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SEDIMENT ACCUMULATION AND CHARACTERIZATION OF THE BLOEDE DAM IMPOUNDMENT

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Acronyms and Abbreviations used in this report	
Abbreviation	***Description***
DGPS	Differential Global Positioning System
DVD-R	Digital Versatile/Video Recordable Dics
GIS	Geographical Information System
KHz	Kilohertz
MGS	Maryland Geological Survey
MSL	Mean sea level
NAD83	North America [Horizontal] Datum of 1983
NIST	National Institute of Standards and Technology
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resource Conservation Service
PDOP	Positional Dilution of Precision
RMS	Root mean Square
SBAS	Satallite Based Augmentation System (GPS)
SRM	Standard Reference Material
US SCS	U.S. Soil Conservation Service (in 1994, name changed to NRCS)
UTM	Universal Transverse Mercator (coordinate system)
RL	Reporting Limit
LOD	Limit of Detection

Directions

Cardinal directions are used whenever possible. In the case where the sinuosity of the river creates variability of cardinal directions, river left and river right terminology is used. "River left" and "river right" describe the sides of the river as one sees it when facing downstream.

Conversion Factors

Multiply	by	To obtain
	LENGTH	
foot (ft)	0.3048	meters (m)
mile (mi)	1.609	kilometers (km)
	AREA	
acre	0.004047	square kilometer (km^2)
square mile (mi^2)	2.590	square kilometer (km^2)
	VOLUME	
acre ft (ac. ft)	1,233.482	cubic meter (m^3)
gallons (gal.) (US, liquid)	0.003785	cubic meter (m^3)
acre ft (ac. ft)	325,851.433	gallon (gal.) (US, liquid)

CONCENTRATION

mg/Kg = ppm (parts per million)

EXECUTIVE SUMMARY

In response to a request by American Rivers, Maryland Geological Survey (MGS) was contracted to study the sub-surface geological conditions and sediment properties within the Bloede Dam impoundment located in Howard and Baltimore Counties in the State of Maryland. Sub-surface data was collected within the impoundment using ground penetrating radar and acoustic seismic equipment. Records were analyzed to determine the underlying geology. Cores were collected at eleven locations to quantify the physical and chemical properties of the sediment, and to test for the presence of specified pollutants. The fieldwork for this study occurred between November 2011 and February 2012.

Sub-surface data collection on the floodplain adjacent to the Bloede impoundment was collected, but the results were inconclusive. Ground-penetrating radar was used for the collection, and the environmental conditions degraded the ability of the equipment to penetrate deeply into the soils.

Sub-bottom seismic data was collected within the river, and the underlying geology of the river was defined along sixteen transects. These transects show a historic river channel at 25 meters depth just upstream of the dam. Further upstream, the historic river channel broadens into a basin ranging from 10 to 30 meters in depth across the valley. This historic basin is north of the current river thalweg in the vicinity of the dam, and it is west of the current river thalweg near the pedestrian swinging bridge.

The sediments deposited behind Bloede Dam within the river are very homogenous, and consist of sand and gravel with less than 2 percent of mud. The soils on the floodplain adjacent to the Bloede impoundment vary both spatially and with depth; however, they generally are muddy sands ranging to sandy muds at depth.

Based on the elements and pollutants analyzed in this report, the sediments located within the Bloede Dam impoundment and the adjacent floodplain do not have any pollutant levels above the expected levels of the regional geology.

INTRODUCTION

Historical Context

Bloede Dam is located on the Patapsco River between Baltimore County and Howard County, Maryland. The Dam was constructed in 1906-1907 for the purpose of hydroelectric power generation by Consolidated Gas Electric Light and Power Company. Shortly after its construction, sediments began to accumulate behind the dam prompting a routine operation of maintenance and dredging. In 1914, the sediment depth behind the dam was documented at 12.5 feet. In 1924, the hydroelectric generation operation ceased, and presumably all sediment maintenance behind the dam also ceased at that time. Currently, the Maryland Department of Natural Resources (DNR) owns the Dam. DNR, along with American Rivers and NOAA, are collecting information for the possible alternative uses of the Dam including the potential removal of the Dam.

Physical and Geological Setting

The Patapsco River Valley between Ellicott City and Bloede Dam is underlain by ancient, very hard rock formations. The major rock type around Ellicott City is the Ellicott City Granite, which is about 420 million years old. It is used as a building stone and is seen extensively in old Ellicott City construction. South of Ellicott City, the river has eroded through the valley into the much older Baltimore Gabbro Complex, which is about 750 million years old. This dark, dense rock is also valued for construction. Throughout the valley are numerous mineral veins and deposits within the bedrock. Quarry and mining operations in the Patapsco Valley were common in the 18th and 19th century, and were an important part of the regional economy.

Soils within the river valley are derived from the bedrock erosion. Most of the rock erodes to sandy and gravelly sediments, with relatively little clayey material remaining. While the bedrock produces clay and iron-rich fine sediments, most of these are swept away by water. The valley walls are steep enough in many areas to prevent thick accumulations of fine-grained soils.

Previous Sediment Surveys

The only known sediment sampling within the Bloede impoundment occurred in 1989 by WAPORA, Inc.(WAPORA, 1989) Five cores were tested throughout the depth of the deposit. These samples were tested for Toxic Metals [Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, and Silver]. Two conglomerated samples were also tested for pesticides (Endrin, Lindane, Methoxychlor, and Toxaphene) and herbicides (2,4,-D, and 2,4,5,-TP). All results were below or near detectable limits. None of the results indicated any elevation of these metals or pollutants at harmful levels. A sediment study in 2009 and 2010 at Simkins Dam, located about 0.75 miles upstream of Bloede Dam showed that the riverine sediments were mostly medium sands with finer material collected near the riverbanks. The sediments collected from the Simkins Dam site were analyzed for semi-volatile pollutants (EPA8270). Results indicated that none of the measured pollutants were above lab detection limits. However, a medium sized factory used in

textile and paper manufacturing is located between Simkins Dam and Bloede Dam. This factory had been cited at various times for petrochemical spills, caustic chemical spills, improper wastewater discharge, improper landfill use and operation, and asbestos hazards. The factory was abandoned in 2003 with the buildings left in disrepair.

STUDY OBJECTIVES

The objectives for this study were:

1. To determine the underlying geology of the dam impoundment.
2. To determine the physical and chemical characteristics of the sediment.

METHODS

Study Approach

The study consisted of a remote assessment of the accumulated sediment in the backwater of Bloede Dam and a sampling of that sediment to determine the chemical and physical properties.

The remote assessment was performed through the use of ground penetrating radar (GPR) and acoustic seismic reflectivity measurements. Both of these methods send energy into the earth and map the reflected energy. These reflections are used to map historic channels, bedrock, and other features.

The second phase determined sediment character and chemistry. Sediments were collected throughout the impoundment and analyzed for a wide range of pollutants, chemical makeup and physical properties.

Sub-Bottom Seismic Reflection Surveying

Sub-bottom seismic reflection surveys were conducted using a Knudsen 328B and a transducer with a low frequency of 28 KHz. The 28 KHz frequency is ideal for identifying shallow and thin deposits as it has penetration power while maintaining resolution due to its short wavelength. Previous experience with this equipment has identified geologic horizons under 25 meters of sediment in riverine systems and sediment layers less than 10 centimeters. Two other seismic instruments were tested [Datasonics 3100P with a SB-424 transducer and a Knudsen 320B with a Massa 5KHz frequency transducer array], but they proved unusable in the river due to the shallow water depth of the river, limited response from the frequencies, and logistical setup over sediment bars.

The seismic equipment was placed on a floating catamaran to maintain submersion of the transducer and to provide a light and portable platform which would float over the shallow sediment bars. Data was collected over sixteen transects (Figure 1.).

Horizontal positioning from an Ashtech DG16 using satellite-based augmentation system (SBAS) and differential GPS (DGPS) corrections was recorded within the seismic records.

The acoustic records permitted differentiation of the recently deposited, less dense, sediment from the underlying, pre-impoundment bottom sediment as well as the identification of bedrock outcroping. The theoretical resolution (1/3 of a wavelength) of the acoustic profiling equipment operating at 28 KHz is 0.017 meters [0.6 inches].

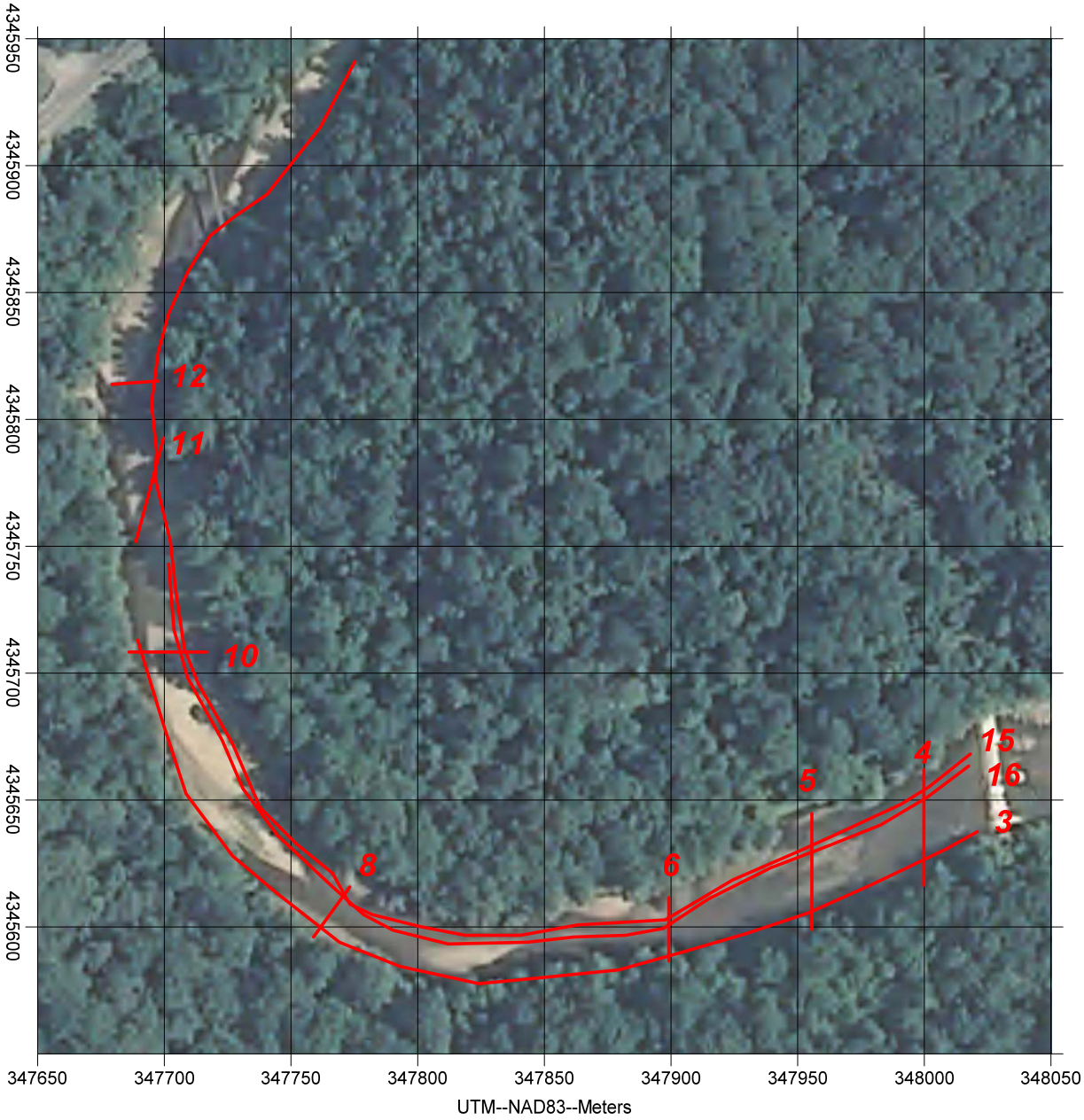

Figure 1. Location Map of analyzed sub-bottom seismic reflection transects.

Ground-Penetrating Radar (GPR) Surveying

Ground-penetrating radar data were collected using a Mala X3M system with both 250 MHz and 100 MHz antennas. The 250MHz antenna has a greater resolution but less penetration power, and the 100MHz antenna has greater penetration power but less resolution. GPR transmits electromagnetic waves into the ground. Changes in the dielectric constants of the soils, sediments, and rocks reflect this energy to the antenna where it is recorded. GPR is limited by the electrical conductivity of the material it is transmitting through. Highly conductive soils drastically decrease the range of the system.

Horizontal positioning from an Ashtech DG16 using GPS with SBAS and DGPS corrections was recorded within the seismic records.

The GPR antennas were pulled along the upland portions of the study areas and floated in a shallow plastic boat while in the river. Eighty transects were collected utilizing a variety of settings and antennas to obtain discernable records. (Figure 2.)

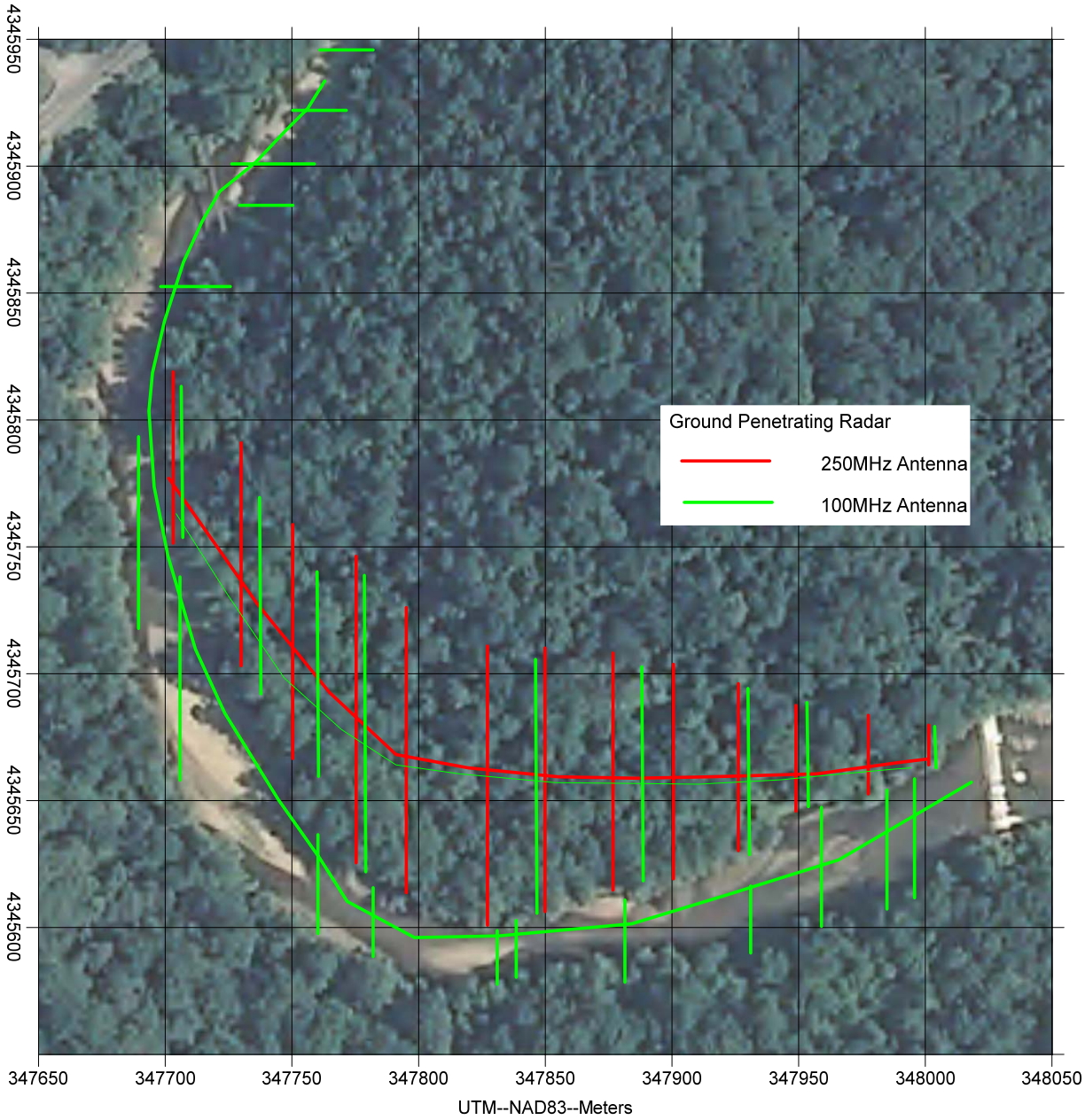

Figure 2. Location Map of collected ground-penetrating radar transects. Transects collected using the 250 MHz antenna are in red. Transects collected using the 100MHz antenna are annotated in green.

Sediment Coring

MGS collected eleven sediment cores for this study. Cores were selected to document the sediment which is currently captured behind Bloede Dam. Cores #1 and #2 were collected on the lowland area located on river left and just upstream of the dam. Cores #4 through #9 were collected between the banks of the current river alignment. A control core was collected from downstream

of the dam (Core #3). Two additional cores (#8a and #8b) were collected adjacent to core #8. (Figure 3.)

Sediment cores were collected in aluminum liners attached to a vibracore head supplemented with 113 kilograms [250 pounds] of added weight. The vibration speed was varied to obtain the greatest penetration. Cores were driven to refusal then capped, labeled, and retrieved. Horizontal control was provided through a Thales Navigation ProMark 3 GPS supplemented with satellite based augmentation system (SBAS) differential corrections providing a real-time horizontal accuracy of 2-5 meters [6-15 feet]. Horizontal positions were recorded in the Universal Transverse Mercator (UTM) system based upon the North American Datum of 1983 (NAD83). Core logs include depth of water, total depth driven, and GPS coordinates of each core. Cores were collected between December 17, 2011 and February 1, 2012.

Core #2 was extended using a split spoon style auger from the bottom of the vibracore hole at 1.15m to a final depth of 3.05 meters. Samples were retrieved in 0.15m [6 inches] intervals and arranged on a tarp for documentation and sampling.

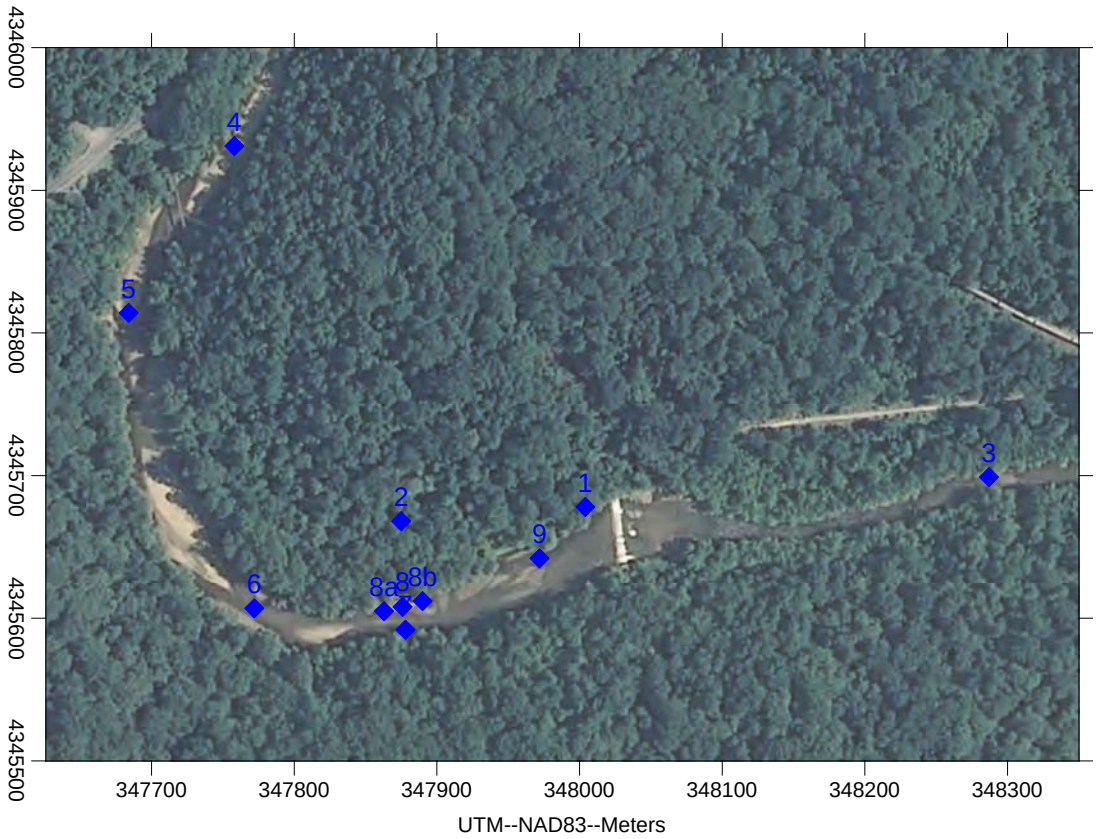

Figure 3. Sediment cores locations.

Laboratory Analyses

<u>Core Processing</u>

. Upon collection, cores were stored in a sample refrigerator at four degrees centigrade until they were split. Cores were split and sediment was sampled within 24 hours of collection. Cores were opened using a circular saw, the blade of which was set to cut the core liner only. Each coreliner was cut lengthwise on the front and back. Using stainless steel spatulas, the core was carefully split to minimize any disturbance of sediment structure, dividing the sediment between the coreliner halves. Immediately upon splitting the core, the core was described, photographed, and sampled for analysis.

Pollutant samples were collected on selected cores by taking a channel sample on the upper and lower portions of the core. These samples were placed in sealed glass jars with Teflon lids, stored in ice, and transported to Phase Separation Science laboratories on the same day.

A second set of samples were taken from each core at specific intervals based on lithological changes in sediments. These samples were analyzed for textural and elemental components.

Core sampling was confined, when possible, to one half of the core. The other half of the core was sealed in plastic wrap, labeled, and stored at four degrees Celsius should further testing be needed.

Pollutant Analysis

Pollutant samples of unprepared sediment were taken to Phase Separation Science laboratories in Catonsville, to be analyzed for a suite of pollutants. The pollutant suite is identified below along with the EPA method utilized for the analysis.

Table 1. Pollutants analyzed and reported in this study. Preparation and analytical methods for each pollutant are identified.

Pollutant	Preparation Method	Analytical Method
TAL Metals	EPA 3050B	EPA SW-846 / 6020A
Total Petroleum Hydrocarbons – Diesel Range	EPA 3550	EPA SW-846/8015C
Total Petroleum Hydrocarbons – Gasoline Range	EPA 5030	EPA SW-846/8015C
Organochlorine Pesticides	EPA 3550	EPA SW-846/8081B
Polychlorinated Biphenyls	EPA 3550	EPA SW-846/8082A
TCL Volatile Organic Compounds (VOC)	EPA 5030	EPA SW-846/8260B
TCL Semivolatile Organic Compounds	EPA 3550	EPA SW-846/8270C
Cyanide		EPA SW-

		846/9014

Reported pollutant values, units, reporting limits, and limit of detection are summarized in Table C-1. The laboratory certificate of analysis, chain of custody, and quality assurance documentation is included in Appendix B.

Textural Analyses

Sediment samples were analyzed for water content, bulk density, and grain size (sand, silt, clay contents, as well as gravel, when present). Two homogeneous splits of each sample are processed, one for bulk property analyses and the other for grain-size characterization. Analyses were performed as soon as possible after sample collection, and all samples were refrigerated in sealed Whirl-Pak™ plastic bags prior to analysis.

Water content was calculated as the percentage of water weight to the weight of the wet sediment using Equation 1.

$$\%Water = \frac{W_w}{W_t} * 100 \qquad \text{Equation 1}$$

where: W_w is the weight of water; and
W_t is the weight of wet sediment.

Water content was determined by weighing 20-30 g of sediment; the sediment was dried at 65°C, and then re-weighing the dried sediment. Dried sediments were saved for elemental analyses (see **Elemantal Analyses** section).

Bulk density (ρ_B) is calculated from water content utilizing Equation 2 by assuming an average grain density (ρ_s) of 2.72 g/cm^3 and saturation of voids with water of density ρ_w = 1.0 g/cm^3. This method was adopted from the work of Bennett and Lambert (1971):

$$\rho_B = \frac{W_t}{W_d \ / \ 2.72 + W_w} \qquad \text{Equation 2}$$

where W_d is the weight of dry sediment.

Sand, silt and clay contents were determined using the textural analysis detailed in Kerhin and others, (1988). Grain size analysis consists of cleaning the samples in solutions of 10 percent hydrochloric acid and 6 or 15 percent hydrogen peroxide (determined by water content) with subsequent rinsing with deionized water. This process removed soluble salts, carbonates, and organic matter that could interfere with the disaggregation of the individual grains. The samples are

then treated with a 0.26 percent solution of the dispersant sodium hexametaphosphate ($(NaPO_3)_6$) to ensure that individual grains did not re-aggregate during analysis.

The separation of the gravel-sand (coarse) fraction and the silty-clay or mud (fine) fraction of the sample was accomplished by wet-sieving through a 4-phi mesh sieve (0.0625 mm, U.S. Standard Sieve #230). The coarse fraction was dried, weighed, and dry-sieved through 2mm mesh sieve (U.S. Standard Sieve #10), separating gravel and sand-sized particles.

The finer silt and clay-sized particles are suspended in a 1000 ml cylinder in a solution of 0.26 percent sodium hexametaphosphate. The suspension is agitated and, at specified times thereafter; 20 mL pipette withdrawals are made (Carver, 1971; Folk, 1974). The rationale behind this process is that larger particles settle faster than smaller ones (Stoke's Law). By calculating the settling velocities for different sized particles, times for withdrawal can be determined at which all particles of a specified size will have settled past the point of withdrawal. Sampling times are calculated to permit the determination of the amount of silt (4 phi) and clay sized (8 phi) particles in the suspension. Withdrawn samples are dried at 65°C and weighed. From these data the percentages by dry weight of gravel, sand, and mud (silt and clay) are calculated for each sample and classified according to Folk's nomenclature (Figure D-2).

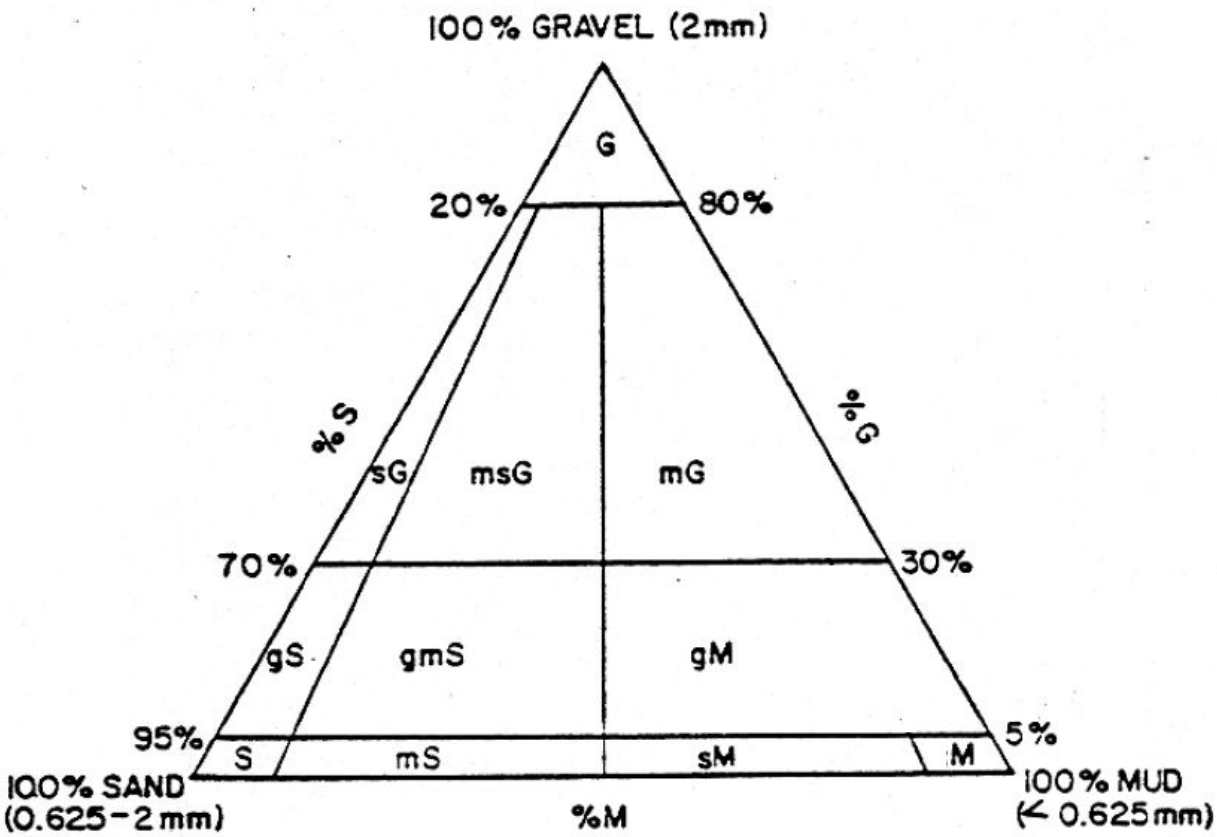

Figure 4. Folk classification of sediment types

Although the techniques used to determine grain size are based on traditional analytical methods developed for the sedimentology lab, some analytical error is inherent to the techniques.

