Not Sampled

Ammonia grab sample collected in error. Analysis not required per the June 2016, OM&M Plan.

Table 3a
Operations, Maintenance and Monitoring
Water Quality Parameters
SW-2-IP (Atlantic Ave Drainway)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Temperature (^0C)	Dissolved Oxygen (mg/l)	pH	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
SW-2-IP	10/12/16	17.2	9.3	8.1	102.7	652	1.9
	11/01/16	10.4	12.3	7.7	143.6	478	1.1
	12/01/16	8.4	11.5	7.2	45.9	576	2.3
	01/05/17	2.3	13.1	7.2	6.7	1,002	0.2
	03/09/17	10.5	12.3	7.0	11.0	1,623	7.4
	04/14/17	18.6	12.2	8.0	77.8	1,207	0.0
	05/11/17	17.3	11.1	7.6	49.8	987	0.4
	06/12/17	30.1	7.5	6.8	99.1	1,053	0.7
	07/06/17	27.8	6.7	6.9	159.7	1,121	6.0
	08/07/17	23.7	8.1	7.3	113.6	937	0.0
	09/06/17	20.6	6.8	7.3	56.3	388	1.1
	10/02/17	21.2	9.3	7.3	221.5	218	ERR
	11/06/17	16.3	10.5	7.5	149.8	420	0.6
	12/04/17	4.5	12.5	7.5	56.5	876	ERR

Notes:

^oC = Degrees Celsius

mg/l = milligram per liter.

s.u. = standard units

mV = millivolts

µS/cm = microSiemens per centimeter

NTU = Nephelometric Turbidity Units

NM = Not Measured

ERR = Equipment error (e.g. ice, sensor drift, calibration interference, etc.)

Table 3b
Operations, Maintenance and Monitoring
Water Quality Parameters
SW-3-IP (Boston Edison Co. ROW)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Temperature (^{0}C)	Dissolved Oxygen (mg/l)	pH	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
SW-3-IP	10/12/16	NM	NM	NM	NM	NM	NM
	11/01/16	NM	NM	NM	NM	NM	NM
	12/01/16	NM	NM	NM	NM	NM	NM
	01/05/17	NM	NM	NM	NM	NM	NM
	03/09/17	NM	NM	NM	NM	NM	NM
	04/14/17	14.7	12.0	7.5	14.9	1,101	9.2
	05/11/17	13.5	10.8	7.1	NR	1,154	4.0
	06/12/17	24.6	4.8	7.1	83.4	1,165	3.6
	07/06/17	NM	NM	NM	NM	NM	NM
	08/07/17	NM	NM	NM	NM	NM	NM
	09/06/17	NM	NM	NM	NM	NM	NM
	10/02/17	NM	NM	NM	NM	NM	NM
	11/06/17	NM	NM	NM	NM	NM	NM
	12/04/17	NM	NM	NM	NM	NM	NM

Notes:

^{o}C = Degrees Celsius

mg/l = milligram per liter.

s.u. = standard units

mV = millivolts

µS/cm = microSiemens per centimeter

NTU = Nephelometric Turbidity Units

NM = Not Measured

NR = Not recorded

Table 3d
Operations, Maintenance and Monitoring
Water Quality Parameters
Remote Monitoring N0. 11 (RM11)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Temperature (^{0}C)	Dissolved Oxygen (mg/l)	pH	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
RM-11	10/12/16	18.9	7.6	7.8	97.1	840	5.9
	10/14/16	14.2	8.3	6.8	-37.2	715	14.0
	10/18/16	14.8	10.0	6.9	55.7	820	6.1
	10/20/16	16.7	7.2	7.0	46.5	1,047	6.7
	10/25/16	9.7	8.3	6.8	52.5	767	8.5
	10/27/16	7.4	8.9	6.8	63.5	739	14.8
	11/01/16	11.0	8.1	6.7	114.6	779	8.8
	11/03/16	12.1	6.3	6.5	101.9	1,295	22.6
	11/08/16	11.4	8.3	6.8	65.0	919	21.2
	11/10/16	9.5	8.9	6.8	92.9	907	23.7
	11/15/16	9.2	7.9	6.9	84.5	825	22.0
	11/17/16	10.9	8.5	6.6	59.1	696	22.7
	11/22/16	4.9	9.2	6.9	91.1	783	102.0
	11/29/16	6.0	7.7	6.9	88.1	801	18.7
	12/01/16	11.3	10.3	7.0	58.2	361	7.2
	12/06/16	4.4	11.0	6.9	61.6	662	5.9
	01/05/17	2.4	11.7	6.9	24.9	1,039	0.8
	02/17/17	4.2	13.0	7.1	-82.7	2,593	21.2
	03/09/17	8.4	12.3	7.0	11.0	1,525	7.4
	03/23/17	NM	NM	NM	NM	NM	NM
	04/14/17	15.8	9.8	7.6	68.4	1,184	3.7
	04/20/17	12.4	10.9	6.9	49.5	1,256	4.6
	05/11/17	14.0	9.6	6.9	65.9	1,131	3.0
	05/18/17	28.3	7.8	7.0	99.3	1,084	3.4
	06/12/17	29.0	7.2	6.8	99.1	1,053	0.7
	06/23/17	21.4	6.7	6.8	114.3	1,102	8.8
	07/06/17	26.8	6.7	6.9	159.7	1,121	6.0
	07/21/17	26.7	6.6	6.7	143.0	1,140	12.3
	08/07/17	22.1	7.2	6.8	119.4	1,028	7.3
	08/25/17	21.9	7.2	ERR	ERR	1,212	5.0
	09/06/17	20.1	8.1	7.2	57.7	1,070	9.1
	09/15/17	23.0	8.8	7.7	284.3	1,042	6.9
	09/22/17	17.9	7.9	7.0	178.6	1,217	11.2
	09/28/17	22.0	7.0	6.9	200.4	1,281	9.3
	10/02/17	17.9	8.2	6.7	229.4	1,208	6.9
	10/13/17	16.8	7.9	7.0	126.8	1,283	14.4
	10/17/17	14.0	8.6	7.2	129.2	1,319	14.9
	10/20/17	15.3	9.2	6.9	173.7	1,329	13.6
	10/23/17	15.6	8.2	6.9	178.7	1,359	13.2
	10/26/17	16.6	6.7	6.9	180.2	837	6.8
	10/30/17	15.8	8.5	6.9	168.6	419	16.6

Table 3d
Operations, Maintenance and Monitoring
Water Quality Parameters
Remote Monitoring N0. 11 (RM11)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Temperature (^{0}C)	Dissolved Oxygen (mg/l)	pH	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
RM-11 *Cont'd*	11/06/17	15.0	8.9	7.0	164.3	956	8.3
	11/09/17	9.6	10.1	6.8	169.0	1,064	5.5
	11/14/17	5.9	10.7	7.2	143.0	1,079	7.6
	11/16/17	7.8	9.3	7.0	110.9	1,165	8.8
	11/21/17	7.6	11.3	6.9	98.9	967	5.1
	11/28/17	4.8	11.9	6.9	90.9	1,113	5.6
	12/04/17	7.3	11.9	7.1	62.4	1,180	8.9
	12/12/17	4.1	ERR	6.9	50.2	1,369	7.0
	12/21/17	NM	NM	NM	NM	NM	NM

Notes:

^{o}C = Degrees Celsius

mg/l = milligram per liter.

s.u. = standard units

mV = millivolts

µS/cm = microSiemens per centimeter

NTU = Nephelometric Turbidity Units

NM = Not Measured

ERR = Equipment error (e.g. ice, sensor drift, calibration interference, etc.)

Text = Possible sensor drift

Table 3c
Operations, Maintenance and Monitoring
Water Quality Parameters
SW-01-TT (Halls Brook)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Temperature (^{0}C)	Dissolved Oxygen (mg/l)	pH	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
SW-01-TT	10/12/16	NM	NM	NM	NM	NM	NM
	11/01/16	7.8	9.4	6.6	82.4	1,034	2.6
	12/01/16	8.5	9.5	7.5	49.3	262	2.5
	01/05/17	2.2	12.1	7.1	14.3	1,011	0.3
	02/17/17	2.6	14.0	7.3	-101.7	3,064	8.7
	03/09/17	8.3	12.4	7.5	2.8	1,197	6.4
	04/14/17	13.8	10.9	7.8	81.6	1,142	7.3
	05/11/17	13.7	10.2	7.5	52.3	1,065	3.2
	06/12/17	22.0	7.3	6.9	99.5	1,031	0.2
	07/06/17	20.3	6.6	7.0	151.1	1,072	2.7
	08/07/17	18.2	7.0	7.2	114.9	921	0.0
	09/06/17	20.7	5.1	7.1	60.9	311	21.5
	10/02/17	14.4	7.5	7.0	225.2	877	ERR
	11/06/17	14.6	7.3	7.0	158.5	964	ERR
	12/04/17	5.1	ERR	7.1	59.9	1,026	ERR

Notes:

^{o}C = Degrees Celsius

mg/l = milligram per liter

s.u. = standard units

mV = millivolts

µS/cm = microSiemens per centimeter

NTU = Nephelometric Turbidity Units

NM = Not Measured

ERR = Equipment error (e.g. ice, sensor drift, calibration interference, etc.)

Table 3f
Operations, Maintenance and Monitoring
Water Quality Parameters
SW-02-TT (HBHA Pond Outlet)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Temperature (^{0}C)	Dissolved Oxygen (mg/l)	pH	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
SW-02-TT	10/12/16	14.2	7.7	7.7	48.9	762	15.6
	10/14/16	13.8	7.7	6.9	-32.5	627	13.2
	10/18/16	16.2	9.5	7.1	55.8	811	6.3
	10/20/16	15.6	10.0	6.9	42.2	865	6.1
	10/25/16	12.3	6.2	6.7	6.4	647	6.3
	10/27/16	10.2	7.6	6.8	69.8	678	13.2
	11/01/16	9.9	8.2	6.9	122.7	624	7.1
	11/03/16	10.6	7.1	6.2	88.5	765	9.8
	11/08/16	9.5	7.2	6.8	71.5	815	15.7
	11/10/16	9.1	7.4	6.7	118.7	798	17.0
	11/15/16	8.0	8.7	7.1	90.9	828	22.3
	11/17/16	9.5	8.8	6.7	74.8	490	19.9
	11/22/16	6.5	8.7	6.7	142.5	800	2.9
	11/29/16	5.5	9.4	7.1	90.2	676	7.3
	12/01/16	8.5	9.8	7.2	46.0	313	5.2
	12/06/16	4.3	10.2	6.9	63.2	583	7.9
	12/09/16	4.3	ERR	6.5	54.7	888	19.1
	12/13/16	2.8	10.1	6.6	89.6	774	13.4
	12/14/16	2.8	10.1	6.7	106.8	854	14.6
	12/20/16	1.3	11.2	7.0	76.2	1,030	4.6
	12/23/16	1.8	11.0	6.7	61.8	983	4.3
	12/29/16	3.7	11.3	7.0	40.4	833	4.9
	01/05/17	3.5	11.3	6.9	20.0	1,061	4.3
	01/19/17	2.9	13.1	6.9	70.6	1,252	5.5
	02/17/17	2.0	15.1	7.3	-105.9	2,419	11.3
	02/23/17	4.7	12.3	7.0	28.6	1,433	4.9
	03/09/17	7.3	11.7	7.2	1.9	1,590	17.1
	03/23/17	3.8	13.6	6.7	9.2	1,545	12.6
	04/14/17	13.7	10.5	7.5	66.7	1,161	4.4
	04/20/17	13.3	10.2	7.0	48.8	1,270	6.1
	05/11/17	14.0	10.5	7.1	67.3	1,070	3.1
	05/18/17	17.7	9.5	7.3	100.2	958	4.8
	06/12/17	21.6	6.0	6.7	97.4	1,167	1.8
	06/23/17	21.9	8.0	7.0	110.2	996	5.1
	07/06/17	24.1	7.9	7.1	131.8	969	0.5
	07/21/17	24.4	8.3	7.0	154.8	1,067	6.0
	08/07/17	21.9	7.8	7.1	122.5	1,002	1.1
	08/25/17	22.9	7.2	ERR	ERR	1,225	0.0
	09/06/17	20.8	8.8	7.2	57.3	1,253	1.6
	09/08/17	18.6	7.8	6.9	228.2	753	6.6
	09/15/17	22.5	9.2	7.2	317.0	992	3.5
	09/22/17	19.2	7.1	6.9	179.0	1,138	7.6
	09/28/17	23.0	8.2	7.4	197.1	1,238	10.7
	10/02/17	19.8	7.8	6.9	234.9	1,225	3.1

Table 3f
Operations, Maintenance and Monitoring
Water Quality Parameters
SW-02-TT (HBHA Pond Outlet)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Temperature (^{0}C)	Dissolved Oxygen (mg/l)	pH	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
SW-02-TT ***Cont'd***	10/13/17	18.0	7.2	7.1	125.2	1,253	10.2
	10/17/17	15.3	7.9	7.1	129.7	1,288	13.8
	10/20/17	15.5	9.0	7.1	167.4	1,309	10.2
	10/23/17	15.5	8.3	7.0	178.2	1,333	7.2
	10/26/17	16.9	7.6	7.0	180.2	1,141	10.5
	10/30/17	15.9	7.3	6.7	173.7	271	7.5
	11/06/17	13.7	8.9	7.1	162.4	778	10.7
	11/09/17	10.8	9.0	6.9	167.2	974	6.3
	11/14/17	6.1	11.6	7.4	143.2	1,091	13.2
	11/16/17	6.5	9.8	7.2	118.1	1,120	9.6
	11/21/17	6.7	11.4	7.1	99.2	966	6.9
	11/28/17	5.0	11.5	7.0	92.0	947	4.2
	12/04/17	6.3	12.2	7.3	62.7	1,118	7.3
	12/12/17	3.8	ERR	7.0	51.8	1,018	8.3
	12/21/17	2.1	13.9	7.1	114.5	1,359	8.9

Notes:

^{o}C = Degrees Celsius

mg/l = milligram per liter.

s.u. = standard units

mV = millivolts

µS/cm = microSiemens per centimeter

NTU = Nephelometric Turbidity Units

NM = Not Measured

ERR = Equipment error (e.g. ice, sensor drift, calibration interference, etc.)

Text = Possible sensor drift

Table 3g

Operations, Maintenance and Monitoring

Water Quality Parameters

SW-03-TT (Aberjona)

Industri-plex Superfund Site Operable Unit 2

Woburn, Massachusetts

DRAFT

Sample ID	Date	Temperature (^{0}C)	Oxygen (mg/l)	pH	ORP (mV)	Conductance (µS/cm)	Turbidity (NTU)
SW-03-TT	10/12/16	13.8	7.2	7.3	72.1	1,062	2.2
	11/01/16	8.3	7.9	7.0	63.0	797	3.2
	12/01/16	7.8	9.8	7.1	53.1	432	4.1
	01/05/17	2.6	11.7	7.0	18.5	1,079	0.4
	02/17/17	NA	NA	NA	NA	NA	NA
	02/23/17	4.2	11.7	6.8	35.5	1,533	2.5
	03/09/17	7.3	11.7	7.2	1.9	1,590	17.1
	04/14/17	13.0	10.9	7.4	62.7	1,399	1.6
	05/11/17	13.4	8.9	7.1	67.8	1,235	2.0
	06/12/17	21.6	6.0	6.7	97.4	1,167	1.80
	07/06/17	21.2	5.1	6.7	124.7	1,301	0.0
	08/07/17	19.0	4.8	6.8	97.2	1,362	0.0
	09/06/17	19.6	3.8	6.8	74.7	1,598	0.0
	10/02/17	12.9	5.1	6.5	219.5	1,689	7.8
	11/06/17	14.8	5.2	6.8	154.7	1,341	2.4
	12/04/17	5.2	9.3	6.9	63.8	1,312	1.3

Notes:

^{o}C = Degrees Celsius

mg/l = milligram per liter.

s.u. = standard units

mV = millivolts

µS/cm = microSiemens per centimeter

NTU = Nephelometric Turbidity Units

NM = Not Measured

ERR = Equipment error (e.g. ice, sensor drift, calibration interference, etc.)

Table 3h
Operations, Maintenance and Monitoring
Water Quality Parameters
SW-04-TT (HBHA Wetland Outlet)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Temperature (^{0}C)	Dissolved Oxygen (mg/l)	pH	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
SW-04-TT	10/12/16	16.0	10.2	7.4	101.5	734	6.2
	10/14/16	12.6	ERR	6.9	-25.9	652	6.9
	10/18/16	15.7	6.1	6.9	2.1	796	6.1
	10/20/16	13.4	7.7	6.8	21.6	835	-1.9
	10/25/16	9.5	8.3	6.5	26.6	614	6.1
	10/27/16	6.8	8.4	6.6	25.0	628	9.1
	11/01/16	8.2	9.3	6.9	72.5	604	5.8
	11/03/16	11.3	6.6	6.2	58.8	775	11.5
	11/08/16	6.8	8.8	6.4	43.1	754	14.7
	11/10/16	7.5	9.1	6.2	82.6	767	16.0
	11/15/16	7.5	8.1	6.3	56.3	833	21.9
	11/17/16	9.3	8.6	6.1	75.3	496	19.0
	11/22/16	4.1	8.9	6.1	78.2	731	12.5
	11/29/16	4.2	9.4	6.8	96.3	665	19.2
	12/01/16	8.2	9.3	7.0	49.0	375	5.6
	12/06/16	3.4	10.6	6.5	65.9	568	8.2
	12/09/16	2.5	10.7	6.0	76.3	890	21.8
	12/13/16	2.0	11.2	6.6	159.2	725	16.5
	12/14/16	2.7	10.1	6.3	102.7	841	19.8
	12/20/16	0.6	11.2	6.8	9.8	977	13.2
	12/23/16	1.4	10.5	6.5	57.9	959	12.9
	12/29/16	2.5	10.9	6.9	47.7	806	20.1
	01/05/17	3.1	11.1	6.8	32.7	1,073	12.3
	01/19/17	2.8	12.7	6.8	129.7	1,252	8.0
	02/17/17	2.2	13.4	6.9	-85.8	2,275	23.8
	02/23/17	5.1	12.3	6.7	97.1	1,443	4.6
	03/09/17	7.4	13.3	6.9	21.9	1,352	9.2
	03/23/17	1.8	13.3	6.3	34.9	1,577	13.4
	04/14/17	14.1	10.3	7.4	78.2	1,173	4.4
	04/20/17	12.7	9.2	6.5	60.7	1,283	6.4
	05/11/17	14.2	11.9	6.9	76.4	1,047	5.2
	05/18/17	20.1	11.4	7.3	95.1	950	6.2
	06/12/17	22.4	8.7	6.9	93.3	949	8.4
	06/23/17	21.2	3.4	6.6	100.6	1,002	9.0
	07/06/17	24.3	6.3	6.9	131.5	996	1.1
	07/21/17	24.0	7.0	6.8	129.3	1,080	4.2
	08/07/17	21.3	8.4	7.0	118.5	1,023	0.0
	08/25/17	19.5	6.9	ERR	ERR	1,236	0.2
	09/06/17	21.4	5.4	6.9	73.8	1,294	0.0
	09/08/17	19.2	8.0	6.8	176.2	805	1.3

Table 3h
Operations, Maintenance and Monitoring
Water Quality Parameters
SW-04-TT (HBHA Wetland Outlet)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Temperature (^{0}C)	Dissolved Oxygen (mg/l)	pH	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
SW-04-TT ***Cont'd***	09/15/17	23.3	7.1	6.8	363.1	1,015	3.3
	09/22/17	17.2	6.8	6.8	178.8	1,143	3.3
	09/28/17	22.5	6.1	6.7	203.1	1,257	11.0
	10/02/17	17.9	10.6	6.9	237.5	1,127	2.5
	10/13/17	13.0	7.8	7.0	135.6	1,270	2.9
	10/17/17	8.8	6.9	6.8	147.0	1,309	5.5
	10/20/17	12.6	5.9	6.6	181.5	1,320	4.3
	10/23/17	14.6	4.7	6.6	187.8	1,344	2.9
	10/26/17	16.5	5.3	6.6	190.5	1,111	5.1
	10/30/17	15.6	6.4	6.5	178.9	337	8.1
	11/06/17	15.3	7.0	6.8	162.6	817	23.8
	11/09/17	7.4	8.8	6.6	177.3	963	6.5
	11/14/17	5.9	9.5	7.2	143.4	1,078	7.9
	11/16/17	6.6	8.6	6.9	115.7	1,132	27.9
	11/21/17	5.2	9.6	6.8	108.1	995	3.2
	11/28/17	2.5	10.7	6.6	100.0	978	2.6
	12/04/17	4.8	11.0	7.0	64.5	1,130	5.8
	12/12/17	3.4	ERR	6.6	54.9	1,086	17.7
	12/21/17	0.2	13.4	6.7	91.1	1,394	12.2

Notes:

^{o}C = Degrees Celsius

mg/l = milligram per liter.

s.u. = standard units

mV = millivolts

µS/cm = microSiemens per centimeter

NTU = Nephelometric Turbidity Units

NM = Not Measured

ERR = Equipment error (e.g. ice, sensor drift, calibration interference, etc.)

Table 3i
Operations, Maintenance and Monitoring
Water Quality Parameters
SW-05-TT (Salem Street)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Temperature (^0C)	Dissolved Oxygen (mg/l)	pH	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
SW-05-TT	10/12/16	15.5	8.0	7.4	18.7	946	10.6
	11/01/16	7.4	8.9	6.8	49.3	706	6.1
	12/01/16	7.9	9.2	6.8	56.9	351	4.7
	01/05/17	2.4	11.7	6.8	35.7	1,108	5.6
	02/17/17	2.3	13.8	6.8	-82.6	2,277	15.9
	03/09/17	6.3	12.8	6.7	22.1	1,480	15.3
	04/14/17	12.6	9.9	7.2	68.7	1,303	2.9
	05/11/17	12.9	9.5	6.8	71.4	1,184	6.1
	06/12/17	21.7	6.7	6.8	90.3	1,095	4.8
	07/06/17	24.0	10.6	7.6	117.5	1,199	4.0
	08/07/17	21.2	8.0	7.0	101.9	1,192	0.0
	09/06/17	20.9	5.6	6.8	76.6	1,408	0.0
	10/02/17	15.2	7.1	6.7	223.0	1,425	2.6
	11/06/17	14.5	5.8	6.9	151.0	1,032	6.6
	12/04/17	4.6	10.4	6.9	61.4	1,259	4.8

Notes:

^oC = Degrees Celsius

mg/l = milligram per liter.

s.u. = standard units

mV = millivolts

µS/cm = microSiemens per centimeter

NTU = Nephelometric Turbidity Units

NM = Not Measured

ERR = Equipment error (e.g. ice, sensor drift, calibration interference, etc.)

Table 3j
Operations, Maintenance and Monitoring
Water Quality Parameters
SW-06-TT (Montvale Ave)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Temperature (^{0}C)	Dissolved Oxygen (mg/l)	pH	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
SW-06-TT	10/12/16	11.2	8.4	6.5	115.8	933	5.1
	11/01/16	6.6	9.2	6.7	75.2	1,111	12.4
	12/01/16	7.9	9.3	6.7	57.5	325	6.0
	01/05/17	1.8	12.2	6.8	38.2	1,139	3.5
	02/17/17	0.6	13.7	6.9	-73.8	2,490	10.9
	03/09/17	4.8	11.9	6.5	29.1	1,499	12.6
	04/14/17	10.4	10.1	7.1	82.5	1,362	6.4
	05/11/17	11.4	9.2	6.9	79.7	1,245	5.9
	06/12/17	19.4	6.1	6.9	91.8	1,142	1.6
	07/06/17	19.8	5.8	6.9	117.0	1,223	0.8
	08/07/17	18.7	6.1	7.1	92.4	1,169	0.0
	09/06/17	20.4	6.0	6.6	85.6	1,275	0.0
	10/02/17	12.4	7.4	6.8	223.8	1,260	1.0
	11/06/17	13.9	6.6	6.9	161.6	1,078	6.8
	12/04/17	4.6	10.2	6.8	67.2	1,262	4.2

Notes:

^{o}C = Degrees Celsius

mg/l = milligram per liter.

s.u. = standard units

mV = millivolts

µS/cm = microSiemens per centimeter

NTU = Nephelometric Turbidity Units

NM = Not Measured

ERR = Equipment error (e.g. ice, sensor drift, calibration interference, etc.)

Table 3k
Operations, Maintenance and Monitoring
Water Quality Parameters
SW-07-TT (Swanton Street)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

DRAFT

Sample ID	Date	Temperature (^{0}C)	Dissolved Oxygen (mg/l)	pH	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
SW-07-TT	10/12/16	12.1	11.2	7.4	127.3	891	3.8
	11/01/16	7.8	9.4	6.6	82.4	1,034	2.6
	12/01/16	8.1	9.8	6.6	56.9	270	7.3
	01/05/17	2.4	11.9	6.7	52.4	1,116	2.4
	02/17/17	NA	NA	NA	NA	NA	NA
	02/23/17	4.6	12.1	6.5	45.1	952	3.4
	03/09/17	6.1	12.6	6.2	50.9	1,364	5.4
	04/14/17	10.2	10.6	6.8	83.4	1,287	1.5
	05/11/17	11.7	9.8	6.2	94.2	1,164	4.7
	06/12/17	19.7	6.8	6.9	94.8	1,076	3.1
	07/06/17	20.5	6.7	7.0	124.8	1,112	3.6
	08/07/17	19.0	6.8	6.8	109.7	987	0.0
	09/06/17	19.0	6.1	6.5	91.5	1,057	0.0
	10/02/17	12.3	7.4	6.7	229.4	1,056	1.6
	11/06/17	13.8	7.5	6.8	163.9	996	3.9
	12/04/17	5.0	10.7	6.5	77.0	1,147	1.9

Notes:

^{o}C = Degrees Celsius

mg/l = milligram per liter.

s.u. = standard units

mV = millivolts

µS/cm = microSiemens per centimeter

NTU = Nephelometric Turbidity Units

NM = Not Measured

ERR = Equipment error (e.g. ice, sensor drift, calibration interference, etc.)

AMBIENT WATER QUALITY CRITERIA

AMMONIA CALCULATIONS

COMPLIANCE POINT - STATION SW-02-TT

AMMONIA TREATMENT DATA NRWQC
INDUSTRI-PLEX OPERABLE UNIT 2 SUPERFUND SITE
WOBURN, MASSACHUSETTS

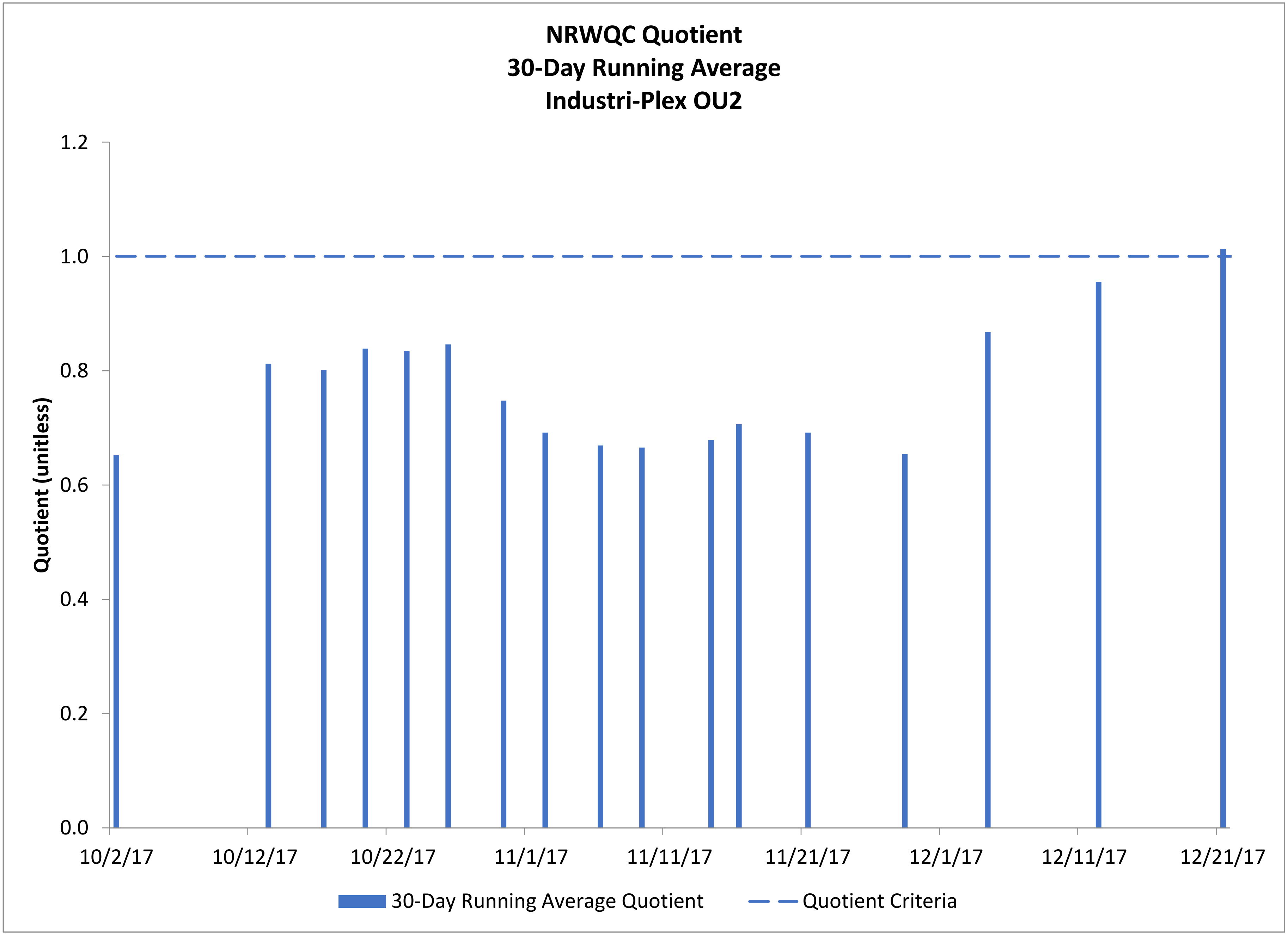
Date	Sample Location	Ammonia (mg/L)	Temp. (°C)	pH Lab Measurement	pH YSI - Field	Compare to	Min Factor	Point NRWQCCC	Point Quotient	Quotient 30-day Trailing Running Average (unitless)	Quotient 4-day Trailing Running Average (unitless)	System Status
10/02/17	SW-02-TT	2.80	19.8	--	6.9	2.85	2.03	4.29	0.65	0.65	0.65	Aeration System Op.
10/13/17	SW-02-TT	4.35	18.0	--	7.1	2.85	2.28	4.48	0.97	0.81	0.97	Aeration System Op.
10/17/17	SW-02-TT	4.11	15.3	7.0	7.1	2.85	2.72	5.27	0.78	0.80	0.78	Aeration System Op.
10/20/17	SW-02-TT	5.05	15.5	6.9	7.1	2.85	2.67	5.31	0.95	0.84	0.87	Aeration System Op.
10/23/17	SW-02-TT	4.55	15.5	6.9	7.0	2.85	2.68	5.55	0.82	0.83	0.88	Aeration System Op.
10/26/17	SW-02-TT	4.58	16.9	7.2	7.0	2.85	2.44	5.07	0.90	0.85	0.86	Aeration System Op.
10/30/17	SW-02-TT	0.94	15.8	6.5	6.7	2.85	2.62	5.97	0.16	0.75	0.16	Aeration System Op.
11/02/17	SW-02-TT	1.62	12.3	6.9	6.8	2.85	2.85	6.24	0.26	0.69	0.21	Aeration System Op.
11/06/17	SW-02-TT	2.93	13.7	7.2	7.1	2.85	2.85	5.72	0.51	0.67	0.51	Aeration System Op.
11/09/17	SW-02-TT	3.88	10.8	7.0	6.9	2.85	2.85	6.10	0.64	0.67	0.57	Aeration System Op.
11/14/17	SW-02-TT	5.32	6.1	7.1	7.4	2.85	2.85	4.87	1.09	0.68	1.09	Aeration System Op.
11/16/17	SW-02-TT	5.59	6.5	7.2	7.2	2.85	2.85	5.45	1.03	0.71	1.06	Aeration System Op.
11/21/17	SW-02-TT	4.60	6.7	7.4	7.1	2.85	2.85	5.61	0.82	0.69	0.82	Aeration System Op.
11/28/17	SW-02-TT	4.28	5.0	--	7.0	2.85	2.85	5.86	0.73	0.65	0.73	Aeration System Op.
12/04/17	SW-02-TT	6.39	6.3	--	7.3	2.85	2.85	5.08	1.26	0.87	1.26	Aeration System Op.
12/12/17	SW-02-TT	4.68	3.8	--	7.0	2.85	2.85	5.79	0.81	0.96	0.81	Aeration System Op.
12/21/17	SW-02-TT	7.15	2.1	--	7.1	2.85	2.85	5.69	1.26	1.01	1.26	Aeration System Op.

Notes:

01/06/00	data entered
01/01/00	automatically calculated
▨	Laboratory data has not been received to date.
7.0	pH is greater than accuracy of sensors when field measurements are compared to lab measurement.

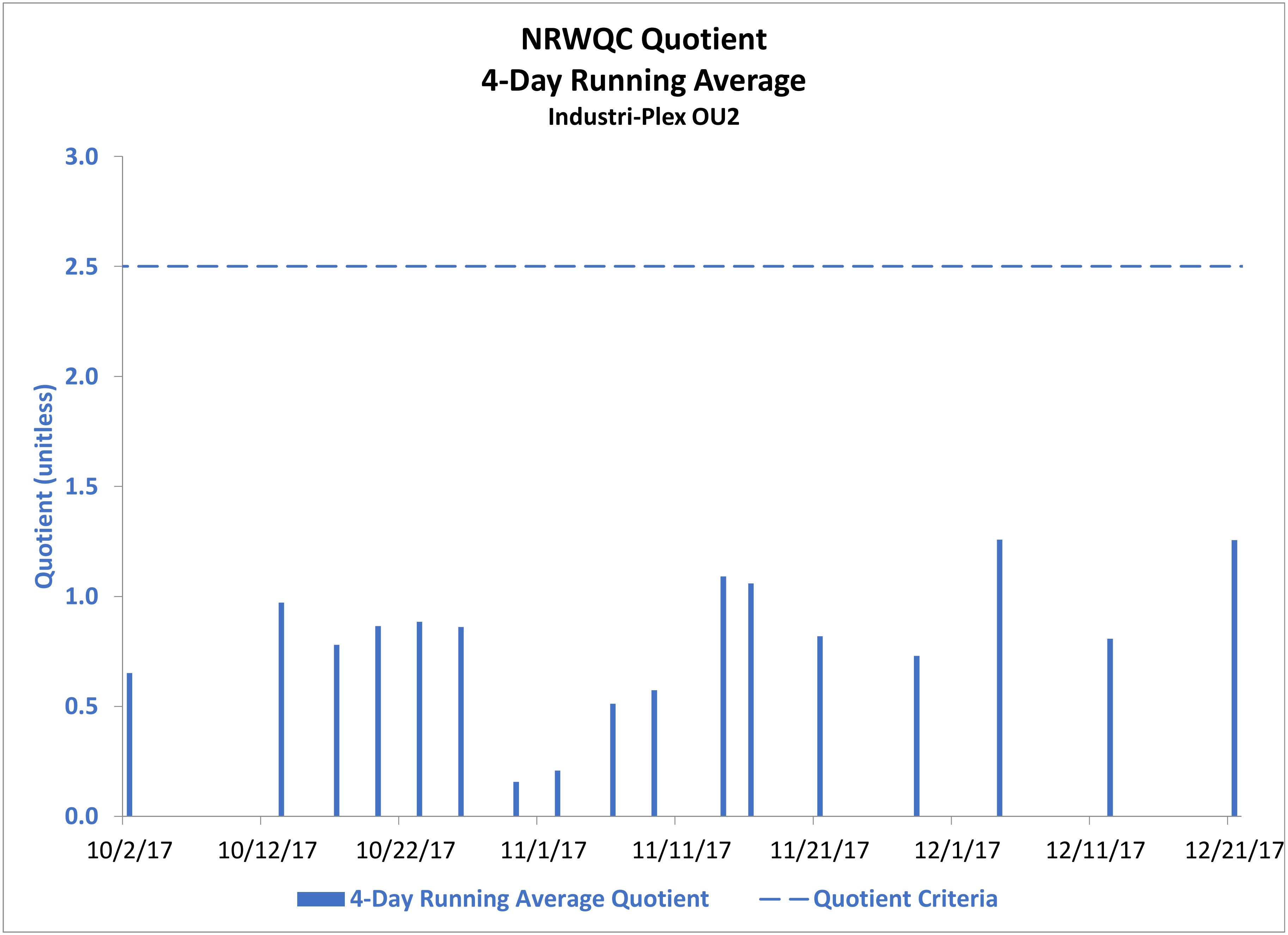
YSI pH sensor & pH lab meter accuracy is +/- 0.2 units.

$$CCC = \left(\frac{0.0577}{1 + 10^{7.688 - pH}} + \frac{2.487}{1 + 10^{pH - 7.688}} \right) \cdot MIN(2.85,\ 1.45 \cdot 10^{0.028 \cdot (25 - T)})$$



HALEY & ALDRICH, INC.

1/9/2018



NRWQC Quotient
4-Day Running Average
Industri-Plex OU2

HALEY & ALDRICH, INC.

