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URS
CONSULTANTS, INC.

Quality Control Summary Report

VOLUME 1 OF 2

Pre-design Investigation
Delaware Sand And Gravel
Superfund Site (Phase II)
New Castle, Delaware

Prepared for:

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A-E QUALITY CONTROL SUMMARY REPORT

PURPOSE

The purpose of this report is to present the Quality Control Procedures and Results used for and during the Pre-Design Investigation at the Delaware Sand and Gravel Superfund Site, New Castle, Delaware which were conducted at the site during the periods from July and August 1990, and January - February 1991.

This report has been written for a technically oriented reader familar with environmental investigations, procedures, requirements, and terminology.

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2.0 PROJECT DESCRIPTION

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3.0 SAMPLING PROCEDURES

Refer to Delaware Sand and Gravel Phase II Field Investigations Report, Section III.

4.0 SUMMARY OF A-E DAILY QUALITY CONTROL REPORTS

The Daily Quality Control Reports (DQCR) for the two stages of work (July 19, 1990 through August 31, 1990, and January 14, 1991 through February 8, 1991) are presented in Appendix A. The DQCRs provide the date, weather, and a brief description of the work performed, samples collected, the associated field analysis (PID and/or OVA readings), and problems with the corrective actions on a daily basis. It is important to note that the problems/corrective actions noted during both stages of the field work were resolved within twenty-four hours of the onset of the

problem. The remaining section of the DQCR provides the quality control activities for the day. These activities include the collection of duplicate, matrix spike, and matrix spike duplicate samples during the day.

5.0 ANALYTICAL PROCEDURES

The offsite analytical procedures for the Delaware Sand and Gravel Site Field Investigations (Stage 1 and 2) were performed by Southwest Laboratories of Oklahoma, Inc. (SWLO) and Environmental Health Research and Testing, Inc. (EHRT). All analyses were performed in accordance with the Pre-Design Investigation Work Plan (URS 12/90) and are presented in the following tables by analytical schedule (A through E). Also included on each table are the proposed and actual number of samples analyzed per schedule. Schedule A has been modified for the Stage 2 phase of the Delaware Sand and Gravel Investigation per the 12/90 work plan. The modified table is also included here and has been designated Table 5-1AM. In addition to the above mentioned tables, Schedules F and G were devised in order to include geotechnical and air monitoring parameters, respectively. The onsite screening laboratory and compatiblity testing during the Stage 1 and 2 field investigation was performed by Wadsworth/Alert Laboratories, Inc. The analytical procedures employed by the onsite laboratories are presented in the A-E Quality Control Plan, Revision I, (December 1990), Sections 4.6 and 4.7.

TABLE 5-1A

REQUIRED ANALYSES - DELAWARE SAND AND GRAVEL SITE - SCHEDULE A
(BORING COMPOSITES)

Parameter	Document/Method No.	Reference
Specific Gravity	D287	1
Heat of Combustion	D2382	1
Percent Moisture	3540	2
Flashpoint	1010 or 1020	2
Viscosity	D1092	1
Ash	D482	1
Fusibility	D1857	1
Particle Size	C-136-84A	1
pH	9040/9045	2
Halogens (Br, F, I, Cl)	9020/9022	2
Volatile Organics (VOA)	8240	2
Semivolatile Organics (SVOA)	8270	2
Pesticides/PCBs	8080	2
Dioxins/Furans	8280	2
Cyanide	9010A/9010	2
Sulfide	9030	2
Metals	3050/6010	2
Arsenic	3050/7060	2
Lead	3050/7421	2
Selenium	3050/7740	2
Mercury	7471	2

Proposed Total No. Samples 41
Actual Total No. Samples 39

TABLE 5-1AM

REQUIRED ANALYSES - DELAWARE SAND AND GRAVEL SITE - SCHEDULE A (MODIFIED)
(BORING COMPOSITE)

Parameter	Document/Method No.	Reference
Specific Gravity	D287	1
Heat of Combustion	D2382	1
Percent Moisture	3540	2
Flashpoint	1010 or 1020	2
Viscosity	D1092	1
Ash	D482	1
Particle Size	F490	1
pH	9040/9045	2
Halogens (Br, F, I, Cl)	9020/9022	2
Volatiles (VOA)	8240-CLP	2
Semivolatile Organics (SVOA)	8270-CLP	2
Dioxins/Furans	8280	2
Cyanide	9010A/9010	2
Sulfide	9030	2
Metals	3050/6010	2
Arsenic	3050/7060	2
Lead	3050/7421	2
Selenium	3050/7740	2
Mercury	7471	2
Pesticides/PCBs	8080-CLP	2
Fusibility	D1857	
Ultimate Analyses		
Carbon, Hydrogen, Oxygen	D3178	1
Nitrogen	D3179	1
Sulfur	D3177	1
Ash	D3174	1
Moisture	D3173	1

Proposed Total No. Samples 8
Actual Total No. Samples 8

TABLE 5-1B

REQUIRED ANALYSES - DELAWARE SAND AND GRAVEL SITE - SCHEDULE B

Parameters	Document/Method No.	Reference
EP Toxicity - Metals & Organics	1310	2
Ignitability	1010 or 1020	2
Corrosivity (as pH)	1110	2
Reactivity	9010/9030	2

Proposed Total No. Samples 9
Actual Total No. Samples 7

TABLE 5-1C

REQUIRED ANALYSES - DELAWARE SAND AND GRAVEL SITE - SCHEDULE C
(MUFFLE FURNACE RESIDUE)

Parameters	Document/Method No.	Reference
TCLP Metals (8)	F.R. Vol. 51 No. 216	3
Metals	3050/6010	2
Arsenic	3050/7060	2
Lead	3050/7421	2
Selenium	3050/7740	2
Mercury	7471	2
Acid/Base/Neutral Organics	8270-CLP	2
Pesticides/PCBs	8080-CLP	2

Proposed Total No. Samples	24
Actual Total No. Samples	23

TABLE 5-1D

REQUIRED ANALYSES - DELAWARE SAND AND GRAVEL SITE - SCHEDULE D
(TEST PIT AND SURFACE/DRUM WASTE)

Parameters	Document/Method No.	Reference
Volatile Organics (VOA)	8240	2
Semivolatile Organics (SVOA)	8270	2
Pesticides/PCBs	8080	2
Dioxins/Furans	8280	2
Cyanide	9010A/9010	2
Sulfide	9030	2
Metals	3050/6010	2
Arsenic	3050/7060	2
Lead	3050/7421	2
Selenium	3050/7740	2
Mercury	7471	2

Proposed Total No. Samples	26
Actual Total No. Samples	22

TABLE 5-1E

REQUIRED ANALYSES - DELAWARE SAND AND GRAVEL SITE - SCHEDULE E
(SOIL BORINGS AND RIDGE AND DRUM DISPOSAL AREAS)

Parameters	Document/Method No.	Reference
Volatiles (VOA)	8240	2
Semivolatiles Organics (SVOA)	8270	2
Pesticides/PCBs	8080	2
Total Recoverable Petroleum Hydrocarbons(TRPH)	9071/418.1	2/4
Cyanide	9010A/9010	2
Metals	3050/6010	2
Arsenic	3050/7060	2
Lead	3050/7421	2
Selenium	3050/7740	2
Mercury	7471	2

Proposed Total No. Samples	178
Actual Total No. Samples	153

TABLE 5-1F

REQUIRED ANALYSES - DELAWARE SAND AND GRAVEL SITE - SCHEDULE F
(SOIL BORINGS)

Parameters	Document/Method No.	Reference
Water Content	D2217-85	1
Atterberg Limits	D4318-84	1
Liquid Limit	D4318-84	1
Plastic Limit	D4318-84	1
Plasticity Index	D4318-84	1
Specific Gravity	D854-83	1
Grain Size	D422-72	1

Proposed Total No. Samples	20
Actual Total No. Samples	24
Grand Total Proposed No. Samples	304
Grand Total Actual No. Samples	276

TABLE 5-1G

REQUIRED ANALYSES - DELAWARE SAND AND GRAVEL SITE - SCHEDULE G
(AIR MONITORING)

Parameters	Document/Method No.	Reference
Benzene	1501	5
1,2-Dichloroethane	1003	5
Ethylbenzene	1501	5
Methyl ethyl ketone	1300	5
Methyl isobutyl ketone	1300	5
Toluene	1501	5
Xylene	1501	5
Bis(2-ethyl hexyl)phthalate	5020	5
Di-n-butyl phthalate	5020	5
PCBs	5503	5
Metals (As, Cd, Cr, Co, Cu, Pb, Ni, Se, Sn, Zn)	7300	5

Total No. Samples 74

References:

1) American Society for Testing and Materials: Part 23, 24, and 25 - Petroleum Products, ASTM 1983.
2) Test Methods for Evaluating Solid Waste, USEPA SW-846, November 1986, Third Edition.
3) Federal Register, Volume 51, No. 216
4) Methods of Chemical Analysis for Water and Wastes, USEPA Cincinnati, Ohio. EPA 600/4-79-020, Revised March 1983.
5) NIOSH Manual of Analytical Methods, Third Edition, 1987.

6.0 DATA PRESENTATION

6.1 Analytical Data Format

The analytical data supplied for the Delaware Sand and Gravel Site Field Investigations (Stage 1 and 2) by the offsite laboratory are presented in the following format (see Appendix B):

Samples are grouped together in tabular form by ID (e.g., UR, UD, TP, etc.) and in sequential order (e.g., UR-1, UR-2). The following is a list of abbreviations used:

a) TP - Test Pit
b) TP - Air Monitoring (Stage I)
c) SDD - Surface Drum - Drum Disposal Area
d) SDR - Surface Drum - Ridge Area
e) UD - Drum Disposal Area
f) GT - Geotechnical (UD)
g) UR - Ridge Area
h) BC - Boring Composite
i) DC - Drill Cutting
j) DW - Drill Water
k) RB - Rinse Blank
l) TB - Trip Blank
m) TTC - Test Trench Composite/TBR - Trench Boring/TBC - Trench Boring Composite
n) TR - Trench (Aqueous)
o) AS - Air Monitoring (Stage 2)
p) TBC/TTC - Muffle Furnace Residue (Ash)

Sample results are grouped per fraction, followed by their corresponding sample detection limits (SDL). Associated quality control

(QC) where applicable, are presented in Appendix B.

a) Volatile organics analysis (VOA)/detection limits
b) Semivolatile organics analysis (SVOA)/detection limits
c) Pesticides/PCB (Pest/PCB)/detection limits
d) Dioxin/Furan (where applicable)/detection limits
e) Metals/detection limits
f) Miscellaneous analyses (where applicable)/detection limits

6.2 Data Qualifier Definitions

The sample results are qualified using the USEPA CLP format with additional data qualifiers applied to the SW-846 methodologies. Data qualifier definitions for organic compounds may be found in Table 6-1 and the data qualifier definitions for inorganic analytes may be found in Table 6-2.

TABLE 6-1

Organic Samples - Data Qualifiers

Qualifier	Description
B	Compound detected in associated method blank. Most analytes flagged with a "B" are considered by USEPA as common laboratory contaminants. For example, common VOA lab contaminants are methylene chloride, acetone, 2-butanone and toluene. Common SVOA lab contaminants are phthalate esters. The actual presence of these contaminants is questionable.
E	Compound concentration exceeded the linear range of calibration. The sample should require reanalysis (at a secondary dilution) in order to get the compound "on scale".
D	Analysis required further dilution to prevent exceeding linear range of calibration.
J	Indicates the value is less than the sample detection (SDL) limit but greater than zero.
NA	Not analyzed
RE	Sample re-extracted and/or reanalyzed due to analytical deviations or quality control outliers (values not within the established ranges of recovery).
P	Compound concentration estimated due to surrogate outliers.

TABLE 6-1 - Continued

Organic Samples Data Qualifiers

Qualifier	Description
X	Concentration is calculated from multi-peak compound.
#	Sample was split with the United States Army Corps of Engineers (USACE) for interlaboratory quality assurance/quality control (QA/QC) purposes.
+	Values are reported although there are analytical deviations. This qualifier pertains only to the SVOA fraction of the boring composite (BC) data in Stage I. Some sample volume was lost due to laboratory instrument malfunctions, resulting in values which are estimated (J) but are comparable to analytical results which exceeded extraction holding time.
*	The sample exceeded the extraction holding times but was within the analysis holding times. This qualifier pertains to SVOA and Pest/PCB fractions for three (3) aqueous samples (SDD-1, SDD-5, and TP-2-2).
@	Results calculated with holding times exceeded.

Please note: According to SW-846 methodologies, samples with non-compliant surrogates may be flagged as estimated (P) if other problem solving remedies fail, therefore the data are usable whether surrogates are compliant or not.

TABLE 6-2

Inorganic Samples Data Qualifiers

The following data qualifiers pertain to metals and miscellaneous parameters only.

Qualifier	Description
B	Value is less than SDL but greater than the instrument detection limits.
E	Value is estimated due to the presence of an interference.
N	Spike recovery is not within QC limits due to matrix interference.
S	Value determined by Method of Standard Addition (MSA).
W	Post-digestion spike (known amount of analyte added to sample) for furnace is out of QC limits, while absorbance (sample response) is less than 50% of spike absorbance due to possible matrix interference.
*	Duplicate analysis not within QC limits. The relative percent difference between initial and duplicate analyses is out of control. (The reproducibility of duplicate data for soil matrices is difficult due to the nonhomogeneous nature of soils which is normally due to matrix interference).
NA	Not Analyzed

Please note: The data qualifiers, as defined by USEPA and URS, are not intended to be used, by themselves, to disqualify the data but to signify that analytical deviations or quality control outliers have occurred. The inorganic qualifiers, (e.g.: N, W, and *) signify sample nonhomogeneity and/or matrix interferences.

6.3 Air Monitoring Data Presentation

Stage 1 air samplers were identified as follows:

TPX-Y

Where:

TPX represents the test pit at which the sample was taken

Y represents a sequential sample number and type

Sample types (Y) were designated as follows:

#A represented a charcoal filter tube

#C represented a cellulose cartridge

Letter represented a fluorisil filter tube

Stage 2 air samples were identified as follows:

AS-Z

Where:

As represents an air sample

Z represents a sequential sample number and type

Sample types (Z) were designated as follows:

#A represented a charcoal filter tube

#C represented a cellulose cartridge

represented a fluorisil filter tube

BK# represented a QA/QC Blank sample of any type

Samples were labeled numerically, in order, as prepared prior to sampling. Sampling was performed continuously during all trenching activities. Samples were only sent to the laboratory for analysis when OVA and/or HNu readings at the perimeter of the exclusion zone exceeded background levels by 1 ppm or greater. This situation occurred a total of 5 times (twice in stage 1, and three times in Stage 2).

7.0 QUALITY CONTROL ACTIVITIES

7.1 Presentation of Field Screening Laboratory Analytical Results

The field screening Stage 1 compatibility testing and screening laboratory results may be found in Appendix C. These results are from samples collected in the Ridge Area (UR), Drum Disposal Area (UD), and Drum Disposal Area composites (UDC) and were analyzed on site.

The field screening Stage 2 compatibility testing results may be found in Appendix D. These results are from drum samples and the material around the drums encountered during the Stage 2 trenching activities.

7.2 Presentation of Laboratory Analytical Results

The screening Stage 1 compatibility and screening laboratory results may be found in Appendix C. These results are from samples collected in the Ridge Area (UR), Drum Disposal Area (UD), and Drum Disposal Area Composites (UDC) and have been analyzed according to the format described in Section 6.1, Analytical Data Format. They are presented in Appendix B, Field Investigations Analytical Results.

7.3 Analytical Data Assessment

Introduction: This assessment represents the best judgement of URS Consultants, Inc. (URS) concerning the usability and defensibility of the chemical data produced by Southwest Laboratories of Oklahoma, Inc. (SWLO) and Environmental Health and Research Testing, Inc. (EHRT), subcontractors to URS, as part of the Stage 1 and 2 Pre-Design Investigation. The data being evaluated is from Stage 1 sampling of soil borings, surface or drum waste, and boring composites. Stage 2 data are being evaluated from sampling of trench borings, trench composites, and muffle-furnace residue (ash) samples. All analyses performed by SWLO and EHRT were subject to those procedures stated in Section 5.0, Tables 5-1A through 5-1G.

Data validation, chain of custody procedures and determination of usability were performed in accordance with the Pre-Design Investigation Work plan 12/90.

Categories: The following table summaries are assessment of data usability on a sample-by-sample and fraction-by-fraction basis. In evaluating these data, URS has established 3 categories which are, for the most part, gradational in nature. The categories are defined as follows:

Category 1a Usable and Defensible - Fully usable despite possible minor deviations from SW846 methodologies.

Category 1b Usable Though Not Fully Defensible - Usable with caution, cumulative deviations from SW-846 criteria are greater than 1a, though not considered so significant as to jeopardize the chemical representativeness of the sample results.

Category 1c Usable for Design Purposes Only - Did not comply with SW-846 holding times. The results are for design purposes only and should not be used for site characterization.

In Tables 7-1 through 7-11 fractions are assigned single categories, indicating that they are considered usable in their entirety, usable with caution, or usable for design purposes only. The notes accompanying these tables indicate the reason for conditional acceptances (Category 1b) and for the those sample fractions which exceeded holding time criteria (Category 1c).

7.3.1 Completeness

A total of 375 samples (QC samples included) for a total of 2,353 fractions (VOA, Metals, TRPH, etc.) were analyzed between the Stage 1 and 2 sampling events (See Table 7-12). The total of 28 non-compliant fractions (Category 1c) are subtracted from the total number of fractions analyzed, thus creating a completeness ratio of 98.8% as shown below:

$$\frac{a-b}{a} \times 100 = \% \text{ complete}$$

a = total number of fractions analyzed (categories 1a, 1b and 1c)
b = total number of fractions non-compliant (category 1c)

$$\frac{2,353 - 28}{2,353} \times 100 = 98.8\% \text{ complete}$$

Please note: Each Schedule A and AM (Modified) Category 1a includes 11 and 12 classical chemistry fractions, respectively.

7.3.2 Data Assessment Summary

URS recommends acceptance and use of all data in Category 1a. The use of Category 1b data involves some risk in the event of a legal challenge base upon non-compliance with SW-846 criteria. However, given the purpose of the Delaware Sand and Gravel study, URS cautiously recommends the use of the data categorized as 1b. URS recommends that the data categorized as 1c are usable from a design point of view only and not for site characterization purposes.

TABLE 7 - 1

ANALYTICAL DATA ASSESSMENT SUMMARY
MATRIX: Soil Borings, Sludges, and Aqueous Wastes
Assessment Categories: 1a, 1b, 1c

Sample ID	VOA	SVOA	Pest/PCB	Metals	CN	Dioxin/Furan	Classical Chem.	Notes
SDD-1	1b	1c	1c	1a	1a	1a	1a	2,3
SDD-2	1a	1a	1a	1a	1a	1a	1a	
SDD-3	1a	1a	1a	1a	1a	1a	1a	
SDD-5	1a	1c	1c	1a	1a	1a	1a	3
SDR-1	1b	1a	1a	1a	1a	1a	1a	1
SDR-2	1a	1a	1a	1a	1a	1a	1a	
SDR-3	---	1a	1a	1a	1a	1a	1a	

Abbreviation/Legend:

VOA - Target Compound List (TCL) Volatiles
SVOA - TCL Semivolatiles
Pest/PCB - TCL Pesticides/PCBs
Metals - Target Analyte List (TAL) Metals
CN - Cyanide
Dioxin/Furan - Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzo-p-Furans
Classical Chem. - Sulfide

SDD - Surface or Drum Waste Drum Disposal Area
SDR - Surface or Drum Waste Ridge Area
--- - Parameter not analyzed

TABLE 7-1 (Continued)

Notes for Table 7-1

(1) The volatiles sample analysis resulted in internal standard outliers. Sample reanalysis resulted in the same internal standard deviations, thus indicating a matrix interference.

(2) The initial volatile sample analysis resulted in surrogate outliers. Sample reanalysis was performed, which resulted in the same surrogate outliers, thus indicating matrix interference.

(3) The semivolatiles and pesticides/PCB samples were extracted outside the SW-846 holding times.

TABLE 7 - 2

ANALYTICAL DATA ASSESSMENT SUMMARY
MATRIX: SOIL BORINGS
Assessment Categories: 1a, 1b, 1c

Sample ID	VOA	SVOA	Pest/PCB	Metals	CN	Dioxin/Furan	Classical Chem.	Notes
TP-1-1	1b	1a	1a	1a	1a	1a	1a	2
TP-2-1	1a	1a	1a	1a	1a	1a	1a	
TP-2-2	1a	1c	1c	1a	1a	1a	1a	3
TP-3-1	1a	1a	1a	1a	1a	1a	1a	
TP-3-2	1a	1a	1a	1a	1a	1a	1a	
TP-3-3	1a	1a	1a	1a	1a	1a	1a	
TP-4-1	1a	1a	1a	1a	1a	1a	1a	
TP-4-2	1b	1a	1a	1a	1a	1a	1a	1
TP-4-3	1b	1a	1a	1a	1a	1a	1a	2
TP-5-1	1a	1a	1a	1a	1a	1a	1a	
TP-5-2	1a	1a	1a	1a	1a	1a	1a	
TP-6-1	1a	1a	1a	1a	1a	1b	1a	6
TP-6-1 FLD DUP	1b	1a	1a	1a	1a	1b	1a	4,6
TP-6-2	1a	1c	1a	1a	1a	1b	1a	5,6
TP-6-2 MS	1a	1c	1a	1a	1a	1b	1a	5,6
TP-6-2 MSD	1a	1c	1a	---	---	1b	---	5,6

Abbreviation/Legend:

VOA - Target Compound List (TCL) Volatiles
SVOA - TCL Semivolatiles
Pest/PCB - TCL Pesticides/PCBs
Metals - Target Analyte List (TAL) Metals
CN - Cyanide
Dioxin/Furan - Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzo-p-Furans
Classical Chem. - Sulfide
TP - Test Pit
MS - Matrix Spike
MSD - Matrix Spike Duplicate
FLD DUP - Field Duplicate
--- - Parameter not analyzed

TABLE 7-2 (Continued)

Notes for Table 7-2

(1) The volatile sample analysis resulted in internal standard outliers. Sample reanalysis resulted in the same internal standard deviations, thus indicating a matrix interference.

(2) The volatile sample had an analyte concentration which exceeded the linear range of calibration. The sample was not diluted to bring the analyte within range, and therefore the compound concentration is considered a minimal value.

(3) The semivolatile and pesticide/PCB samples were extracted outside the SW-846 holding times.

(4) The duplicate volatiles sample was not analyzed at the same concentration as the sample. Both samples should have been analyzed at the same concentration. However, the results are comparable for both samples.

(5) The laboratory reported that samples TP-6-2 and its associated QC, TP-6-2MS and TP-6-2MSD, were initially analyzed within SW-846 holding times and produced non-comparable chromatograms. Although now out of holding time, the laboratory chose to reextract these samples in order to try to clarify the chromatograms. The results of the reanalysis are comparable to the initial data.

(6) The dioxin/furan sample analysis resulted in surrogate outliers. A duplicate was performed on this sample with the same results, indicating that a matrix interference may be present.

TABLE 7 - 3

ANALYTICAL DATA ASSESSMENT SUMMARY
MATRIX: SOIL BORINGS
Assessment Categories: 1a, 1b, 1c

Sample ID	VOA	SVOA	Pest/PCB	Metals	CN	Dioxin/Furan	Classical Chem.	Notes
UR-1	1a	1a	1a	1a	1a	---	1a	
UR-2	1a	1a	1a	1a	1a	---	1a	
UR-2 FLD DUP	1a	1a	1a	1a	1a	---	1a	
UR-3	1a	1a	1a	1a	1a	---	1a	
UR-4	1a	1a	1a	1a	1a	---	1a	
UR-5	1a	1a	1a	1a	1a	---	1a	
UR-6	1a	1a	1a	1a	1a	---	1a	
UR-7	1a	1a	1a	1a	1a	---	1a	
UR-8	1a	1a	1a	1a	1a	---	1a	
UR-9	1a	1a	1a	1a	1a	---	1a	
UR-9 FLD DUP	1a	1a	1a	1a	1a	---	1a	
UR-10	1a	1a	1a	1a	1a	---	1a	
UR-11	1a	1a	1a	1a	1a	---	1a	
UR-11 MS	1a	1a	1a	1a	1a	---	1a	
UR-11 MSD	1a	1a	1a	---	---	---	1a	
UR-12	1a	1a	1a	1a	1a	---	1a	
UR-13	1a	1a	1a	1a	1a	---	1a	
UR-14	1a	1a	1a	1a	1a	---	1a	
UR-15	1a	1a	1a	1a	1a	---	1a	
UR-16	1a	1a	1a	1a	1a	---	1a	
UR-17	1a	1a	1a	1a	1a	---	1a	
UR-18	1a	1a	1a	1a	1a	---	1a	
UR-18 MS	1a	1a	1a	1a	1a	---	1a	
UR-18 MSD	1a	1a	1a	---	---	---	1a	
UR-19	1a	1a	1a	1a	1a	---	1a	
UR-20	1a	1a	1a	1a	1a	---	1a	
UR-21	1a	1a	1a	1a	1a	---	1a	
UR-22	1a	1a	1a	1a	1a	---	1a	
UR-23	1a	1a	1a	1a	1a	---	1a	
UR-23 FLD DUP	1a	1a	1a	1a	1a	---	1a	

Abbreviation/Legend:

VOA - Target Compound List (TCL) Volatiles
SVOA - TCL Semivolatiles
Pest/PCB - TCL Pesticides/PCBs
Metals - Target Analyte List (TAL) Metals
CN - Cyanide
Dioxin/Furan - Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzo-p-Furans
Classical Chem. - Total Recoverable Petroleum Hydrocarbons
UR - Soil Boring Ridge Area
MS - Matrix Spike
MSD - Matrix Spike Duplicate
FLD DUP - Field Duplicate
--- - Parameter not analyzed

TABLE 7 - 3 (continued)

ANALYTICAL DATA ASSESSMENT SUMMARY
MATRIX: SOIL BORINGS
Assessment Categories: 1a, 1b, 1c

Sample ID	VOA	SVOA	Pest/PCB	Metals	CN	Dioxin/Furan	Classical Chem.	Notes
UR-24	1a	1a	1a	1a	1a	---	1a	
UR-25	1a	1a	1a	1a	1a	---	1a	
UR-26	1a	1a	1a	1a	1a	---	1a	
UR-27	1a	1a	1a	1a	1a	---	1a	
UR-27 FLD DUP	1a	1a	1a	1a	1a	---	1a	
UR-28	1a	1a	1b	1a	1a	---	1a	1
UR-29	1a	1a	1a	1a	1a	---	1a	
UR-29 MS	1a	1a	1a	1a	1a	---	1a	
UR-29 MSD	1a	1a	1a	---	---	---	1a	
UR-30	1a	1a	1a	1a	1a	---	1a	
UR-31	1b	1a	1a	1a	1a	---	1a	2
UR-32	1a	1a	1a	1a	1a	---	1a	
UR-33	1a	1a	1a	1a	1a	---	1a	
UR-34	1a	1a	1b	1a	1a	---	1a	1
UR-35	1a	1a	1b	1a	1a	---	1a	1
UR-36	1a	1a	1a	1a	1a	---	1a	
UR-36 MS	1a	1a	1a	1a	1a	---	1a	
UR-36 MSD	1a	1a	1a	---	---	---	1a	
UR-37	1a	1a	1a	1a	1a	---	1a	
UR-38	1a	1a	1a	1a	1a	---	1a	
UR-39	1a	1a	1a	1a	1a	---	1a	
UR-40	1a	1a	1a	1a	1a	---	1a	
UR-41	1a	1a	1a	1a	1a	---	1a	
UR-42	1a	1a	1a	1a	1a	---	1a	
UR-43	1a	1a	1a	1a	1a	---	1a	
UR-43 FLD DUP	1a	1a	1a	1a	1a	---	1a	
UR-44	1a	1a	1a	1a	1a	---	1a	
UR-44 MS	1a	1a	1a	1a	1a	---	1a	
UR-44 MSD	1a	1a	1a	---	---	---	1a	
UR-45	1a	1a	1a	1a	1a	---	1a	
UR-46	1a	1a	1a	1a	1a	---	1a	

Abbreviation/Legend:

VOA - Target Compound List (TCL) Volatiles
SVOA - TCL Semivolatiles
Pest/PCB - TCL Pesticides/PCBs
Metals - Target Analyte List (TAL) Metals
CN - Cyanide
Dioxin/Furan - Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzo-p-Furans
Classical Chem. - Total Recoverable Petroleum Hydrocarbons
UR - Soil Boring Ridge Area
MS - Matrix Spike
MSD - Matrix Spike Duplicate
FLD DUP - Field Duplicate
--- - Parameter not analyzed

TABLE 7-3 (Continued)

Notes for Table 7-3

(1) In accordance with SW-846 methodologies, the pesticides/PCB target compounds and detection limits are flagged as estimated due to surrogate outliers.

(2) The percent recovery of the surrogate compound, toluene-d8, was above QC limits due to elevated concentrations of the target analyte, toluene. The laboratory did not reanalyze the sample because the concentration of toluene resulted in the surrogate outlier.

TABLE 7 - 4

ANALYTICAL DATA ASSESSMENT SUMMARY
MATRIX: SOIL BORINGS
Assessment Categories: 1a, 1b, 1c

Sample ID	VOA	SVOA	Pest/PCB	Metals	CN	Dioxin/Furan	Classical Chem.	Notes
UD-2-8	1a	1a	1a	1a	1a	---	1a	
UD-2-9	1a	1a	1a	1a	1a	---	1a	
UD-2-12	1a	1a	1a	1a	1a	---	1a	
UD-3-10	1a	1a	1a	1a	1a	---	1a	
UD-3-13	1a	1a	1a	1a	1a	---	1a	
UD-3-14	1a	1a	1a	1a	1a	---	1a	
UD-4-10	1a	1a	1a	1a	1a	---	1a	
UD-4-12	1a	1a	1a	1a	1a	---	1a	
UD-4-16	1a	1a	1a	1a	1a	---	1a	
UD-5-7	1a	1a	1a	1a	1a	---	1a	
UD-5-11	1a	1a	1a	1a	1a	---	1a	
UD-5-12	1a	1a	1a	1a	1a	---	1a	
UD-6-10	1a	1a	1a	1a	1a	---	1a	
UD-6-11	1a	1a	1a	1a	1a	---	1a	
UD-6-12	1a	1a	1a	1a	1a	---	1a	
UD-7-10	1a	1a	1a	1a	1a	---	1a	
UD-7-10 MS	---	1a	1a	1a	1a	---	1a	
UD-7-10 MSD	---	1a	1a	---	---	---	1a	
UD-7-11	1a	1a	1a	1a	1a	---	1a	
UD-7-11 FLD DUP	1a	1a	1a	1a	1a	---	1a	
UD-7-12	1a	1a	1a	1a	1a	---	1a	
UD-7-12 MS	---	1a	1a	1a	1a	---	1a	
UD-7-12 MSD	---	1a	1a	---	---	---	1a	
UD-9-8	1a	1a	1a	1a	1a	---	1a	
UD-9-9	1a	1a	1a	1a	1a	---	1a	
UD-11A-11	1a	1a	1a	1a	1a	---	1a	
UD-11A-11 FLD DUP	1a	1a	1a	1a	1a	---	1a	
UD-11A-12	1a	1a	1a	1a	1a	---	1a	
UD-11A-12 MS	---	1a	1a	1a	1a	---	1a	
UD-11A-12 MSD	---	1a	1a	---	---	---	1a	

Abbreviation/Legend:

VOA - Target Compound List (TCL) Volatiles
SVOA - TCL Semivolatiles
Pest/PCB - TCL Pesticides/PCBs
Metals - Target Analyte List (TAL) Metals
CN - Cyanide
Dioxin/Furan - Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzo-p-Furans
Classical Chem. - Total Recoverable Petroleum Hydrocarbons
UD - Soil Boring Drum Disposal Area
MS - Matrix Spike
MSD - Matrix Spike Duplicate
FLD DUP - Field Duplicate
--- - Parameter not analyzed

ANALYTICAL DATA ASSESSMENT SUMMARY
MATRIX: SOIL BORINGS
Assessment Categories: 1a, 1b, 1c

Sample ID	VOA	SVOA	Pest/PCB	Metals	CN	Dioxin/Furan	Classical Chem.	Notes
UD-11A-13	1a	1a	1a	1a	1a	---	1a	
UD-11A-13 FLD DUP	1a	1a	1a	1a	1a	---	1a	
UD-13-8	1a	1a	1a	1a	1a	---	1a	
UD-13-10	1b	1a	1a	1a	1a	---	1a	1
UD-13-11	1a	1a	1a	1a	1a	---	1a	
UD-14-8	1a	1a	1a	1a	1a	---	1a	
UD-14-8 FLD DUP	1a	1a	1a	1a	1a	---	1a	
UD-14-9	1a	1a	1a	1a	1a	---	1a	
UD-14-9 MS	1a	1a	1a	1a	1a	---	1a	
UD-14-9 MSD	1a	1a	1a	---	---	---	1a	
UD-14-10	1a	1a	1a	1a	1a	---	1a	
UD-14-10 FLD DUP	1b	1a	1a	1a	1a	---	1a	1
UD-15A-6	1a	1a	1a	1a	1a	---	1a	
UD-15A-8	1a	1a	1a	1a	1a	---	1a	
UD-16A-9	1a	1a	1a	1a	1a	---	1a	
UD-16A-10	1a	1a	1a	1a	1a	---	1a	
UD-16A-11	1a	1a	1a	1a	1a	---	1a	
UD-17-9	1a	1a	1a	1a	1a	---	1a	
UD-17-10	1a	1a	1a	1a	1a	---	1a	
UD-17-11	1a	1a	1a	1a	1a	---	1a	
UD-18-10	1a	1a	1a	1a	1a	---	1a	
UD-18-11	1a	1a	1a	1a	1a	---	1a	
UD-18-12	1a	1a	1a	1a	1a	---	1a	
UD-19-8	1a	1a	1a	1a	1a	---	1a	
UD-19-10	1a	1a	1a	1a	1a	---	1a	
UD-19-13	1b	1a	1a	1a	1a	---	1a	1
UD-20-10	1a	1a	1a	1a	1a	---	1a	
UD-20-11	1a	1c	1a	1a	1a	---	1a	3
UD-20-12	1a	1a	1a	1a	1a	---	1a	
UD-21-11	1a	1a	1a	1a	1a	---	1a	

Abbreviation/Legend:

VOA - Target Compound List (TCL) Volatiles
SVOA - TCL Semivolatiles
Pest/PCB - TCL Pesticides/PCBs
Metals - Target Analyte List (TAL) Metals
CN - Cyanide
Dioxin/Furan - Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzo-p-Furans
Classical Chem. - Total Recoverable Petroleum Hydrocarbons
UD - Soil Boring Drum Disposal Area
MS - Matrix Spike
MSD - Matrix Spike Duplicate
FLD DUP - Field Duplicate
--- - Parameter not analyzed

TABLE 7 - 4 (continued)

ANALYTICAL DATA ASSESSMENT SUMMARY
MATRIX: SOIL BORINGS
Assessment Categories: 1a, 1b, 1c

Sample ID	VOA	SVOA	Pest/PCB	Metals	CN	Dioxin/Furan	Classical Chem.	Notes
UD-21-12	1a	1a	1a	1a	1a	---	1a	
UD-21-13	1b	1a	1a	1a	1a	---	1a	1
UD-23-10	1a	1a	1a	1a	1a	---	1a	
UD-23-12	1a	1a	1a	1a	1a	---	1a	
UD-25-9	1a	1a	1a	1a	1a	---	1a	
UD-25-10	1a	1a	1a	1a	1a	---	1a	
UD-26-8	1b	1a	1a	1a	1a	---	1a	2
UD-26-8 FLD DUP	1b	1a	1a	1a	1a	---	1a	2
UD-26-9	1a	1a	1a	1a	1a	---	1a	
UD-26-9 MS	1a	1a	1a	1a	1a	---	1a	
UD-26-9 MSD	1a	1a	1a	---	---	---	1a	
UD-26-10	1a	1a	1a	1a	1a	---	1a	
UD-26-10 MS	1a	1a	1a	1a	1a	---	1a	
UD-26-10 MSD	1a	1a	1a	---	---	---	1a	
UD-26-10 FLD DUP	1a	1a	1a	1a	1a	---	1a	
UD-26-10 B	1a	---	---	---	---	---	---	
UD-27-9	1a	1a	1a	1a	1a	---	1a	
UD-27-9 FLD DUP	1a	1a	1a	1a	1a	---	1a	
UD-27-10	1a	1a	1a	1a	1a	---	1a	
UD-27-10 MS	1a	1a	1a	1a	1a	---	1a	
UD-27-10 MSD	1a	1a	1a	---	---	---	1a	
UD-27-15	1a	1a	1a	1a	1a	---	1a	
UD-27-15 FLD DUP	1a	1a	1a	1a	1a	---	1a	
UD-28-8	1a	1a	1a	1a	1a	---	1a	
UD-28-8 MS	1a	1a	1a	1a	1a	---	1a	
UD-28-8 MSD	1a	1a	1a	---	---	---	1a	
UD-28-9	1a	1a	1a	1a	1a	---	1a	
UD-28-9 FLD DUP	1a	1a	1a	1a	1a	---	1a	
UD-28-10	1b	1a	1a	1a	1a	---	1a	1
UD-28-10 MS	1a	1a	1a	1a	1a	---	1a	
UD-28-10 MSD	1a	1a	1a	---	---	---	1a	
UD-30-10	1a	1a	1a	1a	1a	---	1a	
UD-30-12	1a	1a	1a	1a	1a	---	1a	
UD-30-13	1a	1a	1a	1a	1a	---	1a	

Abbreviation/Legend:

VOA - Target Compound List (TCL) Volatiles
SVOA - TCL Semivolatiles
Pest/PCB - TCL Pesticides/PCBs
Metals - Target Analyte List (TAL) Metals
CN - Cyanide
Dioxin/Furan - Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzo-p-Furans
Classical Chem. - Total Recoverable Petroleum Hydrocarbons
UD - Soil Boring Drum Disposal Area
MS - Matrix Spike
MSD - Matrix Spike Duplicate
FLD DUP - Field Duplicate
--- - Parameter not analyzed

TABLE 7-4 (Continued)

Notes for Table 7-4

(1) The volatile sample had analyte concentrations exceeding the linear range of calibration. The sample was not diluted to bring the analytes to within range, therefore, the compound concentrations are considered minimal values.