For example, results can be affected by level of technician skill and/or changes in laboratory conditions (such as sudden temperature changes). Furthermore, there is no standard reference material available that includes the broad range of particle sizes and shapes contained in natural sediment. To maximize consistency of textural analysis, several "checks" are used to monitor results. The calculated sand, silt, clay and gravel (when present) percentages are checked against 1) sample field descriptions; 2) calculated water contents; and 3) calculated weight loss of sample during processing. These comparisons are made to determine if the size components match the visual description of the sample and/or fall within an expected classification with respect to water content and weight loss. Any discrepancy is "flagged" and the results are reviewed further to determine if re-analysis is warranted.

Elemental Analyses

Splits of dried sediment samples were shipped to Activation Laboratories, Ltd. (Actlabs) in Ontario, Canada to be analyzed for 48 elements. Prior to elemental analyses, Actlabs ground the samples to the point where 95% of the sample passed 200-mesh sieve (0.074 mm screen opening). Elemental concentrations were determined by one of two techniques depending on the particular element. Splits of the ground samples were digested using a four-acid "near total" digestion technique which employed perchloric ($HClO_4$), hydrochloric (HCl), nitric (HNO_3), and hydrofluoric (HF) acids. The digested samples were then analyzed using an Inductively Coupled Argon Plasma Spectrometer - Optical emission spectrometry (ICAP-OES), also referred to as inductively coupled plasma - atomic emission spectrometry (ICP-AES).

The four-acid digestion is considered the most vigorous digestion method using in geochemistry. However, certain refractory or resistant minerals, such as barite, chromite, and cassiterite, still may not be completely dissolved. Also, even with total dissolution, as with most silicates, some elements may be volatilized, including Si, As, Sb, Cr, U, Au and most rare earth elements (REEs). These elements are determined by a second method. Untreated splits of the ground samples were analyzed using Neutron Activation Analysis (INAA).

Detection limit and analytical method used for each element are listed in Table 2. As part of their QA/QC protocol, Actlabs analyzed a series of blanks, replicates and standard reference materials (SRM). MGS also included blind duplicates with the samples sent to Actlabs. Analytical results are presented in Tables 3 and 4 of SRMs and blanks.

There are several factors to consider when comparing the Actlabs element results with those from Phase Separation. These factors are related to the differences in the sample preparation and analytical techniques used by the two laboratories. Phase Separation used analytical methods SW-846 6020A (Inductively Coupled Plasma Spectrometer – Mass Spectrophotometer, or ICP-MS) and preparation method 3050B (nitric acid/hydrocholoric acid reflux digestions) to analyze for the target analyte list (TAL) metals. This digestion method is not a total digestion for most sediments and rock. This method will dissolve almost all elements that could be come "environmentally/biologically available". Elements that are bound in silicate structures are not normally dissolved by this procedure as they are

not usually mobile in the environment. Also, Phase Separation may not have pulverized the sample (at least to the extent as Actlabs did) prior to digestion. As a result, concentration values for most elements will be a fraction of those values reported by Actlabs. Detection limits reported by Phase Separation were higher than those reported by Actlabs for many metals.

Table 2 . Elements (Analytes) reported in this study include 49 elements analyzed by Actlabs. TAL metals are indicated by shading; Thallium (Tl) was not included in the Actlabs suite. Methods abbreviations: High Temp. Combustion-GC: High Temperature combustion, following by Gas Chromatography; TD-ICP: Total Digestion followed by Inductively Coupled Plasma Spectrometry; INAA: Instrumental Neutron Activation Analysis.

Element	Symbol	Reporting Unit	Detection Limit	Analysis Method	Element	Symbol	Reporting Unit	Detection Limit	Analysis Method
Aluminum	Al	%	0.01	TD-ICP	Molybdenum	Mo	ppm	1	TD-ICP
Antimony	Sb	ppm	0.1	INAA	Neodymium	Nd	ppm	5	INAA
Arsenic	As	ppm	0.5	INAA	Nickel	Ni	ppm	1	INAA / TD-ICP
Barium	Ba	ppm	50	INAA	Phosphorus	P	%	0.001	TD-ICP
Beryllium	Be	ppm	1	TD-ICP	Potassium	K	%	0.01	TD-ICP
Bismuth	Bi	ppm	2	TD-ICP	Rubidium	Rb	ppm	15	INAA
Bromine	Br	ppm	0.5	INAA	Samarium	Sm	ppm	0.1	INAA
Cadmium	Cd	ppm	0.3	TD-ICP	Scandium	Sc	ppm	0.1	INAA
Calcium	Ca	%	0.01	TD-ICP	Selenium	Se	ppm	3	INAA
Cerium	Ce	ppm	3	INAA	Silver	Ag	ppm	0.3	INAA / TD-ICP
Cesium	Cs	ppm	1	INAA	Sodium	Na	%	0.01	INAA
Chromium	Cr	ppm	2	INAA	Strontium	Sr	ppm	1	TD-ICP
Cobalt	Co	ppm	1	INAA	Sulfur	S	%	0.01	TD-ICP
Copper	Cu	ppm	1	TD-ICP	Tantalum	Ta	ppm	0.5	INAA
Europium	Eu	ppm	0.2	INAA	Terbium	Tb	ppm	0.5	INAA
Gold	Au	ppb	2	INAA	Thorium	Th	ppm	0.2	INAA
Hafnium	Hf	ppm	1	INAA	Tin	Sn	%	0.01	INAA
Iridium	Ir	ppb	5	INAA	Titanium	Ti	%	0.01	TD-ICP
Iron	Fe	%	0.01	INAA	Tungsten	W	ppm	1	INAA
Lanthanum	La	ppm	0.5	INAA	Uranium	U	ppm	0.5	INAA
Lead	Pb	ppm	3	TD-ICP	Vanadium	V	ppm	2	TD-ICP
Lutetium	Lu	ppm	0.05	INAA	Ytterbium	Yb	ppm	0.2	INAA
Magnesium	Mg	%	0.01	TD-ICP	Yttrium	Y	ppm	1	TD-ICP

Table 2 . Elements (Analytes) reported in this study include 49 elements analyzed by Actlabs. TAL metals are indicated by shading; Thallium (Tl) was not included in the Actlabs suite. Methods abbreviations: High Temp. Combustion-GC: High Temperature combustion, following by Gas Chromatography; TD-ICP: Total Digestion followed by Inductively Coupled Plasma Spectrometry; INAA: Instrumental Neutron Activation Analysis.

Element	Symbol	Reporting Unit	Detection Limit	Analysis Method	Element	Symbol	Reporting Unit	Detection Limit	Analysis Method
Manganese	Mn	ppm	1	TD-ICP	Zinc	Zn	ppm	1	INAA / TD-ICP
Mercury	Hg	ppm	1	INAA					

Table 3. Result for internal blanks and reference standards run with MGS sediment samples for INAA analysis.

INAA Analyses Method			Canadian Reference Standard: DMMAS 114		
Analyte Symbol	**Unit Symbol**	**Detection Limit**	**Measured value**	**Certified value**	**Method Blank**
Au	ppb	2	2170	2199	< 2
Ag	ppm	5			< 5
Ni	ppm	20			< 20
Zn	ppm	50			< 50
As	ppm	0.5	1500	1624	< 0.5
Ba	ppm	50	1600	1561	< 50
Br	ppm	0.5			< 0.5
Co	ppm	1	38	42	< 1
Cr	ppm	2	96	84	< 2
Cs	ppm	1			< 1
Eu	ppm	0.2			< 0.2
Fe	%	0.01	3.69	3.31	< 0.01
Hf	ppm	1			< 1
Hg	ppm	1			< 1
Ir	ppb	5			< 5
Na	%	0.01	1.84	1.78	< 0.01
Rb	ppm	15			< 15
Sb	ppm	0.1	12	11.2	< 0.1
Sc	ppm	0.1	7.1	6.5	< 0.1
Se	ppm	3			< 3
Ta	ppm	0.5			< 0.5
Th	ppm	0.2			< 0.2
U	ppm	0.5	16	17.4	< 0.5
W	ppm	1			< 1
La	ppm	0.5	17	15.1	< 0.5
Ce	ppm	3	36	23.7	< 3
Nd	ppm	5			< 5
Sm	ppm	0.1	2.3	2.4	< 0.1
Sn	%	0.01			< 0.01
Tb	ppm	0.5			< 0.5
Yb	ppm	0.2			< 0.2
Lu	ppm	0.05			< 0.05

Table 4. Results of Actlabs analyses of Reference material for the TD-ICP method. Actlabs' measure values compared to the certified values. Reference materials include USGS geochemical exploration references and Canadian SRMs

Analyte Symbol	Unit Symbol	Detection Limit	USGS GXR -1: Jasperoid		USGS GXR-4: CopperMill Head		USGS SDC-1: Mica Schist		Method Blank
			Measured value	Certified value	Measured value	Certified value	Measured value	Certified value	
Ag	ppm	0.3	29	31	3.5	4	< 0.3	0.041	< 0.3
Cu	ppm	1	1100	1110	6440	6520	31	30	< 1
Cd	ppm	0.3	3.3	3.3	0.4	0.86	< 0.3	0.08	< 0.3
Mo	ppm	1	14	18	310	310	< 1	0.25	< 1
Pb	ppm	3	684	730	45	52	22	25	< 3
Ni	ppm	1	43	41	41	42	37	38	< 1
Zn	ppm	1	708	760	74	73	104	103	< 1
S	%	0.01	0.23	0.257	1.8	1.77	0.07	0.065	< 0.01
Al	%	0.01	3.48	3.52	4.7	7.2	5.93	8.34	< 0.01
Be	ppm	1	1	1.22	2	1.9	3	3	< 1
Bi	ppm	2	1280	1380	10	19	< 2	2.6	< 2
Ca	%	0.01	0.98	0.96	1.17	1.01	1.22	1	< 0.01
K	%	0.01	0.06	0.05	3.27	4.01	2.77	2.72	< 0.01
Li	ppm	1	12	8.2	11	11.1	36	34	< 1
Mg	%	0.01	0.33	0.217	1.75	1.66	1.04	1.02	< 0.01
Mn	ppm	1	900	852	147	155	926	880	13
P	%	0.001	0.055	0.065	0.133	0.12	0.053	0.069	< 0.001
Sr	ppm	1	286	275	218	221	182	180	< 1
Ti	%	0.01					0.27	0.606	< 0.01
V	ppm	2	84	80	91	87	61	102	< 2
Y	ppm	1	27	32	14	14	34	40	< 1

Table 4 (cont.). Results of Actlabs analyses of reference material for the TD-ICP method. Actlabs' measure values compared to the certified values. Reference materials include USGS geochemical exploration references and Canadian SRMs.

Analyte Symbol	Unit Symbol	Detection Limit	USGS SCO-1: Shale		USGS GXR-6: Powdered Soil		USGS DNC-1a: Dolerite		Method Blank
			Measured value	Certified value	Measured value	Certified value	Measured value	Certified value	
Ag	ppm	0.3	< 0.3	0.134	0.4	1.3			< 0.3
Cu	ppm	1	31	29	68	66	100	100	< 1
Cd	ppm	0.3	< 0.3	0.14	0.7	1			< 0.3
Mo	ppm	1	< 1	1.4	2	2.4			< 1
Pb	ppm	3	31	31	76	101			< 3
Ni	ppm	1	29	27	22	27	260	247	< 1
Zn	ppm	1	103	100	115	118	60	70	< 1
S	%	0.01	0.07	0.063	0.02	0.016			< 0.01
Al	%	0.01	5.23	7.24	13.8	17.7			< 0.01
Be	ppm	1	2	1.8	1	1.4			< 1
Bi	ppm	2	< 2	0.37	< 2	0.29			< 2
Ca	%	0.01	2.28	1.87	0.31	0.18			< 0.01
K	%	0.01	2.33	2.3	1.81	1.87			< 0.01
Li	ppm	1	46	45	42	32	5	5.2	< 1
Mg	%	0.01	1.69	1.64	0.85	0.609			< 0.01
Mn	ppm	1	410	410	990	1010			6
P	%	0.001	0.086	0.09	0.043	0.035			< 0.001
Sr	ppm	1	169	170	57	35	139	144	< 1
Ti	%	0.01	0.36	0.38					< 0.01
V	ppm	2	141	130	188	186	152	148	< 2
Y	ppm	1	20	26	17	14	16	18	< 1

RESULTS AND DISCUSSION

Sub-Surface Exploration

Ground-Penetrating Radar

Eighty transects were collected using the 250MHz and 100MHz antennas. A majority of these lines did not produce any identifiable or definitive results. The GPR detected sub-surface structures in the upper three meters; however, depths greater than three meters showed little to no identification of boundaries. This is likely due to the highly saturated clay soils which makeup the floodplain.

In general, point features are identifiable in the 0-2 meter range of the records; however, no solid underlying rock surface is definitively recorded. (Figures 5 and 5a)

Coring on the floodplain demonstrated a soil profile exceeding twelve feet with various soil types throughout the depth profile. It is likely that the boundaries which are observed in the upper two to three meters of the GPR records are soil type variations.

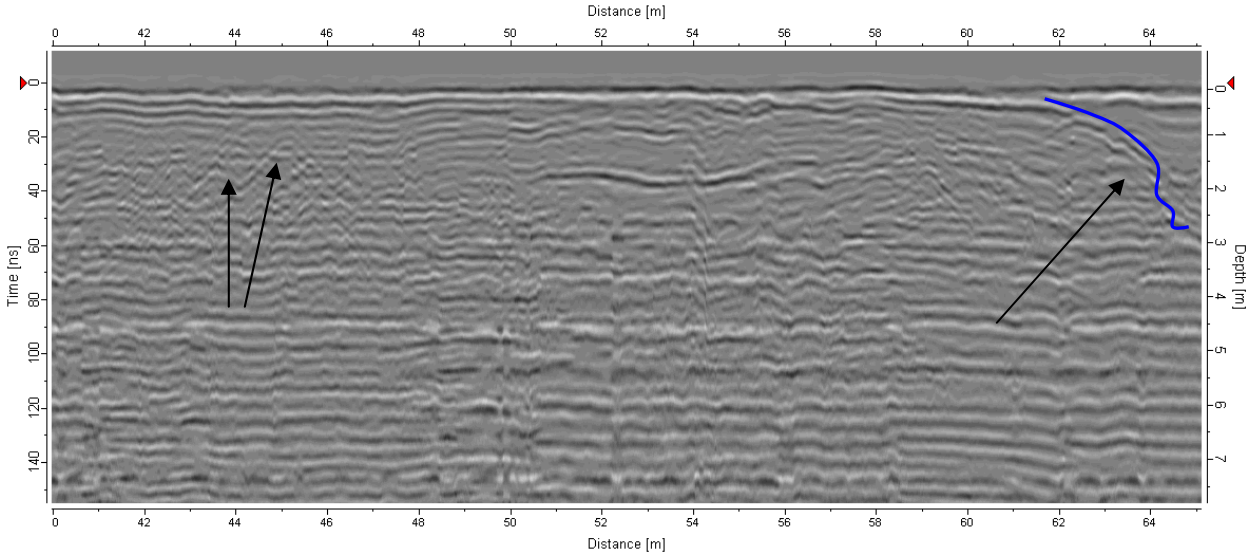

Figure 5. GPR Line 38 running north to south along 347875 Easting. Park trail is on the left, and the river is on the right of the image. Point features are identified at 42-48 meters as upside down parabolas. The dip in the rightside of the record is the beginning of the historic river channel as a slight point bar has formed in this vicinity.

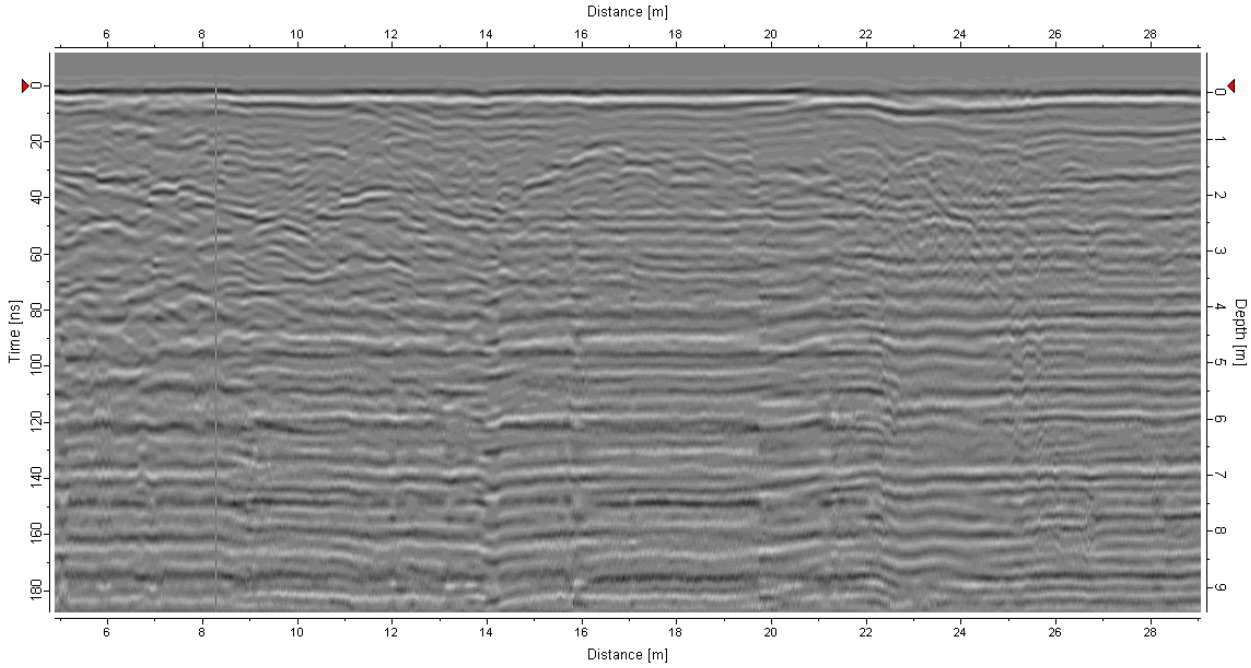

Figure 5a. GPR Line 46 running north to south along 347700 Easting. Slight features are discernable in the upper three meters; however, no definitive boundaries are observed.

Sub-Bottom Seismic Profiling

Seismic records were collected in the river where the water depth was over six inches. Recordings clearly identified historic river channels and bedrock outcrops.

The records show that the river valley is incised with controlling bedrock structures on one side of the river, and a depositional plain on the other. Upstream of the swinging bridge (Northing 4345875), the river left side of the river is bedrock constrained while the river right side of the river is situated on the surface of approximately twenty meters of alluvial deposits (Figure 12). There is a transitional portion of the river immediately downstream of the swinging bridge and upstream of the easterly bend of the river (4345875 to 4345725 Northing) where neither side of the river is constrained by bedrock and the river is running through alluvial deposits ranging in depth from 5 to 14 meters (Figure 11). At the easterly bend of the river (approx. 4346725 Northing) and continuing to Bloede Dam, the river is constrained on river right by bedrock. This bedrock is exposed at the river right shoreline where it plunges to a depth of 10 to 30 meters, and generally remains at that depth on the river left (Figures 8-10). Immediately upstream of the dam, the seismic records indicate that the historic channel ascends toward the surface indicating that this section of the river was highly constrained (Figures 6 and 7). The historic channel bottom is at a depth of approximately 25 meters. The records also indicate gas formation at the bottom of the channel near the dam indicating that the channel once accumulated organic material.

The longitudinal cross-sections (Figures 13 and 14) demonstrate the differences between the right and left sides of the river. The right side of the river (Figure 13) shows a shallower depth

to the historic channel, and it is irregular due to the jutting of the bedrock along that side of the river. The left side of the river (Figure 14) shows a deeper and more basin-like structure. Both of these profiles show a rise in the pre-dam surface just prior to the dam indicating a bedrock sill at that location.

Throughout the recordings, little variation is detected in the deposited material above the historic channels. This is an indication that the sediment type does not change considerably within the deposited sediments behind the dam.

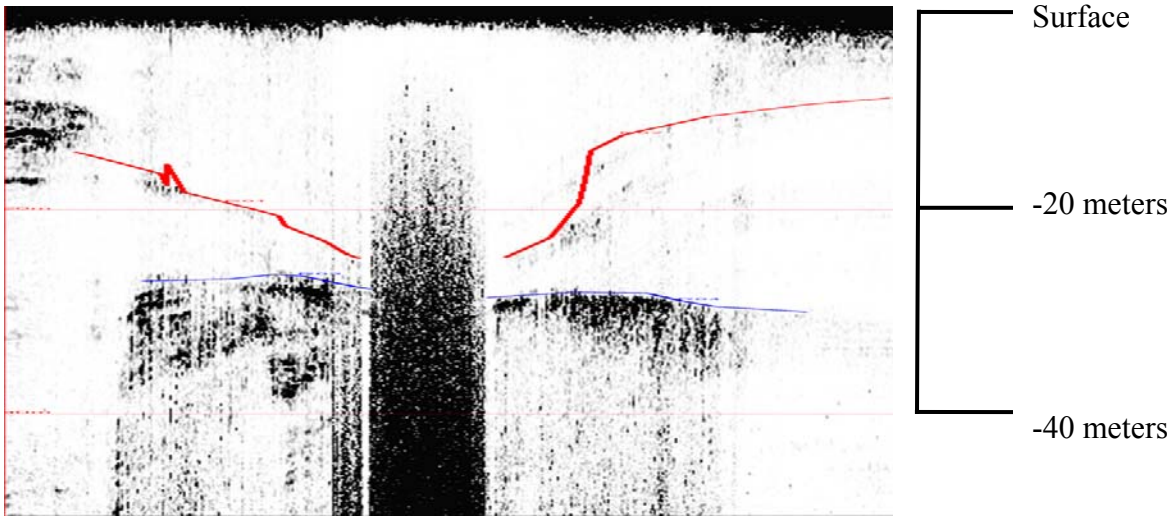

Figure 6. Seismic line 4 from south to north (River right to left) at 348000 Easting. Red line indicates historic channel predating the Bloede Dam. Blue line is interpreted as a reflector from the dam. The black streak in the middle is likely methane from organic rich sediments deposited in the base of the channel at approximately 25 meters depth from water surface. The center of the historic channel is located at 347997 Easting, 4345643 Northing.

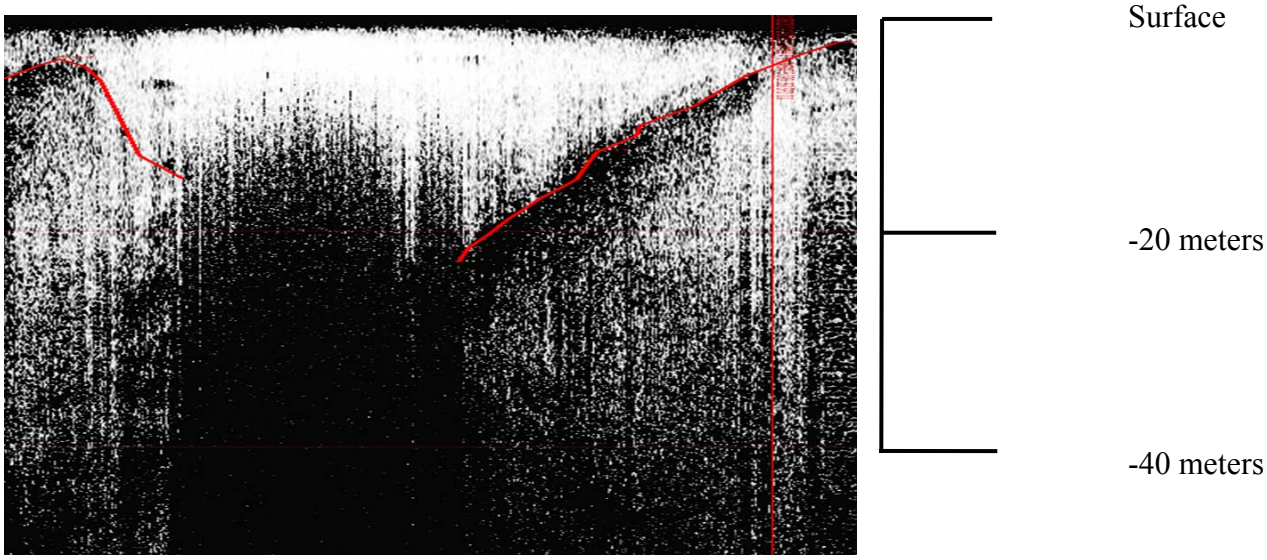

Figure 7. Seismic line 5 from south to north (River right to left) at 347960 Easting. Red line indicates historic channel predating Bloede Dam.

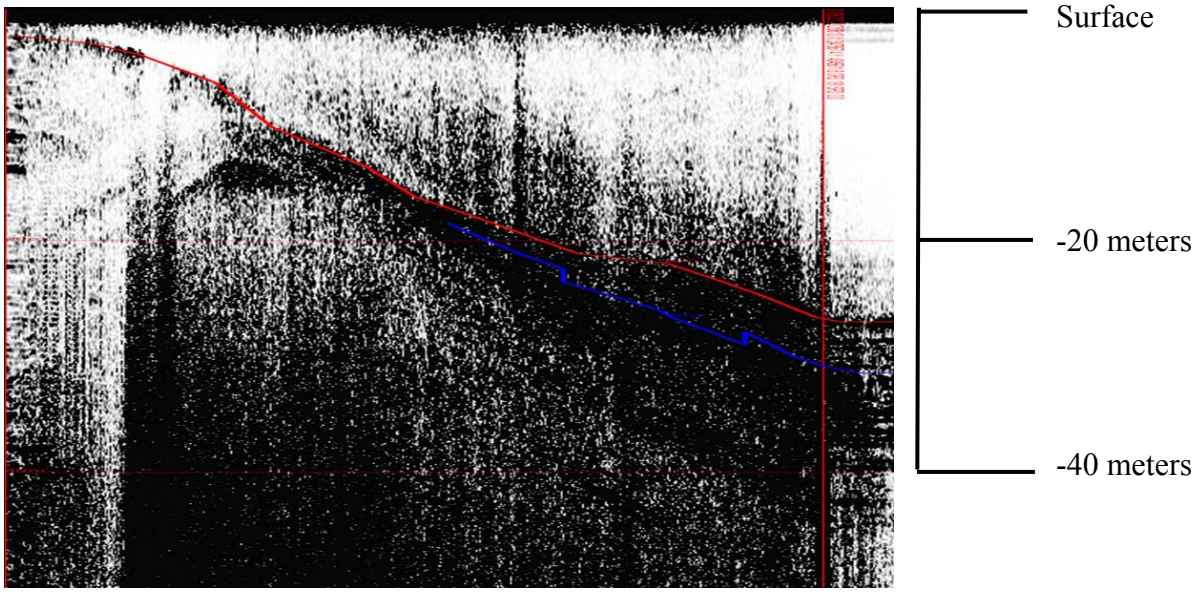

Figure 8. Seismic line 6 from south to north (River right to left) at 347895 Easting. Red line indicates historic channel predating Bloede Dam. Blue line is a previous channel.

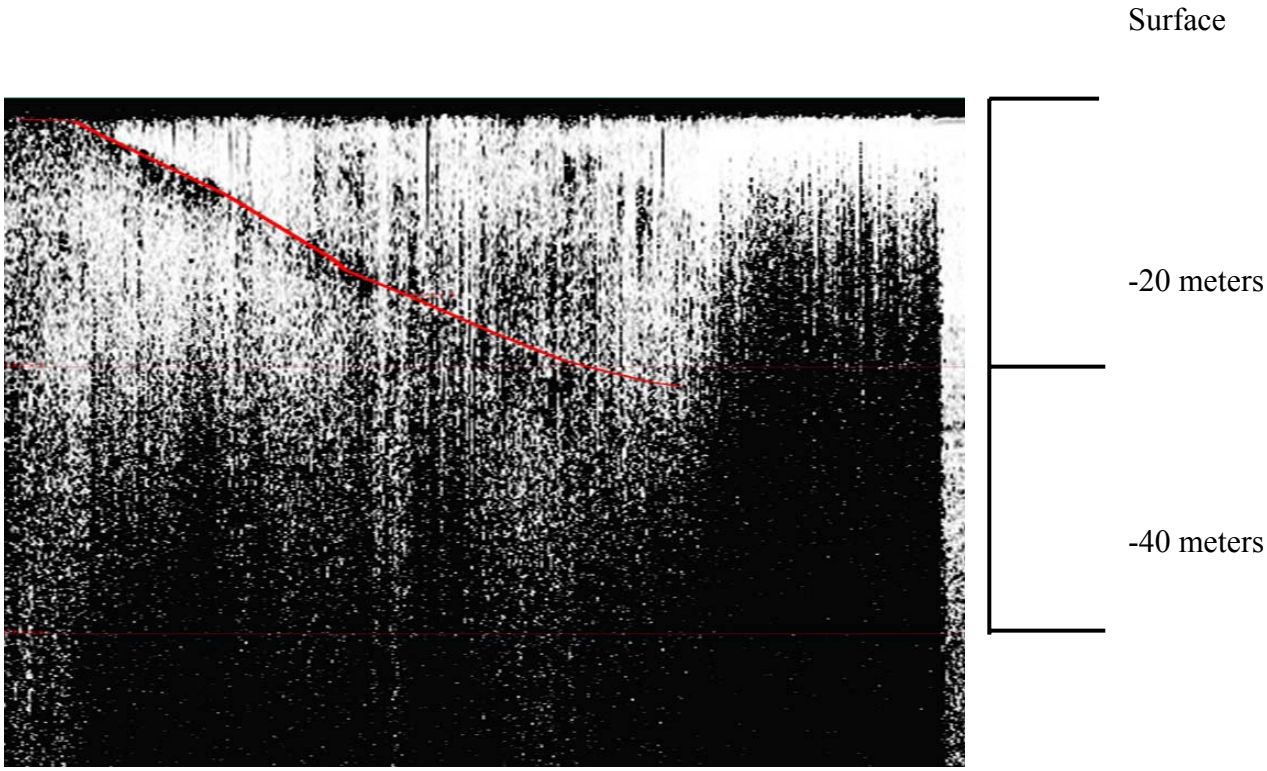

Figure 9. Seismic line 8 from southwest to northeast (River right to left) generally at 347770

Easting. Red line indicates historic channel predating Bloede Dam.