1/9/2018

ARSENIC FLUX CALCULATIONS

STATION SW-02-TT

Arsenic Flux - SW-02-TT
Industri-plex (OU2) Superfund Site
Woburn, MA

SW-02-TT																			
					Total As "J_t"					Dissolved As "J_d"					Particulate As "J_p"				
Date	**Total "As"**	**Dissolved "As"**	**Stage "SonTek" (Ft)**	**Flow Discharge "SonTek" (Ft^3/s)**	**Total As Flux "J_t" (kg/d)**	**"J_t" Geomean**	**"J_t" Median**	**"J_t" Min**	**"J_t" Max**	**Dissolved As Flux "J_d" (kg/d)**	**"J_d" Geomean**	**"J_d" Median**	**"J_d" Min**	**"J_d" Max**	**Particulate As Flux "J_p" (kg/d)**	**"J_p" Geomean**	**"J_p" Median**	**"J_p" Min**	**"J_p" Max**
09/06/17	0.016	0.007	1.11	2.86	0.11	0.11	0.11	0.11	0.11	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06
10/02/17	0.019	0.006	1.00	1.68	0.08	0.09	0.10	0.08	0.11	0.02	0.03	0.04	0.02	0.05	0.05	0.06	0.06	0.05	0.06
11/06/17	0.018	0.009	1.10	3.77	0.17	0.11	0.11	0.08	0.17	0.08	0.05	0.05	0.02	0.08	0.08	0.07	0.06	0.05	0.08
12/04/17	0.027	0.007	1.08	2.54	0.17	0.13	0.14	0.08	0.17	0.04	0.05	0.04	0.02	0.08	0.13	0.08	0.07	0.05	0.13

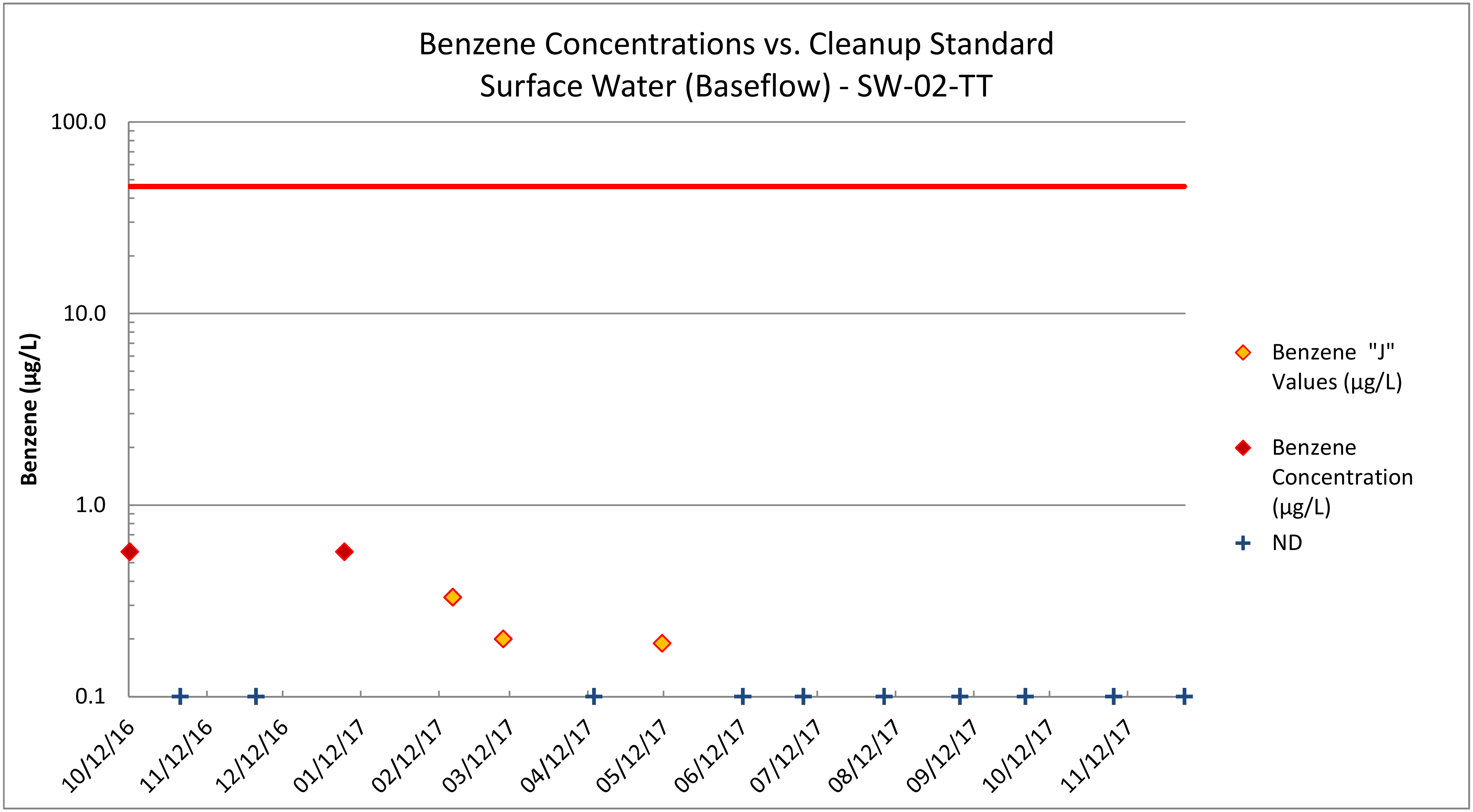
Notes:

SonTek stage and flow data that was recorded closest to actual baseflow surface water sample time was used.

COMPLIANCE MONITORING

BENZENE RESULTS

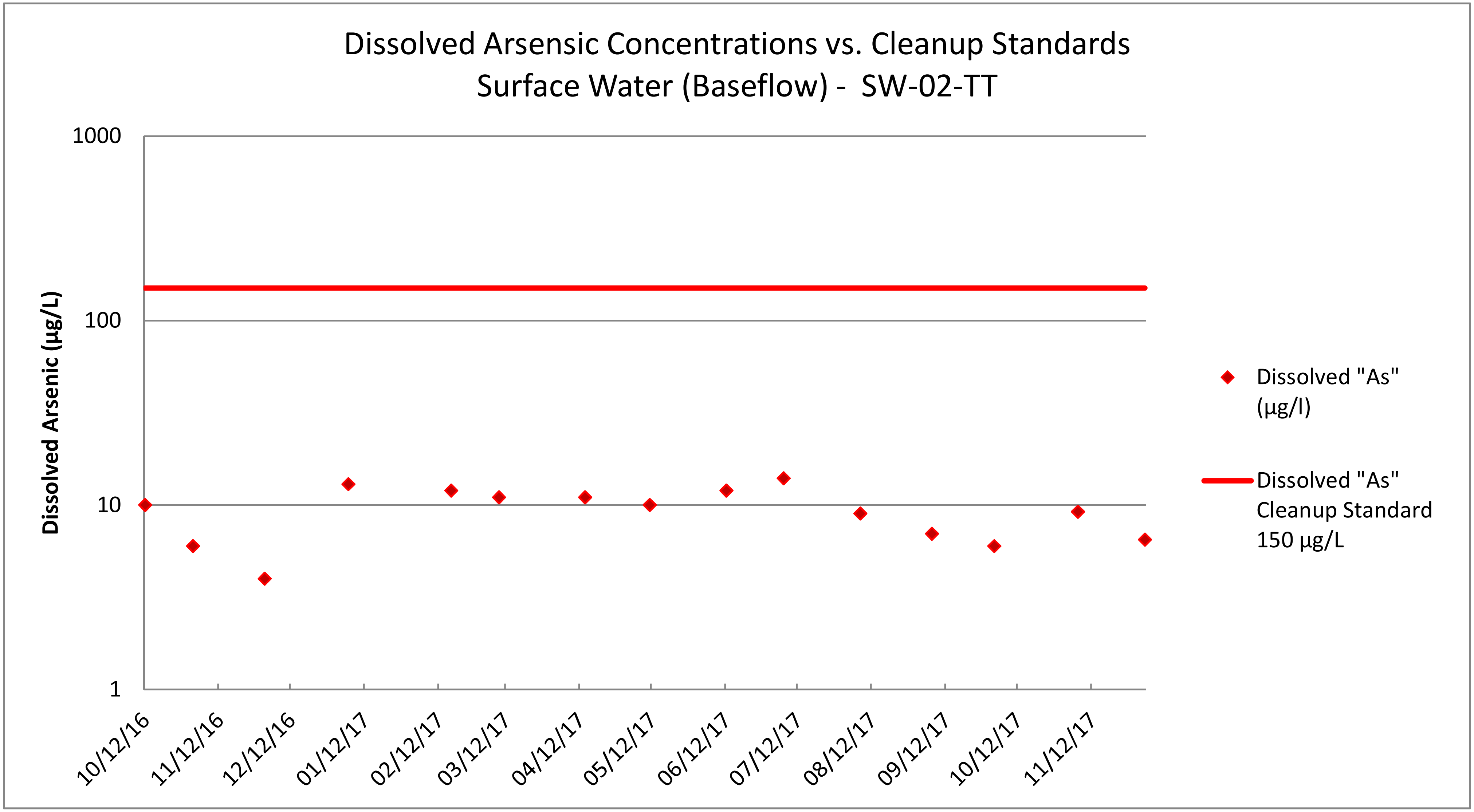
COMPLIANCE POINT - SW-O2-TT


Benzene Concentrations vs. Cleanup Standard
Surface Water (Baseflow) - SW-02-TT
100.0
10.0
1.0
0.1
Benzene (µg/L)
10/12/16
11/12/16
12/12/16
01/12/17
02/12/17
03/12/17
04/12/17
05/12/17
06/12/17
07/12/17
08/12/17
09/12/17
10/12/17
11/12/17
Benzene "J" Values (µg/L)
Benzene Concentration (µg/L)
ND

COMPLIANCE MONITORING

DISSOLVED ARSENIC RESULTS

COMPLIANCE POINT - SW-O2-TT


Dissolved Arsensic Concentrations vs. Cleanup Standards
Surface Water (Baseflow) - SW-02-TT
Dissolved Arsenic (µg/L)
1000
100
10
1
10/12/16
11/12/16
12/12/16
01/12/17
02/12/17
03/12/17
04/12/17
05/12/17
06/12/17
07/12/17
08/12/17
09/12/17
10/12/17
11/12/17
Dissolved "As" (µg/l)
Dissolved "As" Cleanup Standard 150 µg/L

SUMMARY OF LONG-TERM SURFACE WATER ANALYTICAL AND WATER QUALITY RESULTS

NINE SURFACE WATER MONITORING STATIONS

Table 1a
Operations, Maintenance and Monitoring
Monthly Baseflow Surface Water Results
SW-2-IP (Atlantic Ave Drainway)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Sample ID	Date	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Ammonia (mg/l)
SW-2-IP	01/11/18	NS	NS	NS
	02/05/18	< 0.002	< 0.002	0.639
	03/19/18	< 0.002	0.003	0.215
	04/02/18	0.003 J	ND	0.208
	05/08/18	< 0.002	< 0.002	0.045 J
	06/11/18	0.002 J	< 0.002	0.225
	07/02/18	0.003 J	0.003 J	0.074 J
	08/06/18	< 0.002	< 0.002	0.038 J
	09/04/18	< 0.002	< 0.002	0.032 J
	10/01/18	< 0.002	< 0.002	0.086
	12/04/18	0.003	< 0.002	0.438

Notes

J = Analyte result is estimated

U = Analyte not detected above the laboratory reporting limit

ND = Non Detect

NS = Not Sampled

Table 1b
Operations, Maintenance and Monitoring
Baseflow Surface Water Results
SW-3-IP (Boston Edison Co. ROW)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Sample ID	Date	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Ammonia (mg/l)
SW-3-IP	01/11/18	NS	NS	NS
	02/05/18	NS	NS	NS
	03/19/18	NS	NS	NS
	04/02/18	NS	NS	NS
	05/08/18	NS	NS	NS
	06/11/18	NS	NS	NS
	07/02/18	NS	NS	NS
	08/06/18	NS	NS	NS
	09/04/18	NS	NS	NS
	10/01/18	NS	NS	NS
	12/04/18	NS	NS	NS

Notes

NS = Not Sampled (No Flow)

* = The monthly surface water baseflow monitoring event was not conducted as baseflow conditions were not met.

Table 1c
Operations, Maintenance Monitoring
Baseflow Surface Water Results
SW-01-TT (Halls Brook)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Sample ID	Date	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Ammonia (mg/l)
SW-01-TT	01/11/18	NS	NS	NS
	02/05/18	< 0.002	< 0.002	0.92
	03/19/18	0.005	0.004	1.13
	04/02/18	< 0.002	< 0.002	1.09
	05/08/18	< 0.002	< 0.002	0.88
	06/11/08	< 0.002	< 0.002	0.78
	07/02/18	0.002 J	<0.002	1.23
	08/06/18	< 0.002	< 0.003	0.10
	09/04/18	< 0.002	< 0.002	0.08
	10/01/18	< 0.002	< 0.002	0.89
	12/04/18	< 0.002	0.003 J	0.71

Notes
J = Analyte result is estimated
NS = Not Sampled
ND = Non Detect

Table 1d

Operations, Maintenance Monitoring

Baseflow Surface Water Results

Remote Station No. 1 (RM-1 Above Chemocline)

Industri-plex Superfund Site Operable Unit 2

Woburn, Massachusetts

Sample ID	Date	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Iron (mg/l)	Ammonia (mg/l)	Nitrate (mg/l)
RM-1 (Above)	01/12/18	NS	NS	NS	NS	NS
	02/06/18	NS	NS	NS	NS	NS
	03/20/18	0.351	0.231	32.7	65.70	0.05 J
	04/03/18	0.021	0.017	1.07	5.40	1.06
	05/09/18	0.049	0.586	2.24	3.38	1.13
	06/11/18	0.034	0.009	1.77	5.02	3.50
	07/03/18	0.036	0.014	1.84	3.38	2.68
	08/07/18	0.188	0.077	4.70	9.76	3.52
	09/05/18	0.059	0.022	1.26	5.18	5.33
	10/02/18	0.273	0.014	1.34	4.59	1.35
	12/05/18	0.538	0.561	17.6	9.12	0.31

Notes

J = Analyte result is estimated

NS = Not Sampled

ND = Non Detect

Table 1e
Operations, Maintenance Monitoring
Baseflow Surface Water Results
Remote Station No. 1 (RM-1 Below Chemocline)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Sample ID	Date	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Iron (mg/l)	Ammonia (mg/l)	Nitrate (mg/l)
RM-1 (Below)	01/12/18	NS	NS	NS	NS	NS
	02/06/18	NS	NS	NS	NS	NS
	03/20/18	4.38	4.24	101	250	< 0.03
	04/03/18	4.14	3.62	99.2	276	< 0.03
	05/09/18	4.14	3.99	121	294	0.16
	06/11/18	1.85	1.09	145	220	0.42
	07/03/18	2.71	2.65	138	279	0.08 J
	08/07/18	2.17	1.88	152	282	0.06 J
	09/05/18	1.98	1.67	135	261	< 0.03
	10/02/18	1.80	1.62	144	228	0.05 J
	12/05/18	2.89	2.64	105	299	0.05 J

Notes
J = Analyte result is estimated
NS = Not Sampled
ND = Non Detect

Table 1f
Operations, Maintenance Monitoring
Baseflow Surface Water Results
Remote Station No. 10 (RM-10)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Sample ID	Date	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Iron (mg/l)	Ammonia (mg/l)	Nitrate (mg/l)
RM-10	01/12/18	NS	NS	NS	NS	NS
	02/06/18	0.018	0.011	1.23	3.76	0.99
	03/20/18	0.011	0.009	0.98	3.64	1.34
	04/03/18	0.017	0.008	1.07	3.39	1.48
	05/09/18	0.024	0.011	1.66	2.53	1.74
	06/11/18	0.022	0.014	1.32	3.02	4.04
	07/03/18	0.033	0.008	2.13	1.49	2.78
	08/07/18	0.019	0.006	0.99	1.69	5.94
	09/05/18	0.017	0.007	0.829	1.15	7.47
	10/02/18	0.264	0.008	1.48	2.28	3.30
	12/05/18	0.019	0.009	1.32	6.83	1.17

Notes
J = Analyte result is estimated
NS = Not Sampled
ND = Non Detect

Table 1g

Operations, Maintenance and Monitoring

Baseflow/LTM Surface Water Results

Remote Station No. 11 (RM-11)

Industri-plex Superfund Site Operable Unit 2

Woburn, Massachusetts

Sample ID	Date	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Iron (mg/l)	Ammonia (mg/l)	Nitrate (mg/l)
RM-11	01/11/18	0.039	0.017	1.96	8.81	1.17
	01/23/18	NS	NS	NS	4.64	NS
	02/05/18	0.010	0.007	1.03	2.59	0.75
	02/20/18	NS	NS	NS	3.41	NS
	03/20/18	0.013	0.012	0.95	3.68	1.24
	03/27/18	NS	NS	NS	2.85	NS
	04/02/18	0.017	0.012	1.04	3.66	1.33
	04/19/18	NS	NS	NS	1.60	NS
	05/02/18	NS	NS	NS	3.53	NS
	05/08/18	0.020	0.015	1.43	3.70	1.35
	05/14/18	NS	NS	NS	3.56	NS
	05/21/18	NS	NS	NS	2.91	NS
	05/31/18	NS	NS	NS	4.24	NS
	06/05/18	NS	NS	NS	3.30	NS
	06/11/18	0.035	0.006	1.67	3.90	3.33
	06/18/18	NS	NS	NS	5.02	NS
	06/25/18	NS	NS	NS	4.49	NS
	07/03/18	0.038	0.014	2.03	3.70	2.65
	07/09/18	NS	NS	NS	3.52	NS
	07/12/18	NS	NS	NS	2.99	NS
	07/16/18	NS	NS	NS	3.96	NS
	07/19/18	NS	NS	NS	1.90	NS
	07/23/18	NS	NS	NS	2.98	NS
	07/26/18	NS	NS	NS	2.60	NS
	07/30/18	NS	NS	NS	2.97	NS
	08/02/18	NS	NS	NS	4.18	NS
	08/06/18	0.015	0.004	0.73	2.97	3.7

Table 1g
Operations, Maintenance and Monitoring
Baseflow/LTM Surface Water Results
Remote Station No. 11 (RM-11)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Sample ID	Date	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Iron (mg/l)	Ammonia (mg/l)	Nitrate (mg/l)
RM-11 *(Cont'd)*	08/09/18	NS	NS	NS	4.22	NS
	08/13/18	NS	NS	NS	0.77	NS
	08/16/18	NS	NS	NS	2.18	NS
	08/20/18	NS	NS	NS	3.08	NS
	08/23/18	NS	NS	NS	1.35	NS
	08/28/08	NS	NS	NS	4.46	NS
	08/30/18	NS	NS	NS	3.46	NS
	09/04/18	NS	NS	0.76	4.43	6.21
	09/06/18	NS	NS	NS	4.72	NS
	09/10/18	NS	NS	NS	4.89	NS
	09/13/18	NS	NS	NS	1.84	NS
	09/17/18	NS	NS	NS	3.79	NS
	09/20/18	NS	NS	NS	1.50	NS
	09/24/18	NS	NS	NS	3.87	NS
	09/27/18	NS	NS	NS	0.85	NS
	10/01/18	0.018	0.007	1.12	2.61	1.78
	10/04/18	NS	NS	NS	3.11	NS
	10/08/18	NS	NS	NS	4.67	NS
	10/11/18	NS	NS	NS	4.13	NS
	10/15/18	NS	NS	NS	4.40	NS
	10/18/18	NS	NS	NS	5.50	NS
	10/22/18	NS	NS	NS	7.15	NS
	10/25/18	NS	NS	NS	5.59	NS
	10/29/18	NS	NS	NS	4.62	NS
	11/01/18	NS	NS	NS	3.65	NS
	11/05/18	NS	NS	NS	1.84	NS
	11/08/18	NS	NS	NS	3.41	NS

Table 1g
Operations, Maintenance and Monitoring
Baseflow/LTM Surface Water Results
Remote Station No. 11 (RM-11)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Sample ID	Date	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Iron (mg/l)	Ammonia (mg/l)	Nitrate (mg/l)
RM-11 *(Cont'd)*	11/12/18	NS	NS	NS	2.56	NS
	11/15/18	NS	NS	NS	3.94	NS
	11/19/18	NS	NS	NS	3.84	NS
	11/21/18	NS	NS	NS	5.04	NS
	11/26/18	NS	NS	NS	6.80	NS
	11/29/18	NS	NS	NS	5.14	NS
	12/03/18	NS	NS	NS	5.24	NS
	12/04/18	0.016	0.010	1.06	2.79	0.845
	12/10/18	NS	NS	NS	4.30	NS
	12/13/18	NS	NS	NS	3.18	NS
	12/17/18	NS	NS	NS	1.69	NS
	12/20/18	NS	NS	NS	3.54	NS
	12/27/18	NS	NS	NS	7.41	NS
	12/31/18	NS	NS	NS	7.88	NS

Notes:

NS = Not Sample

Table 1h
Operations, Maintenance and Monitoring
Baseflow/LTM Surface Water Results
SW-02-TT (HBHA Pond Outlet)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Sample ID	Date	Benzene (ug/l)	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Iron (mg/l)	Ammonia (mg/l)	Nitrate (mg/l)
SW-02-TT	01/11/18	0.34 J	0.036	0.010	1.72	9.04	1.65
	01/15/18	NS	NS	NS	NS	1.54	NS
	01/23/18	NS	NS	NS	NS	5.15	NS
	02/05/18	0.41 J	0.022	0.010	1.48	4.43	1.07
	02/12/08	NS	NS	NS	NS	2.27	NS
	02/20/18	NS	NS	NS	NS	4.18	NS
	03/05/18	NS	NS	NS	NS	1.66	NS
	03/19/18	0.23 J	0.016	0.010	0.96	3.23	1.23
	03/27/18	NS	NS	NS	NS	2.80	NS
	04/02/18	0.17 J	0.019	0.010	1.18	3.34	1.51
	04/19/18	NS	NS	NS	NS	1.27	NS
	05/02/18	NS	NS	NS	NS	2.30	NS
	05/08/18	0.18 J	0.019	0.013	1.46	2.59	1.80
	05/14/18	NS	NS	NS	NS	2.87	NS
	05/21/18	NS	NS	NS	NS	2.43	NS
	05/31/18	NS	NS	NS	NS	2.76	NS
	06/05/18	NS	NS	NS	NS	2.45	NS
	06/11/18	< 0.16	0.019	0.004	1.05	2.66	3.55
	06/18/18	NS	NS	NS	NS	3.02	NS
	06/25/18	NS	NS	NS	NS	3.12	NS
	07/02/18	< 0.16	0.017	0.006	0.87	1.15	1.97
	07/09/18	NS	NS	NS	NS	1.61	NS
	07/12/18	NS	NS	NS	NS	1.44	NS
	07/16/18	NS	NS	NS	NS	1.15	NS
	07/19/18	NS	NS	NS	NS	0.98	NS
	07/23/18	NS	NS	NS	NS	0.81	NS
	07/26/18	NS	NS	NS	NS	1.48	NS
	07/30/18	NS	NS	NS	NS	0.97	NS
	08/02/18	NS	NS	NS	NS	1.01	NS

Table 1h
Operations, Maintenance and Monitoring
Baseflow/LTM Surface Water Results
SW-02-TT (HBHA Pond Outlet)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Sample ID	Date	Benzene (ug/l)	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Iron (mg/l)	Ammonia (mg/l)	Nitrate (mg/l)
SW-02-TT *(Cont'd)*	08/06/18	< 0.16	0.010	0.004	0.32	1.42	5.83
	08/09/18	NS	NS	NS	NS	1.55	NS
	08/13/18	NS	NS	NS	NS	0.65	NS
	08/16/18	NS	NS	NS	NS	0.86	NS
	08/20/18	NS	NS	NS	NS	1.53	NS
	08/23/18	NS	NS	NS	NS	2.09	NS
	08/28/18	NS	NS	NS	NS	1.20	NS
	08/30/18	NS	NS	NS	NS	0.91	NS
	09/04/18	< 0.16	0.010	0.004	0.45	1.17	6.45
	09/06/18	NS	NS	NS	NS	1.22	NS
	09/10/18	NS	NS	NS	NS	1.33	NS
	09/13/18	NS	NS	NS	NS	0.95	NS
	09/17/18	NS	NS	NS	NS	1.08	NS
	09/20/18	NS	NS	NS	NS	0.47	NS
	09/24/18	NS	NS	NS	NS	1.42	NS
	09/27/18	NS	NS	NS	NS	0.60	NS
	10/01/18	< 0.16	0.017	0.007	1.04	1.22	1.93
	10/04/18	NS	NS	NS	NS	1.49	NS
	10/08/18	NS	NS	NS	NS	2.35	NS
	10/11/18	NS	NS	NS	NS	2.94	NS
	10/15/18	NS	NS	NS	NS	2.01	NS
	10/18/18	NS	NS	NS	NS	3.19	NS
	10/22/18	NS	NS	NS	NS	4.30	NS
	10/25/08	NS	NS	NS	NS	4.55	NS
	10/29/18	NS	NS	NS	NS	1.50	NS
	10/31/18	NS	NS	NS	NS	3.34	NS
	11/01/18	NS	NS	NS	NS	3.53	NS
	11/05/18	NS	NS	NS	NS	0.87	NS
	11/07/18	NS	NS	NS	NS	0.98	NS

Table 1h
Operations, Maintenance and Monitoring
Baseflow/LTM Surface Water Results
SW-02-TT (HBHA Pond Outlet)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Sample ID	Date	Benzene (ug/l)	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Total Iron (mg/l)	Ammonia (mg/l)	Nitrate (mg/l)
SW-02-TT *(Cont'd)*	11/08/18	NS	NS	NS	NS	1.43	NS
	11/12/18	NS	NS	NS	NS	1.29	NS
	11/14/18	NS	NS	NS	NS	0.84	NS
	11/15/18	NS	NS	NS	NS	1.08	NS
	11/19/18	NS	NS	NS	NS	1.04	NS
	11/21/18	NS	NS	NS	NS	1.39	NS
	11/26/18	NS	NS	NS	NS	1.60	NS
	11/27/18	NS	NS	NS	NS	1.61	NS
	11/29/18	NS	NS	NS	NS	1.15	NS
	12/03/18	NS	NS	NS	NS	1.18	NS
	12/04/18	< 0.16	0.024	0.009	1.68	3.60	1.20
	12/10/18	NS	NS	NS	NS	3.40	NS
	12/13/18	NS	NS	NS	NS	4.03	NS
	12/17/18	NS	NS	NS	NS	2.19	NS
	12/20/18	NS	NS	NS	NS	3.64	NS
	12/21/18	NS	NS	NS	NS	3.04	NS
	12/27/18	NS	NS	NS	NS	2.75	NS
	12/28/18	NS	NS	NS	NS	4.51	NS
	12/31/18	NS	NS	NS	NS	4.46	NS

Notes

ND = Non Detect

J = Analyte result is estimated

Table 1i
Operations, Maintenance and Monitoring
Baseflow Surface Water Results
SW-03-TT (Aberjona)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Sample ID	Date	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Ammonia (mg/l)
SW-03-TT	01/11/18	NS	NS	NS
	02/05/18	0.004	< 0.002	0.46
	03/19/18	0.005	0.005	0.74
	04/02/18	0.006	0.004	0.70
	05/08/18	0.006	0.005	0.42
	06/11/18	0.009	0.005	1.04
	07/02/18	0.009	0.008	0.43
	08/06/18	0.004	0.002 J	0.24
	09/04/18	0.006	0.003 J	0.33
	10/01/18	0.006	0.003	0.30
	12/04/18	0.005	0.004	0.50

Notes

NS = Not Sampled

ND = Non Detect

Table 1j
Operations, Maintenance and Monitoring
Baseflow/LTM Surface Water Results
SW-04-TT (HBHA Wetland Outlet)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Sample ID	Date	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Ammonia (mg/l)
SW-04-TT	01/11/18	0.210	0.007	8.24
	01/23/18	NS	NS	4.74
	02/05/18	0.019	0.008	4.36
	02/20/18	NS	NS	3.97
	03/19/18	0.014	0.009	2.90
	03/27/18	NS	NS	2.48
	04/02/18	0.014	0.009	3.08
	04/19/18	NS	NS	1.04
	05/02/18	NS	NS	2.00
	05/08/18	0.013	0.006	2.21
	05/14/18	NS	NS	2.28
	05/21/18	NS	NS	1.66
	05/31/18	NS	NS	1.61
	06/05/18	NS	NS	1.72
	06/11/18	0.010	0.004	1.45
	06/18/18	NS	NS	1.74
	06/25/18	NS	NS	2.04
	07/02/18	0.012	0.006	0.39
	07/09/18	NS	NS	0.26
	07/12/18	NS	NS	0.11
	07/16/18	NS	NS	0.09
	07/19/18	NS	NS	0.47
	07/23/18	NS	NS	0.15
	07/26/18	NS	NS	0.53
	07/30/18	NS	NS	0.29
	08/02/18	NS	NS	0.04 J
	08/06/18	0.005	0.002 J	0.14

Table 1j
Operations, Maintenance and Monitoring
Baseflow/LTM Surface Water Results
SW-04-TT (HBHA Wetland Outlet)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Sample ID	Date	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Ammonia (mg/l)
SW-04-TT *(Cont'd)*	08/09/18	NS	NS	0.15
	08/13/18	NS	NS	0.53
	08/16/18	NS	NS	0.03 J
	08/20/18	NS	NS	0.30
	08/23/18	NS	NS	1.11
	08/28/18	NS	NS	0.32
	08/30/18	NS	NS	0.04 J
	09/04/18	0.005	< 0.002	0.05 J
	09/06/18	NS	NS	0.10
	09/10/18	NS	NS	0.19
	09/13/18	NS	NS	0.35
	09/17/18	NS	NS	0.07 J
	09/20/18	NS	NS	0.17
	09/24/18	NS	NS	0.26
	09/27/18	NS	NS	0.25
	10/01/18	0.009	0.002 J	0.16
	10/04/18	NS	NS	0.87
	10/08/18	NS	NS	0.50
	10/11/18	NS	NS	0.92
	10/15/18	NS	NS	0.55
	10/18/18	NS	NS	1.67
	10/22/18	NS	NS	2.86
	10/25/18	NS	NS	3.52
	10/29/18	NS	NS	0.88
	11/01/18	NS	NS	2.08
	11/05/18	NS	NS	0.46
	11/08/18	NS	NS	0.75

Table 1j
Operations, Maintenance and Monitoring
Baseflow/LTM Surface Water Results
SW-04-TT (HBHA Wetland Outlet)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Sample ID	Date	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Ammonia (mg/l)
SW-04-TT *(Cont'd)*	11/12/18	NS	NS	0.90
	11/15/18	NS	NS	0.93
	11/19/18	NS	NS	0.87
	11/21/18	NS	NS	2.62
	11/26/18	NS	NS	1.76
	11/29/18	NS	NS	0.99
	12/03/18	NS	NS	1.19
	12/04/18	0.018	0.007	3.18
	12/10/18	NS	NS	3.14
	12/13/18	NS	NS	3.82
	12/17/18	NS	NS	2.39
	12/20/18	NS	NS	2.76
	12/27/18	NS	NS	2.50
	12/31/18	NS	NS	3.30

Notes:

NS = Not Sampled

Table 1k
Operations, Maintenance and Monitoring
Baseflow Surface Water Results
SW-05-TT (Salem Street)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Sample ID	Date	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Ammonia (mg/l)
SW-05-TT	01/11/18	0.011	0.003	NS
	02/05/08	0.013	0.008	NS
	03/19/18	0.010	0.007	NS
	04/02/18	0.007	0.003	NS
	05/08/18	0.010	0.006	NS
	06/11/18	0.008	0.005	NS
	07/02/18	0.015	0.006	NS
	08/06/18	0.008	0.004	NS
	09/04/18	0.012	0.004	NS
	10/01/18	0.006	< 0.002	NS
	12/04/18	0.010	0.004	NS

Notes
NS = Not Sampled

Table 1l
Operations, Maintenance and Monitoring
Baseflow Surface Water Results
SW-06-TT (Montvale Ave)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Sample ID	Date	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Ammonia (mg/l)
SW-06-TT	01/11/18	NS	NS	NS
	02/05/18	0.011	0.004	NS
	03/19/18	0.007	0.003	NS
	04/02/18	0.008	0.003	NS
	05/08/18	0.009	0.002 J	NS
	06/11/18	0.007	0.002 J	NS
	07/02/18	0.009	0.007	NS
	08/06/18	0.004	< 0.002	NS
	09/04/18	0.008	0.002 J	NS
	10/01/18	0.007	0.002	NS
	12/04/18	0.007	0.005	NS

Notes

J = Analyte result is estimated

NS = Not Sampled

Table 1m

Operations, Maintenance and Monitoring

Baseflow Surface Water Results

SW-07-TT (Swanton Street)

Industri-plex Superfund Site Operable Unit 2

Woburn, Massachusetts

Sample ID	Date	Total Arsenic (mg/l)	Dissolved Arsenic (mg/l)	Ammonia (mg/l)
SW-07-TT	01/11/18	NS	NS	NS
	02/05/18	0.007	0.003	NS
	03/19/18	0.062	0.003	NS
	04/02/18	0.007	0.003 J	NS
	05/08/18	0.005	ND	NS
	06/11/18	0.006	0.004	NS
	07/02/18	0.010	0.004	NS
	08/06/18	0.005	0.003	NS
	09/04/18	0.004	< 0.002	NS
	10/02/18	0.004	< 0.002	NS
	12/04/18	0.004	0.004	NS

Notes

J = Analyte result is estimated

NS = Not Sampled

Table 2a
Operations, Maintenance and Monitoring
Water Quality Parameters
SW-2-IP (Atlantic Ave Drainway)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Site ID	Date	Temperature (^{0}C)	Dissolved Oxygen (mg/l)	pH	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
SW-2-IP	01/11/18	NM	NM	NM	NM	NM	NM
	02/05/18	3.5	12.1	7.2	187.2	1,575	1.7
	03/19/18	6.4	12.6	7.4	152.5	1,644	ERR
	04/02/18	7.8	11.4	7.4	154.7	1,986	1.1
	05/08/18	24.6	11.0	7.7	161.3	1,224	0.4
	06/11/18	25.3	9.9	7.5	180.0	1,565	0.8
	07/02/18	32.1	8.1	7.5	183.6	857	ERR
	08/06/18	34.3	11.4	7.9	139.3	1,000	2.3
	09/04/18	31.6	16.0	9.1	66.1	998	1.6
	10/01/18	15.9	9.2	7.4	102.4	670	0.5
	12/04/18	4.6	12.0	7.3	139.7	950	1.4

Notes:

^{o}C = Degrees Celsius

mg/l = milligram per liter.

s.u. = standard units

mV = millivolts

µS/cm = microSiemens per centimeter

NTU = Nephelometric Turbidity Units

NM = Not Measured

ERR = Equipment error (e.g. ice, sensor drift, calibration interference, etc.)

Table 2b
Operations, Maintenance and Monitoring
Water Quality Parameters
SW-3-IP (Boston Edison Co. ROW)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Site ID	Date	Temperature (^0C)	Dissolved Oxygen (mg/l)	pH	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
SW-3-IP	01/11/18	NM	NM	NM	NM	NM	NM
	02/05/18	NM	NM	NM	NM	NM	NM
	03/19/18	NM	NM	NM	NM	NM	NM
	04/02/18	NM	NM	NM	NM	NM	NM
	05/08/18	NM	NM	NM	NM	NM	NM
	06/11/18	NM	NM	NM	NM	NM	NM
	07/02/18	NM	NM	NM	NM	NM	NM
	08/06/18	NM	NM	NM	NM	NM	NM
	09/04/18	NM	NM	NM	NM	NM	NM
	10/01/18	NM	NM	NM	NM	NM	NM
	12/04/18	NM	NM	NM	NM	NM	NM

Notes:

^oC = Degrees Celsius

mg/l = milligram per liter.

s.u. = standard units

mV = millivolts

µS/cm = microSiemens per centimeter

NTU = Nephelometric Turbidity Units

NM = Not Measured

NR = Not recorded

Table 2c
Operations, Maintenance and Monitoring
Water Quality Parameters
Remote Monitoring N0. 11 (RM11)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Site ID	Date	Temperature (^{0}C)	Dissolved Oxygen (mg/l)	pH	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
RM-11	01/11/18	2.4	11.6	7.0	80.3	1,706	10.7
	01/23/18	2.3	12.4	7.0	75.4	1,390	5.3
	02/05/18	3.3	11.4	6.9	146.3	1,904	8.3
	02/20/18	7.8	11.7	6.9	83.0	1,479	8.5
	03/20/18	4.0	11.6	7.1	102.3	1,451	ERR
	03/27/18	5.1	11.8	7.0	100.1	1,453	0.0
	04/02/18	7.1	10.4	7.0	110.7	1,424	2.1
	04/19/18	6.8	10.4	6.8	135.3	900	4.0
	05/02/18	19.2	8.2	6.8	90.7	1,122	7.6
	05/08/18	18.3	8.5	6.8	143.3	1,153	0.9
	05/14/18	14.9	11.8	7.0	115.1	1,257	4.1
	05/21/18	21.9	7.9	7.2	146.8	1,180	11.2
	05/31/18	19.3	8.4	7.0	114.9	1,397	6.9
	06/05/18	16.1	7.4	6.9	138.2	1,254	6.7
	06/11/18	19.8	6.8	6.8	170.4	1,428	6.4
	06/18/18	20.7	7.3	6.8	100.1	1,504	15.8
	06/25/18	19.5	6.2	6.7	156.1	1,123	19.4
	07/03/18	24.1	6.5	6.7	116.2	1,070	4.4
	07/09/18	22.7	7.3	6.7	82.5	1,314	14.6
	07/12/18	23.6	7.5	6.8	161.9	1,335	12.7
	07/16/18	23.3	7.2	6.8	172.2	1,423	10.8
	07/19/18	21.7	7.4	6.7	153.8	814	3.1
	07/23/18	23.0	7.2	6.7	184.7	1,057	3.9
	07/26/18	25.1	6.5	6.6	148.4	836	5.9
	07/30/18	23.8	7.7	7.0	172.7	1,048	2.7
	08/02/18	24.6	7.5	6.8	165.2	1,192	5.1
	08/06/18	31.6	7.5	7.4	139.4	1,209	4.8
	08/09/18	24.4	7.2	6.9	130.6	1,198	5.4
	08/13/18	20.7	7.4	7.3	146.6	642	11.2
	08/16/18	23.7	7.4	7.0	138.9	780	3.4
	08/20/18	20.5	7.4	7.3	152.3	927	4.3
	08/23/18	20.3	8.7	7.8	168.9	717	3.8
	08/28/18	23.4	7.2	6.8	185.1	1,236	9.4
	08/30/18	24.7	7.7	6.7	203.3	1,307	5.6
	09/04/18	28.4	8.8	6.9	92.3	1,152	5.1
	09/06/18	24.1	8.0	6.6	170.7	1,298	13.5
	09/10/18	18.2	8.0	6.8	163.7	1,340	9.3
	09/13/18	19.2	8.0	6.7	155.6	674	4.9
	09/17/18	20.3	8.5	6.9	200.4	1,022	5.0

Table 2c
Operations, Maintenance and Monitoring
Water Quality Parameters
Remote Monitoring N0. 11 (RM11)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Site ID	Date	Temperature (^{0}C)	Dissolved Oxygen (mg/l)	pH	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
RM-11 *(Cont'd)*	09/20/18	17.9	8.3	6.9	156.3	664	4.8
	09/24/18	14.9	8.8	6.8	169.0	1,045	6.4
	09/27/18	18.7	8.3	7.1	143.8	522	7.5
	10/01/18	16.2	8.2	6.8	94.8	967	1.8
	10/04/18	15.7	9.6	6.9	94.0	912	1.4
	10/08/18	15.3	8.6	6.8	102.6	1,204	1.9
	10/11/18	17.4	7.8	6.7	106.8	1,232	3.8
	10/15/18	10.8	8.9	6.8	100.6	1,089	1.6
	10/18/18	8.8	10.4	7.0	106.5	1,203	3.8
	10/22/18	9.7	11.3	7.3	78.6	1,236	6.9
	10/25/18	8.0	13.2	6.9	105.9	1,203	5.3
	10/29/18	9.1	11.8	6.8	103.6	1,089	4.9
	11/01/18	10.3	11.2	6.9	84.2	1,031	2.0
	11/05/18	9.0	10.6	7.0	114.1	764	2.5
	11/08/18	8.6	10.5	6.9	127.2	792	3.1
	11/12/18	5.6	11.9	7.0	108.7	813	1.9
	11/15/18	4.1	11.7	7.0	100.8	804	3.5
	11/19/18	3.9	11.7	6.9	100.6	944	6.2
	11/21/18	3.5	13.2	6.8	125.9	948	7.7
	11/26/18	5.0	11.4	6.9	106.8	1,218	10.8
	11/29/18	4.9	12.2	7.0	106.6	965	6.2
	12/03/18	8.2	11.1	6.9	133.3	923	9.1
	12/04/18	5.4	11.6	6.9	125.5	921	3.0
	12/10/18	2.4	11.9	7.0	85.1	1,175	2.8
	12/13/18	2.3	11.9	6.9	62.4	1,206	5.6
	12/17/18	3.0	11.8	6.9	128.3	783	7.7
	12/20/18	3.4	11.7	6.8	100.6	1,070	12.4
	12/27/18	2.2	12.8	6.9	109.3	1,120	5.7
	12/31/18	3.5	13.7	6.9	87.2	1,086	8.9

Notes:

^{o}C = Degrees Celsius

mg/l = milligram per liter.

s.u. = standard units

mV = millivolts

µS/cm = microSiemens per centimeter

NTU = Nephelometric Turbidity Units

NM = Not Measured

ERR = Equipment error (e.g. ice, sensor drift, calibration interference, etc.)