(2) The initial volatile sample analysis resulted in surrogate outliers. The sample was reanalyzed and resulted in the same surrogate outliers, thus indicating a matrix interference.

(3) The initial semivolatile sample analysis resulted in surrogate outliers. Sample reextraction occurred outside the SW-846 holding times with surrogates within QC limits. Although holding times were exceeded, the target compound results are comparable and the sample is flagged accordingly.

TABLE 7 - 5

ANALYTICAL DATA ASSESSMENT SUMMARY
MATRIX: SOIL BORINGS
Assessment Categories: 1a, 1b, 1c

Sample ID	VOA	SVOA	Pest/PCB	Metals	CN	Dioxin/Furan	Classical Chem.	Notes
BC-5-1	1a	1a	1a	1a	1a	1a	1a	
BC-5-2	1a	1a	1a	1a	1a	1a	1a	
BC-5-2 FLD DUP	1a	1c	1a	1a	1a	1a	1a	3
BC-5-3	1a	1a	1a	1a	1a	1a	1a	
BC-5-4	1a	1a	1a	1a	1a	1a	1a	
BC-5-5	1a	1a	1a	1a	1a	1a	1a	
BC-5-6	1a	1a	1a	1a	1a	1a	1a	
BC-6-1	1a	1a	1a	1a	1a	1a	1a	
BC-6-1 MS	1a	1a	1a	1a	1a	1a	1a	
BC-6-1 MSD	1a	1a	1a	---	---	1a	---	
BC-6-2	1b	1a	1a	1a	1a	1a	1a	1,2
BC-6-3	1a	1a	1a	1a	1a	1a	1a	
BC-6-3 FLD DUP	1a	1c	1a	1a	1a	1a	1a	3
BC-6-4	1a	1a	1a	1a	1a	1a	1a	
BC-6-4 MS	1a	1c	1a	1a	1a	1a	1a	3
BC-6-4 MSD	1a	1c	1a	---	---	1a	---	3
BC-6-5	1a	1a	1a	1a	1a	1a	1a	
BC-6-6	1a	1a	1a	1a	1a	1a	1a	
BC-7-1	1a	1c	1b	1a	1a	1a	1a	3
BC-7-2	1a	1c	1b	1a	1a	1a	1a	3
BC-7-2 MS	1a	1c	1a	1a	1a	1a	1a	3
BC-7-2 MSD	1a	1a	1a	---	---	1a	---	
BC-7-3	1a	1a	1a	1a	1a	1a	1a	
BC-7-3 FLD DUP	1b	1a	1a	1a	1a	1a	1a	2
BC-7-4	1a	1c	1a	1a	1a	1a	1a	3
BC-7-5	1a	1a	1a	1a	1a	1a	1a	
BC-7-6	1a	1a	1a	1a	1a	1a	1a	
BC-8-1	1a	1a	1a	1a	1a	1a	1a	
BC-8-3	1a	1a	1a	1a	1a	1a	1a	
BC-8-4	1a	1a	1a	1a	1a	1a	1a	
BC-8-5	1a	1a	1a	1a	1a	1a	1a	
BC-8-6	1a	1a	1a	1a	1a	1a	1a	
BC-9-1	1a	1a	1a	1a	1a	1a	1a	
BC-9-2	1a	1c	1a	1a	1a	1a	1a	3
BC-10-1	1a	1c	1a	1a	1a	1a	1a	3
BC-10-2	1a	1c	1a	1a	1a	1a	1a	3

Abbreviation/Legend:

VOA - Target Compound List (TCL) Volatiles
SVOA - TCL Semivolatiles
Pest/PCB - TCL Pesticides/PCBs
Metals - Target Analyte List (TAL) Metals
CN - Cyanide
Dioxin/Furan - Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzo-p-Furans
Classical Chem. - Refer to Table 5-1a Schedule A

BC - Boring Composite
MS - Matrix Spike
MSD - Matrix Spike Duplicate
FLD DUP - Field Duplicate
--- - Parameter not analyzed

TABLE 7-5 (Continued)

Notes for Table 7-5

(1) The initial volatile sample analysis resulted in surrogate outliers. The sample was reanalyzed and resulted in the same surrogate outliers, thus indicating a matrix interference.

(2) The volatile sample had analyte concentrations exceeding the linear range of calibration. The sample was not diluted to bring the analytes within range, and therefore the compound concentrations are considered to be minimal values.

(3) The initial volatile analysis resulted in surrogate outliers due to a malfunction of the gel permeation chromatogram (GPC) during sample extraction. The sample was reextracted, outside of holding time, with compliant surrogates and comparable target compound results.

(4) The pesticide/PCB analysis resulted in surrogate outliers. In accordance with SW-846 methodologies, the data are flagged as estimated.

TABLE 7 - 6

ANALYTICAL DATA ASSESSMENT SUMMARY
MATRIX: SOIL BORINGS
Assessment Categories: 1a, 1b, 1c

Sample ID	VOA	SVOA	Pest/PCB	Metals	CN	Dioxin/Furan	Geotechnical Parameters	Notes
GT-1 (UD-19)	---	---	---	---	---	---	1a	
GT-2 (UD-21)	---	---	---	---	---	---	1a	
GT-3 (UD-16A)	---	---	---	---	---	---	1a	
GT-4 (UD-30)	---	---	---	---	---	---	1a	
GT-5 (UD-17)	---	---	---	---	---	---	1a	
GT-6 (UD-17)	---	---	---	---	---	---	1a	
GT-7 (UD-11A)	---	---	---	---	---	---	1a	
GT-8 (UD-11A)	---	---	---	---	---	---	1a	
GT-9 (UD-7)	---	---	---	---	---	---	1a	
GT-10 (UD-27)	---	---	---	---	---	---	1a	
GT-11 (UD-27)	---	---	---	---	---	---	1a	
GT-12 (UD-26)	---	---	---	---	---	---	1a	
GT-13 (UD-14)	---	---	---	---	---	---	1a	
GT-14 (UD-5)	---	---	---	---	---	---	1a	
GT-15 (UD-5)	---	---	---	---	---	---	1a	
GT-16 (UD-2)	---	---	---	---	---	---	1a	
GT-17 (UD-2)	---	---	---	---	---	---	1a	
GT-18 (UD-2)	---	---	---	---	---	---	1a	
GT-19 (UD-3)	---	---	---	---	---	---	1a	
GT-20 (UD-13)	---	---	---	---	---	---	1a	
GT-21 (UD-4)	---	---	---	---	---	---	1a	
GT-22 (UD-25)	---	---	---	---	---	---	1a	
GT-23 (UD-25)	---	---	---	---	---	---	1a	
GT-24 (UD-9)	---	---	---	---	---	---	1a	

Abbreviation/Legend:

VOA - Target Compound List (TCL) Volatiles
SVOA - TCL Semivolatiles
Pest/PCB - TCL Pesticides/PCBs
Metals - Target Analyte List (TAL) Metals
CN - Cyanide
Dioxin/Furan - Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzo-p-Furans
Geotechnical Parameters - Water Content, Atterberg Limits, Specific Gravity, and Grain Size

GT - Geotechnical (Boring location)
--- - Parameter not analyzed

TABLE 7 - 7

ANALYTICAL DATA ASSESSMENT SUMMARY
MATRIX: Air Monitoring
Assessment Categories: 1a, 1b, 1c

Sample ID	VOA	SVOA	PCB	Metals	CN	Dioxin/Furan	Classical Chem.	Notes
TP-1-3C	---	---	---	1a	---	---	---	
TP-1-16C	---	---	---	1a	---	---	---	
TP-3-17C	---	---	---	1a	---	---	---	
TP-3-40C	---	---	---	1a	---	---	---	
MATRIX SPIKE 1	---	---	---	1a	---	---	---	
MATRIX SPIKE 2	---	---	---	1a	---	---	---	
TP-1F	---	---	1a	---	---	---	---	
TP-3G	---	---	1a	---	---	---	---	
MATRIX SPIKE	---	---	1a	---	---	---	---	
TP-1-11C	---	---	---	---	---	---	---	
TP-1-10C	---	1a	---	---	---	---	---	
TP-3-35C	---	1a	---	---	---	---	---	
TP-3-38C	---	1a	---	---	---	---	---	
TP-3-29C	---	1a	---	---	---	---	---	
MATRIX SPIKE	---	1a	---	---	---	---	---	
TP-1-45A	1a	---	---	---	---	---	---	
TP-1-23A	1a	---	---	---	---	---	---	
TP-3-93A	1a	---	---	---	---	---	---	
TP-3-68A	1a	---	---	---	---	---	---	
MATRIX SPIKE	1a	---	---	---	---	---	---	
TP-1-19A	1a	---	---	---	---	---	---	
TP-1-12A	1a	---	---	---	---	---	---	
TP-3-63A	1a	---	---	---	---	---	---	
TP-3-35A	1a	---	---	---	---	---	---	
TP-3-56A	1a	---	---	---	---	---	---	
TP-3-94A	1a	---	---	---	---	---	---	
MATRIX SPIKE	1a	---	---	---	---	---	---	
TP-1-17A	1a	---	---	---	---	---	---	
TP-1-13A	1a	---	---	---	---	---	---	
TP-1-1A	1a	---	---	---	---	---	---	
TP-1-24A	1a	---	---	---	---	---	---	
TP-3-86A	1a	---	---	---	---	---	---	
TP-3-76A	1a	---	---	---	---	---	---	
TP-3-66A	1a	---	---	---	---	---	---	
TP-3-88A	1a	---	---	---	---	---	---	
TP-3-69A	1a	---	---	---	---	---	---	
TP-3-65A	1a	---	---	---	---	---	---	
MATRIX SPIKE	1a	---	---	---	---	---	---	

Abbreviation/Legend:

VOA - 1,2-Dichloroethane, Benzene, Ethylbenzene, Total Xylenes, Toluene, Methylethyl Ketone, and Methylisobutyl Ketone
SVOA - Bis(2-ethylhexyl)phthalate and Di-n-butylphthalate
PCB - PCBs
Metals - As, Cd, Cr, Co, Cu, Pb, Ni, Se, Sn, and Zn
CN - Cyanide
Dioxin/Furan - Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzo-p-Furans
Classical Chem. - Total Recoverable Petroleum Hydrocarbons

--- - Parameter not analyzed
TP - Test Pit
A - Charcoal filter tube
C - Cellulose cartridge
F,G - Fluorisil filter tube

TABLE 7 - 8

ANALYTICAL DATA ASSESSMENT SUMMARY
MATRIX: SOIL BORINGS
Assessment Categories: 1a, 1b, 1c

Sample ID	VOA	SVOA	Pest/PCB	Metals	CN	Dioxin/Furan	Classical Chem.	Notes
TBR-1(14')	1a	1a	1a	1a	1a	---	1a	
TBR-1(24')	1a	1a	1a	1a	1a	---	1a	
TBR-1(34')	1a	1a	1a	1a	1a	---	1a	
TBR-3(13')	1a	1a	1a	1a	1a	---	1a	
TBR-3(23')	1a	1a	1a	1a	1a	---	1a	
TBR-3(33')	1a	1a	1a	1a	1a	---	1a	
TBC-1	1a	1a	1a	1a	1a	1a	1a	
TBC-1 MS	1a	1a	1a	1a	1a	1a	1a	
TBC-1 MSD	1a	1a	1a	---	---	1a	---	
TBC-1 DUP	1c	1c	1c	1a	1a	1a	1a	1
TTC-1	1b	1a	1a	1a	1a	1a	1a	2
TTC-1 MS	1a	1a	1a	1a	1a	1a	1a	
TTC-1 MSD	1a	1a	1a	---	---	1a	---	
TTC-1 DUP	1c	1c	1c	1a	1a	1a	1a	1
TR-2	1a	1a	1a	1a	1a	---	1a	

Abbreviation/Legend:

VOA - Target Compound List (TCL) Volatiles
SVOA - TCL Semivolatiles
Pest/PCB - TCL Pesticides/PCBs
Metals - Target Analyte List (TAL) Metals
CN - Cyanide
Dioxin/Furan - Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzo-p-Furans
Classical Chem. - Refer to Table 5 - 1AM and 5 - 1E Schedules A(Modified) and E

TBR - Trench Boring
TBC - Trench Boring Composite
TTC - Test Trench Composite
DUP - Duplicate
--- - Parameter not analyzed

TABLE 7-8 (Continued)

Notes for Table 7-8

(1) The volatile, semivolatile and pesticide/PCB sample fractions were extracted and analyzed outside SW-846 holding time criteria. Additional quality control was performed on this sample duplicate, and all results are comparable.

(2) The volatile sample had an analyte concentration exceeding the linear range of calibration. The sample was not diluted in order to bring the analyte within range, and therefore the compound concentration is considered to be a minimal value.

TABLE 7 - 9

ANALYTICAL DATA ASSESSMENT SUMMARY
MATRIX: ASH
Assessment Categories: 1a, 1b, 1c

Sample ID	VOA	SVOA	Pest/PCB	TCLP Metals	CN	Dioxin/Furan	Classical Chem.	Notes
TBC-1/1200/15	---	1a	1b	1a	---	---	---	2
TBC-1/1200/30	---	1a	1b	1a	---	---	---	2
TBC-1/1200/45	---	1a	1b	1a	---	---	---	2
TBC-1/1500/15	---	1a	1b	1a	---	---	---	2
TBC-1/1500/30	---	1a	1b	1a	---	---	---	2
TBC-1/1500/45	---	1a	1b	1a	---	---	---	2
TBC-1/1800/15	---	1a	1b	1a	---	---	---	2
TBC-1/1800/30	---	1a	1b	1a	---	---	---	2
TBC-1/1800/45	---	1a	1b	1a	---	---	---	2
TTC-1/1200/15	---	1a	1b	1a	---	---	---	2
TTC-1/1200/30	---	1a	1b	1a	---	---	---	2
TTC-1/1200/45	---	1a	1b	1a	---	---	---	2
TTC-1/1500/15	---	1c	1b	1a	---	---	---	1,2
TTC-1/1500/30	---	1a	1b	1a	---	---	---	2
TTC-1/1500/45	---	1a	1b	1a	---	---	---	2
TTC-1/1800/15	---	1c	1b	1a	---	---	---	1,2
TTC-1/1800/30	---	1a	1b	1a	---	---	---	2
TTC-1/1800/45	---	1a	1b	1a	---	---	---	2

Abbreviation/Legend:

VOA - Target Compound List (TCL) Volatiles
SVOA - TCL Semivolatiles
Pest/PCB - TCL Pesticides/PCBs
TCLP Metals - Toxicity Leaching Characteristic Procedure (TCLP) Metals
CN - Cyanide
Dioxin/Furan - Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzo-p-Furans
Classical Chem. - Total Recoverable Petroleum Hydrocarbons

TBC - Test Boring Composite
TTC - Test Trench Composite
--- - Parameter not analyzed

TABLE 7-9 (Continued)

Notes for Table 7-9

(1) The initial semivolatile sample analysis resulted in surrogate outliers. The sample was reextracted outside SW-846 holding time criteria with compliant surrogates. The target compared results between the initial and reextraction analyses are comparable.

(2) The pesticide/PCB data deviated from SW-846 method 8080 criteria with reference to the retention time (RT) shift for the surrogate dibutylchlorendate (DBC). An RT shift occurred due to an instrument malfunction, as was stated in the case narrative. Each sample chromatogram was reviewed in order to take into account the RT shift when identifying the presence of target analytes.

TABLE 7 - 10

ANALYTICAL DATA ASSESSMENT SUMMARY
MATRIX: AIR MONITORING
Assessment Categories: 1a, 1b, 1c

Sample ID	VOA	SVOA	PCB	Metals	CN	Dioxin/Furan	Classical Chem.	Notes
AS-40A	1a	—	—	—	—	—	—	
AS-8A	1a	—	—	—	—	—	—	
AS-36A	1a	—	—	—	—	—	—	
AS-10A	1a	—	—	—	—	—	—	
AS-1A	1a	—	—	—	—	—	—	
AS-32A	1a	—	—	—	—	—	—	
AS-BK3	1a	—	—	—	—	—	—	
AS-3A	1a	—	—	—	—	—	—	
AS-24A	1a	—	—	—	—	—	—	
AS-7	—	—	1a	—	—	—	—	
AS-6	—	—	1a	—	—	—	—	
AS-BK5	—	—	1a	—	—	—	—	
AS-6C	—	1a	—	—	—	—	—	
AS-38C	—	1a	—	—	—	—	—	
AS-20C	—	—	—	1a	—	—	—	
AS-36C	—	—	—	1a	—	—	—	
AS-BK7	—	—	—	1a	—	—	—	
AS-67A	1a	—	—	—	—	—	—	
AS-59A	1a	—	—	—	—	—	—	
AS-BK8	1a	—	—	—	—	—	—	
AS-73A	1a	—	—	—	—	—	—	
AS-54A	1a	—	—	—	—	—	—	
AS-BK9	1a	—	—	—	—	—	—	
AS-76A	1a	—	—	—	—	—	—	
AS-57A	1a	—	—	—	—	—	—	
AS-BK10	1a	—	—	—	—	—	—	
AS-72A	1a	—	—	—	—	—	—	
AS-60A	1a	—	—	—	—	—	—	
AS-BK11	1a	—	—	—	—	—	—	
AS-13	—	—	1a	—	—	—	—	

Abbreviation/Legend:

VOA - 1,2-Dichloroethane, Benzene, Ethylbenzene, Total Xylenes, Toluene, Methylethyl Ketone, and Methylisobutyl Ketone
SVOA - Bis(2-ethylhexyl)phthalate and Di-n-butylphthalate
PCB - PCBs
Metals - As, Cd, Cr, Co, Cu, Pb, Ni, Se, Sn, and Zn
CN - Cyanide
Dioxin/Furan - Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzo-p-Furans
Classical Chem. - Total Recoverable Petroleum Hydrocarbons
BK - Blank Spike

AS - Air Sample
A - Charcoal filter tube
C - Cellulose cartridge
— - Parameter not analyzed

TABLE 7 - 10 (continued)

ANALYTICAL DATA ASSESSMENT SUMMARY
MATRIX: AIR MONITORING
Assessment Categories: 1a, 1b, 1c

Sample ID	VOA	SVOA	PCB	Metals	CN	Dioxin/Furan	Classical Chem.	Notes
AS-17	---		1a	---	---	---	---	
AS-16C	---	1a	---	---	---	---	---	
AS-33C	---	1a	---	---	---	---	---	
AS-BK13	---	1a	---	---	---	---	---	
AS-13C	---	---	---	1a	---	---	---	
AS-35C	---	---	---	1a	---	---	---	
AS-89A	1a	---	---	---	---	---	---	
AS-95A	1a	---	---	---	---	---	---	
AS-BK15	1a	---	---	---	---	---	---	
AS-90A	1a	---	---	---	---	---	---	
AS-92A	1a	---	---	---	---	---	---	
AS-BK16	1a	---	---	---	---	---	---	
AS-93A	1a	---	---	---	---	---	---	
AS-81A	1a	---	---	---	---	---	---	
AS-BK17	1a	---	---	---	---	---	---	
AS-84A	1a	---	---	---	---	---	---	
AS-91A	1a	---	---	---	---	---	---	
AS-BK18	1a	---	---	---	---	---	---	
AS-15	---	---	1a	---	---	---	---	
AS-20	---	---	1a	---	---	---	---	
AS-BK19	---	---	1a	---	---	---	---	
AS-43C	---	1a	---	---	---	---	---	
AS-26C	---	1a	---	---	---	---	---	
AS-BK20	---	1a	---	---	---	---	---	
AS-27C	---	---	---	1a	---	---	---	
AS-31C	---	---	---	1a	---	---	---	
AS-BK21	---	---	---	1a	---	---	---	

Abbreviation/Legend:

VOA - 1,2-Dichloroethane, Benzene, Ethylbenzene, Total Xylenes, Toluene, Methylethyl Ketone, and Methylisobutyl Ketone
SVOA - Bis(2-ethylhexyl)phthalate and Di-n-butylphthalate
PCB - PCBs
Metals - As, Cd, Cr, Co, Cu, Pb, Ni, Se, Sn, and Zn
CN - Cyanide
Dioxin/Furan - Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzo-p-Furans
Classical Chem. - Total Recoverable Petroleum Hydrocarbons
BK - Blank Spike

AS - Air Sample
A - Charcoal filter tube
C - Cellulose cartridge
--- - Parameter not analyzed

TABLE 7 - 11

ANALYTICAL DATA ASSESSMENT SUMMARY
MATRIX: Drill Water, Drill Cutting, Rinse Blank and Trip Blank
Assessment Categories: 1a, 1b, 1c

Sample ID	TCLP VOA	TCLP SVOA	TCLP Pest/PCB	TCLP Metals	CN	TCLP Herb	RCRA	EP-TOX Metals	EP-TOX Pest	EP-TOX Herb	Notes
DW-1	—	—	—	—	—	—	1a	—	—	—	
DW-1 DUP	—	—	—	—	—	—	1a	—	—	—	
DW-2	1a	1a	1a	1a	—	1a	—	—	—	—	
DC-1	—	—	—	—	—	—	1a	1a	1a	1a	
DC-1 MS	—	—	—	—	—	—	1a	1a	1a	1a	
DC-1 MSD	—	—	—	—	—	—	—	—	1a	1a	
DC-2	—	—	—	—	—	—	1a	1a	1a	1a	
RB-1	1a	1a	1a	—	1a	—	—	—	—	—	
TB-1	1a	1a	1a	—	1a	—	—	—	—	—	

Abbreviation/Legend:

TCLP VOA - Toxicity Characteristic Procedure (TCLP) Volatiles
TCLP SVOA - TCLP Semivolatiles
TCLP Pest/PCB - TCLP Pesticides/PCBs
TCLP Metals - TCLP Metals
TCLP Herb - TCLP Herbicides
CN - Cyanide
EP-TOX Metals - Extraction Procedure Toxicity Metals
EP-TOX Pest - Extraction Procedure Toxicity Pesticides
EP-TOX Herb - Extraction Procedure Toxicity Herbicides
RCRA - Corrosivity, Ignitability, and Reactivity
RB - Rinse Blank
TB - Trip Blank
MS - Matrix Spike
MSD - Matrix Spike Duplicate
DUP - Duplicate
DW - Drill Water
DC - Drill Cutting
— - Parameter not analyzed

TABLE 7-12
ANALYTICAL COMPLETENESS

Data Assessment Table	# of Samples	# of Samples x # of Fractions	# of Samples Category 1a and 1b	# of Samples Category 1c
7-1	7	48	45	3
7-2	16	109	104	5
7-3	61	356	356	0
7-4	94	536	535	1
7-5	36	573	562	11
7-6	24	96	96	0
7-7	38	152	152	0
7-8	15	162	156	6
7-9	18	54	52	2
7-10	57	228	228	0
7-11	9	39	39	0
TOTALS	375	2,353	2,325	28

8.0 CONCLUSIONS

All samples analyses, with the exceptions previously noted, conform to the prescribed methodologies, and presented (where applicable) in accordance with USEPA deliverables criteria.

Occasional communications breakdowns, misinterpretation of instruments, and equipment problems resulted in holding time violations which necessitated that some or all the parameters of a few samples be assessed as 1c (useable for design only). In the future even greater effort will have to be made to avoid even the few communications breakdowns which caused the problems herein noted.

The use of on-site lab screening of samples would have been more useful in selecting samples for off-site analysis if the vertical extent of the contaminated soils within and surrounding the drum disposal area had not for the most part extended down to the Top of Potomac Clay (limits of investigation).

A calculation of completeness (although not required for this project) based on data assessment of fully useable, or fully useable with caution, resulted in a completeness ratio of 98.8%.

APPENDIX A

DAILY QUALITY CONTROL REPORTS

URS Consultants, Inc.
Daily Quality Control Report

Date: 7/19/90 Weather: Hazy, Humid, High 95°

Work Performed: Health & Safety Briefing. Trench Excavation TP-1, Ridge Sampling at Borings ~~UR-1~~ UR-1, 3 & 7

Sampling Performed: Soil & Waste Samples at TP-1. Air Samples at TP-1. Soil Samples at UR-1, 3 & 7

Field Analysis: HNu within TP-1 50 ppm. HNu within Ridge Borings 0 ppm. HNu within soil and waste removed from TP-1 up to 70 ppm. Particulate Monitoring at Drum Disposal & Ridge Areas within Acceptable Limits.

Problems\Corrective Actions: Level B Escape Air Bottles Recieved Empty / Had Bottles Filled at Local Fire Company. Leaking Drum Encountered at TP-1 / TP-1 Backfilled Following Sampling

Quality Control Activities: Decon Samplers & Tools

AR101013

Printed Name: André J. LaPerle Signed Name: André J. LaPerle

URS Consultants, Inc.
Daily Quality Control Report

Date: 7/20/90 Weather: Humid, 90°

Work Performed: TAILGATE MEETING. EXCAVATION OF TRENCH TP-2 AT DRUM DISPOSAL AREA. SOIL SAMPLING AT LOCATIONS UR 4, 2 & 6 WITHIN RIDGE AREA.

Sampling Performed: AIR SAMPLING AT TP-2. SOIL SAMPLING AT TP-2 & UR 4, 2 & 6

Field Analysis: HNU MONITORING WITHIN RIDGE AREA FIND NO DETECTABLE ORGANIC VAPORS / DOWNGRADE PERSONNEL TO LEVEL D PPE. HNU READINGS AT TP-2 15 PPM

Problems\Corrective Actions: BROKEN SUB FOR AIR HAMMER / DRIVE SPLIT SPOON SAMPLER WITH SLEDGE HAMMER FOR REMAINDER OF DAY AND DRILLER WILL PICK UP NEW SUB AT SHOP TONIGHT. LOSS OF HYDRAULIC PRESSURE ON BACKHOE / CALLED FOR REPAIR. USACE REQUEST STAINLESS STEEL SPLIT SPOONS FOR RIDGE SAMPLING / REQUESTED SPOONS FROM DRILLER AND DRILLER WILL PICK UP TONIGHT. RADIO AT TRENCH EXCAVATION WILL NOT RECEIVE TRANSMISSION / SWITCHED RADIO WITH RIDGE CREW.

Quality Control Activities: DECON BACKHOE & TOOLS. SAMPLER DECON PROCEDURE MODIFIED PER USACE REQUEST TO INCLUDE HEXANE RINSE~~[illegible]~~ QA SAMPLES SENT TO USACE LAB. ALL SAMPLES SHIPPED UNDER CHAIN OF CUSTODY.

Printed Name: ANGLE V. LAPREZ Signed Name: Angle V. LaPrez

URS Consultants, Inc.
Daily Quality Control Report

Date: 7/21/90 Weather: Humid, 90°, LT Rain in PM

Work Performed: Tailgate Meeting. Excavation of Trench TP-3. Soil Sampling at Ridge Locations UR-10, 14, 17, 20, 23, 18, 19 & 15. Backfill Trench TP-3 and will continue excavation tomorrow.

Sampling Performed: Air Sampling at TP-3. Soil Sampling at Ridge Locations UR-10, 14, 17, 20, 23, 18, 19 & 15.

Field Analysis: HNu Monitoring at Ridge 0 ppm. HNu & OVA Monitoring at TP-3 0 ppm above background in breathing zone. OVA 100 ppm within soil from Trench TP-3.

Problems\Corrective Actions: Drive Rod Broken during Sampling at Ridge / Rod Delivered in Early Afternoon. Recurring Loss of Hydraulic Pressure on Backhoe / Called for Repair however Rental Company is Closed / Rented another Backhoe from different Rental Company. Called for Replacement or Repair of Defective Radio / Will have to Buy New Radio at W.W. Grainger.

Quality Control Activities: Stainless Steel Split Spoons used for Ridge Sampling. Decon Backhoe & Sampling Tools. Duplicate Samples Recovered from Ridge Area. Samples Refrigerated for Shipment Monday.

Printed Name: Andre J. LaPres Signed Name: Andre J. LaPres

URS Consultants, Inc.
Daily Quality Control Report

Date: 7/22/90 Weather: Humid, 90°

Work Performed: Tailgate Meeting. Continue Excavation of Trench TP-2. Ridge Soil Sampling at Locations UR-11, 5, 21, 8, 9, 13, 12 & 16. Backfill Trench TP-2. Excavation of Trench TP-4 and Backfill.

Sampling Performed: Air Monitoring at Trench TP-2 up to .9 mg/m³ above background for particulates. Air Sampling at TP-2 4 ppm above background with HNU at perimeter of exclusion zone and air samples to be sent to offsite lab for chemical analysis. Surface waste samples retrieved from Ridge areas SDR-1 & 2

Field Analysis: OVA Monitoring at Trench TP-2 500 ppm within uncovered drum. OVA at exclusion zone perimeter up to 4 ppm. HNU 500 ppm & OVA 700 ppm within soil removed from excavation.

Problems\Corrective Actions: Driller for Ridge Sampling unable to work due to pulled back muscle / URS crew sampling without driller until 2:15 when replacement driller arrives.

Quality Control Activities: Decon Backhoe and Sampling Tools

Printed Name: Angie J. LaPack Signed Name: Angie J. LaPack

AR101016

URS Consultants, Inc.
Daily Quality Control Report

Date: 7/23/90 . Weather: HUMID 95°

Work Performed: TAILGATE MEETING, EXCAVATION OF TRENCH TP-5, RIDGE SAMPLING AT LOCATIONS UR 22, 23, 24, 25, 26, 29, 32, 35, 38 & 41

Sampling Performed: AIR MONITORING AT TRENCH TP-5 SOIL & WASTE SAMPLING AT TP-5. SOIL SAMPLING AT UR-22, 23, 24, 25, 26, 29, 32, 35, 38 & 41

Field Analysis: OVA & HNu MONITORING AT TRENCH TP-5 AND RIDGE SAMPLE MONITORING WITH HNu. TP-5 OVA UP TO 30-40 PPM, HNu UP TO 100 PPM AT WASTE DRUM. HNu AT RIDGE 0 PPM ABOVE BACKGROUND

Problems\Corrective Actions: FLAT TIRE ON BACKHOE / CALLED FOR REPAIR. POSSIBLE PROBLEM WITH MOVING HEAVY EQUIPMENT ACROSS DRUM DISPOSAL AREA DURING UPCOMING BORING PROGRAM AND PROBABLE PROBLEM DRILLING INTO INTACT DRUMS / DISCUSSED WITH USACE & URS PERSONNEL AND USACE & URS TO DEVELOP PROGRAM MODIFICATIONS. RELOCATION OF TRENCH TP-6 NECESSARY DUE TO LOCATION WITHIN DRUM AREA / CALLED USACE FOR AUTHORIZATION

Quality Control Activities: DECON BACKHOE & TOOLS.

Printed Name: ANDRE J. LAPAS Signed Name: Andre J. LaPas

AR101017

URS CONSULTANTS, INC. | DAILY QUALITY CONTROL REPORT | A-000005

A-3094

URS Consultants, Inc.
Daily Quality Control Report

Date: 7/24/90 Weather: Sunny 90°

Work Performed: TAILGATE MEETING. TRENCH EXCAVATION AND BACKFILL TP-6. SOIL SAMPLING AT REMAINING RIDGE LOCATIONS. PACKAGING SAMPLES FOR SHIPMENT. TRENCH EXCAVATION SURFACES COVERED WITH CLEAN FILL.

Sampling Performed: AIR MONITORING AT TP-6. SOIL AND WASTE SAMPLING AT TP-6. SOIL SAMPLING AT REMAINING 15 RIDGE LOCATIONS

Field Analysis: HNu & OVA MONITORING AT TP-6, HNu UP TO 20 PPM & OVA UP TO 1000 PPM IN TRENCH. HNu MONITORING AT RIDGE 0 PPM ABOVE BACKGROUND.

Problems\Corrective Actions: DAVE SOLLY STUNG BY BEE / HAS DAVE REST AWHILE.

Quality Control Activities: DECON BACKHOE AND SAMPLING TOOLS. TP-6 FIELD DUPLICATE AND MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECEIVED

Printed Name: ANDRE J. LAPLANT Signed Name: Andre J. LaPlant

AR101018

URS CONSULTANTS, INC.	DAILY QUALITY CONTROL REPORT	A-000006

4-3094

URS Consultants, Inc.
Daily Quality Control Report

Date: 7/25/90 Weather: Sunny 75°

Work Performed: PACKAGE & SHIP SOIL SAMPLES. SECURE EQUIPMENT AND TRAILERS FOR URS 4 DAY BREAK

Sampling Performed: NONE

Field Analysis: NONE

Problems\Corrective Actions: NONE

Quality Control Activities: ALL SAMPLES PACKED IN ICE AND SHIPPED FED EX NEXT DAY UNDER CHAIN OF CUSTODY

Printed Name: ANDRE J. LABREC Signed Name: Andre J. LaBrec

AR101019

A-3094

URS CONSULTANTS, INC. | DAILY QUALITY CONTROL REPORT | A-000007

URS Consultants, Inc.
Daily Quality Control Report

Date: 7/30/90 Weather: Overcast, Humid, 90°

Work Performed: TAILGATE MEETING, SET UP FOR SURVEY AND DRILLING

Sampling Performed: NONE

Field Analysis: NONE

Problems\Corrective Actions: ~~NONE~~ DISCUSSED USE OF NITRIC ACID IN SAMPLER DECON FOR METALS ANALYSIS WITH USACE

Quality Control Activities: DECON DRILL RIG AND TOOLS WITH STEAM CLEANER

Printed Name: ANDRE J. LAPLES Signed Name: Andre J. LaPlace

AR101020

URS CONSULTANTS, INC.	DAILY QUALITY CONTROL REPORT	A-000008

URS Consultants, Inc.
Daily Quality Control Report

Date: 7/31/90 Weather: Hazy, Humid, Rain, 90°

Work Performed: Health & Safety Briefing. Drilling & Soil Sampling at UD-18. Survey of proposed boring locations at Basin Disposal Area. Grout UD-18

Sampling Performed: Split Spoon Soil Sampling at UD-18.

Field Analysis: HNu & OVA monitoring of air and soil samples at UD-18. OVA readings on samples up to 90 ppm. UD-18 samples delivered to Wadsworth on site laboratory for compatibility testing and screening.

Problems\Corrective Actions: HNu not operating correctly due to rain / Continue to monitor with OVA. Unable to begin second boring today as driller has only one lead auger / Driller called shop and additional augers to be sent this afternoon

Quality Control Activities: Decon split spoon samplers per URS/USACE agreed protocol. Decon rig and tools with steam cleaner

Printed Name: André J. LaPlante Signed Name: André J. LaPlante

AR101021

URS CONSULTANTS, INC. | DAILY QUALITY CONTROL REPORT | A-000009

4-3004

URS Consultants, Inc.
Daily Quality Control Report

Date: 8/1/90 Weather: Sunny, 85°

Work Performed: Drilling and Sampling UD-19 & 21. Continue Survey of Trenches and Proposed Boring Locations.

Sampling Performed: Split Spoon Soil Sampling at Borings UD-19 & 21

Field Analysis: HNU & OVA Monitoring of Soil Samples and Air within work zone. UD-19 22-36 Ft OVA ranging 5-100 ppm, HNU ranging 50-120 ppm on samples. UD-21 35-37 Ft OVA 100+ & HNU 100 ppm on sample.

Problems\Corrective Actions: None

Quality Control Activities: Eliminate Nitric Acid Rinse from Decon Procedure per USACE Chemist. Decon Rig and Sampling Tools. Stainless Steel Split Spoon Decon Between Samples.

Printed Name: Andrea J. LaPres Signature: Andrea J. LaPres

AR101022

URS CONSULTANTS, INC.	DAILY QUALITY CONTROL REPORT	A-000010

A-304

URS Consultants, Inc.
Daily Quality Control Report

Date: 8/2/90 Weather: Sunny 90°

Work Performed: Tailgate Meeting. Drilling and Sampling Borings UD-23. Borings UD-19 & 21 & 23 Grouted. Begin survey of Ridge Boring Locations

Sampling Performed: Split Spoon Soil Sampling at Boring UD-23

Field Analysis: HNu & OVA Monitoring of Soil Samples and Air in Work Zone. Radiation Survey of Ridge Area

Problems\Corrective Actions: 15 Borings within Drum Disposal Area and Suspect Area to be eliminated due to presence of drums and possible soft ground cover / Additional boring to possibly be located around drum area perimeter

Quality Control Activities: U.S.A.C.E - Steve Rowe, USEPA - Eric Newman, DNREC - Rob Allen & URS - Jerry Jackal & Duane Lenhart on site to review progress and site conditions. Steam clean Drill Rig & Tools. Decon Stainless Steel Split Spoon between Samples.

Printed Name: Andre J. LaPlante Signed Name: Andre J. LaPlante

URS CONSULTANTS, INC.	DAILY QUALITY CONTROL REPORT	A-000011

4-3091

AR101023

URS Consultants, Inc.
Daily Quality Control Report

Date: 8/3/90 Weather: Sunny, 90°

Work Performed: Tailgate Meeting. Continue survey of Ridge Boring Locations. Drilling & Sampling Borings UD-6 & 16. Grout UD-16

Sampling Performed: Split Spoon Soil Sampling at Boring Locations UD-6 & 16. UD-6 Soil Sample 22-24 ft Max on OVA. UD-16 OVA 120 ppm on Drill Cuttings

Field Analysis: HNU & OVA Monitoring of Soil Samples and Waste Material

Problems\Corrective Actions: OVA Readings up to 2500 ppm during drilling 20-22 ft and 4000 ppm 24-26 ft requires upgrade to Level B PPE for grouting / Called URS H&S officer for authorization to upgrade. Waste material encountered in Boring UD-16 at 2-4 ft/ Abandon UD-16 and will relocate tomorrow

Quality Control Activities: Steam clean drill rig & tools

Printed Name: Andre J. Lapres Signed Name: Andre J. LaPres

A-3094

URS CONSULTANTS, INC. | DAILY QUALITY CONTROL REPORT | A-000012

AR101024

URS Consultants, Inc.
Daily Quality Control Report

Date: 8/4/90 Weather: Sunny 70°

Work Performed: None

Sampling Performed: None

Field Analysis: None

Problems\Corrective Actions: Drillers helper quits work due to scheduling of vacation day with Mathes for wedding anniversary and then being denied time off / All personnel take day off and go fishing

Quality Control Activities: None

Printed Name: Andre J. LaPre Signed Name: Andre J. LaPre

A-3091

URS
CONSULTANTS, INC.