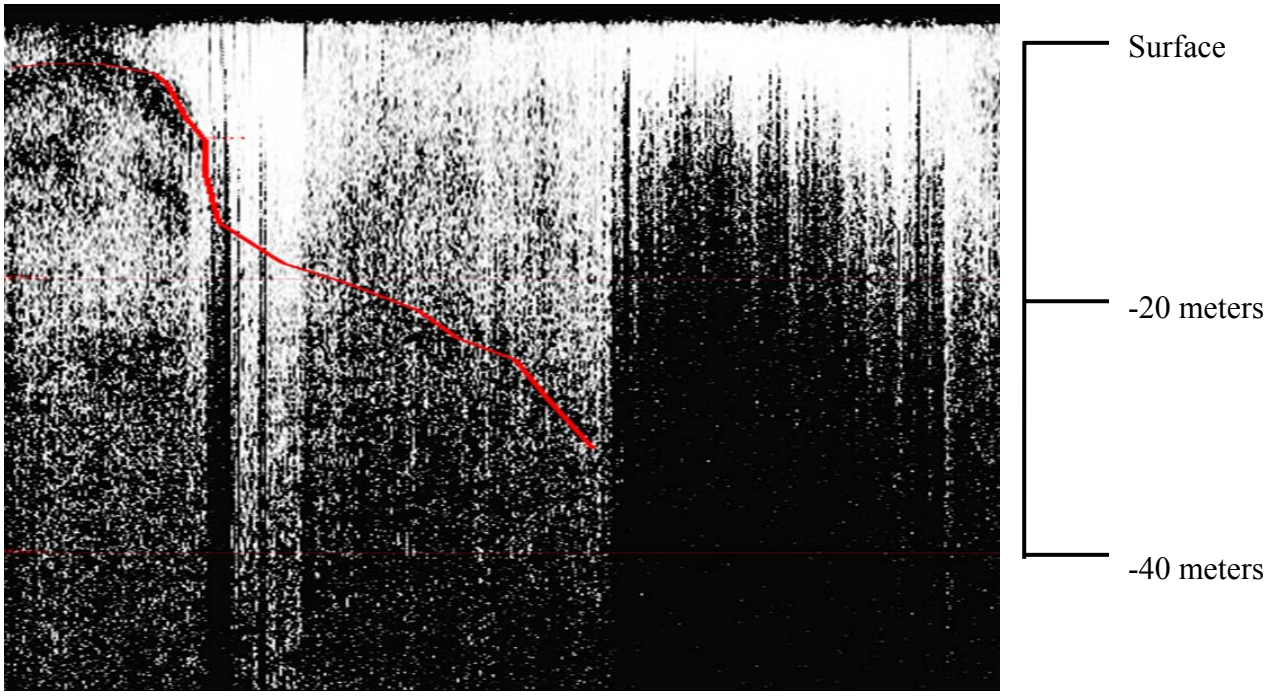

Figure 10. Seismic line 10 from west to east (River right to left) at 4345715 Northing. Red line indicates historic channel predating Bloede Dam.

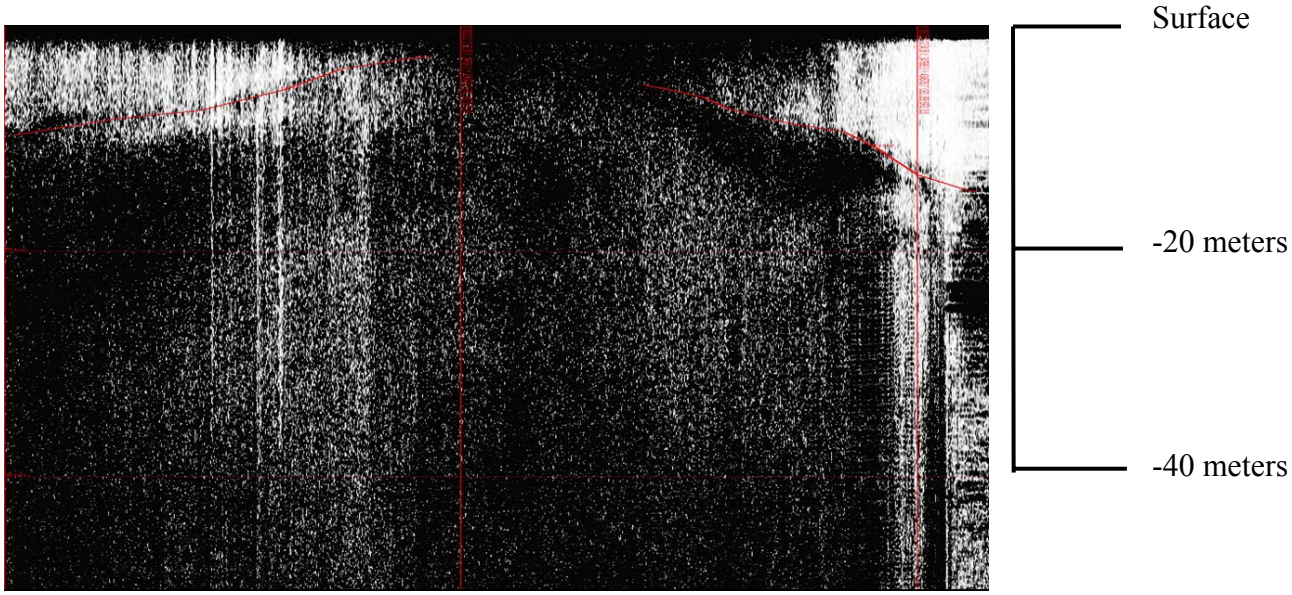

Figure 11. Seismic line 11 from southwest to northeast (River right to left) at an oblique angle between 4345740 and 4345785 Northing. Red line indicates historic river channel(s) predating Bloede Dam. The returned signal is significantly degraded below the channel which may be indicative of cobble / boulder field rather than solid rock.

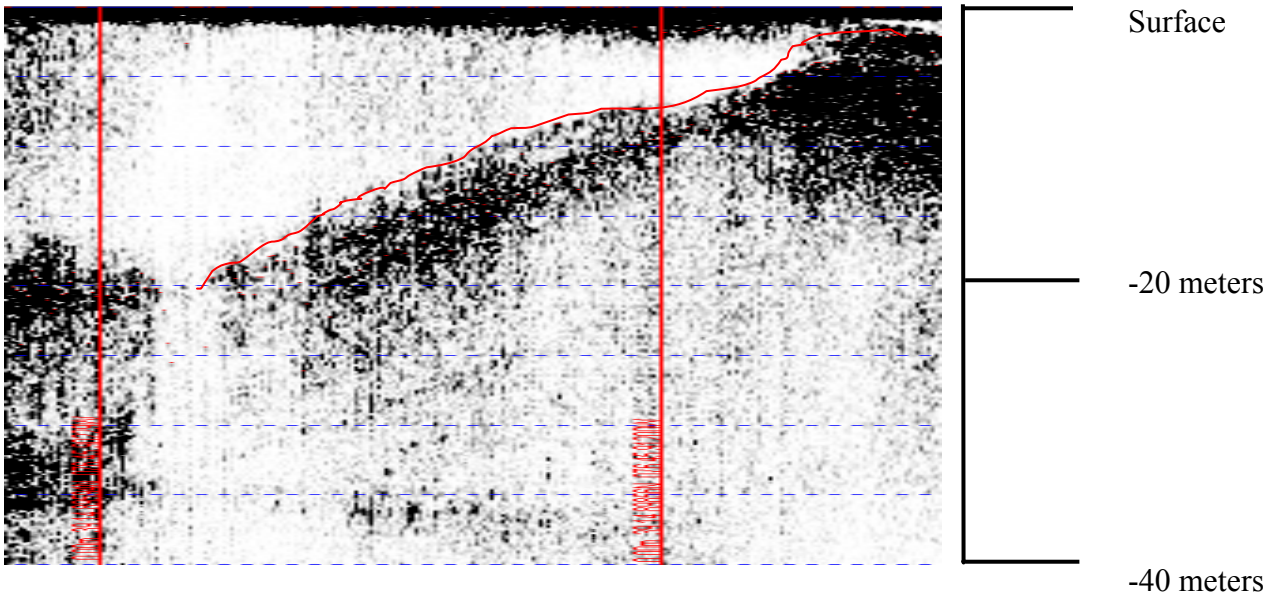

Figure 12. Seismic line 12 from west to east (River right to left) at 4345815 Northing. Cross-Section from West to East (River right to river left).

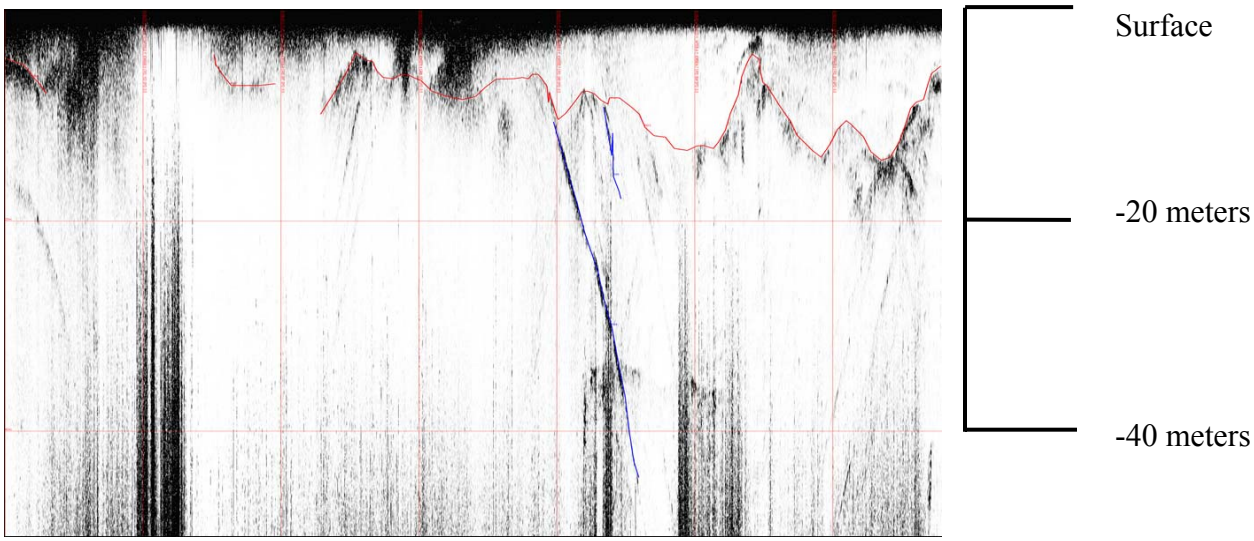

Figure 13. Seismic line 3 running from 4345700 to the Dam along river right (southwest side of river). Red line indicates historic river channel. Blue lines indicate point reflectors.

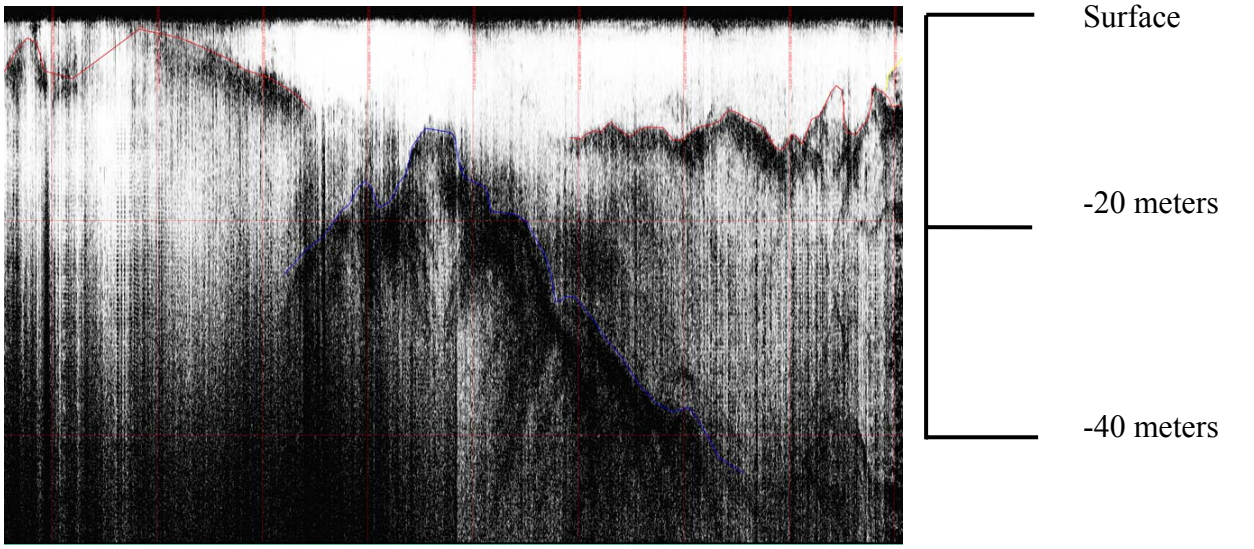

Figure 14. Seismic line 16 running from 4345740 to the Dam along river left (northeast side of river). Sill top is located at UTM 347832 E, 4345590 N and at a depth of 11.5 meters from water surface.

Sediment Character and Chemistry

Table 5. Collected core locations and depths.

Core (Attempt)	**Northing**	**Easting**	**Penetration**	**Comment**
	(UTM-Meters)	(UTM-Meters)	(Meters)	
1 (1)	348004	4345678	2.5	Hit large cobbles, bent barrel
1 (2)			1.2	
2 (1)	347875	4345668	1.2	Stopped at clay transition
2 (2)			1.2	Stopped at clay transition
2 (3)			0.6	Organic material blockage
2 (4)			0.5	Organic material blockage
2 (5)			1.15	Stopped at clay transition
2 (Auger)			3.05	Water table prevented further coring, sample washed out
3 (1)	348287	4345699	0.94	Hit rock, bent barrel
3 (2)			0.91	Hit rock, bent barrel
4	347758	4345931	0.93	Hit rock, bent barrel
5	347684	4345814	2.47	
6	347772	4345607	2.68	
7	347878	4345592	1.46	
8	347876	4345608	2.5	
9 (1)	347972	4345642	1.83	Hit cobble
9 (2)			2.13	Hit cobble
9 (3)			3.35	
9 (4)			3.14	
8a	347863	4345605	0.66	
8b	347890	4345612	0.86	

Physical Properties

Laboratory results are located in Appendix E.

The physical properties of the sediment within the riverbed behind Bloede Dam are very consistent. Gravelly-sand to sandy-gravel with less than two percent fine material dominates the sediment throughout the collected cores. The gravel content typically increases with depth and ranges from 20 percent up to an extreme 77 percent of the sediment composition. The core located downstream of the dam (Core #3) was slightly more sandy with a 27 percent gravel content. None of the riverbed collected cores showed any significant layering or stratification of sediments.

The cores located on the floodplain just upstream from the dam on river left (Cores #1 and #2) demonstrated a variation of sediment types. They consist of a much higher fine-grained particle (<62 microns) composition ranging from 30 to 90 percent. Core #1 shows layering of

sediments throughout the entire collected length. This layering varies from muddy sands to sand to sandy muds. It is likely that this location saw significant overbank deposits (sands) and floodplain deposits (muds) throughout its development. Core #2 which is located further upstream and more inland consists of gravelly sands for the topmost 76 centimeters [2.5 feet], and then it becomes a very homogenous sandy mud throughout the collected depth of 3.07 meters [10.1 feet]. A noticeable lack of gravel also occurs at the 76 centimeter interface.

Pollutant Analysis

Pollutant analyses were run on Core #1 (upper and lower halves), Core #3, Core #5 (upper and lower), Core #6 (upper and lower), Core #8 (upper and lower), and Core #9 (upper and lower). Partial pollutant testing, including total petroleum hydrocarbons-diesel range organics, total petroleum hydrocarbons-gasoline range organics, and semivolatile organic compounds, were performed on Core #8 Duplicate, Core #8a, and Core #8b.

Laboratory results from the analysis are contained in Appendix B. A summary table is contained in Appendix C.

With the exception of two cores, all analyses yielded results that were below the reporting limits of the analysis method and within the QA/QC of the instrument. Acetone, at 110 ug/kg, was detected in the sediment sample from the lower half of Core#1. Acetone is a known cleaning agent in the laboratory, and this anomaly is most likely associated with contamination within the lab. Sediments from the upper section of Core #8 yielded elevated concentrations of benzo(a)anthracene, benzo(b)fluoranthene, chrysene, fluoranthene, phenanthrene, and pyrene. These pollutants are polycyclic aromatic hydrocarbons (PAH). They are generally associated with coal tar products. Due to the reported contaminants, a second sample was taken from the other side of the core at the same sampling depth interval (Core #8 Duplicate). This sample was analyzed, and no detections above the reporting limits were identified. An additional two cores were collected near Core #8 (approx. 12 meters upstream (Core #8a) and 12 meters downstream (Core#8b)). These cores were analyzed and reported no elevated results. Based on the lack of redetection, it is likely that there are very sparse, small-sized solid contaminants (road millings, asphalt, slag, coke, etc) located at that site, but no large scale pollutant source.

Elemental Analysis

In general, reported concentrations of the elements for the core samples fell within the ranges expected for the type of sediments found in the study area. The sediment samples analyzed consisted of very angular particles, a portion of which was unweathered parent rock. The portion of the Patapsco River watershed (Lower North Branch sub-basin), upstream of the study site, drains an area underlain by Eastern Piedmont crystalline rocks consisting of, but not limited to, gabbro, granite, schist, gneiss, and pegmatites. These rocks weathered to produce quartz/quartzite sands with mica, heavy minerals, and clay minerals.

The mineral composition of these rock yield elemental abundances that fall within

those of average continental crustal rock. However, weathering processes of the parent rock and the transport and redistribution of the resulting sediments will change the relative abundance of the elements when compared to average crustal rock composition. For example, certain highly soluble elements such as Ca and Na will be leached during the erosion process, resulting in lower abundance compared to crustal rock. Those samples containing mostly quartz sand will have comparatively little Al, Fe and Mg.

CONCLUSION

The underlying geology in the Bloede impoundment shows a sill at the location of the dam with an historic basin reaching upstream. The rocks surrounding the dam create a pinch point in the river where a deep (25 meters) incised river channel existed. This historic river valley widens out into a basin ranging from 10-30 meters in depth upstream of the dam. Close to the dam, the south bank (river right) controls this basin and forces it north under the current floodplain located on river left upstream of the dam. Further upstream, at the location of the swinging bridge, the controlling geology changes sides, and the river becomes constrained on the east bank (river left) forcing the basin westerly.

The physical properties of the sediments within the reverbed are dominated by sands and gravel with less than two percent fine material. Riverbank soils are varied in composition; however, they have a significantly higher (60-90%) mud (silt and clay) composition which increases with depth.

The seismic records and the cores indicate that the accumulated sediment behind the dam is homogenous. The only observable exception is the area immediately upstream of the dam at 20-25 meters depth where organic material appears to have been deposited.

Based on the elements and pollutants analyzed in this report, the sediments located behind Bloede Dam do not have any increased pollutants or elemental makeup than the soils or localized geology of the region.

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Appendix A: Core Description Logs

GRAPHIC LOG

ID Site #1
Date collected 12/19/2011
Core no.

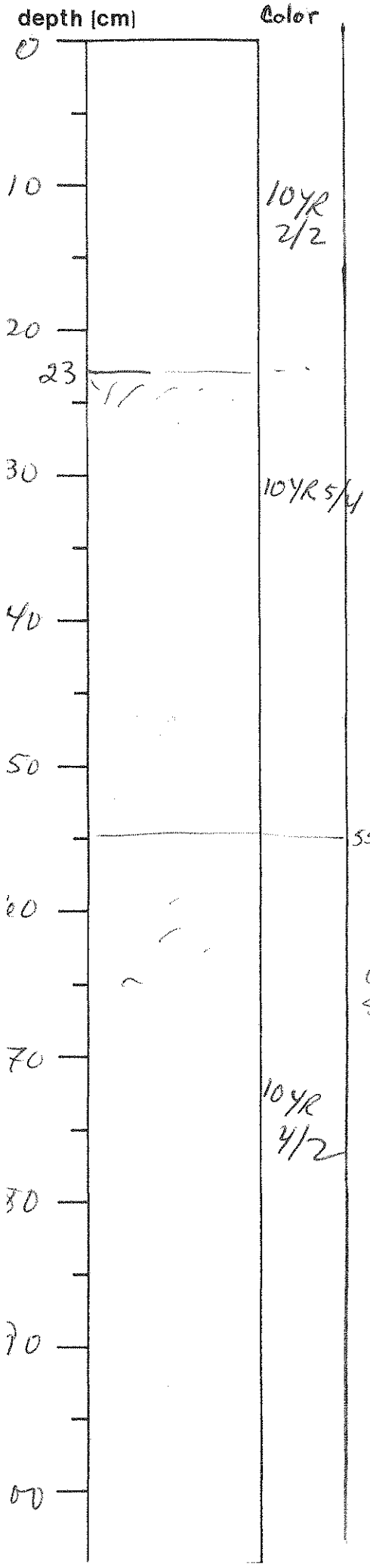
page 1 of 3

221cm - length.

Samples at intervals based on lithology

0 - 23
23 - 55
55 - 121
121 - 215
215 - 221

Det labs + G.S.



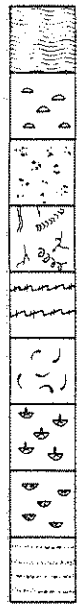
dk brown silty mud w/ micac. roots

med to coarse sand.. Some roots at top of section.

compact silty sand fining w/ depth

roots throughout

LEGEND:



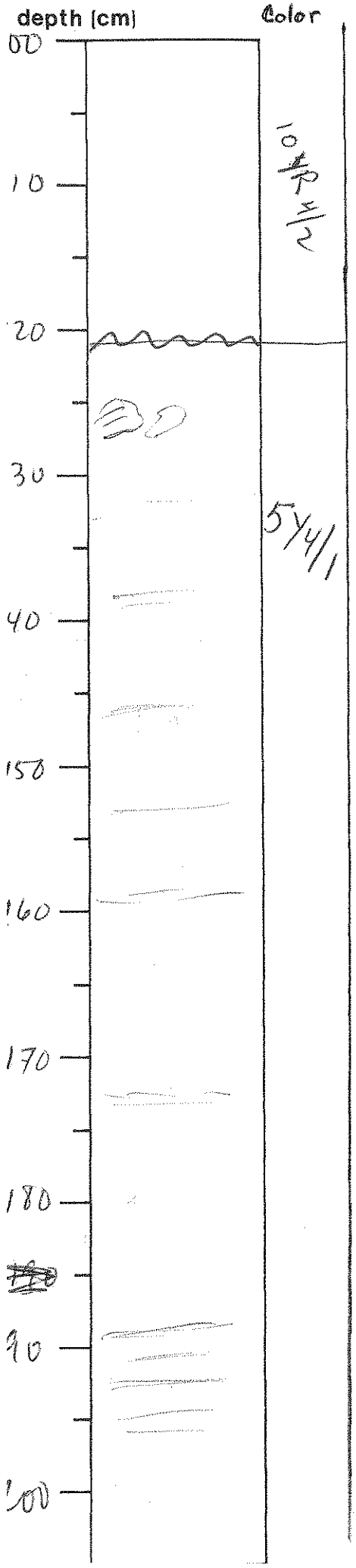
wavy bedding
lenticular bedding
mottling
bioturbated
chaotic bedding
shells
shell lenses
pebble lenses
sand partings

interbedded sand & mud
parallel lamination
ripple lamination
cross-bedding
flaser bedding

peat
Roots

GRAPHIC LOG

ID Site #1
Date collected 12/19/2011
Core no. A2 of 3



Compact
silty mud w/ sand.

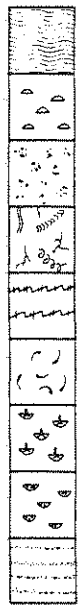
abrupt
color change
to darker greenish grey
silty mud - more anoxic
may be top of
water table / saturation
zone.
- Peat layer - woody at 127
laminated ~~oxid~~
anoxic zones -
lamination due to
subtle g.s. changes + mineralogy
as well as organic
content.
- less silty at 157 to
bottom of section -
very cohesive clayey mud, dry.

} roots - very dark.
} N2 - anoxic organic
zones - layers.
some laminae are very
micaceous.

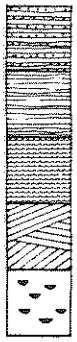
2 channels
0 - 121 } for priority
121 - 221 } pollutants
Phase Seperator Samples
S1 Upper - Two jars
S1 Lower - Two jars

Also for Acl labs
& Grain Size

LEGEND:



- wavy bedding
- lenticular bedding
- mottling
- bioturbated
- chaotic bedding
- shells
- shell lenses
- pebble lenses
- sand partings

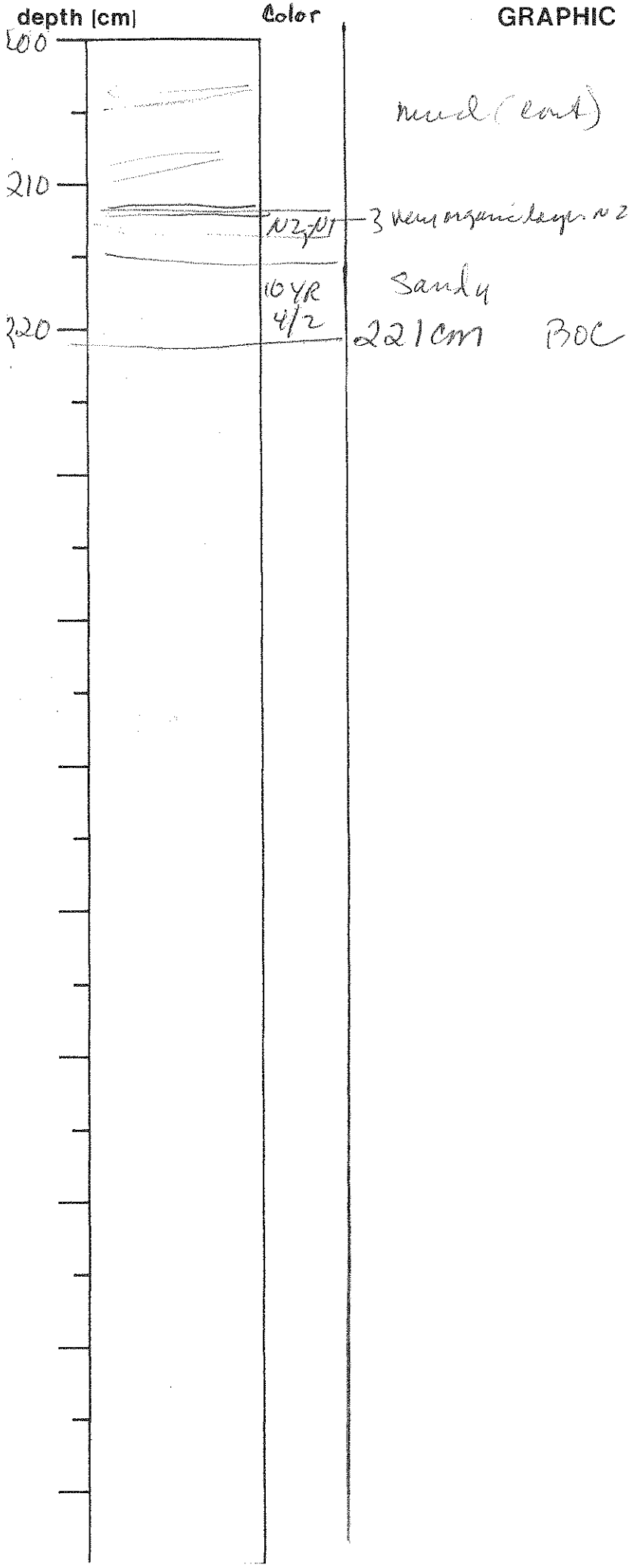


- interbedded sand & mud
- parallel lamination
- ripple lamination
- cross-bedding
- flaser bedding

- peat
- Roots

GRAPHIC LOG

ID Site #1
Date collected 12/19/2011
Core no.
p2 of 3



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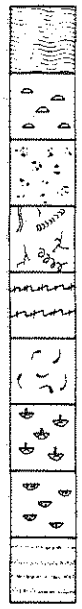


wavy bedding
lenticular bedding
mottling
bioturbated
chaotic bedding
shells
shell lenses
pebble lenses
sand partings

interbedded sand & mud
parallel lamination
ripple lamination
cross-bedding
flaser bedding

peat
Roots

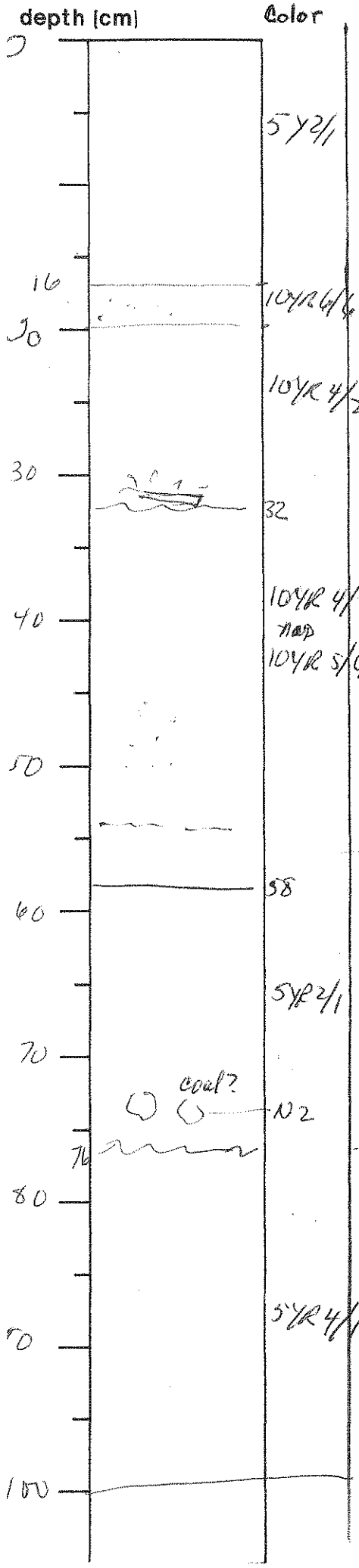
GRAPHIC LOG

Gloede

ID Site #2
Date collected 12/19/2011
Core no.