Table 2d
Operations, Maintenance and Monitoring
Water Quality Parameters
SW-01-TT (Halls Brook)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Site ID	Date	Temperature (^{0}C)	Dissolved Oxygen (mg/l)	pH	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
SW-01-TT	01/11/18	NM	NM	NM	NM	NM	NM
	02/05/18	3.0	10.8	6.9	168.7	1,815	3.8
	03/19/18	4.3	11.8	7.1	146.5	1,335	ERR
	04/02/18	6.6	10.9	7.2	164.6	1,250	2.3
	05/08/18	17.3	8.9	7.2	177.1	1,076	ERR
	06/11/18	17.1	7.2	7.1	194.5	1,309	8.7
	07/02/18	22.5	6.0	7.1	231.0	1,177	ERR
	08/06/18	23.5	6.7	7.3	161.4	1,105	8.2
	09/04/18	22.7	9.3	7.3	104.9	1,155	27.6
	10/01/18	14.8	7.8	7.0	87.8	993	3.5
	12/04/18	5.3	10.8	6.9	136.9	838	2.1

Notes:

^{o}C = Degrees Celsius

mg/l = milligram per liter

s.u. = standard units

mV = millivolts

µS/cm = microSiemens per centimeter

NTU = Nephelometric Turbidity Units

NM = Not Measured

ERR = Equipment error (e.g. ice, sensor drift, calibration interference, etc.)

Table 2e
Operations, Maintenance and Monitoring
Water Quality Parameters
SW-02-TT (HBHA Pond Outlet)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Site ID	Date	Temperature (^{0}C)	Dissolved Oxygen (mg/l)	pH	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
SW-02-TT	01/11/18	1.9	13.7	7.3	150.0	1,815	10.3
	01/15/18	0.4	12.7	6.7	133.4	1,167	6.7
	01/23/18	2.6	14.7	7.2	120.8	1,434	6.8
	02/05/18	2.6	13.6	7.1	181.8	1,934	8.1
	02/12/18	2.5	12.9	6.7	158.1	1,411	9.7
	02/20/18	5.8	13.2	7.2	148.1	1,467	8.7
	03/05/18	4.5	12.0	6.7	195.4	1,034	3.6
	03/19/18	2.8	12.5	7.2	148.0	1,542	ERR
	03/27/18	6.0	12.5	7.1	153.5	1,535	1.6
	04/02/18	8.9	10.4	7.2	194.9	1,414	2.4
	04/19/18	8.5	11.0	6.9	184.9	870	3.3
	05/02/18	15.0	10.0	7.1	154.7	1,085	15.8
	05/08/18	16.7	8.6	7.0	177.2	844	9.9
	05/14/18	15.0	11.3	7.1	162.3	1,274	5.2
	05/21/18	19.2	8.3	7.1	187.7	1,186	0.5
	05/31/18	18.7	8.8	7.0	179.8	1,368	6.7
	06/05/18	17.6	7.8	7.0	176.6	1,322	6.4
	06/11/18	19.0	8.3	7.1	170.5	1,342	1.9
	06/18/18	20.7	7.9	7.0	141.2	1,489	6.5
	06/25/18	20.9	7.5	7.0	177.7	1,448	7.0
	07/02/18	26.4	8.2	7.1	263.7	901	ERR
	07/09/18	24.2	7.3	7.1	183.9	1,183	4.2
	07/12/18	24.3	8.3	7.0	211.7	1,246	4.4
	07/16/18	24.3	8.2	7.1	194.7	1,392	4.6
	07/19/18	23.2	6.7	6.7	173.5	798	5.5
	07/23/18	23.0	6.4	6.7	191.0	966	3.7
	07/26/18	24.5	7.0	6.8	171.9	1,049	6.9
	07/30/18	24.3	7.2	6.9	182.3	978	6.5
	08/02/18	24.4	6.3	6.7	175.8	1,067	4.3
	08/06/18	28.3	7.5	7.1	151.7	1,227	0.8
	08/09/18	26.0	7.6	6.8	141.1	1,254	3.0
	08/13/18	21.7	7.2	6.6	161.4	416	5.4
	08/16/18	22.6	7.2	6.7	155.4	663	4.7
	08/20/18	22.5	6.0	6.8	172.1	884	5.0
	08/23/18	20.8	7.0	6.7	191.3	853	9.0
	08/28/18	22.8	7.9	6.7	204.0	1,054	5.1
	08/30/18	25.0	8.3	6.9	216.8	1,165	3.8
	09/04/18	27.0	9.5	7.1	79.7	1,012	1.0
	09/06/18	24.5	9.1	6.9	179.1	1,241	2.6
	09/10/18	20.4	7.5	6.8	157.6	1,311	8.2
	09/13/18	18.7	7.9	6.5	206.5	705	7.2

Table 2e
Operations, Maintenance and Monitoring
Water Quality Parameters
SW-02-TT (HBHA Pond Outlet)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Site ID	Date	Temperature (^{0}C)	Dissolved Oxygen (mg/l)	pH	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
SW-02-TT *(Cont'd)*	09/17/18	20.5	8.2	6.7	232.4	856	4.4
	09/20/18	19.4	7.6	6.6	170.3	487	4.7
	09/24/18	17.2	7.7	6.8	196.2	887	8.0
	09/27/18	18.5	7.4	6.7	153.6	523	9.0
	10/01/18	16.8	7.7	6.9	120.3	769	3.1
	10/04/18	15.2	8.5	6.7	132.2	910	3.9
	10/08/18	15.7	7.7	6.8	125.7	1,067	5.5
	10/11/18	17.0	7.9	6.8	123.3	1,196	5.7
	10/15/18	13.0	8.1	6.8	126.5	947	2.4
	10/18/18	11.5	9.4	7.0	137.5	1,140	7.8
	10/22/18	10.5	8.4	7.1	96.1	1,192	6.8
	10/25/18	9.1	10.7	7.0	126.9	1,246	10.3
	10/29/18	9.0	9.9	6.8	127.9	795	2.1
	10/31/18	8.6	10.0	6.6	204.1	993	5.9
	11/01/18	8.8	11.3	6.9	133.8	982	5.8
	11/05/18	10.0	9.8	7.0	146.5	602	2.8
	11/07/18	9.8	9.4	6.9	123.4	635	1.7
	11/08/18	9.8	9.3	7.0	156.0	709	2.7
	11/12/18	6.1	10.6	6.9	148.9	657	2.7
	11/14/18	6.2	10.3	6.5	170.1	533	2.3
	11/15/18	4.2	11.4	7.0	133.3	668	0.6
	11/19/18	4.6	11.0	6.8	135.1	857	3.9
	11/21/18	3.9	12.1	6.9	128.7	862	4.5
	11/26/18	4.2	11.2	6.8	125.2	1,027	3.9
	11/27/18	5.3	10.8	6.9	119.5	587	9.1
	11/29/18	4.8	10.9	6.8	135.1	720	2.0
	12/03/18	6.7	10.0	6.8	134.4	706	2.3
	12/04/18	6.2	11.8	7.2	146.9	922	9.5
	12/10/18	2.5	13.2	7.1	144.1	1,109	6.5
	12/13/18	2.8	13.3	7.1	113.6	1,159	5.6
	12/17/18	3.2	11.8	6.9	130.6	851	8.6
	12/20/18	2.3	13.4	7.0	105	981	10.7
	12/21/18	5.8	12.9	6.8	153.9	994	15.3
	12/27/18	2.5	12.9	7.0	104.2	970	6.9
	12/28/18	4.7	11.4	6.6	168.8	997	23.9
	12/31/18	3.5	13.3	7.0	104.2	994	4.6

Notes:

^{o}C = Degrees Celsius

mg/l = milligram per liter.

s.u. = standard units

mV = millivolts

µS/cm = microSiemens per centimeter

NTU = Nephelometric Turbidity Units

NM = Not Measured

ERR = Equipment error (e.g. ice, sensor drift, calibration interference, etc.)

Table 2f

Operations, Maintenance and Monitoring

Water Quality Parameters

SW-03-TT (Aberjona)

Industri-plex Superfund Site Operable Unit 2

Woburn, Massachusetts

Site ID	Date	Temperature (^{0}C)	Dissolved Oxygen (mg/l)	pH	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
SW-03-TT	01/11/18	NM	NM	NM	NM	NM	NM
	02/05/18	2.7	10.9	6.9	139.9	1,495	8.0
	03/19/18	3.3	11.7	7.1	96.0	1,754	ERR
	04/02/18	7.1	9.3	7.0	96.9	1,599	0.0
	05/08/18	16.9	7.9	6.9	76.1	1,310	ERR
	06/11/18	17.3	5.3	6.9	116.5	1,658	1.7
	07/02/18	23.1	4.7	7.0	102.1	1,295	ERR
	08/06/18	24.1	4.0	6.8	120.1	750	ERR
	09/04/18	23.4	4.9	6.7	59.4	1,414	0.2
	10/01/18	16.7	5.9	6.8	67.0	1,145	0.6
	12/04/18	5.7	11.0	7.1	112.7	902	0.6

Notes:

^{o}C = Degrees Celsius

mg/l = milligram per liter.

s.u. = standard units

mV = millivolts

µS/cm = microSiemens per centimeter

NTU = Nephelometric Turbidity Units

NM = Not Measured

ERR = Equipment error (e.g. ice, sensor drift, calibration interference, etc.)

Table 2g
Operations, Maintenance and Monitoring
Water Quality Parameters
SW-04-TT (HBHA Wetland Outlet)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Site ID	Date	Temperature (^{0}C)	Dissolved Oxygen (mg/l)	pH	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
SW-04-TT	01/11/18	1.8	11.3	7.0	72.5	1,846	5.7
	01/23/18	2.4	13.4	6.9	127.1	1,446	13.7
	02/05/18	2.9	11.8	7.1	162.7	1,877	6.0
	02/20/18	6.0	12.1	7.1	118.7	1,443	9.7
	03/19/18	2.4	12.3	7.1	98.9	1,580	3.1
	03/27/18	4.5	11.6	6.9	115.6	1,570	1.7
	04/02/18	6.8	9.5	7.0	117.4	1,421	6.4
	04/19/18	7.4	10.3	6.8	152.1	802	4.4
	05/02/18	16.9	9.9	6.8	106.4	1,091	11.1
	05/08/18	18.0	8.9	7.0	144.0	1,159	6.1
	05/14/18	16.5	11.2	6.9	105.3	1,280	3.9
	05/21/18	22.8	11.0	7.0	215.5	1,192	1.4
	05/31/18	18.5	6.3	6.8	103.6	1,379	7.2
	06/05/18	19.5	8.3	6.9	174.4	1,338	2.8
	06/11/18	20.4	7.8	7.0	173.7	1,383	2.7
	06/18/18	19.7	6.1	6.6	133.9	1,494	5.2
	06/25/18	21.0	5.8	6.7	167.7	1,245	6.7
	07/02/18	27.1	10.1	7.5	201.4	933	ERR
	07/09/18	25.7	13.2	8.4	180.5	1,181	2.8
	07/12/18	21.5	9.8	7.1	192.3	1,281	1.1
	07/16/18	23.1	9.0	6.9	162.8	1,237	1.6
	07/19/18	20.2	6.1	6.5	178.6	875	1.9
	07/23/18	23.0	4.3	6.5	151.0	937	0.2
	07/26/18	25.2	8.5	6.6	188.7	950	4.1
	07/30/18	21.7	5.7	6.5	183.2	1,038	ERR
	08/02/18	23.5	3.1	6.5	179.4	1,089	1.2
	08/06/18	28.6	11.2	7.3	151.0	1,260	ERR
	08/09/18	25.0	3.7	6.6	115.7	1,127	1.0
	08/13/18	21.4	3.8	6.3	144.9	462	2.5
	08/16/18	22.1	4.4	6.3	121.7	713	1.5
	08/20/18	21.0	2.4	6.4	134.1	928	1.4
	08/23/18	20.2	3.6	6.4	159.7	890	2.9
	08/28/18	22.9	4.4	6.4	129.7	1,043	2.9
	08/30/18	25.0	3.9	6.5	168.9	1,215	ERR
	09/04/18	29.4	10.1	7.3	104.5	994	2.1
	09/06/18	23.8	4.5	6.5	142.2	1,271	0.6
	09/10/18	15.6	6.4	6.5	110.3	1,335	13.3
	09/13/18	18.8	5.8	6.2	162.8	636	3.7
	09/17/18	20.1	5.5	6.4	149.2	878	1.8

Table 2g
Operations, Maintenance and Monitoring
Water Quality Parameters
SW-04-TT (HBHA Wetland Outlet)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Site ID	Date	Temperature (^0C)	Dissolved Oxygen (mg/l)	pH	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
SW-04-TT *(Cont'd)*	09/20/18	18.3	4.8	6.4	153.1	492	2.5
	09/24/18	14.8	5.8	6.7	130.2	892	3.9
	09/27/18	18.1	4.8	6.3	153.7	530	6.9
	10/01/18	16.6	6.5	6.8	97.5	821	2.3
	10/04/18	15.1	4.6	6.5	146.5	923	0.4
	10/08/18	15.3	5.1	6.6	110.1	1,053	0.3
	10/11/18	17.3	3.2	6.5	119.1	1,193	2.4
	10/15/18	11.0	5.6	6.6	114.4	924	2.2
	10/18/18	8.2	6.9	6.7	113.5	1,126	2.3
	10/22/18	7.2	9.0	6.8	100.5	1,196	4.3
	10/25/18	6.9	8.2	6.8	103.5	1,255	5.1
	10/29/18	8.8	7.5	6.6	98.6	781	6.7
	11/01/18	9.3	7.6	6.6	120.4	971	14.5
	11/05/18	9.2	7.6	6.7	155.5	573	0.9
	11/08/18	8.8	7.0	6.6	148.2	697	5.0
	11/12/18	5.3	9.2	6.5	132.3	658	7.8
	11/15/18	3.6	10.0	6.5	145.2	642	ERR
	11/19/18	4.5	9.7	6.5	128.4	913	6.5
	11/21/18	3.5	11.0	6.5	142.7	856	3.1
	11/26/18	4.0	10.2	6.6	130.4	1,065	2.9
	11/29/18	4.1	9.6	6.5	220.0	679	1.2
	12/03/18	6.5	8.9	6.5	183.7	707	1.8
	12/04/18	5.7	9.7	7.2	450.1	808	5.2
	12/10/18	1.2	11.7	6.7	101.2	1,114	8.7
	12/13/18	0.8	12.1	6.7	50.6	1,186	29.5
	12/17/18	3.4	11.6	6.7	172.1	1,013	8.9
	12/20/18	1.1	11.5	6.5	109.8	997	26.8
	12/27/18	1.7	11.4	6.8	73.0	999	4.7
	12/31/18	2.4	12.9	6.6	69.1	1,000	5.7

Notes:

^oC = Degrees Celsius

mg/l = milligram per liter.

s.u. = standard units

mV = millivolts

µS/cm = microSiemens per centimeter

NTU = Nephelometric Turbidity Units

NM = Not Measured

ERR = Equipment error (e.g. ice, sensor drift, calibration interference, etc.)

Table 2h
Operations, Maintenance and Monitoring
Water Quality Parameters
SW-05-TT (Salem Street)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Site ID	Date	Temperature (^{0}C)	Dissolved Oxygen (mg/l)	pH	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
SW-05-TT	01/11/18	0.2	10.4	6.9	65.0	1,862	4.5
	02/05/18	2.5	11.3	7.0	152.8	1,750	8.5
	03/19/18	2.0	11.9	7.0	89.2	1,694	ERR
	04/02/18	6.7	9.4	7.0	88.8	1,535	0.3
	05/08/18	16.5	8.3	6.9	89.9	1,260	1.2
	06/11/18	19.0	8.2	7.1	143.0	1,426	3.3
	07/02/18	25.5	10.1	7.5	232.9	1,173	ERR
	08/06/18	26.9	8.9	7.3	154.7	1,416	3.0
	09/04/18	27.6	8.2	7.1	80.8	1,231	8.3
	10/01/18	16.4	7.3	6.9	81.2	1,011	1.4
	12/04/18	5.6	11.5	7.1	130.0	942	4.3

Notes:

^{o}C = Degrees Celsius

mg/l = milligram per liter.

s.u. = standard units

mV = millivolts

µS/cm = microSiemens per centimeter

NTU = Nephelometric Turbidity Units

NM = Not Measured

ERR = Equipment error (e.g. ice, sensor drift, calibration interference, etc.)

Table 2i
Operations, Maintenance and Monitoring
Water Quality Parameters
SW-06-TT (Montvale Ave)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Site ID	Date	Temperature (^{0}C)	Dissolved Oxygen (mg/l)	pH	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
SW-06-TT	01/11/18	NM	NM	NM	NM	NM	NM
	02/05/18	2.0	11.3	7.0	174.6	1,667	10.6
	03/19/18	0.8	12.2	7.0	110.9	1,734	ERR
	04/02/18	6.3	9.6	6.9	143.0	1,550	ERR
	05/08/18	14.1	8.3	7.0	152.5	1,282	0.9
	06/11/18	16.7	6.3	6.9	152.2	1,539	7.9
	07/02/18	22.6	5.3	6.9	134.8	1,203	12.0
	08/06/18	23.3	5.5	6.9	144.5	1,377	0.9
	09/04/18	23.5	7.1	7.1	74.2	1,206	1.5
	10/01/18	15.5	7.7	7.0	106.4	1,077	4.1
	12/04/18	5.6	11.4	7.2	134.7	948	2.4

Notes:

^{o}C = Degrees Celsius

mg/l = milligram per liter.

s.u. = standard units

mV = millivolts

µS/cm = microSiemens per centimeter

NTU = Nephelometric Turbidity Units

NM = Not Measured

ERR = Equipment error (e.g. ice, sensor drift, calibration interference, etc.)

Table 2j
Operations, Maintenance and Monitoring
Water Quality Parameters
SW-07-TT (Swanton Street)
Industri-plex Superfund Site Operable Unit 2
Woburn, Massachusetts

Site ID	Date	Temperature (^{0}C)	Dissolved Oxygen (mg/l)	pH	ORP (mV)	Specific Conductance (µS/cm)	Turbidity (NTU)
SW-07-TT	01/11/18	NM	NM	NM	NM	NM	NM
	02/05/18	2.7	11.4	7.0	174.6	1,596	19.0
	03/19/18	1.6	12.1	6.8	123.7	1,625	ERR
	04/02/18	6.6	10.1	6.8	187.3	1,445	ERR
	05/08/18	16.7	8.6	7.0	177.2	844	9.9
	06/11/18	17.2	6.9	6.7	134.1	1,318	6.3
	07/02/18	22.8	5.8	6.8	145.6	1,139	ERR
	08/06/18	23.3	6.1	6.6	158.6	1,198	0.9
	09/04/18	22.8	7.4	6.9	89.7	1,089	1.2
	10/01/18	15.7	8.3	6.9	98.9	1,056	0.9
	12/04/18	6.0	11.4	7.2	118.7	914	1.5

Notes:

^{o}C = Degrees Celsius

mg/l = milligram per liter.

s.u. = standard units

mV = millivolts

µS/cm = microSiemens per centimeter

NTU = Nephelometric Turbidity Units

NM = Not Measured

ERR = Equipment error (e.g. ice, sensor drift, calibration interference, etc.)

AMBIENT WATER QUALITY CRITERIA

AMMONIA CALCULATIONS

COMPLIANCE POINT - STATION SW-02-TT

TABLE 3
AMMONIA TREATMENT DATA AWQC
INDUSTRI-PLEX OPERABLE UNIT 2 SUPERFUND SITE
WOBURN, MASSACHUSETTS

Date	Sample Location	Ammonia (mg/L)	Temp. (°C)	pH Lab Measurement	pH YSI - Field	Compare to	Min Factor	Point NRWQCCC	Point Quotient	Quotient 30-day Trailing Running Average (unitless)	Quotient 4-day Trailing Running Average (unitless)	System Status
01/11/18	SW-02-TT	9.04	1.9	--	7.3	2.85	2.85	5.08	1.78	1.52	1.78	Aeration System Op.
01/14/18	SW-02-TT	3.36	1.5	--	7.3	2.85	2.85	5.14	0.65	1.23	1.22	Aeration System Op.
01/15/18	SW-02-TT	1.54	0.4	--	6.7	2.85	2.85	6.42	0.24	0.98	0.45	Aeration System Op.
01/23/18	SW-02-TT	5.15	2.6	--	7.2	2.85	2.85	5.53	0.93	0.90	0.93	Aeration System Op.
02/05/18	SW-02-TT	4.43	2.6	--	7.1	2.85	2.85	5.72	0.77	0.88	0.77	Aeration System Op.
02/12/18	SW-02-TT	2.27	2.5	--	6.7	2.85	2.85	6.46	0.35	0.59	0.35	Aeration System Op.
02/20/18	SW-02-TT	4.18	5.8	--	7.2	2.85	2.85	5.45	0.77	0.71	0.77	Aeration System Op.
03/05/18	SW-02-TT	1.66	4.5	--	6.7	2.85	2.85	6.47	0.26	0.54	0.26	Aeration System Op.
03/19/18	SW-02-TT	3.23	2.8	--	7.2	2.85	2.85	5.39	0.60	0.54	0.60	Aeration System Op.
03/27/18	SW-02-TT	2.80	5.1	--	7.0	2.85	2.85	5.91	0.47	0.44	0.47	Aeration System Op.
04/02/18	SW-02-TT	3.34	8.9	--	7.2	2.85	2.85	5.33	0.63	0.49	0.63	Aeration System Op.
04/19/18	SW-02-TT	1.27	8.5	--	6.9	2.85	2.85	6.08	0.21	0.44	0.21	Aeration System Op.
05/02/18	SW-02-TT	2.00	15.0	--	7.1	2.85	2.76	5.58	0.36	0.28	0.36	Aeration System Op.
05/08/18	SW-02-TT	2.21	16.7	--	7.0	2.85	2.47	5.08	0.43	0.33	0.43	Aeration System Op.
05/14/18	SW-02-TT	2.28	15.0	--	7.1	2.85	2.75	5.48	0.42	0.35	0.42	Aeration System Op.
05/21/18	SW-02-TT	2.43	19.2	--	7.1	2.85	2.11	4.27	0.57	0.44	0.57	Aeration System Op.
05/31/18	SW-02-TT	2.76	18.7	--	7.0	2.85	2.18	4.51	0.61	0.48	0.61	Aeration System Op.
06/05/18	SW-02-TT	2.45	17.6	--	7.0	2.85	2.33	4.90	0.50	0.51	0.50	Aeration System Op.
06/11/18	SW-02-TT	2.66	19.0	--	7.1	2.85	2.14	4.18	0.64	0.55	0.64	Aeration System Op.
06/18/18	SW-02-TT	3.02	20.7	--	7.0	2.85	1.91	4.00	0.75	0.61	0.75	Aeration System Op.
06/25/18	SW-02-TT	3.12	20.9	--	7.0	2.85	1.89	4.00	0.78	0.66	0.78	Aeration System Op.
07/02/18	SW-02-TT	1.15	26.4	--	7.1	2.85	1.32	2.62	0.44	0.62	0.44	Aeration System Op.
07/09/18	SW-02-TT	1.61	22.7	--	6.7	2.85	1.69	3.80	0.42	0.61	0.42	Aeration System Op.
07/12/18	SW-02-TT	1.44	24.3	--	7.0	2.85	1.52	3.10	0.46	0.57	0.44	Aeration System Op.
07/16/18	SW-02-TT	1.15	24.3	--	7.1	2.85	1.52	3.07	0.37	0.54	0.37	Aeration System Op.
07/19/18	SW-02-TT	0.98	23.2	--	6.7	2.85	1.63	3.69	0.27	0.46	0.32	Aeration System Op.
07/23/18	SW-02-TT	0.81	23.0	--	6.4	2.85	1.65	3.91	0.21	0.42	0.21	Aeration System Op.
07/26/18	SW-02-TT	1.48	24.5	--	6.8	2.85	1.50	3.34	0.44	0.37	0.32	Aeration System Op.
07/30/18	SW-02-TT	0.97	24.3	--	6.9	2.85	1.51	3.30	0.29	0.36	0.29	Aeration System Op.
08/02/18	SW-02-TT	1.01	24.4	--	6.7	2.85	1.51	3.39	0.30	0.35	0.30	Aeration System Op.
08/06/18	SW-02-TT	1.42	28.3	--	7.1	2.85	1.17	2.34	0.61	0.38	0.61	Aeration System Op.
08/09/18	SW-02-TT	1.55	26.0	--	6.8	2.85	1.36	2.98	0.52	0.39	0.56	Aeration System Op.
08/13/18	SW-02-TT	0.65	21.7	--	6.6	2.85	1.80	4.17	0.16	0.35	0.16	Aeration System Op.
08/16/18	SW-02-TT	0.86	22.6	--	6.7	2.85	1.69	3.83	0.22	0.34	0.19	Aeration System Op.
08/20/18	SW-02-TT	1.53	22.5	--	6.8	2.85	1.70	3.79	0.40	0.35	0.40	Aeration System Op.
08/23/18	SW-02-TT	2.09	20.8	--	6.7	2.85	1.90	4.28	0.49	0.38	0.45	Aeration System Op.
08/28/18	SW-02-TT	1.20	22.8	--	6.7	2.85	1.67	3.79	0.32	0.37	0.32	Aeration System Op.
08/30/18	SW-02-TT	0.91	25.0	--	6.9	2.85	1.45	3.11	0.29	0.37	0.30	Aeration System Op.
09/04/18	SW-02-TT	1.17	27.0	--	7.1	2.85	1.28	2.53	0.46	0.39	0.46	Aeration System Op.
09/06/18	SW-02-TT	1.22	24.5	--	6.9	2.85	1.49	3.20	0.38	0.36	0.42	Aeration System Op.
09/10/18	SW-02-TT	1.33	20.4	--	6.8	2.85	1.95	4.31	0.31	0.34	0.31	Aeration System Op.
09/13/18	SW-02-TT	0.95	18.8	--	6.2	2.85	2.16	5.21	0.18	0.34	0.25	Aeration System Op.
09/17/18	SW-02-TT	1.08	20.5	--	6.7	2.85	1.94	4.40	0.25	0.34	0.25	Aeration System Op.

TABLE 3
AMMONIA TREATMENT DATA AWQC
INDUSTRI-PLEX OPERABLE UNIT 2 SUPERFUND SITE
WOBURN, MASSACHUSETTS

Date	Sample Location	Ammonia (mg/L)	Temp. (°C)	pH Lab Measurement	pH YSI - Field	Compare to	Min Factor	Point NRWQCCC	Point Quotient	Quotient 30-day Trailing Running Average (unitless)	Quotient 4-day Trailing Running Average (unitless)	System Status
09/20/18	SW-02-TT	0.47	19.4	--	6.6	2.85	2.07	4.73	0.10	0.31	0.17	Aeration System Op.
09/24/18	SW-02-TT	1.42	17.2	--	6.8	2.85	2.39	5.33	0.27	0.28	0.27	Aeration System Op.
09/27/18	SW-02-TT	0.60	18.5	--	6.7	2.85	2.21	5.03	0.12	0.26	0.19	Aeration System Op.
10/01/08	SW-02-TT	1.22	16.8	--	6.9	2.85	2.45	5.20	0.23	0.23	0.23	Aeration System Op.
10/04/18	SW-02-TT	1.49	15.2	--	6.7	2.85	2.73	6.13	0.24	0.21	0.24	Aeration System Op.
10/08/18	SW-02-TT	2.35	15.7	--	6.8	2.85	2.63	5.86	0.40	0.22	0.40	Aeration System Op.
10/11/18	SW-02-TT	2.94	17.0	--	6.8	2.85	2.42	5.33	0.55	0.27	0.48	Aeration System Op.
10/15/18	SW-02-TT	2.01	10.8	--	6.8	2.85	2.85	6.28	0.32	0.28	0.32	Aeration System Op.
10/18/18	SW-02-TT	3.19	8.8	--	7.0	2.85	2.85	5.98	0.53	0.33	0.43	Aeration System Op.
10/22/18	SW-02-TT	4.30	9.7	--	7.3	2.85	2.85	5.01	0.86	0.41	0.86	Aeration System Op.
10/25/18	SW-02-TT	4.55	9.1	--	7.0	2.85	2.85	5.79	0.79	0.49	0.82	Aeration System Op.
10/29/18	SW-02-TT	1.50	9.0	--	6.8	2.85	2.85	6.31	0.24	0.49	0.24	Aeration System Op.
10/31/18	SW-02-TT	3.34	8.6	--	6.6	2.85	2.85	6.55	0.51	0.49	0.37	Aeration System Op.
11/01/18	SW-02-TT	3.53	8.8	--	6.9	2.85	2.85	6.14	0.58	0.50	0.44	Aeration System Op.
11/05/18	SW-02-TT	0.87	10.0	--	7.0	2.85	2.85	5.98	0.15	0.49	0.15	Aeration System Op.
11/07/18	SW-02-TT	0.98	9.8	--	6.9	2.85	2.85	6.06	0.16	0.47	0.15	Aeration System Op.
11/08/18	SW-02-TT	1.43	9.8	--	7.0	2.85	2.85	5.93	0.24	0.45	0.18	Aeration System Op.
11/12/18	SW-02-TT	1.29	6.1	--	6.9	2.85	2.85	6.08	0.21	0.42	0.21	Aeration System Op.
11/14/18	SW-02-TT	0.84	6.2	--	6.5	2.85	2.85	6.63	0.13	0.40	0.17	Aeration System Op.
11/15/18	SW-02-TT	1.08	4.2	--	7.0	2.85	2.85	6.02	0.18	0.38	0.17	Aeration System Op.
11/19/18	SW-02-TT	1.04	4.6	--	6.8	2.85	2.85	6.23	0.17	0.35	0.17	Aeration System Op.
11/21/18	SW-02-TT	1.39	3.9	--	6.9	2.85	2.85	6.19	0.22	0.30	0.20	Aeration System Op.
11/26/18	SW-02-TT	1.60	4.2	--	6.8	2.85	2.85	6.23	0.26	0.25	0.26	Aeration System Op.
11/27/18	SW-02-TT	1.16	5.3	--	6.9	2.85	2.85	6.21	0.19	0.25	0.22	Aeration System Op.
11/29/18	SW-02-TT	1.15	4.8	--	6.8	2.85	2.85	6.37	0.18	0.24	0.21	Aeration System Op.
12/03/18	SW-02-TT	1.18	6.7	--	6.8	2.85	2.85	6.31	0.19	0.19	0.19	Aeration System Op.
12/04/18	SW-02-TT	3.60	6.2	--	7.2	2.85	2.85	5.53	0.65	0.22	0.42	Aeration System Op.
12/10/18	SW-02-TT	3.40	2.5	--	7.1	2.85	2.85	5.69	0.60	0.27	0.60	Aeration System Op.
12/13/18	SW-02-TT	4.03	2.8	--	7.1	2.85	2.85	5.67	0.71	0.32	0.65	Aeration System Op.
12/17/18	SW-02-TT	2.19	3.2	--	6.9	2.85	2.85	6.08	0.36	0.35	0.36	Aeration System Op.
12/20/18	SW-02-TT	3.64	2.3	--	7.0	2.85	2.85	5.95	0.61	0.40	0.49	Aeration System Op.
12/21/18	SW-02-TT	3.04	5.8	--	6.8	2.85	2.85	6.31	0.48	0.42	0.55	Aeration System Op.
12/27/18	SW-02-TT	2.75	2.5	--	7.0	2.85	2.85	5.86	0.47	0.47	0.47	Aeration System Op.
12/28/18	SW-02-TT	4.51	4.7	--	6.6	2.85	2.85	6.59	0.68	0.49	0.58	Aeration System Op.
12/31/18	SW-02-TT	4.46	3.5	--	7.0	2.85	2.85	5.93	0.75	0.55	0.72	Aeration System Op.

Notes:

01/06/00	data entered
01/01/00	automatically calculated
▨	Laboratory data has not been received to date.
7.0	pH is greater than accuracy of sensors when field measurements are compared to lab measurement.

YSI pH sensor & pH lab meter accuracy is +/- 0.2 units.

🟨 = Sample collected by Roux as part of a storm sample event.

$$\mathrm{CCC} = \left(\frac{0.0577}{1 + 10^{7.688 - \mathrm{pH}}} + \frac{2.487}{1 + 10^{\mathrm{pH} - 7.688}} \right) \cdot \mathrm{MIN}\left(2.85,\ 1.45 \cdot 10^{0.028 \cdot (25 - T)}\right)$$

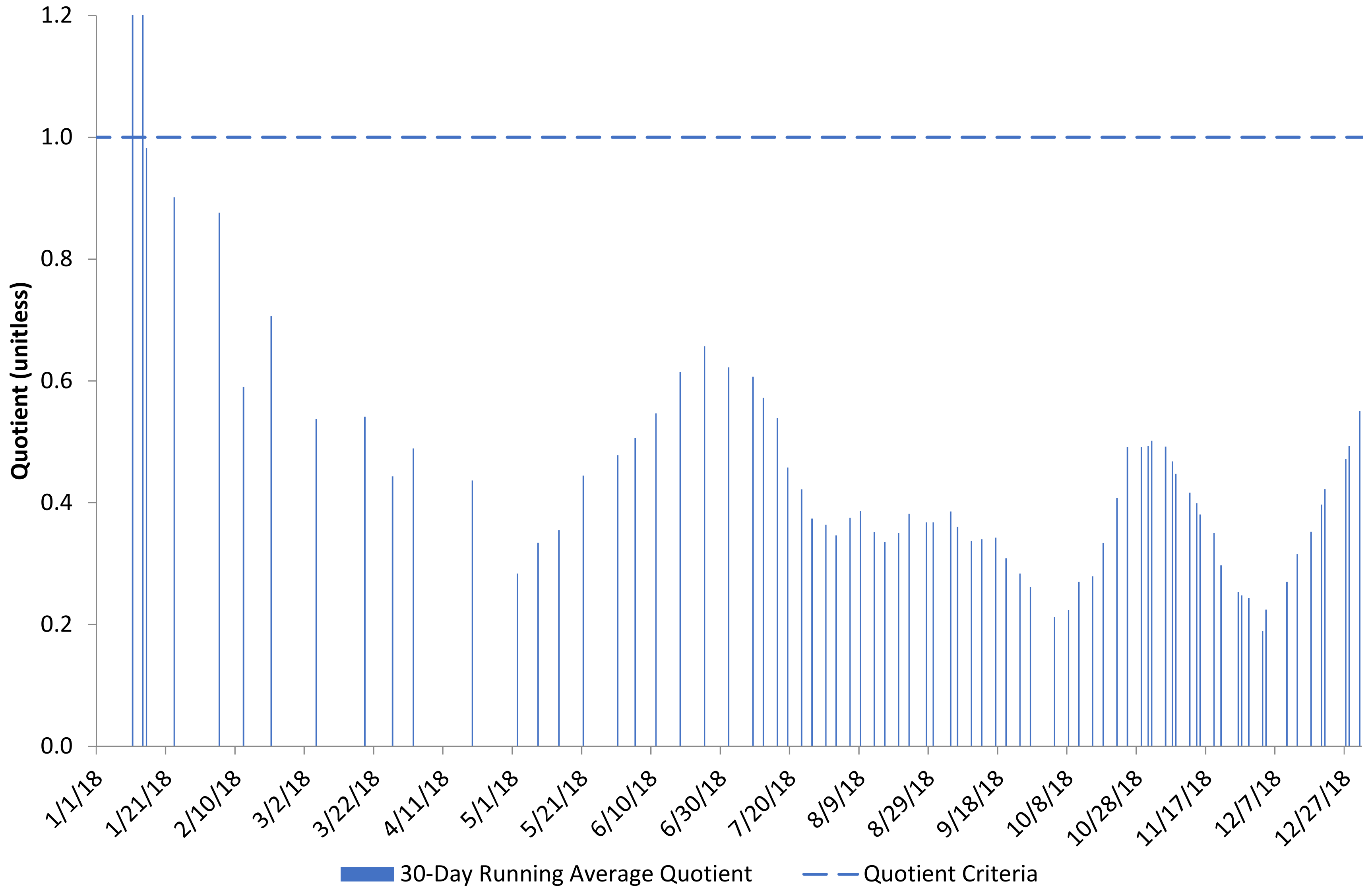
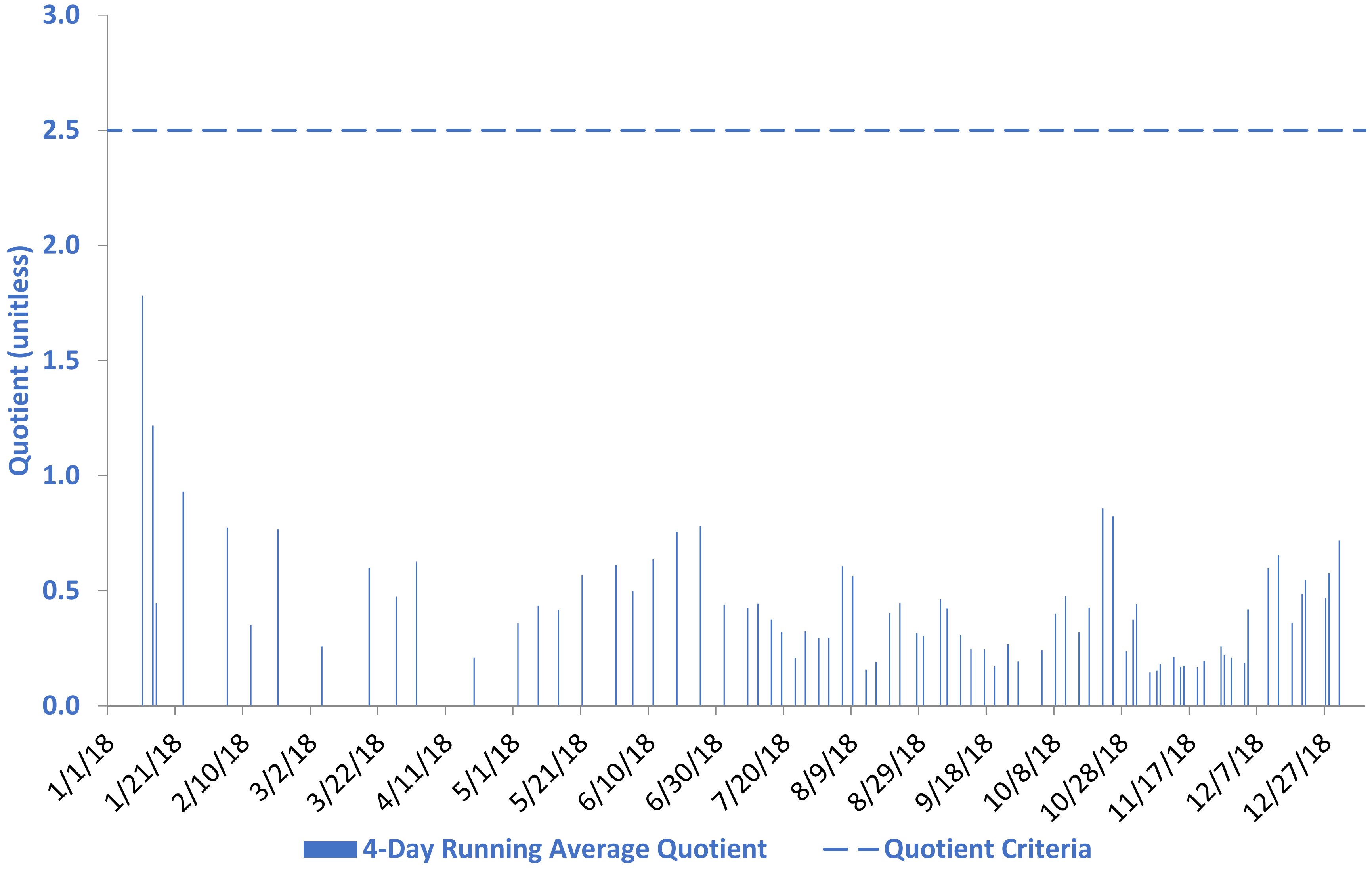


Figure 1 - AWQC Quotient
30-Day Running Average
Industri-Plex OU2

Figure 2- AWQC Quotient
4-Day Running Average
Industri-Plex OU2



O&M, INC.