DAILY QUALITY CONTROL REPORT

A-000013

AR101025

URS Consultants, Inc.
Daily Quality Control Report

Date: 8/5/90 Weather: OVERCAST, RAIN, 75°

Work Performed: HEALTH & SAFETY BRIEFING. DRILLING & SAMPLING BORINGS UD-16A & UD-30

Sampling Performed: SPLIT SPOON SOIL SAMPLING AT BORINGS UD-16A & UD-30.

Field Analysis: HNU & OVA MONITORING OF SOIL SAMPLES AND AIR IN WORK ZONE.

Problems\Corrective Actions: RAIN & LIGHTNING IN LATE AFTERNOON PROHIBITS DRILLING / DISCONTINUE DRILLING.

Quality Control Activities: STEAM CLEANED DRILL RIG AND TOOLS. STAINLESS STEEL SPLIT SPOON SAMPLER DECONTAMINATED BETWEEN SAMPLES.

Printed Name: ANDRE J. LAPRES Signed Name: Andre J. LaPre

A-30M

URS CONSULTANTS, INC. | DAILY QUALITY CONTROL REPORT | A-000014

AR101026

URS Consultants, Inc.
Daily Quality Control Report

Date: 8/6/90 Weather: Overcast, Humid, 90°

Work Performed: Conduct Health & Safety Tailgate Meeting. Drilling & Sampling completed at UD-30. Borehole UD-16 & UD-16A Grouted.

Sampling Performed: Split Spoon sampling at UD-30.

Field Analysis: HNU & OVA monitoring of soil samples and air within work zone.

Problems\Corrective Actions: None

Quality Control Activities: Steam cleaned drill rig & tools. Split spoon sampler decontaminated between samples.

Printed Name: Andre J. LaPlante Signed Name: Andre J. LaPlante

URS Consultants, Inc.
Daily Quality Control Report

Date: 8/7/90 Weather: Overcast 90°

Work Performed: Tailgate Meeting. Drilling & Sampling at Boring Locations UD-17 & UD-11. Grout UD-11.

Sampling Performed: Split Spoon Soil Sampling at Borings UD-17 & UD-11.

Field Analysis: HNU & OVA Monitoring of Soil Samples and Air within work area.

Problems\Corrective Actions: Drum Encountered during drilling at location UD-11 / Borehole Abandoned and Grouted

Quality Control Activities: Steam cleaned rig & tools. Split Spoon Sampler Decontaminated between Samples.

Printed Name: Andre J. Lapres Signed Name: Andre J. Lapres

URS CONSULTANTS INC. | DAILY QUALITY CONTROL REPORT | A-000016

AR101028

A-3094

URS Consultants, Inc.
Daily Quality Control Report

Date: 8/8/90 Weather: Sunny 90°

Work Performed: Boreholes UD-17 & UD-30 Grouted. Soil waste drums moved to staging area within support zone.

Sampling Performed: None

Field Analysis: HNU & OVA Monitoring of air within work areas.

Problems\Corrective Actions: None.

Quality Control Activities: Steam cleaned rig & tools.

Printed Name: Andrew J. LaPlant Signed Name: Andrew J. LaPlant

ARI01029

URS Consultants, Inc.
Daily Quality Control Report

Date: 8/13/90 Weather: Hazy, Humid, 95°

Work Performed: Tailgate Meeting. Drilling & Sampling at Boring UD-11A.

Sampling Performed: Split Spoon Soil Sampling at Boring UD-11A

Field Analysis: HNu & OVA Monitoring of Soil Samples and Air within work zones

Problems\Corrective Actions: Driller sick with stomach flu / Driller leaves for home at 2:30

Quality Control Activities: Steam cleaned Rig & Tools. Split Spoon Samples decontaminated between samples

Printed Name: Angie J. Lopez Signed Name: Angie J. Lopez

AR101030

URS Consultants, Inc.
Daily Quality Control Report

Date: 8/14/90 Weather: Sunny 90°

Work Performed: Tailgate Meeting. Drilling & Sampling at US-11A, US-7 & US-27.

Sampling Performed: Split spoon soil sampling at borings US-11A, US-7 & US-27.

Field Analysis: HNu & OVA Monitoring of soil samples and air within work zones.

Problems\Corrective Actions: Drill crew having trouble with breathing Level B air possibly due to faulty manifold or regulator / Crew down graded to Level C PPE and continue to monitor air in breathing zones.

Quality Control Activities: Steam clean rig & tools. Split spoon sampler decontaminated between samples.

Printed Name: Andre J. LaPlante Signed Name: Andre J. LaPlante

AR101031

URS CONSULTANTS, INC.	DAILY QUALITY CONTROL REPORT	A-000019

A-3091

URS Consultants, Inc.
Daily Quality Control Report

Date: 8/15/90 Weather: Sunny 90°

Work Performed: TAILGATE MEETING. URS HEALTH & SAFETY AUDIT. COMPLETE DRILLING & SAMPLING AT UD-27. GROUTING COMPLETED AT UD-11A & UD-7 & [illegible]. SURVEY UD-11A, UD-7 & UD-27

Sampling Performed: SPLIT SPOON SAMPLING AT BORING UD-27

Field Analysis: HNU & OVA MONITORING OF SOIL SAMPLES AND AIR WITHIN WORK ZONES.

Problems\Corrective Actions: INSPECTED AND CLEANED LEVEL B BREATHING APPARATUS DUE TO MALFUNCTION YESTERDAY.

Quality Control Activities: STEAM CLEANED RIG & TOOLS. SPLIT SPOON SAMPLER DECONTAMINATED BETWEEN SAMPLES. URS HEALTH & SAFETY AUDIT PERFORMED

Printed Name: ANDRE J. LaPLCA Signed Name: [signature]

AR101032

A-3091

URS CONSULTANTS, INC. | DAILY QUALITY CONTROL REPORT | A-000020

URS Consultants, Inc.
Daily Quality Control Report

Date: 8/16/90 Weather: Hazy, Humid, 90°

Work Performed: Tailgate Meeting. Drilling and Sampling at Boring Locations UD-26 & UD-28.

Sampling Performed: Split Spoon Soil Sampling at Boring Locations UD-26 & UD-28.

Field Analysis: HNu & OVA Monitoring of Soil Samples and Air in Work Zone.

Problems\Corrective Actions: None

Quality Control Activities: Decon Rig & Tools. Split Spoon Sampler Decontaminated Between Borings.

Printed Name: Andre J. Labbe Signed Name: Andre J. Labbe

AR101033

URS CONSULTANTS, INC.	DAILY QUALITY CONTROL REPORT	A-000021

A-3094

URS Consultants, Inc.
Daily Quality Control Report

Date: 8/17/90 Weather: Hazy, Humid, 90°

Work Performed: Tailgate Meeting. Grouting completed at Borings UD-26, UD-27 & UD-28.

Sampling Performed: None

Field Analysis: HNu & OVA Monitoring of Air in Work Zone during Grouting

Problems\Corrective Actions: None

Quality Control Activities: Steam Clean Rig & Tools

Printed Name: Robert J. LaPan Re: Robert J. LaPan

URS CONSULTANTS, INC. | DAILY QUALITY CONTROL REPORT | A-000022

AR101034

4-3054

URS Consultants, Inc.
Daily Quality Control Report

Date: 8/18/90 Weather: Sunny, 85°

Work Performed: Tailgate Meeting. Drilling & Sampling Borings UD-13 & UD-14.

Sampling Performed: Split Spoon Soil Sampling at Boring Locations UD-13 & UD-14.

Field Analysis: HNu & OVA Monitoring of Soil Samples and Air in Work Zone.

Problems\Corrective Actions: Auger Locks on 1 Ton Support Truck / Mather Mechanic Called for Repair

Quality Control Activities: Steam Clean Rig & Tools. Split Spoon Sampler Decontaminated Between Samples.

Printed Name: Andre J. LaPlante Signed Name: Andre J. LaPlante

URS CONSULTANTS, INC. | DAILY QUALITY CONTROL REPORT | A-000023

4-3091

AR101035

URS Consultants, Inc.
Daily Quality Control Report

Date: 8/19/90 Weather: Sunny, Humid, 95°

Work Performed: TAILGATE MEETING. DRILLING & SAMPLING AT BORING LOCATION US-20. SOIL WASTE DRUMS MOVED TO STAGING AREA WITHIN SUPPORT ZONE.

Sampling Performed: SPLIT SPOON SOIL SAMPLING AT BORING LOCATION US-20.

Field Analysis: HNU & OVA MONITORING OF SOIL SAMPLES AND AIR IN WORK ZONE.

Problems\Corrective Actions: NONE

Quality Control Activities: STEAM CLEAN RIG & TOOLS. SPLIT SPOON SAMPLER DECONTAMINATED BETWEEN SAMPLES.

Printed Name: ANNE T. LARKIN Signed Name: Anne T. Larkin

URS Consultants, Inc.
Daily Quality Control Report

Date: 8/20/90 Weather: RAIN 70°

Work Performed: TAILGATE MEETING. GROUTING COMPLETED AT BORING LOCATIONS US-13, US-14 & US-20.

Sampling Performed: NONE

Field Analysis: HNU & OVA MONITORING OF AIR IN WORK ZONE DURING GROUTING.

Problems\Corrective Actions: 3 INTRUDER FOUND WITHIN SUPPORT ZONE LAST NIGHT ABOUT 2:00 AM MONITOR NOTHING MISSING OR DAMAGED / NOTIFIED OTHER GUARDS AND GUARD TO INCREASE PATROLS OF ENTIRE SUPPORT AREA.
APPARENT RABID RACCOON FOUND WANDERING WITHIN SUPPORT AREA / STATE GAME WARDEN IS CALLED AND ARRIVES AT SITE AND SHOOTS RACCOON

Quality Control Activities: QC SAMPLES (DUPLICATE SAMPLES US-13 & US-20) SENT TO USACE QC LABORATORY

Printed Name: ANDRE J. LaPERE Signed Name: Andre J. LaPere

URS CONSULTANTS, INC.	DAILY QUALITY CONTROL REPORT	A-000025
	AR101037	

A-30(N)

URS Consultants, Inc.
Daily Quality Control Report

Date: 8/21/90 Weather: LT RAIN, 70°

Work Performed: TAILGATE MEETING, DRILLING & SAMPLING AT BORING LOCATIONS UD-2 & UD-5.

Sampling Performed: SPLIT SPOON SOIL SAMPLING AT BORING LOCATIONS UD-2 & UD-5.

Field Analysis: H&W & OVA MONITORING OF SOIL SAMPLES AND AIR WITHIN WORK ZONE.

Problems\Corrective Actions: NONE

Quality Control Activities: STEAM CLEAN RIG & TOOLS. SPLIT SPOON SAMPLER DECONTAMINATED BETWEEN SAMPLES

Printed Name: ANDRE J. LAPLANTE Signed Name: Andre J. LaPlante

A-3094

URS CONSULTANTS INC. | DAILY QUALITY CONTROL REPORT | A-000026

AR101038

URS Consultants, Inc.
Daily Quality Control Report

Date: 8/22/90 Weather: RAW, 70°

Work Performed: TAILGATE MEETING. GROUTING COMPLETED AT BORING LOCATIONS UD-2 & UD-5. TRASH PICKED UP FROM SUPPORT AREA. SAND WASTE DRUMS MOVED TO STAGING AREA WITHIN SUPPORT ZONE.

Sampling Performed: NONE

Field Analysis: HNU & OVA MONITORING OF AIR IN WORK ZONE DURING GROUTING

Problems\Corrective Actions: DRILLERS HELPER TO BE REPLACED MONDAY WHEN WORK RESUMES DUE TO PERSONALITY CONFLICT WITH DRILLER

Quality Control Activities: STEAM CLEANED RIG & TOOLS.

Printed Name: ANDREW J. LAPKA Signed Name: Andrew J. LaPka

URS Consultants, Inc.
Daily Quality Control Report

Date: 8/27/90 Weather: Hazy, Humid, 95°

Work Performed: TAILGATE MEETING. DRILLING & SAMPLING AT BORING LOCATION UD-3.

Sampling Performed: SPLIT SPOON SAMPLING AT BORING LOCATION UD-3.

Field Analysis: HNU & OVA MONITORING OF SOIL SAMPLES AND AIR IN WORK ZONE.

Problems\Corrective Actions: RENTAL CAR KEYS FOUND TO BE LEFT IN BUFFALO DURING WEEKEND / RETURNED TO HERTZ AT PHILADELPHIA AIRPORT FOR REPLACEMENT SET OF KEYS.

Quality Control Activities: STEAM CLEAN RIG & TOOLS. SPLIT SPOON SAMPLER DECONTAMINATED BETWEEN SAMPLES.

Printed Name: ANDRE J. LaPRES Signed Name: Andre J. LaPres

A-3094

URS CONSULTANTS, INC. | DAILY QUALITY CONTROL REPORT | A-000028

AR101040

URS Consultants, Inc.
Daily Quality Control Report

Date: 8/28/90 Weather: Sunny, Humid, 95°

Work Performed: Tailgate Meeting. Drilling & Sampling at Boring Location UD-4. Grouting completed at UD-3. Surveyed Locations UD-3 & UD-4.

Sampling Performed: Split Spoon Soil Sampling at Boring Location UD-4.

Field Analysis: HNU & OVA monitoring of soil samples and air in work zone during drilling and grouting

Problems\Corrective Actions: Safety valve blown on air tank in support zone / Advised drill crew to try to keep tanks cool and use caution around tanks.

Quality Control Activities: Steam cleaned rig & tools. Split spoon samplers decontaminated between samples

Printed Name: Bruce J. LaPan Signed Name: Bruce J. LaPan

URS Consultants, Inc.
Daily Quality Control Report

Date: 8/29/98 Weather: Sunny, 95°, Rain in PM

Work Performed: Tailgate Meeting, Drilling & Sampling at Boring Locations US-8 & US-25

Sampling Performed: Split Spoon Soil Sampling at Boring Locations US-8 & US-25.

Field Analysis: HNu & OVA monitoring of soil samples and air within work zone.

Problems\Corrective Actions: Drillers Helper experiencing chest pains which he feels require doctors attention / Driller drive Helper to Emergency Room at Christiana Hospital. Doctor says pains is probably related to intestinal virus and Helper will not be able to continue work / URS personnel to assist Driller during afternoon and Helper will be retracted tomorrow.

Quality Control Activities: Steam clean Rig & Tools. Split Spoon samplers decontaminated between samples.

Printed Name: Andre J. LaPlante Signed Name: Andre J. LaPlante

A-3091

URS CONSULTANTS INC. | DAILY QUALITY CONTROL REPORT | A-000030

AR101042

URS Consultants, Inc.
Daily Quality Control Report

Date: 8/30/90 Weather: Sunny, 85°

Work Performed: TAILGATE MEETING, DRILLING & SAMPLING AT BORING LOCATIONS UD-9 & UD-15. GROUTING COMPLETED AT BORING LOCATIONS UD-4, UD-9 & UD-25.

Sampling Performed: SPLIT SPOON SOIL SAMPLING AT BORING LOCATIONS UD-9 & UD-15.

Field Analysis: HNU & OVA MONITORING AT BORING LOCATIONS UD-9 & UD-15 FOR SOIL SAMPLES AND AIR WITHIN WORK ZONE. HNU & OVA MONITORING OF AIR WITHIN WORK ZONE WHILE GROUTING BORINGS UD-4, UD-9 & UD-25.

Problems\Corrective Actions: 1 TON SUPPORT TRUCK STUCK IN TEST PIT TP-6 WHILE BACKING TO GROUT BORING UD-25 & UNLOADED TRUCK AND PULLED TRUCK OUT WITH HART ENVIRONMENTAL'S PICK UP TRUCK.

Quality Control Activities: STEAM CLEANED RIG & TOOLS. SPLIT SPOON SAMPLER DECONTAMINATED BETWEEN SAMPLES.

Printed Name: ANDRE J. LABBE Signed Name: Andre J. Labbe

URS CONSULTANTS, INC.	DAILY QUALITY CONTROL REPORT	A-000031

A-3091

AR101043

URS Consultants, Inc.
Daily Quality Control Report

Date: 8/31/90 Weather: Sunny 85°

Work Performed: Tailgate Meeting. Drilling & Sampling at Boring Location UD-15A. Grouting completed at Boring UD-15A. Driller Demobilization

Sampling Performed: Split Spoon Soil Sampling at Boring Location UD-15A.

Field Analysis: HNu & OVA monitoring of soil samples and air within work zone.

Problems\Corrective Actions: None

Quality Control Activities: Steam clean rig & tools. Split spoon sampler decontamination between each sample.

Printed Name: Andrew J. LaPan Signed Name: Andrew J. LaPan

URS CONSULTANTS, INC. | DAILY QUALITY CONTROL REPORT | A-000032

AR101044

A-3094

URS Consultants, Inc.
Daily Quality Control Report

Date: 1-14-91 Weather: 28°F, Clear

Work Performed: Guardian worked on completing cover form. They backfilled area around cover form for additional support. Guardian completed the form construction, layed down the interior plastic and sealed all the seams in the form. The electricians (Hatzel + Buehler) mounted the Flood lights on the URS and Hart trailers

Sampling Performed: None

Field Analysis: ~~None~~ QA ~~See Boring Log~~ QA None

Problems\Corrective Actions: None

Quality Control Activities: None

Printed Name: David J. Sheppard Signed Name:

URS CONSULTANTS, INC. | DAILY QUALITY CONTROL REPORT | A-000033 ARI01046

A-3091

URS Consultants, Inc.
Daily Quality Control Report

Date: 1-15-91 **Weather:** 40°F, Clear, Calm

Work Performed: Guardian mobilized a concrete pump truck and 8 concrete trucks to the site and poured the rolloff storage pad. 6x6 wire mesh was laid down on top of the first 2" of concrete and rebar was installed according to the contract. The pad was graded and brushed. The interior ramp was formed and graded and all concrete pouring ended at 1310. The pad was left uncovered until 1800 when the thermal blankets and plastic were put over the entire trench.

Sampling Performed: None

Field Analysis: None

Problems\Corrective Actions: None

Quality C[illegible] Activities: None

Printed Name: David \ Sheppard **Signed Name:** [signature]

URS Consultants, Inc.
Daily Quality Control Report

Date: 1-16-91 Weather: 45°F, Overcast/Rain, SSW 3-5mph

Work Performed: Guardian activities included:
1) Removal of the thermal cover and plastic for off site transport
2) Cut expansion joints in the concrete pad
3) Removed the corner posts from the footer form
4) Remove all unnecessary equipment and supplies used for the pad construction from the site

URS completed plumbing hook-up above ground

Sampling Performed: None

Field Analysis: None

Problems\Corrective Actions: Heavy rain slowed activities and made it difficult for Guardian personnel to get around on site. An inquiry was made to Atlantic State Tree Service to get prices on wood chips to alleviate problem.

Quality Control Activities: None

Printed Name: David J. Shepard Signed Name: [signature]

URS Consultants, Inc.
Daily Quality Control Report

Date: 1-17-91 **Weather:** 45°F, P. Cloudy, ESE @ 10-15mph

Work Performed: Guardian activities included:
1) Removal of all forms around the rolloff storage pad.
2) Cleaned all the slush/mud from the exterior of the storage pad.
3) Brought in clean backfill for the exterior ramp construction.

The electricians installed the immersence heaters in the decon tank and the water supply tank. They also installed the heat tracing for the above ground water line.

Sampling Performed: None

Field Analysis: None

Problems\Corrective Actions: The heat tracing estimate was incorrect on the URS diagram. An additional 40' needed to be installed @ $5.50/foot for a total of $220.00 + labor.

Quality Control Activities: None

Printed Name: David J. Sheppard **Signed Name:** [signature]

URS Consultants, Inc.
Daily Quality Control Report

Date: 1-18-91 Weather: 45°F, Overcast, NNW@5-10mph

Work Performed: Subdivision activities included:
1) Completed the excavation ramp of the cutoff storage pad, ~~(6" sand) QA~~
2) Constructed the clay storage pad (6" of sand),
3) 6 dump loads of wood chips were delivered to the site.
All other heavy equipment and level B gear was mobilized to the site.

Sampling Performed: None

Field Analysis: None

Problems\Corrective Actions: None

Quality Control Activities: None

Printed Name: David L. Shappard Signed Name: [signature]

URS CONSULTANTS, INC. | DAILY QUALITY CONTROL REPORT | A-000037

AR101049

URS Consultants, Inc.
Daily Quality Control Report

Date: 1-19-91 Weather: Clear, 35°F, NW@5-10

Work Performed: Guardian's Field supervisor Jim Crosby worked on site from 0900 - 1400. An additional 3-4" of sand was placed on the day storage pad. Six (6) piles of wood chips were spread throughout the rolloff storage pad area. UES Cleaned and sanitized all Level B equipment for 1-21 work day.

Sampling Performed: None

Field Analysis: None

Problems\Corrective Actions: None

Quality Control Activities: None

Printed Name: David J. Sheppard Signed Name: [signature]

A-3004

URS CONSULTANTS, INC. | DAILY QUALITY CONTROL REPORT | A-000038

AR|01050

URS Consultants, Inc.
Daily Quality Control Report

Date: 1-20-91 Weather: Clear, 40°F, Calm

Work Performed: Checked to insure site security.

Sampling Performed: None

Field Analysis: None

Problems\Corrective Actions: None

Quality C[redacted] Activities: None

Printed Name: David J. Shepard Signed Name: [signature]

URS Consultants, Inc.
Daily Quality Control Report

Date: 1-21-91 Weather: Overcast/Snow, 35°F, WE 5-10

Work Performed: Hazen/Buehler Completed the Support Zone electrical hook-up. Wood chips were delivered and spread throughout the excavation ramp area. Guardian constructed trench box, delivered the 85 gal. overpack drums and brought the fire/foam truck to the site. All of Guardians heavy equipment and safety equipment is now present on site. The on site safety briefing was held for all URS/Guardian and some Hart personnel last minute safety security supplies were picked up.

Sampling Performed: ~~None~~ Three were 2 trench samples taken: 1) TR2-5'6x5'D.
2) TR2-10'6x5'D.

Field Analysis: None

Problems\Corrective Actions: None

Quality C[redacted] Activities: None

Printed Name: David L Sheppard Signed [redacted]

URS Consultants, Inc.
Daily Quality Control Report

Date: 1-22-91 **Weather:** 25°F, Clear

Work Performed: The trench box was constructed and all other heavy equipment was set in place to begin Trench 2. Trenching began at 1340. Two (2) drums were overpacked and transported to the day pad. Trench dimensions at the end of the day were 15'L x 5'D x 10'W.

Sampling Performed: Two (2) trench samples were taken. TR2 - 5'L x 5'D and TR2 - 5'L x 10'D.

Field Analysis: See Test Pit Log

Problems\Corrective Actions: Water accumulation becomes major problem as Trench 2 was advanced and work was halted until USACE representatives could look and determine what actions to take.

The original position of Trench 2 was changed in the field just prior to beginning excavation. Approximately 1 hour of field time was lost remobilizing ~ 35' from the original trench area

Quality Control Activities: None

Printed Name: David S. Sheppard **Signed Name:** [signature]

URS CONSULTANTS, INC.	DAILY QUALITY CONTROL REPORT	A-000041

A-30W

BR101053

URS Consultants, Inc.
Daily Quality Control Report

Date: 1-23-91 Weather: 35°F, Clear, SE 5-15mph

Work Performed: Guardian backfilled Trench 2 and mobilized to Trench 1. The trench box sections were advanced and installed as the trenching continued through the non-drum disposal area. There were not any drums encountered on this day.

Sampling Performed: None

Field Analysis: ~~None~~ See Test Pit Log

Problems\Corrective Actions: Trench 2 was abandoned due to the large quantities of water currently in the trench. A new trench, Trench 3, will be installed ~ 40' West of Trench 2, on the South edge of the drum disposal area. This decision was made by J. Jacobi, D. Lenhardt, T. Knickerbocker, (URS) S. Rowe, D. Kercheck, (USACE).

Quality Control Activities: None

Printed Name: David J. Sheppard Signed Name: [signature]

URS Consultants, Inc.
Daily Quality Control Report

Date: 1-24-91 Weather: 40°F, Overcast, NW@35mph

Work Performed: Trenching into the drum disposal area began at 1000. A total of 10 drums were overpacked, placed on the grapple truck and moved to the day storage pad for sampling on 1-25-91.

Sampling Performed: Six (6) trench samples were taken from Trench 1. TR1- 5'Lx5'D/5'Lx10'D/5'Lx15'D/10'Lx5'D 10'Lx10'D/10'Lx15'D were given to Wadsworth on 1-25-91 for comparability testing.

Field Analysis: ~~None~~ NA. See Test Pit Log.

Problems\Corrective Actions: Guardian's fire/foam truck broke down on the way to the site. All work was halted until the replacement truck arrived on site from the Christiana Fire Dept at 0940.

Guardian field supervisor informed ~~TRC~~ URS that they had installed the top half of the trench box backwards and they would have to turn it around. One hour and forty-five minutes lost turning the trench box

Quality Control Activities: None

Printed Name: _____ Signed Name: _____

URS CONSULTANTS, INC. | DAILY QUALITY CONTROL REPORT | A-000043

AR101055

A-309N

URS Consultants, Inc.
Daily Quality Control Report

Date: 1-25-91 **Weather:** 35°F, Clear, NW 5-10 mph

Work Performed: Trenching into the drum disposal area continued. Twenty-four drums were overpacked and moved to the staging pad for 1-26 sampling. Trench 1 is now complete.

Sampling Performed: Ten (10) drum samples were submitted to Wadsworth for on site acceptability testing. The samples were as follows: TR1-1, TR1-2, TR1-3, TR1-4, TR1-5, TR1-6, TR1-7, TR1-8, TR1-9 + TR1-10. Also two (2) drums from abandoned trench 2 were sampled: TR2-1 + TR2-2. will be
Fifteen (15) trench samples were taken and submitted to Wadsworth on 1-26-91. The samples were as follows: TR1-15'L x 5'D, 15'L x 10'D, 15'L x 15'D, 20'L x 5'D, 20'L x 10'D, 20'L x 15'D, 25'L x 5'D, 25'L x 10'D, 25'L x 15'D, 30'L x 5'D, 30'L x 10'D, 30'L x 15'D, 35'L x 5'D, 35'L x 10'D, 35'L x 15'D.

Field Analysis: ~~None Det.~~ See Test Pit Log

Problems\Corrective Actions: PID readings at the exclusion zone perimeter were 8ppm at 0915. Operations were shut down until 0945 when readings were back to background. PID readings at the exclusion zone perimeter were 13 ppm at 1130. Operations were hauled until after lunch when the PID readings were back to background.

Water in the trench forced operations to be shut down. The trench was discontinued @ 1445.

Quality Control Activities: One (1) duplicate drum sample: TR1-10D

Printed Name: David L. Shepard **Signed Name:**

URS Consultants, Inc.
Daily Quality Control Report

Date: 1-26-91 Weather: 40°F Clear, NNW@ 3-5 mph

Work Performed: Guardian decon'ed and demobilized the trench box and heavy equipment. Clean backfill was brought to the site and placed in the Trench 1 designated boring area. All heavy equipment was decon'ed in-situ and mobilized to Trench 3.

Sampling Performed: Twenty-four (24) drums were sampled at the day pad. The samples are as follows: TRI-11, TRI-12, TRI-13, TRI-14, TRI-15, TRI-16, TRI-17, TRI-18, TRI-19, TRI-20, TRI-21, TRI-22, TRI-23, TRI-24, TRI-25, TRI-26, TRI-27, TRI-28 TRI-29, TRI-30, TRI-31, TRI-32, TRI-33, TRI-34. All samples were submitted to Wadsworth AN 1-26.

Field Analysis: ~~None~~ QA See Test Pit Log.

Problems\Corrective Actions: None

Quality Control Activities: Two (2) duplicate drum samples were submitted as TRI-20D and TRI-30D.

Printed Name: David J. Sheppard Signed Name: [signature]

A-3098

URS CONSULTANTS, INC. DAILY QUALITY CONTROL REPORT IA-000045

AR101057

URS Consultants, Inc.
Daily Quality Control Report

Date: 1-27-91 **Weather:** 40°F, Clear, WNW 5-10mph

Work Performed: Guardian completed backfilling at Trench 1. Trenching began at Trench 3 at 0900 in an area south of the drum disposal area to insure installation of the trench box without drum interference. A total of four (4) drums were overpacked and moved onto the day storage pad. URS personnel labeled the rolloffs to start storage of material within the rolloffs.

Sampling Performed: Six (6) trench samples were submitted to Wadsworth from the days activities. The sampling was as follows: TR3 - 5'Lx5'D, 5'Lx10'D, 15'Lx5'D, 10'Lx5'D, 10'Lx10'D, 10'Lx15'D.

Field Analysis: ~~None Obs.~~ See Test Pit Log

Problems\Corrective Actions: Guardian experienced difficulty advancing the trench box with the trackhoe alone. The bulldozer was brought to the exclusion zone and hooked up to the trench box to give the trackhoe more support. The box was advanced with no further problems.

Quality [redacted] Activities: None

Printed Name: David J. Sheppard **Signed Name:**

URS CONSULTANTS, INC. | DAILY QUALITY CONTROL REPORT | A-000046

AR101058

A-3004

URS Consultants, Inc.
Daily Quality Control Report

Date: 1-28-91 Weather: 45°F, Clear, NE 3-5mph

Work Performed: Guardian removed and overpacked twenty-four drums. Backfilling of the trench began each time the trench box was moved. Drum sampling at the day pad took place throughout the morning and into the afternoon. Drums were labeled and moved from the day pad to the predesignated cutoff pad

Sampling Performed: Twenty-eight drum samples were taken as follows: TR3-1, TR3-2, TR3-3, TR3-4, TR3-5, TR3-6, TR3-7, TR3-8, TR3-9, TR3-10, TR3-11, TR3-12, TR3-13, TR3-14, TR3-15, TR3-16, TR3-17, TR3-18, TR3-19, TR3-20, TR3-21, TR3-22, TR3-23, TR3-24, TR3-25, TR3-26, TR3-27, TR3-28. All these samples were submitted to Woods-worth Labs for on site compatibility testing.
Nine (9) trench samples were also taken as follows: TR3-15'x10'D, TR3-20'x 5'D, 20'x 10'D, 25'x 5'D, 25'x 10'D, 30'x 5'D, 30'x 10'D, 35'x 5'D, 35'x 10'D.
Field Analysis: None Det. See Test Pit Log

Problems\Corrective Actions: Trenching at Trench 3 was haulted due to water entering the trench. After confering with J. Jacobi and S. Rowe, Trench 3 was considered complete and should be backfilled

Quality Control Activities: Two (2) duplicates were submitted as TR3-10D and TR3-20D.

Printed Name: David J. Sheppard Signed Name: [signature]

URS CONSULTANTS, INC.	DAILY QUALITY CONTROL REPORT	A-000047

A-309N

URS Consultants, Inc.
Daily Quality Control Report

Date: 1-29-91 Weather: 45°F, calm, & cloudy

Work Performed: Guardian decon'd and demobilized the trench box and heavy equipment. Backfilling of Trench 3 also took place. All the results for the drum comparability testing were given to PRS. All the drums on the day pad were labeled and put into predesignated areas.

Sampling Performed: One (1) drum was sampled as follows: TRZ-1.

Field Analysis: None

Problems\Corrective Actions: Drum TRZ-1 was initially opened by Guardian personnel and it was found that there was insufficient material within the drum to sample. URS personnel opened and sampled the drum on 1-29.

Quality C[redacted] Activities: None

Printed Name: Dave Sheppard Signed Name: [signature]

URS CONSULTANTS, INC.	DAILY QUALITY CONTROL REPORT	A-000048

A-3008

AR101060

URS Consultants, Inc.
Daily Quality Control Report

Date: 4-30-91 Weather: 55°F, Cloudy, Calm

Work Performed: Guardwin activities included:
1) Secured collars with staples and bungi cords.
2) Installed six (6) corner posts used as anchors for the perimeter fence.
3) Cleaned up all trash from site and trailer area
4) Decontinued all heavy equipment.

Sampling Performed: None

Field Analysis: None

Problems\Corrective Actions: None

Quality C[redacted] Activities: None

Printed Name: David L Sheppard Signed Name: [signature]

URS CONSULTANTS, INC.	DAILY QUALITY CONTROL REPORT	A- 000049

A-RT0T06T

URS Consultants, Inc.
Daily Quality Control Report

Date: 2-4-91 Weather: 20°F, Clear, SSW 3-5 mph

Work Performed: All field personnel were mobilized To the Site at 1100. Sampling and safety equipment was prepared by URS for the borings. URS survey crew active on site.

Sampling Performed: None

Field Analysis: None

Problems\Corrective Actions: J. Mathes drillers were expected to be on site at 1000. They arrived to the site at 1300. Three issues came up upon inspecting the crew and equipment 1) Only two (2) men from J. Mathes were sent to the site 2) The drillers only brought two (2) useable split spoons. 3) The drillers did not bring a hose to fill the fire hydrant gauge.
J. Jacobi contacted T. Macio and he said he would send down a third man with a split spoon on 2-5.

Quality Control Activities: None

Printed Name: David J. Sheppard Signed Name: [signature]

URS CONSULTANTS, INC. | DAILY QUALITY CONTROL REPORT | A-000050

4-3084

AR101062

URS Consultants, Inc.
Daily Quality Control Report

Date: 2-5-91 Weather: 65°F, Sunny, Calm

Work Performed: The drillers steam cleaned all equipment and the drill rig, then proceeded to mobilize to Boring 7. 12" augers were advanced down through the clean backfill, the casing was installed and the hole was grouted up as the 12" Augers were removed from around the casing.

URS personnel relocated thirty (30) 55-gallon drums from Phase I from the support zone to the day storage pad.

Sampling Performed: None

Field Analysis: None QA. See Boring Log

Problems\Corrective Actions: None

Quality Control Activities: None

Printed Name: David J. Sheppard Signed Name: [signature]

URS CONSULTANTS, INC.	DAILY QUALITY CONTROL REPORT	A-000051

AR101063

URS Consultants, Inc.
Daily Quality Control Report

Date: 2-6-91 Weather: 50°F, Overcast, Var 3-5mph

Work Performed: The drillers mobilized to Boring 3 at 1000. 12" augers were turned down through the clean backfill, the casing was installed and the hole was grouted up around the casing as the 12" augers were removed. Steam cleaning and mobilization to TBB-1 for 2-7 boring.

Sampling Performed: The Test trench composite sample (TTC-1) was segregated by compatability, mixed and placed into sample bottles for off site analysis.

TTC-1 / TTC-1-DUP / TTC-1-MS / TTC-1-MSD samples were sent to Southwest Labs of O.K.
TTC-1-USACE was sent to the Army Engineers Lab in Omaha, NE.
Eight (8) gallons of sample was collected for the treatability study and will be sent off-site on 2-7-91

Field Analysis: None Q.A. See Boring log

Problems\Corrective Actions: None

Quality Control Activities: Test trench composite (TTC-1) underwent a duplicate, a matrix spike and a matrix spike duplicate.

Printed Name: David L. Sheppard Signed Name:

URS CONSULTANTS, INC.	DAILY QUALITY CONTROL REPORT	A-000052

A-1004

URS Consultants, Inc.
Daily Quality Control Report

Date: 2-7-91 **Weather:** 45°F, Overcast, Calm

Work Performed: The drillers augered and spooned at TBR-1 to the 34'-36' interval where the clay layer was found. All equipment and tools were decened prior to moving to TBR-3. Augering and spooning at TBR-3 continued to the 33-35' interval where the clay layer was found.

Sampling Performed: Three (3) environmental samples from each of the two (2) borings were taken as follows:
TBR-1-14 (top), TBR-1-24 (middle), TBR-1-34 (bottom)
TBR-3-13 (top), TBR-3-23 (middle), TBR-1-33 (bottom).
The above samples were sent to Southwest Labs of O.K.
TBR-3 samples will be sent on 2-8-91.
At each 2' interval (spoon), a sample was grabbed for compatibility testing as follows: TBR-1 → 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34
TBR-3 → 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, + 33.
TRENCH 1 bottom sample and Trench 3 bottom samples were also given to [illegible]

Field Analysis: None QA. See Boring Log

Problems\Corrective Actions: None

Quality [illegible] Activities: None

Printed Name: David J. Sheppard **Signed Name:** [signature]

URS CONSULTANTS, INC. | DAILY QUALITY CONTROL REPORT | A-000053

URS Consultants, Inc.
Daily Quality Control Report

Date: 2-8-91 Weather: 60°F, Clear, SW @ 3-5mph

Work Performed: The drillers grouted up TBR-1 and TBR-3. They steam cleaned and moved all the drill cuttings to the day storage pad. The entire site was demobilized.

Sampling Performed: The test boring composite sample (TBC-1) was segregated by compatability, mixed and placed into sample bottles for offsite analysis.

TBC-1, TBC-1-DUP, TBC-1-MS, TBC-1-MSD, TBC-1-USACE. All but the TBC-1-USACE samples were sent to Southwest Labs of Okla. TBC-1-USACE was sent to the Army Engineers Lab in Omaha, NE. The treatability study composite (TBC-1) (6 jars) was sent to Alliance.

Field Analysis: None

Problems\Corrective Actions: None

Quality Control Activities: TBC = test boring composite sample QC included a duplicate, a matrix spike and a matrix spike duplicate.