Core length 1m

3.8 penetration
.6
3.2



Samples

Cores

5Y2/1 dark brownish ~~orange~~ orange micaceous sand.
Med to coarse sand
NOTE: MICA Throughout core.

10YR6/4 yellow orange ~~med~~ med to coarse sand

#1

10YR 4/2 fining to med to fine sand w/ silt: darker in color. ~~Roots at 32cm~~

~0 m

roots at ~32cm.
Distinct horizon

10YR 4/2 sand - coarse gravel (1)
map
10YR 5/4 - laminated lighter & dark in color.

#2

very coarse lighter color sand. distinct horizon 58

Brown silty sand with pores spotted.

5YR2/1 Clasts of higher organic mud - very compact
some layers (4cm lamina) #3
ground - more gravelly at bottom of section - piece of coal
~~embedded~~ indistinct horizon. 74

N2

Compact sandy mud - v silty -

5YR4/1 Brown to Bronish gray oxidized clasts - roots -

#4

100

LEGEND:

- wavy bedding
- lenticular bedding
- mottling
- bioturbated
- chaotic bedding
- shells
- shell lenses
- pebble lenses
- sand partings
- interbedded sand & mud
- parallel lamination
- ripple lamination
- cross-bedding
- flaser bedding
- peat
- Roots

NOTE - lengths in ft/inches

CORE ID: site 2 auger started at 4' (1.22m)

DATE COLLECTED: 1/4/2012

Auger

INITIAL LENGTH: _____ cm

COMPACTION: 0 cm

FINAL LENGTH: 12.1" (10') cm

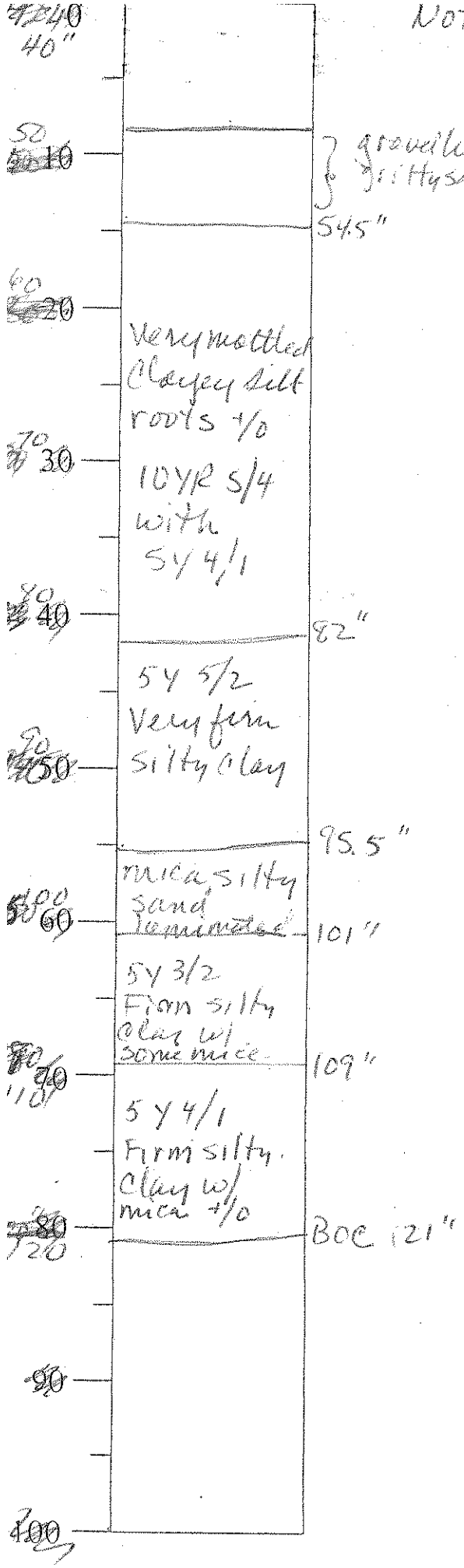
DATE OPENED: 1/5/2012

NOTES: Augered down at 4' at site 2 core

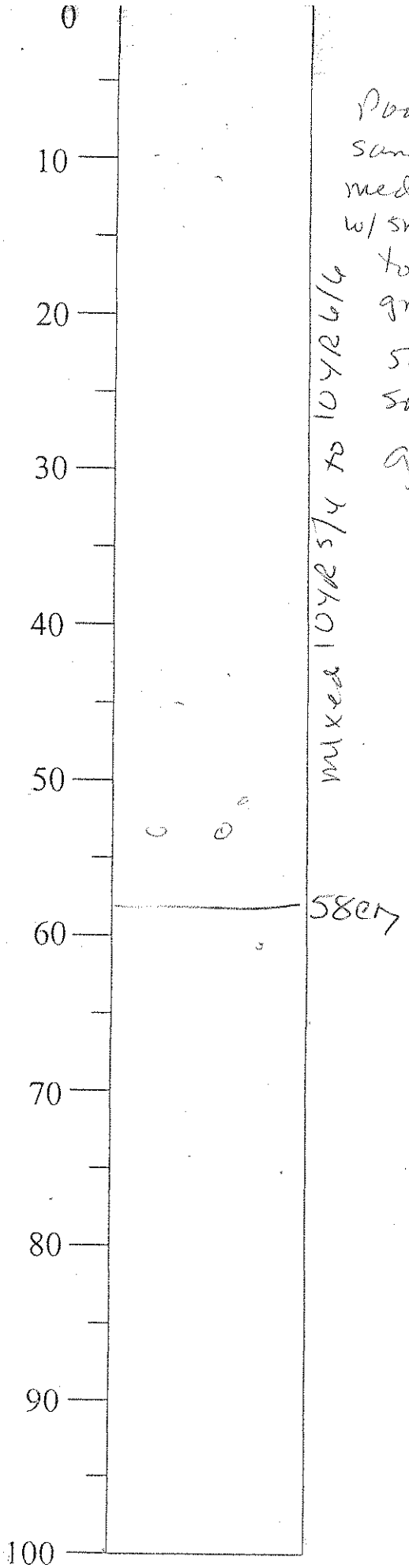
no EPA readings

took Photos

opened & described on site



SAMPLE	GRAIN SIZE	
54.5-82"	x	Acid?
82-95.5"	x	x
101-121"	x	x
95.5-101"	x	x



Poorly sorted sand - med to v. coarse sand w/ sm. gravel. Uniform to 50cm - larger gravel particles below 50cm mixed w/ poorly sorted sand - lg mica particles

Mixed 10YR 5/4 to 10YR 6/4 gravel - dk brn to brn/black

sand

CORE ID: Site #3

DATE COLLECTED: 4 JAN 12

Vibracore
INITIAL LENGTH: 3.1 ft penetration cm

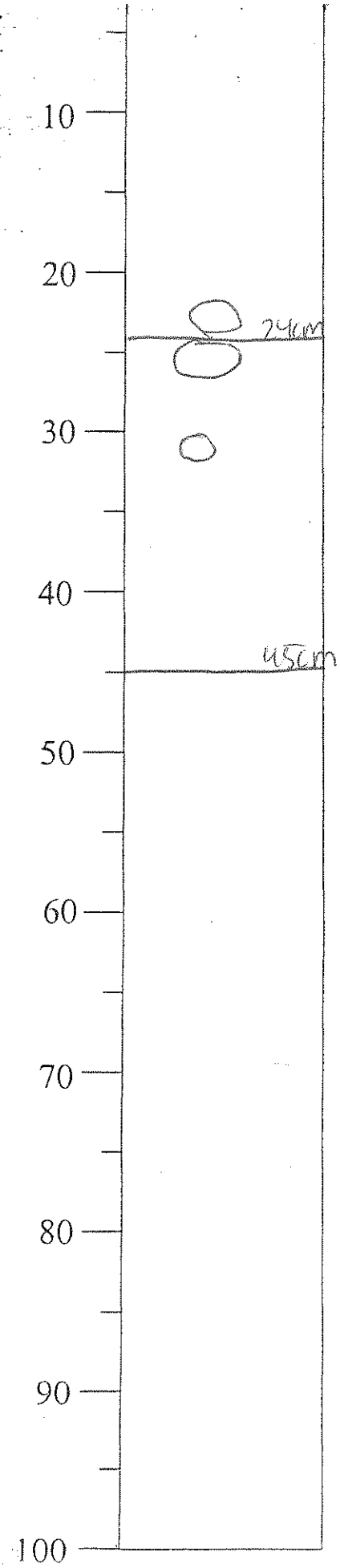
COMPACTION: 1.2 ft. cm

FINAL LENGTH: 1.9 ft — 58 cm

DATE OPENED: 5 JAN 12

NOTES:

SAMPLE	GRAIN SIZE	
0-58cm	X	
	X	EPA PRIOR.
	X	Geotech



C–VC Sand to gravel, with fines (muddier than bottom), poorly sorted
10YR 5/4 to 5YR 4/4

Cobbles

VC Sand to gravel, granules, pebbles
10YR 6/6 to 5YR 3/4

Bloede Dam Site #4

DATE COLLECTED: 1/11/12

INITIAL LENGTH: ~~[illegible]~~ cm

COMPACTION: _____ cm

FINAL LENGTH: 45cm cm

DATE OPENED: 1/24/12

NOTES:

SAMPLE	GRAIN SIZE
0-24cm	X
24-45cm	X

Bloede

CORE ID: Site 5

DATE COLLECTED: 1/10/2012

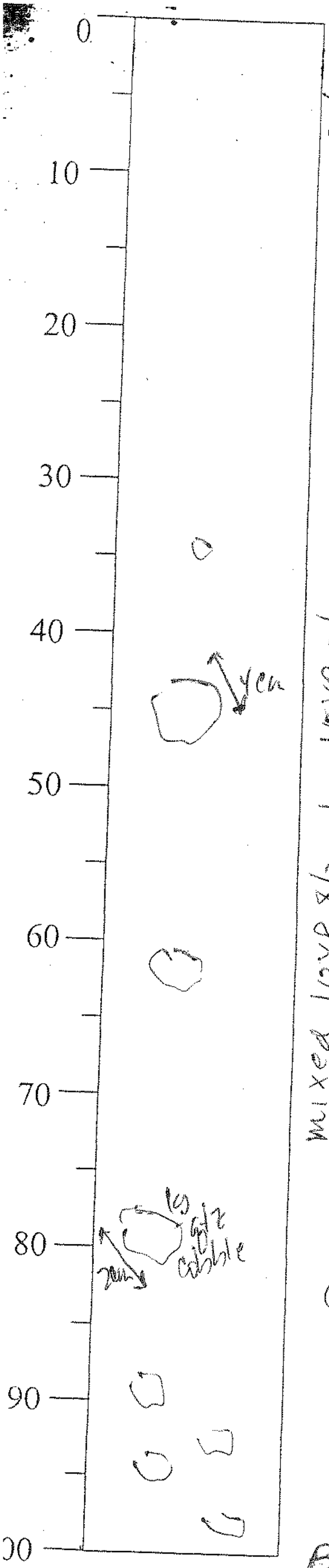
INITIAL LENGTH: ________ cm

COMPACTION: ________ cm

FINAL LENGTH: ________ cm

DATE OPENED: 1/11/2012

NOTES: penetrated 8.1 ft
outside 3.3'
inside 7.7
3.4' consolidation



Color

poorly sorted
& gravel

Coarse to v. coarse
sand
gravel & cobbles (↑4cm)
+/o

mixed 10YR 8/2 to 10YR 2/2
lg gravel & cobbles - as dark as 10/2

Increased gravel &
cobbles w/ depth
~ 90 cm - coarsening
of sand fraction also

B

3 jar ea {

SAMPLE	GRAIN SIZE
0-57cm -	x x EPA x Poll
57-114cm -	x x
& GS &	
Aeltenfen	
0-114cm	

Bloede

CORE ID: Site 5

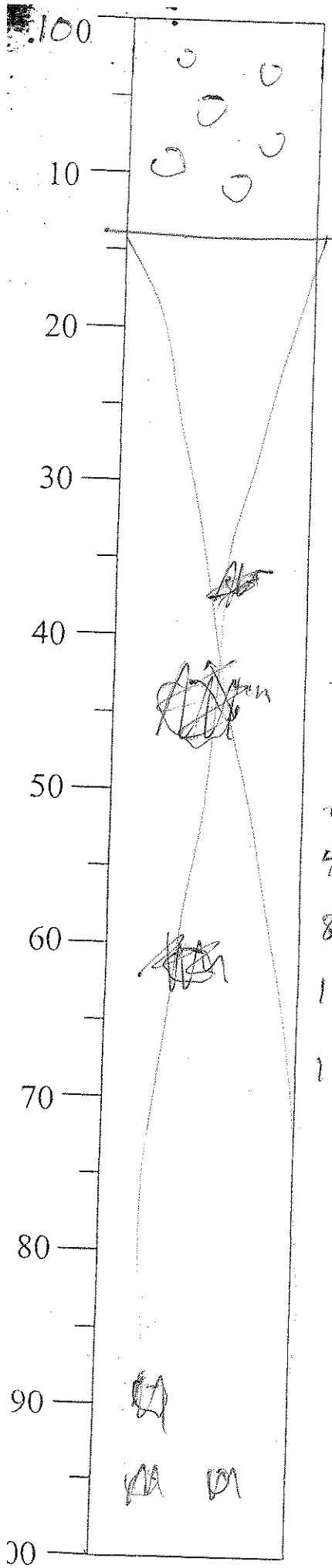
DATE COLLECTED: 1/10/2012

INITIAL LENGTH: _____ cm

COMPACTION: _____ cm

FINAL LENGTH: _____ cm

DATE OPENED: _____



depth	cm		W(g)
~90-92	5 cm x 3	pink smoky	37.4
78-80	5.5 x 2.5	quartz	58.1
70 cm	4 x 3.5		22.3
68-70	3.5 x 3.0	plagio?	32.4
60-61	2.5 x 1.5	feldspar	6.9
42-44	4 x 2	gneiss?	23.9
84-85	3 x 1.5	pegm. chunk	5.6
100 wedged in cor	5 x 3	well rounded quartz	53.3
100	4 x 2.5	well rounded quartz	27.4

NOTES:

SAMPLE	GRAIN SIZE

Bloede

CORE ID: Site 6

DATE COLLECTED: 1/10/2012

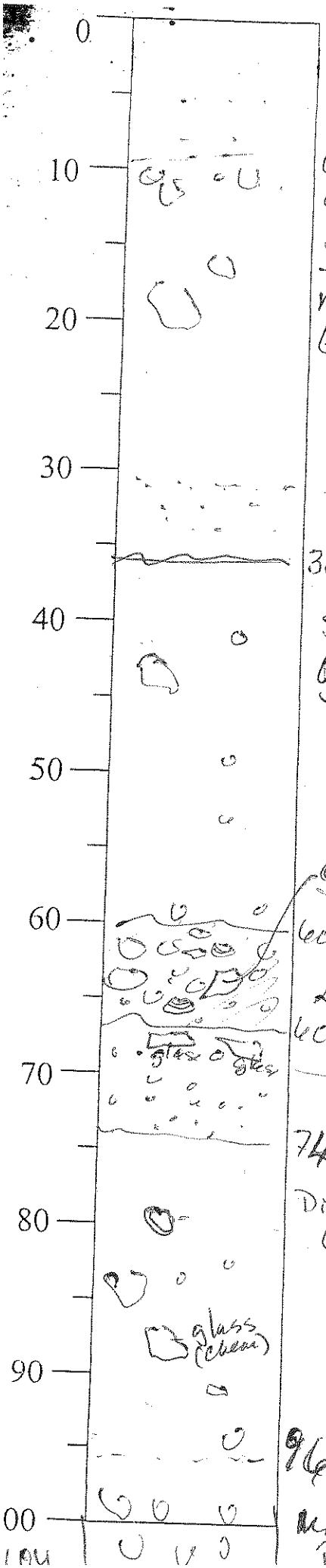
INITIAL LENGTH: 8.8 ft cm

COMPACTION: 5.3 ft cm

FINAL LENGTH: 105 cm (41")

DATE OPENED: 1/11/2012

NOTES: Penetration 8.8 ft - 5.3 - compaction



Gravelly
Coarse to v.c
Sand w/ Cobbles
- Gravelly layers at 10cm & 34-38cm
Mixed mineral assemb
Color mixed yellows
brown (oxidized)
10YR 8/2 → 10YR 2/2
Very poorly sorted
} slightly coarser
34 30-34 cm

Slightly darker (↑ H_2O_2)
g. c to v c sand
w/ Cobbles, poorly sorted
10YR 5/4 → 10YR 2/2

glass

glass shards at 60 & 67 cm (brown) (green)

60 g. and c to v c sand
w/ Cobbles - and coal?
60 coal gives to darker
color N2-N3
} shell frags!

g & c to v c sand w/
74. some cobbles - slightly more
grave than other layers.
Disarticulated shell (bivalve). at 80cm
c to v.c. Sand w/ gravel
& Cobbles 10YR 4/2
Sand is slightly
better sorted
some shell frag. throughout
96cm
c to v c sand 10YR 4/2 to
more gravel & cobbles 5YR 3/4
Bot. 104

SAMPLE	GRAIN SIZE	
0-60		EPA Poll
60-~~96~~		EPA
~~No EPA~~		
~~Pollutants~~		
0-60 - Gs & Cec lab		
60-96 "	"	"

Ploede

CORE ID: Site 7

DATE COLLECTED: 1/10/2012

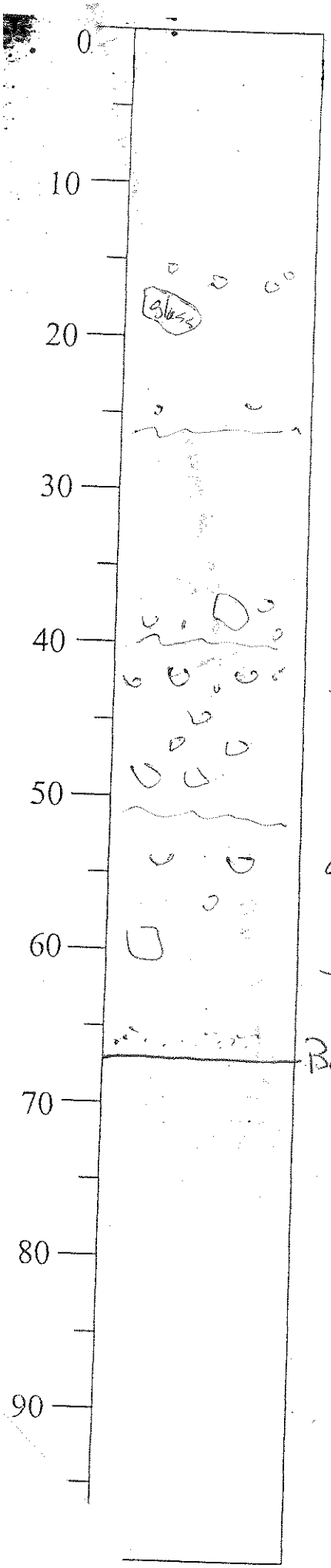
INITIAL LENGTH: 4.8' penetration cm

COMPACTION: 2.6' cm

FINAL LENGTH: 67cm (26") cm

DATE OPENED: 1/11/2012

NOTES:



V.C sandy gravel w/ Couple ~~some~~ ~~cobbles~~ pebbles (4cm ~~>4cm~~) (4mm-64mm)

10YR 8/2 → 10YR 2/2 w/ some orange Hue

gravelly v.c. sand w/ some pebbles & cobbles

Slightly darker 10YR 2/2

Pebbly gravelly V C sand.

gravelly v-vc. sand w/ pebbles

finer sand at very bottom

10YR 4/2 → 10YR 6/4

BOC 67cm

No EPA Priority Pol.

SAMPLE	GRAIN SIZE	
0-40	✓	Acitbs
40-67cl	✓	Acitbs

chlorinated hydrocarbons

CORE ID: Site 8 Bloede Dam

DATE COLLECTED: 1/19/2012

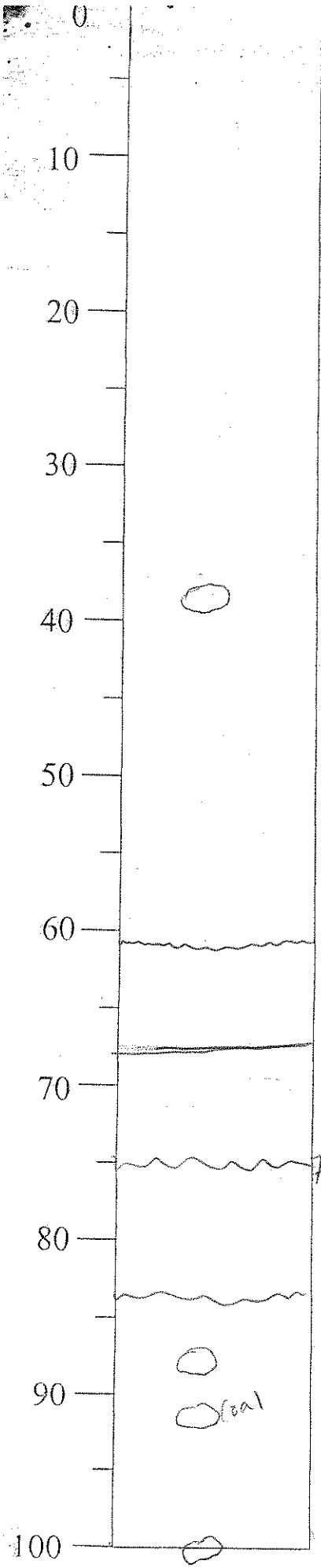
INITIAL LENGTH: _____ cm

COMPACTION: _____ cm

FINAL LENGTH: ~~41.65~~ 44 inches cm

DATE OPENED: 1/20/2012

NOTES: Penetration - 8.2ft
Shells throughout - freshwater clams



piece of pottery found ≈ 20cm

Coarse to very coarse sand w/ gravel + pebbles + a couple cobbles
mica flakes
Colors range 10YR 8/2 to 10YR 4/2
larger particles (& gravel) are darker color (N2-N3)

62cm
Coarser mix, C-VC sand, more poorly sorted, more 10YR 8/2 w/ mixed darker (10YR 4/2)

67.5cm

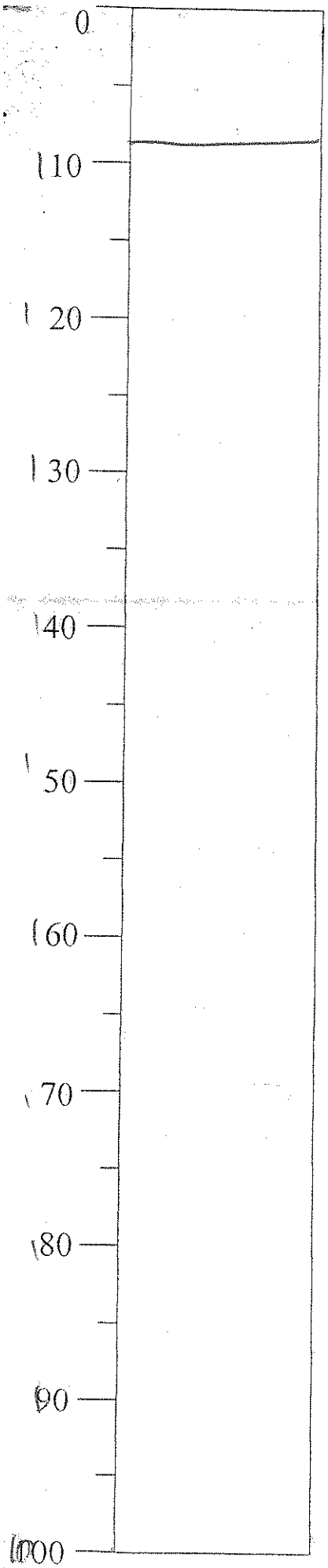
75cm
Slightly lighter in color 10YR 6/2

84cm

Darker, overall finer med-VC sand better sorted overall color - 10YR 4/2

to 109cm

SAMPLE	GRAIN SIZE	
0-67.5cm	x	channel Actlabs
67.5-109cm	x	channel Actlabs
12-23cm	x	Actlab
61.6-67.5cm	x	Actlab
75-84cm	x	Actlab
84-100cm	x	Actlab



bottom of core
109cm

CORE ID: Site 8 Bloede Dam

DATE COLLECTED: 1/19/2012

INITIAL LENGTH: _____ cm

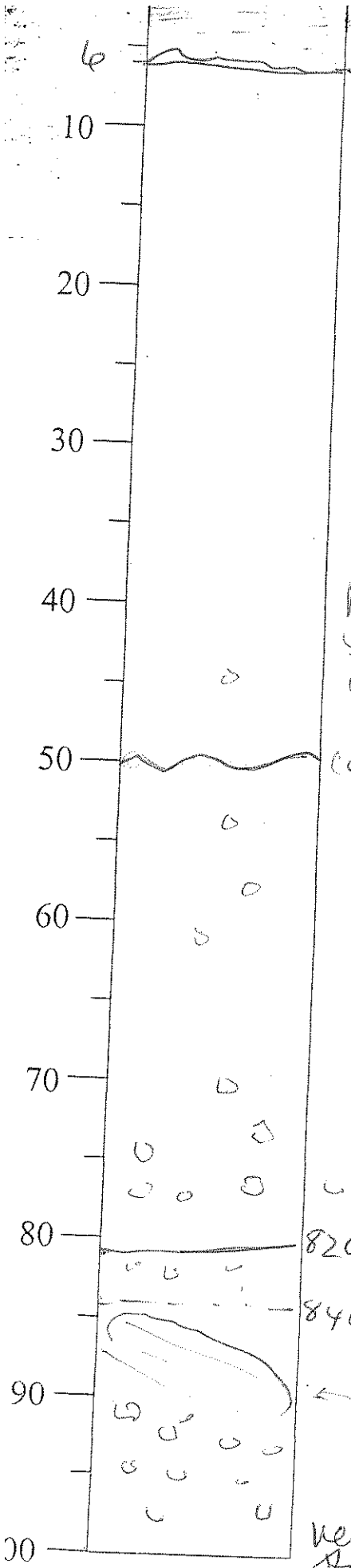
COMPACTION: _____ cm

FINAL LENGTH: _____ cm

DATE OPENED: _____

NOTES:

SAMPLE	GRAIN SIZE



mud
5Y 2/1

pit 1 of 2

CORE ID: Site #9 core #3

DATE COLLECTED: 1/19/12

INITIAL LENGTH: _____ cm

COMPACTION: 6.5 ft cm

FINAL LENGTH: 138 cm 4.5 ft cm

DATE OPENED: 1/20/12

NOTES:
penetration = 11 ft

poorly sorted
coarse to v. coarse
sand w/ gravel, pebbles

overall color
10YR 4/2
particles colors range
from 10YR 8/2 to
10YR 2/2

color change to slightly lighter
and more red

increase gravel
& pebbles with
depth

82 cm
84 cm
darker coarse to v. coarse
sand w/ some gravel
darker color may be
reducing environment
(? organic ?) 10YR 4/2

5YR 5/6 - color of very
large pebble - diameter
of core liner

very poorly sorted coarse to v. c.
sand, gravel, pebbles & cobbles
darker than upper section
overall - 5Y 3/1

cont. on next page

SAMPLE	GRAIN SIZE

CORE ID: Site 9 core 3

DATE COLLECTED:

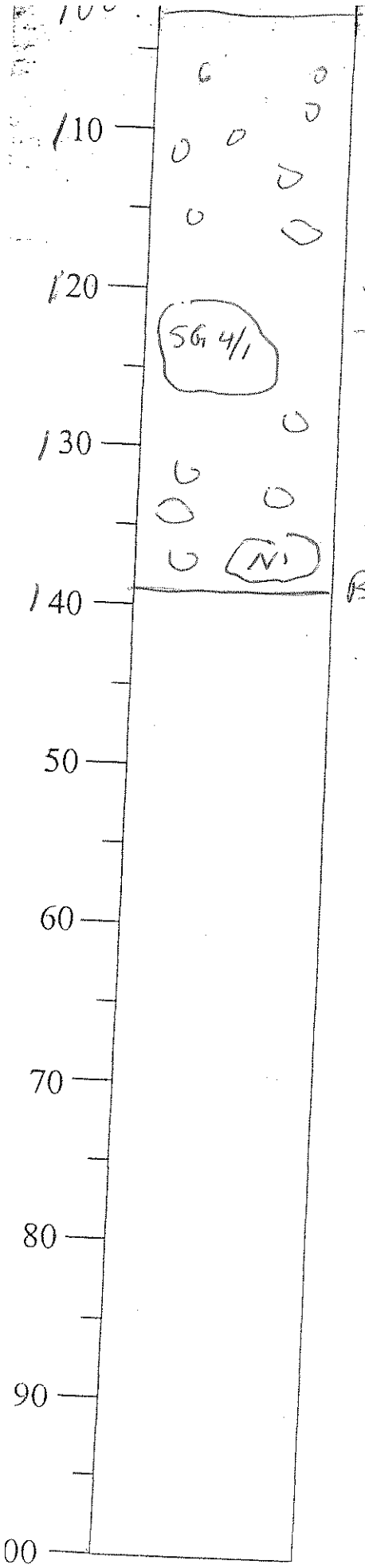
INITIAL LENGTH: cm

COMPACTION: cm

FINAL LENGTH: cm

DATE OPENED:

NOTES:



5Y 3/1 overall color
Extremely poorly sorted
Increased amount
of gravel, cobbles &
pebbles w/ coarse to
v.c. sand matrix.

section darker in color
due to more darker
minerals/rocks and/or
5Y 3/1 some fine grain material, or coal dust/particle

BOC 138 cm
(4.5')

SAMPLE	GRAIN SIZE

Bleeck Site #9 Core #4

DATE COLLECTED: 1/19/12

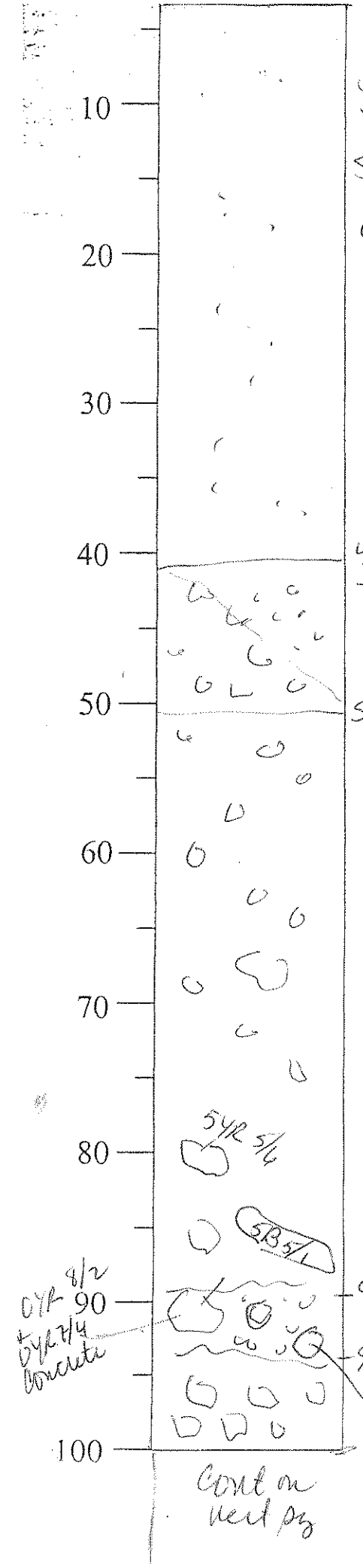
INITIAL LENGTH: _____ cm

COMPACTION: _____ cm

FINAL LENGTH: 118cm cm

DATE OPENED: 1/20/12

NOTES:
penetration = 10.3ft



2cm - mud 5Y 2/1

fairly good sorted med to V.C. sand

Some gravel

Overall color

10YR 6/2 to 10YR 5/4

fairly uniform throughout

41

Transition zone

Coarser C to V.C. sand w/ gravel & pebbles

51

darker in color 10YR 4/2

Very poorly sorted C to V.C. sand w/ lots of gravel, pebbles & some cobbles; color of particles ranged from 10YR 8/2 to 10YR 4/2 w/ black particles (N2-N1)

91

Very dark (N1-N2) sandy gravelly, lots of dark particles

94

pieces of glass - clear & green throughout -

SAMPLE	GRAIN SIZE

Cont on next pg

Bloede Site 9, Core 4

DATE COLLECTED: 1/19/12

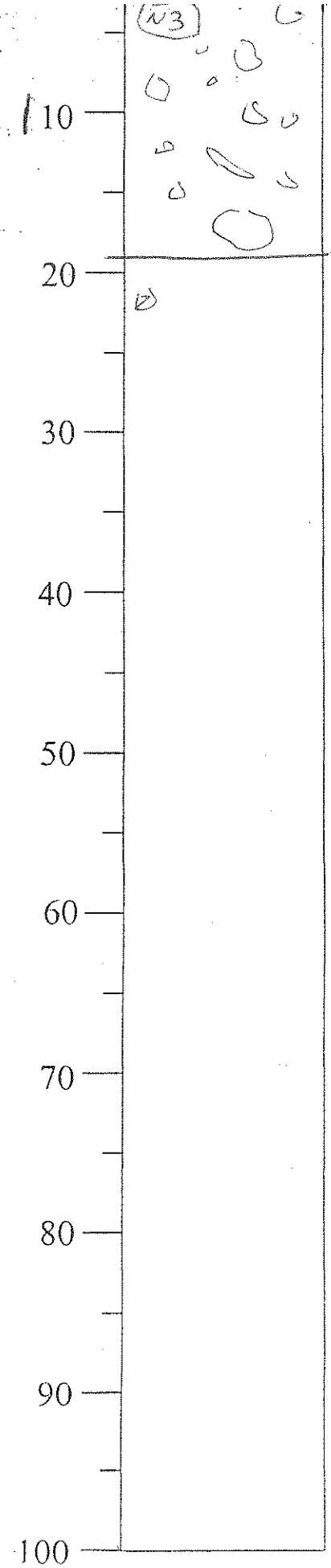
INITIAL LENGTH: _____ c

COMPACTION: _____ cm

FINAL LENGTH: 118cm cm

DATE OPENED: 1/20/12

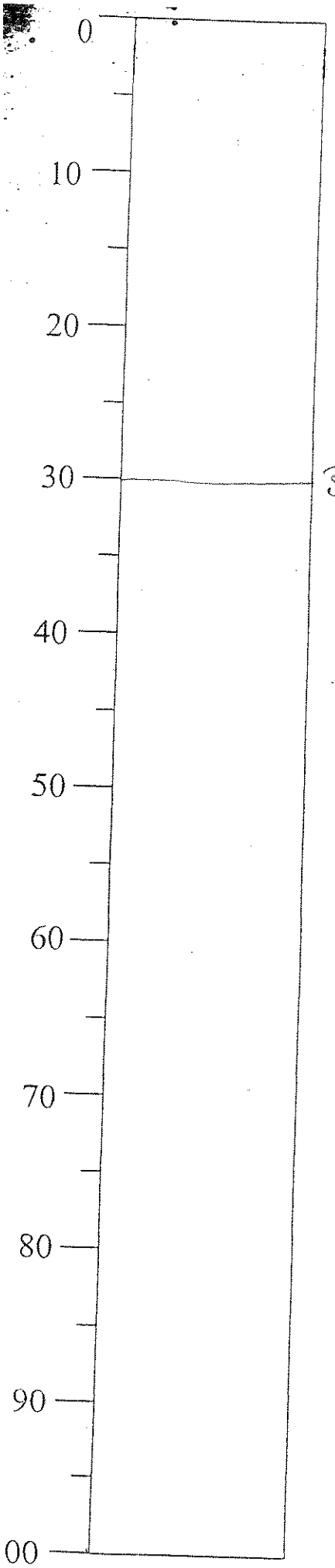
NOTES:



Very poorly sorted gravelly sand, v to vc sand w/ pebbles & cobbles

118

SAMPLE	GRAIN SIZE



Moderate yellowish brown 10YR 5/4

Coarse sand to gravel

CORE ID: Bloede Site 8 reassessm. Upstream

DATE COLLECTED: 2/1/12

INITIAL LENGTH: [redacted] cm

COMPACTION: _____ cm

FINAL LENGTH: 30 cm

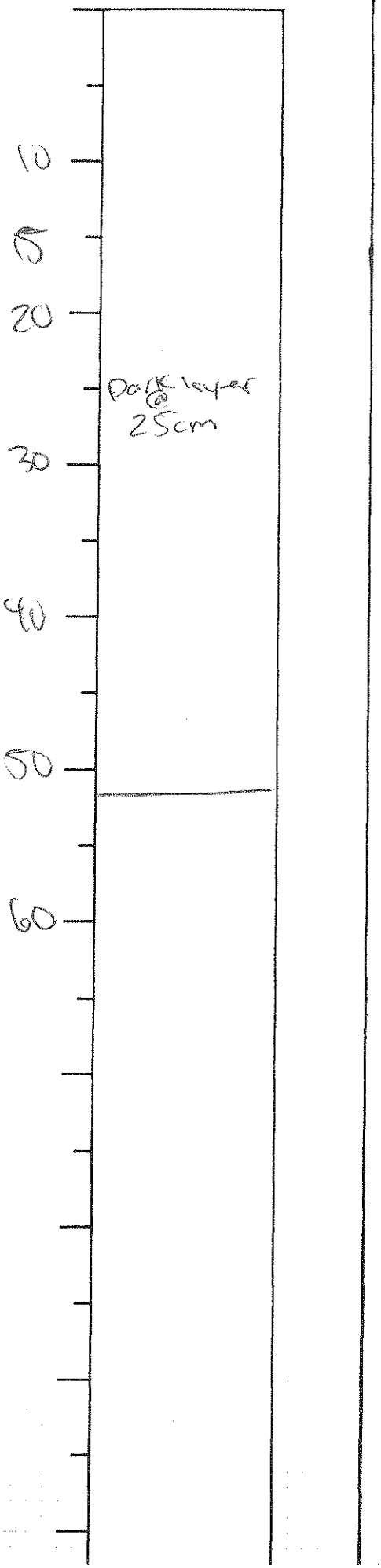
DATE OPENED: 2/2/12

NOTES: One GS for sample (0-30cm)

SAMPLE	GRAIN SIZE

depth (cm) | Color | GRAPHIC LOG

ID Bloede Site 8 reassessment downstream
Date collected 2/1/12
Core no.



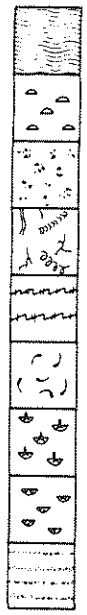
Moderate yellowish brown 10YR 5/4 to moderate brown 5 YR 4/4 Coarse sand to gravel

52cm

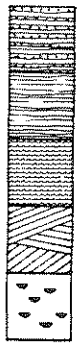
One GS for sample (0-52cm)

Final length = 52cm

LEGEND:



wavy bedding
lenticular bedding
mottling
bioturbated
chaotic bedding
shells
shell lenses
pebble lenses
sand partings



interbedded sand & mud
parallel lamination
ripple lamination
cross-bedding
flaser bedding

peat
Roots

Appendix B: Pollutant Laboratory Documents

Analytical Report for

Maryland Geological Survey (MGS)

Certificate of Analysis No.: 11122034

Project Manager: Richard Ortt
Project Name : Bloede
Project Location: Patapsco River
Project ID : 0

February 16, 2012

Phase Separation Science, Inc.
6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

OFFICES:
6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
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FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

February 16, 2012

Richard Ortt
Maryland Geological Survey (MGS)
2300 St. Paul Street
Baltimore, MD 21218

Reference: PSS Work Order No: **11122034**
Project Name: Bloede
Project Location: Patapsco River
Project ID.: 0

Dear Richard Ortt :

This report includes the analytical results from the analyses performed on the samples received under the project name referenced above and identified with the Phase Separation Science (PSS) Work Order numbered **11122034**.

All work reported herein has been performed in accordance with current NELAP standards referenced methodologies, PSS Standard Operating Procedures and the PSS Quality Assurance Manual unless otherwise noted in the Case Narrative Summary. PSS is limited in liability to the actual cost of the sample analysis done.

PSS reserves the right to return any unused samples, extracts or related solutions. Otherwise, the samples are scheduled for disposal, without any further notice, on January 24, 2012. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt , the request will be acknowledged by PSS, thus extending the storage period.

This report shall not be reproduced except in full, without the written approval of an authorized PSS representative. A copy of this report will be retained by PSS for at least 5 years, after which time it will be disposed without further notice, unless prior arrangements have been made.

We thank you for selecting Phase Separation Science, Inc. to serve your analytical needs. If you have any questions concerning this report, do not hesitate to contact us at 410-747-8770 or info@phaseonline.com.

Dan Prucnal
Laboratory Manager

Sample Summary

Client Name: Maryland Geological Survey (MGS)

Project Name: Bloede

Project ID: 0

Work Order Number: 11122034

The following samples were received under chain of custody by Phase Separation Science (PSS) on 12/20/2011 at 05:19 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
11122034-001	S1 Upper	SOIL	12/20/2011 15:30
11122034-002	S1 Lower	SOIL	12/20/2011 15:30

Please reference the Chain of Custody and Sample Receipt Checklist for specific container counts and preservatives. Any sample conditions not in compliance with sample acceptance criteria are described in Case Narrative Summary.

Notes:

1. The presence of common laboratory contaminants such as acetone, methylene chloride and phthalates, may be considered a possible laboratory artifact. Where observed, appropriate consideration of data should be taken.
2. The following analytical results are never reported on a dry weight basis: pH, flashpoint, moisture and paint filter test.
3. Drinking water samples collected for the purpose of compliance with SDWA may not be suitable for their intended use unless collected by a certified sampler [COMAR 26.08.05.07.C.2].

Standard Flags/Abbreviations:

B A target analyte or commone laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
C Results Pending Final Confirmation.
E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
Fail The result exceeds the regulatory level for Toxicity Characteristic (TCLP) as cited in 40 CFR 261.24 Table 1.
J The target analyte was positively identified below the reporting limit but greater than the LOD.
LOD Limit of Detection. An estimate of the minimum amount of a substance that an analytical process can reliably detect. An LOD is analyte and matrix specific.
ND Not Detected at or above the reporting limit.
RL PSS Reporting Limit.
U Not detected.

Case Narrative Summary

Client Name: Maryland Geological Survey (MGS)

Project Name: Bloede

Project ID: 0 Work Order Number: 11122034

Any holding time exceedances, deviations from the method specifications, regulatory requirements or variations to the procedures outlined in the PSS Quality Assurance Manual are outlined below.

Sample Receipt:

All sample receipt conditions were acceptable.

General Comments:
Revised report to include lower reporting limits per client request.

Analytical:

TAL Metals

Batch: 95052
Mercury CCV exceedance of 111%; limits are 90-110%.

NELAP accreditation was held for all analyses performed unless noted below. See www.phaseonline.com for complete PSS scope of accreditation.

OFFICES:
6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
410-747-8770
800-932-9047
FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 11122034

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede
Project Location: Patapsco River
Project ID: 0

Sample ID: S1 Upper | **Date/Time Sampled: 12/20/2011 15:30** | **PSS Sample ID: 11122034-001**
Matrix: SOIL | **Date/Time Received: 12/20/2011 17:19** | **% Solids: 82**

TAL Metals — Analytical Method: SW-846 6020 A — Preparation Method: 3050B

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Aluminum	**20000**	mg/kg	1000		20	510	12/23/11	12/30/11 11:27	1033
Antimony	ND	mg/kg	2.6		1	1.3	12/23/11	12/27/11 20:30	1033
Arsenic	**3.5**	mg/kg	0.51		1	0.26	12/23/11	12/27/11 20:30	1033
Barium	**120**	mg/kg	2.6		1	1.3	12/23/11	12/27/11 20:30	1033
Beryllium	ND	mg/kg	2.6		1	1.3	12/23/11	12/27/11 20:30	1033
Cadmium	ND	mg/kg	2.6		1	1.3	12/23/11	12/27/11 20:30	1033
Calcium	**2000**	mg/kg	1000		20	510	12/23/11	12/30/11 11:27	1033
Chromium	**48**	mg/kg	2.6		1	1.3	12/23/11	12/27/11 20:30	1033
Cobalt	**13**	mg/kg	2.6		1	1.3	12/23/11	12/27/11 20:30	1033
Copper	**28**	mg/kg	2.6		1	1.3	12/23/11	12/27/11 20:30	1033
Iron	**25000**	mg/kg	1000		20	510	12/23/11	12/30/11 11:27	1033
Lead	**31**	mg/kg	2.6		1	1.3	12/23/11	12/27/11 20:30	1033
Magnesium	**5100**	mg/kg	1000		20	510	12/23/11	12/29/11 19:04	1033
Manganese	**370**	mg/kg	51		20	26	12/23/11	12/29/11 19:04	1033
Mercury	ND	mg/kg	0.10		1	0.051	12/23/11	12/29/11 19:32	1033
Nickel	**28**	mg/kg	2.6		1	1.3	12/23/11	12/27/11 20:30	1033
Potassium	**2700**	mg/kg	1000		20	510	12/23/11	12/29/11 19:04	1033
Selenium	ND	mg/kg	2.6		1	1.3	12/23/11	12/27/11 20:30	1033
Silver	ND	mg/kg	2.6		1	1.3	12/23/11	12/27/11 20:30	1033
Sodium	**84**	mg/kg	51		1	26	12/23/11	12/27/11 20:30	1033
Thallium	ND	mg/kg	2.1		1	1	12/23/11	12/27/11 20:30	1033
Vanadium	**40**	mg/kg	2.6		1	1.3	12/23/11	12/27/11 20:30	1033
Zinc	**61**	mg/kg	10		1	5.1	12/23/11	12/29/11 19:32	1033

Total Petroleum Hydrocarbons - DRO — Analytical Method: SW-846 8015 C — Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
TPH-DRO (Diesel Range Organics)	ND	mg/kg	4.9		1	4.9	12/26/11	12/27/11 12:34	1040

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 11122034

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede
Project Location: Patapsco River
Project ID: 0

Sample ID: S1 Upper | **Date/Time Sampled: 12/20/2011 15:30** | **PSS Sample ID: 11122034-001**
Matrix: SOIL | **Date/Time Received: 12/20/2011 17:19** | **% Solids: 82**

Total Petroleum Hydrocarbons-GRO — Analytical Method: SW-846 8015C — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
TPH-GRO (Gasoline Range Organics)	ND	ug/kg	120		1	48	12/21/11	12/21/11 17:01	1035

Organochlorine Pesticides — Analytical Method: SW-846 8081 B — Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
alpha-BHC	ND	ug/kg	9.7		1	4.8	12/27/11	12/28/11 17:12	1029
gamma-BHC (Lindane)	ND	ug/kg	9.7		1	4.8	12/27/11	12/28/11 17:12	1029
beta-BHC	ND	ug/kg	9.7		1	4.8	12/27/11	12/28/11 17:12	1029
delta-BHC	ND	ug/kg	9.7		1	4.8	12/27/11	12/28/11 17:12	1029
Heptachlor	ND	ug/kg	9.7		1	4.8	12/27/11	12/28/11 17:12	1029
Aldrin	ND	ug/kg	9.7		1	4.8	12/27/11	12/28/11 17:12	1029
Heptachlor epoxide	ND	ug/kg	9.7		1	4.8	12/27/11	12/28/11 17:12	1029
gamma-Chlordane	ND	ug/kg	9.7		1	4.8	12/27/11	12/28/11 17:12	1029
alpha-Chlordane	ND	ug/kg	9.7		1	4.8	12/27/11	12/28/11 17:12	1029
4,4-DDE	ND	ug/kg	9.7		1	4.8	12/27/11	12/28/11 17:12	1029
Endosulfan I	ND	ug/kg	9.7		1	4.8	12/27/11	12/28/11 17:12	1029
Dieldrin	ND	ug/kg	9.7		1	4.8	12/27/11	12/28/11 17:12	1029
Endrin	ND	ug/kg	9.7		1	4.8	12/27/11	12/28/11 17:12	1029
4,4-DDD	ND	ug/kg	9.7		1	4.8	12/27/11	12/28/11 17:12	1029
Endosulfan II	ND	ug/kg	9.7		1	4.8	12/27/11	12/28/11 17:12	1029
4,4-DDT	ND	ug/kg	9.7		1	4.8	12/27/11	12/28/11 17:12	1029
Endrin aldehyde	ND	ug/kg	9.7		1	4.8	12/27/11	12/28/11 17:12	1029
Methoxychlor	ND	ug/kg	9.7		1	4.8	12/27/11	12/28/11 17:12	1029
Endosulfan sulfate	ND	ug/kg	9.7		1	4.8	12/27/11	12/28/11 17:12	1029
Endrin ketone	ND	ug/kg	9.7		1	4.8	12/27/11	12/28/11 17:12	1029
Toxaphene	ND	ug/kg	240		1	120	12/27/11	12/28/11 17:12	1029
Chlordane	ND	ug/kg	240		1	120	12/27/11	12/28/11 17:12	1029

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February 16, 2012

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Project Location: Patapsco River
Project ID: 0

Sample ID: S1 Upper | **Date/Time Sampled: 12/20/2011 15:30** | **PSS Sample ID: 11122034-001**
Matrix: SOIL | **Date/Time Received: 12/20/2011 17:19** | **% Solids: 82**

Polychlorinated Biphenyls | Analytical Method: SW-846 8082 A | Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
PCB-1016	ND	mg/kg	0.12		1	0.061	12/27/11	12/27/11 15:21	1029
PCB-1221	ND	mg/kg	0.12		1	0.061	12/27/11	12/27/11 15:21	1029
PCB-1232	ND	mg/kg	0.12		1	0.061	12/27/11	12/27/11 15:21	1029
PCB-1242	ND	mg/kg	0.12		1	0.061	12/27/11	12/27/11 15:21	1029
PCB-1248	ND	mg/kg	0.12		1	0.061	12/27/11	12/27/11 15:21	1029
PCB-1254	ND	mg/kg	0.12		1	0.061	12/27/11	12/27/11 15:21	1029
PCB-1260	ND	mg/kg	0.12		1	0.061	12/27/11	12/27/11 15:21	1029

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February 16, 2012

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Project Location: Patapsco River
Project ID: 0

Sample ID: S1 Upper | **Date/Time Sampled: 12/20/2011 15:30** | **PSS Sample ID: 11122034-001**
Matrix: SOIL | **Date/Time Received: 12/20/2011 17:19** | **% Solids: 82**

TCL Volatile Organic Compounds | Analytical Method: SW-846 8260 B | Preparation Method: 5030

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Dichlorodifluoromethane	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
Chloromethane	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
Vinyl Chloride	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
Bromomethane	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
Chloroethane	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
Acetone	ND	ug/kg	24		1	12	12/21/11	12/21/11 19:17	1011
Cyclohexane	ND	ug/kg	24		1	12	12/21/11	12/21/11 19:17	1011
Trichlorofluoromethane	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
1,1-Dichloroethene	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
Methylene Chloride	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
trans-1,2-Dichloroethene	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
Methyl-t-butyl ether	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
1,1-Dichloroethane	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
2-Butanone (MEK)	ND	ug/kg	24		1	12	12/21/11	12/21/11 19:17	1011
cis-1,2-Dichloroethene	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
Bromochloromethane	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
Chloroform	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
1,1,1-Trichloroethane	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
1,2-Dichloroethane	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
Carbon Tetrachloride	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
Benzene	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
1,2-Dichloropropane	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
Carbon Disulfide	ND	ug/kg	12		1	6.1	12/21/11	12/21/11 19:17	1011
Methylcyclohexane	ND	ug/kg	24		1	12	12/21/11	12/21/11 19:17	1011
Trichloroethene	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
Methyl Acetate	ND	ug/kg	24		1	12	12/21/11	12/21/11 19:17	1011
Bromodichloromethane	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
cis-1,3-Dichloropropene	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
4-Methyl-2-Pentanone	ND	ug/kg	24		1	12	12/21/11	12/21/11 19:17	1011

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No: 11122034

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede
Project Location: Patapsco River
Project ID: 0

Sample ID: S1 Upper	**Date/Time Sampled: 12/20/2011 15:30**	**PSS Sample ID: 11122034-001**
Matrix: SOIL	**Date/Time Received: 12/20/2011 17:19**	**% Solids: 82**

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
trans-1,3-Dichloropropene	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
1,1,2-Trichloroethane	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
Toluene	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
2-Hexanone	ND	ug/kg	24		1	12	12/21/11	12/21/11 19:17	1011
1,2-Dibromoethane (EDB)	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
Dibromochloromethane	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
Bromoform	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
Tetrachloroethene	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
Chlorobenzene	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
Ethylbenzene	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
m,p-Xylenes	ND	ug/kg	12		1	6.1	12/21/11	12/21/11 19:17	1011
Styrene	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
1,1,2,2-Tetrachloroethane	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
o-Xylene	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
Isopropylbenzene	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
1,3-Dichlorobenzene	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
1,4-Dichlorobenzene	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
1,2-Dichlorobenzene	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
1,2-Dibromo-3-Chloropropane	ND	ug/kg	48		1	24	12/21/11	12/21/11 19:17	1011
1,2,4-Trichlorobenzene	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
Naphthalene	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011
1,2,3-Trichlorobenzene	ND	ug/kg	6.1		1	3	12/21/11	12/21/11 19:17	1011

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Project Name: Bloede
Project Location: Patapsco River
Project ID: 0

Sample ID: S1 Upper **Date/Time Sampled: 12/20/2011 15:30** **PSS Sample ID: 11122034-001**
Matrix: SOIL **Date/Time Received: 12/20/2011 17:19** **% Solids: 82**

TCL Semivolatile Organic Compounds Analytical Method: SW-846 8270 C Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Acenaphthene	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
Acenaphthylene	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
Acetophenone	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
Anthracene	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
Benzo(a)anthracene	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
Benzo(a)pyrene	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
Benzo(b)fluoranthene	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
Benzo(g,h,i)perylene	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
Benzo(k)fluoranthene	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
Biphenyl (Diphenyl)	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
Butyl benzyl phthalate	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
bis(2-chloroethoxy) methane	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
bis(2-chloroethyl) ether	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
bis(2-chloroisopropyl) ether	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
bis(2-ethylhexyl) phthalate	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
4-Bromophenylphenyl ether	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
Di-n-butyl phthalate	ND	ug/kg	400		1	200	12/23/11	12/23/11 20:50	1014
Carbazole	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
4-Chloro-3-methyl phenol	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
4-Chloroaniline	ND	ug/kg	400		1	200	12/23/11	12/23/11 20:50	1014
2-Chloronaphthalene	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
2-Chlorophenol	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
4-Chlorophenyl Phenyl ether	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
Chrysene	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
Dibenz(a,h)Anthracene	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
Dibenzofuran	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
3,3-Dichlorobenzidine	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
2,4-Dichlorophenol	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
Diethyl phthalate	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
Dimethyl phthalate	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014

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Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede
Project Location: Patapsco River
Project ID: 0

Sample ID: S1 Upper **Date/Time Sampled: 12/20/2011 15:30** **PSS Sample ID: 11122034-001**
Matrix: SOIL **Date/Time Received: 12/20/2011 17:19** **% Solids: 82**

TCL Semivolatile Organic Compounds Analytical Method: SW-846 8270 C Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
2,4-Dimethylphenol	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
4,6-Dinitro-2-methyl phenol	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
2,4-Dinitrophenol	ND	ug/kg	400		1	200	12/23/11	12/23/11 20:50	1014
2,4-Dinitrotoluene	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
2,6-Dinitrotoluene	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
Fluoranthene	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
Fluorene	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
Hexachlorobenzene	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
Hexachlorobutadiene	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
Hexachlorocyclopentadiene	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
Hexachloroethane	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
Indeno(1,2,3-c,d)Pyrene	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
Isophorone	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
2-Methylnaphthalene	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
2-Methyl phenol	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
3&4-Methylphenol	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
Naphthalene	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
4-Nitroaniline	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
3-Nitroaniline	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
2-Nitroaniline	ND	ug/kg	400		1	200	12/23/11	12/23/11 20:50	1014
Nitrobenzene	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
2-Nitrophenol	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
4-Nitrophenol	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
N-Nitrosodi-n-propyl amine	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
N-Nitrosodiphenylamine	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
Di-n-octyl phthalate	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
Pentachlorophenol	ND	ug/kg	400		1	200	12/23/11	12/23/11 20:50	1014
Phenanthrene	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
Phenol	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
Atrazine	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014

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No: 11122034

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede
Project Location: Patapsco River
Project ID: 0

Sample ID: S1 Upper | **Date/Time Sampled: 12/20/2011 15:30** | **PSS Sample ID: 11122034-001**
Matrix: SOIL | **Date/Time Received: 12/20/2011 17:19** | **% Solids: 82**

TCL Semivolatile Organic Compounds — Analytical Method: SW-846 8270 C — Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Pyrene	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
Pyridine	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
Caprolactam	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
2,4,6-Trichlorophenol	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014
2,4,5-Trichlorophenol	ND	ug/kg	200		1	100	12/23/11	12/23/11 20:50	1014

Cyanide — Analytical Method: SW-846 9014

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Cyanide, Total	**0.29**	mg/kg	0.18		1	0.091	12/23/11	12/23/11 15:27	1044

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 11122034

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede
Project Location: Patapsco River
Project ID: 0

Sample ID: S1 Lower | **Date/Time Sampled: 12/20/2011 15:30** | **PSS Sample ID: 11122034-002**
Matrix: SOIL | **Date/Time Received: 12/20/2011 17:19** | **% Solids: 60**

TAL Metals — Analytical Method: SW-846 6020 A — Preparation Method: 3050B

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Aluminum	**37000**	mg/kg	1500		20	770	12/23/11	12/30/11 11:32	1033
Antimony	ND	mg/kg	3.9		1	1.9	12/23/11	12/27/11 20:59	1033
Arsenic	**6.2**	mg/kg	0.77		1	0.39	12/23/11	12/27/11 20:59	1033
Barium	**200**	mg/kg	3.9		1	1.9	12/23/11	12/27/11 20:59	1033
Beryllium	ND	mg/kg	3.9		1	1.9	12/23/11	12/27/11 20:59	1033
Cadmium	ND	mg/kg	3.9		1	1.9	12/23/11	12/27/11 20:59	1033
Calcium	**3000**	mg/kg	1500		20	770	12/23/11	12/30/11 11:32	1033
Chromium	**71**	mg/kg	3.9		1	1.9	12/23/11	12/27/11 20:59	1033
Cobalt	**22**	mg/kg	3.9		1	1.9	12/23/11	12/27/11 20:59	1033
Copper	**51**	mg/kg	3.9		1	1.9	12/23/11	12/27/11 20:59	1033
Iron	**40000**	mg/kg	1500		20	770	12/23/11	12/30/11 11:32	1033
Lead	**63**	mg/kg	3.9		1	1.9	12/23/11	12/27/11 20:59	1033
Magnesium	**6900**	mg/kg	1500		20	770	12/23/11	12/29/11 19:26	1033
Manganese	**650**	mg/kg	77		20	39	12/23/11	12/29/11 19:26	1033
Mercury	**0.18**	mg/kg	0.15		1	0.077	12/23/11	12/29/11 19:37	1033
Nickel	**39**	mg/kg	3.9		1	1.9	12/23/11	12/27/11 20:59	1033
Potassium	**3500**	mg/kg	77		1	39	12/23/11	12/27/11 20:59	1033
Selenium	ND	mg/kg	3.9		1	1.9	12/23/11	12/27/11 20:59	1033
Silver	ND	mg/kg	3.9		1	1.9	12/23/11	12/27/11 20:59	1033
Sodium	**140**	mg/kg	77		1	39	12/23/11	12/27/11 20:59	1033
Thallium	ND	mg/kg	3.1		1	1.5	12/23/11	12/27/11 20:59	1033
Vanadium	**59**	mg/kg	3.9		1	1.9	12/23/11	12/27/11 20:59	1033
Zinc	**110**	mg/kg	15		1	7.7	12/23/11	12/29/11 19:37	1033

Total Petroleum Hydrocarbons - DRO — Analytical Method: SW-846 8015 C — Preparation Method: 3550

HF - Heavier fuel/oil pattern observed in sample.