1/8/2019

COMPLIANCE MONITORING

BENZENE RESULTS

COMPLIANCE POINT - SW-02-TT

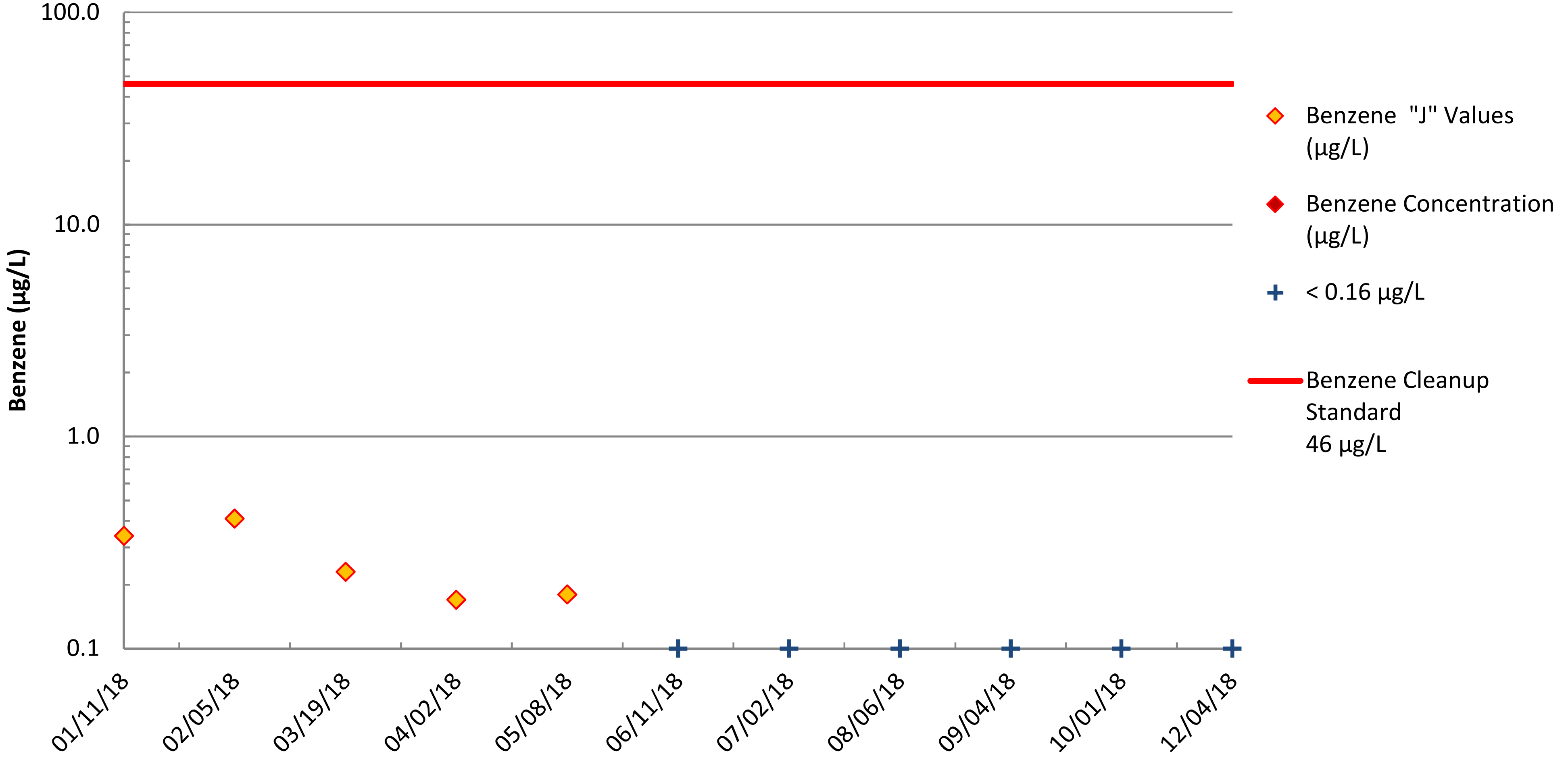


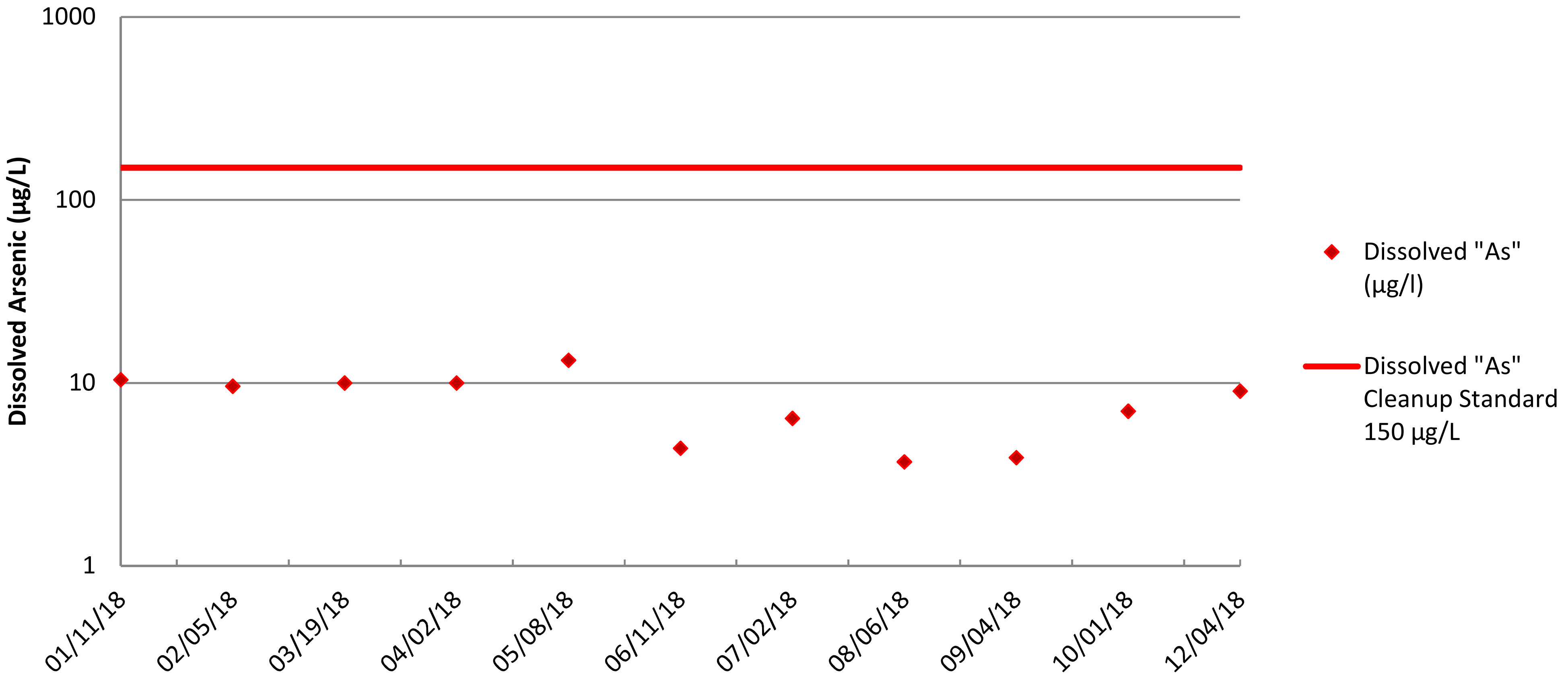
Figure 3 - Benzene Concentrations vs. Cleanup Standard
Surface Water (Baseflow) - SW-02-TT

COMPLIANCE MONITORING

DISSOLVED ARSENIC RESULTS

COMPLIANCE POINT - SW-02-TT

Figure 4 - Dissolved Arsensic Concentrations vs. Cleanup Standards
Surface Water (Baseflow) - SW-02-TT



ARSENIC FLUX CALCULATIONS

STATION SW-02-TT

Table 4 - Baseflow Arsenic Flux - SW-02-TT
Industri-plex (OU2) Superfund Site
Woburn, MA

SW-02-TT																				
					Total As "J_t"					Dissolved As "J_d"					Particulate As "J_p"					
Date	Total "As"	Dissolved "As"	Stage "SonTek" (Ft)	Flow Discharge "SonTek" (Ft^3/s)	Total As Flux "J_t" (kg/d)	"J_t" Geomean	"J_t" Median	"J_t" Min	"J_t" Max	Dissolved As Flux "J_d" (kg/d)	"J_d" Geomean	"J_d" Median	"J_d" Min	"J_d" Max	Particulate As Flux "J_p" (kg/d)	"J_p" Geomean	"J_p" Median	"J_p" Min	"J_p" Max	% Reduction
Baseline As Flux (6/09- 4/12)																				
2009-2012	--	--	--	--	--	0.16	--	--	--	--	0.07	--	--	--	--	0.07	--	--	--	
Operation Maintenance & Monitoring																				
01/11/18	0.036	0.010	1.30	3.37	0.29	0.15	0.17	0.08	0.29	0.09	0.05	0.05	0.02	0.09	0.21	0.09	0.08	0.05	0.21	2.0%
03/19/18	0.016	0.010	1.39	9.16	0.35	0.17	0.17	0.08	0.35	0.22	0.07	0.07	0.02	0.22	0.13	0.10	0.10	0.05	0.21	-12.1%
04/02/18	0.020	0.010	1.38	9.90	0.48	0.20	0.17	0.08	0.48	0.24	0.08	0.08	0.02	0.24	0.24	0.11	0.13	0.05	0.24	-30.2%
05/08/18	0.019	0.013	1.28	9.14	0.43	0.22	0.23	0.08	0.48	0.30	0.09	0.09	0.02	0.30	0.14	0.12	0.13	0.05	0.24	-42.7%
06/11/18	0.019	0.004	1.20	3.16	0.15	0.21	0.17	0.08	0.48	0.03	0.08	0.08	0.02	0.30	0.12	0.12	0.13	0.05	0.24	-36.4%
07/02/18	0.017	0.006	1.24	3.94	0.17	0.21	0.17	0.08	0.48	0.06	0.08	0.07	0.02	0.30	0.10	0.11	0.12	0.05	0.24	-33.5%
08/06/18	0.010	0.004	1.21	1.88	0.05	0.18	0.17	0.05	0.48	0.02	0.07	0.06	0.02	0.30	0.03	0.10	0.12	0.03	0.24	-16.7%
09/04/18	0.010	0.004	1.16	1.82	0.04	0.16	0.17	0.04	0.48	0.02	0.06	0.06	0.02	0.30	0.03	0.09	0.11	0.03	0.24	-3.9%
10/01/18	0.017	0.007	1.42	6.07	0.25	0.17	0.17	0.04	0.48	0.10	0.06	0.06	0.02	0.30	0.15	0.09	0.12	0.03	0.24	-7.9%
12/04/18	0.024	0.009	1.82	12.01	0.71	0.18	0.17	0.04	0.71	0.26	0.07	0.07	0.02	0.30	0.45	0.10	0.12	0.03	0.45	-19.9%

Notes:

SonTek stage and flow data that was recorded closest to actual baseflow surface water sample time was used.

Baseline As Flux Geomean data as included from Exhibit 2 of the June 2016, Operation Maintenance & Monitoring Plan.

NS = Not sampled

NM = Not measured

Table 5 - Storm Event Arsenic Flux - SW-02-TT
Industri-plex (OU2)
Woburn, MA

SW-02-TT																						
						Total As "J_t"						Dissolved As "J_d"						Particulate As "J_p"				
Date	Total "As"	Dissolved "As"	Precipitation (inches)	Storm Duration (hours)	Total Flow at 75% of Falling Limb (ft^3)	Vol x Total-As (ft^3 * mg/L)	Total As Flux "J_t" (kg/d)	"J_t" Geomean	"J_t" Median	"J_t" Min	"J_t" Max	Vol x Dissolved-As (ft^3 * mg/L)	Dissolved As Flux "J_d" (kg/d)	"J_d" Geomean	"J_d" Median	"J_d" Min	"J_d" Max	Particulate As Flux "J_p" (kg/d)	"J_p" Geomean	"J_p" Median	"J_p" Min	"J_p" Max
Baseline As Flux (Geomean)																						
2009-2012	--	--		--	--	--	--	1.06	--	--	--	--	--	0.52	--	--	--	--	0.56	--	--	--
Operation Maintenance & Monitoring																						
01/15/18	0.007	0.003	1.09	36.50	6,979,242	47,459	0.88	0.88	0.88	0.88	0.88	22,334	0.42	0.42	0.42	0.42	0.42	0.47	0.47	0.47	0.47	0.47
09/18/18	0.010	0.006	2.07	30.35	4,219,057	40,503	0.91	0.90	0.90	0.88	0.91	25,314	0.57	0.49	0.49	0.42	0.57	0.34	0.40	0.40	0.34	0.47
10/28/18	0.008	0.005	1.24	45.30	3,232,438	27,152	0.41	0.69	0.88	0.41	0.91	16,162	0.24	0.39	0.42	0.24	0.57	0.16	0.30	0.34	0.16	0.47

Notes:

Baseline As Flux Geomean data as included from Exhibit 2 of the June 2016, Operation Maintenance & Monitoring Plan.

REMOTE MONITORING STATION DATA

Table 6 - Remote Monitoring Station Geochemical Profile

Industri-plex (OU2)

Location	Date	Depth (CM)	Depth (ft)	Elevation (ft)	Elevation (m)	Temp ^{o}C	SpCond µS/CM	pH	Orp mV	NH$_4$ mg/L	NH$_3$ mg/L	Turbid NTU	DO Sat %	DO mg/L
RM-10	02/06/18	200	6.56	44.86	13.67	2.1	1,769	7.1	121.1	3.3	0.004	6.2	92.9	12.7
RM-11	02/06/18	0	0.00	51.42	15.67	2.0	1,562	7.0	90.8	3.4	0.003	2.9	87.8	12.1
	02/06/18	50	1.64	49.78	15.17	2.0	1,568	7.0	89.7	3.3	0.003	2.7	88.0	12.1
	02/06/18	100	3.28	48.14	14.67	2.0	1,566	6.9	89.1	3.4	0.003	2.7	88.3	12.1
	02/06/18	150	4.92	46.50	14.17	2.0	1,564	6.9	88.9	3.4	0.003	2.9	87.7	12.1
RM-12	03/20/18	0	0.00	51.44	15.68	3.0	1,526	7.2	214.5	3.9	0.007	ERR	89.0	11.9
	03/20/18	50	1.64	49.80	15.18	3.0	1,523	6.9	198.6	3.7	0.003	ERR	89.7	12.0
	03/20/18	100	3.28	48.16	14.68	3.0	1,521	6.9	190.1	3.7	0.003	ERR	89.5	12.0
	03/20/18	150	4.92	46.52	14.18	2.9	1,523	7.0	177.5	3.8	0.004	ERR	89.4	12.0
	03/20/18	200	6.56	44.88	13.68	2.9	1,522	7.0	168.0	3.8	0.004	ERR	89.4	12.0
	03/20/18	250	8.20	43.24	13.18	2.9	1,522	7.1	130.6	3.8	0.005	0.2	89.2	12.0
	03/20/18	300	9.84	41.60	12.68	2.9	1,523	7.1	157.1	3.8	0.005	ERR	89.3	12.0
	03/20/18	350	11.48	39.96	12.18	2.9	1,522	7.1	150.9	3.8	0.005	ERR	89.3	12.0
	03/20/18	400	13.12	38.32	11.68	2.9	1,522	7.1	149.8	3.8	0.005	ERR	89.3	12.0
RM-10	03/20/18	200	6.56	44.88	13.68	2.8	1,481	7.2	161.9	3.8	0.006	ERR	91.5	12.3
RM-11	03/20/18	0	0.00	51.44	15.68	4.0	1,452	7.2	114.9	4.4	0.009	ERR	88.3	11.5
	03/20/18	50	1.64	49.80	15.18	4.0	1,452	7.2	107.6	4.4	0.007	ERR	88.5	11.5
	03/20/18	100	3.28	48.16	14.68	4.0	1,451	7.1	102.3	4.3	0.006	ERR	88.7	11.6
	03/20/18	150	4.92	46.52	14.18	4.0	1,451	7.0	99.1	4.4	0.005	22.3	87.6	11.4
RM-1	03/20/18	0	0.00	51.44	15.68	4.3	1,506	6.9	96.0	6.2	0.006	ERR	84.1	10.9
	03/20/18	50	1.64	49.80	15.18	4.4	1,534	6.8	95.0	6.4	0.005	ERR	82.3	10.6
	03/20/18	100	3.28	48.16	14.68	4.4	1,557	6.7	92.1	6.7	0.004	ERR	80.2	10.3
	03/20/18	150	4.92	46.52	14.18	8.0	2,036	6.3	66.1	27.8	0.009	21.4	60.3	7.1
	03/20/18	200	6.56	44.88	13.68	8.5	4,158	6.6	-38.7	278.2	0.192	56.3	25.4	2.9
	03/20/18	225	7.38	44.06	13.43	9.2	4,928	6.9	-103.5	544.4	0.744	31.8	9.4	1.1
	03/20/18	250	8.20	43.24	13.18	10.2	5,512	6.9	-133.0	701.9	1.098	9.6	5.3	0.6
	03/20/18	275	9.02	42.42	12.93	10.7	6,025	6.9	-148.4	887.4	1.448	7.5	3.5	0.4
	03/20/18	300	9.84	41.60	12.68	11.1	6,853	6.9	-157.5	1,110.0	1.922	6.4	2.9	0.3
	03/20/18	325	10.66	40.78	12.43	11.2	5,802	6.8	-154.9	515.6	0.596	ERR	2.5	0.3
RM-`12	04/03/18	0	0.00	51.44	15.68	8.4	1,420	6.6	245.9	3.9	0.002	2.2	91.1	10.6
	04/03/18	50	1.64	49.80	15.18	8.4	1,421	6.8	239.4	3.9	0.004	2.0	91.0	10.6
	04/03/18	100	3.28	48.16	14.68	8.3	1,421	6.9	235.4	3.8	0.005	2.0	90.8	10.6
	04/03/18	150	4.92	46.52	14.18	8.1	1,423	6.9	233.3	3.8	0.005	2.1	89.3	10.5
	04/03/18	200	6.56	44.88	13.68	7.6	1,437	6.9	218.5	3.8	0.005	2.8	88.1	10.5
	04/03/18	250	8.20	43.24	13.18	7.3	1,432	7.0	194.0	3.8	0.005	2.5	89.0	10.7
	04/03/18	300	9.84	41.60	12.68	7.0	1,434	7.0	176.4	3.9	0.006	2.1	89.6	10.8
	04/03/18	350	11.48	39.96	12.18	6.8	1,427	7.0	163.7	3.9	0.006	2.1	89.8	10.9
	04/03/18	400	13.12	38.32	11.68	6.8	1,429	7.0	155.3	3.9	0.006	2.4	89.0	10.8
	04/03/18	450	14.76	36.68	11.18	6.8	1,440	7.0	130.0	4.0	0.005	22.6	88.3	10.7

Table 6 - Remote Monitoring Station Geochemical Profile
Industri-plex (OU2)

Location	Date	Depth (CM)	Depth (ft)	Elevation (ft)	Elevation (m)	Temp °C	SpCond µS/CM	pH	Orp mV	NH_4 mg/L	NH_3 mg/L	Turbid NTU	DO Sat %	DO mg/L
RM-10	04/03/18	200	6.56	44.88	13.68	8.4	1,438	7.1	169.3	3.7	0.009	2.1	90.9	10.6
RM-11	04/03/18	0	0.00	51.44	15.68	7.1	1,425	7.2	106.4	4.7	0.010	0.7	90.5	10.9
	04/03/18	50	1.64	49.80	15.18	7.1	1,423	7.1	102.3	4.8	0.009	0.8	90.1	10.8
	04/03/18	100	3.28	48.16	14.68	7.1	1,433	7.0	99.6	5.4	0.008	1.1	89.9	10.8
	04/03/18	150	4.92	46.52	14.18	7.1	1,488	6.9	92.9	8.9	0.012	3.5	89.1	10.7
RM-1	04/03/18	0	0.00	51.44	15.68	7.7	1,478	7.0	105.1	4.4	0.007	0.6	86.7	10.3
	04/03/18	50	1.64	49.80	15.18	7.7	1,479	6.9	105.8	4.5	0.006	0.6	85.1	10.1
	04/03/18	100	3.28	48.16	14.68	7.5	1,456	6.9	106.7	4.8	0.005	0.7	84.5	10.1
	04/03/18	150	4.92	46.52	14.18	7.4	1,445	6.8	101.7	5.4	0.006	2.5	83.3	10.0
	04/03/18	175	5.74	45.70	13.93	10.3	3,816	6.5	-12.2	224.5	0.146	103.2	32.1	3.6
	04/03/18	200	6.56	44.88	13.68	10.5	4,121	6.8	-70.0	340.2	0.387	51.6	9.8	1.1
	04/03/18	225	7.38	44.06	13.43	10.6	4,832	6.9	-93.5	627.2	0.922	23.0	6.5	0.7
	04/03/18	250	8.20	43.24	13.18	10.8	5,262	6.9	-111.2	803.5	1.286	16.3	5.3	0.6
	04/03/18	275	9.02	42.42	12.93	11.2	6,139	6.9	-128.2	1,034.0	1.725	9.1	4.2	0.4
	04/03/18	300	9.84	41.60	12.68	11.2	6,582	6.9	-140.3	1,232.0	2.135	24.2	3.2	0.3
	04/03/18	325	10.66	40.78	12.43	11.5	6,847	6.9	-136.7	1,016.0	1.610	13.6	2.8	0.3
RM-12	05/09/18	0	0.00	51.34	15.65	17.7	1,193	7.0	253.6	7.6	0.028	1.8	105.2	10.0
	05/09/18	50	1.64	49.70	15.15	16.6	1,180	7.0	247.7	7.7	0.023	2.2	100.7	9.8
	05/09/18	100	3.28	48.06	14.65	16.3	1,182	7.0	245.7	7.5	0.021	2.0	100.0	9.8
	05/09/18	150	4.92	46.42	14.15	16.2	1,180	6.9	243.4	7.6	0.020	2.4	98.6	9.7
	05/09/18	200	6.56	44.78	13.65	16.1	1,183	6.9	240.1	7.6	0.019	2.9	98.7	9.7
	05/09/18	250	8.20	43.14	13.15	16.1	1,185	6.9	236.8	7.6	0.019	3.4	98.5	9.7
	05/09/18	300	9.84	41.50	12.65	16.0	1,187	6.9	229.7	7.6	0.018	3.9	97.6	9.6
	05/09/18	350	11.48	39.86	12.15	16.0	1,192	6.9	217.7	7.6	0.018	4.8	96.9	9.5
	05/09/18	400	13.12	38.22	11.65	15.6	1,272	6.8	144.8	7.6	0.014	10.7	81.4	8.1
	05/09/18	450	14.76	36.58	11.15	11.3	2,271	6.7	-84.2	14.6	0.015	38.0	15.7	1.7
RM-10	05/09/18	200	6.56	44.78	13.65	16.2	1,179	6.8	228.1	7.6	0.016	2.4	99.2	9.7
RM-11	05/09/18	0	0.00	51.34	15.65	16.9	1,219	6.9	-28.5	11.3	0.027	2.8	53.5	5.2
	05/09/18	50	1.64	49.70	15.15	16.9	1,219	6.8	-21.0	11.3	0.024	2.8	22.1	2.1
	05/09/18	100	3.28	48.06	14.65	16.9	1,225	6.8	-14.5	12.2	0.023	2.8	20.9	2.0
	05/09/18	150	4.92	46.42	14.15	16.2	1,308	6.6	-10.0	22.3	0.026	6.7	85.0	8.3
	05/09/18	200	6.56	44.78	13.65	15.9	1,322	6.6	-3.5	20.0	0.022	6.7	88.3	8.7
RM-1	05/09/18	0	0.00	51.34	15.65	19.8	1,232	6.9	142.3	8.3	0.026	0.5	107.5	9.8
	05/09/18	50	1.64	49.70	15.15	19.1	1,228	6.8	140.9	9.0	0.020	0.5	102.7	9.5
	05/09/18	100	3.28	48.06	14.65	16.6	1,200	6.8	147.6	9.9	0.018	1.1	97.9	9.5
	05/09/18	150	4.92	46.42	14.15	15.1	1,714	6.2	60.6	68.2	0.029	33.6	62.0	6.2
	05/09/18	175	5.74	45.60	13.90	13.8	3,743	6.4	-9.0	346.3	0.201	202.1	16.3	1.7
	05/09/18	200	6.56	44.78	13.65	12.8	4,102	6.6	-73.6	439.2	0.410	166.5	24.8	2.6
	05/09/18	225	7.38	43.96	13.40	12.0	4,929	6.8	-108.1	636.9	0.779	45.1	26.3	2.8
	05/09/18	250	8.20	43.14	13.15	11.9	5,242	6.8	-127.8	726.5	0.935	20.4	6.2	0.7
	05/09/18	275	9.02	42.32	12.90	11.8	5,744	6.8	-139.5	865.3	1.103	11.6	3.1	0.3

Table 6 - Remote Monitoring Station Geochemical Profile

Industri-plex (OU2)

Location	Date	Depth (CM)	Depth (ft)	Elevation (ft)	Elevation (m)	Temp °C	SpCond µS/CM	pH	Orp mV	NH_4 mg/L	NH_3 mg/L	Turbid NTU	DO Sat %	DO mg/L
RM-1 *(Cont'd)*	05/09/18	300	9.84	41.50	12.65	11.8	6,440	6.8	-151.7	911.5	1.315	41.3	4.7	0.5
	05/09/18	325	10.66	40.68	12.40	11.9	5,494	6.6	-132.4	636.9	0.606	-2.1	4.7	0.5
RM-10	06/12/18	200	6.56	44.68	13.62	18.3	1,404	6.9	92.7	7.6	0.024	4.1	82.2	7.7
RM-12	06/12/18	0	0.00	51.24	15.62	19.9	1,398	7.1	158.1	7.5	0.038	ERR	91.6	8.3
	06/12/18	50	1.64	49.60	15.12	19.3	1,395	7.1	157.4	7.8	0.037	ERR	91.0	8.3
	06/12/18	100	3.28	47.96	14.62	18.7	1,392	7.1	158.8	8.3	0.035	ERR	89.6	8.3
	06/12/18	150	4.92	46.32	14.12	18.5	1,394	7.0	160.5	8.5	0.031	0.4	86.8	8.1
	06/12/18	200	6.56	44.68	13.62	18.3	1,422	6.9	160.9	9.3	0.028	4.7	81.5	7.6
	06/12/18	250	8.20	43.04	13.12	18.3	1,420	6.9	158.6	9.4	0.028	4.3	81.4	7.6
	06/12/18	300	9.84	41.40	12.62	18.1	1,424	6.9	131.6	9.7	0.028	7.3	79.6	7.5
	06/12/18	350	11.48	39.76	12.12	18.0	1,437	6.9	115.0	10.1	0.029	8.8	81.8	7.7
	06/12/18	400	13.12	38.12	11.62	17.2	1,594	6.8	74.5	10.1	0.018	19.1	50.1	4.8
RM-1	06/12/18	0	0.00	51.24	15.62	21.3	1,477	7.0	161.0	10.4	0.049	4.9	91.3	8.1
	06/12/18	50	1.64	49.60	15.12	20.4	1,484	6.9	149.4	12.1	0.043	5.9	87.4	7.8
	06/12/18	100	3.28	47.96	14.62	17.9	1,477	6.8	111.5	14.4	0.034	7.2	81.3	7.7
	06/12/18	150	4.92	46.32	14.12	17.2	1,580	6.4	4.1	26.0	0.024	80.1	38.6	3.7
	06/12/18	175	5.74	45.50	13.87	14.4	4,367	6.8	-139.7	845.1	1.234	278.4	13.1	1.3
	06/12/18	200	6.56	44.68	13.62	13.0	5,455	7.1	-192.1	1,365.0	3.736	74.4	11.1	1.1
	06/12/18	225	7.38	43.86	13.37	13.0	5,516	7.1	-204.7	1,312.0	3.775	50.9	7.1	0.7
	06/12/18	250	8.20	43.04	13.12	12.5	6,024	7.0	-198.1	1,577.0	3.673	29.7	6.1	0.6
	06/12/18	275	9.02	42.22	12.87	12.4	6,675	7.0	-206.0	1,970.0	4.858	38.6	3.9	0.4
	06/12/18	300	9.84	41.40	12.62	12.5	4,258	6.7	-147.1	1,083.0	1.331	ERR	3.3	0.3
RM-11	06/12/18	0	0.00	51.24	15.62	18.8	1,481	7.1	13.9	16.1	0.077	8.8	69.5	6.4
	06/12/18	50	1.64	49.60	15.12	18.9	1,482	6.9	33.8	15.0	0.050	8.5	82.1	7.6
	06/12/18	100	3.28	47.96	14.62	18.6	1,489	6.9	37.4	15.8	0.044	9.0	81.3	7.6
	06/12/18	150	4.92	46.32	14.12	18.5	1,506	6.8	36.0	18.5	0.040	21.9	55.6	5.2
RM-12	07/03/18	0	0.00	51.28	15.63	25.8	875	7.4	178.7	4.0	0.067	-3.1	95.8	7.8
	07/03/18	50	1.64	49.64	15.13	24.8	889	7.1	191.2	4.5	0.036	-2.2	97.2	8.0
	07/03/18	100	3.28	48.00	14.63	23.8	894	7.0	197.5	4.5	0.025	-0.5	94.8	8.0
	07/03/18	150	4.92	46.36	14.13	23.2	866	6.9	206.6	4.5	0.016	0.0	79.2	6.8
	07/03/18	200	6.56	44.72	13.63	23.1	864	6.8	210.9	4.6	0.014	0.3	73.5	6.3
	07/03/18	250	8.20	43.08	13.13	23.2	914	6.8	207.3	5.1	0.015	2.2	71.2	6.1
	07/03/18	300	9.84	41.44	12.63	23.0	880	6.7	208.5	4.8	0.013	1.4	70.9	6.1
	07/03/18	350	11.48	39.80	12.13	22.9	843	6.7	211.0	4.4	0.012	-0.3	71.8	6.2
	07/03/18	400	13.12	38.16	11.63	21.5	1,104	6.6	205.8	5.5	0.009	8.3	29.1	2.6
RM-10	07/03/18	200	6.56	44.72	13.63	23.3	939	6.8	138.0	5.7	0.019	6.6	76.0	6.5
RM-11	07/03/18	0	0.00	51.28	15.63	24.0	561	6.8	125.2	11.9	0.039	4.2	78.6	6.6
	07/03/18	50	1.64	49.64	15.13	24.1	1,070	6.7	116.2	11.1	0.033	4.4	77.4	6.5
	07/03/18	100	3.28	48.00	14.63	23.5	1,089	6.7	100.3	13.1	0.033	5.4	74.3	6.3

Table 6 - Remote Monitoring Station Geochemical Profile

Industri-plex (OU2)

Location	Date	Depth (CM)	Depth (ft)	Elevation (ft)	Elevation (m)	Temp ^{o}C	SpCond µS/CM	pH	Orp mV	NH_4 mg/L	NH_3 mg/L	Turbid NTU	DO Sat %	DO mg/L
RM-1	07/03/18	0	0.00	51.28	15.63	26.1	1,070	6.8	236.5	12.0	0.047	1.1	84.5	6.8
	07/03/18	50	1.64	49.64	15.13	24.1	1,061	6.7	225.7	11.9	0.035	2.4	78.7	6.6
	07/03/18	100	3.28	48.00	14.63	23.7	1,063	6.7	201.2	12.4	0.033	3.8	76.9	6.5
	07/03/18	150	4.92	46.36	14.13	22.5	1,579	6.5	26.5	17.9	0.029	21.4	25.2	2.2
	07/03/18	175	5.74	45.54	13.88	16.3	3,824	6.4	-7.1	287.7	0.235	329.6	11.8	1.1
	07/03/18	200	6.56	44.72	13.63	14.5	4,663	6.9	-160.9	435.1	0.996	188.5	7.8	0.8
	07/03/18	225	7.38	43.90	13.38	13.4	5,049	7.0	-177.1	490.8	1.147	38.2	4.3	0.4
	07/03/18	250	8.20	43.08	13.13	13.0	5,354	7.0	-195.3	587.1	1.488	17.4	3.4	0.4
	07/03/18	275	9.02	42.26	12.88	12.7	5,809	7.0	-186.8	677.9	1.403	9.8	3.2	0.3
	07/03/18	300	9.84	41.44	12.63	12.5	6,559	6.9	-185.7	794.6	1.486	5.9	2.9	0.3
	07/03/18	325	10.66	40.62	12.38	12.4	7,384	6.9	-196.2	884.2	1.538	14.5	2.6	0.3
RM-12	08/07/18	0	0.00	51.28	15.63	27.1	1,272	7.0	147.2	5.2	NR	1.6	99.2	8.0
	08/07/18	50	1.64	49.64	15.13	26.8	1,267	6.9	147.1	5.0	NR	1.8	98.0	8.0
	08/07/18	100	3.28	48.00	14.63	25.7	1,260	6.8	148.2	5.3	NR	3.0	91.7	8.2
	08/07/18	150	4.92	46.36	14.13	25.1	1,242	6.7	148.5	5.3	NR	3.7	83.8	8.3
	08/07/18	200	6.56	44.72	13.63	24.8	1,239	6.7	148.5	5.3	NR	4.4	73.9	8.3
	08/07/18	250	8.20	43.08	13.13	24.8	1,246	6.6	148.0	5.5	NR	5.3	72.4	8.3
	08/07/18	300	9.84	41.44	12.63	24.8	1,256	6.6	146.3	5.6	NR	7.3	74.0	8.3
	08/07/18	350	11.48	39.80	12.13	24.7	1,256	6.6	144.3	5.6	NR	7.8	71.7	8.3
	08/07/18	400	13.12	38.16	11.63	24.4	1,252	6.6	144.2	5.4	NR	5.4	64.6	8.4
RM-10	08/07/18	200	6.56	44.58	13.59	24.9	1,245	6.9	78.0	5.3	NR	6.3	74.0	6.1
RM-11	08/07/18	0	0.00	51.14	15.59	26.77	1,300	6.8	141.0	11.0	0.045	4.3	89.8	7.2
	08/07/18	50	1.64	49.50	15.09	25.94	1,297	6.6	148.1	11.8	0.030	4.8	86.2	7.0
	08/07/18	100	3.28	47.86	14.59	23.97	1,325	6.4	127.9	13.8	0.021	7.7	70.4	5.9
	08/07/18	150	4.92	46.22	14.09	19.87	3,109	6.2	62.6	157.9	0.098	66.6	9.1	0.8
RM-1	08/07/18	0	0.00	51.14	15.59	29.87	123	6.9	157.0	17.4	0.116	3.1	103.9	7.9
	08/07/18	50	1.64	49.50	15.09	27.40	1,322	6.7	154.1	16.6	0.053	5.0	89.9	7.1
	08/07/18	100	3.28	47.86	14.59	24.85	1,317	6.5	86.3	18.8	0.031	6.2	80.9	6.7
	08/07/18	150	4.92	46.22	14.09	17.33	3,304	6.1	-10.4	128.5	0.056	30.1	27.9	2.6
	08/07/18	175	5.74	45.40	13.84	14.89	4,211	6.4	-84.0	288.9	0.202	156.8	11.1	1.1
	08/07/18	200	6.56	44.58	13.59	14.11	4,990	6.8	-170.2	542.8	0.906	138.5	4.4	0.4
	08/07/18	225	7.38	43.76	13.34	13.65	5,399	6.9	-191.3	598.8	1.140	45.5	3.3	0.3
	08/07/18	250	8.20	42.94	13.09	13.42	5,848	7.0	-208.0	711.8	1.661	25.9	2.4	0.3
	08/07/18	275	9.02	42.12	12.84	13.17	6,151	6.9	-204.8	771.3	1.514	16.9	2.1	0.2
	08/07/18	300	9.84	41.30	12.59	12.91	6,808	6.9	-206.8	946.3	1.700	55.4	2.0	0.2
RM-12	09/05/18	0	0	51.24	15.62	24.8	1,196	7.0	205.0	3.4	0.022	2.8	106.0	8.8
	09/05/18	50	1.64	49.60	15.12	24.6	1,194	7.0	201.4	3.4	0.020	2.8	105.4	8.7
	09/05/18	100	3.28	47.96	14.62	24.3	1,194	7.0	198.4	3.4	0.018	4.3	103.9	8.7
	09/05/18	150	4.92	46.32	14.12	23.4	1,197	6.7	199.6	3.6	0.009	5.1	75.8	6.4
	09/05/18	200	6.56	44.68	13.62	23.2	1,197	6.6	198.2	3.6	0.008	5.9	72.3	6.1
	09/05/18	250	8.20	43.04	13.12	23.1	1,206	6.6	195.2	3.7	0.008	7.7	72.1	6.1

Table 6 - Remote Monitoring Station Geochemical Profile

Industri-plex (OU2)