Printed Name: David J. Sheppard Signed Name: [signature]

URS CONSULTANTS, INC. | DAILY QUALITY CONTROL REPORT | A-000051

AD101066

APPENDIX B

FIELD INVESTIGATIONS

ANALYTICAL RESULTS

APPENDIX B

TABLE OF CONTENTS

DELAWARE ... & GRAVEL
VOLATILE ORGANIC COMPOUND
ANALYTICAL RESULTS

SAMPLE-ID	TP-1-1	TP-2-1	TP-3-1	TP-3-2	TP-3-3	TP-4-1	TP-4-2	TP-4-3	TP-5-1	TP-5-2
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	7/20/90	7/20/90	7/21/90	7/21/90	7/21/90	7/21/90	7/21/90	7/21/90	7/24/90	7/24/90
PARAMETER										
CHLOROMETHANE										
BROMOMETHANE										
VINYL CHLORIDE										
CHLOROETHANE										
METHYLENE CHLORIDE	180000 BE	47 B	21 B	18 B		19 B	27 P	240 B	120	110
ACETONE	16000	120	26	19		71		7700 E	10 BJ	8 BJ
CARBON DISULFIDE										
1,1-DICHLOROETHENE										
1,1-DICHLOROETHANE										
1,2-DICHLOROETHENE (TOTAL)								39		
CHLOROFORM										
1,2-DICHLOROETHANE	26000							780		
2-BUTANONE										
1,1-TRICHLOROETHANE										
CARBON TETRACHLORIDE										
VINYL ACETATE										
BROMODICHLOROMETHANE										
1,2-DICHLOROPROPANE										
CIS-1,3-DICHLOROPROPENE										
TRICHLOROETHENE							34 P	590		
DIBROMOCHLOROMETHANE										
1,1,2-TRICHLOROETHANE										
BENZENE	12000								2 J	
TRANS-1,3-DICHLOROPROPENE										
BROMOFORM										
4-METHYL-2-PENTANONE										
2-HEXANONE										
TETRACHLOROETHENE							50 P	99	1 J	
1,1,2,2-TETRACHLOROETHANE										
TOLUENE	30000			3 J	54000		11 P	12 J	13	7 J
CHLOROBENZENE	1900 J									
ETHYLBENZENE	4700				33000					
STYRENE	20000				23000			93	3J	2 J
TOTAL XYLENES	16000							23 J	8	1 J

All results reported in µg/kg (ppb).
Only detected results are reported.

B – Compound detected in associated method blank.
E – Concentration exceeded linear range of calibration.
P – Compound concentration estimated due to surrogate outliers.

J – Indicates the value is less than the quantitation limit but greater than zero.

DELAWARE SAND & GRAVEL
VOLATILE ORGANIC COMPOUND
DETECTION LIMITS

SAMPLE-ID	TP-1-1	TP-2-1	TP-3-1	TP-3-2	TP-3-3	TP-4-1	TP-4-2	TP-4-3	TP-5-1	TP-5-2
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	7/20/90	7/20/90	7/21/90	7/21/90	7/21/90	7/21/90	7/21/90	7/21/90	7/24/90	7/24/90
PARAMETER										
CHLOROMETHANE	8600	11	11	12	3600	14	12 P	70	14	14
BROMOMETHANE	8600	11	11	12	3600	14	12 P	70	14	14
VINYL CHLORIDE	8600	11	11	12	3600	14	12 P	70	14	14
CHLOROETHANE	8600	11	11	12	3600	14	12 P	70	14	14
METHYLENE CHLORIDE					1800					
ACETONE					3600		12 P			
CARBON DISULFIDE	4300	6	6	6	1800	7	6 P	35	7	7
1,1-DICHLOROETHENE	4300	6	6	6	1800	7	6 P	35	7	7
1,1-DICHLOROETHANE	4300	6	6	6	1800	7	6 P	35	7	7
1,2-DICHLOROETHENE (TOTAL)	4300	6	6	6	1800	7	6 P		7	7
CHLOROFORM	4300	6	6	6	1800	7	6 P	35	7	7
1,2-DICHLOROETHANE		6	6	6	1800	7	6 P		7	7
2-BUTANONE	8600	11	11	12	3600	14	12 P	70	14	14
1,1,1-TRICHLOROETHANE	4300	6	6	6	1800	7	6 P	35	7	7
CARBON TETRACHLORIDE	4300	6	6	6	1800	7	6 P	35	7	7
VINYL ACETATE	8600	11	11	12	3600	14	12 P	70	14	14
BROMODICHLOROMETHANE	4300	6	6	6	1800	7	6 P	35	7	7
1,2-DICHLOROPROPANE	4300	6	6	6	1800	7	6 P	35	7	7
CIS-1,3-DICHLOROPROPENE	4300	6	6	6	1800	7	6 P	35	7	7
TRICHLOROETHENE	4300	6	6	6	1800	7			7	7
DIBROMOCHLOROMETHANE	4300	6	6	6	1800	7	6 P	35	7	7
1,1,2-TRICHLOROETHANE	4300	6	6	6	1800	7	6 P	35	7	7
BENZENE		6	6	6	1800	7	6 P	35		7
TRANS-1,3-DICHLOROPROPENE	4300	6	6	6	1800	7	6 P	35	7	7
BROMOFORM	4300	6	6	6	1800	7	6 P	35	7	7
4-METHYL-2-PENTANONE	8600	11	11	12	3600	14	12 P	70	14	14
2-HEXANONE	8600	11	11	12	3600	14	12 P	70	14	14
TETRACHLOROETHENE	4300	6	6	6	1800	7				7
1,1,2,2-TETRACHLOROETHANE	4300	6	6	6	1800	7	6 P	35	7	7
TOLUENE		6	6			7				
CHLOROBENZENE		6	6	6	1800	7	6 P	35	7	7
ETHYLBENZENE		6	6	6		7	6 P	35	7	7
STYRENE		6	6	6		7	6 P			
TOTAL XYLENES		6	6	6	1800	7	6 P			

All results reported in µg/kg (ppb).
Detection limits for positive results not reported.

P - Compound concentration estimated due to surrogate outliers.

DEL[illegible]E SAND & GRAVEL
VOLATILE ORGANIC COMPOUND
ANALYTICAL RESULTS

SAMPLE-ID	TP-6-1	TP-6-1 FLD DUP	TP-6-2
SAMPLE TYPE	SOIL	SOIL	SOIL
COLLECTION DATE	7/24/90	7/24/90	7/24/90
PARAMETER			
CHLOROMETHANE			
BROMOMETHANE			
VINYL CHLORIDE			
CHLOROETHANE			
METHYLENE CHLORIDE	1600	990 J	250000
ACETONE			
CARBON DISULFIDE			
1,1-DICHLOROETHENE			
1,1-DICHLOROETHANE			
1,2-DICHLOROETHENE (TOTAL)			
CHLOROFORM			
1,2-DICHLOROETHANE			
2-BUTANONE			
1,1,1-TRICHLOROETHANE			
CARBON TETRACHLORIDE			
VINYL ACETATE			
BROMODICHLOROMETHANE			
1,2-DICHLOROPROPANE			
CIS-1,3-DICHLOROPROPENE			
TRICHLOROETHENE			
DIBROMOCHLOROMETHANE			
1,1,2-TRICHLOROETHANE			
BENZENE	2800	6300	
TRANS-1,3-DICHLOROPROPENE			
BROMOFORM			
4-METHYL-2-PENTANONE			
2-HEXANONE			
TETRACHLOROETHENE			
1,1,2,2-TETRACHLOROETHANE			
TOLUENE	1600	3900	400000
CHLOROBENZENE			
ETHYLBENZENE	3700	7600	86000
STYRENE			
TOTAL XYLENES	43000	82000	1700000

All results reported in µg/kg (ppb).
Only detected results are reported.
J – Indicates the value is less than the quantitation limit but greater than zero.

DELAW. SAND & GRAVEL

VOLATILE ORGANIC COMPOUND

DETECTION LIMITS

SAMPLE-ID	TP-6-1	TP-6-1 FLD DUP	TP-6-2
SAMPLE TYPE	SOIL	SOIL	SOIL
COLLECTION DATE	7/24/90	7/24/90	7/24/90
PARAMETER			
CHLOROMETHANE	1900	3700	80000
BROMOMETHANE	1900	3700	80000
VINYL CHLORIDE	1900	3700	80000
CHLOROETHANE	1900	3700	80000
METHYLENE CHLORIDE			
ACETONE	1900	3700	80000
CARBON DISULFIDE	930	1900	40000
1,1-DICHLOROETHENE	930	1900	40000
1,1-DICHLOROETHANE	930	1900	40000
1,2-DICHLOROETHENE (TOTAL)	930	1900	40000
CHLOROFORM	930	1900	40000
1,2-DICHLOROETHANE	930	1900	40000
2-BUTANONE	1900	3700	80000
1,1,1-TRICHLOROETHANE	930	1900	40000
CARBON TETRACHLORIDE	930	1900	40000
VINYL ACETATE	1900	3700	80000
BROMODICHLOROMETHANE	930	1900	40000
1,2-DICHLOROPROPANE	930	1900	40000
CIS-1,3-DICHLOROPROPENE	930	1900	40000
TRICHLOROETHENE	930	1900	40000
DIBROMOCHLOROMETHANE	930	1900	40000
1,1,2-TRICHLOROETHANE	930	1900	40000
BENZENE			40000
TRANS-1,3-DICHLOROPROPENE	930	1900	40000
BROMOFORM	930	1900	40000
4-METHYL-2-PENTANONE	1900	3700	80000
2-HEXANONE	1900	3700	80000
TETRACHLOROETHENE	930	1900	40000
1,1,2,2-TETRACHLOROETHANE	930	1900	40000
TOLUENE			
CHLOROBENZENE	930	1900	40000
ETHYLBENZENE			
STYRENE	930	1900	40000
TOTAL XYLENES			

All results reported in µg/kg (ppb).

Detection limits for positive results not reported.

DELAWA[redacted]D & GRAVEL
SEMIVOLATILE [redacted]GANIC COMPOUND
ANALYTICAL RESULTS

SAMPLE-ID	TP-1-1	TP-2-1	TP-3-1	TP-3-2	TP-3-3	TP-4-1	TP-4-2	TP-4-3	TP-5-1	TP-5-2
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	7/20/90	7/20/90	7/21/90	7/21/90	7/21/90	7/21/90	7/21/90	7/21/90	7/24/90	7/24/90
PARAMETER										
PHENOL	2100								130 J	
BIS(2-CHLOROETHYL) ETHER										
2-CHLOROPHENOL										
1,3-DICHLOROBENZENE										
1,4-DICHLOROBENZENE										
BENZYL ALCOHOL					330 J					
1,2-DICHLOROBENZENE										71 J
2-METHYLPHENOL					530 J				90 J	55 J
BIS(2-CHLOROISOPROPYL) ETHER										
4-METHYLPHENOL	340 J				770 J				130 J	160 J
N-NITROSO-DI-N-PROPYLAMINE										
HEXACHLOROETHANE										
NITROBENZENE										
ISOPHORONE	120 J									
2-NITROPHENOL										
2,4-DIMETHYLPHENOL									100 J	93 J
BENZOIC ACID					1900 J					
BIS(2-CHLOROETHOXY)METHANE										
2,4-DICHLOROPHENOL										
1,2,4-TRICHLOROBENZENE	1300									
NAPHTHALENE	370 J									
4-CHLOROANILINE										
HEXACHLOROBUTADIENE										
CHLORO-3-METHYLPHENOL										
METHYLNAPHTHALENE										
HEXACHLOROCYCLOPENTADIENE										
4,6-TRICHLOROPHENOL										
,4,5-TRICHLOROPHENOL										
CHLORONAPHTHALENE										
NITROANILINE										
IMETHYLPHTHALATE										
ACENAPHTHYLENE										
2,6-DINITROTOLUENE										

All results reported in µg/kg (ppb).
Only detected results are reported.

J – Indicates the value is less than the quantitation limit but greater than zero.

DELAWARE ...ND & GRAVEL
SEMIVOLATILE ORGANIC COMPOUND
DETECTION LIMITS

SAMPLE-ID	TP-1-1	TP-2-1	TP-3-1	TP-3-2	TP-3-3	TP-4-1	TP-4-2	TP-4-3	TP-5-1	TP-5-2
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	7/20/90	7/20/90	7/21/90	7/21/90	7/21/90	7/21/90	7/21/90	7/21/90	7/24/90	7/24/90
PARAMETER										
PHENOL		750	740	780	940	890	810	930		930
BIS(2-CHLOROETHYL) ETHER	900	750	740	780	940	890	810	930	930	930
2-CHLOROPHENOL	900	750	740	780	940	890	810	930	930	930
1,3-DICHLOROBENZENE	900	750	740	780	940	890	810	930	930	930
1,4-DICHLOROBENZENE	900	750	740	780	940	890	810	930	930	930
BENZYL ALCOHOL	900	750	740	780		890	810	930	930	930
1,2-DICHLOROBENZENE	900	750	740	780	940	890	810	930	930	
2-METHYLPHENOL	900	750	740	780		890	810	930		
BIS(2-CHLOROISOPROPYL) ETHER	900	750	740	780	940	890	810	930	930	930
4-METHYLPHENOL		750	740	780		890	810	930		
N-NITROSO-DI-N-PROPYLAMINE	900	750	740	780	940	890	810	930	930	930
HEXACHLOROETHANE	900	750	740	780	940	890	810	930	930	930
NITROBENZENE	900	750	740	780	940	890	810	930	930	930
ISOPHORONE		750	740	780	940	890	810	930	930	930
2-NITROPHENOL	900	750	740	780	940	890	810	930	930	930
2,4-DIMETHYLPHENOL	900	750	740	780	940	890	810	930		
BENZOIC ACID	4400	3600	3600	3800		4300	4000	4500	4500	4500
BIS(2-CHLOROETHOXY)METHANE	900	750	740	780	940	890	810	930	930	930
2,4-DICHLOROPHENOL	900	750	740	780	940	890	810	930	930	930
1,2,4-TRICHLOROBENZENE		750	740	780	940	890	810	930	930	930
NAPHTHALENE		750	740	780	940	890	810	930	930	930
4-CHLOROANILINE	900	750	740	780	940	890	810	930	930	930
HEXACHLOROBUTADIENE	900	750	740	780	940	890	810	930	930	930
4-CHLORO-3-METHYLPHENOL	900	750	740	780	940	890	810	930	930	930
2-METHYLNAPHTHALENE	900	750	740	780	940	890	810	930	930	930
HEXACHLOROCYCLOPENTADIENE	900	750	740	780	940	890	810	930	930	930
2,4,6-TRICHLOROPHENOL	900	750	740	780	940	890	810	930	930	930
2,4,5-TRICHLOROPHENOL	4400	3600	3600	3800	4600	4300	4000	4500	4500	4500
2-CHLORONAPHTHALENE	900	750	740	780	940	890	800	930	930	930
2-NITROANILINE	4400	3600	3600	3800	4600	4300	4000	4500	4500	4500
DIMETHYLPHTHALATE	900	750	740	780	940	890	810	930	930	930
ACENAPHTHYLENE	900	750	740	780	940	890	810	930	930	930
2,6-DINITROTOLUENE	900	750	740	780	940	890	810	930	930	930

All results reported in µg/kg (ppb).
Detection limits for positive results not reported.

DELAWAR & GRAVEL
SEMIVOLATILE ANIC COMPOUND
ANALYTICAL RESULTS

SAMPLE-ID	TP-1-1	TP-2-1	TP-3-1	TP-3-2	TP-3-3	TP-4-1	TP-4-2	TP-4-3	TP-5-1	TP-5-2
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	7/20/90	7/20/90	7/21/90	7/21/90	7/21/90	7/21/90	7/21/90	7/21/90	7/24/90	7/24/90
PARAMETER										
3-NITROANILINE										
ACENAPHTHENE										
2,4-DINITROPHENOL										
4-NITROPHENOL										
DIBENZOFURAN										
2,4-DINITROTOLUENE										
DIETHYLPHTHALATE										
4-CHLOROPHENYL-PHENYL ETHER										
FLUORENE										
4-NITROANILINE										
4,6-DINITRO-2-METHYLPHENOL										
N-NITROSODIPHENYLAMINE										
4-BROMOPHENYL-PHENYL ETHER										
HEXACHLOROBENZENE										
PENTACHLOROPHENOL										
PHENANTHRENE										
NTHRACENE	49 J									
-N-BUTYLPHTHALATE										
LUORANTHENE	3200									
YRENE									790 J	5900
UTYLBENZYLPHTHALATE										
3'-DICHLOROBENZIDINE	140 J									
ENZO(A)ANTHRACENE										
HRYSENE										
S(2-ETHYLHEXYL)PHTHALATE	3800 B	85 BJ								
-N-OCTYL PHTHALATE	120 J									
BENZO(B)FLUORANTHENE						2600	2000	620 J	71 BJ	89 BJ
BENZO(K)FLUORANTHENE										
BENZO(A)PYRENE										
INDENO(1,2,3-CD)PYRENE										
DIBENZ(A,H)ANTHRACENE										
BENZO(G,H,I)PERYLENE										

All results reported in µg/kg (ppb).
Only detected results are reported.

B – Compound detected in associated method blank.
J – Indicates the value is less than the quantitation limit but greater than zero.

DELAWARE SAND & GRAVEL
SEMIVOLATILE ORGANIC COMPOUND
DETECTION LIMITS

SAMPLE-ID	TP-1-1	TP-2-1	TP-3-1	TP-3-2	TP-3-3	TP-4-1	TP-4-2	TP-4-3	TP-5-1	TP-5-2
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	7/20/90	7/20/90	7/21/90	7/21/90	7/21/90	7/21/90	7/21/90	7/21/90	7/24/90	7/24/90
PARAMETER										
3-NITROANILINE	4400	3600	3600	3800	4600	4300	4000	4500	4500	4500
ACENAPHTHENE	900	750	740	780	940	890	810	930	930	930
2,4-DINITROPHENOL	4400	3600	3600	3800	4600	4300	4000	4500	4500	4500
4-NITROPHENOL	4400	3600	3600	3800	4600	4300	4000	4500	4500	4500
DIBENZOFURAN	900	750	740	780	940	890	810	930	930	930
2,4-DINITROTOLUENE	900	750	740	780	940	890	810	930	930	930
DIETHYLPHTHALATE	900	750	740	780	940	890	810	930	930	930
4-CHLOROPHENYL-PHENYL ETHER	900	750	740	780	940	890	810	930	930	930
FLUORENE	900	750	740	780	940	890	810	930	930	930
4-NITROANILINE	4400	3600	3600	3800	4600	4300	4000	4500	4500	4500
4,6-DINITRO-2-METHYLPHENOL	4400	3600	3600	3800	4600	4300	4000	4500	4500	4500
N-NITROSODIPHENYLAMINE	900	750	740	780	940	890	810	930	930	930
4-BROMOPHENYL-PHENYL ETHER	900	750	740	780	940	890	810	930	930	930
HEXACHLOROBENZENE	900	750	740	780	940	890	810	930	930	930
PENTACHLOROPHENOL	4400	3600	3600	3800	4600	4300	4000	4500	4500	4500
PHENANTHRENE		750	740	780	940	890	810	930	930	930
ANTHRACENE	900	750	740	780	940	890	810	930	930	930
DI-N-BUTYLPHTHALATE		750	740	780	940	890	810	930		
FLUORANTHENE	900	750	740	780	940	890	810	930	930	930
PYRENE	900	750	740	780	940	890	810	930	930	930
BUTYLBENZYLPHTHALATE		750	740	780	940	890	810	930	930	930
3,3'-DICHLOROBENZIDINE	1800	1500	1500	1600	1900	1800	1600	1900	1900	1900
BENZO(A)ANTHRACENE	900	750	740	780	940	890	810	930	930	930
CHRYSENE	900	750	740	780	940	890	810	930	930	930
BIS(2-ETHYLHEXYL)PHTHALATE			740	780	940					
DI-N-OCTYL PHTHALATE		750	740	780	940	890	810	930	930	930
BENZO(B)FLUORANTHENE	900	750	740	780	940	890	810	930	930	930
BENZO(K)FLUORANTHENE	900	750	740	780	940	890	810	930	930	930
BENZO(A)PYRENE	900	750	740	780	940	890	810	930	930	930
INDENO(1,2,3-CD)PYRENE	900	750	740	780	940	890	810	930	930	930
DIBENZ(A,H)ANTHRACENE	900	750	740	780	940	890	810	930	930	930
BENZO(G,H,I)PERYLENE	900	750	740	780	940	890	810	930	930	930

All results reported in µg/kg (ppb).
Detection limits for positive results not reported.

DE[illegible]E SAND & GRAVEL
SEMIVOLATILE ORGANIC COMPOUND
ANALYTICAL RESULTS

SAMPLE-ID	TP-6-1	TP-6-1 FLD DUP	TP-6-2 ●
SAMPLE TYPE	SOIL	SOIL	SOIL
COLLECTION DATE	7/24/90	7/24/90	7/24/90
PARAMETER			
PHENOL			
BIS(2-CHLOROETHYL) ETHER			
2-CHLOROPHENOL			
1,3-DICHLOROBENZENE			
1,4-DICHLOROBENZENE			
BENZYL ALCOHOL			
1,2-DICHLOROBENZENE			16 J
2-METHYLPHENOL			3200 J
BIS(2-CHLOROISOPROPYL) ETHER			
4-METHYLPHENOL			
N-NITROSO-DI-N-PROPYLAMINE			
HEXACHLOROETHANE			
NITROBENZENE			
ISOPHORONE			2000 J
2-NITROPHENOL			
2,4-DIMETHYLPHENOL	79 J		880 J
BENZOIC ACID			
BIS(2-CHLOROETHOXY)METHANE			
2,4-DICHLOROPHENOL			
1,2,4-TRICHLOROBENZENE	1700	1100	
NAPHTHALENE	100 J		640 J
4-CHLOROANILINE			
HEXACHLOROBUTADIENE			
4-CHLORO-3-METHYLPHENOL			
2-METHYLNAPHTHALENE			
HEXACHLOROCYCLOPENTADIENE			
2,4,6-TRICHLOROPHENOL			
2,4,5-TRICHLOROPHENOL			
2-CHLORONAPHTHALENE	230 J	210 J	
2-NITROANILINE			
DIMETHYLPHTHALATE			
ACENAPHTHYLENE			
2,6-DINITROTOLUENE			

All results reported in µg/kg (ppb).
Only detected results are reported.
● - Results calculated with holding times exceeded.

J - Indicates the value is less than the quantitation limit but greater than zero.

DELAWA SAND & GRAVEL
SEMIVOLATILE ORGANIC COMPOUND
DETECTION LIMITS

SAMPLE-ID	TP-6-1	TP-6-1 FLD DUP	TP-6-2 ●
SAMPLE TYPE	SOIL	SOIL	SOIL
COLLECTION DATE	7/24/90	7/24/90	7/24/90
PARAMETER			
PHENOL	990	990	4200
BIS(2-CHLOROETHYL) ETHER	990	990	4200
2-CHLOROPHENOL	990	990	4200
1,3-DICHLOROBENZENE	990	990	4200
1,4-DICHLOROBENZENE	990	990	4200
BENZYL ALCOHOL	990	990	4200
1,2-DICHLOROBENZENE	990	990	
2-METHYLPHENOL	990	990	
BIS(2-CHLOROISOPROPYL) ETHER	990	990	4200
4-METHYLPHENOL	990	990	4200
N-NITROSO-DI-N-PROPYLAMINE	990	990	4200
HEXACHLOROETHANE	990	990	4200
NITROBENZENE	990	990	4200
ISOPHORONE	990	990	
2-NITROPHENOL	990	990	4200
2,4-DIMETHYLPHENOL		990	
BENZOIC ACID	4800	4800	21000
BIS(2-CHLOROETHOXY)METHANE	990	990	4200
2,4-DICHLOROPHENOL	990	990	4200
1,2,4-TRICHLOROBENZENE			4200
NAPHTHALENE		990	
4-CHLOROANILINE	990	990	4200
HEXACHLOROBUTADIENE	990	990	4200
4-CHLORO-3-METHYLPHENOL	990	990	4200
2-METHYLNAPHTHALENE	990	990	4200
HEXACHLOROCYCLOPENTADIENE	990	990	4200
2,4,6-TRICHLOROPHENOL	990	990	4200
2,4,5-TRICHLOROPHENOL	4800	4800	21000
2-CHLORONAPHTHALENE			4200
2-NITROANILINE	4800	4800	21000
DIMETHYLPHTHALATE	990	990	4200
ACENAPHTHYLENE	990	990	4200
2,6-DINITROTOLUENE	990	990	4200

All results reported in µg/kg (ppb).
Detection limits for positive results not reported.
● - Results calculated with holding times exceeded.

DEL[illegible]RE SAND & GRAVEL
SEMIVOLATILE ORGANIC COMPOUND
ANALYTICAL RESULTS

SAMPLE-ID	TP-6-1	TP-6-1 FLD DUP	TP-6-2 ●
SAMPLE TYPE	SOIL	SOIL	SOIL
COLLECTION DATE	7/24/90	7/24/90	7/24/90
PARAMETER			
3-NITROANILINE			
ACENAPHTHENE			
2,4-DINITROPHENOL			
4-NITROPHENOL			
DIBENZOFURAN			
2,4-DINITROTOLUENE			
DIETHYLPHTHALATE			
4-CHLOROPHENYL-PHENYL ETHER			
FLUORENE			
4-NITROANILINE			
4,6-DINITRO-2-METHYLPHENOL			
N-NITROSODIPHENYLAMINE			370 J
4-BROMOPHENYL-PHENYL ETHER			
HEXACHLOROBENZENE			
PENTACHLOROPHENOL			
PHENANTHRENE			660 J
ANTHRACENE			
DI-N-BUTYLPHTHALATE	1500	1200	9900
FLUORANTHENE			
PYRENE			
BUTYLBENZYLPHTHALATE			
3,3'-DICHLOROBENZIDINE			
BENZO(A)ANTHRACENE			
CHRYSENE			
BIS(2-ETHYLHEXYL)PHTHALATE	150 BJ		55000
DI-N-OCTYL PHTHALATE			1900 J
BENZO(B)FLUORANTHENE			
BENZO(K)FLUORANTHENE			
BENZO(A)PYRENE			
INDENO(1,2,3-CD)PYRENE			
DIBENZ(A,H)ANTHRACENE			
BENZO(G,H,I)PERYLENE			

All results reported in µg/kg (ppb).

Only detected results are reported.

● – Results calculated with holding times exceeded.

B – Compound detected in associated method blank.

J – Indicates the value is less than the quantitation limit but greater than zero.

DELAW. , SAND & GRAVEL
SEMIVOLATILE ORGANIC COMPOUND
DETECTION LIMITS

SAMPLE-ID	TP-6-1	TP-6-1 FLD DUP	TP-6-2 ●
SAMPLE TYPE	SOIL	SOIL	SOIL
COLLECTION DATE	7/24/90	7/24/90	7/24/90
PARAMETER			
3-NITROANILINE	4800	4800	210000
ACENAPHTHENE	990	990	4200
2,4-DINITROPHENOL	4800	4800	21000
4-NITROPHENOL	4800	4800	21000
DIBENZOFURAN	990	900	4200
2,4-DINITROTOLUENE	990	900	4200
DIETHYLPHTHALATE	990	900	4200
4-CHLOROPHENYL-PHENYL ETHER	990	900	4200
FLUORENE	990	900	4200
4-NITROANILINE	4800	4800	21000
4,6-DINITRO-2-METHYLPHENOL	4800	4800	21000
N-NITROSODIPHENYLAMINE	990	990	
4-BROMOPHENYL-PHENYL ETHER	990	990	4200
HEXACHLOROBENZENE	990	990	4200
PENTACHLOROPHENOL	4800	4800	21000
PHENANTHRENE	990	990	
ANTHRACENE	990	990	4200
DI-N-BUTYLPHTHALATE			
FLUORANTHENE	990	990	4200
PYRENE	990	990	4200
BUTYLBENZYLPHTHALATE	990	990	4200
3,3'-DICHLOROBENZIDINE	2000	2000	8500
BENZO(A)ANTHRACENE	990	990	4200
CHRYSENE	990	990	4200
BIS(2-ETHYLHEXYL)PHTHALATE		990	
DI-N-OCTYL PHTHALATE	990	990	
BENZO(B)FLUORANTHENE	990	990	4200
BENZO(K)FLUORANTHENE	990	990	4200
BENZO(A)PYRENE	990	990	4200
INDENO(1,2,3-CD)PYRENE	990	990	4200
DIBENZ(A,H)ANTHRACENE	990	990	4200
BENZO(G,H,I)PERYLENE	990	990	4200

All results reported in µg/kg (ppb).

Detection limits for positive results not reported.

● - Results calculated with holding times exceeded.

DELAWAR[redacted] & GRAVEL
PESTICIDE/PCB
ANALYTICAL RESULTS

SAMPLE-ID	TP-1-1	TP-2-1	TP-3-1	TP-3-2	TP-3-3	TP-4-1	TP-4-2	TP-4-3	TP-5-1	TP-5-2
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	7/20/90	7/20/90	7/21/90	7/21/90	7/21/90	7/21/90	7/21/90	7/21/90	7/24/90	7/24/90
PARAMETER										
ALPHA-BHC										
BETA-BHC										
DELTA-BHC										
GAMMA-BHC (LINDANE)										
HEPTACHLOR										
ALDRIN										
HEPTACHLOR EPOXIDE										
ENDOSULFAN I										
DIELDRIN										
4,4'-DDE										
ENDRIN										
ENDOSULFAN II										
4,4'-DDD										
[redacted]IDOSULFAN SULFATE										
[redacted]'-DDT										
[redacted]ETHOXYCHLOR										
[redacted]IDRIN KETONE										
[redacted].PHA-CHLORDANE										
[redacted]AMMA-CHLORDANE										
[redacted]OXAPHENE										
[redacted]ROCLOR-1016										
AROCLOR-1221										
AROCLOR-1232										
AROCLOR-1242										
AROCLOR-1248									1600 JX	19000 X
AROCLOR-1254	3100 X						720 X			
AROCLOR-1260										

All results reported in µg/kg (ppb).
Only detected results are reported.

X - Concentration calculated from multi-peak response factor.

[redacted]

DELAWARE SAND & GRAVEL

PESTICIDE/PCB

DETECTION LIMITS

SAMPLE-ID	TP-1-1	TP-2-1	TP-3-1	TP-3-2	TP-3-3	TP-4-1	TP-4-2	TP-4-3	TP-5-1	TP-5-2
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	7/20/90	7/20/90	7/21/90	7/21/90	7/21/90	7/21/90	7/21/90	7/21/90	7/24/90	7/24/90
PARAMETER										
ALPHA-BHC	22	18	18	19	23	22	20	23	230	230
BETA-BHC	22	18	18	19	23	22	20	23	230	230
DELTA-BHC	22	18	18	19	23	22	20	23	230	230
GAMMA-BHC (LINDANE)	22	18	18	19	23	22	20	23	230	230
HEPTACHLOR	22	18	18	19	23	22	20	23	230	230
ALDRIN	22	18	18	19	23	22	20	23	230	230
HEPTACHLOR EPOXIDE	22	18	18	19	23	22	20	23	230	230
ENDOSULFAN I	22	18	18	19	23	22	20	23	230	230
DIELDRIN	44	36	36	38	46	43	40	45	450	450
4,4'-DDE	44	36	36	38	46	43	40	45	450	450
ENDRIN	44	36	36	38	46	43	40	45	450	450
ENDOSULFAN II	44	36	36	38	46	43	40	45	450	450
4,4'-DDD	44	36	36	38	46	43	40	45	450	450
ENDOSULFAN SULFATE	44	36	36	38	46	43	40	45	450	450
4,4'-DDT	44	36	36	38	46	43	40	45	450	450
METHOXYCHLOR	220	180	180	190	230	220	200	230	2300	2300
ENDRIN KETONE	44	36	36	38	46	43	40	45	450	450
ALPHA-CHLORDANE	220	180	180	190	230	220	200	230	2300	2300
GAMMA-CHLORDANE	220	180	180	190	230	220	200	230	2300	2300
TOXAPHENE	440	360	360	380	460	430	400	450	4500	4500
AROCLOR-1016	220	180	180	190	230	220	200	230	2300	2300
AROCLOR-1221	220	180	180	190	230	220	200	230	2300	2300
AROCLOR-1232	220	180	180	190	230	220	200	230	2300	2300
AROCLOR-1242	220	180	180	190	230	220	200	230	2300	2300
AROCLOR-1248	220	180	180	190	230	220	200	230		
AROCLOR-1254		360	360	380	460	430		450	4500	4500
AROCLOR-1260	440	360	360	380	460	430	400	450	4500	4500

All results reported in µg/kg (ppb).

Detection limits for positive results not reported.

DELAWARE SAND & GRAVEL
PESTICIDE/PCB
ANALYTICAL RESULTS

SAMPLE-ID	TP-6-1	TP-6-1 FLD DUP	TP-6-2
SAMPLE TYPE	SOIL	SOIL	SOIL
COLLECTION DATE	7/24/90	7/24/90	7/24/90
PARAMETER			
ALPHA-BHC			
BETA-BHC			
DELTA-BHC			
GAMMA-BHC (LINDANE)			
HEPTACHLOR			
ALDRIN			
HEPTACHLOR EPOXIDE			
ENDOSULFAN I			
DIELDRIN			
4,4'-DDE			
ENDRIN			
ENDOSULFAN II			
4,4'-DDD			
ENDOSULFAN SULFATE			
4,4'-DDT			
METHOXYCHLOR			
ENDRIN KETONE			
ALPHA-CHLORDANE			
GAMMA-CHLORDANE			
TOXAPHENE			
AROCLOR-1016	19000 X	16000 X	
AROCLOR-1221			
AROCLOR-1232			
AROCLOR-1242			
AROCLOR-1248			
AROCLOR-1254			110000XP
AROCLOR-1260			

All results reported in µg/kg (ppb).
Only detected results are reported.
X – Concentration calculated from multi-peak response factor.
P – Compound concentration estimated due to surrogate outliers.

DELAWA... SAND & GRAVEL

PESTICIDE/PCB

DETECTION LIMITS

SAMPLE-ID	TP-6-1	TP-6-1 FLD DUP	TP-6-2
SAMPLE TYPE	SOIL	SOIL	SOIL
COLLECTION DATE	7/24/90	7/24/90	7/24/90
PARAMETER			
ALPHA-BHC	240	240	2100 P
BETA-BHC	240	240	2100 P
DELTA-BHC	240	240	2100 P
GAMMA-BHC (LINDANE)	240	240	2100 P
HEPTACHLOR	240	240	2100 P
ALDRIN	240	240	2100 P
HEPTACHLOR EPOXIDE	240	240	2100 P
ENDOSULFAN I	240	240	2100 P
DIELDRIN	480	480	4100 P
4,4'-DDE	480	480	4100 P
ENDRIN	480	480	4100 P
ENDOSULFAN II	480	480	4100 P
4,4'-DDD	480	480	4100 P
ENDOSULFAN SULFATE	480	480	4100 P
4,4'-DDT	480	480	4100 P
METHOXYCHLOR	2400	2400	21000 P
ENDRIN KETONE	480	480	4100 P
ALPHA-CHLORDANE	2400	2400	21000 P
GAMMA-CHLORDANE	2400	2400	21000 P
TOXAPHENE	4800	4800	41000 P
AROCLOR-1016			21000 P
AROCLOR-1221	2400	2400	21000 P
AROCLOR-1232	2400	2400	21000 P
AROCLOR-1242	2400	2400	21000 P
AROCLOR-1248	2400	2400	21000 P
AROCLOR-1254	4800	4800	
AROCLOR-1260	4800	4800	41000 P

All results reported in µg/kg (ppb).

Detection limits for positive results not reported.

P – Compound concentration estimated due to surrogate outlier.

DELAWARE & GRAVEL
POLYCHLORINATED DIBENZO-P-DIOXIN
POLYCHLORINATED DIBENZO-P-FURAN
ANALYTICAL RESULTS

SAMPLE-ID	TP-1-1	TP-2-1	TP-3-1	TP-3-2	TP-3-3	TP-4-1	TP-4-2	TP-4-3	TP-5-1	TP-5-2
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	7/20/90	7/20/90	7/21/90	7/21/90	7/21/90	7/21/90	7/21/90	7/21/90	7/21/90	7/24/90
PARAMETER										
DIOXIN										
TETRA 2378 TCDD										
TETRA TOTAL TCDD										
PENTA 12378 PeCDD										
PENTA TOTAL PeCDD	0.312									
HEXA 123478 HxCDD										
HEXA 123678 HxCDD										
HEXA 123789 HxCDD										
HEXA TOTAL HxCDD										
HEPTA 1234678 HpCDD										
HEPTA TOTAL HpCDD										
OCTA TOTAL OCDD	1.336	0.215	0.523	2.452	0.955	0.706	2.141	0.462	1.22	3.785
FURAN										
TETRA 2378 TCDF										
TETRA TOTAL TCDF										
PENTA 12378 PeCDF										
PENTA 23478 PeCDF										
PENTA TOTAL PeCDF										
HEXA 123478 HxCDF										
HEXA 123678 HxCDF										
HEXA 123789 HxCDF										
HEXA 234678 HxCDF										
HEXA TOTAL HxCDF										
HEPTA 1234678 HpCDF										
HEPTA 1234789 HpCDF										
HEPTA TOTAL HpCDF										
OCTA TOTAL OCDF										

All results reported in µg/kg (ppb).
Only detected results are reported.

DELAWARE SAND & GRAVEL

POLYCHLORINATED DIBENZO-P-DIOXIN

POLYCHLORINATED DIBENZO-P-FURAN

DETECTION LIMITS

SAMPLE-ID	TP-1-1	TP-2-1	TP-3-1	TP-3-2	TP-3-3	TP-4-1	TP-4-2	TP-4-3	TP-5-1	TP-5-2
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	7/20/90	7/20/90	7/21/90	7/21/90	7/21/90	7/21/90	7/21/90	7/21/90	7/24/90	7/24/90
PARAMETER										
DIOXIN										
TETRA 2378 TCDD										
TETRA TOTAL TCDD	0.016	0.043	0.020	0.017	0.044	0.057	0.015	0.039	0.066	0.089
PENTA 12378 PeCDD										
PENTA TOTAL PeCDD		0.016	0.044	0.065	0.105	0.102	0.037	0.072	0.079	0.059
HEXA 123478 HxCDD										
HEXA 123678 HxCDD										
HEXA 123789 HxCDD										
HEXA TOTAL HxCDD	0.088	0.087	0.094	0.091	0.201	0.090	0.107	0.055	0.134	0.251
HEPTA 1234678 HpCDD										
HEPTA TOTAL HpCDD	0.151	0.089	0.115	0.165	0.160	0.277	0.078	0.164	0.154	0.259
OCTA TOTAL OCDD							2.141			
FURAN										
TETRA 2378 TCDF										
TETRA TOTAL TCDF	0.036	0.020	0.021	0.057	0.058	0.059	0.032	0.042	0.051	0.025
PENTA 12378 PeCDF										
PENTA 23478 PeCDF										
PENTA TOTAL PeCDF	0.020	0.035	0.038	0.044	0.067	0.05	0.017	0.067	0.041	0.061
HEXA 123478 HxCDF										
HEXA 123678 HxCDF										
HEXA 123789 HxCDF										
HEXA 234678 HxCDF										
HEXA TOTAL HxCDF	0.050	0.067	0.058	0.046	0.106	0.107	0.074	0.084	0.082	0.068
HEPTA 1234678 HpCDF										
HEPTA 1234789 HpCDF										
HEPTA TOTAL HpCDF	0.026	0.076	0.125	0.149	0.183	0.212	0.055	0.100	0.093	0.353
OCTA TOTAL OCDF	0.165	0.112	0.165	0.146	0.179	0.219	0.097	0.183	0.136	0.422

All results reported in µg/kg (ppb).