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
TPH-DRO (Diesel Range Organics)	**24**	mg/kg	6.6	HF	1	6.6	12/26/11	12/27/11 12:58	1040

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No: 11122034

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede
Project Location: Patapsco River
Project ID: 0

Sample ID: S1 Lower | **Date/Time Sampled: 12/20/2011 15:30** | **PSS Sample ID: 11122034-002**
Matrix: SOIL | **Date/Time Received: 12/20/2011 17:19** | **% Solids: 60**

Total Petroleum Hydrocarbons-GRO — Analytical Method: SW-846 8015C — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
TPH-GRO (Gasoline Range Organics)	ND	ug/kg	160		1	65	12/21/11	12/21/11 17:28	1035

Organochlorine Pesticides — Analytical Method: SW-846 8081 B — Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
alpha-BHC	ND	ug/kg	13		1	6.6	12/27/11	12/28/11 17:40	1029
gamma-BHC (Lindane)	ND	ug/kg	13		1	6.6	12/27/11	12/28/11 17:40	1029
beta-BHC	ND	ug/kg	13		1	6.6	12/27/11	12/28/11 17:40	1029
delta-BHC	ND	ug/kg	13		1	6.6	12/27/11	12/28/11 17:40	1029
Heptachlor	ND	ug/kg	13		1	6.6	12/27/11	12/28/11 17:40	1029
Aldrin	ND	ug/kg	13		1	6.6	12/27/11	12/28/11 17:40	1029
Heptachlor epoxide	ND	ug/kg	13		1	6.6	12/27/11	12/28/11 17:40	1029
gamma-Chlordane	ND	ug/kg	13		1	6.6	12/27/11	12/28/11 17:40	1029
alpha-Chlordane	ND	ug/kg	13		1	6.6	12/27/11	12/28/11 17:40	1029
4,4-DDE	ND	ug/kg	13		1	6.6	12/27/11	12/28/11 17:40	1029
Endosulfan I	ND	ug/kg	13		1	6.6	12/27/11	12/28/11 17:40	1029
Dieldrin	ND	ug/kg	13		1	6.6	12/27/11	12/28/11 17:40	1029
Endrin	ND	ug/kg	13		1	6.6	12/27/11	12/28/11 17:40	1029
4,4-DDD	ND	ug/kg	13		1	6.6	12/27/11	12/28/11 17:40	1029
Endosulfan II	ND	ug/kg	13		1	6.6	12/27/11	12/28/11 17:40	1029
4,4-DDT	ND	ug/kg	13		1	6.6	12/27/11	12/28/11 17:40	1029
Endrin aldehyde	ND	ug/kg	13		1	6.6	12/27/11	12/28/11 17:40	1029
Methoxychlor	ND	ug/kg	13		1	6.6	12/27/11	12/28/11 17:40	1029
Endosulfan sulfate	ND	ug/kg	13		1	6.6	12/27/11	12/28/11 17:40	1029
Endrin ketone	ND	ug/kg	13		1	6.6	12/27/11	12/28/11 17:40	1029
Toxaphene	ND	ug/kg	330		1	170	12/27/11	12/28/11 17:40	1029
Chlordane	ND	ug/kg	330		1	170	12/27/11	12/28/11 17:40	1029

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Project Location: Patapsco River
Project ID: 0

Sample ID: S1 Lower | **Date/Time Sampled: 12/20/2011 15:30** | **PSS Sample ID: 11122034-002**
Matrix: SOIL | **Date/Time Received: 12/20/2011 17:19** | **% Solids: 60**

Polychlorinated Biphenyls | Analytical Method: SW-846 8082 A | Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
PCB-1016	ND	mg/kg	0.17		1	0.083	12/27/11	12/27/11 15:49	1029
PCB-1221	ND	mg/kg	0.17		1	0.083	12/27/11	12/27/11 15:49	1029
PCB-1232	ND	mg/kg	0.17		1	0.083	12/27/11	12/27/11 15:49	1029
PCB-1242	ND	mg/kg	0.17		1	0.083	12/27/11	12/27/11 15:49	1029
PCB-1248	ND	mg/kg	0.17		1	0.083	12/27/11	12/27/11 15:49	1029
PCB-1254	ND	mg/kg	0.17		1	0.083	12/27/11	12/27/11 15:49	1029
PCB-1260	ND	mg/kg	0.17		1	0.083	12/27/11	12/27/11 15:49	1029

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February 16, 2012

Project Name: Bloede
Project Location: Patapsco River
Project ID: 0

Sample ID: S1 Lower	**Date/Time Sampled: 12/20/2011 15:30**	**PSS Sample ID: 11122034-002**
Matrix: SOIL	**Date/Time Received: 12/20/2011 17:19**	**% Solids: 60**

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Dichlorodifluoromethane	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
Chloromethane	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
Vinyl Chloride	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
Bromomethane	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
Chloroethane	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
Acetone	**110**	ug/kg	34		1	17	12/21/11	12/21/11 19:46	1011
Cyclohexane	ND	ug/kg	34		1	17	12/21/11	12/21/11 19:46	1011
Trichlorofluoromethane	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
1,1-Dichloroethene	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
Methylene Chloride	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
trans-1,2-Dichloroethene	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
Methyl-t-butyl ether	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
1,1-Dichloroethane	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
2-Butanone (MEK)	**27**	ug/kg	34	J	1	17	12/21/11	12/21/11 19:46	1011
cis-1,2-Dichloroethene	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
Bromochloromethane	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
Chloroform	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
1,1,1-Trichloroethane	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
1,2-Dichloroethane	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
Carbon Tetrachloride	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
Benzene	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
1,2-Dichloropropane	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
Carbon Disulfide	ND	ug/kg	17		1	8.5	12/21/11	12/21/11 19:46	1011
Methylcyclohexane	ND	ug/kg	34		1	17	12/21/11	12/21/11 19:46	1011
Trichloroethene	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
Methyl Acetate	ND	ug/kg	34		1	17	12/21/11	12/21/11 19:46	1011
Bromodichloromethane	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
cis-1,3-Dichloropropene	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
4-Methyl-2-Pentanone	ND	ug/kg	34		1	17	12/21/11	12/21/11 19:46	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 11122034

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede
Project Location: Patapsco River
Project ID: 0

Sample ID: S1 Lower	**Date/Time Sampled: 12/20/2011 15:30**	**PSS Sample ID: 11122034-002**
Matrix: SOIL	**Date/Time Received: 12/20/2011 17:19**	**% Solids: 60**

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
trans-1,3-Dichloropropene	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
1,1,2-Trichloroethane	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
Toluene	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
2-Hexanone	ND	ug/kg	34		1	17	12/21/11	12/21/11 19:46	1011
1,2-Dibromoethane (EDB)	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
Dibromochloromethane	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
Bromoform	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
Tetrachloroethene	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
Chlorobenzene	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
Ethylbenzene	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
m,p-Xylenes	ND	ug/kg	17		1	8.5	12/21/11	12/21/11 19:46	1011
Styrene	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
1,1,2,2-Tetrachloroethane	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
o-Xylene	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
Isopropylbenzene	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
1,3-Dichlorobenzene	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
1,4-Dichlorobenzene	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
1,2-Dichlorobenzene	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
1,2-Dibromo-3-Chloropropane	ND	ug/kg	68		1	34	12/21/11	12/21/11 19:46	1011
1,2,4-Trichlorobenzene	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
Naphthalene	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011
1,2,3-Trichlorobenzene	ND	ug/kg	8.5		1	4.2	12/21/11	12/21/11 19:46	1011

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Sample ID: S1 Lower | **Date/Time Sampled: 12/20/2011 15:30** | **PSS Sample ID: 11122034-002**
Matrix: SOIL | **Date/Time Received: 12/20/2011 17:19** | **% Solids: 60**

TCL Semivolatile Organic Compounds | Analytical Method: SW-846 8270 C | Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Acenaphthene	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
Acenaphthylene	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
Acetophenone	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
Anthracene	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
Benzo(a)anthracene	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
Benzo(a)pyrene	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
Benzo(b)fluoranthene	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
Benzo(g,h,i)perylene	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
Benzo(k)fluoranthene	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
Biphenyl (Diphenyl)	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
Butyl benzyl phthalate	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
bis(2-chloroethoxy) methane	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
bis(2-chloroethyl) ether	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
bis(2-chloroisopropyl) ether	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
bis(2-ethylhexyl) phthalate	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
4-Bromophenylphenyl ether	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
Di-n-butyl phthalate	ND	ug/kg	550		1	280	12/23/11	12/23/11 16:49	1014
Carbazole	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
4-Chloro-3-methyl phenol	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
4-Chloroaniline	ND	ug/kg	550		1	280	12/23/11	12/23/11 16:49	1014
2-Chloronaphthalene	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
2-Chlorophenol	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
4-Chlorophenyl Phenyl ether	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
Chrysene	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
Dibenz(a,h)Anthracene	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
Dibenzofuran	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
3,3-Dichlorobenzidine	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
2,4-Dichlorophenol	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
Diethyl phthalate	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
Dimethyl phthalate	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014

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No: 11122034

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede
Project Location: Patapsco River
Project ID: 0

Sample ID: S1 Lower **Date/Time Sampled: 12/20/2011 15:30** **PSS Sample ID: 11122034-002**
Matrix: SOIL **Date/Time Received: 12/20/2011 17:19** **% Solids: 60**

TCL Semivolatile Organic Compounds Analytical Method: SW-846 8270 C Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
2,4-Dimethylphenol	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
4,6-Dinitro-2-methyl phenol	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
2,4-Dinitrophenol	ND	ug/kg	550		1	280	12/23/11	12/23/11 16:49	1014
2,4-Dinitrotoluene	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
2,6-Dinitrotoluene	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
Fluoranthene	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
Fluorene	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
Hexachlorobenzene	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
Hexachlorobutadiene	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
Hexachlorocyclopentadiene	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
Hexachloroethane	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
Indeno(1,2,3-c,d)Pyrene	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
Isophorone	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
2-Methylnaphthalene	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
2-Methyl phenol	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
3&4-Methylphenol	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
Naphthalene	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
4-Nitroaniline	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
3-Nitroaniline	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
2-Nitroaniline	ND	ug/kg	550		1	280	12/23/11	12/23/11 16:49	1014
Nitrobenzene	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
2-Nitrophenol	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
4-Nitrophenol	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
N-Nitrosodi-n-propyl amine	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
N-Nitrosodiphenylamine	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
Di-n-octyl phthalate	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
Pentachlorophenol	ND	ug/kg	550		1	280	12/23/11	12/23/11 16:49	1014
Phenanthrene	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
Phenol	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
Atrazine	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 11122034

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede
Project Location: Patapsco River
Project ID: 0

Sample ID: S1 Lower | **Date/Time Sampled: 12/20/2011 15:30** | **PSS Sample ID: 11122034-002**
Matrix: SOIL | **Date/Time Received: 12/20/2011 17:19** | **% Solids: 60**

TCL Semivolatile Organic Compounds — Analytical Method: SW-846 8270 C — Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Pyrene	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
Pyridine	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
Caprolactam	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
2,4,6-Trichlorophenol	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014
2,4,5-Trichlorophenol	ND	ug/kg	280		1	140	12/23/11	12/23/11 16:49	1014

Cyanide — Analytical Method: SW-846 9014

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Cyanide, Total	**0.17**	mg/kg	0.25	J	1	0.12	12/23/11	12/23/11 15:27	1044

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	11122034	**Received By**	Rachel Davis
Client Name	Maryland Geological Survey (MGS)	**Date Received**	12/20/2011 05:19:00 PM
Project Name	Bloede	**Delivered By**	Client
Project Number	0	**Tracking No**	Not Applicable
Disposal Date	01/24/2012	**Logged In By**	Rachel Davis

Shipping Container(s)

No. of Coolers	1	Ice	Present
		Temp (deg C)	15
Custody Seal(s) Intact?	N/A	Temp Blank Present	No
Seal(s) Signed / Dated?	N/A		

Documentation

		Sampler Name	Robert Ortt
		MD DW Cert. No.	N/A
COC agrees with sample labels?	Yes		
Chain of Custody	Yes		

Sample Container

		Custody Seal(s) Intact?	Not Applicable
Appropriate for Specified Analysis?	Yes	Seal(s) Signed / Dated	Not Applicable
Intact?	Yes		
Labeled and Labels Legible?	Yes		

Total No. of Samples Received 2

Total No. of Containers Received 4

Preservation

Metals	(pH<2)	N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, COD, Phenols	(ph<2)	N/A
TOX, TKN, NH3, Total Phos	(pH<2)	N/A
VOC, BTEX (VOA Vials Rcvd Preserved)	(pH<2)	N/A
Do VOA vials have zero headspace?		N/A

Comments: (Any "No" response must be detailed in the comments section below.)

For any improper preservation conditions, list sample ID, preservative added (reagent ID number) below as well as documentation of any client notification as well as client instructions. Samples for pH, chlorine and dissolved oxygen should be analyzed as soon as possible, preferably in the field at the time of sampling. Samples which require thermal preservation shall be considered acceptable when received at a temperature above freezing to 6°C. Samples that are hand delivered on the day that they are collected may not meet these criteria but shall be considered acceptable if there is evidence that the chilling process has begun such as arrival on ice.

Samples Inspected/Checklist Completed By: Rachel Davis — Date: 12/21/2011

PM Review and Approval: Lynn Moran — Date: 12/27/2011

Analytical Report for

Maryland Geological Survey (MGS)

Certificate of Analysis No.: 12010517

Project Manager: Richard Ortt

Project Name : Bloede

Project Location: Patapsco River

February 16, 2012

Phase Separation Science, Inc.

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PHASE SEPARATION SCIENCE, INC.

February 16, 2012

Richard Ortt
Maryland Geological Survey (MGS)
2300 St. Paul Street
Baltimore, MD 21218

Reference: PSS Work Order No: **12010517**
Project Name: Bloede
Project Location: Patapsco River

Dear Richard Ortt :

This report includes the analytical results from the analyses performed on the samples received under the project name referenced above and identified with the Phase Separation Science (PSS) Work Order numbered **12010517**.

All work reported herein has been performed in accordance with current NELAP standards referenced methodologies, PSS Standard Operating Procedures and the PSS Quality Assurance Manual unless otherwise noted in the Case Narrative Summary. PSS is limited in liability to the actual cost of the sample analysis done.

PSS reserves the right to return any unused samples, extracts or related solutions. Otherwise, the samples are scheduled for disposal, without any further notice, on February 9, 2012. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt , the request will be acknowledged by PSS, thus extending the storage period.

This report shall not be reproduced except in full, without the written approval of an authorized PSS representative. A copy of this report will be retained by PSS for at least 5 years, after which time it will be disposed without further notice, unless prior arrangements have been made.

We thank you for selecting Phase Separation Science, Inc. to serve your analytical needs. If you have any questions concerning this report, do not hesitate to contact us at 410-747-8770 or info@phaseonline.com.

Dan Prucnal
Laboratory Manager

Sample Summary

Client Name: Maryland Geological Survey (MGS)

Project Name: Bloede

Project ID: N/A

Work Order Number: 12010517

The following samples were received under chain of custody by Phase Separation Science (PSS) on 01/05/2012 at 03:45 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
12010517-001	Site 3	SOIL	01/05/2012 11:00

Please reference the Chain of Custody and Sample Receipt Checklist for specific container counts and preservatives. Any sample conditions not in compliance with sample acceptance criteria are described in Case Narrative Summary.

Notes:

1. The presence of common laboratory contaminants such as acetone, methylene chloride and phthalates, may be considered a possible laboratory artifact. Where observed, appropriate consideration of data should be taken.
2. The following analytical results are never reported on a dry weight basis: pH, flashpoint, moisture and paint filter test.
3. Drinking water samples collected for the purpose of compliance with SDWA may not be suitable for their intended use unless collected by a certified sampler [COMAR 26.08.05.07.C.2].

Standard Flags/Abbreviations:

B A target analyte or commone laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
C Results Pending Final Confirmation.
E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
Fail The result exceeds the regulatory level for Toxicity Characteristic (TCLP) as cited in 40 CFR 261.24 Table 1.
J The target analyte was positively identified below the reporting limit but greater than the LOD.
LOD Limit of Detection. An estimate of the minimum amount of a substance that an analytical process can reliably detect. An LOD is analyte and matrix specific.
ND Not Detected at or above the reporting limit.
RL PSS Reporting Limit.
U Not detected.

Case Narrative Summary

Client Name: Maryland Geological Survey (MGS)

Project Name: Bloede

Project ID: N/A

Work Order Number: 12010517

Any holding time exceedances, deviations from the method specifications, regulatory requirements or variations to the procedures outlined in the PSS Quality Assurance Manual are outlined below.

Sample Receipt:

Sample(s) received at a temperature greater than 6 degrees C and ice was not present.

General Comments:

Revised report to include lower reporting limits per client request.

NELAP accreditation was held for all analyses performed unless noted below. See www.phaseonline.com for complete PSS scope of accreditation.

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 12010517

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede
Project Location: Patapsco River

Sample ID: Site 3 | **Date/Time Sampled: 01/05/2012 11:00** | **PSS Sample ID: 12010517-001**
Matrix: SOIL | **Date/Time Received: 01/05/2012 15:45** | **% Solids: 97**

TAL Metals — Analytical Method: SW-846 6020 A — Preparation Method: 3050B

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Aluminum	**3500**	mg/kg	450		10	220	01/06/12	01/11/12 11:33	1034
Antimony	ND	mg/kg	2.2		1	1.1	01/06/12	01/09/12 16:54	1034
Arsenic	**2.9**	mg/kg	0.45		1	0.22	01/06/12	01/09/12 16:54	1034
Barium	**23**	mg/kg	2.2		1	1.1	01/06/12	01/09/12 16:54	1034
Beryllium	ND	mg/kg	2.2		1	1.1	01/06/12	01/09/12 16:54	1034
Cadmium	ND	mg/kg	2.2		1	1.1	01/06/12	01/09/12 16:54	1034
Calcium	**1900**	mg/kg	45		1	22	01/06/12	01/09/12 16:54	1034
Chromium	**61**	mg/kg	2.2		1	1.1	01/06/12	01/09/12 16:54	1034
Cobalt	**11**	mg/kg	2.2		1	1.1	01/06/12	01/09/12 16:54	1034
Copper	**5.5**	mg/kg	2.2		1	1.1	01/06/12	01/09/12 16:54	1034
Iron	**18000**	mg/kg	450		10	220	01/06/12	01/11/12 11:33	1034
Lead	**3.6**	mg/kg	2.2		1	1.1	01/06/12	01/09/12 16:54	1034
Magnesium	**1400**	mg/kg	45		1	22	01/06/12	01/09/12 16:54	1034
Manganese	**290**	mg/kg	22		10	11	01/06/12	01/11/12 11:33	1034
Mercury	ND	mg/kg	0.089		1	0.045	01/06/12	01/09/12 16:54	1034
Nickel	**41**	mg/kg	2.2		1	1.1	01/06/12	01/09/12 16:54	1034
Potassium	**540**	mg/kg	45		1	22	01/06/12	01/09/12 16:54	1034
Selenium	ND	mg/kg	2.2		1	1.1	01/06/12	01/09/12 16:54	1034
Silver	ND	mg/kg	2.2		1	1.1	01/06/12	01/09/12 16:54	1034
Sodium	**88**	mg/kg	45		1	22	01/06/12	01/09/12 16:54	1034
Thallium	ND	mg/kg	1.8		1	0.89	01/06/12	01/09/12 16:54	1034
Vanadium	**13**	mg/kg	2.2		1	1.1	01/06/12	01/09/12 16:54	1034
Zinc	**25**	mg/kg	8.9		1	4.5	01/06/12	01/10/12 16:37	1034

Total Petroleum Hydrocarbons - DRO — Analytical Method: SW-846 8015 C — Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
TPH-DRO (Diesel Range Organics)	ND	mg/kg	4.1		1	4.1	01/09/12	01/09/12 15:08	1040

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 12010517

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede
Project Location: Patapsco River

Sample ID: Site 3	**Date/Time Sampled: 01/05/2012 11:00**	**PSS Sample ID: 12010517-001**
Matrix: SOIL	**Date/Time Received: 01/05/2012 15:45**	**% Solids: 97**

Total Petroleum Hydrocarbons-GRO — Analytical Method: SW-846 8015C — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
TPH-GRO (Gasoline Range Organics)	ND	ug/kg	100		1	40	01/06/12	01/06/12 12:46	1035

Organochlorine Pesticides — Analytical Method: SW-846 8081 B — Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
alpha-BHC	ND	ug/kg	8.2		1	4.1	01/11/12	01/11/12 13:58	1029
gamma-BHC (Lindane)	ND	ug/kg	8.2		1	4.1	01/11/12	01/11/12 13:58	1029
beta-BHC	ND	ug/kg	8.2		1	4.1	01/11/12	01/11/12 13:58	1029
delta-BHC	ND	ug/kg	8.2		1	4.1	01/11/12	01/11/12 13:58	1029
Heptachlor	ND	ug/kg	8.2		1	4.1	01/11/12	01/11/12 13:58	1029
Aldrin	ND	ug/kg	8.2		1	4.1	01/11/12	01/11/12 13:58	1029
Heptachlor epoxide	ND	ug/kg	8.2		1	4.1	01/11/12	01/11/12 13:58	1029
gamma-Chlordane	ND	ug/kg	8.2		1	4.1	01/11/12	01/11/12 13:58	1029
alpha-Chlordane	ND	ug/kg	8.2		1	4.1	01/11/12	01/11/12 13:58	1029
4,4-DDE	ND	ug/kg	8.2		1	4.1	01/11/12	01/11/12 13:58	1029
Endosulfan I	ND	ug/kg	8.2		1	4.1	01/11/12	01/11/12 13:58	1029
Dieldrin	ND	ug/kg	8.2		1	4.1	01/11/12	01/11/12 13:58	1029
Endrin	ND	ug/kg	8.2		1	4.1	01/11/12	01/11/12 13:58	1029
4,4-DDD	ND	ug/kg	8.2		1	4.1	01/11/12	01/11/12 13:58	1029
Endosulfan II	ND	ug/kg	8.2		1	4.1	01/11/12	01/11/12 13:58	1029
4,4-DDT	ND	ug/kg	8.2		1	4.1	01/11/12	01/11/12 13:58	1029
Endrin aldehyde	ND	ug/kg	8.2		1	4.1	01/11/12	01/11/12 13:58	1029
Methoxychlor	ND	ug/kg	8.2		1	4.1	01/11/12	01/11/12 13:58	1029
Endosulfan sulfate	ND	ug/kg	8.2		1	4.1	01/11/12	01/11/12 13:58	1029
Endrin ketone	ND	ug/kg	8.2		1	4.1	01/11/12	01/11/12 13:58	1029
Toxaphene	ND	ug/kg	210		1	100	01/11/12	01/11/12 13:58	1029
Chlordane	ND	ug/kg	210		1	100	01/11/12	01/11/12 13:58	1029

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CERTIFICATE OF ANALYSIS

No: 12010517

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede
Project Location: Patapsco River

Sample ID: Site 3 | **Date/Time Sampled: 01/05/2012 11:00** | **PSS Sample ID: 12010517-001**
Matrix: SOIL | **Date/Time Received: 01/05/2012 15:45** | **% Solids: 97**

Polychlorinated Biphenyls — Analytical Method: SW-846 8082 A — Preparation Method: 3550
Clean up Method: SW846 3665A

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
PCB-1016	ND	mg/kg	0.10		1	0.051	01/09/12	01/10/12 11:13	1029
PCB-1221	ND	mg/kg	0.10		1	0.051	01/09/12	01/10/12 11:13	1029
PCB-1232	ND	mg/kg	0.10		1	0.051	01/09/12	01/10/12 11:13	1029
PCB-1242	ND	mg/kg	0.10		1	0.051	01/09/12	01/10/12 11:13	1029
PCB-1248	ND	mg/kg	0.10		1	0.051	01/09/12	01/10/12 11:13	1029
PCB-1254	ND	mg/kg	0.10		1	0.051	01/09/12	01/10/12 11:13	1029
PCB-1260	ND	mg/kg	0.10		1	0.051	01/09/12	01/10/12 11:13	1029

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CERTIFICATE OF ANALYSIS

No: 12010517

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede
Project Location: Patapsco River

Sample ID: Site 3 | **Date/Time Sampled: 01/05/2012 11:00** | **PSS Sample ID: 12010517-001**
Matrix: SOIL | **Date/Time Received: 01/05/2012 15:45** | **% Solids: 97**

TCL Volatile Organic Compounds | Analytical Method: SW-846 8260 B | Preparation Method: 5030

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Dichlorodifluoromethane	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
Chloromethane	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
Vinyl Chloride	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
Bromomethane	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
Chloroethane	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
Acetone	ND	ug/kg	20		1	10	01/11/12	01/11/12 21:51	1011
Cyclohexane	ND	ug/kg	20		1	10	01/11/12	01/11/12 21:51	1011
Trichlorofluoromethane	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
1,1-Dichloroethene	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
Methylene Chloride	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
trans-1,2-Dichloroethene	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
Methyl-t-butyl ether	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
1,1-Dichloroethane	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
2-Butanone (MEK)	ND	ug/kg	20		1	10	01/11/12	01/11/12 21:51	1011
cis-1,2-Dichloroethene	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
Bromochloromethane	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
Chloroform	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
1,1,1-Trichloroethane	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
1,2-Dichloroethane	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
Carbon Tetrachloride	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
Benzene	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
1,2-Dichloropropane	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
Carbon Disulfide	ND	ug/kg	10		1	5.1	01/11/12	01/11/12 21:51	1011
Methylcyclohexane	ND	ug/kg	20		1	10	01/11/12	01/11/12 21:51	1011
Trichloroethene	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
Methyl Acetate	ND	ug/kg	20		1	10	01/11/12	01/11/12 21:51	1011
Bromodichloromethane	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
cis-1,3-Dichloropropene	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
4-Methyl-2-Pentanone	ND	ug/kg	20		1	10	01/11/12	01/11/12 21:51	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 12010517

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede
Project Location: Patapsco River

Sample ID: Site 3	**Date/Time Sampled: 01/05/2012 11:00**	**PSS Sample ID: 12010517-001**
Matrix: SOIL	**Date/Time Received: 01/05/2012 15:45**	**% Solids: 97**