Location	Date	Depth (CM)	Depth (ft)	Elevation (ft)	Elevation (m)	Temp °C	SpCond µS/CM	pH	Orp mV	NH_4 mg/L	NH_3 mg/L	Turbid NTU	DO Sat %	DO mg/L
RM-12 *(Cont'd)*	09/05/18	300	9.84	41.40	12.62	23.1	1,208	6.6	188.3	3.7	0.007	8.8	71.3	6.1
	09/05/18	350	11.48	39.76	12.12	23.0	1,212	6.6	156.5	3.8	0.007	12.0	70.9	6.1
	09/05/18	400	13.12	38.12	11.62	22.8	1,202	6.5	147.4	3.6	0.006	12.8	58.5	5.0
RM-10	09/05/18	200	6.56	44.68	13.62	23.3	1,198	6.7	186.0	3.7	0.009	6.4	74.9	6.4
RM-11	09/05/18	0	0.00	51.24	15.62	25.0	1,266	6.7	226.6	13.5	0.036	8.8	85.1	7.0
	09/05/18	50	1.64	49.60	15.12	24.1	1,267	6.6	219.8	14.1	0.028	13.7	82.4	6.9
	09/05/18	100	3.28	47.96	14.62	22.1	1,286	6.4	155.9	20.5	0.022	15.5	64.7	5.6
RM-1	09/05/18	0	0.00	51.24	15.62	26.2	1,266	6.7	197.2	13.3	0.041	7.7	90.1	7.3
	09/05/18	50	1.64	49.60	15.12	25.6	1,256	6.6	194.3	13.7	0.035	8.7	83.3	6.8
	09/05/18	100	3.28	47.96	14.62	22.9	1,259	6.5	146.4	14.3	0.022	11.3	74.4	6.4
	09/05/18	150	4.92	46.32	14.12	17.2	3,038	6.2	32.2	276.5	0.133	117.4	8.4	0.8
	09/05/18	175	5.74	45.50	13.87	15.0	3,861	6.5	-68.9	453.2	0.358	248.3	4.9	0.5
	09/05/18	200	6.56	44.68	13.62	13.8	4,165	6.7	-116.9	601.7	0.757	101.8	3.1	0.3
	09/05/18	225	7.38	43.86	13.37	13.5	4,814	6.9	-157.1	822.4	1.442	36.1	2.4	0.3
	09/05/18	250	8.20	43.04	13.12	13.4	5,239	7.0	-187.9	976.2	2.459	27.1	2.4	0.3
	09/05/18	275	9.02	42.22	12.87	13.0	5,555	6.9	-174.0	1,056.0	1.871	15.7	1.9	0.2
	09/05/18	300	9.84	41.40	12.62	12.9	6,211	6.9	-179.7	1,265.0	2.381	12.1	1.5	0.2
	09/05/18	325	10.66	40.58	12.37	12.8	7,212	6.9	-194.6	1,450.0	2.727	17.6	1.4	0.1
RM-12	10/02/18	0	0.00	51.64	15.74	16.0	938	7.0	180.8	3.3	0.008	4.5	78.2	7.7
	10/02/18	50	1.64	50.00	15.24	16.0	939	6.8	170.6	3.3	0.006	4.5	75.6	7.5
	10/02/18	100	3.28	48.36	14.74	16.0	936	6.8	166.7	3.2	0.005	4.3	74.9	7.4
	10/02/18	150	4.92	46.72	14.24	16.0	958	6.7	164.6	3.5	0.006	4.8	76.1	7.5
	10/02/18	200	6.56	45.08	13.74	16.0	999	6.7	162.6	3.9	0.006	6.4	78.0	7.7
	10/02/18	250	8.20	43.44	13.24	15.8	1,028	6.7	161.6	4.0	0.006	6.8	79.0	7.8
	10/02/18	300	9.84	41.80	12.74	15.6	1,013	6.7	152.7	4.3	0.006	8.1	80.9	8.1
	10/02/18	350	11.48	40.16	12.24	15.4	1,006	6.7	147.2	4.6	0.007	7.7	81.8	8.2
	10/02/18	400	13.12	38.52	11.74	15.4	1,003	6.7	128.4	4.7	0.007	8.2	83.0	8.3
RM-10	10/02/18	200	6.56	45.08	13.74	15.7	987	6.8	144.6	3.9	0.007	5.5	81.5	8.1
RM-11	10/02/18	0	0.00	51.64	15.74	15.0	1,036	6.7	105.8	7.6	0.011	5.8	75.6	7.6
	10/02/18	50	1.64	50.00	15.24	15.0	1,035	6.7	98.7	8.0	0.010	6.4	74.1	7.4
	10/02/18	100	3.28	48.36	14.74	15.0	1,035	6.6	97.0	8.0	0.010	5.9	74.3	7.5
	10/02/18	150	4.92	46.72	14.24	15.0	1,041	6.6	92.0	8.5	0.010	6.1	72.6	7.3
RM-1	10/02/18	0	0.00	51.64	15.74	15.1	987	6.6	119.1	9.5	0.011	4.3	70.3	7.0
	10/02/18	50	1.64	50.00	15.24	15.1	1,010	6.6	121.4	9.3	0.010	4.4	67.8	6.8
	10/02/18	100	3.28	48.36	14.74	14.9	1,027	6.6	113.4	9.1	0.009	4.7	68.4	6.9
	10/02/18	150	4.92	46.72	14.24	14.9	1,103	6.2	48.3	20.7	0.009	7.1	50.4	5.1
	10/02/18	175	5.74	45.90	13.99	14.4	3,661	6.3	-73.3	342.8	0.187	72.9	4.9	0.5
	10/02/18	200	6.56	45.08	13.74	14.0	4,206	6.6	-93.5	631.7	0.592	67.0	9.1	0.9
	10/02/18	225	7.38	44.26	13.49	13.8	5,058	6.9	-155.7	1,062.0	2.102	62.4	4.4	0.4
	10/02/18	250	8.20	43.44	13.24	13.5	5,390	7.0	-171.6	1,234.0	2.854	23.5	3.0	0.3

Table 6 - Remote Monitoring Station Geochemical Profile

Industri-plex (OU2)

Location	Date	Depth (CM)	Depth (ft)	Elevation (ft)	Elevation (m)	Temp °C	SpCond µS/CM	pH	Orp mV	NH_4 mg/L	NH_3 mg/L	Turbid NTU	DO Sat %	DO mg/L
RM-1 *(Cont'd)*	10/02/18	275	9.02	42.62	12.99	13.2	5,708	6.9	-173.7	1,351.0	2.805	13.8	2.6	0.3
	10/02/18	300	9.84	41.80	12.74	13.0	6,251	6.9	-181.5	1,677.0	3.484	9.0	3.5	0.4
	10/02/18	325	10.66	40.98	12.49	12.9	6,991	6.9	-190.8	1,872.0	3.621	9.6	2.1	0.2
RM-12	12/05/18	0	0.00	52.24	15.92	4.9	886	6.8	220.4	8.6	0.008	6.5	*94.7*	12.1
	12/05/18	50	1.64	50.60	15.42	5.0	888	6.8	211.6	8.3	0.007	6.5	*94.2*	12.0
	12/05/18	100	3.28	48.96	14.92	5.0	888	6.8	207.1	7.5	0.007	6.5	*92.6*	11.8
	12/05/18	150	4.92	47.32	14.42	5.0	888	6.9	203.6	7.4	0.007	6.5	*91.8*	11.7
	12/05/18	200	6.56	45.68	13.92	4.9	889	6.9	199.5	7.3	0.007	7.0	*90.8*	11.6
	12/05/18	250	8.20	44.04	13.42	4.5	898	6.9	194.6	7.5	0.007	5.8	*91.4*	11.8
	12/05/18	300	9.84	42.40	12.92	4.3	900	6.9	188.5	8.1	0.007	5.8	*91.7*	11.9
	12/05/18	350	11.48	40.76	12.42	4.2	905	6.9	176.1	8.6	0.007	5.7	*92.2*	12.0
	12/05/18	400	13.12	39.12	11.92	4.1	915	6.8	161.2	9.0	0.007	6.4	*92.7*	12.1
	12/05/18	450	14.76	37.48	11.42	4.3	921	6.8	140.2	8.3	0.007	11.7	*91.7*	11.9
RM-10	12/05/18	200	6.56	45.68	13.92	4.8	887	7.0	165.0	6.8	0.008	6.1	*93.7*	12.0
RM-11	12/05/18	0	0.00	52.24	15.92	3.1	943	6.8	103.8	10.9	0.009	3.3	*86.6*	11.6
	12/05/18	50	1.64	50.60	15.42	3.1	950	6.8	102.0	11.5	0.008	3.5	*86.6*	11.6
	12/05/18	100	3.28	48.96	14.92	3.1	950	6.8	99.8	11.2	0.007	3.4	*85.1*	11.4
	12/05/18	150	4.92	47.32	14.42	3.1	951	6.8	98.2	11.0	0.007	3.5	*83.6*	11.2
RM-1	12/05/18	0	0.00	52.24	15.92	3.6	953	6.9	131.1	9.8	0.009	4.5	*82.5*	10.9
	12/05/18	50	1.64	50.60	15.42	3.8	953	6.8	126.2	9.8	0.007	4.8	*81.4*	10.7
	12/05/18	100	3.28	48.96	14.92	4.0	955	6.8	122.1	10.0	0.007	4.8	*81.0*	10.6
	12/05/18	150	4.92	47.32	14.42	6.0	1,098	6.5	72.1	9.1	0.004	5.1	*72.4*	9.0
	12/05/18	175	5.74	46.50	14.17	10.0	3,340	6.6	-9.4	88.8	0.071	42.1	*20.4*	2.3
	12/05/18	200	6.56	45.68	13.92	10.1	3,890	6.8	-44.5	155.2	0.186	52.7	*10.7*	1.2
	12/05/18	225	7.38	44.86	13.67	10.4	4,530	7.7	-97.2	267.3	0.609	20.8	*11.6*	1.3
	12/05/18	250	8.20	44.04	13.42	11.0	4,845	7.1	-123.2	298.7	0.813	12.9	*13.6*	1.5
	12/05/18	275	9.02	43.22	13.17	11.4	5,477	7.2	-138.0	375.3	1.195	11.9	*13.8*	1.5
	12/05/18	300	9.84	42.40	12.92	11.8	5,978	7.2	-148.8	440.2	1.465	10.4	*13.9*	1.5

NR = Not Recorded

ERR = Sensor error

Figure 5 - Conductivity Temperature Depth Sensor Elevation
RM-1 - December 2018

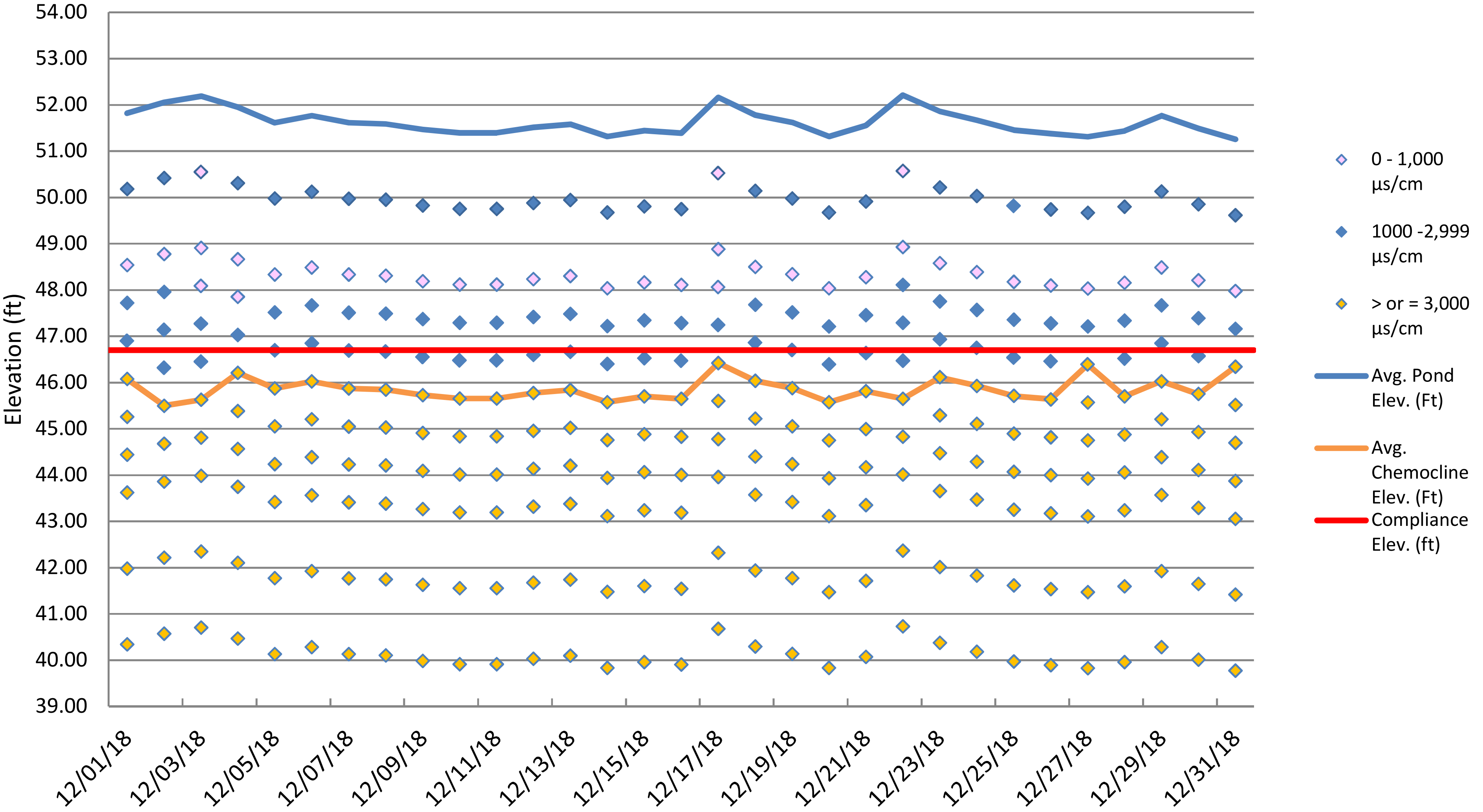


Figure 6 - Conductivity Temperature Depth Sensor Elevation
RM-11 - December 2018

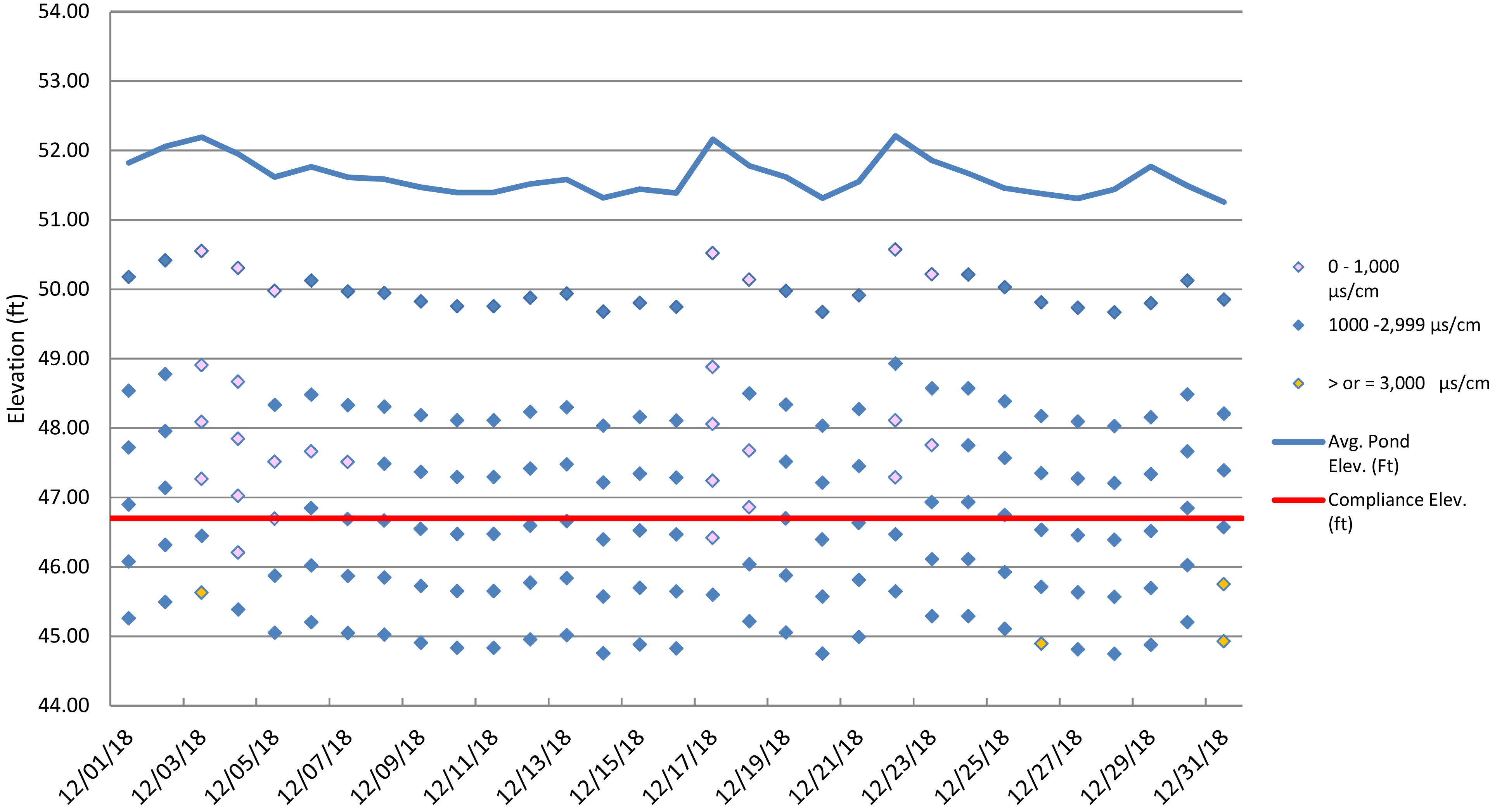


Figure 7 - Conductivity Temperature Depth Sensor Elevation
RM-12 - December 2018

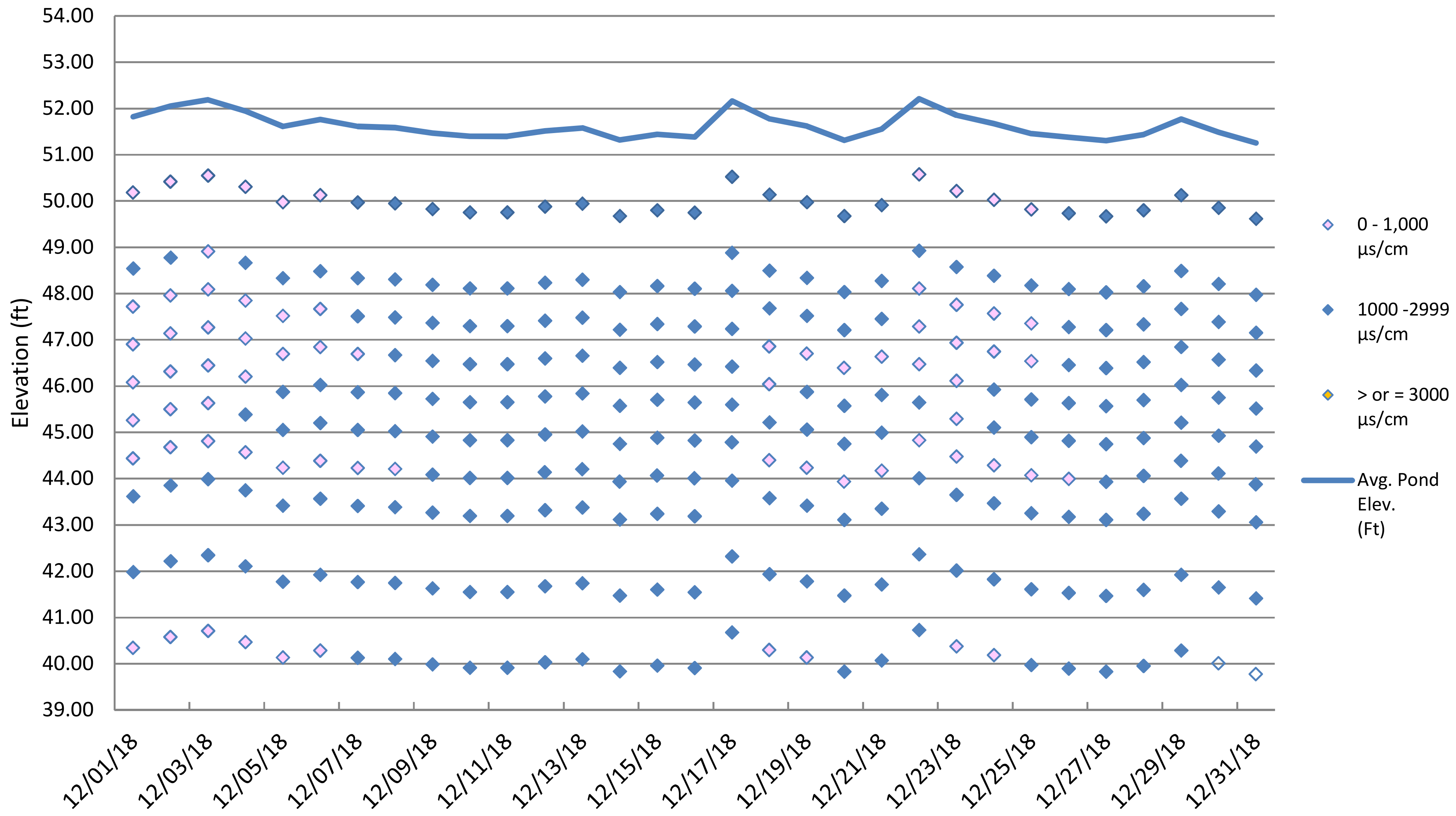


Table 9
2018 Wetland Piezometer Groundwater Elevation

Date	HA15-4 (OW)				HA17-1 (OW)				HA17-2 (OW)				HA17-3 (OW)			
	Ground Surface Elevation	Top of Riser Elevation (ft)	Depth to Water (ft)	Groundwater Elevation (ft)	Ground Surface Elevation	Top of Riser Elevation (ft)	Depth to Water (ft)	Groundwater Elevation (ft)	Ground Surface Elevation	Top of Riser Elevation (ft)	Depth to Water (ft)	Groundwater Elevation (ft)	Ground Surface Elevation	Top of Riser Elevation (ft)	Depth to Water (ft)	Groundwater Elevation (ft)
01/22/18	54.24	54.24	2.33	51.91	52.26	55.42	3.15	52.27	53.06	55.10	3.43	51.67	51.76	54.46	2.71	51.75
02/23/18	54.24	54.24	2.24	52.00	52.26	55.42	3.09	52.33	53.06	55.10	3.33	51.77	51.76	54.46	2.63	51.83
03/23/18	54.24	54.24	2.07	52.17	52.26	55.42	3.04	52.38	53.06	55.10	3.13	51.97	51.76	54.46	2.57	51.89
04/24/18	54.24	54.24	2.18	52.06	52.26	55.42	3.09	52.33	53.06	55.10	3.32	51.78	51.76	54.46	2.55	51.91
05/18/18	54.24	54.24	2.43	51.81	52.26	55.42	3.70	51.72	53.06	55.10	3.61	51.49	51.76	54.46	2.85	51.61
06/13/18	54.24	54.24	2.85	51.39	52.26	55.42	4.39	51.03	53.06	55.10	3.85	51.25	51.76	54.46	3.48	50.98
06/28/18	54.24	54.24	2.60	51.64	52.26	55.42	3.79	51.63	53.06	55.10	3.72	51.38	51.76	54.46	3.17	51.29
07/11/18	54.24	54.24	2.97	51.27	52.26	55.42	4.48	50.94	53.06	55.10	4.03	51.07	51.76	54.46	3.61	50.85
07/26/18	54.24	54.24	2.34	51.90	52.26	55.42	3.46	51.96	53.06	55.10	3.33	51.77	51.76	54.46	2.81	51.65
08/08/18	54.24	54.24	2.86	51.38	52.26	55.42	4.37	51.05	53.06	55.10	3.96	51.14	51.76	54.46	3.45	51.01
08/20/18	54.24	54.24	2.34	51.90	52.26	55.42	3.15	52.27	53.06	55.10	3.39	51.71	51.76	54.46	2.75	51.71
09/11/18	54.24	54.24	1.94	52.30	52.26	55.42	3.19	52.23	53.06	55.10	2.92	52.18	51.76	54.46	2.54	51.92
09/24/18	54.24	54.24	2.48	51.76	52.26	55.42	3.20	52.22	53.06	55.10	3.54	51.56	51.76	54.46	2.83	51.63
10/10/18	54.24	54.24	2.49	51.75	52.26	55.42	3.35	52.07	53.06	55.10	3.53	51.57	51.76	54.46	2.83	51.63
10/25/18	54.24	54.24	2.52	51.72	52.26	55.42	3.70	51.72	53.06	55.10	3.60	51.50	51.76	54.46	2.91	51.55
11/06/18	54.24	54.24	1.97	52.27	52.26	55.42	2.91	52.51	53.06	55.10	2.56	52.54	51.76	54.46	2.33	52.13
11/27/18	54.24	54.24	0.48	53.76	52.26	55.42	2.23	53.19	53.06	55.10	1.68	53.42	51.76	54.46	1.14	53.32
12/14/18	54.24	54.24	2.26	51.98	52.26	55.42	3.28	52.14	53.06	55.10	3.38	51.72	51.76	54.46	2.63	51.83

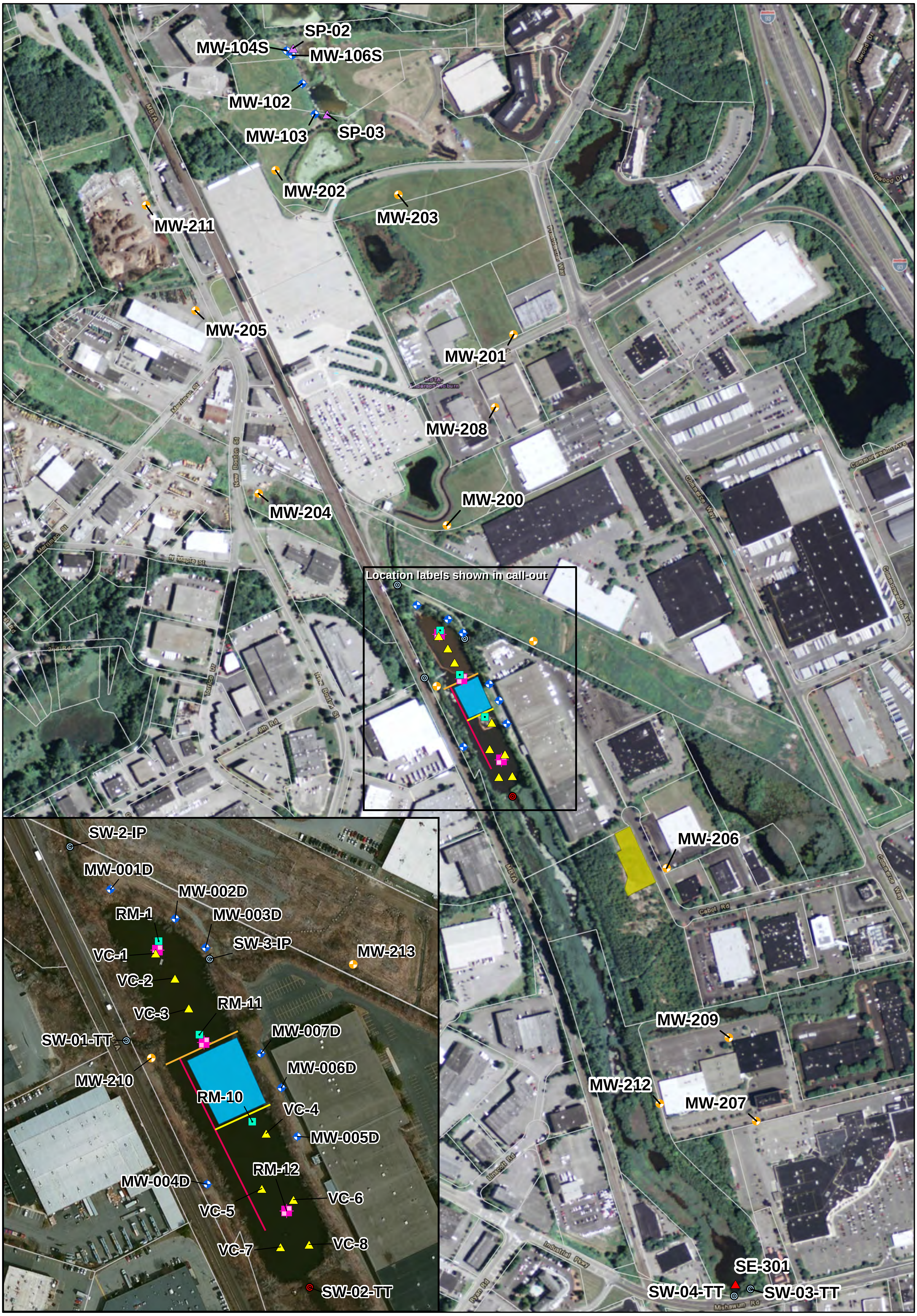
Notes:

Table 9

2018 Wetland Piezometer Groundwater Elevation

Date	HA17-4 (OW)				HA17-5 (OW)				HA17-6 (OW)				HA17-7 (OW)			
	Ground Surface Elevation	Top of Riser Elevation (ft)	Depth to Water (ft)	Groundwater Elevation (ft)	Ground Surface Elevation	Top of Riser Elevation (ft)	Depth to Water (ft)	Groundwater Elevation (ft)	Ground Surface Elevation	Top of Riser Elevation (ft)	Depth to Water (ft)	Groundwater Elevation (ft)	Ground Surface Elevation	Top of Riser Elevation (ft)	Depth to Water (ft)	Groundwater Elevation (ft)
01/22/18	51.80	54.48	2.98	51.50	52.27	54.90	3.29	51.61	52.99	54.82	2.95	51.87	51.32	55.04	3.19	51.85
02/23/18	51.80	54.48	2.85	51.63	52.27	54.90	3.22	51.68	52.99	54.82	2.83	51.99	51.32	55.04	3.10	51.94
03/23/18	51.80	54.48	2.77	51.71	52.27	54.90	3.13	51.77	52.99	54.82	2.68	52.14	51.32	55.04	2.89	52.15
04/24/18	51.80	54.48	2.93	51.55	52.27	54.90	3.20	51.70	52.99	54.82	2.75	52.07	51.32	55.04	2.83	52.21
05/18/18	51.80	54.48	3.07	51.41	52.27	54.90	3.40	51.50	52.99	54.82	3.13	51.69	51.32	55.04	3.43	51.61
06/13/18	51.80	54.48	3.79	50.69	52.27	54.90	4.08	50.82	52.99	54.82	3.74	51.08	51.32	55.04	4.71	50.33
06/27/18	51.80	54.48	3.41	51.07	52.27	54.90	3.80	51.10	52.99	54.82	3.47	51.35	51.32	55.04	3.78	51.26
07/11/18	51.80	54.48	3.96	50.52	52.27	54.90	4.21	50.69	52.99	54.82	3.89	50.93	51.32	55.04	4.23	50.81
07/26/18	51.80	54.48	2.95	51.53	52.27	54.90	3.44	51.46	52.99	54.82	3.12	51.70	51.32	55.04	3.48	51.56
08/08/18	51.80	54.48	3.77	50.71	52.27	54.90	4.09	50.81	52.99	54.82	3.71	51.11	51.32	55.04	4.07	50.97
08/20/18	51.80	54.48	2.96	51.52	52.27	54.90	3.35	51.55	52.99	54.82	3.02	51.80	51.32	55.04	3.32	51.72
09/11/18	51.80	54.48	2.69	51.79	52.27	54.90	3.13	51.77	52.99	54.82	2.83	51.99	51.32	55.04	3.17	51.87
09/24/18	51.80	54.48	3.15	51.33	52.27	54.90	3.47	51.43	52.99	54.82	3.07	51.75	51.32	55.04	3.37	51.67
10/10/18	51.80	54.48	3.17	51.31	52.27	54.90	3.50	51.40	52.99	54.82	3.17	51.65	51.32	55.04	3.49	51.55
10/25/18	51.80	54.48	3.22	51.26	52.27	54.90	3.53	51.37	52.99	54.82	3.23	51.59	51.32	55.04	3.56	51.48
11/06/18	51.80	54.48	2.59	51.89	52.27	54.90	2.97	51.93	52.99	54.82	2.43	52.39	51.32	55.04	2.70	52.34
11/28/18	51.80	54.48	1.32	53.16	52.27	54.90	1.73	53.17	52.99	54.82	1.40	53.42	51.32	55.04	1.79	53.25
12/14/18	51.80	54.48	3.08	51.40	52.27	54.90	3.31	51.59	52.99	54.82	2.87	51.95	51.32	55.04	3.14	51.90

Appendix D.7
OU2 Groundwater Data



Legend

● Proposed Monitoring Well	▪ Geochemical Profiling Station
◆ Existing Monitoring Well	— Baffle
● Remedial Action Point of Compliance	— Cofferdam
◎ Surface Water Monitoring Station	— Bypass
▪ In-Pond Sampling Location	🟨 Future Dredging Laydown Area Easement
▲ Sediment Sample Compliance Location	🟦 Aeration Zone
▲ Sediment Accumulation Monitoring Location	☐ Parcel Boundary
▲ Proposed Sediment Sample below 2 feet	

Projection: Lambert Conformal Conic
Coordinate System: MA State Plane (Mainland)
FIPS Zone: 2001
Units: US Feet
Datum: North American Datum (NAD) 83

Monitoring Locations North Portion of Site

Industri-Plex OU2
Woburn, Massachusetts

Project No.: 3204
Plot Date: 6/22/2016
Arc Operator: KEK
Reviewed by: TM

Figure 3-1

ddms
1217 Bandana Boulevard North
Saint Paul, Minnesota 55108
Main Phone: (651) 842-4224
www.ddmsinc.com

R:\Projects\DEF\demax-1547\3204-Industri-PlexOU2\DataAnalysis\GISData\Projects\EMP Figures\IndustriPlex Long-Term Monitoring N.mxd

TABLE I
SUMMARY OF ANALYTICAL DATA
NOVEMBER 2017
GROUNDWATER RESULTS
INDUSTRI-PLEX OU2, WOBURN, MA

Location	MW-001D		MW-001D		MW-002D		MW-003D		MW-004D		MW-005D		MW-006D	
Sample ID	MW001D-111417		MW001DD-111417		MW002D-111417		MW003D-111417		MW004D-111717		MW005D-111517		MW006D-111517	
Sample Date	11/14/2017 13:10		11/14/2017 13:20		11/14/2017 14:15		11/14/2017 15:50		11/17/2017 10:55		11/15/2017 12:30		11/15/2017 12:45	
Lab Sample ID	L1741955-03		L1741955-04		L1741955-06		L1741955-07		L1742478-11		L1742184-06		L1742184-05	
NITROGEN SPECIES (mg/L)														
NITROGEN, AMMONIA	**0.732**		**0.844**		**142**		**333**		**0.05**	J	**0.479**		**38.4**	
METALS (mg/L)														
ARSENIC (TOTAL)	<0.0030	U	<0.0030	U	**0.852**		**0.0517**		**0.138**		**0.0032**		**0.129**	
ARSENIC (DISSOLVED)	<0.0030	U	<0.0030	U	**0.807**		**0.0484**		**0.107**		**0.0026**	J	**0.122**	
VOCs (ug/L)														
1,2-DICHLOROETHANE	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U
BENZENE	<0.50	U	<0.50	U	**0.18**	J	**100**		<0.50	U	<0.50	U	<0.50	U
NAPHTHALENE	<2.0	U	<2.0	U	<2.0	U	<2.0	U	<2.0	U	<2.0	U	<2.0	U
TRICHLOROETHENE	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U

NOTES:
1. ALL DATA ARE NOT VALIDATED
2. "-" INDICATES DATA NOT COLLECTED
3. ANALYTE DETECTED ABOVE THE LABORATORY REPORTING LIMIT ARE **BOLD**
4. U QUALIFER INDICATES A NON-DETECT
5. J QUALIFIER INDICATES ESTIMATED VALUE

ddms

TABLE I
SUMMARY OF ANALYTICAL DATA
NOVEMBER 2017
GROUNDWATER RESULTS
INDUSTRI-PLEX OU2, WOBURN, MA

Location	MW-007D		MW-102		MW-103		MW-200		MW-201		MW-202		MW-203	
Sample ID	MW007D-111517		MW102-111517		MW103-111517		MW200-111417		MW201-111417		MW202-111417		MW203-111517	
Sample Date	11/15/2017 10:25		11/15/2017 13:10		11/15/2017 11:00		11/14/2017 14:00		11/14/2017 11:05		11/14/2017 11:10		11/15/2017 14:30	
Lab Sample ID	L1742184-04		L1742184-03		L1742184-02		L1741955-05		L1741955-01		L1741955-02		L1742478-03	
NITROGEN SPECIES (mg/L)														
NITROGEN, AMMONIA	**76.3**		-		-		**45.6**		**51.6**		**17.6**		**0.102**	
METALS (mg/L)														
ARSENIC (TOTAL)	**0.228**		-		-		**0.005**		**0.248**		**1.76**		**0.0172**	
ARSENIC (DISSOLVED)	**0.221**		-		-		**0.0047**		**0.222**		**1.85**		-	
VOCs (ug/L)														
1,2-DICHLOROETHANE	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U
BENZENE	**0.21**	J	<0.50	U	<0.50	U	**2.4**		<0.50	U	**2**		<0.50	U
NAPHTHALENE	<2.0	U	<2.0	U	<2.0	U	<2.0	U	<2.0	U	<2.0	U	<2.0	U
TRICHLOROETHENE	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U

NOTES:
1. ALL DATA ARE NOT VALIDATED
2. "-" INDICATES DATA NOT COLLECTED
3. ANALYTE DETECTED ABOVE THE LABORATORY REPORTING LIMIT ARE **BOLD**
4. U QUALIFER INDICATES A NON-DETECT
5. J QUALIFIER INDICATES ESTIMATED VALUE

TABLE I
SUMMARY OF ANALYTICAL DATA
NOVEMBER 2017
GROUNDWATER RESULTS
INDUSTRI-PLEX OU2, WOBURN, MA

Location	MW-203	MW-204	MW-205	MW-206	MW-207	MW-208	MW-209
Sample ID	MW203-111617	MW204-111617	MW205-111617	MW206-111717	MW207-111617	MW208-111517	MW209-111617
Sample Date	11/16/2017 12:55	11/16/2017 11:05	11/16/2017 12:55	11/17/2017 10:55	11/16/2017 15:15	11/15/2017 16:25	11/16/2017 14:25
Lab Sample ID	L1742478-04	L1742478-05	L1742478-08	L1742478-10	L1742478-09	L1742184-09	L1742478-02
NITROGEN SPECIES (mg/L)							
NITROGEN, AMMONIA	-	**26.3**	**0.056** J	**0.081**	-	**99.1**	**3.93**
METALS (mg/L)							
ARSENIC (TOTAL)	-	**5.54**	**0.0172**	**0.0025** J	**0.0029** J	**0.0163**	**0.166**
ARSENIC (DISSOLVED)	**0.0075**	**5.51**	**0.0032**	<0.0030 U	<0.0030 U	**0.0179**	**0.158**
VOCs (ug/L)							
1,2-DICHLOROETHANE	-	<1.0 U	-	-	-	-	-
BENZENE	-	<0.50 U	-	-	-	-	-
NAPHTHALENE	-	<2.0 U	-	-	-	-	-
TRICHLOROETHENE	-	<1.0 U	-	-	-	-	-

NOTES:
1. ALL DATA ARE NOT VALIDATED
2. "-" INDICATES DATA NOT COLLECTED
3. ANALYTE DETECTED ABOVE THE LABORATORY REPORTING LIMIT ARE **BOLD**
4. U QUALIFER INDICATES A NON-DETECT
5. J QUALIFIER INDICATES ESTIMATED VALUE

TABLE I
SUMMARY OF ANALYTICAL DATA
NOVEMBER 2017
GROUNDWATER RESULTS
INDUSTRI-PLEX OU2, WOBURN, MA

Location	MW-210		MW-212	MW-213
Sample ID	MW210-111517		MW212-111617	MW213-111517
Sample Date	11/15/2017 15:00		11/16/2017 12:00	11/15/2017 10:20
Lab Sample ID	L1742184-07		L1742478-07	L1742184-01
NITROGEN SPECIES (mg/L)				
NITROGEN, AMMONIA	**1.27**		**5.51**	**493**
METALS (mg/L)				
ARSENIC (TOTAL)	**0.0213**		**0.289**	**0.555**
ARSENIC (DISSOLVED)	**0.0174**		**0.262**	**0.528**
VOCs (ug/L)				
1,2-DICHLOROETHANE	<1.0	U	-	-
BENZENE	<0.50	U	-	-
NAPHTHALENE	<2.0	U	-	-
TRICHLOROETHENE	<1.0	U	-	-

NOTES:

1. ALL DATA ARE NOT VALIDATED
2. "-" INDICATES DATA NOT COLLECTED
3. ANALYTE DETECTED ABOVE THE LABORATORY REPORTING LIMIT ARE **BOLD**
4. U QUALIFER INDICATES A NON-DETECT
5. J QUALIFIER INDICATES ESTIMATED VALUE

TABLE I
SUMMARY OF ANALYTICAL DATA
FEBUARY 2018
GROUNDWATER RESULTS
INDUSTRI-PLEX OU2, WOBURN, MA

Location	MW-001D		MW-002D		MW-003D		MW-004D		MW-004D		MW-005D		MW-006D		MW-007D		MW-210	
Sample ID	MW001D-022618		MW002D-022618		MW003D-022718		MW004D-022718		MW004DD-022718		MW005D-022818		MW006D-022718		MW007D-022718		MW210-022718	
Sample Date	2/26/2018 15:20		2/26/2018 15:55		2/27/2018 11:30		2/27/2018 15:30		2/27/2018 15:40		2/28/2018 11:30		2/27/2018 14:05		2/27/2018 13:40		2/27/2018 12:20	
Lab Sample ID	L1806918-02		L1806918-03		L1806918-04		L1806918-07		L1806918-09		L1806918-11		L1806918-05		L1806918-06		L1806918-10	
NITROGEN SPECIES (mg/L)																		
NITROGEN, AMMONIA	**0.759**		**189**		**294**		**0.51**		**0.133**		**0.987**		**41.1**		**79.7**		**1.16**	
METALS (mg/L)																		
ARSENIC (TOTAL)	<0.0030	U	**0.867**		**0.0546**		**0.209**		**0.217**		**0.0024**	J	**0.135**		**0.223**		**0.0177**	
ARSENIC (DISSOLVED)	<0.0030	U	**0.917**		**0.0501**		**0.204**		**0.207**		<0.0030	U	**0.116**		**0.216**		**0.0158**	
VOCs (ug/L)																		
1,2-DICHLOROETHANE	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U
BENZENE	<0.50	U	**0.86**		**72**		<0.50	U	<0.50	U	<0.50	U	<0.50	U	<0.50	U	<0.50	U
NAPHTHALENE	<2.0	U	<2.0	U	<2.0	U	<2.0	U	<2.0	U	<2.0	U	<2.0	U	<2.0	U	<2.0	U
TRICHLOROETHENE	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U

NOTES:

1. ALL DATA ARE NOT VALIDATED
2. "-" INDICATES DATA NOT COLLECTED
3. ANALYTE DETECTED ABOVE THE LABORATORY REPORTING LIMIT ARE **BOLD**
4. U QUALIFER INDICATES A NON-DETECT
5. J QUALIFIER INDICATES ESTIMATED VALUE

TABLE 8
SUMMARY OF ANALYTICAL DATA
MAY 2018
GROUNDWATER RESULTS
INDUSTRI-PLEX OU2, WOBURN, MA

Location	MW-001D		MW-002D		MW-003D		MW-004D		MW-004D		MW-005D		MW-006D	
Sample ID	MW001D-052218		MW002D-052218		MW003D-052218		MW004D-052418		MW004DD-052418		MW005D-052318		MW006D-052318	
Sample Date	5/22/2018 11:10		5/22/2018 12:10		5/22/2018 13:05		5/24/2018 11:05		5/24/2018 11:20		5/23/2018 11:10		5/23/2018 11:20	
Lab Sample ID	L1818995-02		L1818995-03		L1818995-04		L1819477-03		L1819477-04		L1818995-07		L1818995-06	
NITROGEN SPECIES (mg/L)														
NITROGEN, AMMONIA	**0.813**		**197**		**262**		**0.077**		**0.062**	J	**0.749**		**40**	
METALS (mg/L)														
ARSENIC (TOTAL)	<0.0030	U	**0.946**		**0.0497**		**0.221**		**0.212**		<0.0030	U	**0.135**	
ARSENIC (DISSOLVED)	<0.0030	U	**0.963**		**0.0467**		**0.217**		**0.2**		<0.0030	U	**0.126**	
VOCs (ug/L)														
1,2-DICHLOROETHANE	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U
BENZENE	<0.50	U	**1.3**		**81**		<0.50	U	<0.50	U	<0.50	U	<0.50	U
NAPHTHALENE	<2.0	U	<2.0	U	<2.0	U	<2.0	U	<2.0	U	<2.0	U	<2.0	U
TRICHLOROETHENE	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U

NOTES:

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5. J QUALIFIER INDICATES ESTIMATED VALUE

TABLE 8
SUMMARY OF ANALYTICAL DATA
MAY 2018
GROUNDWATER RESULTS
INDUSTRI-PLEX OU2, WOBURN, MA

Location	MW-007D		MW-102		MW-103		MW-104S		MW-106S		MW-200		MW-201	
Sample ID	MW007D-052218		MW102-053018		MW103-052918		MW104S-053018		MW106S-052918		MW200-052318		MW201-052518	
Sample Date	5/22/2018 14:20		5/30/2018 13:30		5/29/2018 12:40		5/30/2018 14:00		5/29/2018 15:45		5/23/2018 13:40		5/25/2018 11:40	
Lab Sample ID	L1818995-05		L1819840-05		L1819840-03		L1819840-07		L1819840-04		L1818995-10		L1819477-07	
NITROGEN SPECIES (mg/L)														
NITROGEN, AMMONIA	**78.8**		-		-		-		-		**5.08**		**25.3**	
METALS (mg/L)														
ARSENIC (TOTAL)	**0.209**		-		-		-		-		<0.0030	U	**0.18**	
ARSENIC (DISSOLVED)	**0.212**		-		-		-		-		<0.0030	U	**0.187**	
VOCs (ug/L)														
1,2-DICHLOROETHANE	<1.0	U	<1.0	U	<1.0	U	<100	U	<40	U	<1.0	U	<1.0	U
BENZENE	**0.3**	J	**100**		<0.50	U	**73000**	E	**3800**		<0.50	U	<0.50	U
NAPHTHALENE	<2.0	U	<2.0	U	<2.0	U	**25**	J	<80	U	<2.0	U	**68**	
TRICHLOROETHENE	<1.0	U	<1.0	U	<1.0	U	<100	U	<40	U	<1.0	U	<1.0	U

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TABLE 8
SUMMARY OF ANALYTICAL DATA
MAY 2018
GROUNDWATER RESULTS
INDUSTRI-PLEX OU2, WOBURN, MA

Location	MW-202	MW-204	MW-205	MW-206	MW-207	MW-208	MW-209
Sample ID	MW202-052518	MW204-052418	MW205-053018	MW206-052418	MW207-052918	MW208-052518	MW209-052518
Sample Date	5/25/2018 13:25	5/24/2018 13:00	5/30/2018 11:05	5/24/2018 12:50	5/29/2018 11:25	5/25/2018 11:25	5/25/2018 13:10
Lab Sample ID	L1819477-08	L1819477-05	L1819840-06	L1819477-06	L1819840-02	L1819477-09	L1819477-10
NITROGEN SPECIES (mg/L)							
NITROGEN, AMMONIA	**14.4**	**29.9**	0.045 J	**0.066** J	-	**102**	**3.95**
METALS (mg/L)							
ARSENIC (TOTAL)	**2.52**	**3.23**	**0.469**	**0.0027** J	<0.0030 U	**0.0398**	**0.112**
ARSENIC (DISSOLVED)	**2.58**	**3.16**	**0.0848**	<0.0030 U	<0.0030 U	**0.037**	**0.114**
VOCs (ug/L)							
1,2-DICHLOROETHANE	<1.0 U	<1.0 U	-	-	-	<500 U	-
BENZENE	**0.95**	<0.50 U	-	-	-	**69000**	-
NAPHTHALENE	**0.38** J	<2.0 U	-	-	-	<1000 U	-
TRICHLOROETHENE	<1.0 U	<1.0 U	-	-	-	<500 U	-

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TABLE 8
SUMMARY OF ANALYTICAL DATA
MAY 2018
GROUNDWATER RESULTS
INDUSTRI-PLEX OU2, WOBURN, MA

Location	MW-210		MW-212	MW-213
Sample ID	MW210-052418		MW212-052518	MW213-052318
Sample Date	5/24/2018 11:00		5/25/2018 14:40	5/23/2018 13:10
Lab Sample ID	L1819477-02		L1819477-11	L1818995-09
NITROGEN SPECIES (mg/L)				
NITROGEN, AMMONIA	**2.16**		**5.72**	**568**
METALS (mg/L)				
ARSENIC (TOTAL)	**0.0221**		**0.276**	**0.646**
ARSENIC (DISSOLVED)	**0.0208**		**0.277**	**0.676**
VOCs (ug/L)				
1,2-DICHLOROETHANE	<1.0	U	-	-
BENZENE	<0.50	U	-	-
NAPHTHALENE	<2.0	U	-	-
TRICHLOROETHENE	<1.0	U	-	-

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TABLE 8
SUMMARY OF ANALYTICAL DATA
AUGUST 2018
GROUNDWATER RESULTS
INDUSTRI-PLEX OU2, WOBURN, MA

Location	MW-001D		MW-002D		MW-003D		MW-004D		MW-004D		MW-005D		MW-006D		MW-007D		MW-210	
Sample ID	MW001D-082118		MW002D-082118		MW003D-082118		MW004D-082118		MW004DD-082118		MW005D-082118		MW006D-082218		MW007D-082218		MW210-082118	
Sample Date	8/21/2018 9:45		8/21/2018 11:55		8/21/2018 14:35		8/21/2018 12:40		8/21/2018 12:50		8/21/2018 16:45		8/22/2018 10:10		8/22/2018 10:30		8/21/2018 10:10	
Lab Sample ID	L1833094-02		L1833094-03		L1833094-04		L1833094-08		L1833094-07		L1833094-09		L1833094-10		L1833094-11		L1833094-05	
NITROGEN SPECIES (mg/L)																		
NITROGEN, AMMONIA	**0.641**		**121**		**282**		**0.246**		**0.089**		**0.463**		**40**		**81.4**		**1.59**	
METALS (mg/L)																		
ARSENIC (TOTAL)	<0.0030	U	**0.995**		**0.0535**		**0.210**		**0.211**		**0.0083**		**0.124**		**0.207**		**0.0194**	
ARSENIC (DISSOLVED)	<0.0030	U	**0.907**		**0.0456**		**0.154**		**0.154**		<0.0030	U	**0.119**		**0.199**		**0.0191**	
VOCs (ug/L)																		
1,2-DICHLOROETHANE	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U
BENZENE	<0.50	U	<0.50	U	**48**		<0.50	U	<0.50	U	<0.50	U	<0.50	U	**0.32**	J	<0.50	U
NAPHTHALENE	<2.0	U	<2.0	U	<2.0	U	<2.0	U	<2.0	U	<2.0	U	<2.0	U	<2.0	U	<2.0	U
TRICHLOROETHENE	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U	<1.0	U

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Table 9 - Summary of Analytical Data
November 2018
Groundwater Results
Industri-Plex OU2, Woburn, MA

			Location, Sample ID, Sample Date, Lab Sample ID															
	CAS Number	**Groundwater Performance Standard**	MW-001D		MW-002D		MW-003D		MW-004D		MW-005D		MW-006D		MW-007D		MW-102	
			MW001D-110718		MW002D-110718		MW003D-110718		MW004D-110718		MW005D-110818		MW006D-110818		MW007D-110718		MW102-110918	
			11/07/2018 09:35		11/07/2018 11:20		11/07/2018 13:00		11/07/2018 13:50		11/08/2018 12:45		11/08/2018 11:40		11/07/2018 15:05		11/09/2018 12:25	
			L1845765-01		L1845765-03		L1845765-06		L1845765-07		L1846076-05		L1846076-03		L1845765-11		L1846076-15	
Nitrogen Species (mg/l)																		
Nitrogen, Ammonia	7664-41-7	4 mg/l	0.755		**107**		**337**		0.098		0.624		**37.4**		**76.4**		--	
Metals (mg/l)																		
Arsenic (Total)	7440-38-2	0.15 mg/l	0.0030	U	**0.959**		0.0519		**0.177**		0.0030	U	0.125		**0.196**		--	
Arsenic (Dissolved)	7440-38-2	0.15 mg/l	0.003	U	**0.812**		0.049		0.124		0.003	U	0.122		**0.180**		--	
VOCs (ug/l)																		
1,2-Dichloroethane	107-06-2	2 ug/l	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Benzene	71-43-2	4 ug/l	0.50	U	0.50	U	**59**		0.50	U	0.50	U	0.50	U	0.40	J	0.50	U
Naphthalene	91-20-3	5 ug/l	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Trichloroethene	79-01-6	1 ug/l	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	0.26	J

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Table 9 - Summary of Analytical Data
November 2018
Groundwater Results
Industri-Plex OU2, Woburn, MA

	CAS Number	**Groundwater Performance Standard**	**Location, Sample ID, Sample Date, Lab Sample ID**															
			MW-103		MW-104S		MW-106S		MW-200		MW-201		MW-202		MW-203		MW-204	
			MW103-110918		MW104S-110918		MW106S-110918		MW200-110818		MW201-110918		MW202-110918		MW203-110718		MW204-110718	
			11/09/2018 13:45		11/09/2018 14:00		11/09/2018 10:50		11/08/2018 14:30		11/09/2018 10:45		11/09/2018 12:20		11/07/2018 15:00		11/07/2018 10:20	
			L1846076-16		L1846076-17		L1846076-13		L1846076-07		L1846076-12		L1846076-14		L1845765-10		L1845765-02	
Nitrogen Species (mg/l)																		
Nitrogen, Ammonia	7664-41-7	4 mg/l	--		--		--		**10.4**		**31.6**		**16.6**		0.395		**31.9**	
Metals (mg/l)																		
Arsenic (Total)	7440-38-2	0.15 mg/l	--		--		--		0.0030	U	**0.193**		**1.31**		0.0104		**4.33**	
Arsenic (Dissolved)	7440-38-2	0.15 mg/l	--		--		--		0.003	U	**0.206**		**1.43**		0.007		**4.13**	
VOCs (ug/l)																		
1,2-Dichloroethane	107-06-2	2 ug/l	1.0	U	500	U	100	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Benzene	71-43-2	4 ug/l	0.50	U	**71000**		**12000**		0.50	U	0.50	U	0.76		0.50	U	0.50	U
Naphthalene	91-20-3	5 ug/l	2.0	U	1000	U	200	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Trichloroethene	79-01-6	1 ug/l	0.19	J	500	U	100	U	1.0	U	1.0	U	0.44	J	1.0	U	1.0	U

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Table 9 - Summary of Analytical Data
November 2018
Groundwater Results
Industri-Plex OU2, Woburn, MA

			Location, Sample ID, Sample Date, Lab Sample ID							
	CAS Number	**Groundwater Performance Standard**	MW-205 MW205-110718 11/07/2018 14:40 L1845765-09	MW-206 MW206-110818 11/08/2018 13:30 L1846076-06	MW-207 MW207-110818 11/08/2018 10:10 L1846076-01	MW-208 MW208-110918 11/09/2018 09:10 L1846076-11	MW-209 MW209-110818 11/08/2018 12:30 L1846076-04	MW-210 MW210-110718 11/07/2018 12:00 L1845765-04	MW-210 DUP-110718 11/07/2018 12:15 L1845765-05	MW-211 MW211-110718 11/07/2018 14:20 L1845765-08
Nitrogen Species (mg/l)										
Nitrogen, Ammonia	7664-41-7	4 mg/l	0.142	0.067 J	--	**116**	3.43	3.13	3.24	0.886
Metals (mg/l)										
Arsenic (Total)	7440-38-2	0.15 mg/l	0.0656	0.0030 U	0.0030 U	0.0248	0.115	0.0276	0.0259	0.0030
Arsenic (Dissolved)	7440-38-2	0.15 mg/l	0.008	0.003 U	0.003 U	0.024	0.118	0.018	0.019	0.003 U
VOCs (ug/l)										
1,2-Dichloroethane	107-06-2	2 ug/l	--	--	--	400 U	--	1.0 U	1.0 U	--
Benzene	71-43-2	4 ug/l	--	--	--	**43000**	--	0.50 U	0.50 U	--
Naphthalene	91-20-3	5 ug/l	--	--	--	800 U	--	2.0 U	2.0 U	--
Trichloroethene	79-01-6	1 ug/l	--	--	--	400 U	--	1.0 U	1.0 U	--

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Table 9 - Summary of Analytical Data
November 2018
Groundwater Results
Industri-Plex OU2, Woburn, MA

			Location, Sample ID, Sample Date, Lab Sample ID		
	CAS Number	**Groundwater Performance Standard**	MW-212	MW-213	MW-213
			MW212-110818	MW213-110818	DUP-110818
			11/08/2018 11:25	11/08/2018 14:45	11/08/2018 15:00
			L1846076-02	L1846076-08	L1846076-09
Nitrogen Species (mg/l)					
Nitrogen, Ammonia	7664-41-7	4 mg/l	**5.44**	**453**	--
Metals (mg/l)					
Arsenic (Total)	7440-38-2	0.15 mg/l	**0.249**	**0.551**	**0.562**
Arsenic (Dissolved)	7440-38-2	0.15 mg/l	**0.238**	**0.568**	**0.574**
VOCs (ug/l)					
1,2-Dichloroethane	107-06-2	2 ug/l	--	--	--
Benzene	71-43-2	4 ug/l	--	--	--
Naphthalene	91-20-3	5 ug/l	--	--	--
Trichloroethene	79-01-6	1 ug/l	--	--	--

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Appendix E
Interviews

Summary of Interviewees*, Affiliations and Interview Dates

Interviewee	Affiliation	Interview Date	Interview Type
Todd Majer	OU1 Project Coordinator - de maximis, inc.	4/18/19	Email
Bruce Thompson	OU2 Project Coordinator - de maximis, inc.	4/18/19	Email
Jennifer McWeeney	Project Manager, MassDEP	4/24/19	Email
Michael L. Raymond	Co-chariman, Aberjona Study Coalition, Inc.	4/5/19	Email
Linda A. Raymond	Co-chariman, Aberjona Study Coalition, Inc.	5/5/19	Email

*City of Woburn officials were invited to review and respond to interview questions. No comments were received for this report.

INTERVIEW RECORD

Site Name: Industri-plex Superfund Site	**EPA ID No.:** MAD076580950	
Subject: Five Year Review	**Time:**	**Date: 04/18/19**
Type: ☐ Telephone ☐ Visit ☐ Other **Location of Visit:**	☐ Incoming ☐ Outgoing N/A	

Contact Made By:

Name: Gordon Bullard	**Title: Principal**	**Organization: Twin Lights Associates, LLC – subcontractor to AECOM**

Individual Contacted:

Name: Todd Majer Bruce Thompson	**Title:** OU1 Project Coordinator OU2 Project Coordinator	**Organization:** ***de maximis, inc.*** ***de maximis, inc.***
Telephone No.:860-298-0541 **Fax No.: 860-298-0561** **E-Mail Address:** **tmajer@demaximis.com** **brucet@demaximis.com**	**Street Address:** **200 Day Hill Road, Suite 200** **Windsor, CT 06095**	

Preface:

1.A. What is your overall impression of the project? (general sentiment)

Our impression of the projects (OU1 and OU2) to date is that both have successfully met the remedial action objectives set forth in the Consent Decrees & Statement of Work. The combined project teams have addressed and resolved a variety of technical issues and will be able to have continued success while implementing the Operations and Maintenance of the projects.

2.A. Is the remedy functioning as expected? How well is the remedy performing?

The OU1 & OU2 remedies are generally functioning and performing as expected.

3.A. What does the monitoring data show? Are there any trends that show contaminant levels are decreasing?

The monitoring data is provided monthly through each respective Operable Unit's monthly progress reports. There is insufficient data at this point to establish definitive trends for OU2 surface water or groundwater data. It appears that the OU2 remedy has decreased the magnitude of the range of ammonia concentrations in surface water crossing the cofferdam constructed in the HBHA Pond, resulting in more consistent treatment.

4.A. Is there a continuous on-site O&M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities.

There is an O&MM Technician on-site 27-32 hours per week, 52 weeks a year and at certain times of the year (April 1st through June 30th), are on-site 40 hours per week. Activities range from operation of the OU1 Thermal Oxidation Unit (TOU), to OU2 aeration treatment system monitoring, compliance surface water monitoring and groundwater monitoring.

5.A. Have there been any significant changes in the O&M requirements, maintenance schedules, or sampling routes since start-up or in the last five years? Please describe the changes and any potential impacts on the remedy.

Yes. EPA and the Settling Defendants have agreed to increase the ammonia compliance monitoring at the HBHA Pond outlet to twice weekly for the entire year.

6.A. Have there been unexpected O&M difficulties or costs at the site since start-up or in the last five years? If so, please provide details.

No.

7.A. Have there been opportunities to optimize O&M, or sampling efforts? Please describe changes and resultant, or improved efficiency.

The OM&M Plan is set-up to reduce monitoring frequency after the third year of monitoring (2020) is complete.

8.A. Do you have any comments, suggestions, or recommendations regarding the project?

No.

SUPPLEMENTAL QUESTIONS

Questions specific to OU1

1.B. Are you aware of any land use changes which would impact the protectiveness of the current remedy (e.g., residential use, etc.)? For properties requiring institutional controls, are you aware of any property ownership changes? Please describe.

Land Use Changes – EPA prepared an Explanation of Significant Difference for 120 Commerce Way and 200 Presidential Way to permit residential use. There have been two major ownerships changes in recent years, the Chestnut Hill Realty Trust Property (i.e., a large portion of the East Central Hide Pile) and the Interim Custodial Trust Properties (IC-27, IC-29, IC-45 & IC-46) have all been transferred to Industri-plex Woburn LLC.

2.B. Are inspection records up-to-date? If maintenance of covers is

noted during inspections, what is the current procedure related to notification and follow-up on such maintenance?

Yes, the OU1 inspection records are up-to-date. If maintenance of the cover was documented during the property inspection, the property owner was sent the inspection report indicating the need to make repair(s).

3.B. Have there been any Health & Safety issues on site?

No.

4.B. Is there evidence or sightings of trespassers on the property? If yes, how often and what type of activities do they engage in?

Yes. Activities include mountain biking, walking and model plane flying on the OU1 landfill caps.

5.B. Have there been any events of vandalism at the property?

Yes. Tire track ruts on the East Central Hide Pile and South Hide Pile.

6.B. Have there been any unusual or unexpected activities or events at the site (e.g., flooding)?

No.

7.B. Has the site been the subject of any community complaints (e.g., odor, noise, health, etc.)?

None that we are aware of.

Questions specific to OU2

1.C. Discuss any operational adjustments which have been implemented since the 2017 construction close-out report, as well as any potential adjustments currently being considered.

There have been no permanent operation adjustments to the aeration treatment system. However, there has been several capital improvement projects, including installation of a stop-gate system at the Atlantic Avenue Drainway to hold back water for contingency measures, upgrades to the aeration systems PLC, installation of an uninterrupted Power Supply for transfer of energy from power source to backup generator and installation of straw wattles along the toe of the western slope of the Permeable Cap area.

2.C. Is the system performing as expected?
Yes.

3.C. Have there been any noticeable surface water flow changes that impact the system performance? Do monitoring results appear to be better during either the high or low water season?
No. Apart from one AWQC exceedance, the monitoring results, whether during a high or low water season have met the compliance criteria.

4.C. Any operational issues associated with the change of each season (e.g., colder surface water temperatures during winter months, etc.)?
No. Since the one AWQC exceedance, we monitor the webitats for ice build up. No issues during the 2018-2019 winter.

5.C Are sediment depths in the HBHA pond increasing at a rate beyond that which is expected? When would the sediments need to be dredged (e.g., Primary Treatment Cell, Aeration Zone of the Secondary Treatment Cell, Settling Zone of the Secondary Treatment Cell) in the pond?
At this point there is no data to determine whether the HBHA Pond sediments thickness has increased or not. The OMM Plan requires a bathometry survey of the HBHA Pond every five years after completion of the remedy. Survey will be performed in 2022.

6.C Anything to note regarding the wetland mitigation and fish ladder components of the remedy?

The wetland mitigation areas are thriving, with the designed ground cover and shrubs and trees becoming well-established. The Fish Ladder has only been in operation for one year, but based on the number of river herring that passed through the ladder in 2018, (approximately ~109,000), we believe the fish ladder has been highly successful.

7.C. What site investigation and remediation reports have been generated in the past 5 years?

Pre-Design Reports, Remedial Action Work Plans, Remedial Design Report, Construction Completion Report, Institutional Controls Plan

8.C. Provide a summary of the types of problems or errors that have been observed since the 2017 construction close-out.

1). Invasive species in the created wetlands, 2). ice formation on the webitats.

9.C. Have there been any health and safety issues on-site?

No

10.C. For properties requiring institutional controls, have there been any property ownership changes? Not Applicable.

Settling Defendants are awaiting approval of the 100% Remedial Design Institutional Control Plan.

11.C. Are there any uses of the neighboring properties which are of concern as they relate to the remedy?

No.

12.C. Is there evidence or sightings of trespassers on the property? If yes, how often and what type of activities do they engage in?

No.

13.C. Have there been any events of vandalism at the property?

No.

14.C. Have there been any unusual or unexpected activities or events at the site (e.g., flooding)?

No.

15.C. Has the site been the subject of any community complaints (e.g., odor, noise, health, etc.)?

None that we are aware of currently.

Wrap-Up

1.D. Is there any other information that you wish to share that might be of use?

No.

INTERVIEW RECORD

Site Name: Industri-plex Superfund Site	**EPA ID No.:** MAD076580950	
Subject: Five Year Review	**Time:** 10:00 am	**Date: 4/24/19**
Type: ☐ Telephone ☐ Visit ■ Other **Location of Visit:**	☐ Incoming ☐ Outgoing N/A	

Contact Made By:

Name: Gordon Bullard	**Title: Principal**	**Organization: Twin Lights Associates, LLC – subcontractor to AECOM**

Individual Contacted:

Name: Jennifer McWeeney	**Title: project manager**	**Organization: MassDEP**
Telephone: 617-654-6560 **Fax No.** **E-mail Address: Jennifer.mcweeney@mass.gov**	**Street Address:** **1 Winter St, 6th floor, BWSC** **Boston, MA 02108**	

Preface:

5-YEAR REVIEW QUESTIONS FOR STATE/LOCAL OFFICIALS

1.A. What is your overall impression of the project? (general sentiment)

Overall, the project is well managed.

2.A. Have there been routine communication or activities (site visits, inspections, redevelopment) involving your office regarding the site? If so, please give details.

No.

3.A. Have there been any complaints, violations, or other incidents related to the site requiring a response by your office. If so, please give details.

No.

4.A. Do you feel well informed about the site's activities and progress?

Yes, very well informed.

5.A. Do you have any comments, suggestions, or recommendations regarding the site's management, operation, or overall project?

No.

SUPPLEMENTAL QUESTIONS

1.B. What concerns do you have about the site?

Being able to review and approve all NAULS for both OUs in a timely manner.

2.B. Are you aware of any community concerns regarding the site? Please provide details.

No.

3.B. Have the activities to date at the site helped the neighborhood and/or community?

Yes, in a few ways: 1) Safety (the public is not exposed to site contaminants at concentrations that pose risk), 2) redevelopment of brownfield properties, including (forthcoming) residential reuse at two properties, 3) creation of the Aberjona Nature Trail and 1-acre floodplain enhancement, 4) Fish ladder at Center Falls Dam in Winchester, 5) 2.4 acre created wetlands, to help minimize flooding.

4.B. Are you aware of any events of vandalism or trespassing at the site?
No.

5.B. Are you aware of any changes in projected land use at or near the site?

Just the two properties which have been approved for redevelopment for residential use.

6.B. Are there any pending changes in laws or regulations that may impact the site?

No.

7.B. Is there any other information that you wish to share that might be of use?

No.

INTERVIEW RECORD

Site Name: Industri-plex Superfund Site	**EPA ID No.:** MAD76580950	
Subject: Five Year Review	**Time:** 10:00 am	**Date: 4-5-19**
Type: ☐ Telephone ☐ Visit ■ Other **Location of Visit:**	☐ Incoming ☐ Outgoing	

Contact Made By:

Name:	**Title:**	**Organization:Twin Lights Associates,LLC-subcontractor to AECOM**

Individual Contacted:

Name: Michael L Raymond-Linda A Raymond	**Title: Co-Chairman**	**Organization: Aberjona Study Coalition, Inc.**
Telephone No.: 781-935-2438 **Fax No.:** **E-Mail Address: fitwalker1@comcast.net**	**Street Address: 10 North Maple Street Woburn MA 01801**	
Permission to Use Interviewee's Name in the Five-Year Review	**x Yes (permission granted)** ☐ **No (prefer to remain anonymous & identified only by role/title)**	

<u>Preface:</u>

5-YEAR REVIEW QUESTIONS FOR COMMUNITY

1.A. What is your overall impression of the project? (general sentiment)?

My overall impression of the project is favorable. My concern is with the possible development of the adjoining Olin Chemical property. The proposed development calls for over 1,000,000 ft of hot top surface water draining into the New Boston Street Drain way which empties into Halls Brook

2.A. What effects have site operations had on the surrounding community?

The effects on the surrounding community are positive, one example is the wetland restoration and walking path created adjacent to the Gun Club.

3.A. Are you aware of any community concerns regarding the site's operation and administration? If so, please give details.

I am not aware of any community concerns regarding the site's operation and administration. I think this is due to fact that the experienced EPA project manager took and continue to take a proactive approach to the project.

4.A. Are you aware of any events, incidents, or activities at the site (such as emergency responses)? If so, please give details.

I am not aware of any incidents or activities at the site.

5.A. Do you feel well informed about the site's activities and progress?

No. The Aberjona Study Coalition is the TAG for the project and it seems we have been left off of the mailing list.

6.A. Do you have any comments, suggestions, or recommendations regarding the site's management, operation or overall project?

Yes, my comments and concerns relate to the adjoining Olin Chemical Co. I believe that if nothing is done regarding the surface water drainage the pollution of the Aberjona River will only increase instead of decreasing.

SUPPLEMENTAL QUESTIONS FOR COMMUNITY GROUPS

1.B. What concerns do you have about the site?

I have no concerns regarding the site.

2.B. Are you aware of any other community concerns regarding the site? Provide details.

Yes. During a recent site visit Employees working for company's adjacent to the site are concerned about their business closing due to the cleanup.

3.B. Have the activities to date at the site helped the neighborhood and/or community?

I believe that the activities to date at the site have helped the community, one example is the walking path.

4.B. Are you aware of any events of vandalism or trespassing at the site?

I am not aware of any events of vandalism or trespassing at the site.

5.B. Are you aware of any other activities at the site that might be of importance? (e.g., flooding)?

I am not aware of any other activities that might be of importance.

6.B. Are you aware of any changes in projected land use at or near the site?

Yes, I am aware of any change in the projected land use at or near the site. The redevelopment of the Woburn Mall might have a direct impact on the project.

7.B. Is there any other information that you wish to share that might be of use?

Yes, I would like the adjoining property Olin Chemical proposed trans-rail facility investigated to see what effect it will have on the Aberjona watershed.

END

Appendix F
ARARs

Table F-1
Review of ARARs from 2014 ESD for Lower South Pond (LSP) Sediments Dredging and Off-Site Disposal, and Restoration of All Disturbed Areas
Industri-Plex Superfund Site Operable Unit 2 (and Including Wells G&H Superfund Site Operable Unit 3, Aberjona River Study)

ACTION-SPECIFIC ARARs

AUTHORITY	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	FIVE-YEAR REVIEW
Federal Regulatory Requirements	RCRA Identification and Listing of Hazardous Wastes, 40 C.F.R. 261.3	Applicable	Criteria for determining if a waste or contaminated media is a hazardous waste subject to regulation. If a contaminated media exhibits the characteristics of a hazardous waste, RCRA hazardous waste regulations are applicable.	Excavated sediments were characterized and disposed off-site as non-hazardous waste.
	RCRA Hazardous Waste Regulations (Storage and Disposal of Hazardous Waste) 40 C.F.R. Part 262, Subpart A, 40 C.F.R. Part 264, Subparts I and J.	Relevant and Appropriate	Subparts I and J of Part 264 identify design, operating, monitoring, closure, and post-closure care requirements for RCRA hazardous waste in containers and tank systems, respectively. However, Section 262.34(a) allows accumulation of RCRA hazardous wastes for up to 90 days in containers or tanks provided generator complies with requirements of Subparts I and J of Part 265. Relevant and appropriate standards for less than 90 storage.	Not ARAR. No hazardous wastes were generated from the sediment removal.
	RCRA Closure and Post-Closure Requirements, 40 C.F.R. Subpart G	Applicable	If contaminated sediments constitute characteristic hazardous waste these regulations are applicable. Closure must be completed in a manner that minimizes the need for further maintenance, and controls, minimizes or eliminates, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated run-off, or hazardous waste decomposition products to the ground or surface waters or to the atmosphere.	Excavated sediments were tested and not found to constitute characteristic hazardous waste.

ACTION-SPECIFIC ARARs (cont.)

AUTHORITY	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	FIVE-YEAR REVIEW
Federal Regulatory Requirements (cont.)	Clean Water Act, National Pollutant Discharge Elimination System (NPDES),40 CFR 122 and 450	Applicable for discharge to surface water standards; Stormwater standards Applicable for over one acre, Relevant and Appropriate for under one acre	Regulates the discharge of water into public surface waters. Major requirements include the following: • Use of best available technology economically achievable is required to control toxic and non-conventional pollutants. Use of best conventional pollutant control technology is required to control conventional pollutants. Technology-based limitations may be determined on a case-by-case basis. • Applicable federally-approved state water quality standards must be complied with. These standards may be in addition to or more stringent than other federal standards under the CWA. Requires the use of best practicable technology (as defined at 40 C.F.R. 450.21) for disturbances of less than 10 acres and best available technology (as defined at 40 C.F.R. 450.22) for disturbance of over 10 acres to control stormwater discharges from construction activity.	The dewatering treatment system was designed to comply with this ARAR. The system required modification during implementation due to discharge exceedances for benzene and ammonia.
	Clean Water Act, Section 304(1)(1) National Recommended Water Quality Criteria	Relevant and Appropriate	Provides surface water quality standards for a number of organic and inorganic contaminants.	NRWQC were used as monitoring standards for surface water during remedy implementation.
	Clean Air Act (CAA), Hazardous Air Pollutants, 42.U.S.C. § 112(b)(1), National Emission Standards for Hazardous Air Pollutants (NESHAPS), 40 C.F.R. Part 61	Applicable	The regulations establish emissions standards for 189 hazardous air pollutants. Standards set for dust and other release sources.	Air monitoring was not determined to be necessary.

ATTACHMENT 2 –LOWER SOUTH POND (LSP) SEDIMENTS DREDGING AND OFF-SITE DISPOSAL, AND RESTORATION OF ALL DISTURBED AREAS

ACTION-SPECIFIC ARARs (cont.)				
AUTHORITY	**REQUIREMENT**	**STATUS**	**REQUIREMENT SYNOPSIS**	**FIVE-YEAR REVIEW**
State Regulatory Requirements	Massachusetts Surface Water Quality Standards 314 CMR 4.00	Applicable	These standards designate the most sensitive uses for which the various waters of the Commonwealth shall be enhanced, maintained, or protected. Minimum water quality criteria required to sustain the designated uses are established. Federal NRWQCs are to be considered in determining effluent discharge limits. Where recommended limits are not available, site-specific limits shall be developed.	This ARAR was met through the use of engineering controls and protective construction methods during sediment removal activities. The dewatering treatment system was designed to comply with this ARAR. The system required modification during implementation due to discharge exceedances for benzene and ammonia. Federal NRWQC were used to establish monitoring standards for the remedial action to protect surface water quality.
	Water Quality Certification for Discharge of Dredged or Fill Material, Dredging and Dredged Material Disposal in Waters of the United States within the Commonwealth, 314 CMR 9.06	Applicable	For discharge of dredged or fill material, there must be no practicable alternative with less adverse impact on aquatic ecosystem; must take practicable steps to minimize adverse impacts on wetlands or land under water; stormwater discharges must be controlled with BMPs; must be no substantial adverse impact to physical, chemical, or biological integrity of surface waters.	This ARAR was met because (a) there was no practicable alternative method with less adverse impact on the aquatic ecosystem; (b) all practical measures were taken to minimize adverse impacts on wetlands and land under water; (c) stormwater discharges were controlled through BMPs; and (d) there were no substantial long-term adverse impacts to integrity of surface waters.
	Water Quality Certification for Discharge of Dredged or Fill Material, Dredging and Dredged Material Disposal in Waters of the United States within the Commonwealth, 314 CMR 9.07	Applicable	Hydraulic or mechanical dredging allowed; must avoid fisheries impacts.	No significant fisheries were identified in the area during the remedial design. BMPs were implemented during sediment dredging and filling activities and aquatic habitat is being restored.

ACTION-SPECIFIC ARARs (cont.)

AUTHORITY	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	FIVE-YEAR REVIEW
State Regulatory Requirements (cont.)	Massachusetts Surface Water Discharge Permit Regulations, 314 CMR 3.00	Applicable	Regulates the discharge of water into public surface waters, allows Commonwealth to establish state standards under federal NPDES program.	See above discussion of federal NPDES requirements.
	Mass. Hazardous Waste Regulations (Storage of Hazardous Waste), 310 CMR 30.300, 30.680, 30.690 310 CMR 30.340	Applicable	Requirements for long-term storage, transport and disposal of RCRA hazardous waste in containers and tank systems	See discussion of federal RCRA Hazardous Waste Regulations above.
	Massachusetts Ambient Air Quality standards, 310 C.M.R. 6.0	Applicable	These regulations contain standard for fugitive emissions, dust, and particulates that may be generated from the remedial action.	Air monitoring was not determined to be necessary.
	Massachusetts Air Pollution Control Regulations, 310 C.M.R. 7.00	Applicable	These regulations contain standard for fugitive emissions, dust, and particulates that may be generated from the remedial action.	Air monitoring was not determined to be necessary.
Criteria, Advisories, and Guidance	Contaminated Sediment Remediation Guidance for Hazardous Waste Sites, EPA-540-R-05-012 OSWER 9355.0-85 (December 2005)	To Be Considered	Guidance for making remedy decisions for contaminated sediment sites. Some of the relevant sections of the guidance address Remedial Investigations (Ch. 2), FS Considerations (Ch. 3), and Dredging and Excavation (Ch. 6).	It was determined that the removal of all contaminated sediment, along with dewatering and off-site disposal meets guidance standards for addressing contaminated sediments in the wetlands (as long as habitat restoration requirements can be met).
	Massachusetts Sedimentation and Erosion Control Guidance	To Be Considered	Standards for preventing erosion and sedimentation.	The remedial activities were managed to control erosion and sedimentation in compliance with this guidance.