Only detection limits for total isomers reported.

DE[redacted]E SAND & GRAVEL
POLYCHLORINATED DIBENZO-P-DIOXIN
POLYCHLORINATED DIBENZO-P-FURAN
ANALYTICAL RESULTS

SAMPLE-ID	TP-6-1	TP-6-1 FLD DUP	TP-6-2
SAMPLE TYPE	SOIL	SOIL	SOIL
COLLECTION DATE	7/24/90	7/24/90	7/24/90
PARAMETER			
DIOXIN			
TETRA 2378 TCDD			
TETRA TOTAL TCDD			
PENTA 12378 PeCDD			
PENTA TOTAL PeCDD			0.095
HEXA 123478 HxCDD			
HEXA 123678 HxCDD			
HEXA 123789 HxCDD			
HEXA TOTAL HxCDD			0.125
HEPTA 1234678 HpCDD			
HEPTA TOTAL HpCDD			0.33
OCTA TOTAL OCDD	2.932	1.996	2.043
FURAN			
TETRA 2378 TCDF			
TETRA TOTAL TCDF			
PENTA 12378 PeCDF			
PENTA 23478 PeCDF			
PENTA TOTAL PeCDF			0.037
HEXA 123478 HxCDF			
HEXA 123678 HxCDF			
HEXA 123789 HxCDF			
HEXA 234678 HxCDF			
HEXA TOTAL HxCDF			0.289
HEPTA 1234678 HpCDF			
HEPTA 1234789 HpCDF			
HEPTA TOTAL HpCDF			0.107
QCTA TOTAL OCDF			

All results reported in µg/kg (ppb).
Only detected results are reported.

DELAWARE SAND & GRAVEL
POLYCHLORINATED DIBENZO-P-DIOXIN
POLYCHLORINATED DIBENZO-P-FURAN
DETECTION LIMITS

SAMPLE-ID	TP-6-1	TP-6-1 FLD DUP	TP-6-2
SAMPLE TYPE	SOIL	SOIL	SOIL
COLLECTION DATE	7/24/90	7/24/90	7/24/90
PARAMETER			
DIOXIN			
TETRA 2378 TCDD			
TETRA TOTAL TCDD	0.175	0.017	0.108
PENTA 12378 PeCDD			
PENTA TOTAL PeCDD	0.191	0.044	
HEXA 123478 HxCDD			
HEXA 123678 HxCDD			
HEXA 123789 HxCDD			
HEXA TOTAL HxCDD	0.217	0.105	
HEPTA 1234678 HpCDD			
HEPTA TOTAL HpCDD	0.467	0.189	
OCTA TOTAL OCDD			
FURAN			
TETRA 2378 TCDF			
TETRA TOTAL TCDF	0.137	0.016	0.057
PENTA 12378 PeCDF			
PENTA 23478 PeCDF			
PENTA TOTAL PeCDF	0.127	0.024	
HEXA 123478 HxCDF			
HEXA 123678 HxCDF			
HEXA 123789 HxCDF			
HEXA 234678 HxCDF			
HEXA TOTAL HxCDF	0.147	0.068	
HEPTA 1234678 HpCDF			
HEPTA 1234789 HpCDF			
HEPTA TOTAL HpCDF	0.212	0.127	
OCTA TOTAL OCDF	0.267	0.227	0.033

All results reported in µg/kg (ppb).
Only detection limits for total isomers reported.

DELAWARE & GRAVEL
METAL/CLASSICAL CHEMISTRIES
ANALYTICAL RESULTS

SAMPLE-ID	TP-1-1	TP-2-1	TP-3-1	TP-3-2	TP-3-3	TP-4-1	TP-4-2	TP-4-3	TP-5-1	TP-5-2
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	7/20/90	7/20/90	7/21/90	7/21/90	7/21/90	7/21/90	7/21/90	7/21/90	7/24/90	7/24/90
PARAMETER										
ALUMINUM	21900	4000	13400	17600	81300	66000	30900	79600	49300 *	75800 *
ANTIMONY	10.9 B		17.6	17.2	24.1	31.6	53.2	19.1	19.7 B	27.5 B
ARSENIC	2.0 B		3	3	5.3	4.7	2.1 BW	2 B		9.3 N
BARIUM	99.9	19.6 B	86.3	57.8	106	133	81.5	256	217	196
BERYLLIUM	1.2 B	0.39 B	0.66 B	0.83 B	1.6	2.3	0.97 B	1.9	2.4 B	3.2
CADMIUM	0.84 B				1.3 B	1.4	3.3		2 BN	3 N
CALCIUM	435 BE	34.0 BE	1620 E	180 BE	749 BE	652 BE	362 BE	671 BE	934 BE	1110 BE
CHROMIUM	27.9	4.3	26.3	30	41.5	44.3	30.4	45.4	38.2	59.3
COBALT	11.0 B	11.0 B	13.9	7.5 B	18.4	16.8	12.9	14 B	43.6	30.7
COPPER	22	6	15.3	12.2	15.9	15.1	118	17.7	14.2	17.4
IRON	25800	14200	29900	27200	39800	47800	30600	36500	55500	71900
LEAD	19.8 S	2.5 S	9.3 S	9.6	17.9 S	18.5 S	45.5	24.8 S	31.4 S	38.3 S
MAGNESIUM	852 B	143 B	813 B	771 B	894 B	1320 B	595 B	1390 B	1740 BE	1980 BE
MANGANESE	495	881	2130	366	771	925	586	453	853	1200
MERCURY	0.38	0.37							0.42 N*	0.45 N*
NICKEL	28.3	2.9 B	16.4	19.9	59	36.5	3600	45.3	25.3	103
POTASSIUM	557 B	202 B	506 B	673 B	705 B	1030 B	528 B	1140 B	913 B	1140 B
SELENIUM										
SILVER	2.0 B	0.95 B	2.3	2.3 B	3.2	4	2.6	2.9	4.1 B	5.1 B
SODIUM	162.0 B		148 B	142 B	201 B	179	191 B	290 B	229 B	286 B
THALLIUM										
VANADIUM	49.1	8.0 B	28.6	37.5	71.9	82.8	48.6	72	78.6	134
ZINC	40.8 E	11.8 E	29.6 E	30.2 E	47.9 E	463 E	52.4 E	55.2 E	55.2 E	101 E
CYANIDE										
SULFIDE	219	339	197	298	178	281	475	217	235	308

ARI 01089

All results reported in mg/kg (ppm).
Only detected results are reported.

W – Post-digestion spike for furnace is out of QC limits, while absorbance is less than 50% of spike absorbance.

B – Value is less than quantitation limit but greater than instrument detection limit.

N – Spike recovery not within QC limits.

E – Value is estimated due to the presence of interference.

S – Value determined by Method of Standard Addition (MSA).

* – Duplicate analysis not within QC limits.

6000-2

DELAWARE SAND & GRAVEL
METAL/CLASSICAL CHEMISTRIES
DETECTION LIMITS

SAMPLE-ID	TP-1-1	TP-2-1	TP-3-1	TP-3-2	TP-3-3	TP-4-1	TP-4-2	TP-4-3	TP-5-1	TP-5-2
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	7/20/90	7/20/90	7/21/90	7/21/90	7/21/90	7/21/90	7/21/90	7/21/90	7/24/90	7/24/90
PARAMETER										
ALUMINUM										
ANTIMONY		5.80								
ARSENIC		1.10							2.40	
BARIUM										
BERYLLIUM										
CADMIUM		0.67	0.68	0.70				0.87		
CALCIUM										
CHROMIUM										
COBALT										
COPPER										
IRON										
LEAD										
MAGNESIUM										
MANGANESE										
MERCURY			0.08	0.10	0.12	0.14	0.12	0.13		
NICKEL										
POTASSIUM										
SELENIUM	0.82	0.67	0.45	0.47	0.57	0.53	0.50	0.58	1.50	1.80
SILVER										
SODIUM		81.40								
THALLIUM	0.82	0.67	0.68	0.70	0.85	0.80	0.75	0.87	1.50	1.80
VANADIUM										
ZINC										
CYANIDE	5.20	4.10	2.00	1.90	2.50	2.80	2.30	2.70	5.10	4.60
SULFIDE										

All results reported in mg/kg (ppm).
Detection limits for positive results not reported.

DELAW[illegible]AND & GRAVEL
METAL/CLASSICAL CHEMISTRIES
ANALYTICAL RESULTS

SAMPLE-ID	TP-6-1	TP-6-1 FLD DUP	TP-6-2
SAMPLE TYPE	SOIL	SOIL	SOIL
COLLECTION DATE	7/24/90	7/24/90	7/24/90
PARAMETER			
ALUMINUM	90600 *	69900 *	29800 *
ANTIMONY	17.7 B	37.4	79.1
ARSENIC	8.2 N	6.9 N	2.7 BN
BARIUM	147	196	258
BERYLLIUM	3.8	2.9	1.8 B
CADMIUM	3 N	3.3 N	6.5 N
CALCIUM	544 BE	616 BE	944 BE
CHROMIUM	177	115	133
COBALT	25.8 B	25.1	22.1 B
COPPER	18.7	13.9	81.3
IRON	82300	62600	111000
LEAD	40.4 S	35.2 S	660 S
MAGNESIUM	1980 BE	1420 BE	1220 BE
MANGANESE	795	1570	729
MERCURY	0.73 N*		3.3 N*
NICKEL	50.6	91.2	367
POTASSIUM	1190 B	692 B	574 B
SELENIUM			
SILVER	6.1	4.3 B	7
SODIUM	419 B	321 B	195 B
THALLIUM			
VANADIUM	161	132	75.5
ZINC	105 E	82.8 E	465 E
CYANIDE			
SULFIDE	236	868	243

All results reported in mg/kg (ppm) unless otherwise specified.
Only detected results are reported.

B – Value is less than quantitation limit but greater than instrument detection limit.
N – Spike recovery not within QC limits.
E – Value is estimated due to the presence of interference.
S – Value determined by Method of Standard Addition (MSA).
* – Duplicate analysis not within QC limits.

DELAWARE SAN.. & GRAVEL
METAL/CLASSICAL CHEMISTRIES
DETECTION LIMITS

SAMPLE-ID	TP-6-1	TP-6-1 FLD DUP	TP-6-2
SAMPLE TYPE	SOIL	SOIL	SOIL
COLLECTION DATE	7/24/90	7/24/90	7/24/90
PARAMETER			
ALUMINUM			
ANTIMONY			
ARSENIC			
BARIUM			
BERYLLIUM			
CADMIUM			
CALCIUM			
CHROMIUM			
COBALT			
COPPER			
IRON			
LEAD			
MAGNESIUM			
MANGANESE			
MERCURY		0.22	
NICKEL			
POTASSIUM			
SELENIUM	1.70	1.30	1.40
SILVER			
SODIUM			
THALLIUM	1.70	1.30	1.40
VANADIUM			
ZINC			
CYANIDE	5.20	3.40	4.60
SULFIDE			

All results reported in mg/kg (ppm).
Detection limits for positive results not reported.

DELAWARE SAND & GRAVEL
AIR MONITORING ANALYTICAL RESULTS

SAMPLE-ID	TP-1-17A	TP-1-13A	TP-1-1A	TP-1-24A	TP-3-86A	TP-3-76A	TP-3-66A	TP-3-88A	TP-3-69A	TP-3-65A
SAMPLE TYPE	AIR	AIR	AIR	AIR	AIR	AIR	AIR	AIR	AIR	AIR
COLLECTION DATE	7/19/90	7/19/90	7/19/90	7/19/90	7/22/90	7/22/90	7/22/90	7/22/90	7/22/90	7/22/90
PARAMETER										
BENZENE	NA	NA			NA	NA		NA	NA	
ETHYLBENZENE	NA	NA			NA	NA		NA	NA	
TOTAL XYLENES	NA	NA			NA	NA		NA	NA	
TOLUENE			NA	NA			NA			NA

All results reported in mg/cu. meter
Only detected results are reported.

NA - Not analyzed.

DELAWARE SAND & GRAVEL
AIR MONITORING DETECTION LIMITS

SAMPLE-ID	TP-1-17A	TP-1-13A	TP-1-1A	TP-1-24A	TP-3-86A	TP-3-76A	TP-3-66A	TP-3-88A	TP-3-69A	TP-3-65A
SAMPLE TYPE	AIR	AIR	AIR	AIR	AIR	AIR	AIR	AIR	AIR	AIR
COLLECTION DATE	7/19/90	7/19/90	7/19/90	7/19/90	7/22/90	7/22/90	7/22/90	7/22/90	7/22/90	7/22/90
PARAMETER										
BENZENE	NA	NA	1.21	1.27	NA	NA	1.26	NA	NA	1.23
ETHYLBENZENE	NA	NA	1.21	1.27	NA	NA	1.26	NA	NA	1.23
TOTAL XYLENES	NA	NA	1.21	1.27	NA	NA	1.26	NA	NA	1.23
TOLUENE	4.1	4.7	NA	NA	4.8	5.02	NA	4.79	5.08	NA

All results reported in mg/cu. meter

NA – Not analyzed.

DELAWARE SAND & GRAVEL
AIR MONITORING ANALYTICAL RESULTS

SAMPLE-ID	TP-1-19A	TP-1-12A	TP-3-63A	TP-3-35A	TP-3-56A	TP-3-94A
SAMPLE TYPE	AIR	AIR	AIR	AIR	AIR	AIR
COLLECTION DATE	7/19/90	7/19/90	7/22/90	7/22/90	7/22/90	7/22/90
PARAMETER						
1,2-DICHLOROETHANE						

All results reported in mg/cu. meter
Only detected results are reported.

DELAWARE SAND & GRAVEL
AIR MONITORING DETECTION LIMITS

SAMPLE-ID	TP-1-19A	TP-1-12A	TP-3-63A	TP-3-35A	TP-3-56A	TP-3-94A
SAMPLE TYPE	AIR	AIR	AIR	AIR	AIR	AIR
COLLECTION DATE	7/19/90	7/19/90	7/22/90	7/22/90	7/22/90	7/22/90
PARAMETER						
1,2-DICHLOROETHANE	3.05	3.51	3.57	3.74	3.45	3.67

All results reported in mg/cu. meter

DELAWARE SAND & GRAVEL
AIR MONITORING ANALYTICAL RESULTS

SAMPLE-ID	TP-1-45A	TP-1-23A	TP-3-93A	TP-3-68A
SAMPLE TYPE	AIR	AIR	AIR	AIR
COLLECTION DATE	7/19/90	7/19/90	7/22/90	7/22/90
PARAMETER				
METHYLETHYL KETONE				
METHYLISOBUTYL KETONE				

All results reported in mg/cu. meter
Only detected results are reported.

DELAWARE SAND & GRAVEL

AIR MONITORING DETECTION LIMITS

SAMPLE-ID	TP-1-45A	TP-1-23A	TP-3-93A	TP-3-68A
SAMPLE TYPE	AIR	AIR	AIR	AIR
COLLECTION DATE	7/19/90	7/19/90	7/22/90	7/22/90
PARAMETER				
METHYLETHYL KETONE	2.36	2.18	2.27	2.3
METHYLISOBUTYL KETONE	2.36	2.18	2.27	2.3

All results reported in mg/cu. meter

DELAWARE SAND & GRAVEL
AIR MONITORING ANALYTICAL RESULTS

SAMPLE-ID	TP-1-11C	TP-1-10C	TP-3-35C	TP-3-18C	TP-3-38C	TP-3-29C
SAMPLE TYPE	AIR	AIR	AIR	AIR	AIR	AIR
COLLECTION DATE	7/19/90	7/19/90	7/22/90	7/22/90	7/22/90	7/22/90
PARAMETER						
DI-N-BUTYLPHTHALATE						
BIS(2-ETHYLHEXYL)PHTHALATE						

All results reported in mg/cu. meter
Only detected results are reported.

DELAWARE SAND & GRAVEL
AIR MONITORING DETECTION LIMITS

SAMPLE-ID	TP-1-11C	TP-1-10C	TP-3-35C	TP-3-18C	TP-3-38C	TP-3-29C
SAMPLE TYPE	AIR	AIR	AIR	AIR	AIR	AIR
COLLECTION DATE	7/19/90	7/19/90	7/22/90	7/22/90	7/22/90	7/22/90
PARAMETER						
DI-N-BUTYLPHTHALATE	0.2	0.23	0.22	0.24	0.22	0.23
BIS(2-ETHYLHEXYL)PHTHALATE	0.2	0.23	0.22	0.24	0.22	0.23

All results reported in mg/cu. meter

DELAWARE SAND & GRAVEL
AIR MONITORING ANALYTICAL RESULTS

SAMPLE-ID	TP-1F	TP-3G
SAMPLE TYPE	AIR	AIR
COLLECTION DATE	7/19/90	7/22/90
PARAMETER		
PCB		

All results reported in mg/cu. meter
Only detected results are reported.

DELAWARE SAND & GRAVEL

AIR MONITORING DETECTION LIMITS

SAMPLE-ID	TP-1F	TP-3G
SAMPLE TYPE	AIR	AIR
COLLECTION DATE	7/19/90	7/22/90
PARAMETER		
PCB	0.003	0.003

All results reported in mg/cu. meter

DELAWARE SAND & GRAVEL
AIR MONITORING ANALYTICAL RESULTS

SAMPLE-ID	TP-1-3C	TP-1-16C	TP-3-17C	TP-3-40C
SAMPLE TYPE	AIR	AIR	AIR	AIR
COLLECTION DATE	7/19/90	7/19/90	7/22/90	7/22/90
PARAMETER				
ARSENIC				
CADMIUM				
CHROMIUM	0.0055	0.0055	0.0062	0.0056
COBALT				
COPPER	0.002			
LEAD				
NICKEL				
SELENIUM				
TIN				
ZINC				

All results reported in mg/cu. meter
Only detected results are reported.

DELAWARE SAND & GRAVEL

AIR MONITORING DETECTION LIMITS

SAMPLE-ID	TP-1-3C	TP-1-16C	TP-3-17C	TP-3-40C
SAMPLE TYPE	AIR	AIR	AIR	AIR
COLLECTION DATE	7/19/90	7/19/90	7/22/90	7/22/90
PARAMETER				
ARSENIC	0.0043	0.004	0.0043	0.0042
CADMIUM	0.0017	0.0016	0.0017	0.0017
CHROMIUM				
COBALT	0.0006	0.0006	0.0006	0.0006
COPPER		0.0007	0.0008	0.0008
LEAD	0.0043	0.004	0.0043	0.0042
NICKEL	0.0017	0.0016	0.0017	0.0017
SELENIUM	0.017	0.016	0.017	0.017
TIN	0.02	0.019	0.02	0.019
ZINC	0.0009	0.0008	0.0009	0.0008

All results reported in mg/cu. meter

DELAWARE SAND & .AVEL
VOLATILE ORGANIC COMPOUND
ANALYTICAL RESULTS

SAMPLE-ID	SDD-2	SDD-3	SDR-1	SDR-2	SDR-3
SAMPLE TYPE	SLUDGE	SLUDGE	SOIL	SOIL	SOIL
COLLECTION DATE	7/20/90	7/20/90	7/22/90	7/22/90	7/24/90
PARAMETER					
CHLOROMETHANE					NA
BROMOMETHANE					NA
VINYL CHLORIDE					NA
CHLOROETHANE					NA
METHYLENE CHLORIDE	1200 B		29 D	3 JP	NA
ACETONE	5000		16 D		NA
CARBON DISULFIDE					NA
1,1-DICHLOROETHENE					NA
1,1-DICHLOROETHANE					NA
1,2-DICHLOROETHENE (TOTAL)					NA
CHLOROFORM	490 J				NA
1,2-DICHLOROETHANE	1100				NA
2-BUTANONE					NA
1,1,1-TRICHLOROETHANE					NA
CARBON TETRACHLORIDE					NA
VINYL ACETATE					NA
BROMODICHLOROMETHANE					NA
1,2-DICHLOROPROPANE					NA
CIS-1,3-DICHLOROPROPENE					NA
TRICHLOROETHENE					NA
DIBROMOCHLOROMETHANE					NA
1,1,2-TRICHLOROETHANE					NA
BENZENE		69000000 D			NA
TRANS-1,3-DICHLOROPROPENE					NA
BROMOFORM					NA
4-METHYL-2-PENTANONE					NA
2-HEXANONE					NA
TETRACHLOROETHENE			170 D	1 JP	NA
1,1,2,2-TETRACHLOROETHANE					NA
TOLUENE			330 D	210 P	NA
CHLOROBENZENE					NA
ETHYLBENZENE				4 JP	NA
STYRENE					NA
TOTAL XYLENES			7 JD	4 JP	NA

All results reported in µg/kg (ppb).
Only detected results are reported.
J – Indicates the value is less than the quantitation limit but greater than zero.

B – Compound detected in associated method blank.
D – Compound analyzed at a secondary dilution.
NA – Not analyzed.
[illegible] Compound concentration estimated due to surrogate outliers.

DELAWARE SAND &
VOLATILE ORGANIC COMPOUND
DETECTION LIMITS

SAMPLE-ID	SDD-2	SDD-3	SDR-1	SDR-2	SDR-3
SAMPLE TYPE	SLUDGE	SLUDGE	SOIL	SOIL	SOIL
COLLECTION DATE	7/20/90	7/20/90	7/22/90	7/22/90	7/24/90
PARAMETER					
CHLOROMETHANE	1200	4000000	25	11 P	NA
BROMOMETHANE	1200	4000000	25	11 P	NA
VINYL CHLORIDE	1200	4000000	25	11 P	NA
CHLOROETHANE	1200	4000000	25	11 P	NA
METHYLENE CHLORIDE		2000000			NA
ACETONE		4000000		11 P	NA
CARBON DISULFIDE	620	2000000	13	5 P	NA
1,1-DICHLOROETHENE	620	2000000	13	5 P	NA
1,1-DICHLOROETHANE	620	2000000	13	5 P	NA
1,2-DICHLOROETHENE (TOTAL)	620	2000000	13	5 P	NA
CHLOROFORM		2000000	13	5 P	NA
1,2-DICHLOROETHANE		2000000	13	5 P	NA
2-BUTANONE	1200	4000000	25	11 P	NA
1,1,1-TRICHLOROETHANE	620	2000000	13	5 P	NA
CARBON TETRACHLORIDE	620	2000000	13	5 P	NA
VINYL ACETATE	1200	4000000	25	11 P	NA
BROMODICHLOROMETHANE	620	2000000	13	5 P	NA
1,2-DICHLOROPROPANE	620	2000000	13	5 P	NA
CIS-1,3-DICHLOROPROPENE	620	2000000	13	5 P	NA
TRICHLOROETHENE	620	2000000	13	5 P	NA
DIBROMOCHLOROMETHANE	620	2000000	13	5 P	NA
1,1,2-TRICHLOROETHANE	620	2000000	13	5 P	NA
BENZENE	620		13	5 P	NA
TRANS-1,3-DICHLOROPROPENE	620	2000000	13	5 P	NA
BROMOFORM	620	2000000	13	5 P	NA
4-METHYL-2-PENTANONE	1200	4000000	25	11 P	NA
2-HEXANONE	1200	4000000	25	11 P	NA
TETRACHLOROETHENE	620	2000000			NA
1,1,2,2-TETRACHLOROETHANE	620	2000000	13	5 P	NA
TOLUENE	620	2000000			NA
CHLOROBENZENE	620	2000000	13	5 P	NA
ETHYLBENZENE	620	2000000	13		NA
STYRENE	620	2000000	13	5 P	NA
TOTAL XYLENES	620	2000000			NA

All results reported in µg/kg (ppb).
Detection limits for positive results not reported.

NA – Not analyzed.
P – Compound concentration estimated due to surrogate outliers.

DELAWARE SAND & GRAVEL
SEMIVOLATILE ORGANIC COMPOUND
ANALYTICAL RESULTS

SAMPLE-ID	SDD-2	SDD-3	SDR-1	SDR-2	SDR-3
SAMPLE TYPE	SLUDGE	SLUDGE	SOIL	SOIL	SOIL
COLLECTION DATE	7/20/90	7/20/90	7/22/90	7/22/90	7/24/90
PARAMETER					
PHENOL					110 J
BIS(2-CHLOROETHYL) ETHER					
2-CHLOROPHENOL					
1,3-DICHLOROBENZENE					
1,4-DICHLOROBENZENE					
BENZYL ALCOHOL					
1,2-DICHLOROBENZENE					110 J
2-METHYLPHENOL					
BIS(2-CHLOROISOPROPYL) ETHER					
4-METHYLPHENOL					
N-NITROSO-DI-N-PROPYLAMINE					
HEXACHLOROETHANE					
NITROBENZENE					
ISOPHORONE					
2-NITROPHENOL					
2,4-DIMETHYLPHENOL					
BENZOIC ACID					
BIS(2-CHLOROETHOXY)METHANE					
2,4-DICHLOROPHENOL					
1,2,4-TRICHLOROBENZENE					97 J
NAPHTHALENE		2300000			
4-CHLOROANILINE					
HEXACHLOROBUTADIENE					
4-CHLORO-3-METHYLPHENOL					
2-METHYLNAPHTHALENE		12000 J			
HEXACHLOROCYCLOPENTADIENE					
2,4,6-TRICHLOROPHENOL					
2,4,5-TRICHLOROPHENOL					
2-CHLORONAPHTHALENE					
2-NITROANILINE					
DIMETHYLPHTHALATE					
ACENAPHTHYLENE					
2,6-DINITROTOLUENE					

All results reported in µg/kg (ppb).
Only detected results are reported.

J – Indicates the value is less than the quantitation limit but greater than zero.

DELAWARE SAND & GRA
SEMIVOLATILE ORGANIC COMPOUND
DETECTION LIMITS

SAMPLE-ID	SDD-2	SDD-3	SDR-1	SDR-2	SDR-3
SAMPLE TYPE	SLUDGE	SLUDGE	SOIL	SOIL	SOIL
COLLECTION DATE	7/20/90	7/20/90	7/22/90	7/22/90	7/24/90
PARAMETER					
PHENOL	16000	160000	1000	690	
BIS(2-CHLOROETHYL) ETHER	16000	160000	1000	690	720
2-CHLOROPHENOL	16000	160000	1000	690	720
1,3-DICHLOROBENZENE	16000	160000	1000	690	720
1,4-DICHLOROBENZENE	16000	160000	1000	690	720
BENZYL ALCOHOL	16000	160000	1000	690	720
1,2-DICHLOROBENZENE	16000	160000	1000	690	
2-METHYLPHENOL	16000	160000	1000	690	720
BIS(2-CHLOROISOPROPYL) ETHER	16000	160000	1000	690	720
4-METHYLPHENOL	16000	160000	1000	690	720
N-NITROSO-DI-N-PROPYLAMINE	16000	160000	1000	690	720
HEXACHLOROETHANE	16000	160000	1000	690	720
NITROBENZENE	16000	160000	1000	690	720
ISOPHORONE	16000	160000	1000	690	720
2-NITROPHENOL	16000	160000	1000	690	720
2,4-DIMETHYLPHENOL	16000	160000	1000	690	720
BENZOIC ACID	80000	760000	4800	3400	3500
BIS(2-CHLOROETHOXY)METHANE	16000	160000	1000	690	720
2,4-DICHLOROPHENOL	16000	160000	1000	690	720
1,2,4-TRICHLOROBENZENE	16000	160000	1000	690	
NAPHTHALENE	16000		1000	690	720
4-CHLOROANILINE	16000	160000	1000	690	720
HEXACHLOROBUTADIENE	16000	160000	1000	690	720
4-CHLORO-3-METHYLPHENOL	16000	160000	1000	690	720
2-METHYLNAPHTHALENE	16000		1000	690	720
HEXACHLOROCYCLOPENTADIENE	16000	160000	1000	690	720
2,4,6-TRICHLOROPHENOL	16000	160000	1000	690	720
2,4,5-TRICHLOROPHENOL	80000	760000	4800	3400	3500
2-CHLORONAPHTHALENE	16000	160000	1000	690	720
2-NITROANILINE	80000	760000	4800	3400	3500
DIMETHYLPHTHALATE	16000	160000	1000	690	720
ACENAPHTHYLENE	16000	160000	1000	690	720
2,6-DINITROTOLUENE	16000	160000	1000	690	720

All results reported in µg/kg (ppb).
Detection limits for positive results not reported.

DELAWARE SAN. . GRAVEL
SEMIVOLATILE ORGANIC COMPOUND
ANALYTICAL RESULTS

SAMPLE-ID	SDD-2	SDD-3	SDR-1	SDR-2	SDR-3
SAMPLE TYPE	SLUDGE	SLUDGE	SOIL	SOIL	SOIL
COLLECTION DATE	7/20/90	7/20/90	7/22/90	7/22/90	7/24/90
PARAMETER					
3-NITROANILINE					
ACENAPHTHENE					17 J
2,4-DINITROPHENOL					
4-NITROPHENOL			2500 J		
DIBENZOFURAN					420 J
2,4-DINITROTOLUENE					
DIETHYLPHTHALATE					
4-CHLOROPHENYL-PHENYL ETHER					
FLUORENE					27 J
4-NITROANILINE					
4,6-DINITRO-2-METHYLPHENOL					
N-NITROSODIPHENYLAMINE			240 J		680 J
4-BROMOPHENYL-PHENYL ETHER					
HEXACHLOROBENZENE					650 J
PENTACHLOROPHENOL					
PHENANTHRENE					190 J
ANTHRACENE					
DI-N-BUTYLPHTHALATE					
FLUORANTHENE					150 J
PYRENE					79 J
BUTYLBENZYLPHTHALATE					
3,3'-DICHLOROBENZIDINE					
BENZO(A)ANTHRACENE					
CHRYSENE					
BIS(2-ETHYLHEXYL)PHTHALATE	1800 BJ				660 BJ
DI-N-OCTYL PHTHALATE					53 J
BENZO(B)FLUORANTHENE					
BENZO(K)FLUORANTHENE					
BENZO(A)PYRENE					
INDENO(1,2,3-CD)PYRENE					
DIBENZ(A,H)ANTHRACENE					
BENZO(G,H,I)PERYLENE					

All results reported in µg/kg (ppb).
Only detected results are reported.

B – Compound detected in associated method blank.
J – Indicates the value is less than the quantitation limit but greater than zero.

DELAWARE SAND & GR
SEMIVOLATILE ORGANIC COMPOUND
DETECTION LIMITS

SAMPLE-ID	SDD-2	SDD-3	SDR-1	SDR-2	SDR-3
SAMPLE TYPE	SLUDGE	SLUDGE	SOIL	SOIL	SOIL
COLLECTION DATE	7/20/90	7/20/90	7/22/90	7/22/90	7/24/90
PARAMETER					
3-NITROANILINE	80000	760000	4800	3400	3500
ACENAPHTHENE	16000	160000	1000	690	
2,4-DINITROPHENOL	80000	760000	4800	3400	3500
4-NITROPHENOL	80000	760000		3400	3500
DIBENZOFURAN	16000	160000	1000	690	
2,4-DINITROTOLUENE	16000	160000	1000	690	720
DIETHYLPHTHALATE	16000	160000	1000	690	720
4-CHLOROPHENYL-PHENYL ETHER	16000	160000	1000	690	720
FLUORENE	16000	160000	1000	690	
4-NITROANILINE	80000	760000	4800	3400	3500
4,6-DINITRO-2-METHYLPHENOL	80000	760000	4800	3400	3500
N-NITROSODIPHENYLAMINE	16000	160000		690	
4-BROMOPHENYL-PHENYL ETHER	16000	160000	1000	690	720
HEXACHLOROBENZENE	16000	160000	1000	690	
PENTACHLOROPHENOL	80000	760000	4800	3400	3500
PHENANTHRENE	16000	160000	1000	690	
ANTHRACENE	16000	160000	1000	690	720
DI-N-BUTYLPHTHALATE	16000	160000	1000	690	720
FLUORANTHENE	16000	160000	1000	690	
PYRENE	16000	160000	1000	690	
BUTYLBENZYLPHTHALATE	16000	160000	1000	690	720
3,3'-DICHLOROBENZIDINE	33000	310000	2000	1400	1400
BENZO(A)ANTHRACENE	16000	160000	1000	690	720
CHRYSENE	16000	160000	1000	690	720
BIS(2-ETHYLHEXYL)PHTHALATE		160000	1000	690	
DI-N-OCTYL PHTHALATE	16000	160000	1000	690	
BENZO(B)FLUORANTHENE	16000	160000	1000	690	720
BENZO(K)FLUORANTHENE	16000	160000	1000	690	720
BENZO(A)PYRENE	16000	160000	1000	690	720
INDENO(1,2,3-CD)PYRENE	16000	160000	1000	690	720
DIBENZ(A,H)ANTHRACENE	16000	160000	1000	690	720
BENZO(G,H,I)PERYLENE	16000	160000	1000	690	720

All results reported in µg/kg (ppb).

Detection limits for positive results not reported.

DELAWARE SAN. GRAVEL
PESTICIDE/PCB

ANALYTICAL RESULTS

SAMPLE-ID	SDD-2	SDD-3	SDR-1	SDR-2	SDR-3
SAMPLE TYPE	SLUDGE	SLUDGE	SOIL	SOIL	SOIL
COLLECTION DATE	7/20/90	7/20/90	7/22/90	7/22/90	7/24/90
PARAMETER					
ALPHA-BHC					
BETA-BHC					
DELTA-BHC					
GAMMA-BHC (LINDANE)					
HEPTACHLOR					
ALDRIN					
HEPTACHLOR EPOXIDE					
ENDOSULFAN I					
DIELDRIN					
4,4'-DDE					
ENDRIN					
ENDOSULFAN II					
4,4'-DDD					
ENDOSULFAN SULFATE					
4,4'-DDT					
METHOXYCHLOR					
ENDRIN KETONE					
ALPHA-CHLORDANE					
GAMMA-CHLORDANE					
TOXAPHENE					
AROCLOR-1016					
AROCLOR-1221					
AROCLOR-1232					
AROCLOR-1242					
AROCLOR-1248					
AROCLOR-1254		6000 JX	510 X	940 X	13000 X
AROCLOR-1260					

All results reported in µg/kg (ppb).
Only detected results are reported.

X – Concentration calculated from multi-peak response factor.
J – Indicates the value is less than the quantitation limit but greater than zero.

DELAWARE SAND & GRA
PESTICIDE/PCB

DETECTION LIMITS

SAMPLE-ID	SDD-2	SDD-3	SDR-1	SDR-2	SDR-3
SAMPLE TYPE	SLUDGE	SLUDGE	SOIL	SOIL	SOIL
COLLECTION DATE	7/20/90	7/20/90	7/22/90	7/22/90	7/24/90
PARAMETER					
ALPHA-BHC	400	380	24	17	170
BETA-BHC	400	380	24	17	170
DELTA-BHC	400	380	24	17	170
GAMMA-BHC (LINDANE)	400	380	24	17	170
HEPTACHLOR	400	380	24	17	170
ALDRIN	400	380	24	17	170
HEPTACHLOR EPOXIDE	400	380	24	17	170
ENDOSULFAN I	400	380	24	17	170
DIELDRIN	800	760	48	34	350
4,4'-DDE	800	760	48	34	350
ENDRIN	800	760	48	34	350
ENDOSULFAN II	800	760	48	34	350
4,4'-DDD	800	760	48	34	350
ENDOSULFAN SULFATE	800	760	48	34	350
4,4'-DDT	800	760	48	34	350
METHOXYCHLOR	4000	3800	240	170	1700
ENDRIN KETONE	800	760	48	34	350
ALPHA-CHLORDANE	4000	3800	240	170	1700
GAMMA-CHLORDANE	4000	3800	240	170	1700
TOXAPHENE	8000	7600	480	340	3500
AROCLOR-1016	4000	3800	240	170	1700
AROCLOR-1221	4000	3800	240	170	1700
AROCLOR-1232	4000	3800	240	170	1700
AROCLOR-1242	4000	3800	240	170	1700
AROCLOR-1248	4000	3800	240	170	1700
AROCLOR-1254	8000				
AROCLOR-1260	8000	7600	480	340	3500

All results reported in µg/kg (ppb).

Detection limits for positive results not reported.

DELAWARE SAND & GRAVEL
POLYCHLORINATED DIBENZO-P-DIOXIN
POLYCHLORINATED DIBENZO-P-FURAN
ANALYTICAL RESULTS

	SDD-2	SDD-3	SDR-1	SDR-2	SDR-3
SAMPLE TYPE	SLUDGE	SLUDGE	SOIL	SOIL	SOIL
COLLECTION DATE	7/20/90	7/20/90	7/22/90	7/22/90	7/24/90
PARAMETER					
DIOXIN					
TETRA 2378 TCDD					NA
TETRA TOTAL TCDD					NA
PENTA 12378 PeCDD					NA
PENTA TOTAL PeCDD					NA
HEXA 123478 HxCDD					NA
HEXA 123678 HxCDD					NA
HEXA 123789 HxCDD					NA
HEXA TOTAL HxCDD					NA
HEPTA 1234678 HpCDD					NA
HEPTA TOTAL HpCDD					NA
OCTA TOTAL OCDD		1.356			NA
FURAN					
TETRA 2378 TCDF					NA
TETRA TOTAL TCDF					NA
PENTA 12378 PeCDF					NA
PENTA 23478 PeCDF					NA
PENTA TOTAL PeCDF					NA
HEXA 123478 HxCDF					NA
HEXA 123678 HxCDF					NA
HEXA 123789 HxCDF					NA
HEXA 234678 HxCDF					NA
HEXA TOTAL HxCDF					NA
HEPTA 1234678 HpCDF					NA
HEPTA 1234789 HpCDF					NA
HEPTA TOTAL HpCDF		0.819			NA
OCTA TOTAL OCDF		1.629			NA

All results reported in µg/kg (ppb).
Only detected results are reported.