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
trans-1,3-Dichloropropene	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
1,1,2-Trichloroethane	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
Toluene	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
2-Hexanone	ND	ug/kg	20		1	10	01/11/12	01/11/12 21:51	1011
1,2-Dibromoethane (EDB)	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
Dibromochloromethane	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
Bromoform	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
Tetrachloroethene	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
Chlorobenzene	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
Ethylbenzene	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
m,p-Xylenes	ND	ug/kg	10		1	5.1	01/11/12	01/11/12 21:51	1011
Styrene	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
o-Xylene	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
Isopropylbenzene	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
1,3-Dichlorobenzene	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
1,4-Dichlorobenzene	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
1,2-Dichlorobenzene	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
1,2-Dibromo-3-Chloropropane	ND	ug/kg	40		1	20	01/11/12	01/11/12 21:51	1011
1,2,4-Trichlorobenzene	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
Naphthalene	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011
1,2,3-Trichlorobenzene	ND	ug/kg	5.1		1	2.5	01/11/12	01/11/12 21:51	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 12010517

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede
Project Location: Patapsco River

Sample ID: Site 3 | **Date/Time Sampled: 01/05/2012 11:00** | **PSS Sample ID: 12010517-001**
Matrix: SOIL | **Date/Time Received: 01/05/2012 15:45** | **% Solids: 97**

TCL Semivolatile Organic Compounds | Analytical Method: SW-846 8270 C | Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Acenaphthene	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
Acenaphthylene	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
Acetophenone	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
Anthracene	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
Benzo(a)anthracene	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
Benzo(a)pyrene	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
Benzo(b)fluoranthene	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
Benzo(g,h,i)perylene	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
Benzo(k)fluoranthene	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
Biphenyl (Diphenyl)	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
Butyl benzyl phthalate	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
bis(2-chloroethoxy) methane	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
bis(2-chloroethyl) ether	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
bis(2-chloroisopropyl) ether	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
bis(2-ethylhexyl) phthalate	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
4-Bromophenylphenyl ether	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
Di-n-butyl phthalate	ND	ug/kg	340		1	170	01/09/12	01/09/12 19:51	1014
Carbazole	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
4-Chloro-3-methyl phenol	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
4-Chloroaniline	ND	ug/kg	340		1	170	01/09/12	01/09/12 19:51	1014
2-Chloronaphthalene	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
2-Chlorophenol	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
4-Chlorophenyl Phenyl ether	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
Chrysene	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
Dibenz(a,h)Anthracene	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
Dibenzofuran	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
3,3-Dichlorobenzidine	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
2,4-Dichlorophenol	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
Diethyl phthalate	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
Dimethyl phthalate	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 12010517

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede
Project Location: Patapsco River

Sample ID: Site 3 | **Date/Time Sampled: 01/05/2012 11:00** | **PSS Sample ID: 12010517-001**
Matrix: SOIL | **Date/Time Received: 01/05/2012 15:45** | **% Solids: 97**

TCL Semivolatile Organic Compounds | Analytical Method: SW-846 8270 C | Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
2,4-Dimethylphenol	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
4,6-Dinitro-2-methyl phenol	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
2,4-Dinitrophenol	ND	ug/kg	340		1	170	01/09/12	01/09/12 19:51	1014
2,4-Dinitrotoluene	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
2,6-Dinitrotoluene	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
Fluoranthene	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
Fluorene	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
Hexachlorobenzene	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
Hexachlorobutadiene	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
Hexachlorocyclopentadiene	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
Hexachloroethane	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
Indeno(1,2,3-c,d)Pyrene	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
Isophorone	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
2-Methylnaphthalene	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
2-Methyl phenol	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
3&4-Methylphenol	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
Naphthalene	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
4-Nitroaniline	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
3-Nitroaniline	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
2-Nitroaniline	ND	ug/kg	340		1	170	01/09/12	01/09/12 19:51	1014
Nitrobenzene	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
2-Nitrophenol	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
4-Nitrophenol	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
N-Nitrosodi-n-propyl amine	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
N-Nitrosodiphenylamine	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
Di-n-octyl phthalate	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
Pentachlorophenol	ND	ug/kg	340		1	170	01/09/12	01/09/12 19:51	1014
Phenanthrene	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
Phenol	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
Atrazine	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 12010517

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede
Project Location: Patapsco River

Sample ID: Site 3 | **Date/Time Sampled: 01/05/2012 11:00** | **PSS Sample ID: 12010517-001**
Matrix: SOIL | **Date/Time Received: 01/05/2012 15:45** | **% Solids: 97**

TCL Semivolatile Organic Compounds — Analytical Method: SW-846 8270 C — Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Pyrene	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
Pyridine	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
Caprolactam	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
2,4,6-Trichlorophenol	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014
2,4,5-Trichlorophenol	ND	ug/kg	170		1	86	01/09/12	01/09/12 19:51	1014

Cyanide — Analytical Method: SW-846 9014

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Cyanide, Total	ND	mg/kg	0.15		1	0.077	01/11/12	01/11/12 14:19	1044

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

PHASE SEPARATION SCIENCE, INC.

www.phaseonline.com
email: info@phaseonline.com

(1)

CLIENT: Maryland Geological OFFICE LOC. Baltimore

PROJECT MGR: Rich Ortt PHONE NO.: (410) 554-5541

EMAIL: rortt@dnr.state.md.us FAX NO.: (410) 554-5502

PROJECT NAME: Bloede PROJECT NO.: Ø

SITE LOCATION: Patapsco River P.O. NO.: Ø

SAMPLERS: Rich Ortt, Beth Sylvia, Darlene Wells

PSS Work Order #: 12010517 PAGE 1 OF 1

Matrix Codes: **SW**=Surface Wtr **DW**=Drinking Wrt **GW**=Ground Wtr **WW**=Waste Wtr **O**=Oil **S**=Soil **WL**=Waste Liquid **WS**=Waste Solid **W**= Wipe

(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX (See Codes)	No. CONTAINERS	SAMPLE TYPE C = COMP G = GRAB	VOC	SVOC	PCB	Pesticide	TAL Metals	GRO	DRO	Cyanide				REMARKS
Preservatives Used							4°C →											
	Site 3	5 Jan 12	1100	S	3	C	x	x	x	x	x	x	x	x				

(3) Analysis/Method Required

(4)

Requested Turnaround Time

☒ 5-Day ☐ 3-Day ☐ 2-Day
☐ Next Day ☐ Emergency ☐ Other

Data Deliverables Required: Results, Detection Limits

# of Coolers: 1

Custody Seal: ABS

Ice Present: ABS Temp: 16°C

Shipping Carrier: CLIENT

Special Instructions:

(5)

Relinquished By:	Date	Time	Received By:
(1) Beth Sylvia (MGS)	1/5/12	1545	[signature]
(2)			
(3)			
(4)			

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The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary.

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	12010517	**Received By**	Rachel Davis
Client Name	Maryland Geological Survey (MGS)	**Date Received**	01/05/2012 03:45:00 PM
Project Name	Bloede	**Delivered By**	Client
Project Number	N/A	**Tracking No**	Not Applicable
Disposal Date	02/09/2012	**Logged In By**	Rachel Davis

Shipping Container(s)

No. of Coolers	1	Ice	Absent
		Temp (deg C)	16
Custody Seal(s) Intact?	N/A	Temp Blank Present	No
Seal(s) Signed / Dated?	N/A		

Documentation

		Sampler Name	Richard Ortt
		MD DW Cert. No.	N/A
COC agrees with sample labels?	Yes		
Chain of Custody	Yes		

Sample Container

		Custody Seal(s) Intact?	Not Applicable
Appropriate for Specified Analysis?	Yes	Seal(s) Signed / Dated	Not Applicable
Intact?	Yes		
Labeled and Labels Legible?	Yes		

Total No. of Samples Received 1

Total No. of Containers Received 3

Preservation

Metals	(pH<2)	N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, COD, Phenols	(ph<2)	N/A
TOX, TKN, NH3, Total Phos	(pH<2)	N/A
VOC, BTEX (VOA Vials Rcvd Preserved)	(pH<2)	N/A
Do VOA vials have zero headspace?		N/A

Comments: (Any "No" response must be detailed in the comments section below.)

For any improper preservation conditions, list sample ID, preservative added (reagent ID number) below as well as documentation of any client notification as well as client instructions. Samples for pH, chlorine and dissolved oxygen should be analyzed as soon as possible, preferably in the field at the time of sampling. Samples which require thermal preservation shall be considered acceptable when received at a temperature above freezing to 6°C. Samples that are hand delivered on the day that they are collected may not meet these criteria but shall be considered acceptable if there is evidence that the chilling process has begun such as arrival on ice.

Sample(s) received at a temperature greater than 6 degrees C and ice was not present.

Samples Inspected/Checklist Completed By: Rachel Davis — Date: 01/05/2012

PM Review and Approval: Lynn Moran — Date: 01/10/2012

Analytical Report for

Maryland Geological Survey (MGS)

Certificate of Analysis No.: 12011111

Project Manager: Richard Ortt

Project Name : Bloede

Project Location: Patapsco River

February 16, 2012

Phase Separation Science, Inc.

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PHASE SEPARATION SCIENCE, INC.

February 16, 2012

Richard Ortt
Maryland Geological Survey (MGS)
2300 St. Paul Street
Baltimore, MD 21218

Reference: PSS Work Order No: **12011111**
Project Name: Bloede
Project Location: Patapsco River

Dear Richard Ortt :

This report includes the analytical results from the analyses performed on the samples received under the project name referenced above and identified with the Phase Separation Science (PSS) Work Order numbered **12011111**.

All work reported herein has been performed in accordance with current NELAP standards referenced methodologies, PSS Standard Operating Procedures and the PSS Quality Assurance Manual unless otherwise noted in the Case Narrative Summary. PSS is limited in liability to the actual cost of the sample analysis done.

PSS reserves the right to return any unused samples, extracts or related solutions. Otherwise, the samples are scheduled for disposal, without any further notice, on February 15, 2012. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt , the request will be acknowledged by PSS, thus extending the storage period.

This report shall not be reproduced except in full, without the written approval of an authorized PSS representative. A copy of this report will be retained by PSS for at least 5 years, after which time it will be disposed without further notice, unless prior arrangements have been made.

We thank you for selecting Phase Separation Science, Inc. to serve your analytical needs. If you have any questions concerning this report, do not hesitate to contact us at 410-747-8770 or info@phaseonline.com.

Dan Prucnal
Laboratory Manager

Sample Summary

Client Name: Maryland Geological Survey (MGS)

Project Name: Bloede

Project ID: N/A

Work Order Number: 12011111

The following samples were received under chain of custody by Phase Separation Science (PSS) on 01/11/2012 at 04:52 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
12011111-001	S5 Lower 57-114cm	SOIL	01/11/2012 11:30
12011111-002	S5 Upper 0-57cm	SOIL	01/11/2012 11:30
12011111-003	S6 Lower	SOIL	01/11/2012 14:30
12011111-004	S6 Upper	SOIL	01/11/2012 14:30

Please reference the Chain of Custody and Sample Receipt Checklist for specific container counts and preservatives. Any sample conditions not in compliance with sample acceptance criteria are described in Case Narrative Summary.

Notes:

1. The presence of common laboratory contaminants such as acetone, methylene chloride and phthalates, may be considered a possible laboratory artifact. Where observed, appropriate consideration of data should be taken.
2. The following analytical results are never reported on a dry weight basis: pH, flashpoint, moisture and paint filter test.
3. Drinking water samples collected for the purpose of compliance with SDWA may not be suitable for their intended use unless collected by a certified sampler [COMAR 26.08.05.07.C.2].

Standard Flags/Abbreviations:

B A target analyte or commone laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
C Results Pending Final Confirmation.
E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
Fail The result exceeds the regulatory level for Toxicity Characteristic (TCLP) as cited in 40 CFR 261.24 Table 1.
J The target analyte was positively identified below the reporting limit but greater than the LOD.
LOD Limit of Detection. An estimate of the minimum amount of a substance that an analytical process can reliably detect. An LOD is analyte and matrix specific.
ND Not Detected at or above the reporting limit.
RL PSS Reporting Limit.
U Not detected.

Case Narrative Summary

Client Name: Maryland Geological Survey (MGS)

Project Name: Bloede

Project ID: N/A

Work Order Number: 12011111

Any holding time exceedances, deviations from the method specifications, regulatory requirements or variations to the procedures outlined in the PSS Quality Assurance Manual are outlined below.

Sample Receipt:

All sample receipt conditions were acceptable.

General Comments:

Revised report to include lower reporting limits per client request.

Analytical:

Total Petroleum Hydrocarbons - DRO

Batch: 95321

Matrix spike recovery for 39960-1-BKS is 107% out of 60%-95% control limits.

NELAP accreditation was held for all analyses performed unless noted below. See www.phaseonline.com for complete PSS scope of accreditation.

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 12011111

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede
Project Location: Patapsco River

Sample ID: S5 Lower 57-114cm **Date/Time Sampled: 01/11/2012 11:30** **PSS Sample ID: 12011111-001**
Matrix: SOIL **Date/Time Received: 01/11/2012 16:52** **% Solids: 96**

TAL Metals — Analytical Method: SW-846 6020 A — Preparation Method: 3050B

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Aluminum	**3000**	mg/kg	510		10	260	01/12/12	01/16/12 11:45	1034
Antimony	ND	mg/kg	2.6		1	1.3	01/12/12	01/13/12 15:49	1034
Arsenic	**0.70**	mg/kg	0.51		1	0.26	01/12/12	01/13/12 15:49	1034
Barium	**20**	mg/kg	2.6		1	1.3	01/12/12	01/13/12 15:49	1034
Beryllium	ND	mg/kg	2.6		1	1.3	01/12/12	01/13/12 15:49	1034
Cadmium	ND	mg/kg	2.6		1	1.3	01/12/12	01/13/12 15:49	1034
Calcium	**2900**	mg/kg	510		10	260	01/12/12	01/16/12 11:45	1034
Chromium	**16**	mg/kg	2.6		1	1.3	01/12/12	01/13/12 15:49	1034
Cobalt	**3.4**	mg/kg	2.6		1	1.3	01/12/12	01/13/12 15:49	1034
Copper	**6.3**	mg/kg	2.6		1	1.3	01/12/12	01/13/12 15:49	1034
Iron	**6800**	mg/kg	510		10	260	01/12/12	01/16/12 11:45	1034
Lead	**4.9**	mg/kg	2.6		1	1.3	01/12/12	01/13/12 15:49	1034
Magnesium	**2300**	mg/kg	51		1	26	01/12/12	01/13/12 15:49	1034
Manganese	**110**	mg/kg	2.6		1	1.3	01/12/12	01/13/12 15:49	1034
Mercury	ND	mg/kg	0.10		1	0.051	01/12/12	01/13/12 15:49	1034
Nickel	**8.5**	mg/kg	2.6		1	1.3	01/12/12	01/13/12 15:49	1034
Potassium	**850**	mg/kg	510		10	260	01/12/12	01/16/12 11:45	1034
Selenium	ND	mg/kg	2.6		1	1.3	01/12/12	01/13/12 15:49	1034
Silver	ND	mg/kg	2.6		1	1.3	01/12/12	01/13/12 15:49	1034
Sodium	ND	mg/kg	51		1	26	01/12/12	01/13/12 15:49	1034
Thallium	ND	mg/kg	2.0		1	1	01/12/12	01/13/12 15:49	1034
Vanadium	**10**	mg/kg	2.6		1	1.3	01/12/12	01/13/12 15:49	1034
Zinc	**11**	mg/kg	10		1	5.1	01/12/12	01/13/12 15:49	1034

Total Petroleum Hydrocarbons - DRO — Analytical Method: SW-846 8015 C — Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
TPH-DRO (Diesel Range Organics)	ND	mg/kg	4.2		1	4.2	01/13/12	01/14/12 01:36	1040

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 12011111

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede
Project Location: Patapsco River

Sample ID: S5 Lower 57-114cm **Date/Time Sampled: 01/11/2012 11:30** **PSS Sample ID: 12011111-001**
Matrix: SOIL **Date/Time Received: 01/11/2012 16:52** **% Solids: 96**

Total Petroleum Hydrocarbons-GRO — Analytical Method: SW-846 8015C — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
TPH-GRO (Gasoline Range Organics)	ND	ug/kg	100		1	41	01/12/12	01/12/12 22:19	1035

Organochlorine Pesticides — Analytical Method: SW-846 8081 B — Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
alpha-BHC	ND	ug/kg	8.3		1	4.2	01/12/12	01/13/12 16:23	1029
gamma-BHC (Lindane)	ND	ug/kg	8.3		1	4.2	01/12/12	01/13/12 16:23	1029
beta-BHC	ND	ug/kg	8.3		1	4.2	01/12/12	01/13/12 16:23	1029
delta-BHC	ND	ug/kg	8.3		1	4.2	01/12/12	01/13/12 16:23	1029
Heptachlor	ND	ug/kg	8.3		1	4.2	01/12/12	01/13/12 16:23	1029
Aldrin	ND	ug/kg	8.3		1	4.2	01/12/12	01/13/12 16:23	1029
Heptachlor epoxide	ND	ug/kg	8.3		1	4.2	01/12/12	01/13/12 16:23	1029
gamma-Chlordane	ND	ug/kg	8.3		1	4.2	01/12/12	01/13/12 16:23	1029
alpha-Chlordane	ND	ug/kg	8.3		1	4.2	01/12/12	01/13/12 16:23	1029
4,4-DDE	ND	ug/kg	8.3		1	4.2	01/12/12	01/13/12 16:23	1029
Endosulfan I	ND	ug/kg	8.3		1	4.2	01/12/12	01/13/12 16:23	1029
Dieldrin	ND	ug/kg	8.3		1	4.2	01/12/12	01/13/12 16:23	1029
Endrin	ND	ug/kg	8.3		1	4.2	01/12/12	01/13/12 16:23	1029
4,4-DDD	ND	ug/kg	8.3		1	4.2	01/12/12	01/13/12 16:23	1029
Endosulfan II	ND	ug/kg	8.3		1	4.2	01/12/12	01/13/12 16:23	1029
4,4-DDT	ND	ug/kg	8.3		1	4.2	01/12/12	01/13/12 16:23	1029
Endrin aldehyde	ND	ug/kg	8.3		1	4.2	01/12/12	01/13/12 16:23	1029
Methoxychlor	ND	ug/kg	8.3		1	4.2	01/12/12	01/13/12 16:23	1029
Endosulfan sulfate	ND	ug/kg	8.3		1	4.2	01/12/12	01/13/12 16:23	1029
Endrin ketone	ND	ug/kg	8.3		1	4.2	01/12/12	01/13/12 16:23	1029
Toxaphene	ND	ug/kg	210		1	100	01/12/12	01/13/12 16:23	1029
Chlordane	ND	ug/kg	210		1	100	01/12/12	01/13/12 16:23	1029

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February 16, 2012

Project Name: Bloede
Project Location: Patapsco River

Sample ID: S5 Lower 57-114cm **Date/Time Sampled: 01/11/2012 11:30** **PSS Sample ID: 12011111-001**
Matrix: SOIL **Date/Time Received: 01/11/2012 16:52** **% Solids: 96**

Polychlorinated Biphenyls — Analytical Method: SW-846 8082 A — Preparation Method: 3550
Clean up Method: SW846 3665A

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
PCB-1016	ND	mg/kg	0.10		1	0.052	01/12/12	01/13/12 09:43	1029
PCB-1221	ND	mg/kg	0.10		1	0.052	01/12/12	01/13/12 09:43	1029
PCB-1232	ND	mg/kg	0.10		1	0.052	01/12/12	01/13/12 09:43	1029
PCB-1242	ND	mg/kg	0.10		1	0.052	01/12/12	01/13/12 09:43	1029
PCB-1248	ND	mg/kg	0.10		1	0.052	01/12/12	01/13/12 09:43	1029
PCB-1254	ND	mg/kg	0.10		1	0.052	01/12/12	01/13/12 09:43	1029
PCB-1260	ND	mg/kg	0.10		1	0.052	01/12/12	01/13/12 09:43	1029

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Project Name: Bloede
Project Location: Patapsco River

Sample ID: S5 Lower 57-114cm	**Date/Time Sampled: 01/11/2012 11:30**	**PSS Sample ID: 12011111-001**
Matrix: SOIL	**Date/Time Received: 01/11/2012 16:52**	**% Solids: 96**

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Dichlorodifluoromethane	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
Chloromethane	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
Vinyl Chloride	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
Bromomethane	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
Chloroethane	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
Acetone	ND	ug/kg	21		1	10	01/13/12	01/14/12 05:16	1011
Cyclohexane	ND	ug/kg	21		1	10	01/13/12	01/14/12 05:16	1011
Trichlorofluoromethane	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
1,1-Dichloroethene	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
Methylene Chloride	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
trans-1,2-Dichloroethene	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
Methyl-t-butyl ether	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
1,1-Dichloroethane	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
2-Butanone (MEK)	ND	ug/kg	21		1	10	01/13/12	01/14/12 05:16	1011
cis-1,2-Dichloroethene	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
Bromochloromethane	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
Chloroform	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
1,1,1-Trichloroethane	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
1,2-Dichloroethane	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
Carbon Tetrachloride	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
Benzene	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
1,2-Dichloropropane	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
Carbon Disulfide	ND	ug/kg	10		1	5.2	01/13/12	01/14/12 05:16	1011
Methylcyclohexane	ND	ug/kg	21		1	10	01/13/12	01/14/12 05:16	1011
Trichloroethene	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
Methyl Acetate	ND	ug/kg	21		1	10	01/13/12	01/14/12 05:16	1011
Bromodichloromethane	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
cis-1,3-Dichloropropene	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
4-Methyl-2-Pentanone	ND	ug/kg	21		1	10	01/13/12	01/14/12 05:16	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 12011111

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede
Project Location: Patapsco River

Sample ID: S5 Lower 57-114cm	**Date/Time Sampled: 01/11/2012 11:30**	**PSS Sample ID: 12011111-001**
Matrix: SOIL	**Date/Time Received: 01/11/2012 16:52**	**% Solids: 96**

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
trans-1,3-Dichloropropene	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
1,1,2-Trichloroethane	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
Toluene	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
2-Hexanone	ND	ug/kg	21		1	10	01/13/12	01/14/12 05:16	1011
1,2-Dibromoethane (EDB)	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
Dibromochloromethane	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
Bromoform	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
Tetrachloroethene	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
Chlorobenzene	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
Ethylbenzene	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
m,p-Xylenes	ND	ug/kg	10		1	5.2	01/13/12	01/14/12 05:16	1011
Styrene	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
o-Xylene	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
Isopropylbenzene	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
1,3-Dichlorobenzene	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
1,4-Dichlorobenzene	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
1,2-Dichlorobenzene	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
1,2-Dibromo-3-Chloropropane	ND	ug/kg	42		1	21	01/13/12	01/14/12 05:16	1011
1,2,4-Trichlorobenzene	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
Naphthalene	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011
1,2,3-Trichlorobenzene	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 05:16	1011

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Sample ID: S5 Lower 57-114cm **Date/Time Sampled: 01/11/2012 11:30** **PSS Sample ID: 12011111-001**
Matrix: SOIL **Date/Time Received: 01/11/2012 16:52** **% Solids: 96**

TCL Semivolatile Organic Compounds Analytical Method: SW-846 8270 C Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Acenaphthene	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
Acenaphthylene	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
Acetophenone	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
Anthracene	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
Benzo(a)anthracene	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
Benzo(a)pyrene	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
Benzo(b)fluoranthene	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
Benzo(g,h,i)perylene	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
Benzo(k)fluoranthene	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
Biphenyl (Diphenyl)	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
Butyl benzyl phthalate	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
bis(2-chloroethoxy) methane	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
bis(2-chloroethyl) ether	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
bis(2-chloroisopropyl) ether	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
bis(2-ethylhexyl) phthalate	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
4-Bromophenylphenyl ether	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
Di-n-butyl phthalate	ND	ug/kg	350		1	170	01/13/12	01/13/12 23:01	1014
Carbazole	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
4-Chloro-3-methyl phenol	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
4-Chloroaniline	ND	ug/kg	350		1	170	01/13/12	01/13/12 23:01	1014
2-Chloronaphthalene	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
2-Chlorophenol	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
4-Chlorophenyl Phenyl ether	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
Chrysene	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
Dibenz(a,h)Anthracene	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
Dibenzofuran	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
3,3-Dichlorobenzidine	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
2,4-Dichlorophenol	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
Diethyl phthalate	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
Dimethyl phthalate	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014

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February 16, 2012

Project Name: Bloede
Project Location: Patapsco River

Sample ID: S5 Lower 57-114cm **Date/Time Sampled: 01/11/2012 11:30** **PSS Sample ID: 12011111-001**
Matrix: SOIL **Date/Time Received: 01/11/2012 16:52** **% Solids: 96**

TCL Semivolatile Organic Compounds Analytical Method: SW-846 8270 C Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
2,4-Dimethylphenol	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
4,6-Dinitro-2-methyl phenol	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
2,4-Dinitrophenol	ND	ug/kg	350		1	170	01/13/12	01/13/12 23:01	1014
2,4-Dinitrotoluene	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
2,6-Dinitrotoluene	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
Fluoranthene	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
Fluorene	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
Hexachlorobenzene	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
Hexachlorobutadiene	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
Hexachlorocyclopentadiene	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
Hexachloroethane	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
Indeno(1,2,3-c,d)Pyrene	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
Isophorone	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
2-Methylnaphthalene	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
2-Methyl phenol	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
3&4-Methylphenol	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
Naphthalene	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
4-Nitroaniline	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
3-Nitroaniline	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
2-Nitroaniline	ND	ug/kg	350		1	170	01/13/12	01/13/12 23:01	1014
Nitrobenzene	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
2-Nitrophenol	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
4-Nitrophenol	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
N-Nitrosodi-n-propyl amine	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
N-Nitrosodiphenylamine	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
Di-n-octyl phthalate	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
Pentachlorophenol	ND	ug/kg	350		1	170	01/13/12	01/13/12 23:01	1014
Phenanthrene	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
Phenol	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
Atrazine	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014

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February 16, 2012

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Project Location: Patapsco River

Sample ID: S5 Lower 57-114cm | **Date/Time Sampled: 01/11/2012 11:30** | **PSS Sample ID: 12011111-001**
Matrix: SOIL | **Date/Time Received: 01/11/2012 16:52** | **% Solids: 96**

TCL Semivolatile Organic Compounds — Analytical Method: SW-846 8270 C — Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Pyrene	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
Pyridine	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
Caprolactam	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
2,4,6-Trichlorophenol	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014
2,4,5-Trichlorophenol	ND	ug/kg	170		1	87	01/13/12	01/13/12 23:01	1014

Cyanide — Analytical Method: SW-846 9014

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Cyanide, Total	ND	mg/kg	0.15		1	0.077	01/13/12	01/13/12 17:18	1044

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 12011111

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede
Project Location: Patapsco River

Sample ID: S5 Upper 0-57cm **Date/Time Sampled: 01/11/2012 11:30** **PSS Sample ID: 12011111-002**
Matrix: SOIL **Date/Time Received: 01/11/2012 16:52** **% Solids: 97**

TAL Metals — Analytical Method: SW-846 6020 A — Preparation Method: 3050B

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Aluminum	**4000**	mg/kg	460		10	230	01/12/12	01/16/12 11:51	1034
Antimony	**3.2**	mg/kg	2.3		1	1.2	01/12/12	01/13/12 15:54	1034
Arsenic	**0.90**	mg/kg	0.46		1	0.23	01/12/12	01/13/12 15:54	1034
Barium	**20**	mg/kg	2.3		1	1.2	01/12/12	01/13/12 15:54	1034
Beryllium	ND	mg/kg	2.3		1	1.2	01/12/12	01/13/12 15:54	1034
Cadmium	ND	mg/kg	2.3		1	1.2	01/12/12	01/13/12 15:54	1034
Calcium	**1800**	mg/kg	460		10	230	01/12/12	01/16/12 11:51	1034
Chromium	**20**	mg/kg	2.3		1	1.2	01/12/12	01/13/12 15:54	1034
Cobalt	**4.5**	mg/kg	2.3		1	1.2	01/12/12	01/13/12 15:54	1034
Copper	**13**	mg/kg	2.3		1	1.2	01/12/12	01/13/12 15:54	1034
Iron	**5000**	mg/kg	460		10	230	01/12/12	01/16/12 11:51	1034
Lead	**53**	mg/kg	2.3		1	1.2	01/12/12	01/13/12 15:54	1034
Magnesium	**1600**	mg/kg	46		1	23	01/12/12	01/13/12 15:54	1034
Manganese	**120**	mg/kg	2.3		1	1.2	01/12/12	01/13/12 15:54	1034
Mercury	ND	mg/kg	0.093		1	0.046	01/12/12	01/13/12 15:54	1034
Nickel	**14**	mg/kg	2.3		1	1.2	01/12/12	01/13/12 15:54	1034
Potassium	**570**	mg/kg	460		10	230	01/12/12	01/16/12 11:51	1034
Selenium	ND	mg/kg	2.3		1	1.2	01/12/12	01/13/12 15:54	1034
Silver	ND	mg/kg	2.3		1	1.2	01/12/12	01/13/12 15:54	1034
Sodium	**71**	mg/kg	46		1	23	01/12/12	01/13/12 15:54	1034
Thallium	ND	mg/kg	1.9		1	0.93	01/12/12	01/13/12 15:54	1034
Vanadium	**7.8**	mg/kg	2.3		1	1.2	01/12/12	01/13/12 15:54	1034
Zinc	**11**	mg/kg	9.3		1	4.6	01/12/12	01/13/12 15:54	1034