ATTACHMENT 2 –LOWER SOUTH POND (LSP) SEDIMENTS DREDGING AND OFF-SITE DISPOSAL, AND RESTORATION OF ALL DISTURBED AREAS

LOCATION-SPECIFIC ARARs

AUTHORITY	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	FIVE-YEAR REVIEW
Federal Regulatory Requirements	Floodplain Management and Protection of Wetlands, 44 C.F.R. 9	Relevant and Appropriate	FEMA regulations that set forth the policy, procedure and responsibilities to implement and enforce Executive Order 11988 (Floodplain Management) and Executive Order 11990 (Protection of Wetlands). Prohibits activities that adversely affect a federally-regulated wetland unless there is no practicable alternative and the proposed action includes all practicable measures to minimize harm to wetlands that may result from such use. Requires the avoidance of impacts associated with the occupancy and modification of federally-designated 100-year and 500-year floodplain and to avoid development within floodplain wherever there is a practicable alternative. An assessment of impacts to 500-year floodplain is required for critical actions – which includes siting hazardous waste facilities in a floodplain. Requires public notice when proposing any action in or affecting floodplain or wetlands.	It was determined that there was no practicable alternative method to work in federal jurisdictional wetlands with less adverse impact and all practicable measures were taken to minimize and mitigate any adverse impacts. Erosion and sedimentation control measures were adopted during construction and restoration activities within federal jurisdictional wetlands. Standards for work within regulated floodplain were attained in part because (a) there was no practical alternative method that would achieve cleanup objectives with less adverse impact; (b) all practical measures were be taken to minimize and mitigate any adverse impacts from the work; (c) there was no likely impact on T&E species; (d) actions were taken to minimize impact of hydrologic changes during the work; (e) after completion of the work, there was no significant net loss of flood storage capacity, and no significant net increase in flood stage or velocities; and (f) river and riverbanks were restored and habitat will be improved. Public comment was solicited on the draft ESD concerning the proposed alteration to wetlands and floodplain. No negative comments were received.

ATTACHMENT 2 –LOWER SOUTH POND (LSP) SEDIMENTS DREDGING AND OFF-SITE DISPOSAL, AND RESTORATION OF ALL DISTURBED AREAS

AUTHORITY	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	FIVE-YEAR REVIEW
Federal Regulatory Requirements (cont.)	Clean Water Act §404, and regulations, 33 USC 1344, 40 CFR, 230	Applicable	For discharge of dredged or fill material into water bodies or wetlands, there must be no practical alternative with less adverse impact on aquatic ecosystem; discharge cannot cause or contribute to violation of state water quality standard or toxic effluent standard or jeopardize threatened or endangered (T&E) species; discharge cannot significantly degrade waters of U.S.; must take practicable steps to minimize and mitigate adverse impacts; must evaluate impacts on flood level, flood velocity, and flood storage capacity. Sets standards for restoration and mitigation required as a result of unavoidable impacts to aquatic resources. EPA must determine which alternative is the "Least Environmentally Damaging Practicable Alternative" (LEDPA) to protect wetland and aquatic resources.	It was determined that the sediment remediation, as implemented, was the Least Environmentally Damaging Practicable Alternative (LEDPA).
	Fish and Wildlife Coordination Act 16 USC 662, 663	Applicable	Requires consultation with appropriate agencies to protect fish and wildlife when federal actions may alter waterways. Must develop measures to prevent and mitigate potential loss to the maximum extent possible.	This ARAR was met during the design face through consultations with the USFWS.
State Regulatory Requirements	Massachusetts Wetlands Protection Act and Regulations, MGL c. 131 § 40, 310 CMR 10.00	Applicable	Regulations restrict dredging, filling, altering, or polluting inland wetland resource areas and buffer zones and impose performance standards for work in such areas. Protected resource areas include: 10.54 (Bank); 10.55 (Bordering Vegetated Wetlands); 10.56 (Land under Water); 10.57 (Bordering Land subject to Flooding); and 10.58 (Riverfront Area).	This ARAR was attained because (a) there was no practicable alternative that would be less damaging to resource areas; (b) all practical measures were taken to minimize adverse impacts on wetlands; (c) stormwater discharges were controlled through best management practices (BMPs); (d) actions were taken to minimize impact of hydrologic changes during the work to the extent practicable; (e) after completion of the work, there was no significant net loss of flood storage capacity and no significant net increase in flood storage or velocities; and (f) disturbed vegetation, river, and riverbank is being restored.

ATTACHMENT 2 –LOWER SOUTH POND (LSP) SEDIMENTS DREDGING AND OFF-SITE DISPOSAL, AND RESTORATION OF ALL DISTURBED AREAS

CHEMICAL-SPECIFIC ARARs

AUTHORITY	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTIONS TO BE TAKEN TO ATTAIN REQUIREMENT
Criteria, Advisories, and Guidance	Canadian Council of Ministers of the Environment (CCME). 1999. Canadian water quality guidelines for the protection of aquatic life: Benzene. In: Canadian environmental quality, 1999, Canadian Council of Ministers of the Environment, Winnipeg.	To Be Considered	Guidance used to develop benzene sediment cleanup level based on the water quality guidelines and site-specific calculation of a sediment benchmark for the protection of freshwater aquatic life due to chronic exposure.	This benzene water quality guideline was used to calculate a cleanup level for benzene in Lower South Pond sediments and documented in the 2014 ESD. No changes have since occurred that would impact the sediment cleanup level. All sediments exceeding the cleanup standard for benzene were removed from the wetland and disposed of off-site.

Appendix G
Site Figures

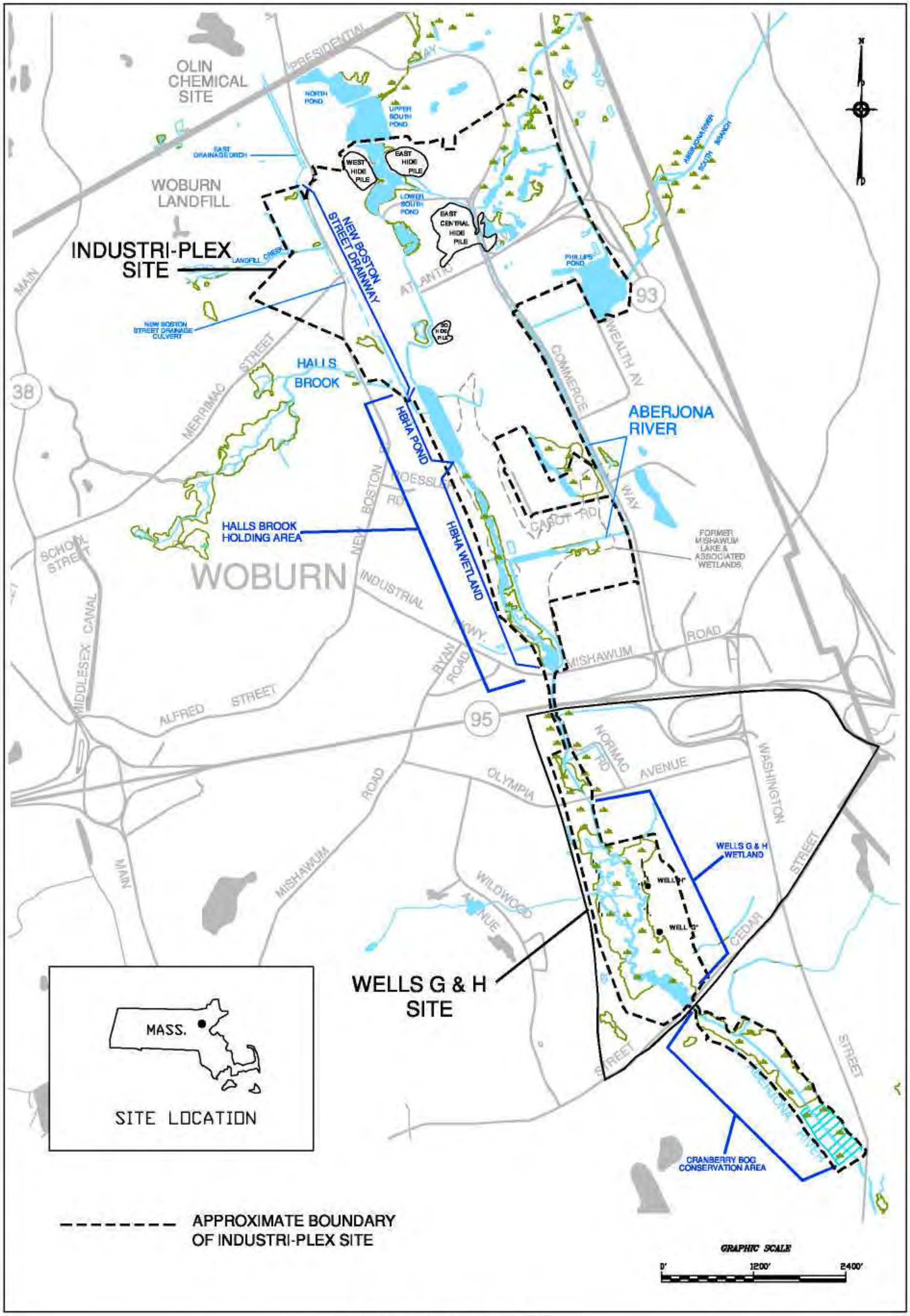

OLIN CHEMICAL SITE
PRESIDENTIAL
NORTH POND
UPPER SOUTH POND
EAST DRAINAGE DITCH
WEST HIDE PILE
EAST HIDE PILE
WOBURN LANDFILL
LOWER SOUTH POND
EAST CENTRAL HIDE PILE
INDUSTRI-PLEX SITE
LANDFILL CREEK
NEW BOSTON STREET DRAINWAY
ATLANTIC
PHILLIPS POND
93
ABERJONA RIVER SOUTH BRANCH
MAIN
NEW BOSTON STREET DRAINAGE CULVERT
SO HIDE PILE
COMMERCE
WEALTH AV
HALLS BROOK
38
MERRIMAC STREET
HBHA POND
ABERJONA RIVER
DRESSER
BOSTON
RD
WAY
CABOT RD
HALLS BROOK HOLDING AREA
HBHA WETLAND
FORMER MISHAWUM LAKE & ASSOCIATED WETLANDS
SCHOOL STREET
WOBURN
NEW
INDUSTRIAL
PKWY.
MIDDLESEX CANAL
RYAN ROAD
MISHAWUM
ROAD
ALFRED STREET
95
NORMAC RD
AVENUE
WASHINGTON
OLYMPIA
ROAD
MAIN
MISHAWUM
WILDWOOD AVENUE
WELLS G & H WETLAND
WELL "H"
WELL "G"
STREET
CEDAR
WELLS G & H SITE
MASS.
SITE LOCATION
STREET
ABERJONA RIVER
STREET
CRANBERRY BOG CONSERVATION AREA
APPROXIMATE BOUNDARY OF INDUSTRI-PLEX SITE
GRAPHIC SCALE
0'
1200'
2400'
N

FIGURE A-1

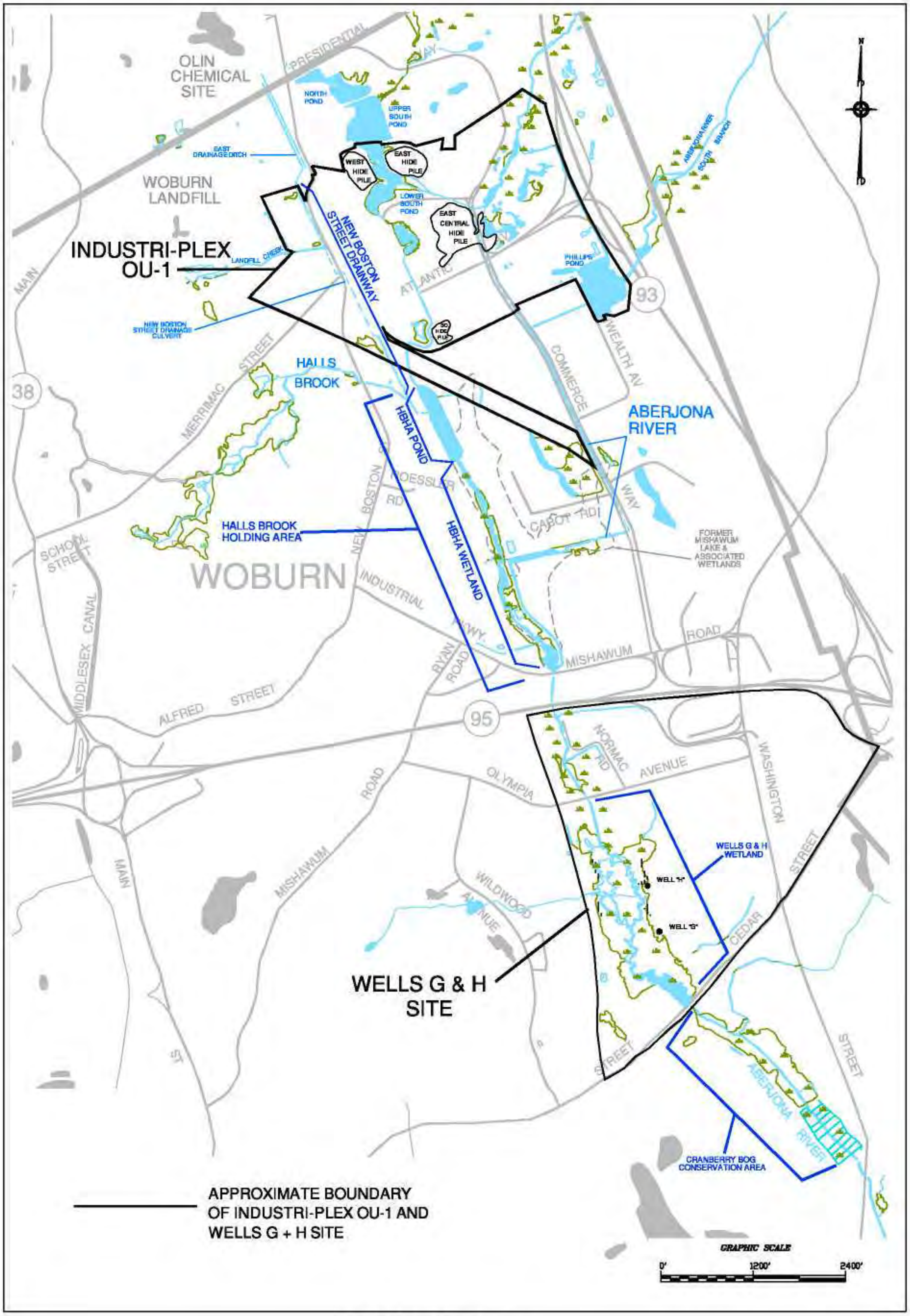
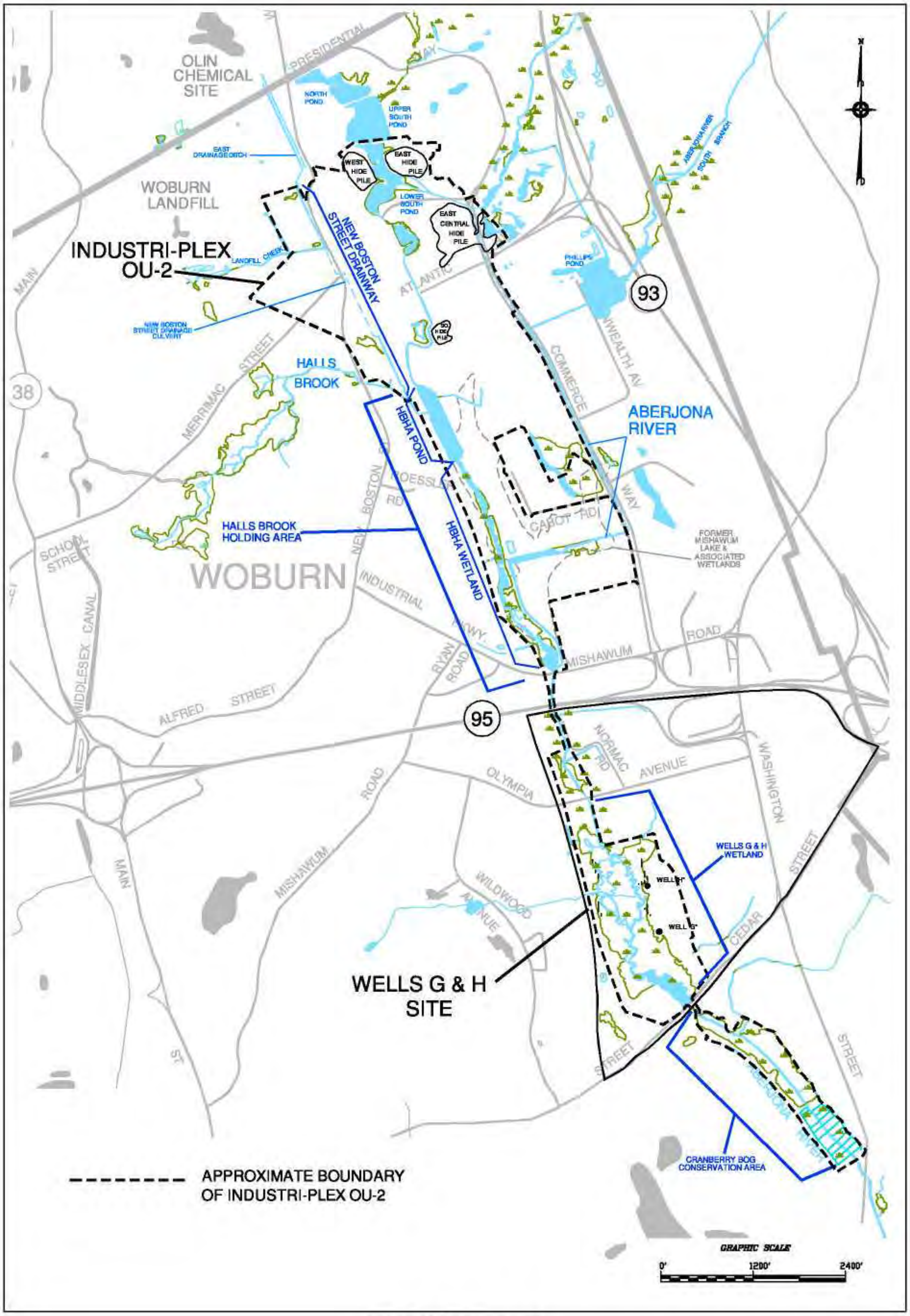

OLIN CHEMICAL SITE
PRESIDENTIAL WAY
NORTH POND
UPPER SOUTH POND
EAST DRAINAGE DITCH
WEST HIDE PILE
EAST HIDE PILE
WOBURN LANDFILL
LOWER SOUTH POND
EAST CENTRAL HIDE PILE
INDUSTRI-PLEX OU-1
LANDFILL CREEK
NEW BOSTON STREET DRAINWAY
ATLANTIC
PHILLIPS POND
93
NEW BOSTON STREET DRAINAGE CULVERT
SO HIDE PILE
ABERJONA RIVER SOUTH BRANCH
HALLS BROOK
38
MERRIMAC STREET
COMMERCE
COMMONWEALTH AV
ABERJONA RIVER
HBHA POND
ROESSLER RD
NEW BOSTON
CABOT RD
WAY
HALLS BROOK HOLDING AREA
HBHA WETLAND
FORMER MISHAWUM LAKE & ASSOCIATED WETLANDS
SCHOOL STREET
WOBURN
INDUSTRIAL PKWY
MIDDLESEX CANAL
MAIN
MISHAWUM ROAD
RYAN ROAD
ALFRED STREET
95
NORMAC RD
AVENUE
WASHINGTON STREET
OLYMPIA
ROAD
MAIN ST
MISHAWUM
WILDWOOD AVENUE
WELLS G & H WETLAND
WELL "H"
WELL "G"
CEDAR STREET
WELLS G & H SITE
ABERJONA RIVER
STREET
CRANBERRY BOG CONSERVATION AREA
APPROXIMATE BOUNDARY OF INDUSTRI-PLEX OU-1 AND WELLS G + H SITE
GRAPHIC SCALE
0'
1200'
2400'
N

FIGURE A-2


OLIN CHEMICAL SITE
PRESIDENTIAL WAY
NORTH POND
UPPER SOUTH POND
EAST DRAINAGE DITCH
WEST HIDE PILE
EAST HIDE PILE
WOBURN LANDFILL
LOWER SOUTH POND
EAST CENTRAL HIDE PILE
INDUSTRI-PLEX OU-2
LANDFILL CREEK
NEW BOSTON STREET DRAINWAY
ATLANTIC
PHILLIPS POND
93
NEW BOSTON STREET DRAINAGE CULVERT
SO HIDE PILE
MAIN
MERRIMAC STREET
HALLS BROOK
38
COMMERCE
COMMONWEALTH AV
ABERJONA RIVER
ABERJONA RIVER SOUTH BRANCH
HBHA POND
BOESSLER RD
NEW BOSTON
CABOT RD
WAY
HALLS BROOK HOLDING AREA
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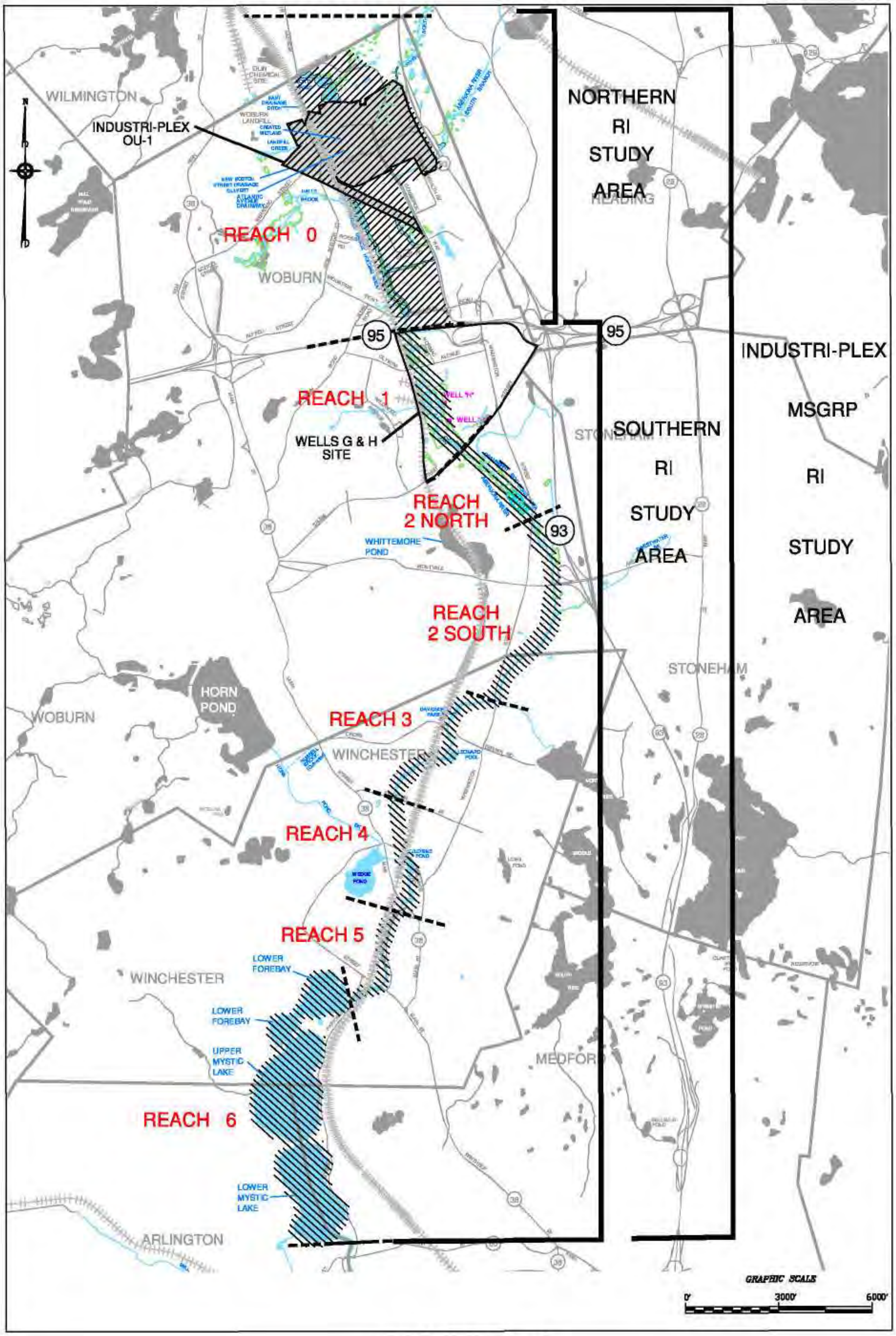
FORMER MISHAWUM LAKE & ASSOCIATED WETLANDS
SCHOOL STREET
WOBURN
INDUSTRIAL PKWY
MIDDLESEX CANAL
ROAD
MISHAWUM
RYAN ROAD
ALFRED STREET
95
NORMAC RD
AVENUE
WASHINGTON
OLYMPIA
ROAD
WELLS G & H WETLAND
STREET
MAIN
MISHAWUM
WILDWOOD AVENUE
WELL "H"
WELL "G"
CEDAR
WELLS G & H SITE
ST
STREET
ABERJONA RIVER
STREET
CRANBERRY BOG CONSERVATION AREA
APPROXIMATE BOUNDARY OF INDUSTRI-PLEX OU-2
GRAPHIC SCALE
0'
1200'
2400'
N

FIGURE A-3



WILMINGTON
INDUSTRI-PLEX OU-1
OLIN CHEMICAL SITE
WOBURN LANDFILL
CREATED WETLAND
LANDFILL CREEK
NEW BOSTON STREET DRAINAGE CULVERT
ATLANTIC AVENUE DRAINWAY
HALLS BROOK
REACH 0
WOBURN
NORTHERN RI STUDY AREA
READING
95
INDUSTRI-PLEX MSGRP RI STUDY AREA
REACH 1
WELL "H"
WELL "G"
WELLS G & H SITE
SOUTHERN RI STUDY AREA
REACH 2 NORTH
93
WHITTEMORE POND
REACH 2 SOUTH
STONEHAM
HORN POND
WOBURN
REACH 3
WINCHESTER
REACH 4
WEDGE POND
REACH 5
LOWER FOREBAY
WINCHESTER
LOWER FOREBAY
UPPER MYSTIC LAKE
MEDFORD
REACH 6
LOWER MYSTIC LAKE
ARLINGTON
GRAPHIC SCALE
0'
3000'
6000'
N

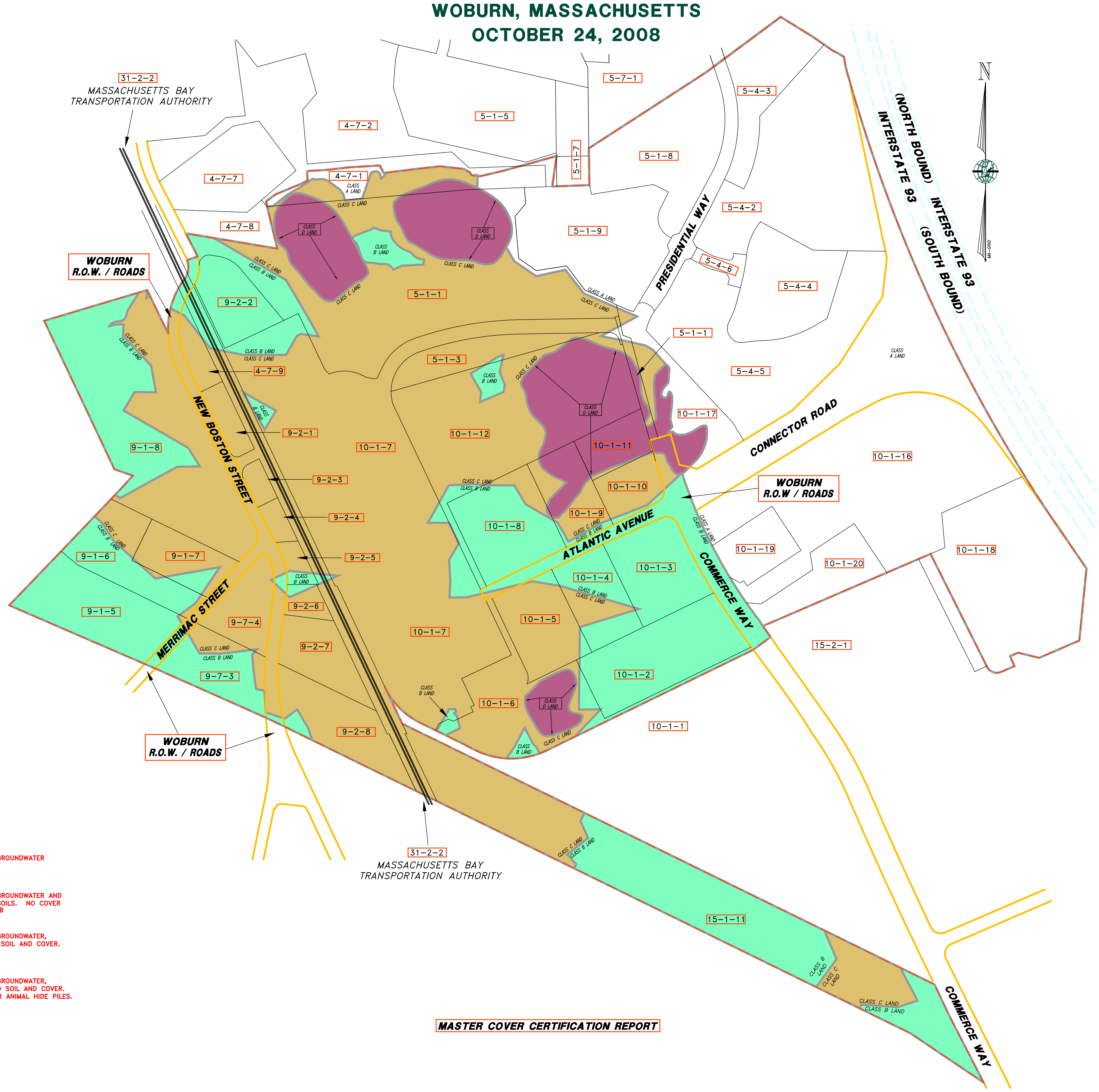
FIGURE A-4

Industri-Plex Site OU1,
Interactive Property Map:
Click on the tax map number
to view the corresponding Cover
Certification Report.

INDUSTRI-PLEX SITE
OU-1 COVER CERTIFICATION REPORT
LOCUS PLAN OF ATTACHMENT 1
(VOLUMES A, B & C)
RECORD DRAWINGS
WOBURN, MASSACHUSETTS
OCTOBER 24, 2008

RESTRICTED AREAS BY CLASSES OF LAND

CLASS OF LAND	DESCRIPTION
A	MAY CONTAIN CONTAMINATED GROUNDWATER
B	MAY CONTAIN CONTAMINATED GROUNDWATER, AND MAY CONTAIN CONTAMINATED SOILS. NO COVER WAS REQUIRED WITHIN CLASS B.
C	MAY CONTAIN CONTAMINATED GROUNDWATER, AND CONTAINS CONTAMINATED SOIL AND COVER.
D	MAY CONTAIN CONTAMINATED GROUNDWATER, AND CONTAINS CONTAMINATED SOIL AND COVER. CLASS D ALSO CONTAINS FOUR ANIMAL HIDE PILES.



LEGEND:

—	BOUNDARY LINE
—	RIGHT–OF–WAY
— — —	IPLEX SITE LIMIT
—	LAND CLASS LINE
5–1–1	TAX MAP PARCEL NO.

▨	CLASS A LAND MAY CONTAIN CONTAMINATED GROUNDWATER
🟩	CLASS B LAND MAY CONTAIN CONTAMINATED GROUNDWATER AND MAY CONTAIN CONTAMINATED SOILS. NO COVER WAS REQUIRED WITHIN CLASS B
🟨	CLASS C LAND MAY CONTAIN CONTAMINATED GROUNDWATER, AND CONTAINS CONTAMINATED SOIL AND COVER.
🟪	CLASS D LAND MAY CONTAIN CONTAMINATED GROUNDWATER, AND CONTAINS CONTAMINATED SOIL AND COVER. CLASS D ALSO CONTAINS FOUR ANIMAL HIDE PILES.

LOT # CHART

LOT #	TAX MAP #	ADDRESS
LOT IC–1	4–7–9	229 NEW BOSTON STREET
LOT IC–2	9–2–1	225 NEW BOSTON STREET
LOT IC–3	9–2–3	223 NEW BOSTON STREET R
LOT IC–4	9–2–4	223 NEW BOSTON STREET
LOT IC–5	9–2–5	219 NEW BOSTON STREET
LOT IC–6	9–2–6	217 NEW BOSTON STREET
LOT IC–7	9–2–7	211 NEW BOSTON STREET
LOT IC–8	9–2–8	NEW BOSTON STREET
LOT IC–9	9–7–3	MERRIMAC STREET
LOT IC–10	9–1–5	MERRIMAC STREET
LOT IC–11	9–1–6	204 MERRIMAC STREET
LOT IC–12	9–1–7	225 MERRIMAC STREET
LOT IC–13	9–1–8	216 NEW BOSTON STREET
LOT IC–14	9–7–4	210 NEW BOSTON STREET
LOT IC–15	31–2–2	N/A
LOT IC–16	15–1–11	COMMERCE WAY
LOT IC–17	10–1–8	41 ATLANTIC AVENUE
LOT IC–18	10–1–5	20 ATLANTIC AVENUE
LOT IC–19	10–1–4	10 ATLANTIC AVENUE
LOT IC–20	10–1–3	120 COMMERCE WAY
LOT IC–21	10–1–10	130 COMMERCE WAY
LOT IC–22	10–1–11	COMMERCE WAY
LOT IC–23	10–1–9	ATLANTIC AVENUE
LOT IC–24	10–1–12	COMM. WAY & ATLANTIC AVE
LOT IC–25	10–1–17	COMMERCE WAY LOT 5
LOT IC–26	5–1–1	SEE IC–28
LOT IC–27	5–1–3	N/A
LOT IC–28	5–1–1	315 NEW BOSTON STREET
LOT IC–29	4–7–1	NEW BOSTON STREET R
LOT IC–30	10–1–6	30 ATLANTIC AVENUE
LOT IC–31	10–1–7	100 ATLANTIC AVENUE
LOT IC–32	9–2–2	NEW BOSTON STREET
LOT IC–33	5–1–9	236 PRESIDENTIAL WAY
LOT IC–34	5–1–8	225 PRESIDENTIAL WAY
LOT IC–35	5–4–3	PRESIDENTIAL WAY
LOT IC–36	5–4–2	200 PRESIDENTIAL WAY
LOT IC–37	5–4–6	PRESIDENTIAL WAY
LOT IC–38	5–4–4	300 PRESIDENTIAL WAY
LOT IC–39	5–4–5	400 PRESIDENTIAL WAY
LOT IC–40	10–1–16	101 COMMERCE WAY
LOT IC–41	10–1–2	112 COMMERCE WAY
LOT IC–42	10–1–19	103 COMMERCE WAY
LOT IC–43	10–1–20	99 COMMERCE WAY
LOT IC–44	10–1–18	COMMERCE WAY LOT 2
LOT IC–45	5–1–1	COMMERCE WAY LOT 4
LOT IC–46		WOBURN R.O.W. / ROADS
MASTER COVER CERTIFICATION REPORT		

GRAPHIC SCALE
200' 100' 0 200' 400' 600'

REV. DATE DESCRIPTION DR CK

PROFESSIONAL LAND SURVEYOR

PROFESSIONAL ENGINEER

PREPARED FOR:
ROUX ASSOCIATES, INC.
Environmental Consulting & Management

PREPARED BY:
MERIDIAN Land Services, Inc.
STREET ADDRESS: 31 OLD NASHUA RD, SUITE 2, AMHERST, N.H. 03031 TEL 603–673–1441 FAX 603–673–1584
MAILING ADDRESS: PO BOX 118, MILFORD, N.H. 03055–0118 EMAIL: MERIDIAN@MeridianLandServices.COM
ENGINEERS - LAND SURVEYORS - SCIENTISTS - LAND PLANNERS

DESIGNED BY:
Golder Associates
Manchester, New Hampshire
400 Commercial Street
Manchester, N.H. USA 03101
603–668–0880 • FAX 603–668–1199

PROJECT RECORD - LOCUS PLAN

ATTACHMENT 1 (VOLUMES A, B & C)

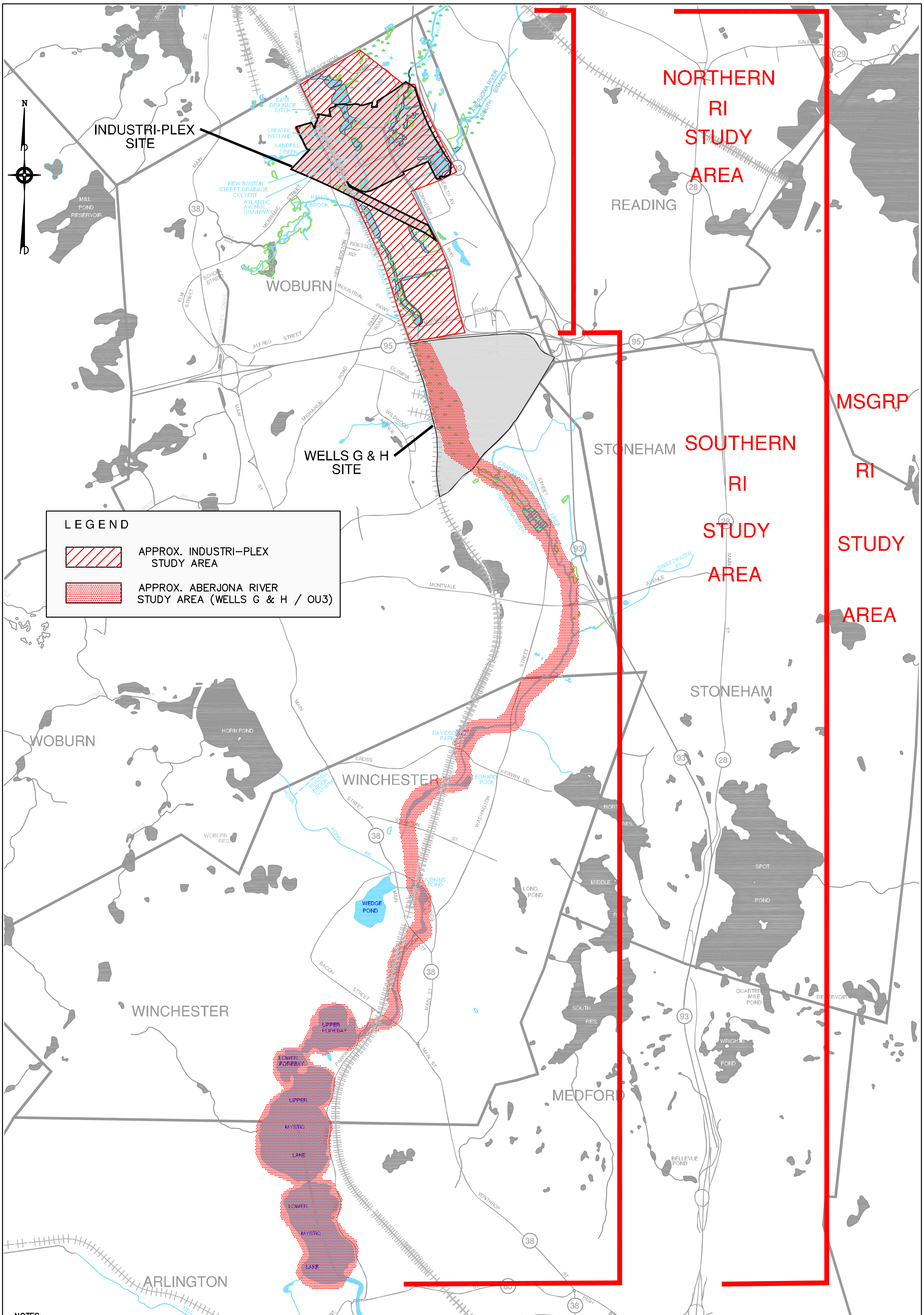
INDUSTRI-PLEX SITE REMEDIAL TRUST
WOBURN, MASSACHUSETTS

OCTOBER 24, 2008

SCALE: 1" = 200'

DESIGNED BY: MDP
DRAFTED BY: MDP
CHECKED BY: MDP
FILE: SITE–LOCUS.dwg
DO NOT SCALE DRAWING

LOCUS
SHEET NO.
PROJECT: 2900.00
SHEET 1 OF 1



NOTES:
1. STREET & TOWNSHIP BOUNDARY LOCATIONS FROM MASSACHUSETTS GIS & CITY OF WOBURN ENGINEERING DEPT.
2. WATERWAY LOCATIONS FROM MASSACHUSETTS GIS & CITY OF WOBURN ENGINEERING DEPT.
3. LOCATIONS OBTAINED FROM ABOVE SOURCES CONVERTED FROM SOURCE DATUM TO NAD 83 FEET USING BLUE MARBLE GEOGRAPHIC CALCULATOR SOFTWARE (VERSION 4.2).
4. PLAN COORDINATES IN NAD 83 FEET.
5. ALL LOCATIONS TO BE CONSIDERED APPROXIMATE; PLAN NOT TO BE USED FOR DESIGN.