NA – Not Analyzed

DELAWARE SAND & G[illegible]

POLYCHLORINATED DIBENZO-P-DIOXIN

POLYCHLORINATED DIBENZO-P-FURAN

DETECTION LIMITS

SAMPLE-ID	SDD-2	SDD-3	SDR-1	SDR-2	SDR-3
SAMPLE TYPE	SLUDGE	SLUDGE	SOIL	SOIL	SOIL
COLLECTION DATE	7/20/90	7/20/90	7/22/90	7/22/90	7/24/90
PARAMETER					
DIOXIN					
TETRA 2378 TCDD					NA
TETRA TOTAL TCDD	0.226	0.046	0.027	0.032	NA
PENTA 12378 PeCDD					NA
PENTA TOTAL PeCDD	0.375	0.132	0.045	0.04	NA
HEXA 123478 HxCDD					NA
HEXA 123678 HxCDD					NA
HEXA 123789 HxCDD					NA
HEXA TOTAL HxCDD	1.608	0.188	0.059	0.079	NA
HEPTA 1234678 HpCDD					NA
HEPTA TOTAL HpCDD	1.280	0.282	0.142	0.074	NA
OCTA TOTAL OCDD	2.478		0.105	0.141	NA
FURAN					
TETRA 2378 TCDF					NA
TETRA TOTAL TCDF	0.325	0.049	0.015	0.031	NA
PENTA 12378 PeCDF					NA
PENTA 23478 PeCDF					NA
PENTA TOTAL PeCDF	0.301	0.071	0.033	0.041	NA
HEXA 123478 HxCDF					NA
HEXA 123678 HxCDF					NA
HEXA 123789 HxCDF					NA
HEXA 234678 HxCDF					NA
HEXA TOTAL HxCDF	1.247	0.049	0.051	0.092	NA
HEPTA 1234678 HpCDF					NA
HEPTA 1234789 HpCDF					NA
HEPTA TOTAL HpCDF	1.032		0.093	0.043	NA
OCTA TOTAL OCDF	1.319		0.141	0.128	NA

All results reported in µg/kg (ppb).

Only detection limits for total isomers reported.

NA - Not analyzed.

DELAWARE SAND & GRAVEL
METAL/CLASSICAL CHEMISTRIES
ANALYTICAL RESULTS

SAMPLE-ID	SDD-2	SDD-3	SDR-1	SDR-2	SDR-3
SAMPLE TYPE	SLUDGE	SLUDGE	SOIL	SOIL	SOIL
COLLECTION DATE	7/20/90	7/20/90	7/22/90	7/22/90	7/24/90
PARAMETER					
ALUMINUM	20.2 B	1050	28300 *	1500 *	5180 *
ANTIMONY			88.4	6.3 B	21.2
ARSENIC			7.6 N		2.2 BN
BARIUM	5 B	15.3 B	31.4 B	20.2 B	789
BERYLLIUM			0.4 B	0.42 B	
CADMIUM			3.5		1.3 BN
CALCIUM	84.9 BE	99200 E	229 BE	61.5 BE	128 BE
CHROMIUM		3.1 B	378 *	5.5 *	17.5
COBALT			4.3 B	0.65 B	3 B
COPPER	3.9 B	23.2	46.3	2820	943
IRON	757	922	130000 *	3840 *	28700
LEAD		3.8 W	109 N	14.6 N	118
MAGNESIUM	30.1 B	1100 B	143 N	68.2 B	228 BE
MANGANESE	39.6	22.5	153 N	37.5 N	70.2
MERCURY	0.35				
NICKEL			7.4 B		6.7 B
POTASSIUM			1360 B		642 B
SELENIUM					
SILVER			10.2		2 B
SODIUM	5770	297 B	3470	79.8 B	207 B
THALLIUM					
VANADIUM		1.8 B	180	4.8 B	24.5
ZINC	2.4 BE	148 E	22.5 E*	8 E*	15.2 E
CYANIDE					
SULFIDE	227	124	260	453	NA

All results reported in mg/kg (ppm).
Only detected results are reported.
E – Value is estimated due to the presence of interference.
* – Duplicate analysis not within QC limits.
NA – Not analyzed.
W – Post-digestion spike for furnace is out of QC limits, while absorbance is less than 50% of spike absorbance.
B – Value is less than quantitation limit but greater than instrument detection limit.
N – Spike recovery not within QC limits.

DELAWARE SAND & GRAVEL
METAL/CLASSICAL CHEMISTRIES
DETECTION LIMITS

SAMPLE-ID	SDD-2	SDD-3	SDR-1	SDR-2	SDR-3
SAMPLE TYPE	SLUDGE	SLUDGE	SOIL	SOIL	SOIL
COLLECTION DATE	7/20/90	7/20/90	7/22/90	7/22/90	7/24/90
PARAMETER					
ALUMINUM					
ANTIMONY	5.40	15.50			
ARSENIC	1.00			1.00	
BARIUM					
BERYLLIUM	0.21	0.60			0.33
CADMIUM	0.62	1.80		0.63	
CALCIUM					
CHROMIUM	0.41				
COBALT	0.62	1.80			
COPPER					
IRON					
LEAD	0.41				
MAGNESIUM					
MANGANESE					
MERCURY		0.25	0.14	0.14	0.13
NICKEL	1.90	5.40		1.90	
POTASSIUM	71.50	205.00		72.10	
SELENIUM	0.62	1.80	0.91	0.63	0.98
SILVER	0.41	1.20		0.42	
SODIUM					
THALLIUM	0.62	1.80	0.91	0.63	0.98
VANADIUM	0.41				
ZINC					
CYANIDE	4.40	11.60	5.90	3.70	2.90
SULFIDE			1.0	1.0	NA

All results reported in mg/kg (ppm).
Detection limits for positive results not reported.
NA - Not analyzed.

DELAWARE SAND & GRAVEL
VOLATILE ORGANIC COMPOUND
ANALYTICAL RESULTS

SAMPLE-ID	SDD-1	SDD-5	TP-2-2
SAMPLE TYPE	AQUEOUS	AQUEOUS	AQUEOUS
COLLECTION DATE	7/24/90	7/24/90	7/24/90
PARAMETER			
CHLOROMETHANE			
BROMOMETHANE			
VINYL CHLORIDE			
CHLOROETHANE			
METHYLENE CHLORIDE	900000		41000
ACETONE	250000		
CARBON DISULFIDE			
1,1-DICHLOROETHENE			
1,1-DICHLOROETHANE			
1,2-DICHLOROETHENE (TOTAL)			
CHLOROFORM			
1,2-DICHLOROETHANE	110000	8	58000
2-BUTANONE	140000		
1,1,1-TRICHLOROETHANE			
CARBON TETRACHLORIDE			
VINYL ACETATE			
BROMODICHLOROMETHANE			
1,2-DICHLOROPROPANE			
CIS-1,3-DICHLOROPROPENE			
TRICHLOROETHENE			
DIBROMOCHLOROMETHANE			
1,1,2-TRICHLOROETHANE			
BENZENE			1100 J
TRANS-1,3-DICHLOROPROPENE			
BROMOFORM			
4-METHYL-2-PENTANONE			
2-HEXANONE			
TETRACHLOROETHENE			
1,1,2,2-TETRACHLOROETHANE			
TOLUENE	12000 J		29000
CHLOROBENZENE			
ETHYLBENZENE			890 J
STYRENE			2400 J
TOTAL XYLENES		6	4000

All results reported in µg/L (ppb).
Only detected results are reported.

J – Indicates the value is less than the quantitation limit but greater than zero.

DELAWARE SAND & GRAVEL
VOLATILE ORGANIC COMPOUND
DETECTION LIMITS

SAMPLE-ID	SDD-1	SDD-5	TP-2-2
SAMPLE TYPE	AQUEOUS	AQUEOUS	AQUEOUS
COLLECTION DATE	7/24/90	7/24/90	7/24/90
PARAMETER			
CHLOROMETHANE	50000	10	5000
BROMOMETHANE	50000	10	5000
VINYL CHLORIDE	50000	10	5000
CHLOROETHANE	50000	10	5000
METHYLENE CHLORIDE		5	
ACETONE		10	5000
CARBON DISULFIDE	25000	5	2500
1,1-DICHLOROETHENE	25000	5	2500
1,1-DICHLOROETHANE	25000	5	2500
1,2-DICHLOROETHENE (TOTAL)	25000	5	2500
CHLOROFORM	25000	5	2500
1,2-DICHLOROETHANE		5	
2-BUTANONE		10	5000
1,1,1-TRICHLOROETHANE	25000	5	2500
CARBON TETRACHLORIDE	25000	5	2500
VINYL ACETATE	50000	10	5000
BROMODICHLOROMETHANE	25000	5	2500
1,2-DICHLOROPROPANE	25000	5	2500
CIS-1,3-DICHLOROPROPENE	25000	5	2500
TRICHLOROETHENE	25000	5	2500
DIBROMOCHLOROMETHANE	25000	5	2500
1,1,2-TRICHLOROETHANE	25000	5	2500
BENZENE	25000	5	
TRANS-1,3-DICHLOROPROPENE	25000	5	2500
BROMOFORM	25000	5	2500
4-METHYL-2-PENTANONE	50000	10	5000
2-HEXANONE	50000	10	5000
TETRACHLOROETHENE	25000	5	2500
1,1,2,2-TETRACHLOROETHANE	25000	5	2500
TOLUENE		5	
CHLOROBENZENE	25000	5	2500
ETHYLBENZENE	25000	5	
STYRENE	25000	5	
TOTAL XYLENES	25000		

All results reported in µg/L (ppb).
Detection limits for positive results not reported.

DELAWARE SAND & GRAVEL
SEMIVOLATILE ORGANIC COMPOUND
ANALYTICAL RESULTS

SAMPLE-ID	SDD-1 *	SDD-5 *	TP-2-2 *
SAMPLE TYPE	AQUEOUS	AQUEOUS	AQUEOUS
COLLECTION DATE	7/24/90	7/24/90	7/24/90
PARAMETER			
PHENOL			
BIS(2-CHLOROETHYL) ETHER			
2-CHLOROPHENOL			
1,3-DICHLOROBENZENE			
1,4-DICHLOROBENZENE			
BENZYL ALCOHOL			
1,2-DICHLOROBENZENE			
2-METHYLPHENOL			
BIS(2-CHLOROISOPROPYL) ETHER			
4-METHYLPHENOL			
N-NITROSO-DI-N-PROPYLAMINE			
HEXACHLOROETHANE			
NITROBENZENE			
ISOPHORONE			
2-NITROPHENOL			
2,4-DIMETHYLPHENOL			
BENZOIC ACID			
BIS(2-CHLOROETHOXY)METHANE			
2,4-DICHLOROPHENOL			
1,2,4-TRICHLOROBENZENE	4000 J		
NAPHTHALENE	3900 J		
4-CHLOROANILINE			
HEXACHLOROBUTADIENE			
4-CHLORO-3-METHYLPHENOL			
2-METHYLNAPHTHALENE			
HEXACHLOROCYCLOPENTADIENE			
2,4,6-TRICHLOROPHENOL			
2,4,5-TRICHLOROPHENOL			
2-CHLORONAPHTHALENE			
2-NITROANILINE			
DIMETHYLPHTHALATE			
ACENAPHTHYLENE			
2,6-DINITROTOLUENE			

All results reported in µg/L (ppb).
Only detected results are reported.

J – Indicates the value is less than the quantitation limit but greater than zero.

* – Sample results calculated with extraction holding times exceeded but within analysis holding times.

DELAWARE SAND & GRAVEL
SEMIVOLATILE ORGANIC COMPOUND
DETECTION LIMITS

SAMPLE-ID	SDD-1 *	SDD-5 *	TP-2-2 *
SAMPLE TYPE	AQUEOUS	AQUEOUS	AQUEOUS
COLLECTION DATE	7/24/90	7/24/90	7/24/90
PARAMETER			
PHENOL	30000	50	30000
BIS(2-CHLOROETHYL) ETHER	30000	50	30000
2-CHLOROPHENOL	30000	50	30000
1,3-DICHLOROBENZENE	30000	50	30000
1,4-DICHLOROBENZENE	30000	50	30000
BENZYL ALCOHOL	30000	50	30000
1,2-DICHLOROBENZENE	30000	50	30000
2-METHYLPHENOL	30000	50	30000
BIS(2-CHLOROISOPROPYL) ETHER	30000	50	30000
4-METHYLPHENOL	30000	50	30000
N-NITROSO-DI-N-PROPYLAMINE	30000	50	30000
HEXACHLOROETHANE	30000	50	30000
NITROBENZENE	30000	50	30000
ISOPHORONE	30000	50	30000
2-NITROPHENOL	30000	50	30000
2,4-DIMETHYLPHENOL	30000	50	30000
BENZOIC ACID	150000	250	150000
BIS(2-CHLOROETHOXY)METHANE	30000	50	30000
2,4-DICHLOROPHENOL	30000	50	30000
1,2,4-TRICHLOROBENZENE		50	30000
NAPHTHALENE		50	30000
4-CHLOROANILINE	30000	50	30000
HEXACHLOROBUTADIENE	30000	50	30000
4-CHLORO-3-METHYLPHENOL	30000	50	30000
2-METHYLNAPHTHALENE	30000	50	30000
HEXACHLOROCYCLOPENTADIENE	30000	50	30000
2,4,6-TRICHLOROPHENOL	30000	50	30000
2,4,5-TRICHLOROPHENOL	150000	250	150000
2-CHLORONAPHTHALENE	30000	50	30000
2-NITROANILINE	150000	250	150000
DIMETHYLPHTHALATE	30000	50	30000
ACENAPHTHYLENE	30000	50	30000
2,6-DINITROTOLUENE	30000	50	30000

All results reported in µg/L (ppb),
Detection limits for positive results not reported.

* – Detection limits calculated with extraction holding times exceeded but within analysis holding times.

DELAWARE SAND & GRAVEL
SEMIVOLATILE ORGANIC COMPOUND
ANALYTICAL RESULTS

SAMPLE-ID	SDD-1 *	SDD-5 *	TP-2-2 *
SAMPLE TYPE	AQUEOUS	AQUEOUS	AQUEOUS
COLLECTION DATE	7/24/90	7/24/90	7/24/90
PARAMETER			
3-NITROANILINE			
ACENAPHTHENE			
2,4-DINITROPHENOL			
4-NITROPHENOL			
DIBENZOFURAN			
2,4-DINITROTOLUENE			
DIETHYLPHTHALATE			
4-CHLOROPHENYL-PHENYL ETHER			
FLUORENE			
4-NITROANILINE			
4,6-DINITRO-2-METHYLPHENOL			
N-NITROSODIPHENYLAMINE			
4-BROMOPHENYL-PHENYL ETHER			
HEXACHLOROBENZENE			
PENTACHLOROPHENOL			
PHENANTHRENE			
ANTHRACENE			
DI-N-BUTYLPHTHALATE	22000 BJ	96	80000 B
FLUORANTHENE			
PYRENE			
BUTYLBENZYLPHTHALATE			
3,3'-DICHLOROBENZIDINE			
BENZO(A)ANTHRACENE			
CHRYSENE			
BIS(2-ETHYLHEXYL)PHTHALATE	22000 J		17000 J
DI-N-OCTYL PHTHALATE			3500 J
BENZO(B)FLUORANTHENE			
BENZO(K)FLUORANTHENE			
BENZO(A)PYRENE			
INDENO(1,2,3-CD)PYRENE			
DIBENZ(A,H)ANTHRACENE			
BENZO(G,H,I)PERYLENE			

All results reported in µg/L (ppb).
Only detected results are reported.

B – Compound detected in associated method blank.
J – Indicates the value is less than the quantitation limit but greater than zero.
* – Sample results calculated with extraction holding times exceeded but within analysis holding times.

DELAWARE SAND & GRAVEL
SEMIVOLATILE ORGANIC COMPOUND
DETECTION LIMITS

SAMPLE-ID	SDD-1 *	SDD-5 *	TP-2-2 *
SAMPLE TYPE	AQUEOUS	AQUEOUS	AQUEOUS
COLLECTION DATE	7/24/90	7/24/90	7/24/90
PARAMETER			
3-NITROANILINE	150000	250	150000
ACENAPHTHENE	30000	50	30000
2,4-DINITROPHENOL	150000	250	150000
4-NITROPHENOL	150000	250	150000
DIBENZOFURAN	30000	50	30000
2,4-DINITROTOLUENE	30000	50	30000
DIETHYLPHTHALATE	30000	50	30000
4-CHLOROPHENYL-PHENYL ETHER	30000	50	30000
FLUORENE	30000	50	30000
4-NITROANILINE	150000	250	150000
4,6-DINITRO-2-METHYLPHENOL	150000	250	150000
N-NITROSODIPHENYLAMINE	30000	50	30000
4-BROMOPHENYL-PHENYL ETHER	30000	50	30000
HEXACHLOROBENZENE	30000	50	30000
PENTACHLOROPHENOL	150000	250	150000
PHENANTHRENE	30000	50	30000
ANTHRACENE	30000	50	30000
DI-N-BUTYLPHTHALATE		50	
FLUORANTHENE	30000	50	30000
PYRENE	30000	50	30000
BUTYLBENZYLPHTHALATE	30000	50	30000
3,3'-DICHLOROBENZIDINE	60000	100	60000
BENZO(A)ANTHRACENE	30000	50	30000
CHRYSENE	30000	50	30000
BIS(2-ETHYLHEXYL)PHTHALATE			
DI-N-OCTYL PHTHALATE	30000	50	
BENZO(B)FLUORANTHENE	30000	50	30000
BENZO(K)FLUORANTHENE	30000	50	30000
BENZO(A)PYRENE	30000	50	30000
INDENO(1,2,3-CD)PYRENE	30000	50	30000
DIBENZ(A,H)ANTHRACENE	30000	50	30000
BENZO(G,H,I)PERYLENE	30000	50	30000

All results reported in µg/L (ppb).
Detection limits for positive results not reported.

* - Detection limits calculated with extraction holding times exceeded but within analysis holding times.

DELAWARE SAND & GRAVEL
PESTICIDE/PCB
ANALYTICAL RESULTS

SAMPLE-ID	SDD-1 *	SDD-5 *	TP-2-2 *
SAMPLE TYPE	AQUEOUS	AQUEOUS	AQUEOUS
COLLECTION DATE	7/24/90	7/24/90	7/24/90
PARAMETER			
ALPHA-BHC			
BETA-BHC			
DELTA-BHC			
GAMMA-BHC (LINDANE)			
HEPTACHLOR			
ALDRIN			
HEPTACHLOR EPOXIDE			
ENDOSULFAN I			
DIELDRIN			
4,4'-DDE			
ENDRIN			
ENDOSULFAN II			
4,4'-DDD			
ENDOSULFAN SULFATE			
4,4'-DDT			
METHOXYCHLOR			
ENDRIN KETONE			
ALPHA-CHLORDANE			
GAMMA-CHLORDANE			
TOXAPHENE			
AROCLOR-1016	1500 X		
AROCLOR-1221			
AROCLOR-1232			
AROCLOR-1242			
AROCLOR-1248			
AROCLOR-1254	4700 X		
AROCLOR-1260			

All results reported in µg/L (ppb).
Only detected results are reported.

X - Concentration calculated from multi-peak response factor.
* - Sample results calculated with extraction holding times exceeded but within analysis holding times.

DELAWARE SAND & GRAVEL
PESTICIDE/PCB
DETECTION LIMITS

SAMPLE-ID	SDD-1 *	SDD-5 *	TP-2-2 *
SAMPLE TYPE	AQUEOUS	AQUEOUS	AQUEOUS
COLLECTION DATE	7/24/90	7/24/90	7/24/90
PARAMETER			
ALPHA-BHC	25	2.0	25
BETA-BHC	25	2.0	25
DELTA-BHC	25	2.0	25
GAMMA-BHC (LINDANE)	25	2.0	25
HEPTACHLOR	25	2.0	25
ALDRIN	25	2.0	25
HEPTACHLOR EPOXIDE	25	2.0	25
ENDOSULFAN I	25	2.0	25
DIELDRIN	50	4.0	50
4,4'-DDE	50	4.0	50
ENDRIN	50	4.0	50
ENDOSULFAN II	50	4.0	50
4,4'-DDD	50	4.0	50
ENDOSULFAN SULFATE	50	4.0	50
4,4'-DDT	50	4.0	50
METHOXYCHLOR	250	20	250
ENDRIN KETONE	50	4.0	50
ALPHA-CHLORDANE	250	20	250
GAMMA-CHLORDANE	250	20	250
TOXAPHENE	500	40	500
AROCLOR-1016		20	250
AROCLOR-1221	250	20	250
AROCLOR-1232	250	20	250
AROCLOR-1242	250	20	250
AROCLOR-1248	250	20	250
AROCLOR-1254		40	500
AROCLOR-1260	500	40	500

All results reported in µg/L (ppb).
Detection limits for positive results not reported.

* - Detection limits calculated with extraction holding times exceeded but within analysis holding times.

DELAWARE SAND & GRAVEL
POLYCHLORINATED DIBENZO-P-DIOXIN
POLYCHLORINATED DIBENZO-P-FURAN
ANALYTICAL RESULTS

SAMPLE-ID	SDD-1	SDD-5	TP-2-2
SAMPLE TYPE	AQUEOUS	AQUEOUS	AQUEOUS
COLLECTION DATE	7/24/90	7/24/90	7/24/90
PARAMETER			
DIOXIN			
TETRA 2378 TCDD			
TETRA TOTAL TCDD			
PENTA 12378 PeCDD			
PENTA TOTAL PeCDD			
HEXA 123478 HxCDD			
HEXA 123678 HxCDD			
HEXA 123789 HxCDD			
HEXA TOTAL HxCDD			
HEPTA 1234678 HpCDD			
HEPTA TOTAL HpCDD			
OCTA TOTAL OCDD			
FURAN			
TETRA 2378 TCDF			
TETRA TOTAL TCDF			
PENTA 12378 PeCDF			
PENTA 23478 PeCDF			
PENTA TOTAL PeCDF			
HEXA 123478 HxCDF			
HEXA 123678 HxCDF			
HEXA 123789 HxCDF			
HEXA 234678 HxCDF			
HEXA TOTAL HxCDF			
HEPTA 1234678 HpCDF			
HEPTA 1234789 HpCDF			
HEPTA TOTAL HpCDF			
OCTA TOTAL OCDF			

All results reported in µg/L (ppb).
Only detected results are reported.

DELAWARE SAND & GRAVEL
POLYCHLORINATED DIBENZO-P-DIOXIN
POLYCHLORINATED DIBENZO-P-FURAN
DETECTION LIMITS

SAMPLE-ID	SDD-1	SDD-5	TP-2-2
SAMPLE TYPE	AQUEOUS	AQUEOUS	AQUEOUS
COLLECTION DATE	7/24/90	7/24/90	7/24/90
PARAMETER			
DIOXIN			
TETRA 2378 TCDD			
TETRA TOTAL TCDD	0.009	0.006	0.009
PENTA 12378 PeCDD			
PENTA TOTAL PeCDD	0.008	0.006	0.007
HEXA 123478 HxCDD			
HEXA 123678 HxCDD			
HEXA 123789 HxCDD			
HEXA TOTAL HxCDD	0.002	0.002	0.001
HEPTA 1234678 HpCDD			
HEPTA TOTAL HpCDD	0.002	0.002	0.003
OCTA TOTAL OCDD	0.001	0.002	0.003
FURAN			
TETRA 2378 TCDF			
TETRA TOTAL TCDF	0.001	0.004	0.004
PENTA 12378 PeCDF			
PENTA 23478 PeCDF			
PENTA TOTAL PeCDF	0.001	0.005	0.001
HEXA 123478 HxCDF			
HEXA 123678 HxCDF			
HEXA 123789 HxCDF			
HEXA 234678 HxCDF			
HEXA TOTAL HxCDF	0.001	0.001	0.006
HEPTA 1234678 HpCDF			
HEPTA 1234789 HpCDF			
HEPTA TOTAL HpCDF	0.001	0.002	0.002
OCTA TOTAL OCDF	0.001	0.002	0.003

All results reported in µg/L (ppb),
Detection limits for positive results not reported.

DELAWARE SAND & GRAVEL
METAL/CLASSICAL CHEMISTRIES
ANALYTICAL RESULTS

SAMPLE-ID	SDD-1	SDD-5	TP-2-2
SAMPLE TYPE	AQUEOUS	AQUEOUS	AQUEOUS
COLLECTION DATE	7/24/90	7/24/90	7/24/90
PARAMETER			
ALUMINUM	8530	5740	71800
ANTIMONY	963	104	206
ARSENIC			9.5 B
BARIUM	1090	514	1780
BERYLLIUM	2.3 B	2.5 B	8.4
CADMIUM	33.6	8.7	7
CALCIUM	61500	12700	26900
CHROMIUM	365	33	376
COBALT	314	55.7	140
COPPER	510	32.5	155
IRON		78000	181000
LEAD	799	148	1490
MAGNESIUM	31900	3850	11500
MANGANESE		2160	7020
MERCURY			
NICKEL	2830	911	152
POTASSIUM	12000	2150 B	5180
SELENIUM			
SILVER			
SODIUM	354000	10000	85600
THALLIUM			
VANADIUM	35.5 B	51.3	355
ZINC	6520	212	905
CYANIDE			
SULFIDE			

All results reported in $\mu g/L$ (ppb).
Only detected results are reported.

B – Value is less than quantitation limit but greater than instrument detection limit.

DELAWARE SAND & GRAVEL
METAL/CLASSICAL CHEMISTRIES
DETECTION LIMITS

SAMPLE-ID	SDD-1	SDD-5	TP-2-2
SAMPLE TYPE	AQUEOUS	AQUEOUS	AQUEOUS
COLLECTION DATE	7/24/90	7/24/90	7/24/90
PARAMETER			
ALUMINUM			
ANTIMONY			
ARSENIC	5.00	5.00	
BARIUM			
BERYLLIUM			
CADMIUM			
CALCIUM			
CHROMIUM			
COBALT			
COPPER			
IRON			
LEAD			
MAGNESIUM			
MANGANESE			
MERCURY	2.00	2.00	2.00
NICKEL			
POTASSIUM			
SELENIUM	15.00	3.00	15.00
SILVER	2.00	2.00	2.00
SODIUM			
THALLIUM	30.00	3.00	30.00
VANADIUM			
ZINC			
CYANIDE	10.00	10.00	10.00
SULFIDE	1.0	1.0	1.0

All results reported in $\mu g/L$ (ppb),
Detection limits for positive results not reported.

DELAWA. SAND & GRAVEL
VOLATILE ORGANIC COMPOUND
ANALYTICAL RESULTS

SAMPLE-ID	UD-2-8	UD-2-9	UD-2-12	UD-3-10	UD-3-13 #	UD-3-14	UD-4-10 #	UD-4-12	UD-4-16	UD-5-7	UD-5-11	UD-5-12
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	8/20/90	8/20/90	8/20/90	8/27/90	8/27/90	8/27/90	8/28/90	8/28/90	8/28/90	8/21/90	8/21/90	8/21/90
PARAMETER												
CHLOROMETHANE												
BROMOMETHANE												
VINYL CHLORIDE												
CHLOROETHANE												
METHYLENE CHLORIDE	18 B	18 B	17 B	5 BJ	18 B	12 BJ	8 BJ	8 BJ	13 BJ			48000 B
ACETONE	38 B	18 B	110	560	140	280	550	970	370		4600	
CARBON DISULFIDE												
1,1-DICHLOROETHENE												
1,1-DICHLOROETHANE												
1,2-DICHLOROETHENE (TOTAL)												
CHLOROFORM	4 BJ	4 BJ	5 BJ							360 BJ	300 J	17000 BJ
1,2-DICHLOROETHANE			4									
2-BUTANONE	4 J		45				84	350				
1,1,1-TRICHLOROETHANE												
CARBON TETRACHLORIDE												
VINYL ACETATE												
BROMODICHLOROMETHANE												
1,2-DICHLOROPROPANE												
CIS-1,3-DICHLOROPROPENE												
TRICHLOROETHENE												
DIBROMOCHLOROMETHANE												
1,1,2-TRICHLOROETHANE												
BENZENE			1 J									
TRANS-1,3-DICHLOROPROPENE												
BROMOFORM												
4-METHYL-2-PENTANONE												
2-HEXANONE												
TETRACHLOROETHENE												
1,1,2,2-TETRACHLOROETHANE												
TOLUENE	0.7 J		5 J		4 J	4 J				1300		830000
CHLOROBENZENE										610 J		
ETHYLBENZENE										2400		110000
STYRENE												
TOTAL XYLENES			3 J							19000		670000

All results reported in µg/kg (ppb)
Only detected results are reported

B - Compound detected in associated method blank.
- Sample split with Army Corps

J - Indicates the value is less than the quantitation limit but greater than zero.

DELAWARE SAN[illegible]RAVEL
VOLATILE ORGANIC COMPOUND
DETECTION LIMITS

SAMPLE-ID	UD-2-8	UD-2-9	UD-2-12	UD-3-10	UD-3-13 #	UD-3-14	UD-4-10 #	UD-4-12	UD-4-16	UD-5-7	UD-5-11	UD-5-12
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	8/20/90	8/20/90	8/20/90	8/27/90	8/27/90	8/27/90	8/28/90	8/28/90	8/28/90	8/21/90	8/21/90	8/21/90
PARAMETER												
CHLOROMETHANE	11	11	14	55	34	62	57	56	60	1800	1400	51000
BROMOMETHANE	11	11	14	55	34	62	57	56	60	1800	1400	51000
VINYL CHLORIDE	11	11	14	55	34	62	57	56	60	1800	1400	51000
CHLOROETHANE	11	11	14	55	34	62	57	56	60	1800	1400	51000
METHYLENE CHLORIDE										920	680	
ACETONE										1800		51000
CARBON DISULFIDE	5	5	7	27	17	31	28	28	30	920	680	25000
1,1-DICHLOROETHENE	5	5	7	27	17	31	28	28	30	920	680	25000
1,1-DICHLOROETHANE	5	5	7	27	17	31	28	28	30	920	680	25000
1,2-DICHLOROETHENE (TOTAL)	5	5	7	27	17	31	28	28	30	920	680	25000
CHLOROFORM				27	17	31	28	28	30			
1,2-DICHLOROETHANE	5	5		27	17	31	28	28	30	920	680	25000
2-BUTANONE		11		55	34	62			60	1800	1400	51000
1,1,1-TRICHLOROETHANE	5	5	7	27	17	31	28	28	30	920	680	25000
CARBON TETRACHLORIDE	5	5	7	27	17	31	28	28	30	920	680	25000
VINYL ACETATE	11	11	14	55	34	62	57	56	60	1800	1400	51000
BROMODICHLOROMETHANE	5	5	7	27	17	31	28	28	30	920	680	25000
1,2-DICHLOROPROPANE	5	5	7	27	17	31	28	28	30	920	680	25000
CIS-1,3-DICHLOROPROPENE	5	5	7	27	17	31	28	28	30	920	680	25000
TRICHLOROETHENE	5	5	7	27	17	31	28	28	30	920	680	25000
DIBROMOCHLOROMETHANE	5	5	7	27	17	31	28	28	30	920	680	25000
1,1,2-TRICHLOROETHANE	5	5	7	27	17	31	28	28	30	920	680	25000
BENZENE	5	5		27	17	31	28	28	30	920	680	25000
TRANS-1,3-DICHLOROPROPENE	5	5	7	27	17	31	28	28	30	920	680	25000
BROMOFORM	5	5	7	27	17	31	28	28	30	920	680	25000
4-METHYL-2-PENTANONE	11	11	14	55	34	62	57	56	60	1800	1400	51000
2-HEXANONE	11	11	14	55	34	62	57	56	60	1800	1400	51000
TETRACHLOROETHENE	5	5	7	27	17	31	28	28	30	920	680	25000
1,1,2,2-TETRACHLOROETHANE	5	5	7	27	17	31	28	28	30	920	680	25000
TOLUENE		5		27			28	28	30		680	
CHLOROBENZENE	5	5	7	27	17	31	28	28	30		680	25000
ETHYLBENZENE	5	5	7	27	17	31	28	28	30		680	
STYRENE	5	5	7	27	17	31	28	28	30	920	680	25000
TOTAL XYLENES	5	5		27	17	31	28	28	30		680	

All results reported in ug/kg (ppb).
Detection limits for positive results not reported.

– Sample split with Army Corps.

DELAWA JAND & GRAVEL
SEMIVOLATILE ORGANIC COMPOUND
ANALYTICAL RESULTS

SAMPLE-ID	UD-2-8	UD-2-9	UD-2-12	UD-3-10	UD-3-13 #	UD-3-14	UD-4-10 #	UD-4-12	UD-4-16	UD-5-7	UD-5-11	UD-5-12
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	8/20/90	8/20/90	8/20/90	8/27/90	8/27/90	8/27/90	8/28/90	8/28/90	8/28/90	8/21/90	8/21/90	8/21/90
PARAMETER												
PHENOL										380 J		1600
BIS(2-CHLOROETHYL) ETHER												
2-CHLOROPHENOL												
1,3-DICHLOROBENZENE												
1,4-DICHLOROBENZENE												
BENZYL ALCOHOL												
1,2-DICHLOROBENZENE										130 J		
2-METHYLPHENOL												
BIS(2-CHLOROISOPROPYL) ETHER												
4-METHYLPHENOL												
N-NITROSO-DI-N-PROPYLAMINE												
HEXACHLOROETHANE												
NITROBENZENE												
ISOPHORONE												
2-NITROPHENOL												
2,4-DIMETHYLPHENOL										900 J		
BENZOIC ACID												340 J
BIS(2-CHLOROETHOXY)METHANE												
2,4-DICHLOROPHENOL												
1,2,4-TRICHLOROBENZENE												
NAPHTHALENE												540 J
4-CHLOROANILINE												
HEXACHLOROBUTADIENE												
4-CHLORO-3-METHYLPHENOL												
2-METHYLNAPHTHALENE												310 J
HEXACHLOROCYCLOPENTADIENE												
2,4,6-TRICHLOROPHENOL												
2,4,5-TRICHLOROPHENOL												
2-CHLORONAPHTHALENE												
2-NITROANILINE												
DIMETHYLPHTHALATE												
ACENAPHTHYLENE												
2,6-DINITROTOLUENE												

All results reported in µg/kg (ppb).
Only detected results are reported.

– Sample split with Army Corps.

J – Indicates the value is less than the quantitation limit but greater than zero.

DELAWA[illegible]ND & GRAVEL
SEMIVOLATILE ORGANIC COMPOUND
DETECTION LIMITS

SAMPLE-ID	UD-2-8	UD-2-9	UD-2-12	UD-3-10	UD-3-13 #	UD-3-14	UD-4-10 #	UD-4-12	UD-4-16	UD-5-7	UD-5-11	UD-5-12
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	8/20/90	8/20/90	8/20/90	8/27/90	8/27/90	8/27/90	8/28/90	8/28/90	8/28/90	8/21/90	8/21/90	8/21/90
PARAMETER												
PHENOL	710	710	900	720	890	810	760	730	790		720	
BIS(2-CHLOROETHYL) ETHER	710	710	900	720	890	810	760	730	790	970	720	800
2-CHLOROPHENOL	710	710	900	720	890	810	760	730	790	970	720	800
1,3-DICHLOROBENZENE	710	710	900	720	890	810	760	730	790	970	720	800
1,4-DICHLOROBENZENE	710	710	900	720	890	810	760	730	790	970	720	800
BENZYL ALCOHOL	710	710	900	720	890	810	760	730	790	970	720	800
1,2-DICHLOROBENZENE	710	710	900	720	890	810	760	730	790		720	800
2-METHYLPHENOL	710	710	900	720	890	810	760	730	790	970	720	800
BIS(2-CHLOROISOPROPYL) ETHER	710	710	900	720	890	810	760	730	790	970	720	800
4-METHYLPHENOL	710	710	900	720	890	810	760	730	790	970	720	800
N-NITROSO-DI-N-PROPYLAMINE	710	710	900	720	890	810	760	730	790	970	720	800
HEXACHLOROETHANE	710	710	900	720	890	810	760	730	790	970	720	800
NITROBENZENE	710	710	900	720	890	810	760	730	790	970	720	800
ISOPHORONE	710	710	900	720	890	810	760	730	790	970	720	800
2-NITROPHENOL	710	710	900	720	890	810	760	730	790	970	720	800
2,4-DIMETHYLPHENOL	710	710	900	720	890	810	760	730	790		720	800
BENZOIC ACID	3400	3400	4400	3500	4300	4000	3700	3600	3800	4700	3500	
BIS(2-CHLOROETHOXY)METHANE	710	710	900	720	890	810	760	730	790	970	720	800
2,4-DICHLOROPHENOL	710	710	900	720	890	810	760	730	790	970	720	800
1,2,4-TRICHLOROBENZENE	710	710	900	720	890	810	760	730	790	970	720	800
NAPHTHALENE	710	710	900	720	890	810	760	730	790	970	720	
4-CHLOROANILINE	710	710	900	720	890	810	760	730	790	970	720	800
HEXACHLOROBUTADIENE	710	710	900	720	890	810	760	730	790	970	720	800
4-CHLORO-3-METHYLPHENOL	710	710	900	720	890	810	760	730	790	970	720	800
2-METHYLNAPHTHALENE	710	710	900	720	890	810	760	730	790	970	720	
HEXACHLOROCYCLOPENTADIENE	710	710	900	720	890	810	760	730	790	970	720	800
2,4,6-TRICHLOROPHENOL	710	710	900	720	890	810	760	730	790	970	720	800
2,4,5-TRICHLOROPHENOL	3400	3400	4400	3500	4300	4000	3700	3600	3800	4700	3500	3900
2-CHLORONAPHTHALENE	710	710	900	720	890	810	760	730	790	970	720	800
2-NITROANILINE	3400	3400	4400	3500	4300	4000	3700	3600	3800	4700	3500	3900
DIMETHYLPHTHALATE	710	710	900	720	890	810	760	730	790	970	720	800
ACENAPHTHYLENE	710	710	900	720	890	810	760	730	790	970	720	800
2,6-DINITROTOLUENE	710	710	900	720	890	810	760	730	790	970	720	800
3-NITROANILINE	3400	3400	4400	3500	4300	4000	3700	3600	3800	4700	3500	3900

All results reported in ug/kg (ppb).
Detection limits for positive results not reported.

– Sample split with Army Corps.