GRAPHIC SCALE
0' 3000' 6000'

MSGRP RI STUDY AREAS
MSGRP REMEDIAL INVESTIGATION REPORT
INDUSTRI-PLEX SITE, WOBURN, MASSACHUSETTS

DRAWN BY:	R.G. DEWSNAP	REV.:	0
CHECKED BY:	P.CALL	DATE:	JANUARY 05, 2005
SCALE:	AS SHOWN	FILE NO.:	\DWG\4123\0910\STUDY_AREAS.DWG

FIGURE 1-1

TETRA TECH NUS, INC.
55 Jonspin Road Wilmington, MA 01887
(978)658-7899

Appendix H
Institutional Controls

OU1 ICs are divided into the four categories (Class D, C, B and A Lands*) and generally described as follows:

Class D Land: May contain contaminated groundwater, and contains contaminated soil and protective cover/cap. Class D also contains four animal hide piles.

Class C Land: May contain contaminated groundwater, and contains contaminated soil and cover/cap.

Class B Land: May contain contaminated groundwater, and may contain contaminated soils. No cover/cap was required within Class B.

Class A Land: May contain contaminated groundwater.

*See attached OU1 IC figures.

OU2 IC's are divided into five categories (Categories I-V**) and generally described as follows:

Category I Land: Surface soils concentrations exceeding soil performance standards.

Category II Land: Sub-Surface Soils Concentrations Exceeding Soil Performance Standards.

Category III Land: Groundwater Concentrations Exceeding Performance Standards.

Category IV Land: Sediments Concentrations Exceeding Performance Standards.

Category V Land: Remedy Components Maintained and Protected to Ensure Long-Term Effectiveness.

**See attached OU2 figures.

IC Summary Tables

Table 1: Summary of Implemented ICs

Media, engineered controls, and areas that do not support UU/UE based on current conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s) Tax Map #/ IC Lot/ other	IC Objective	Title of IC Instrument Implemented and Date (or planned)
OU1 Class C and B Land	Yes	Yes	10-1-2/IC-41	Protect remedy, public health & environment	Grant of Environmental Restrictions and Easements (GERE) (11/9/09)

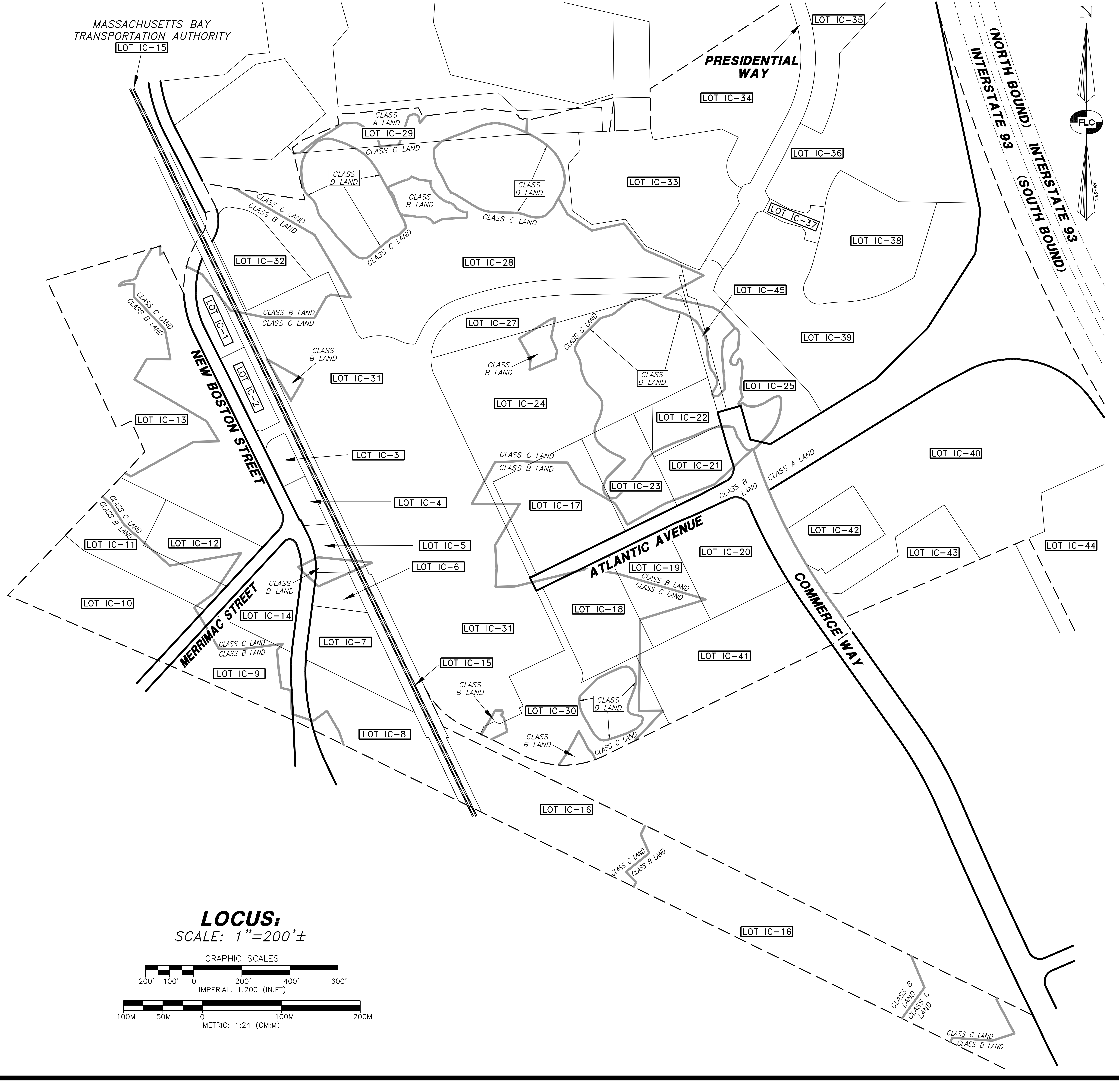
Media, engineered controls, and areas that do not support UU/UE based on current conditions	**ICs Needed**	**ICs Called for in the Decision Documents**	**Impacted Parcel(s) Tax Map #/ IC Lot/ other**	**IC Objective**	**Title of IC Instrument Implemented and Date (or planned)**
OU1 Class B, C, and D Land	Yes	Yes	10-1-9/IC-23 10-1-6/IC-30	Protect remedy, public health & environment	IC-23 - Notice of Activity and Use Limitation (NAUL) (4/26/17) IC-30 - GERE (5/24/11)
OU1 Class B Land	Yes	Yes	10-1-3/IC-20	Protect public health & environment	NAUL (7/10/18)
OU1 Class C Land	Yes	Yes	9-2-7/IC-7	Protect remedy, public health & environment	NAUL (12/28/16)
OU1 Class D & C Land	Yes	Yes	10-1-11/ IC-22	Protect remedy, public health & environment	NAUL (4/26/17)
OU1 Class A, B, C, and D Land	Yes	Yes	10-1-12/IC-24 5-1-1/IC-26 & IC-28	Protect remedy, public health & environment	IC-24 - NAUL (4/26/17) IC-28 - GERE (6/21/16)

Table 2: Summary of Planned ICs

Media, engineered controls, and areas that do not support UU/UE based on current conditions	**ICs Needed**	**ICs Called for in the Decision Documents**	**Impacted Parcel(s) Tax Map #/ IC Lot/ other**	**IC Objective**	**Title of IC Instrument Implemented and Date (or planned)**
OU1 Class C and B Land	Yes	Yes	4-7-9/ IC-1 9-2-5/IC-5 9-2-6/IC-6 9-2-8/IC-8 9-7-3/IC-9 9-1-5/IC-10 9-1-6/IC-11 9-1-7/IC-12 9-1-8/IC-13 9-7-4/IC-14 31-2-2/IC-15 15-1-11/IC-16 10-1-5/IC-18 10-1-4/IC-19 10-1-10/IC-21	Protect remedy, public health & environment	NAUL (planned)
OU1 Class C Land	Yes	Yes	9-2-1/IC-2 9-2-3/IC-3 9-2-4/IC-4	Protect remedy, public health & environment	NAUL (planned)
OU1 Class B, C, and D Land	Yes	Yes	10-1-8/IC-17 5-1-3/IC-27	Protect remedy, public health & environment	NAUL (planned)
OU1 Class B Land	Yes	Yes	9-2-2/IC-32	Protect public health & environment	NAUL (planned)
OU1 Class A, B, C, and D Land	Yes	Yes	10-1-12/IC-24 Woburn ROW/Roads/ IC-46	Protect remedy, public health & environment	NAUL (planned)

Media, engineered controls, and areas that do not support UU/UE based on current conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s) Tax Map #/ IC Lot/ other	IC Objective	Title of IC Instrument Implemented and Date (or planned)
OU1 Class A, B, and C Land	Yes	Yes	10-1-7/IC-31	Protect remedy, public health & environment	NAUL (planned)
OU1 Class A, C, and D Land	Yes	Yes	10-1-17/IC-25 4-7-1/IC-29 5-1-1/IC-45	Protect remedy, public health & environment	NAUL (planned)
OU1 Class A Land	Yes	Yes	5-1-9/IC-33 5-1-8/IC-34 5-4-3/IC-35 5-4-2/IC-36 5-4-6/IC-37 5-4-4/IC-38 5-4-5/IC-39 10-1-16/IC-40 10-1-19/IC-42 10-1-20/IC-43 10-1-18/IC-44	Protect public health & environment	NAUL (planned)
OU2 - Categories I, III & V	Yes	Yes	15-1-4/Lot A	Protect remedy, public health & environment	NAUL (planned)
OU2 - Categories II, III & V	Yes	Yes	15-1-4/Lot B 15-1-4/Lot C	Protect remedy, public health & environment	NAUL (planned)
OU2 - Categories I, III, IV & V	Yes	Yes	15-1-4/ Lot D	Protect remedy, public health & environment	NAUL (planned)

Media, engineered controls, and areas that do not support UU/UE based on current conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s) Tax Map #/ IC Lot/ other	IC Objective	Title of IC Instrument Implemented and Date (or planned)
OU2 - Categories II, III, & IV	Yes	Yes	15-1-20	Protect public health & environment	NAUL (planned)
OU2 – Category III	Yes	Yes	15-1-10	Protect public health & environment	NAUL (planned)
OU2 – Category I	Yes	Yes	15-1-3 20-1-3	Protect public health & environment	NAUL (planned)
OU2 – Categories II & III	Yes	Yes	15-1-2 20-1-23	Protect public health & environment	NAUL (planned)
OU2 – Categories I, II & III	Yes	Yes	20-1-2	Protect public health & environment	NAUL (planned)
OU2 – Category IV	Yes	Yes	20-1-21	Protect public health & environment	NAUL (planned)



LOCUS:

SCALE: 1"=200'±

LEGEND:

RECORD BOUNDARY LINE
SURVEY CONTROL LINE
RECORD RIGHT-OF-WAY LINE
IPLEX OPERABLE UNIT 1
CLASS OF LAND LINE
LOT IC-12 SITE SPECIFIC LOT NUMBER

RESTRICTED AREAS BY CLASSES OF LAND

CLASS OF LAND	DESCRIPTION
A	MAY CONTAIN CONTAMINATED GROUNDWATER
B	MAY CONTAIN CONTAMINATED GROUNDWATER, AND MAY CONTAIN CONTAMINATED SOILS. NO COVER WAS REQUIRED WITHIN CLASS B.
C	MAY CONTAIN CONTAMINATED GROUNDWATER, AND CONTAINS CONTAMINATED SOIL AND COVER.
D	MAY CONTAIN CONTAMINATED GROUNDWATER, AND CONTAINS CONTAMINATED SOIL AND COVER. CLASS D ALSO CONTAINS FOUR ANIMAL HIDE PILES.

PLAN OF RESTRICTED AREAS
(LOCUS & SURVEY CONTROL NETWORK)
PREPARED FOR:
(NOW OR FORMERLY)

INDUSTRI-PLEX SUPERFUND SITE

OPERABLE UNIT 1 PROPERTIES

WOBURN, MASSACHUSETTS

SCALE: 1" = 200' FEBRUARY 16, 2018

Surveying ✦ Engineering ✦ Land Planning ✦ Permitting ✦ Septic Designs

FIELDSTONE
LAND CONSULTANTS, PLLC

206 Elm Street, Milford, NH 03055
Phone: (603)-672-5456 Fax: (603)-413-5456
www.FieldstoneLandConsultants.com

FILE: 307MP00.dwg | PROJ. NO. 307.00 | PAGE NO. 1 OF 1

INDUSTRI-PLEX SITE
OU-1 COVER CERTIFICATION REPORT
LOCUS PLAN OF ATTACHMENT 1
(VOLUMES A, B & C)
RECORD DRAWINGS
WOBURN, MASSACHUSETTS
OCTOBER 24, 2008

RESTRICTED AREAS BY CLASSES OF LAND

CLASS OF LAND	DESCRIPTION
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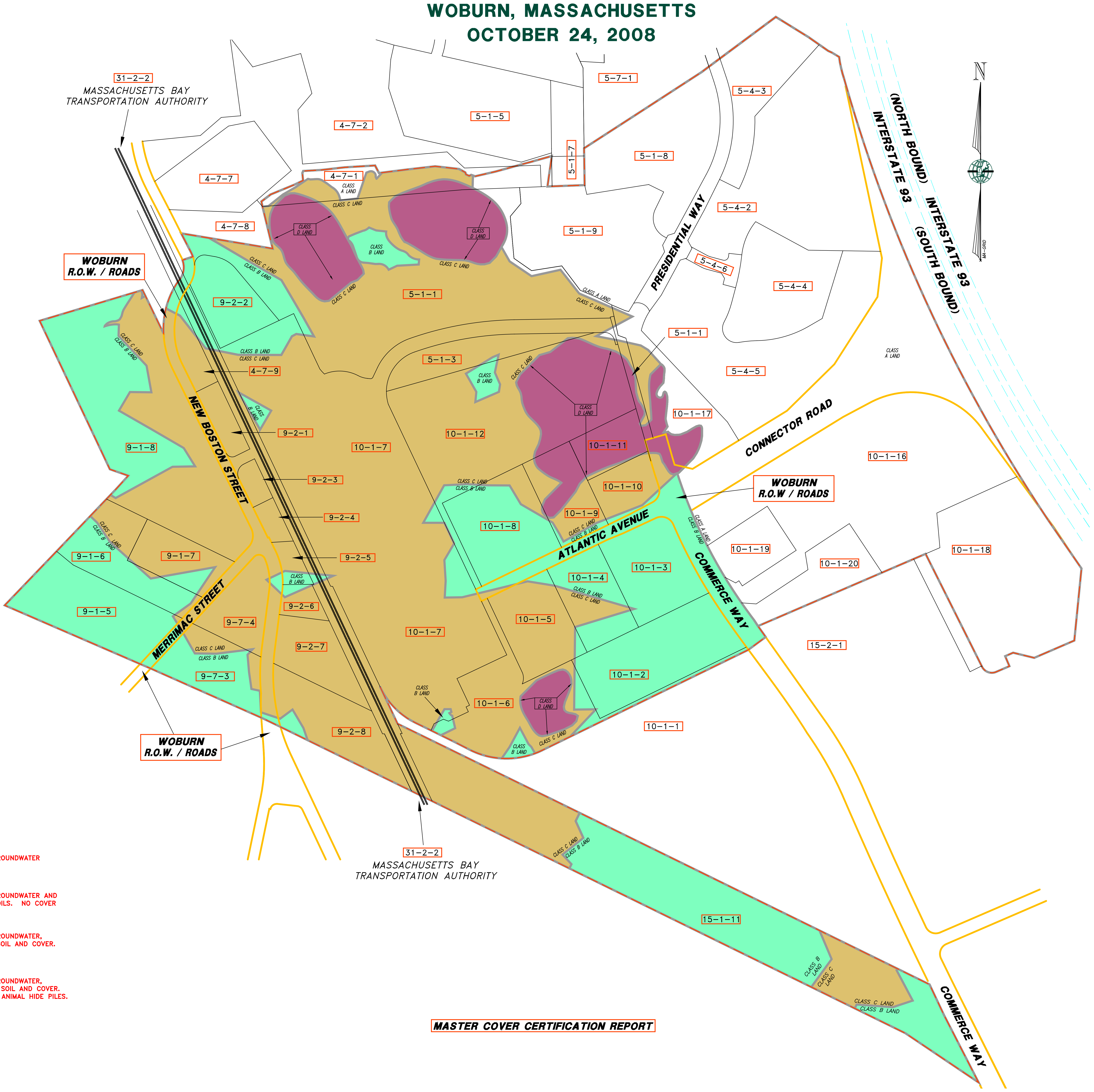
D	MAY CONTAIN CONTAMINATED GROUNDWATER, AND CONTAINS CONTAMINATED SOIL AND COVER. CLASS D ALSO CONTAINS FOUR ANIMAL HIDE PILES.



LEGEND:

───	BOUNDARY LINE
───	RIGHT-OF-WAY
– – –	IPLEX SITE LIMIT
━━━	LAND CLASS LINE
5-1-1	TAX MAP PARCEL NO.

▨	*CLASS A LAND* MAY CONTAIN CONTAMINATED GROUNDWATER
🟩	*CLASS B LAND* MAY CONTAIN CONTAMINATED GROUNDWATER AND MAY CONTAIN CONTAMINATED SOILS. NO COVER WAS REQUIRED WITHIN CLASS B
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🟪	*CLASS D LAND* MAY CONTAIN CONTAMINATED GROUNDWATER, AND CONTAINS CONTAMINANTED SOIL AND COVER. CLASS D ALSO CONTAINS FOUR ANIMAL HIDE PILES.

MASTER COVER CERTIFICATION REPORT

LOT # CHART

LOT #	TAX MAP #	ADDRESS
LOT IC-1	4-7-9	229 NEW BOSTON STREET
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LOT IC-3	9-2-3	223 NEW BOSTON STREET R
LOT IC-4	9-2-4	223 NEW BOSTON STREET
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LOT IC-12	9-1-7	225 MERRIMAC STREET
LOT IC-13	9-1-8	216 NEW BOSTON STREET
LOT IC-14	9-7-4	210 NEW BOSTON STREET
LOT IC-15	31-2-2	N/A
LOT IC-16	15-1-11	COMMERCE WAY
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LOT IC-24	10-1-12	COMM. WAY & ATLANTIC AVE
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LOT IC-26	5-1-1	SEE IC-28
LOT IC-27	5-1-3	N/A
LOT IC-28	5-1-1	315 NEW BOSTON STREET
LOT IC-29	4-7-1	NEW BOSTON STREET R
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LOT IC-31	10-1-7	100 ATLANTIC AVENUE
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LOT IC-36	5-4-2	200 PRESIDENTIAL WAY
LOT IC-37	5-4-6	PRESIDENTIAL WAY
LOT IC-38	5-4-4	300 PRESIDENTIAL WAY
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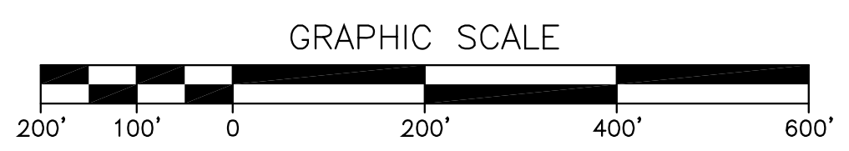
LOT IC-41	10-1-2	112 COMMERCE WAY
LOT IC-42	10-1-19	103 COMMERCE WAY
LOT IC-43	10-1-20	99 COMMERCE WAY
LOT IC-44	10-1-18	COMMERCE WAY LOT 2
LOT IC-45	5-1-1	COMMERCE WAY LOT 4
LOT IC-46		WOBURN R.O.W. / ROADS
MASTER COVER CERTIFICATION REPORT		



REV.	DATE	DESCRIPTION	DR	CK

PROFESSIONAL LAND SURVEYOR

PROFESSIONAL ENGINEER

PREPARED FOR:
ROUX
ROUX ASSOCIATES, INC.
Environmental Consulting & Management

PREPARED BY:
MERIDIAN
Land Services, Inc.
STREET ADDRESS: 31 OLD NASHUA RD, SUITE 2, AMHERST, N.H. 03031 TEL 603-673-1441 FAX 603-673-1584
MAILING ADDRESS: PO BOX 118, MILFORD, N.H. 03055-0118 EMAIL: MERIDIAN@MeridianLandServices.COM
ENGINEERS - LAND SURVEYORS - SCIENTISTS - LAND PLANNERS

DESIGNED BY:
Golder Associates
Manchester, New Hampshire
400 Commercial Street
Manchester, N.H. USA 03101
603-668-0880 • FAX 603-668-1199

PROJECT RECORD - LOCUS PLAN

ATTACHMENT 1 (VOLUMES A, B & C)

INDUSTRI-PLEX SITE REMEDIAL TRUST
WOBURN, MASSACHUSETTS

SCALE: 1" = 200'
OCTOBER 24, 2008

DESIGNED BY: MDP
DRAFTED BY: MDP
CHECKED BY: MDP
FILE: SITE-LOCUS.dwg
DO NOT SCALE DRAWING

LOCUS
SHEET NO.
PROJECT: 2900.00
SHEET 1 OF 1

Oct 24, 2008 - 10:47am MDP Land Desktop 2004 - LDT4
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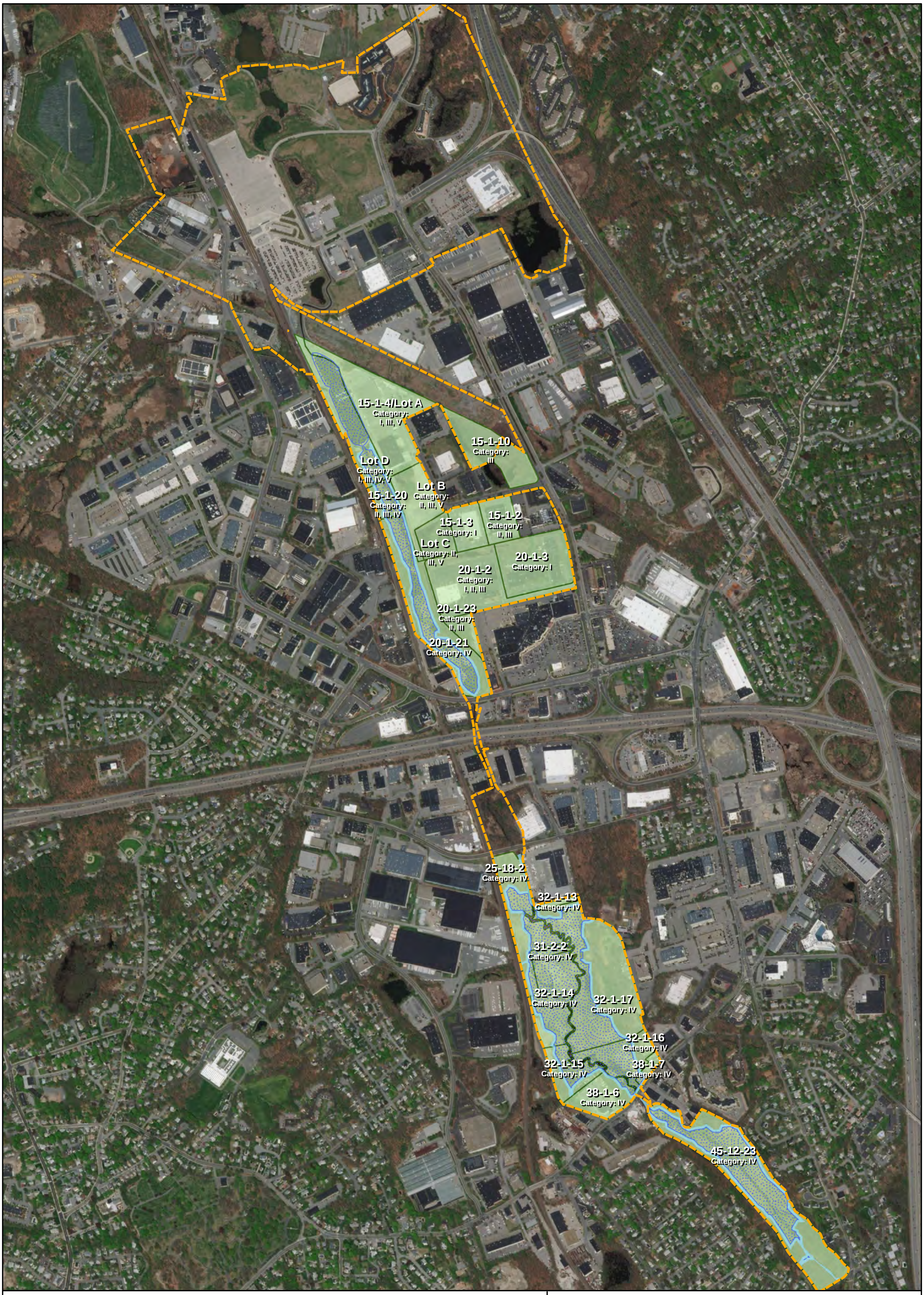

Legend

Category I	Surface Soils (0-3' bgs) Exceeding Performance Standards
Category II	Sub-Surface (3-15' bgs) Exceeding Performance Standards
Category III	Groundwater Concentrations Exceeding Performance Standards
Category IV	Sediments Exceeding Performance Standards
Category V	Remedy Components Maintained and Protected to Ensure Long-Term Effectiveness

10-1-7	Parcel Indentification Number
▭	Industri-plex Superfund Site Boundary
🟩	Properties Requiring Institutional Controls
🟦	Accessible Near-Shore Wetland Area
▨	Properties Requiring Deeper Interior Wetland Institutional Control Area

0 250 500 1,000
Feet

N

Category I - V Properties Requiring Institutional Controls

Industri-Plex

Woburn, Massachusetts

Project No.: 3204
Plot Date: 4/4/2018
Arc Operator: DR
Reviewed by: TM

Projection: Lambert Conformal Conic
Coordinate System: MA State Plane (Mainland)
FIPS Zone: 2001
Units: US Feet
Datum: North American Datum (NAD) 83

Figure 1

ddms
www.ddmsinc.com

R:\Projects\DEF\demax-1547\3204-Industri-PlexOU2\DataAnalysis\GISData\Projects\IC Property Figure\IC_Combined_ParcelEdits.mxd

Appendix I
OU1 Soil Memorandum

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Memorandum

Date: April 15, 2019

Subject: EPA FYR regarding potential ecological risk evaluation issue

From: Joseph F. LeMay, P.E.
Remedial Project Manager JFL

To: File

CC: Richard Sugatt, Risk Assessor
David Peterson, Senior Enforcement Counsel
Lynne Jennings, MA Superfund Section Chief

During EPA's review of the draft Five Year Review (FYR) Report for the Industri-plex Superfund Site, a potential OU1 issue was raised regarding "soil and sediment outside of covered areas may contain concentrations of metals potentially exceeding ecological screening values." EPA evaluated these areas further (Figure 1) and determined that this was not an issue warranting consideration under the FYR based upon the following:

Most of the upland soil habitat beyond the areas of the protective OU1 cover/cap has been developed (e.g., Raytheon, Target Stores, Residence Inn Marriott, Boston Sports Club, etc.), and now include buildings, landscape, paved parking lots, roads and walkways, etc. Consequently, the remedy for soil is considered protective, since the pathway for ecological receptors in upland soil habitats is limited in most areas, and incomplete wherever there is no exposed soil.

The habitat for sediment is also limited to wetlands adjacent to developed areas (e.g., North Branch of Aberjona River including Wetlands 3A-3C) and small uncapped areas of the Lower South Pond (LSP) between the East and West Hide Piles. See Figure 2. During the 1992 Remedial Design review and approval process for OU1, EPA and the State would not allow Wetland 3B to be dredged and restored, and directed any proposed remediation of the wetland be deleted from the remedial design. The basis for EPA and the State's decision was "… there is no evidence that exists to link the minor wetland contamination to site activity. Moreover, the proposed remediation in this wetland area will have an overall disruptive effect on the biota without guarantee that the remediation will be successful."[1]

EPA also reviewed the OU2 ecological risk assessment and OU2 ROD[2] where the only wetland identified as an unacceptable ecological risk was the HBHA Pond (within Reach 0) and established a corresponding arsenic sediment cleanup standard of 273 mg/kg. EPA reviewed historical OU1 sediment data associated with these limited wetland areas (i.e., Wetlands 3A, 3B & 3C, and LSP) and calculated the average arsenic, lead, and chromium concentrations at each area (Table 1). EPA compared these average concentrations to OU2 Reaches 0, 1 and 2 North sediment average concentrations and associated ecological screening criteria[3] (Table 2). As can be seen on Table 2, the average arsenic, lead and chromium concentrations at LSP, Wetland 3A, 3B and 3C are well below the average concentrations of arsenic, lead, and chromium associated with Reach 0, 1 and/or 2 North where no unacceptable risks were identified. Consequently, the remedy for sediment is also considered protective, considering EPA and State's prior OU1 design decision associated with Wetland 3B, and LSP and Wetland 3A-3C sediment average concentrations being low when compared with OU2 Reach 0, 1 and 2 North where no unacceptable risks were identified.

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[1] EPA Comments 100% Design Report from Joseph DeCola, EPA, and Jay Naparstek, MassDEP, to Mike Light, Monsanto Company, dated March 4, 1992.

[2] EPA Industri-plex Operable Unit 2 (including Wells G&H Superfund Site Operable Unit 3, Aberjona River Study) Record of Decision, dated January 31, 2006.

[3] MSGRP Remedial Investigation, by TtNUS, for EPA, dated March 2005, Table 4-4b.

TABLE 1
EPA Industri-plex Draft FYR
OU1 Unremediated Wetlands Evaluation
LSP, North Branch of Aberjona River (Wetlands 3A, 3B & 3C)
Calculated Averages
Based upon Existing Information

LOWER SOUTH POND (LSP)[a,b,c,d,e]

Unremediated Areas

Sediment Samples	Class of Land	Depth (inches) & date	Arsenic (mg/kg)	Lead (mg/kg)	Chromium (mg/kg)
SW-1/48* (Upper)	A	6 (1990)	1.6	6	29.6
PZ-116 (Upper)	A	6 (2012)	77	190	490
SW-1/35 (Lower)	B	6 (1990)	23.6	49.9	25.9
PZ-105 (Lower)	B	3 (2012)	30	49	42
Average Concentration			33.05	73.725	146.875

1/48*Lead was ND, therefore 1/2 RL of 12.1 used.

Wetland 3A[a,b,c]

Sediment Samples	Class of Land	Depth (inches) & date	Arsenic (mg/kg)	Lead (mg/kg)	Chromium (mg/kg)
SW-1/49	A	6 (1990)	69.6	487	51.8
SW-1/50L	A	6 (1990)	10.5	79.8	21.9
SW-1/50M	A	6 (1990)	2.9	14.9	6.3
SW-1/50R	A	6 (1990)	6.2	23.9	9.1
SW-1/51L*	A	6 (1990)	3.8	3.8	5.8
SW-1/51M*	A	6 (1990)	65.3	6.8	8
SW-1/51R*	A	6 (1990)	3.7	3.5	6.8
Average Concentration			23.14285714	88.52857143	15.67142857

1/51L* Lead ND, therefore 1/2 RL of 7.6 used.
1/51M* Lead ND, therefore 1/2 RL of 13.5 used.
1/51R* Lead ND, therefore 1/2 RL of 7.0 used.

Wetland 3B[a,b,c]

Sediment Samples	Class of Land	Depth (inches) & date	Arsenic (mg/kg)	Lead (mg/kg)	Chromium (mg/kg)
SW1/53		6 (1990)	14.6	565	47.6
SW-1/54	A	6 (1990)	18.6	876	60.3
SW-1/120*	A	6 (1991)	8	52	1.7
SW-1/121* D	A	6 (1991)	16.5	480	38
SW-1/122*	A	6 (1991)	6	310	37
SW-1/123*	A	6 (1991)	22.5	310	27
SW-1/124*	A	6 (1991)	21.5	86	26
Average Concentration			15.38571429	382.7142857	33.94285714

120* Arsenic ND, therefore 1/2 RL of 16 used.
121* Arsenic ND, therefore 1/2 RL of 33 used.
122* Arsenic ND, therefore 1/2 RL of 12 used.
123* Arsenic ND, therefore 1/2 RL of 45 used.
124* Arsenic ND, therefore 1/2 RL of 43 used.

Wetland 3C[a,b,c]

Sediment Samples	Class of Land	Depth (inches) & date	Arsenic (mg/kg)	Lead (mg/kg)	Chromium (mg/kg)
SW-1/56	A	6 (1990)	11	19.9	8.4
SW-1/57	A	6 (1990)	5.7	9.5	8.6
SW-1/58	A	6 (1990)	88.1	315	37.1
SW-1/59	A	6 (1990)	3.9	18.4	7.7
Average Concentration			27.175	90.7	15.45

a Pre-desisn Task SW-1 1990, Table 2, by Golder Associates
b Phase 1 GSIP Report, 1991, by Roux Associates
c 100% Remedial Design, Vol 7, 1992, by Golder Associates
d 30% OU2 Remedial Design, Attachment A9, 2012, by Haley & Aldrich
e LSP Closeout Report, 2015, by Haley & Aldrich

TABLE 2
EPA Industri-plex Draft FYR
OU1 Unremediated Wetlands Evaluation
Lower South Pond (LSP) & Wetlands 3A-3C
*Compared with OU2 Reaches 0-2N**
Based upon Existing Information

LSP & Wetland 3A-3C Unremediated Wetland Areas	Average Arsenic (mg/kg)	Average Lead (mg/kg)	Average Chromium (mg/kg)
LSP (Class A & B Lands)	33	74	147
Wetland 3A (Class A Land)	23	89	16
Wetland 3B (Class A Land)	15	383	34
Wetland 3A (Class A Land)	27	91	15

OU2 MSGRP RI, Table 4-4b (2005)[a] Reaches within the Site Boundary	Average Arsenic (mg/kg)	Average Lead (mg/kg)	Average Chromium (mg/kg)
Average Reach 0	380	204	278
Average Reach 1	422	858	2080
Average Reach 2N	140	188	370

*OU2 2006 ROD only identified Unacceptable Ecological Risks at the HBHA Pond within Reach 0. No other Unacceptable Ecological Risks were identified in Reach 0, 1, 2N.

[a] *Industri-plex OU2 MSGRP RI, 2005, by TTNUS*

INDUSTRI-PLEX SITE
OU-1 COVER CERTIFICATION REPORT
LOCUS PLAN OF ATTACHMENT 1
(VOLUMES A, B & C)

RECORD DRAWINGS

WOBURN, MASSACHUSETTS
OCTOBER 24, 2008

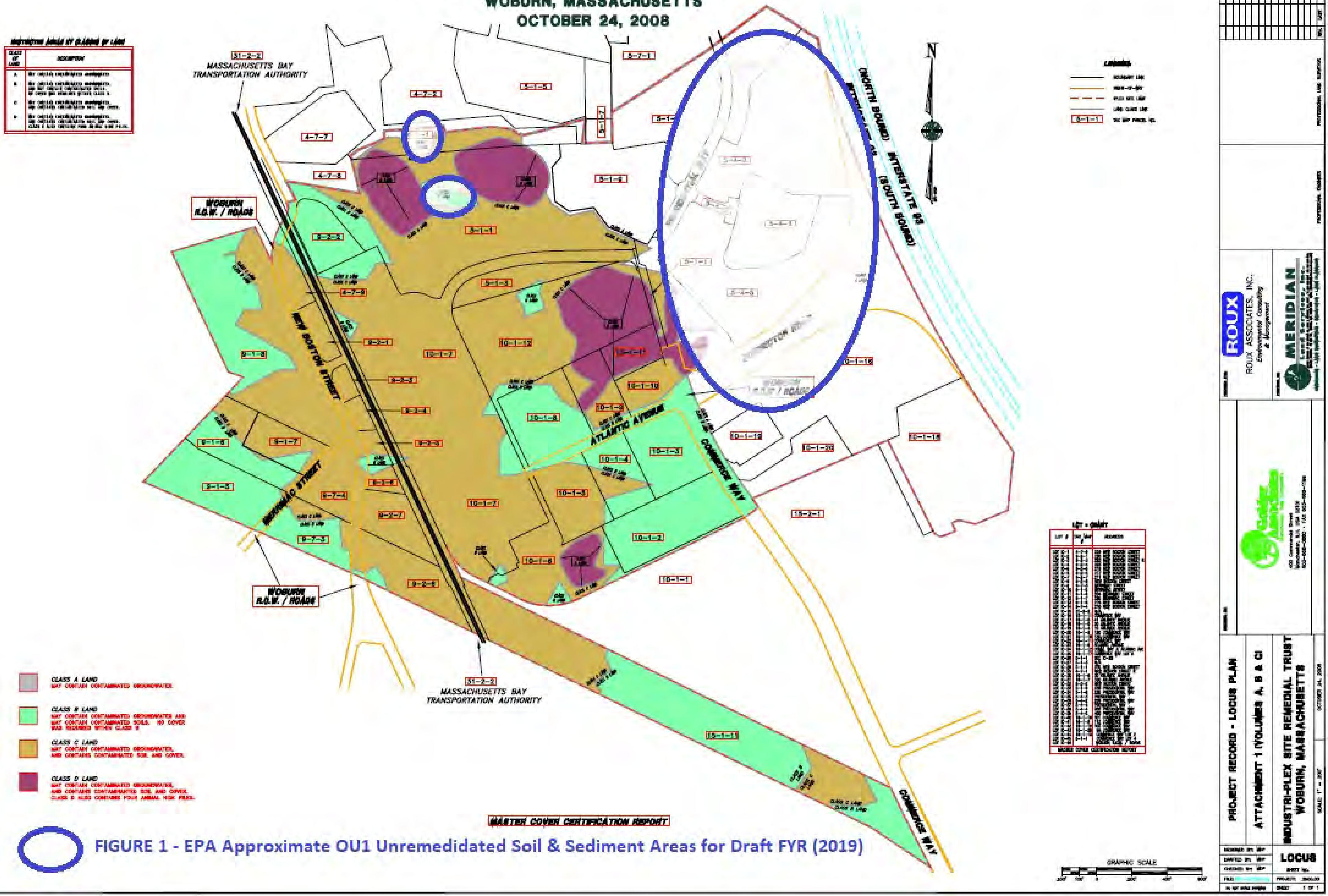

FIGURE 1 - EPA Approximate OU1 Unremedidated Soil & Sediment Areas for Draft FYR (2019)

Figure 2 – Historical Sediment Locations at Lower South Pond (LSP) and Wetlands 3A, 3B and 3C (North Branch Aberjona River)

△ = Sediment Location