DELAWAR .ND & GRAVEL
SEMIVOLATILE ORGANIC COMPOUND
ANALYTICAL RESULTS

SAMPLE-ID	UD-2-8	UD-2-9	UD-2-12	UD-3-10	UD-3-13 #	UD-3-14	UD-4-10 #	UD-4-12	UD-4-16	UD-5-7	UD-5-11	UD-5-12
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	8/20/90	8/20/90	8/20/90	8/27/90	8/27/90	8/27/90	8/28/90	8/28/90	8/28/90	8/21/90	8/21/90	8/21/90
PARAMETER												
3-NITROANILINE												
ACENAPHTHENE												
2,4-DINITROPHENOL												
4-NITROPHENOL												
DIBENZOFURAN												
2,4-DINITROTOLUENE												
DIETHYLPHTHALATE												200 J
4-CHLOROPHENYL-PHENYL ETHER												
FLUORENE												
4-NITROANILINE												
4,6-DINITRO-2-METHYLPHENOL												
N-NITROSODIPHENYLAMINE												
4-BROMOPHENYL-PHENYL ETHER												
HEXACHLOROBENZENE												
PENTACHLOROPHENOL												
PHENANTHRENE												
ANTHRACENE												
DI-N-BUTYLPHTHALATE					44 J					1900	35 J	520 J
FLUORANTHENE												
PYRENE												
BUTYLBENZYLPHTHALATE												
3,3'-DICHLOROBENZIDINE												
BENZO(A)ANTHRACENE												
CHRYSENE												
BIS(2-ETHYLHEXYL)PHTHALATE					91 J	59 J		93 J	50 J	380 J	480 J	4700
DI-N-OCTYL PHTHALATE			55 J								74 J	1000
BENZO(B)FLUORANTHENE												
BENZO(K)FLUORANTHENE												
BENZO(A)PYRENE												
INDENO(1,2,3-CD)PYRENE												
DIBENZ(A,H)ANTHRACENE												
BENZO(G,H,I)PERYLENE												

All results reported in µg/kg (ppb).
Only detected results are reported.

– Sample split with Army Corps.

J – Indicates the value is less than the quantitation limit but greater than zero.

DELAWA[illegible]ND & GRAVEL
SEMIVOLATILE ORGANIC COMPOUND
DETECTION LIMITS

SAMPLE-ID	UD-2-8	UD-2-9	UD-2-12	UD-3-10	UD-3-13 #	UD-3-14	UD-4-10 #	UD-4-12	UD-4-16	UD-5-7	UD-5-11	UD-5-12
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	8/20/90	8/20/90	8/20/90	8/27/90	8/27/90	8/27/90	8/28/90	8/28/90	8/28/90	8/21/90	8/21/90	8/21/90
PARAMETER												
ACENAPHTHENE	710	710	900	720	890	810	760	730	790	970	720	800
2,4-DINITROPHENOL	3400	3400	4400	3500	4300	4000	3700	3600	3800	4700	3500	3900
4-NITROPHENOL	3400	3400	4400	3500	4300	4000	3700	3600	3800	4700	3500	3900
DIBENZOFURAN	710	710	900	720	890	810	760	730	790	970	720	800
2,4-DINITROTOLUENE	710	710	900	720	890	810	760	730	790	970	720	800
DIETHYLPHTHALATE	710	710	900	720	890	810	760	730	790	970	720	
4-CHLOROPHENYL-PHENYL ETHER	710	710	900	720	890	810	760	730	790	970	720	800
FLUORENE	710	710	900	720	890	810	760	730	790	970	720	800
4-NITROANILINE	3400	3400	4400	3500	4300	4000	3700	3600	3800	4700	3500	3900
4,6-DINITRO-2-METHYLPHENOL	3400	3400	4400	3500	4300	4000	3700	3600	3800	4700	3500	3900
N-NITROSODIPHENYLAMINE	710	710	900	720	890	810	760	730	790	970	720	800
4-BROMOPHENYL-PHENYL ETHER	710	710	900	720	890	810	760	730	790	970	720	800
HEXACHLOROBENZENE	710	710	900	720	890	810	760	730	790	970	720	800
PENTACHLOROPHENOL	3400	3400	4400	3500	4300	4000	3700	3600	3800	4700	3500	3900
PHENANTHRENE	710	710	900	720	890	810	760	730	790	970	720	800
ANTHRACENE	710	710	900	720	890	810	760	730	790	970	720	800
DI-N-BUTYLPHTHALATE	710	710	900	720		810	760	730	790			
FLUORANTHENE	710	710	900	720	890	810	760	730	790	970	720	800
PYRENE	710	710	900	720	890	810	760	730	790	970	720	800
BUTYLBENZYLPHTHALATE	710	710	900	720	890	810	760	730	790	970	720	800
3,3'-DICHLOROBENZIDINE	1400	1400	1800	1400	1800	1600	1500	1500	1600	1900	1400	1600
BENZO(A)ANTHRACENE	710	710	900	720	890	810	760	730	790	970	720	800
CHRYSENE	710	710	900	720	890	810	760	730	790	970	720	800
BIS(2-ETHYLHEXYL)PHTHALATE	710	710	900	720			760					
DI-N-OCTYL PHTHALATE	710	710		720	890	810	760	730	790	970		
BENZO(B)FLUORANTHENE	710	710	900	720	890	810	760	730	790	970	720	800
BENZO(K)FLUORANTHENE	710	710	900	720	890	810	760	730	790	970	720	800
BENZO(A)PYRENE	710	710	900	720	890	810	760	730	790	970	720	800
INDENO(1,2,3-CD)PYRENE	710	710	900	720	890	810	760	730	790	970	720	800
DIBENZ(A,H)ANTHRACENE	710	710	900	720	890	810	760	730	790	970	720	800
BENZO(G,H,I)PERYLENE	710	710	900	720	890	810	760	730	790	970	720	800

All results reported in ug/kg (ppb).
Detective limits for positive results not reported

- Sample split with Army Corps.

AR 011134

DELAWA AND & GRAVEL
PESTICIDE/PCB
ANALYTICAL RESULTS

SAMPLE-ID	UD-2-8	UD-2-9	UD-2-12	UD-3-10	UD-3-13 #	UD-3-14	UD-4-10 #	UD-4-12	UD-4-16	UD-5-7	UD-5-11	UD-5-12
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	8/20/90	8/20/90	8/20/90	8/27/90	8/27/90	8/27/90	8/28/90	8/28/90	8/28/90	8/21/90	8/21/90	8/21/90
PARAMETER												
ALPHA-BHC												
BETA-BHC												
DELTA-BHC												
GAMMA-BHC (LINDANE)												
HEPTACHLOR												
ALDRIN												
HEPTACHLOR EPOXIDE												
ENDOSULFAN I												
DIELDRIN												
4,4'-DDE												
ENDRIN												
ENDOSULFAN II												
4,4'-DDD												
ENDOSULFAN SULFATE												
4,4'-DDT												
METHOXYCHLOR												
ENDRIN KETONE												
ALPHA-CHLORDANE												
GAMMA-CHLORDANE												
TOXAPHENE												
AROCLOR-1016												
AROCLOR-1221												
AROCLOR-1232												
AROCLOR-1242												
AROCLOR-1248												
AROCLOR-1254												420 X
AROCLOR-1260												

All results reported in μg/kg (ppb).
Only detected results are reported.

X – Concentration calculated from multi-peak response factor.
– Sample split with Army Corps.

AR101235

B-000067

DELAWARE SAND [illegible]AVEL
PESTICIDE/PCB
DETECTION LIMITS

SAMPLE-ID	UD-2-8	UD-2-9	UD-2-12	UD-3-10	UD-3-13 #	UD-3-14	UD-4-10 #	UD-4-12	UD-4-16	UD-5-7	UD-5-11	UD-5-12
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	8/20/90	8/20/90	8/20/90	8/27/90	8/27/90	8/27/90	8/28/90	8/28/90	8/28/90	8/21/90	8/21/90	8/21/90
PARAMETER												
ALPHA-BHC	17	17	22	18	22	20	18	18	19	24	17	20
BETA-BHC	17	17	22	18	22	20	18	18	19	24	17	20
DELTA-BHC	17	17	22	18	22	20	18	18	19	24	17	20
GAMMA-BHC (LINDANE)	17	17	22	18	22	20	18	18	19	24	17	20
HEPTACHLOR	17	17	22	18	22	20	18	18	19	24	17	20
ALDRIN	17	17	22	18	22	20	18	18	19	24	17	20
HEPTACHLOR EPOXIDE	17	17	22	18	22	20	18	18	19	24	17	20
ENDOSULFAN I	17	17	22	18	22	20	18	18	19	24	17	20
DIELDRIN	34	34	44	35	43	39	36	36	38	47	35	39
4,4'-DDE	34	34	44	35	43	39	36	36	38	47	35	39
ENDRIN	34	34	44	35	43	39	36	36	38	47	35	39
ENDOSULFAN II	34	34	44	35	43	39	36	36	38	47	35	39
4,4'-DDD	34	34	44	35	43	39	36	36	38	47	35	39
ENDOSULFAN SULFATE	34	34	44	35	43	39	36	36	38	47	35	39
4,4'-DDT	34	34	44	35	43	39	36	36	38	47	35	39
METHOXYCHLOR	170	170	220	180	220	200	180	180	190	240	170	200
ENDRIN KETONE	34	34	44	35	43	39	36	36	38	47	35	39
ALPHA-CHLORDANE	170	170	220	180	220	200	180	180	190	240	170	200
GAMMA-CHLORDANE	170	170	220	180	220	200	180	180	190	240	170	200
TOXAPHENE	340	340	440	350	430	390	360	360	380	470	350	390
AROCLOR-1016	170	170	220	180	220	200	180	180	190	240	170	200
AROCLOR-1221	170	170	220	180	220	200	180	180	190	240	170	200
AROCLOR-1232	170	170	200	180	220	200	180	180	190	240	170	200
AROCLOR-1242	170	170	200	180	220	200	180	180	190	240	170	200
AROCLOR-1248	170	170	200	180	220	200	180	180	190	240	170	200
AROCLOR-1254	340	340	440	350	430	390	360	360	380	470	350	
AROCLOR-1260	340	340	440	350	430	390	360	360	380	470	350	390

[illegible]esults reported in ug/kg (ppb).

[illegible]ction limits for positive results not reported.

- Sample split with Army Corps.

DELAWARE .ID & GRAVEL
CLASSICAL CHEMISTRIES
ANALYTICAL RESULTS

MPLE-ID	UD-2-8	UD-2-9	UD-2-12	UD-3-10	UD-3-13 #	UD-3-14	UD-4-10 #	UD-4-12	UD-4-16	UD-5-7	UD-5-11	UD-5-12	)-5-11	UD-5-12
PLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	OIL	SOIL
CTION DATE	8/20/90	8/20/90	8/20/90	8/27/90	8/27/90	8/27/90	8/28/90	8/28/90	8/28/90	8/21/90	8/21/90	8/21/90	21/90	8/21/90
			17							20	59	59	3380	3010
														7.3 B
														7.1
													15.9 B	9.6 B
													0.46 B	0.46 B
													0.72 B	
													315 BE	207 BE
													4.2	5.7
													1.8 B	3.5 B
													17900	14900
													1.8	1.6
													188 B	188 B
													37	70.9
													5.3 B	4.7 B
													114 B	205 B
													0.72 B	0.85 B
													116 B	156 B
													7.5 B	7.8 B
													12 E	14.2 E

od in mg/kg (ppm)
specified.
sults are reported.

– Sample spilt with Army Corps.

A).

DELAWARE S [redacted] RAVEL
METAL/CLASSICAL CHEMISTRIES
DETECTION LIMITS

SAMPLE-ID	UD-2-8	UD-2-9	UD-2-12	UD-3-10	UD-3-13 #	UD-3-14	UD-4-10 #	UD-4-12	UD-4-16	UD-5-7	UD-5-11	UD-5-12
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	8/20/90	8/20/90	8/20/90	8/27/90	8/27/90	8/27/90	8/28/90	8/28/90	8/28/90	8/21/90	8/21/90	8/21/90
PARAMETER												
ALUMINUM												
ANTIMONY											5.60	
ARSENIC					1.20	1.20	1.10				1.10	
BARIUM												
BERYLLIUM		0.21										
CADMIUM		0.64		0.66	0.74				0.71			0.70
CALCIUM												
CHROMIUM												
COBALT												
COPPER	3.50	3.40						3.50			3.40	3.80
IRON												
LEAD												
MAGNESIUM												
MANGANESE												
MERCURY	0.08	0.10	0.13	0.10	0.10	0.10	0.08	0.08	0.09	0.11	0.08	0.10
NICKEL												
POTASSIUM												
SELENIUM	0.65	0.64	0.81	0.66	0.74	0.73	0.68		0.71	0.87	0.65	0.70
SILVER		0.43							0.71			
SODIUM						89.70						
THALLIUM	0.65	0.64	0.81						0.71	0.87	0.65	0.70
VANADIUM												
ZINC												
CYANIDE	2.10	2.00	2.40	2.10	1.90	2.40	2.20	2.10	2.10	2.50	2.00	1.80
TRPH	10.00	10.00		10.00	10.00	10.00	10.00	10.00	10.00			

All results reported in mg/kg (ppm)
unless otherwise specified.
Detection limits for positive results not reported.

– Sample split with Army Corps.

DELAWARE SAND & GRAVEL
VOLATILE ORGANIC COMPOUND
ANALYTICAL RESULTS

SAMPLE-ID	UD-6-10	UD-6-11 #	UD-6-12	UD-7-10	UD-7-11	UD-7-11 FLD DUP	UD-7-12	UD-9-8	UD-9-9	UD-11A-11	UD-11A-11 FLD DUP	UD-11A-12
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	8/5/90	8/5/90	8/5/90	8/14/90	8/14/90	8/14/90	8/14/90	8/30/90	8/30/90	8/14/90	8/14/90	8/14/90
PARAMETER												
CHLOROMETHANE												
BROMOMETHANE												
VINYL CHLORIDE												
CHLOROETHANE												
METHYLENE CHLORIDE		5400	29000					3 BJ	210 BJ	9 BJ	94 B	
ACETONE			35000					130	2800	90	99	370000
CARBON DISULFIDE												
1,1-DICHLOROETHENE												
1,1-DICHLOROETHANE												
1,2-DICHLOROETHENE (TOTAL)												
CHLOROFORM					420 J		3200 J				6 BJ	
1,2-DICHLOROETHANE					1100	1100			210 J			
2-BUTANONE												
1,1,1-TRICHLOROETHANE												
CARBON TETRACHLORIDE												
VINYL ACETATE												
BROMODICHLOROMETHANE												
1,2-DICHLOROPROPANE												
CIS-1,3-DICHLOROPROPENE												
TRICHLOROETHENE												
DIBROMOCHLOROMETHANE												
1,1,2-TRICHLOROETHANE												
BENZENE												
TRANS-1,3-DICHLOROPROPENE												
BROMOFORM												
4-METHYL-2-PENTANONE												
2-HEXANONE												
TETRACHLOROETHENE												
1,1,2,2-TETRACHLOROETHANE												
TOLUENE		65000	19000	3900000	4800	4500	320000		3300	19 J	8 J	1400000
CHLOROBENZENE												
ETHYLBENZENE	280 J	5900		120000 J	740 J	860	26000		730	12 J	9 J	150000
STYRENE				790000	3300	3200	91000		1000			
TOTAL XYLENES	6800	42000	6900	1600000	8400	2800	190000		4800	170	110	980000

ARI01141

All results reported in µg/kg (ppb).
Only detected results are reported.

B - Compound detected in associated method blank.
- Sample split with Army Corps.

J - Indicates the value is less than the quantitation limit but greater than zero.

DELAWARE SAN[illegible]AVEL
VOLATILE ORGANIC COMPOUND
DETECTION LIMITS

SAMPLE-ID	UD-6-10	UD-6-11 #	UD-6-12	UD-7-10	UD-7-11	UD-7-11 FLD DUP	UD-7-12	UD-9-8	UD-9-9	UD-11A-11	UD-11A-11 FLD DUP	UD-11A-12
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	8/5/90	8/5/90	8/5/90	8/14/90	8/14/90	8/14/90	8/14/90	8/30/90	8/30/90	8/14/90	8/14/90	8/14/90
PARAMETER												
CHLOROMETHANE	1400	4700	3400	310000	1600	1600	30000	11	1500	56	56	140000
BROMOMETHANE	1400	4700	3400	310000	1600	1600	30000	11	1500	56	56	140000
VINYL CHLORIDE	1400	4700	3400	310000	1600	1600	30000	11	1500	56	56	140000
CHLOROETHANE	1400	4700	3400	310000	1600	1600	30000	11	1500	56	56	140000
METHYLENE CHLORIDE	680			160000	790	790	15000					72000
ACETONE	1400	4700		310000	1600	1600	30000					
CARBON DISULFIDE	680	2400	1700	160000	790	790	15000	5	730	28	28	72000
1,1-DICHLOROETHENE	680	2400	1700	160000	790	790	15000	5	730	28	28	72000
1,1-DICHLOROETHANE	680	2400	1700	160000	790	790	15000	5	730	28	28	72000
1,2-DICHLOROETHENE (TOTAL)	680	2400	1700	160000	790	790	15000	5	730	28	28	72000
CHLOROFORM	680	2400	1700	160000		790		5	730	28		72000
1,2-DICHLOROETHANE	680	2400	1700	160000			15000	5		28	28	72000
2-BUTANONE	1400	4700	3400	310000	1600	1600	30000	11	1500	56	56	140000
1,1,1-TRICHLOROETHANE	680	2400	1700	16000	790	790	15000	5	730	28	28	72000
CARBON TETRACHLORIDE	680	2400	1700	16000	790	790	15000	5	730	28	28	72000
VINYL ACETATE	1400	4700	3400	310000	1600	1600	30000	11	1500	56	56	140000
[illegible]OMODICHLOROMETHANE	680	2400	1700	160000	790	790	15000	5	730	28	28	72000
[illegible]2-DICHLOROPROPANE	680	2400	1700	160000	790	790	15000	5	730	28	28	72000
[illegible]S-1,3-DICHLOROPROPENE	680	2400	1700	160000	790	790	15000	5	730	28	28	72000
[illegible]RICHLOROETHENE	680	2400	1700	160000	790	790	15000	5	730	28	28	72000
[illegible]BROMOCHLOROMETHANE	680	2400	1700	160000	790	790	15000	5	730	28	28	72000
[illegible],1,2-TRICHLOROETHANE	680	2400	1700	160000	790	790	15000	5	730	28	28	72000
[illegible]ENZENE	680	2400	1700	160000	790	790	15000	5	730	28	28	72000
[illegible]RANS-1,3-DICHLOROPROPENE	680	2400	1700	160000	790	790	15000	5	730	28	28	72000
[illegible]BROMOFORM	680	2400	1700	160000	790	790	15000	5	730	28	28	72000
4-METHYL-2-PENTANONE	1400	4700	3400	310000	1600	1600	30000	11	1500	56	56	140000
2-HEXANONE	1400	4700	3400	310000	1600	1600	30000	11	1500	56	56	140000
TETRACHLOROETHENE	680	2400	1700	160000	790	790	15000	5	730	28	28	72000
1,1,2,2-TETRACHLOROETHANE	680	2400	1700	160000	790	790	15000	5	730	28	28	72000
TOLUENE	680							5				
CHLOROBENZENE	680	2400	1700	160000	790	790	15000	5	730	28	28	72000
ETHYLBENZENE			1700					5				
STYRENE	680	2400	1700					5		28	28	72000
TOTAL XYLENES								5				

All results reported in ug/kg (ppb).
Detection limits for positive results not reported.

– Sample split with Army Corps.

DELAWARE SAND & G .VEL
SEMIVOLATILE ORGANIC COMPOUND
ANALYTICAL RESULTS

SAMPLE-ID	UD-6-10	UD-6-11 #	UD-6-12	UD-7-10	UD-7-11	UD-7-11 FLD DUP	UD-7-12	UD-9-8	UD-9-9	UD-11A-11	UD-11A-11 FLD DUP	UD-11A-12
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	8/5/90	8/5/90	8/5/90	8/14/90	8/14/90	8/14/90	8/14/90	8/30/90	8/30/90	8/14/90	8/14/90	8/14/90
PARAMETER												
PHENOL					660 J	650 J			200 J			
BIS(2-CHLOROETHYL) ETHER												
2-CHLOROPHENOL												
1,3-DICHLOROBENZENE												
1,4-DICHLOROBENZENE												
BENZYL ALCOHOL												
1,2-DICHLOROBENZENE				530 J	200 J	170 J	270 J					
2-METHYLPHENOL					720 J	710 J						
BIS(2-CHLOROISOPROPYL) ETHER												
4-METHYLPHENOL					320 J	270 J	500 J					
N-NITROSO-DI-N-PROPYLAMINE												
HEXACHLOROETHANE												
NITROBENZENE												
ISOPHORONE												
2-NITROPHENOL												
2,4-DIMETHYLPHENOL												
BENZOIC ACID					1200 J	570 J						
BIS(2-CHLOROETHOXY)METHANE												
2,4-DICHLOROPHENOL												
1,2,4-TRICHLOROBENZENE				400 J	28 J	24 J	150 J		110 J			670 J
NAPHTHALENE				1100	260 J	290 J	400 J					4900
4-CHLOROANILINE												
HEXACHLOROBUTADIENE												
4-CHLORO-3-METHYLPHENOL												
2-METHYLNAPHTHALENE				660 J	77 J	76 J	210 J					2300 J
HEXACHLOROCYCLOPENTADIENE												
2,4,6-TRICHLOROPHENOL												
2,4,5-TRICHLOROPHENOL												
2-CHLORONAPHTHALENE												
2-NITROANILINE												
DIMETHYLPHTHALATE												
ACENAPHTHYLENE												
2,6-DINITROTOLUENE												

All results reported in µg/kg (ppb).
Only detected results are reported.

– Sample split with Army Corps.

J – Indicates the value is less than the quantitation limit but greater than zero.

DELAWAI [redacted] & GRAVEL
SEMIVOLATILE ORGANIC COMPOUND
DETECTION LIMITS

SAMPLE-ID	UD-6-10	UD-6-11 #	UD-6-12	UD-7-10	UD-7-11	UD-7-11 FLD DUP	UD-7-12	UD-9-8	UD-9-9	UD-11A-11	UD-11A-11 FLD DUP	UD-11A-12
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	8/5/90	8/5/90	8/5/90	8/14/90	8/14/90	8/14/90	8/14/90	8/30/90	8/30/90	8/14/90	8/14/90	8/14/90
PARAMETER												
PHENOL	720	750	900	820			790	730		730	730	3800
BIS(2-CHLOROETHYL) ETHER	720	750	900	820	840	840	790	730	770	730	730	3800
2-CHLOROPHENOL	720	750	900	820	840	840	790	730	770	730	730	3800
1,3-DICHLOROBENZENE	720	750	900	820	840	840	790	730	770	730	730	3800
1,4-DICHLOROBENZENE	720	750	900	820	840	840	790	730	770	730	730	3800
BENZYL ALCOHOL	720	750	900	820	840	840	790	730	770	730	730	3800
1,2-DICHLOROBENZENE	720	750	900					730	770	730	730	3800
2-METHYLPHENOL	720	750	900	820			790	730	770	730	730	3800
BIS(2-CHLOROISOPROPYL) ETHER	720	750	900	820	840	840	790	730	770	730	730	3800
4-METHYLPHENOL	720	750	900	820	840	840		730	770	730	730	3800
N-NITROSO-DI-N-PROPYLAMINE	720	750	900	820	840	840	790	730	770	730	730	3800
HEXACHLOROETHANE	720	750	900	820	840	840	790	730	770	730	730	3800
NITROBENZENE	720	750	900	820	840	840	790	730	770	730	730	3800
ISOPHORONE	720	750	900	820	840	840	790	730	770	730	730	3800
2-NITROPHENOL	720	750	900	820			790	730	770	730	730	3800
2,4-DIMETHYLPHENOL	720	750	900	820	840	840	790	730	770	730	730	3800
BENZOIC ACID	3500	3600	4400	4000	840	840	3800	3500	3700	3600	3600	18000
BIS(2-CHLOROETHOXY)METHANE	720	750	900	820			790	730	770	730	730	3800
2,4-DICHLOROPHENOL	720	750	900	820	840	840	790	730	770	730	730	3800
1,2,4-TRICHLOROBENZENE	720	750	900		840	840		730		730	730	
NAPHTHALENE	720	750	900					730	770	730	730	
4-CHLOROANILINE	720	750	900	820	840	840	790	730	770	730	730	3800
HEXACHLOROBUTADIENE	720	750	900	820	840	840	790	730	770	730	730	3800
[redacted]-CHLORO-3-METHYLPHENOL	720	750	900	820	840	840	790	730	770	730	730	3800
[redacted]-METHYLNAPHTHALENE	720	750	900					730	770	730	730	
[redacted]EXACHLOROCYCLOPENTADIENE	720	750	900	820	840	840	790	730	770	730	730	3800
[redacted],4,6-TRICHLOROPHENOL	720	750	900	820	840	840	790	730	770	730	730	3800
[redacted],4,5-TRICHLOROPHENOL	3500	3600	4400	4000	4100	4100	3800	3500	3700	3600	3600	18000
[redacted]-CHLORONAPHTHALENE	720	750	900	820	840	840	790	730	770	730	730	3800
[redacted]-NITROANILINE	3500	3600	4400	4000	4100	4100	3800	3500	3700	3600	3600	18000
[redacted]IMETHYLPHTHALATE	720	750	900	820	840	840	790	730	770	730	730	3800
[redacted]CENAPHTHYLENE	720	750	900	820	840	840	790	730	770	730	730	3800
2,6-DINITROTOLUENE	720	750	900	820	840	840	790	730	770	730	730	3800
3-NITROANILINE	3500	3600	4400	4000	4100	4100	3800	3500	3700	3600	3600	18000

All results reported in µg/kg (ppb)
Detection limits for positive results not reported

DELAWARE SAND & C /EL
SEMIVOLATILE ORGANIC COMPOUND
ANALYTICAL RESULTS

SAMPLE-ID	UD-6-10	UD-6-11 #	UD-6-12	UD-7-10	UD-7-11	UD-7-11 FLD DUP	UD-7-12	UD-9-8	UD-9-9	UD-11A-11	UD-11A-11 FLD DUP	UD-11A-12
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	8/5/90	8/5/90	8/5/90	8/14/90	8/14/90	8/14/90	8/14/90	8/30/90	8/30/90	8/14/90	8/14/90	8/14/90
PARAMETER												
3-NITROANILINE												
ACENAPHTHENE												
2,4-DINITROPHENOL												
4-NITROPHENOL												
DIBENZOFURAN				21 J								
2,4-DINITROTOLUENE												
DIETHYLPHTHALATE				87 BJ		19 BJ			160 J			750 BJ
4-CHLOROPHENYL-PHENYL ETHER												
FLUORENE												
4-NITROANILINE												
4,6-DINITRO-2-METHYLPHENOL												
N-NITROSODIPHENYLAMINE												
4-BROMOPHENYL-PHENYL ETHER												
HEXACHLOROBENZENE												
PENTACHLOROPHENOL												
PHENANTHRENE				38 J								180 J
ANTHRACENE												
DI-N-BUTYLPHTHALATE				150 BJ		49 BJ	68 BJ		1700	91 BJ	100 BJ	4100 B
UORANTHENE												
RENE												
TYLBENZYLPHTHALATE				97 J	29 J		41 J			9 J		600 J
'-DICHLOROBENZIDINE												
NZO(A)ANTHRACENE												
RYSENE												
S(2-ETHYLHEXYL)PHTHALATE	1900		88 J	6300 B	570 BJ	490 BJ	3000 B	53 BJ	7700 B	720 BJ	760 B	21000 B
-N-OCTYL PHTHALATE	390 J			500 J	62 J	34 J	200 J		1300	150 J	180 J	4700
ENZO(B)FLUORANTHENE												
ENZO(K)FLUORANTHENE												
BENZO(A)PYRENE												
INDENO(1,2,3-CD)PYRENE												
DIBENZ(A,H)ANTHRACENE												
BENZO(G,H,I)PERYLENE												

All results reported in µg/kg (ppb).
Only detected results are reported.

B – Compound detected in associated method blank.
– Sample split with Army Corps.

J – Indicates the value is less than the quantitation limit but greater than zero.

ARI01145

6000077

DELAWARE & GRAVEL
SEMIVOLATILE ORGANIC COMPOUND
DETECTION LIMITS

SAMPLE-ID	UD-6-10	UD-6-11 #	UD-6-12	UD-7-10	UD-7-11	UD-7-11 FLD DUP	UD-7-12	UD-9-8	UD-9-9	UD-11A-11	UD-11A-11 FLD DUP	UD-11A-12
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	8/5/90	8/5/90	8/5/90	8/14/90	8/14/90	8/14/90	8/14/90	8/30/90	8/30/90	8/14/90	8/14/90	8/14/90
PARAMETER												
ACENAPHTHENE	720	750	900	820	840	840	790	730	770	730	730	3800
2,4-DINITROPHENOL	3500	3600	4400	4000	4100	4100	3800	3500	3770	3600	3600	18000
4-NITROPHENOL	3500	3600	4400	4000	4100	4100	3800	3500	3770	3600	3600	18000
DIBENZOFURAN	720	750	900		840	840	790	730	770	730	730	3800
2,4-DINITROTOLUENE	720	750	900	820	840	840	790	730	770	730	730	3800
DIETHYLPHTHALATE	720	750	900		840		790	730		730	730	
4-CHLOROPHENYL-PHENYL ETHER	720	750	900	820	840	840	790	730	770	730	730	3800
FLUORENE	720	750	900	820	840	840	790	730	770	730	730	3800
4-NITROANILINE	3500	3600	4400	4000	4100	4100	3800	3500	3700	3600	3600	18000
4,6-DINITRO-2-METHYLPHENOL	3500	3600	4400	4000	4100	4100	3800	3500	3700	3600	3600	18000
N-NITROSODIPHENYLAMINE	720	750	900	820	840	840	790	730	770	730	730	3800
4-BROMOPHENYL-PHENYL ETHER	720	750	900	820	840	840	790	730	770	730	730	3800
HEXACHLOROBENZENE	720	750	900	820	840	840	790	730	770	730	730	3800
PENTACHLOROPHENOL	3500	3600	4400	4000	4100	4100	3800	3500	3700	3600	3600	18000
PHENANTHRENE	720	750	900		840	840	790	730	770	730	730	
ANTHRACENE	720	750	900	820	840	840	790	730	770	730	730	3800
DI-N-BUTYLPHTHALATE	720	750	900		840			730				
FLUORANTHENE	720	750	900	820	840	840	790	730	770	730	730	3800
PYRENE	720	750	900	820	840	840	790	730	770	730	730	3800
BUTYLBENZYLPHTHALATE	720	750	900			840		730	770			
3,3'-DICHLOROBENZIDINE	1400	1500	1800	1600	1700	1700	1600	1500	1500	1500	1500	7600
BENZO(A)ANTHRACENE	720	750	900	820	840	840	790	730	770	730	730	3800
CHRYSENE	720	750	900	820	840	840	790	730	770	730	730	3800
BIS(2-ETHYLHEXYL)PHTHALATE		750										
DI-N-OCTYL PHTHALATE		750	900					730				
BENZO(B)FLUORANTHENE	720	750	900	820	840	840	790	730	770	730	730	3800
BENZO(K)FLUORANTHENE	720	750	900	820	840	840	790	730	770	730	730	3800
BENZO(A)PYRENE	720	750	900	820	840	840	790	730	770	730	730	3800
INDENO(1,2,3-CD)PYRENE	720	750	900	820	840	840	790	730	770	730	730	3800
DIBENZ(A,H)ANTHRACENE	720	750	900	820	840	840	790	730	770	730	730	3800
BENZO(G,H,I)PERYLENE	720	750	900	820	840	840	790	730	770	730	730	3800

All results reported in ug/kg (ppb).
Detection limits for positive results not reported.

- Sample split with Army Corps.

ARI01146

DELAWARE SAND & GRAVEL
PESTICIDE/PCB

ANALYTICAL RESULTS

SAMPLE-ID	UD-6-10	UD-6-11 #	UD-6-12	UD-7-10	UD-7-11	UD-7-11 FLD DUP	UD-7-12	UD-9-8	UD-9-9	UD-11A-11	UD-11A-11 FLD DUP	UD-11A-12
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	8/5/90	8/5/90	8/5/90	8/14/90	8/14/90	8/14/90	8/14/90	8/30/90	8/30/90	8/14/90	8/14/90	8/14/90
PARAMETER												
ALPHA-BHC												
BETA-BHC												
DELTA-BHC												
GAMMA-BHC (LINDANE)												
HEPTACHLOR												
ALDRIN												
HEPTACHLOR EPOXIDE												
ENDOSULFAN I												
DIELDRIN												
4,4'-DDE												
ENDRIN												82 J
ENDOSULFAN II												
4,4'-DDD												
ENDOSULFAN SULFATE												
4,4'-DDT				54 J								
METHOXYCHLOR												
ENDRIN KETONE												
ALPHA-CHLORDANE												100 J
GAMMA-CHLORDANE												
TOXAPHENE												
AROCLOR-1016												
AROCLOR-1221												
AROCLOR-1232												
AROCLOR-1242												4100 X
AROCLOR-1248									1600 X			
AROCLOR-1254									1400 X			
AROCLOR-1260				2300 JX			830 JX					

All results reported in µg/kg (ppb).
Only detected results are reported.

X - Concentration calculated from multi-peak response factor.
- Sample split with Army Corps.

J - Indicates the value is less than the quantitation limit but greater than zero.

DELAWARE SAND[illegible]AVEL
PESTICIDE/PCB
DETECTION LIMITS

SAMPLE-ID	UD-6-10	UD-6-11 #	UD-6-12	UD-7-10	UD-7-11	UD-7-11 FLD DUP	UD-7-12	UD-9-8	UD-9-9	UD-11A-11	UD-11A-11 FLD DUP	UD-11A-12
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	8/5/90	8/5/90	8/5/90	8/14/90	8/14/90	8/14/90	8/14/90	8/30/90	8/30/90	8/14/90	8/14/90	8/14/90
PARAMETER												
ALPHA-BHC	170	180	220	200	200	200	190	18	19	180	180	180
BETA-BHC	170	180	220	200	200	200	190	18	19	180	180	180
DELTA-BHC	170	180	220	200	200	200	190	18	19	180	180	180
GAMMA-BHC (LINDANE)	170	180	220	200	200	200	190	18	19	180	180	180
HEPTACHLOR	170	180	220	200	200	200	190	18	19	180	180	180
ALDRIN	170	180	220	200	200	200	190	18	19	180	180	180
HEPTACHLOR EPOXIDE	170	180	220	200	200	200	190	18	19	180	180	180
ENDOSULFAN I	170	180	220	200	200	200	190	18	19	180	180	180
DIELDRIN	350	360	440	400	410	410	380	35	37	360	360	370
4,4'-DDE	350	360	440	400	410	410	380	35	37	360	360	370
ENDRIN	350	360	440	400	410	410	380	35	37	360	360	
ENDOSULFAN II	350	360	440	400	410	410	380	35	37	360	360	370
4,4'-DDD	350	360	440	400	410	410	380	35	37	360	360	370
ENDOSULFAN SULFATE	350	360	440	400	410	410	380	35	37	360	360	370
4,4'-DDT	350	360	440		410	410	380	35	37	360	360	370
METHOXYCHLOR	1700	1800	2200	2000	2000	2000	1900	180	190	1800	1800	1800
ENDRIN KETONE	350	360	440	400	410	410	380	35	37	360	360	370
ALPHA-CHLORDANE	1700	1800	2200	2000	2000	2000	1900	180	190	1800	1800	
GAMMA-CHLORDANE	1700	1800	2200	2000	2000	2000	1900	180	190	1800	1800	1800
TOXAPHENE	3500	3600	4400	4000	4100	4100	3800	350	370	3600	3600	3700
AROCLOR-1016	1700	1800	2200	2000	2000	2000	1900	180	190	1800	1800	1800
OCLOR-1221	1700	1800	2200	2000	2000	2000	1900	180	190	1800	1800	1800
OCLOR-1232	1700	1800	2200	2000	2000	2000	1900	180	190	1800	1800	1800
OCLOR-1242	1700	1800	2200	2000	2000	2000	1900	180	190	1800	1800	
OCLOR-1248	1700	1800	2200	2000	2000	2000	1900	180		1800	1800	1800
OCLOR-1254	3500	3600	4400	4000	4100	4100	3800	350		3600	3600	3700
OCLOR-1260	3500	3600	4400		4100	4100		350	370	3600	3600	3700

results reported in ug/kg (ppb).

tection limits for positive results not reported.

– Sample split with Army Corps.

DELAWARE SAND & GRAVEL
METAL
ANALYTICAL RESULTS

SAMPLE-ID	UD-6-10	UD-6-11 #	UD-6-12	UD-7-10	UD-7-11	UD-7-11 FLD DUP	UD-7-12	UD-9-8	UD-9-9	UD-11A-11	UD-11A-11 FLD DUP	UD-11A-12
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	8/5/90	8/5/90	8/5/90	8/14/90	8/14/90	8/14/90	8/14/90	8/30/90	8/30/90	8/14/90	8/14/90	8/14/90
PARAMETER												
ALUMINUM	4590	13300	28900	7970	8700	8480	6550	3180	4200	4130	3440	4420
ANTIMONY	6.6 B		11.2 B	11.3 BN	16.4 N	6.8 BN			10.6 B	9.6 BN		
ARSENIC	7.2	2.4 B	1.6 B	1.7 BN	1.3 BNW				2.1 BW	2.9 N	3.1 N	2.7 N
BARIUM	27.7 B	77.9	247	14.3 B	24.8 B	23.6 B	21 B	7.3 B	28.2 B	61.5	73.4	146
BERYLLIUM	0.41 B	1.1 B	2.5	0.71 B	1.2 B	1.2 B	0.7 B	0.39 B	0.29 B	0.62 B	0.6 B	0.46 B
CADMIUM	0.96 B		2.9	1.1 BN								
CALCIUM	662 B	380 B	1840	241 B*	162 B*	151 B*	522 B*	54.5 B	80.6 B	229 B*	377 B*	5590 *
CHROMIUM	7.3	21	152	18.9	40.2	41	17.1	3	5.4	6.1	5.3	7.9
COBALT	7.3 B	14.6	19.9	3.9 B	6 B	6.4 B	3.7 B	2.2 B	3.6 B	13.1	16.6	21.9
COPPER		14.1	51.1	4.1 B	5 B	5 B	7.4			14.6	8.7	6.9
IRON	11900	12700	64500	20200	19300	19400	10300	10400	6330	17400	16800	11500
LEAD	4	10.6 S	11.2	4.3	5	4.7	7.4 W	3.8	3.4	2.8	2.8	3.7
MAGNESIUM	265 B	2070	5520	269 B	400 B	318 B	527 B	138 BE	217 BE	169 B	166 B	450 B
MANGANESE	202	631	1040	34.8 N*	594 N*	582 N*	148 N*	162	101	2140 N*	2090 N*	1120 N*
MERCURY												
NICKEL	7.6 B	18.7	59.7	15.2	31.1	32.5	30	7.5 B	7.7 B	5.7 B	6.4 B	5.3 B
TASSIUM	272 B	1420	3940	371 B	551 B	487 B	646 B	193 B	191 B	253 B	220 B	260 B
LENIUM			1.1 BW					0.65 BS		0.67 BW		
VER	0.51 B	0.53 B	1 B	1.1 B	1.2 B	1.1 B	0.68 B	0.48 B		1 B	0.82 B	0.55 B
DIUM	89.9 B	111 B	228 B	179 B	146 B	176 B	142 B	81.7 B	107 B	112 B	98.1 B	147 B
ALLIUM		0.93 B						0.83 BW				
NADIUM	13.8	24.3	67.7	16	22.5	23.3	20.4	7.5 B	7.2 B	13.7	13.2	9.9 B
NC	18.9	52.5	157	106	29.3	28.3	23.8	9.3	16.3	21.8	20.7	17
ANIDE												

All results reported in mg/kg (ppm) unless otherwise specified.

Only detected results are reported.

W - Post-digestion spike for furnace is out of QC limits, while absorbance is less than 50% of spike absorbance.

B - Value is less than quantitation limit but greater than instrument detection limit

N Spike recovery not within QC limits

E - Value is estimated due to the presence of interference.

S - Value determined by Method of Standard Addition (MSA).

- Sample split with Army Corps.

* - Duplicate analysis not within QC limits.

DELAWARE [redacted] & GRAVEL
CLASSICAL CHEMISTRIES
ANALYTICAL RESULTS

SAMPLE-ID	UD-6-10	UD-6-11 #	UD-6-12	UD-7-10	UD-7-11	UD-7-11 FLD DUP	UD-7-12	UD-9-8	UD-9-9	UD-11A-11	UD-11A-11 FLD DUP	UD-11A-12
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	8/5/90	8/5/90	8/5/90	8/14/90	8/14/90	8/14/90	8/14/90	8/30/90	8/30/90	8/14/90	8/14/90	8/14/90
PARAMETER												
TRPH	540	520		9560	61	63	296		580	90	73	4250

All results reported in mg/kg (ppm)
unless otherwise specified.
Only detected results are reported.

– Sample split with Army Corps.

DEL[illegible]RE SAND & GRAVEL
METAL/CLASSICAL CHEMISTRIES
DETECTION LIMITS

SAMPLE-ID	UD-6-10	UD-6-11 #	UD-6-12	UD-7-10	UD-7-11	UD-7-11 FLD DUP	UD-7-12	UD-9-8	UD-9-9	UD-11A-11	UD-11A-11 FLD DUP	UD-11A-12
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	8/5/90	8/5/90	8/5/90	8/14/90	8/14/90	8/14/90	8/14/90	8/30/90	8/30/90	8/14/90	8/14/90	8/14/90
PARAMETER												
ALUMINUM												
ANTIMONY		6.40					6.00	5.60			5.80	6.00
ARSENIC						1.30	1.20	1.10				
BARIUM												
BERYLLIUM												
CADMIUM		0.74			0.74	0.75	0.69	0.66	0.73	0.66	0.67	0.70
CALCIUM												
CHROMIUM												
COBALT												
COOPER	3.50							3.50	3.90			
IRON												
LEAD												
MAGNESIUM												
MANGANESE												
MERCURY	0.08	0.11	0.10	1.00	0.12	0:12	0.90	0.08	0.12	0.08	0.10	0.09
NICKEL												
POTASSIUM												
SELENIUM	0.66	0.74		0.73	0.74	0.75	0.69		0.73		0.67	0.70
SILVER									0.48			
SODIUM												
THALLIUM	0.66		0.83	0.73	0.74	0.75	0.69		0.73	0.66	0.67	0.70
VANADIUM												
ZINC												
CYANIDE	2.12	2.30	2.50	2.30	2.20	2.50	1.70	2.10	2.20	1.60	1.70	2.30
TRPH			10.00									

All results reported in mg/kg (ppb)
unless otherwise specified.
Only detected results are reported.

– Sample split with Army Corps.

DELAWARE & GRAVEL
VOLATILE ORGANIC COMPOUND
ANALYTICAL RESULTS

SAMPLE-ID	UD-11A-13	UD-11A-13 FLD DUP	UD-13-8	UD-13-10	UD-13-11 #	UD-14-8	UD-14-8 FLD DUP	UD-14-9	UD-14-10	UD-14-10 FLD DUP	UD-15A-6	UD-15A-8
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	8/14/90	8/14/90	8/18/90	8/18/90	8/18/90	8/18/90	8/18/90	8/18/90	8/18/90	8/18/90	8/31/90	8/31/90
PARAMETER												
CHLOROMETHANE												
BROMOMETHANE												
VINYL CHLORIDE												
CHLOROETHANE												
METHYLENE CHLORIDE		16000 BJ						2 J	61 B	69 B	6 B	7 B
ACETONE					14000			22	970 B	2300 BE	150	180
CARBON DISULFIDE												
1,1-DICHLOROETHENE												
1,1-DICHLOROETHANE												
1,2-DICHLOROETHENE (TOTAL)												
CHLOROFORM	6900 BJ	6900 BJ				2900 BJ	2600 BJ	2 BJ	16 BJ	15 BJ		
1,2-DICHLOROETHANE					670 J			1 J	120	200		
2-BUTANONE								4 J	810	2200 E		
1,1,1-TRICHLOROETHANE												
CARBON TETRACHLORIDE												
VINYL ACETATE												
BROMODICHLOROMETHANE												
1,2-DICHLOROPROPANE												
CIS-1,3-DICHLOROPROPENE												
TRICHLOROETHENE				26000 J								
BROMOCHLOROMETHANE												
1,2-TRICHLOROETHANE												
BENZENE				480000	850 J			2 J				
TRANS-1,3-DICHLOROPROPENE												
BROMOFORM												
4-METHYL-2-PENTANONE									200	550		
2-HEXANONE												
TETRACHLOROETHENE												
1,1,2,2-TETRACHLOROETHANE												
TOLUENE	400000	400000	47000	1200000	3200	43000	42000	8 B	23 J	38		
CHLOROBENZENE			5200	20000 J								
ETHYLBENZENE	56000	61000	17000	230000	1000	120000	120000	1 J				
STYRENE					1600			4 J				
TOTAL XYLENES	400000	430000	120000	1600000 E	8200	270000	260000	7	10 J	20 J		

All results reported in µg/kg (ppb).
Only detected results are reported.

B – Compound detected in associated method blank.
E – Concentration exceeded linear range of calibration.
– Sample spilt with Army Corps.

J – Indicates the value is less than the quantitation limit but greater than zero.

DELAWARE SAND & GRAVEL
VOLATILE ORGANIC COMPOUND
DETECTION LIMITS

SAMPLE-ID	UD-11A-13	UD-11A-13 FLD DUP	UD-13-8	UD-13-10	UD-13-11 #	UD-14-8	UD-14-8 FLD DUP	UD-14-9	UD-14-10	UD-14-10 FLD DUP	UD-15A-6	UD-15A-8
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	soil	soil
COLLECTION DATE	8/14/90	8/14/90	8/18/90	8/18/90	8/18/90	8/18/90	8/18/90	8/18/90	8/18/90	8/18/90	8/31/90	8/31/90
PARAMETER												
CHLOROMETHANE	51000	51000	6200	70000	1700	13000	13000	11	65	65	11	11
BROMOMETHANE	51000	51000	6200	70000	1700	13000	13000	11	65	65	11	11
VINYL CHLORIDE	51000	51000	6200	70000	1700	13000	13000	11	65	65	11	11
CHLOROETHANE	51000	51000	6200	70000	1700	13000	13000	11	65	65	11	11
METHYLENE CHLORIDE	25000		3100	35000	870	6700	6700					
ACETONE	51000	51000	6200	70000		13000	13000					
CARBON DISULFIDE	25000	25000	3100	35000	870	6700	6700	5	32	32	5	5
1,1-DICHLOROETHENE	25000	25000	3100	35000	870	6700	6700	5	32	32	5	5
1,1-DICHLOROETHANE	25000	25000	3100	35000	870	6700	6700	5	32	32	5	5
1,2-DICHLOROETHENE (TOTAL)	25000	25000	3100	35000	870	6700	6700	5			5	5
CHLOROFORM			3100	35000	870						5	5
1,2-DICHLOROETHANE	25000	25000	3100	35000		6700	6700				5	5
2-BUTANONE	51000	51000	6200	70000	1700	13000	13000		32	32	11	11
1,1,1-TRICHLOROETHANE	25000	25000	3100	35000	870	6700	6700	5	32	32	5	5
CARBON TETRACHLORIDE	25000	25000	3100	35000	870			5	32	32	5	5
VINYL ACETATE	51000	51000	6200	70000	1700	13000	13000	11	65	65	11	11
BROMODICHLOROMETHANE	25000	25000	3100	35000	870	6700	6700	5	32	32	5	5
1,2-DICHLOROPROPANE	25000	25000	3100	35000	870	6700	6700	5	32	32	5	5
CIS-1,3-DICHLOROPROPENE	25000	25000	3100	35000	870	6700	6700	5	32	32	5	5
TRICHLOROETHENE	25000	25000	3100		870	6700	6700	5	32	32	5	5
DIBROMOCHLOROMETHANE	25000	25000	3100	35000	870	6700	6700	5	32	32	5	5
1,1,2-TRICHLOROETHANE	25000	25000	3100	35000	870	6700	6700	5	32	32	5	5
BENZENE	25000	25000	3100			6700	6700		32	32	5	5
TRANS-1,3-DICHLOROPROPENE	25000	25000	3100	35000	870	6700	6700	5	32	32	5	5
BROMOFORM	25000	25000	3100	35000	870	6700	6700	5	32	32	5	5
4-METHYL-2-PENTANONE	51000	51000	6200	70000	1700	1300	1300	11			11	11
2-HEXANONE	51000	51000	6200	70000	1700	1300	1300	11	65	65	11	11
TETRACHLOROETHENE	25000	25000	3100	35000	870	6700	6700	5	32	32	5	5
1,1,2,2-TETRACHLOROETHANE	25000	25000	3100	35000	870	6700	6700	5	32	32	5	5
TOLUENE											5	5
CHLOROBENZENE	25000	25000			870	6700	6700	5	32	32	5	5
ETHYLBENZENE									32	32	5	5
STYRENE	25000	25000	3100	35000		6700	6700		32	32	5	5
TOTAL XYLENES											5	5

All results reported in ug/kg (ppb).
Detection limit[illegible]itive results not reported.

- Sample split with Army Corps.

DELAWARE S[illegible] & GRAVEL
SEMIVOLATILE ORGANIC COMPOUND
ANALYTICAL RESULTS

SAMPLE-ID	UD-11A-13	UD-11A-13 FLD DUP	UD-13-8	UD-13-10	UD-13-11 #	UD-14-8	UD-14-8 FLD DUP	UD-14-9	UD-14-10	UD-14-10 FLD DUP	UD-15A-6	UD-15A-8
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	8/14/90	8/14/90	8/18/90	8/18/90	8/18/90	8/18/90	8/18/90	8/18/90	8/18/90	8/18/90	8/31/90	8/31/90
ARAMETER												
HENOL					14000				810 J	800		
IS(2-CHLOROETHYL) ETHER					3200							
CHLOROPHENOL												
3-DICHLOROBENZENE												
4-DICHLOROBENZENE												
ENZYL ALCOHOL												
2-DICHLOROBENZENE												
METHYLPHENOL					290 J				81 J	74 J		
IS(2-CHLOROISOPROPYL) ETHER												
METHYLPHENOL		350 J			2100				150 J	160 J		
NITROSO-DI-N-PROPYLAMINE												
EXACHLOROETHANE												
ITROBENZENE												
OPHORONE					120 J							
NITROPHENOL												
4-DIMETHYLPHENOL		290 J			170 J							
ENZOIC ACID					1300 J							
IS(2-CHLOROETHOXY)METHANE												
4-DICHLOROPHENOL												
2,4-TRICHLOROBENZENE	110 J	77 J		9100		1100 J	2400	110 J				
APHTHALENE	1300	800 J		19000		2600 J	4800	220 J	82 J	34 J		
CHLOROANILINE												
EXACHLOROBUTADIENE												
CHLORO-3-METHYLPHENOL												
METHYLNAPHTHALENE	660 J	420 J		3100 J		290 J	720	49 J				
EXACHLOROCYCLOPENTADIENE												
4,6-TRICHLOROPHENOL												
4,5-TRICHLOROPHENOL												
CHLORONAPHTHALENE												
NITROANILINE												
IMETHYLPHTHALATE					120 J							
CENAPHTHYLENE												
6-DINITROTOLUENE												

ll results reported in μg/kg (ppb).
nly detected results are reported.

- Sample spilt with Army Corps

J - Indicates the value is less than the quantitation limit but greater than zero.

DELAWAR. .AND & GRAVEL
SEMIVOLATILE ORGANIC COMPOUND
DETECTION LIMITS

SAMPLE-ID	UD-11A-13	D-11A-13 FLD DUP	UD-13-8	UD-13-10	UD-13-11 #	UD-14-8	UD-14-8 FLD DUP	UD-14-9	UD-14-10	UD-14-10 FLD DUP	UD-15A-6	UD-15A-8
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	8/14/90	8/14/90	8/18/90	8/18/90	8/18/90	8/18/90	8/18/90	8/18/90	8/18/90	8/18/90	8/31/90	8/31/90
PARAMETER												
PHENOL	800	800	990	7400		3500	700	730			710	730
BIS(2-CHLOROETHYL) ETHER	800	800	990	7400		3500	700	730	860	730	710	730
2-CHLOROPHENOL	800	800	990	7400	920	3500	700	730	860	730	710	730
1,3-DICHLOROBENZENE	800	800	990	7400	920	3500	700	730	860	730	710	730
1,4-DICHLOROBENZENE	800	800	990	7400	920	3500	700	730	860	730	710	730
BENZYL ALCOHOL	800	800	990	7400	920	3500	700	730	860	730	710	730
1,2-DICHLOROBENZENE	800	800	990	7400	920	3500	700	730	860	730	710	730
2-METHYLPHENOL	800	800	990	7400		3500	700	730			710	730
BIS(2-CHLOROISOPROPYL) ETHER	800	800	990	7400	920	3500	700	730	860	730	710	730
4-METHYLPHENOL	800		990	7400		3500	700	730			710	730
N-NITROSO-DI-N-PROPYLAMINE	800	800	990	7400	920	3500	700	730	860	730	710	730
HEXACHLOROETHANE	800	800	990	7400	920	3500	700	730	860	730	710	730
NITROBENZENE	800	800	990	7400	920	3500	700	730	860	730	710	730
ISOPHORONE	800	800	990	7400		3500	700	730	860	730	710	730
2-NITROPHENOL	800	800	990	7400	920	3500	700	730	860	730	710	730
2,4-DIMETHYLPHENOL	800		990	7400		3500	700	730	860	730	710	730
BENZOIC ACID	3900	3900	4800	36000		17000	3400	3500	4200	3500	3400	3500
BIS(2-CHLOROETHOXY)METHANE	800	800	990	7400	920	3500	700	730	860	730	710	730
2,4-DICHLOROPHENOL	800	800	990	7400	920	3500	700	730	860	730	710	730
1,2,4-TRICHLOROBENZENE			990		920				860	730	710	730
NAPHTHALENE			990		920						710	730
4-CHLOROANILINE	800	800	990	7400	920	3500	700	730	860	730	710	730
HEXACHLOROBUTADIENE	800	800	990	7400	920	3500	700	730	860	730	710	730
4-CHLORO-3-METHYLPHENOL	800	800	990	7400	920	3500	700	730	860	730	710	730
2-METHYLNAPHTHALENE			990		920				860	730	710	730
HEXACHLOROCYCLOPENTADIENE	800	800	990	7400	920	3500	700	730	860	730	710	730
2,4,6-TRICHLOROPHENOL	800	800	990	7400	920	3500	700	730	860	730	710	730
2,4,5-TRICHLOROPHENOL	3900	3900	4800	36000	4400	17000	3400	3500	4200	3500	3400	3500
2-CHLORONAPHTHALENE	800	800	990	7400	920	3500	700	730	860	730	710	730
2-NITROANILINE	3900	3900	4800	36000	4400	17000	3400	3500	4200	3500	3400	3500
DIMETHYLPHTHALATE	800	800	990	7400		3500	700	730	860	730	710	730
ACENAPHTHYLENE	800	800	990	7400	920	3500	700	730	860	730	710	730
2,6-DINITROTOLUENE	800	800	990	7400	920	3500	700	730	860	730	710	730
3-NITROANILINE	3900	3900	4800	36000	4400	17000	3400	3500	4200	3500	3400	3500

All results reported in µg/kg (ppb).
Detection limits for positive results not reported.

- Sample split with Army Corps.

DELAWARE & GRAVEL
SEMIVOLATILE ORGANIC COMPOUND
ANALYTICAL RESULTS

SAMPLE-ID	UD-11A-13	UD-11A-13 FLD DUP	UD-13-8	UD-13-10	UD-13-11 #	UD-14-8	UD-14-8 FLD DUP	UD-14-9	UD-14-10	UD-14-10 FLD DUP	UD-15A-6	UD-15A-8
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	8/14/90	8/14/90	8/18/90	8/18/90	8/18/90	8/18/90	8/18/90	8/18/90	8/18/90	8/18/90	8/31/90	8/31/90
ARAMETER												
NITROANILINE												
CENAPHTHENE												
4-DINITROPHENOL												
NITROPHENOL												
BENZOFURAN												
4-DINITROTOLUENE												
ETHYLPHTHALATE	310 BJ	240 BJ		1800 J	170 J				120 J	78 J		
CHLOROPHENYL-PHENYL ETHER												
LUORENE		15 J										
NITROANILINE												
6-DINITRO-2-METHYLPHENOL												
-NITROSODIPHENYLAMINE												
BROMOPHENYL-PHENYL ETHER												
EXACHLOROBENZENE												
ENTACHLOROPHENOL												
HENANTHRENE	61 J	39 J		630 J								
NTHRACENE												
DI-N-BUTYLPHTHALATE	890 B	680 BJ	130 J	15000	28 J	2400 J	3600	530 J		37 J		
LUORANTHENE												
YRENE												
UTYLBENZYLPHTHALAT	180 J	110 J		1300 J		410 J	500 J					
3'-DICHLOROBENZIDINE												
ENZO(A)ANTHRACENE												
RYSENE												
S(2-ETHYLHEXYL)PHTHALATE	5400 B	3900 B	750 J	54000	110 J	6700	9700	1500			54 BJ	550 BJ
N-OCTYL PHTHALATE	1500	970	62 J	760 J	71 J	130 J	130 J	25 J				
ENZO(B)FLUORANTHENE												
ENZO(K)FLUORANTHENE												
ENZO(A)PYRENE												
NDENO(1,2,3-CD)PYRENE												
BENZ(A,H)ANTHRACENE												
ENZO(G,H,I)PERYLENE												

All results reported in µg/kg (ppb).

Only detected results are reported.

B – Compound detected in associated method blank.

– Sample spilt with Army Corps.

J – Indicates the value is less than the quantitation limit but greater than zero.

DELAWARE SAND & GRAVEL
SEMIVOLATILE ORGANIC COMPOUND
DETECTION LIMITS

SAMPLE-ID	UD-11A-13	UD-11A-13 FLD DUP	UD-13-8	UD-13-10	UD-13-11 #	UD-14-8	UD-14-8 FLD DUP	UD-14-9	UD-14-10	UD-14-10 FLD DUP	UD-15A-6	UD-15A-8
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	8/14/90	8/14/90	8/18/90	8/18/90	8/18/90	8/18/90	8/18/90	8/18/90	8/18/90	8/18/90	8/31/90	8/31/90
PARAMETER												
ACENAPHTHENE	800	800	990	7400	920	3500	700	730	860	730	710	730
2,4-DINITROPHENOL	3900	3900	4800	36000	4400	17000	3400	3500	4200	3500	3400	3500
4-NITROPHENOL	3900	3900	4800	36000	4400	17000	3400	3500	4200	3500	3400	3500
DIBENZOFURAN	800	800	990	7400	920	3500	700	730	860	730	710	730
2,4-DINITROTOLUENE	800	800	990	7400	920	3500	700	730	860	730	710	730
DIETHYLPHTHALATE			990			3500	700	730			710	730
4-CHLOROPHENYL-PHENYL ETHER	800	800	990	7400	920	3500	700	730	860	730	710	730
FLUORENE	800		990	7400	920	3500	700	730	860	730	710	730
4-NITROANILINE	3900	3900	4800	36000	4400	17000	3400	3500	4200	3500	3400	
4,6-DINITRO-2-METHYLPHENOL	3900	3900	4800	36000	4400	17000	3400	3500	4200	3500	3400	3500
N-NITROSODIPHENYLAMINE	800	800	990	7400	920	3500	700	730	860	730	710	730
4-BROMOPHENYL-PHENYL ETHER	800	800	990	7400	920	3500	700	730	860	730	710	730
HEXACHLOROBENZENE	800	800	990	7400	920	3500	700	730	860	730	710	730
PENTACHLOROPHENOL	3900	3900	4800	36000	4400	17000	3400	3500	4200	3500	3400	3500
PHENANTHRENE			990		920	3500	700	730	860	730	710	730
ANTHRACENE	800	800	990	7400	920	3500	700	730	860	730	710	730
DI-N-BUTYLPHTHALATE									860		710	730
FLUORANTHENE	800	800	990	7400	920	3500	700	730	860	730	710	730
PYRENE	800	800	990	7400	920	3500	700	730	860	730	710	730
BUTYLBENZYLPHTHALATE			990		920			730	860	730	710	730
3,3'-DICHLOROBENZIDINE	1600	1600	2000	15000	1800	7000	1400	1500	1700	1500	1400	1500
BENZO(A)ANTHRACENE	800	800	990	7400	920	3500	700	730	860	730	710	730
CHRYSENE	800	800	990	7400	920	3500	700	730	860	730	710	730
BIS(2-ETHYLHEXYL)PHTHALATE									860	730		
DI-N-OCTYL PHTHALATE									860	730	710	730
BENZO(B)FLUORANTHENE	800	800	990	7400	920	3500	700	730	860	730	710	730
BENZO(K)FLUORANTHENE	800	800	990	7400	920	3500	700	730	860	730	710	730
BENZO(A)PYRENE	800	800	990	7400	920	3500	700	730	860	730	710	730
INDENO(1,2,3-CD)PYRENE	800	800	990	7400	920	3500	700	730	860	730	710	730
DIBENZ(A,H)ANTHRACENE	800	800	990	7400	920	3500	700	730	860	730	710	730
BENZO(G,H,I)PERYLENE	800	800	990	7400	920	3500	700	730	860	730	710	730

All results reported in ug/kg (ppb).
Detection limits for positive results not reported.

- Sample split with Army Corps.

DELAWAR[illegible]D & GRAVEL
PESTICIDE/PCB

ANALYTICAL RESULTS

SAMPLE-ID	UD-11A-13	UD-11A-13 FLD DUP	UD-13-8	UD-13-10	UD-13-11 #	UD-14-8	UD-14-8 FLD DUP	UD-14-9	UD-14-10	UD-14-10 FLD DUP	UD-15A-6	UD-15A-8
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	8/14/90	8/14/90	8/18/90	8/18/90	8/18/90	8/18/90	8/18/90	8/18/90	8/18/90	8/18/90	8/31/90	8/31/90
PARAMETER												
ALPHA-BHC												
BETA-BHC												
DELTA-BHC												
GAMMA-BHC (LINDANE)												
HEPTACHLOR												
ALDRIN												
HEPTACHLOR EPOXIDE				47 J								
ENDOSULFAN I												
DIELDRIN												
4,4'-DDE												
ENDRIN				270 J								
ENDOSULFAN II												
4,4'-DDD												
ENDOSULFAN SULFATE												
4,4'-DDT												
METHOXYCHLOR												
DRIN KETONE												
PHA-CHLORDANE				230 J								
MMA-CHLORDANE												
XAPHENE												
OCLOR-1016												
OCLOR-1221												
OCLOR-1232												
AROCLOR-1242	1100 JX	880 JX		21000 X		3300 X	5500 X	1100 X				
AROCLOR-1248												
AROCLOR-1254												
AROCLOR-1260												

AR101158

All results reported in µg/kg (ppb).
Only detected results are reported.

X – Concentration calculated from multi-peak response factor.
– Sample spilt with Army Corps.

J – Indicates the value is less than the quantitation limit but greater than zero.

DELAWARE SAND & GRAVEL
PESTICIDE/PCB
DETECTION LIMITS

SAMPLE-ID	UD-11A-13	UD-11A-13 FLD DUP	UD-13-8	UD-13-10	UD-13-11 #	UD-14-8	UD-14-8 FLD DUP	UD-14-9	UD-14-10	UD-14-10 FLD DUP	UD-15A-6	UD-15A-8
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	8/14/90	8/14/90	8/18/90	8/18/90	8/18/90	8/18/90	8/18/90	8/18/90	8/18/90	8/18/90	8/31/90	8/31/90
PARAMETER												
ALPHA-BHC	200	200	240	180	220	17	17	18	21	21	17	18
BETA-BHC	200	200	240	180	220	17	17	18	21	21	17	18
DELTA-BHC	200	200	240	180	220	17	17	18	21	21	17	18
GAMMA-BHC (LINDANE)	200	200	240	180	220	17	17	18	21	21	17	18
HEPTACHLOR	200	200	240	180	220	17	17	18	21	21	17	18
ALDRIN	200	200	240	180	220	17	17	18	21	21	17	18
HEPTACHLOR EPOXIDE	200	200	240		220	17	17	18	21	21	17	18
ENDOSULFAN I	200	200	240	180	220	17	17	18	21	21	17	18
DIELDRIN	390	390	480	360	440	34	34	35	42	42	34	35
4,4'-DDE	390	390	480	360	440	34	34	35	42	42	34	35
ENDRIN	390	390	480		440	34	34	35	42	42	34	35
ENDOSULFAN II	390	390	480	360	440	34	34	35	42	42	34	35
4,4'-DDD	390	390	480	360	440	34	34	35	42	42	34	35
ENDOSULFAN SULFATE	390	390	480	360	440	34	34	35	42	42	34	35
4,4'-DDT	390	390	480	360	440	34	34	35	42	42	34	35
METHOXYCHLOR	2000	2000	2400	1800	2200	170	170	180	210	210	170	180
ENDRIN KETONE	390	390	480	360	440	34	34	35	420	420	34	35
ALPHA-CHLORDANE	2000	2000	2400		2200	170	170	180	210	210	170	180
GAMMA-CHLORDANE	2000	2000	480	1800	2200	170	170	180	210	210	170	180
TOXAPHENE	3900	3900	2400	3600	4400	340	340	350	420	420	340	350
AROCLOR-1016	2000	2000	2400	1800	2200	170	170	180	210	210	170	180
AROCLOR-1221	2000	2000	4800	1800	2200	170	170	180	210	210	170	180
AROCLOR-1232	2000	2000	2400	1800	2200	170	170	180	210	210	170	180
AROCLOR-1242			2400		2200				210	210	170	180
AROCLOR-1248	2000	2000	2400	1800	2200	170	170	180	210	210	170	180
AROCLOR-1254	3900	3900	4800	3600	4400	340	340	350	420	420	340	350
AROCLOR-1260	3900	3900	4800	3600	4400	340	340	350	420	420	340	350

All results reported in ug/kg (ppb).

Detection limits for positive results not reported.

– Sample split with Army Corps.

DELAWAR[illegible]D & GRAVEL
METAL/CLASSICAL CHEMISTRIES
ANALYTICAL RESULTS

SAMPLE-ID	UD-11A-13	UD-11A-13 FLD DUP	UD-13-8	UD-13-10	UD-13-11 #	UD-14-8	UD-14-8 FLD DUP	UD-14-9	UD-14-10	UD-14-10 FLD DUP	UD-15A-6	UD-15A-8
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	8/14/90	8/14/90	8/18/90	8/18/90	8/18/90	8/18/90	8/18/90	8/18/90	8/18/90	8/18/90	8/31/90	8/31/90
PARAMETER												
ALUMINUM	5940	3910	37500	3250	34700	2520 E	2570 E	2570 E	28200 E	23300 E	2440	4310
ANTIMONY			21.9		44.3	6.4 BN			13.5 BN	11.3 BN	10.1 B	9.6 B
ARSENIC	4.4 N	1.9 BN	1.9 B	1.4 BW	1.4 B							
BARIUM	17.9 B	20.4 B	154	14.8 B	157	7.2 B	9.3 B	23.3 B	202	198	3.7 B	10.6 B
BERYLLIUM	0.52 B	0.5 B	1.5 B	0.34 B	3.1	0.37 B	0.38 B	0.38 B	3	2.9	0.27 B	0.42 B
CADMIUM			1.2 B		1.7				1.5 N	0.9 BN	0.67 B	
CALCIUM	315 B*	974 B*	723 BE	141 BE	1580 E	84.7 B	113 B	150 B	1930	1940	161 B	116 B
CHROMIUM	12.7	8.1	26.3	8	78.8	6.3	6.7	3.5	106	88.6	4.4	6.4
COBALT	5.7 B	10.7 B	9.1 B	4.7 B	34.5	2.3 B	2.2 B	6.3 B	23.4	22.7	1.5 B	2 B
COPPER	7.7	7.4	25.3	6.7	68.8	10	6.6	5.4	54.4	45		
IRON	12900	9750	30900	9620	55500	13900 *	11100 *	7280 *	32900 *	25900 *	10400	13800
LEAD	5.9	12 S	19.3 S	9.6 S	16.3 S	1.7 S	1.6 S	2.2 N	14.4 NS	12.1 NS	1.5	3
MAGNESIUM	375 B	402 B	1200 B	184 B	5150	86.4 B	90.2 B	218 B	6440	6100	109 BE	272 BE
MANGANESE	114 N*	185 N*	436	253	1420	43.8	52.2	92.5	499	496	16.6	27
MERCURY											0.44	
NICKEL	6.6 B	6.8 B	16.8	6.7 B	52.4	4 B	4.3 B	4.6 B	53.6	43.6	2.8 B	3.2 B
POTASSIUM	495 B	387 B	702 B	157 B	4330	89.6 B	135 B	186 B	4270	4180	156 B	281 B
SELENIUM												
SILVER	0.81 B	0.63 B	1.6 B	0.55 B	3.5	1.2 B	0.94 B	0.66 B	2.7 B	2.3 B	0.74 B	1 B
SODIUM	200 B	198 B	355 B	124 B	630 B		93.9 B	85.2 B	310 B	326 B		
THALLIUM											0.89 B	0.89 BW
VANADIUM	17.5	14.8	59	6.5 B	83.8	7.5 B	7.5 B	5.4 B	65.5	57.3	8.7 B	10.4 B
ZINC	18.8	18	35.9 E	15.6 E	128 E	13.8	15.1	10.3	137	121	7.5	12.9
CYANIDE												

A sults reported in mg/kg (ppm)
w otherwise specified.
O letected results are reported.

W – Post-digestion spike for furance is out of QC limits, while absorbance is less than 50% of spike absorbance.
B – Value is less than quantitation limit but greater than instrument detection limit.

E – Value is estimated due to the presence of interference.
S – Value determined by Method of Standard Addition (MSA).
N – Spike recovery not within QC limits.
– Sample split with Army Corps.
* – Duplicate analysis not within QC limits.

DELAWARE SAND & GRAVEL
CLASSICAL CHEMISTRIES
ANALYTICAL RESULTS

SAMPLE-ID	UD-11A-13	UD-11A-13 FLD DUP	UD-13-8	UD-13-10	UD-13-11 #	UD-14-8	UD-14-8 FLD DUP	UD-14-9	UD-14-10	UD-14-10 FLD DUP	UD-15A-6	UD-15A-8
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	8/14/90	8/14/90	8/18/90	8/18/90	8/18/90	8/18/90	8/18/90	8/18/90	8/18/90	8/18/90	8/31/90	8/31/90
PARAMETER												
TRPH	2790	2870	55	7200		3620	3260	25				13

ARI01176.1

All results reported in mg/kg (ppm) unless otherwise specified.
Only detected results are reported.

- Sample split with Army Corps.

A-0000093

DELAWA[redacted]ND & GRAVEL
VOLATILE ORGANIC COMPOUND
ANALYTICAL RESULTS

SAMPLE-ID	UD-16A-9	UD-16A-10	UD-16A-11	UD-17-9	UD-17-10	UD-17-11	UD-18-10	UD-18-11	UD-18-12	UD-19-8	UD-19-10 #	UD-19-13
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	8/5/90	8/5/90	8/5/90	8/7/90	8/7/90	8/7/90	7/31/90	7/31/90	7/31/90	8/1/90	8/1/90	8/1/90
PARAMETER												
CHLOROMETHANE												
BROMOMETHANE												
VINYL CHLORIDE												
CHLOROETHANE												
METHYLENE CHLORIDE	10	9 B	28 B	17		16	6 B	4 BJ	5 BJ	29 B	10	18 BJ
ACETONE	140	24	63	270	790	72	24	33	40	58	46	2000 E
CARBON DISULFIDE												
1,1-DICHLOROETHENE												
1,1-DICHLOROETHANE												
1,2-DICHLOROETHENE (TOTAL)												
CHLOROFORM		0.7 J	3 J	1 J		0.8 J				0.7 BJ		
1,2-DICHLOROETHANE						2 J				8		
2-BUTANONE	81			200	1200					17		3500 E
1,1,1-TRICHLOROETHANE												
CARBON TETRACHLORIDE												
VINYL ACETATE												
BROMODICHLOROMETHANE												
1,2-DICHLOROPROPANE												
CIS-1,3-DICHLOROPROPENE												
TRICHLOROETHENE										37		
DIBROMOCHLOROMETHANE												
1,1,2-TRICHLOROETHANE												
BENZENE										15		
TRANS-1,3-DICHLOROPROPENE												
BROMOFORM												
4-METHYL-2-PENTANONE	190			280	810							
2-HEXANONE												
TETRACHLOROETHENE												
1,1,2,2-TETRACHLOROETHANE												
TOLUENE			8			2 J			1 J	29		42
CHLOROBENZENE										6		
ETHYLBENZENE						1 J				2 J		10 J
STYRENE												
TOTAL XYLENES										49	0.5 J	

All results reported in µg/kg (ppb).
Only detected results are reported.

B – Compound detected in associated method blank.
E – Concentration exceeded linear range of calibration.
– Sample spilt with Army Corps.

J – Indicates the value is less than the quantitation limit but greater than zero.

DELAWARE SAND – GRAVEL
VOLATILE ORGANIC COMPOUND
DETECTION LIMITS

SAMPLE-ID	UD-16A-9	UD-16A-10	UD-16A-11	UD-17-9	UD-17-10	UD-17-11	UD-18-10	UD-18-11	UD-18-12	UD-19-8	UD-19-10 #	UD-19-13
SAMPLE TYPE	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COLLECTION DATE	8/5/90	8/5/90	8/5/90	8/7/90	8/7/90	8/7/90	7/31/90	7/31/90	7/31/90	8/1/90	8/1/90	8/1/90
PARAMETER												
CHLOROMETHANE	11	12	13	18	62	13	11	10	12	11	11	60
BROMOMETHANE	11	12	13	18	62	13	11	10	12	11	11	60
VINYL CHLORIDE	11	12	13	18	62	13	11	10	12	11	11	60
CHLOROETHANE	11	12	13	18	62	13	11	10	12	11	11	60
METHYLENE CHLORIDE					31							
ACETONE												
CARBON DISULFIDE	5	6	7	9	31	6	5	5	6	6	5	30
1,1-DICHLOROETHENE	5	6	7	9	31	6	5	5	6	6	5	30
1,1-DICHLOROETHANE	5	6	7	9	31	6	5	5	6	6	5	30
1,2-DICHLOROETHENE (TOTAL)	5	6	7	9	31	6	5	5	6	6	5	30
CHLOROFORM	5				31		5	5	6		5	30
1,2-DICHLOROETHANE	5	6	7	9	31		5	5	6		5	30
2-BUTANONE		12	13			13	11	10	12		11	
1,1,1-TRICHLOROETHANE	5	6	7	9	31	6	5	5	6	6	5	30
CARBON TETRACHLORIDE	5	6	7	9	31	6	5	5	6	6	5	30
VINYL ACETATE	11	12	13	18	62	13	11	10	12	11	11	60
BROMODICHLOROMETHANE	5	6	7	9	31	6	5	5	6	6	5	30
1,2-DICHLOROPROPANE	5	6	7	9	31	6	5	5	6	6	5	30
CIS-1,3-DICHLOROPROPENE	5	6	7	9	31	6	5	5	6	6	5	30
TRICHLOROETHENE	5	6	7	9	31	6	5	5	6		5	30
DIBROMOCHLOROMETHANE	5	6	7	9	31	6	5	5	6	6	5	30
1,1,2-TRICHLOROETHANE	5	6	7	9	31	6	5	5	6	6	5	30
BENZENE	5	6	7	9	31	6	5	5	6		5	30
TRANS-1,3-DICHLOROPROPENE	5	6	7	9	31	6	5	5	6	6	5	30
BROMOFORM	5	6	7	9	31	6	5	5	6	6	5	30
4-METHYL-2-PENTANONE		12	13			13	11	10	12	11	11	60
2-HEXANONE	11	12	13	18	62	13	11	10	12	11	11	60
TETRACHLOROETHENE	5	6	7	9	31	6	5	5	6	6	5	30
1,1,2,2-TETRACHLOROETHANE	5	6	7	9	31	6	5	5	6	6	5	30
TOLUENE	5	6		9	31		5	5			5	
CHLOROBENZENE	5	6	7	9	31	6	5	5	6		5	30
ETHYLBENZENE	5	6	7	9	31		5	5	6		5	
STYRENE	5	6	7	9	31	6	5	5	6	6	5	30
TOTAL XYLENES	5	6	7	9	31	6	5	5	6			30

All results report[illegible] in μg/kg (ppb).
Detection limit[illegible]sitive results not reported.

– Sample split with A[illegible] Corps.

AR101163

2-000095