Total Petroleum Hydrocarbons - DRO — Analytical Method: SW-846 8015 C — Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
TPH-DRO (Diesel Range Organics)	ND	mg/kg	4.1		1	4.1	01/13/12	01/14/12 02:00	1040

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Project Location: Patapsco River

Sample ID: S5 Upper 0-57cm **Date/Time Sampled: 01/11/2012 11:30** **PSS Sample ID: 12011111-002**
Matrix: SOIL **Date/Time Received: 01/11/2012 16:52** **% Solids: 97**

Total Petroleum Hydrocarbons-GRO — Analytical Method: SW-846 8015C — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
TPH-GRO (Gasoline Range Organics)	ND	ug/kg	100		1	41	01/12/12	01/12/12 22:47	1035

Organochlorine Pesticides — Analytical Method: SW-846 8081 B — Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
alpha-BHC	ND	ug/kg	8.2		1	4.1	01/12/12	01/13/12 16:51	1029
gamma-BHC (Lindane)	ND	ug/kg	8.2		1	4.1	01/12/12	01/13/12 16:51	1029
beta-BHC	ND	ug/kg	8.2		1	4.1	01/12/12	01/13/12 16:51	1029
delta-BHC	ND	ug/kg	8.2		1	4.1	01/12/12	01/13/12 16:51	1029
Heptachlor	ND	ug/kg	8.2		1	4.1	01/12/12	01/13/12 16:51	1029
Aldrin	ND	ug/kg	8.2		1	4.1	01/12/12	01/13/12 16:51	1029
Heptachlor epoxide	ND	ug/kg	8.2		1	4.1	01/12/12	01/13/12 16:51	1029
gamma-Chlordane	ND	ug/kg	8.2		1	4.1	01/12/12	01/13/12 16:51	1029
alpha-Chlordane	ND	ug/kg	8.2		1	4.1	01/12/12	01/13/12 16:51	1029
4,4-DDE	ND	ug/kg	8.2		1	4.1	01/12/12	01/13/12 16:51	1029
Endosulfan I	ND	ug/kg	8.2		1	4.1	01/12/12	01/13/12 16:51	1029
Dieldrin	ND	ug/kg	8.2		1	4.1	01/12/12	01/13/12 16:51	1029
Endrin	ND	ug/kg	8.2		1	4.1	01/12/12	01/13/12 16:51	1029
4,4-DDD	ND	ug/kg	8.2		1	4.1	01/12/12	01/13/12 16:51	1029
Endosulfan II	ND	ug/kg	8.2		1	4.1	01/12/12	01/13/12 16:51	1029
4,4-DDT	ND	ug/kg	8.2		1	4.1	01/12/12	01/13/12 16:51	1029
Endrin aldehyde	ND	ug/kg	8.2		1	4.1	01/12/12	01/13/12 16:51	1029
Methoxychlor	ND	ug/kg	8.2		1	4.1	01/12/12	01/13/12 16:51	1029
Endosulfan sulfate	ND	ug/kg	8.2		1	4.1	01/12/12	01/13/12 16:51	1029
Endrin ketone	ND	ug/kg	8.2		1	4.1	01/12/12	01/13/12 16:51	1029
Toxaphene	ND	ug/kg	210		1	100	01/12/12	01/13/12 16:51	1029
Chlordane	ND	ug/kg	210		1	100	01/12/12	01/13/12 16:51	1029

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Matrix: SOIL **Date/Time Received: 01/11/2012 16:52** **% Solids: 97**

Polychlorinated Biphenyls — Analytical Method: SW-846 8082 A — Preparation Method: 3550 — Clean up Method: SW846 3665A

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
PCB-1016	ND	mg/kg	0.10		1	0.051	01/12/12	01/13/12 10:11	1029
PCB-1221	ND	mg/kg	0.10		1	0.051	01/12/12	01/13/12 10:11	1029
PCB-1232	ND	mg/kg	0.10		1	0.051	01/12/12	01/13/12 10:11	1029
PCB-1242	ND	mg/kg	0.10		1	0.051	01/12/12	01/13/12 10:11	1029
PCB-1248	ND	mg/kg	0.10		1	0.051	01/12/12	01/13/12 10:11	1029
PCB-1254	ND	mg/kg	0.10		1	0.051	01/12/12	01/13/12 10:11	1029
PCB-1260	ND	mg/kg	0.10		1	0.051	01/12/12	01/13/12 10:11	1029

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Project Location: Patapsco River

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Matrix: SOIL **Date/Time Received: 01/11/2012 16:52** **% Solids: 97**

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Dichlorodifluoromethane	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
Chloromethane	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
Vinyl Chloride	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
Bromomethane	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
Chloroethane	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
Acetone	ND	ug/kg	20		1	10	01/13/12	01/14/12 05:45	1011
Cyclohexane	ND	ug/kg	20		1	10	01/13/12	01/14/12 05:45	1011
Trichlorofluoromethane	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
1,1-Dichloroethene	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
Methylene Chloride	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
trans-1,2-Dichloroethene	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
Methyl-t-butyl ether	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
1,1-Dichloroethane	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
2-Butanone (MEK)	ND	ug/kg	20		1	10	01/13/12	01/14/12 05:45	1011
cis-1,2-Dichloroethene	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
Bromochloromethane	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
Chloroform	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
1,1,1-Trichloroethane	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
1,2-Dichloroethane	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
Carbon Tetrachloride	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
Benzene	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
1,2-Dichloropropane	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
Carbon Disulfide	ND	ug/kg	10		1	5.1	01/13/12	01/14/12 05:45	1011
Methylcyclohexane	ND	ug/kg	20		1	10	01/13/12	01/14/12 05:45	1011
Trichloroethene	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
Methyl Acetate	ND	ug/kg	20		1	10	01/13/12	01/14/12 05:45	1011
Bromodichloromethane	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
cis-1,3-Dichloropropene	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
4-Methyl-2-Pentanone	ND	ug/kg	20		1	10	01/13/12	01/14/12 05:45	1011

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CERTIFICATE OF ANALYSIS

No: 12011111

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede
Project Location: Patapsco River

Sample ID: S5 Upper 0-57cm	**Date/Time Sampled: 01/11/2012 11:30**	**PSS Sample ID: 12011111-002**
Matrix: SOIL	**Date/Time Received: 01/11/2012 16:52**	**% Solids: 97**

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
trans-1,3-Dichloropropene	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
1,1,2-Trichloroethane	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
Toluene	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
2-Hexanone	ND	ug/kg	20		1	10	01/13/12	01/14/12 05:45	1011
1,2-Dibromoethane (EDB)	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
Dibromochloromethane	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
Bromoform	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
Tetrachloroethene	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
Chlorobenzene	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
Ethylbenzene	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
m,p-Xylenes	ND	ug/kg	10		1	5.1	01/13/12	01/14/12 05:45	1011
Styrene	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
o-Xylene	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
Isopropylbenzene	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
1,3-Dichlorobenzene	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
1,4-Dichlorobenzene	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
1,2-Dichlorobenzene	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
1,2-Dibromo-3-Chloropropane	ND	ug/kg	41		1	20	01/13/12	01/14/12 05:45	1011
1,2,4-Trichlorobenzene	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
Naphthalene	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011
1,2,3-Trichlorobenzene	ND	ug/kg	5.1		1	2.5	01/13/12	01/14/12 05:45	1011

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TCL Semivolatile Organic Compounds Analytical Method: SW-846 8270 C Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Acenaphthene	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
Acenaphthylene	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
Acetophenone	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
Anthracene	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
Benzo(a)anthracene	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
Benzo(a)pyrene	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
Benzo(b)fluoranthene	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
Benzo(g,h,i)perylene	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
Benzo(k)fluoranthene	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
Biphenyl (Diphenyl)	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
Butyl benzyl phthalate	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
bis(2-chloroethoxy) methane	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
bis(2-chloroethyl) ether	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
bis(2-chloroisopropyl) ether	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
bis(2-ethylhexyl) phthalate	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
4-Bromophenylphenyl ether	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
Di-n-butyl phthalate	ND	ug/kg	340		1	170	01/13/12	01/13/12 23:19	1014
Carbazole	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
4-Chloro-3-methyl phenol	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
4-Chloroaniline	ND	ug/kg	340		1	170	01/13/12	01/13/12 23:19	1014
2-Chloronaphthalene	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
2-Chlorophenol	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
4-Chlorophenyl Phenyl ether	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
Chrysene	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
Dibenz(a,h)Anthracene	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
Dibenzofuran	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
3,3-Dichlorobenzidine	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
2,4-Dichlorophenol	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
Diethyl phthalate	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
Dimethyl phthalate	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014

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TCL Semivolatile Organic Compounds Analytical Method: SW-846 8270 C Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
2,4-Dimethylphenol	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
4,6-Dinitro-2-methyl phenol	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
2,4-Dinitrophenol	ND	ug/kg	340		1	170	01/13/12	01/13/12 23:19	1014
2,4-Dinitrotoluene	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
2,6-Dinitrotoluene	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
Fluoranthene	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
Fluorene	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
Hexachlorobenzene	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
Hexachlorobutadiene	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
Hexachlorocyclopentadiene	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
Hexachloroethane	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
Indeno(1,2,3-c,d)Pyrene	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
Isophorone	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
2-Methylnaphthalene	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
2-Methyl phenol	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
3&4-Methylphenol	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
Naphthalene	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
4-Nitroaniline	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
3-Nitroaniline	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
2-Nitroaniline	ND	ug/kg	340		1	170	01/13/12	01/13/12 23:19	1014
Nitrobenzene	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
2-Nitrophenol	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
4-Nitrophenol	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
N-Nitrosodi-n-propyl amine	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
N-Nitrosodiphenylamine	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
Di-n-octyl phthalate	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
Pentachlorophenol	ND	ug/kg	340		1	170	01/13/12	01/13/12 23:19	1014
Phenanthrene	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
Phenol	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
Atrazine	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 12011111

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede
Project Location: Patapsco River

Sample ID: S5 Upper 0-57cm **Date/Time Sampled: 01/11/2012 11:30** **PSS Sample ID: 12011111-002**
Matrix: SOIL **Date/Time Received: 01/11/2012 16:52** **% Solids: 97**

TCL Semivolatile Organic Compounds — Analytical Method: SW-846 8270 C — Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Pyrene	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
Pyridine	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
Caprolactam	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
2,4,6-Trichlorophenol	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014
2,4,5-Trichlorophenol	ND	ug/kg	170		1	86	01/13/12	01/13/12 23:19	1014

Cyanide — Analytical Method: SW-846 9014

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Cyanide, Total	ND	mg/kg	0.15		1	0.076	01/13/12	01/13/12 17:18	1044

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 12011111

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede
Project Location: Patapsco River

Sample ID: S6 Lower | **Date/Time Sampled: 01/11/2012 14:30** | **PSS Sample ID: 12011111-003**
Matrix: SOIL | **Date/Time Received: 01/11/2012 16:52** | **% Solids: 96**

TAL Metals — Analytical Method: SW-846 6020 A — Preparation Method: 3050B

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Aluminum	**3800**	mg/kg	440		10	220	01/12/12	01/16/12 11:56	1034
Antimony	ND	mg/kg	2.2		1	1.1	01/12/12	01/13/12 16:00	1034
Arsenic	**2.5**	mg/kg	0.44		1	0.22	01/12/12	01/13/12 16:00	1034
Barium	**25**	mg/kg	2.2		1	1.1	01/12/12	01/13/12 16:00	1034
Beryllium	ND	mg/kg	2.2		1	1.1	01/12/12	01/13/12 16:00	1034
Cadmium	ND	mg/kg	2.2		1	1.1	01/12/12	01/13/12 16:00	1034
Calcium	**7800**	mg/kg	440		10	220	01/12/12	01/16/12 11:56	1034
Chromium	**55**	mg/kg	2.2		1	1.1	01/12/12	01/13/12 16:00	1034
Cobalt	**5.2**	mg/kg	2.2		1	1.1	01/12/12	01/13/12 16:00	1034
Copper	**26**	mg/kg	2.2		1	1.1	01/12/12	01/13/12 16:00	1034
Iron	**19000**	mg/kg	440		10	220	01/12/12	01/16/12 11:56	1034
Lead	**6.2**	mg/kg	2.2		1	1.1	01/12/12	01/13/12 16:00	1034
Magnesium	**3200**	mg/kg	440		10	220	01/12/12	01/16/12 11:56	1034
Manganese	**170**	mg/kg	2.2		1	1.1	01/12/12	01/13/12 16:00	1034
Mercury	ND	mg/kg	0.089		1	0.044	01/12/12	01/13/12 16:00	1034
Nickel	**20**	mg/kg	2.2		1	1.1	01/12/12	01/13/12 16:00	1034
Potassium	**1100**	mg/kg	440		10	220	01/12/12	01/16/12 11:56	1034
Selenium	ND	mg/kg	2.2		1	1.1	01/12/12	01/13/12 16:00	1034
Silver	ND	mg/kg	2.2		1	1.1	01/12/12	01/13/12 16:00	1034
Sodium	ND	mg/kg	44		1	22	01/12/12	01/13/12 16:00	1034
Thallium	ND	mg/kg	1.8		1	0.89	01/12/12	01/13/12 16:00	1034
Vanadium	**21**	mg/kg	2.2		1	1.1	01/12/12	01/13/12 16:00	1034
Zinc	**18**	mg/kg	8.9		1	4.4	01/12/12	01/13/12 16:00	1034

Total Petroleum Hydrocarbons - DRO — Analytical Method: SW-846 8015 C — Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
TPH-DRO (Diesel Range Organics)	ND	mg/kg	4.2		1	4.2	01/13/12	01/14/12 02:00	1040

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CERTIFICATE OF ANALYSIS

No: 12011111

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede
Project Location: Patapsco River

Sample ID: S6 Lower	**Date/Time Sampled: 01/11/2012 14:30**	**PSS Sample ID: 12011111-003**
Matrix: SOIL	**Date/Time Received: 01/11/2012 16:52**	**% Solids: 96**

Total Petroleum Hydrocarbons-GRO — Analytical Method: SW-846 8015C — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
TPH-GRO (Gasoline Range Organics)	ND	ug/kg	100		1	42	01/12/12	01/12/12 23:14	1035

Organochlorine Pesticides — Analytical Method: SW-846 8081 B — Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
alpha-BHC	ND	ug/kg	8.3		1	4.2	01/12/12	01/13/12 17:19	1029
gamma-BHC (Lindane)	ND	ug/kg	8.3		1	4.2	01/12/12	01/13/12 17:19	1029
beta-BHC	ND	ug/kg	8.3		1	4.2	01/12/12	01/13/12 17:19	1029
delta-BHC	ND	ug/kg	8.3		1	4.2	01/12/12	01/13/12 17:19	1029
Heptachlor	ND	ug/kg	8.3		1	4.2	01/12/12	01/13/12 17:19	1029
Aldrin	ND	ug/kg	8.3		1	4.2	01/12/12	01/13/12 17:19	1029
Heptachlor epoxide	ND	ug/kg	8.3		1	4.2	01/12/12	01/13/12 17:19	1029
gamma-Chlordane	ND	ug/kg	8.3		1	4.2	01/12/12	01/13/12 17:19	1029
alpha-Chlordane	ND	ug/kg	8.3		1	4.2	01/12/12	01/13/12 17:19	1029
4,4-DDE	ND	ug/kg	8.3		1	4.2	01/12/12	01/13/12 17:19	1029
Endosulfan I	ND	ug/kg	8.3		1	4.2	01/12/12	01/13/12 17:19	1029
Dieldrin	ND	ug/kg	8.3		1	4.2	01/12/12	01/13/12 17:19	1029
Endrin	ND	ug/kg	8.3		1	4.2	01/12/12	01/13/12 17:19	1029
4,4-DDD	ND	ug/kg	8.3		1	4.2	01/12/12	01/13/12 17:19	1029
Endosulfan II	ND	ug/kg	8.3		1	4.2	01/12/12	01/13/12 17:19	1029
4,4-DDT	ND	ug/kg	8.3		1	4.2	01/12/12	01/13/12 17:19	1029
Endrin aldehyde	ND	ug/kg	8.3		1	4.2	01/12/12	01/13/12 17:19	1029
Methoxychlor	ND	ug/kg	8.3		1	4.2	01/12/12	01/13/12 17:19	1029
Endosulfan sulfate	ND	ug/kg	8.3		1	4.2	01/12/12	01/13/12 17:19	1029
Endrin ketone	ND	ug/kg	8.3		1	4.2	01/12/12	01/13/12 17:19	1029
Toxaphene	ND	ug/kg	210		1	100	01/12/12	01/13/12 17:19	1029
Chlordane	ND	ug/kg	210		1	100	01/12/12	01/13/12 17:19	1029

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CERTIFICATE OF ANALYSIS

No: 12011111

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede
Project Location: Patapsco River

Sample ID: S6 Lower | **Date/Time Sampled: 01/11/2012 14:30** | **PSS Sample ID: 12011111-003**
Matrix: SOIL | **Date/Time Received: 01/11/2012 16:52** | **% Solids: 96**

Polychlorinated Biphenyls — Analytical Method: SW-846 8082 A — Preparation Method: 3550
Clean up Method: SW846 3665A

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
PCB-1016	ND	mg/kg	0.10		1	0.052	01/12/12	01/13/12 10:40	1029
PCB-1221	ND	mg/kg	0.10		1	0.052	01/12/12	01/13/12 10:40	1029
PCB-1232	ND	mg/kg	0.10		1	0.052	01/12/12	01/13/12 10:40	1029
PCB-1242	ND	mg/kg	0.10		1	0.052	01/12/12	01/13/12 10:40	1029
PCB-1248	ND	mg/kg	0.10		1	0.052	01/12/12	01/13/12 10:40	1029
PCB-1254	ND	mg/kg	0.10		1	0.052	01/12/12	01/13/12 10:40	1029
PCB-1260	ND	mg/kg	0.10		1	0.052	01/12/12	01/13/12 10:40	1029

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Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede
Project Location: Patapsco River

Sample ID: S6 Lower | **Date/Time Sampled: 01/11/2012 14:30** | **PSS Sample ID: 12011111-003**
Matrix: SOIL | **Date/Time Received: 01/11/2012 16:52** | **% Solids: 96**

TCL Volatile Organic Compounds | Analytical Method: SW-846 8260 B | Preparation Method: 5030

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Dichlorodifluoromethane	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
Chloromethane	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
Vinyl Chloride	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
Bromomethane	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
Chloroethane	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
Acetone	ND	ug/kg	21		1	10	01/13/12	01/14/12 06:15	1011
Cyclohexane	ND	ug/kg	21		1	10	01/13/12	01/14/12 06:15	1011
Trichlorofluoromethane	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
1,1-Dichloroethene	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
Methylene Chloride	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
trans-1,2-Dichloroethene	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
Methyl-t-butyl ether	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
1,1-Dichloroethane	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
2-Butanone (MEK)	ND	ug/kg	21		1	10	01/13/12	01/14/12 06:15	1011
cis-1,2-Dichloroethene	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
Bromochloromethane	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
Chloroform	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
1,1,1-Trichloroethane	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
1,2-Dichloroethane	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
Carbon Tetrachloride	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
Benzene	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
1,2-Dichloropropane	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
Carbon Disulfide	ND	ug/kg	10		1	5.2	01/13/12	01/14/12 06:15	1011
Methylcyclohexane	ND	ug/kg	21		1	10	01/13/12	01/14/12 06:15	1011
Trichloroethene	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
Methyl Acetate	ND	ug/kg	21		1	10	01/13/12	01/14/12 06:15	1011
Bromodichloromethane	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
cis-1,3-Dichloropropene	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
4-Methyl-2-Pentanone	ND	ug/kg	21		1	10	01/13/12	01/14/12 06:15	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 12011111

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede
Project Location: Patapsco River

Sample ID: S6 Lower | **Date/Time Sampled: 01/11/2012 14:30** | **PSS Sample ID: 12011111-003**
Matrix: SOIL | **Date/Time Received: 01/11/2012 16:52** | **% Solids: 96**

TCL Volatile Organic Compounds | Analytical Method: SW-846 8260 B | Preparation Method: 5030

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
trans-1,3-Dichloropropene	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
1,1,2-Trichloroethane	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
Toluene	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
2-Hexanone	ND	ug/kg	21		1	10	01/13/12	01/14/12 06:15	1011
1,2-Dibromoethane (EDB)	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
Dibromochloromethane	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
Bromoform	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
Tetrachloroethene	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
Chlorobenzene	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
Ethylbenzene	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
m,p-Xylenes	ND	ug/kg	10		1	5.2	01/13/12	01/14/12 06:15	1011
Styrene	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
o-Xylene	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
Isopropylbenzene	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
1,3-Dichlorobenzene	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
1,4-Dichlorobenzene	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
1,2-Dichlorobenzene	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
1,2-Dibromo-3-Chloropropane	ND	ug/kg	42		1	21	01/13/12	01/14/12 06:15	1011
1,2,4-Trichlorobenzene	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
Naphthalene	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011
1,2,3-Trichlorobenzene	ND	ug/kg	5.2		1	2.6	01/13/12	01/14/12 06:15	1011

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No: 12011111

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede
Project Location: Patapsco River

Sample ID: S6 Lower | **Date/Time Sampled: 01/11/2012 14:30** | **PSS Sample ID: 12011111-003**
Matrix: SOIL | **Date/Time Received: 01/11/2012 16:52** | **% Solids: 96**

TCL Semivolatile Organic Compounds | Analytical Method: SW-846 8270 C | Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Acenaphthene	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
Acenaphthylene	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
Acetophenone	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
Anthracene	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
Benzo(a)anthracene	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
Benzo(a)pyrene	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
Benzo(b)fluoranthene	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
Benzo(g,h,i)perylene	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
Benzo(k)fluoranthene	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
Biphenyl (Diphenyl)	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
Butyl benzyl phthalate	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
bis(2-chloroethoxy) methane	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
bis(2-chloroethyl) ether	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
bis(2-chloroisopropyl) ether	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
bis(2-ethylhexyl) phthalate	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
4-Bromophenylphenyl ether	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
Di-n-butyl phthalate	ND	ug/kg	350		1	170	01/13/12	01/14/12 23:36	1014
Carbazole	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
4-Chloro-3-methyl phenol	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
4-Chloroaniline	ND	ug/kg	350		1	170	01/13/12	01/14/12 23:36	1014
2-Chloronaphthalene	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
2-Chlorophenol	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
4-Chlorophenyl Phenyl ether	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
Chrysene	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
Dibenz(a,h)Anthracene	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
Dibenzofuran	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
3,3-Dichlorobenzidine	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
2,4-Dichlorophenol	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
Diethyl phthalate	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
Dimethyl phthalate	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 12011111

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede
Project Location: Patapsco River

Sample ID: S6 Lower | **Date/Time Sampled: 01/11/2012 14:30** | **PSS Sample ID: 12011111-003**
Matrix: SOIL | **Date/Time Received: 01/11/2012 16:52** | **% Solids: 96**

TCL Semivolatile Organic Compounds | Analytical Method: SW-846 8270 C | Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
2,4-Dimethylphenol	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
4,6-Dinitro-2-methyl phenol	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
2,4-Dinitrophenol	ND	ug/kg	350		1	170	01/13/12	01/14/12 23:36	1014
2,4-Dinitrotoluene	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
2,6-Dinitrotoluene	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
Fluoranthene	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
Fluorene	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
Hexachlorobenzene	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
Hexachlorobutadiene	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
Hexachlorocyclopentadiene	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
Hexachloroethane	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
Indeno(1,2,3-c,d)Pyrene	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
Isophorone	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
2-Methylnaphthalene	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
2-Methyl phenol	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
3&4-Methylphenol	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
Naphthalene	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
4-Nitroaniline	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
3-Nitroaniline	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
2-Nitroaniline	ND	ug/kg	350		1	170	01/13/12	01/14/12 23:36	1014
Nitrobenzene	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
2-Nitrophenol	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
4-Nitrophenol	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
N-Nitrosodi-n-propyl amine	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
N-Nitrosodiphenylamine	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
Di-n-octyl phthalate	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
Pentachlorophenol	ND	ug/kg	350		1	170	01/13/12	01/14/12 23:36	1014
Phenanthrene	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
Phenol	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
Atrazine	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014

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CERTIFICATE OF ANALYSIS

No: 12011111

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede
Project Location: Patapsco River

Sample ID: S6 Lower | **Date/Time Sampled: 01/11/2012 14:30** | **PSS Sample ID: 12011111-003**
Matrix: SOIL | **Date/Time Received: 01/11/2012 16:52** | **% Solids: 96**

TCL Semivolatile Organic Compounds — Analytical Method: SW-846 8270 C — Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Pyrene	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
Pyridine	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
Caprolactam	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
2,4,6-Trichlorophenol	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014
2,4,5-Trichlorophenol	ND	ug/kg	170		1	87	01/13/12	01/14/12 23:36	1014

Cyanide — Analytical Method: SW-846 9014

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Cyanide, Total	ND	mg/kg	0.15		1	0.077	01/13/12	01/13/12 17:18	1044

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No: 12011111

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede
Project Location: Patapsco River

Sample ID: S6 Upper | **Date/Time Sampled: 01/11/2012 14:30** | **PSS Sample ID: 12011111-004**
Matrix: SOIL | **Date/Time Received: 01/11/2012 16:52** | **% Solids: 97**

TAL Metals — Analytical Method: SW-846 6020 A — Preparation Method: 3050B

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Aluminum	**3000**	mg/kg	380		10	190	01/12/12	01/16/12 12:02	1034
Antimony	ND	mg/kg	1.9		1	0.96	01/12/12	01/13/12 16:06	1034
Arsenic	**1.3**	mg/kg	0.38		1	0.19	01/12/12	01/13/12 16:06	1034
Barium	**24**	mg/kg	1.9		1	0.96	01/12/12	01/13/12 16:06	1034
Beryllium	ND	mg/kg	1.9		1	0.96	01/12/12	01/13/12 16:06	1034
Cadmium	ND	mg/kg	1.9		1	0.96	01/12/12	01/13/12 16:06	1034
Calcium	**1000**	mg/kg	380		10	190	01/12/12	01/16/12 12:02	1034
Chromium	**84**	mg/kg	1.9		1	0.96	01/12/12	01/13/12 16:06	1034
Cobalt	**4.4**	mg/kg	1.9		1	0.96	01/12/12	01/13/12 16:06	1034
Copper	**5.6**	mg/kg	1.9		1	0.96	01/12/12	01/13/12 16:06	1034
Iron	**8500**	mg/kg	380		10	190	01/12/12	01/16/12 12:02	1034
Lead	**7.6**	mg/kg	1.9		1	0.96	01/12/12	01/13/12 16:06	1034
Magnesium	**1300**	mg/kg	38		1	19	01/12/12	01/13/12 16:06	1034
Manganese	**120**	mg/kg	1.9		1	0.96	01/12/12	01/13/12 16:06	1034
Mercury	ND	mg/kg	0.076		1	0.038	01/12/12	01/13/12 16:06	1034
Nickel	**11**	mg/kg	1.9		1	0.96	01/12/12	01/13/12 16:06	1034
Potassium	**740**	mg/kg	380		10	190	01/12/12	01/16/12 12:02	1034
Selenium	ND	mg/kg	1.9		1	0.96	01/12/12	01/13/12 16:06	1034
Silver	ND	mg/kg	1.9		1	0.96	01/12/12	01/13/12 16:06	1034
Sodium	ND	mg/kg	38		1	19	01/12/12	01/13/12 16:06	1034
Thallium	ND	mg/kg	1.5		1	0.76	01/12/12	01/13/12 16:06	1034
Vanadium	**15**	mg/kg	1.9		1	0.96	01/12/12	01/13/12 16:06	1034
Zinc	**13**	mg/kg	7.6		1	3.8	01/12/12	01/13/12 16:06	1034

Total Petroleum Hydrocarbons - DRO — Analytical Method: SW-846 8015 C — Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
TPH-DRO (Diesel Range Organics)	ND	mg/kg	4.1		1	4.1	01/13/12	01/14/12 02:25	1040

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February 16, 2012

Project Name: Bloede
Project Location: Patapsco River

Sample ID: S6 Upper | **Date/Time Sampled: 01/11/2012 14:30** | **PSS Sample ID: 12011111-004**
Matrix: SOIL | **Date/Time Received: 01/11/2012 16:52** | **% Solids: 97**

Total Petroleum Hydrocarbons-GRO — Analytical Method: SW-846 8015C — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
TPH-GRO (Gasoline Range Organics)	ND	ug/kg	100		1	41	01/12/12	01/12/12 23:41	1035

Organochlorine Pesticides — Analytical Method: SW-846 8081 B — Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
alpha-BHC	ND	ug/kg	8.2		1	4.1	01/12/12	01/13/12 17:47	1029
gamma-BHC (Lindane)	ND	ug/kg	8.2		1	4.1	01/12/12	01/13/12 17:47	1029
beta-BHC	ND	ug/kg	8.2		1	4.1	01/12/12	01/13/12 17:47	1029
delta-BHC	ND	ug/kg	8.2		1	4.1	01/12/12	01/13/12 17:47	1029
Heptachlor	ND	ug/kg	8.2		1	4.1	01/12/12	01/13/12 17:47	1029
Aldrin	ND	ug/kg	8.2		1	4.1	01/12/12	01/13/12 17:47	1029
Heptachlor epoxide	ND	ug/kg	8.2		1	4.1	01/12/12	01/13/12 17:47	1029
gamma-Chlordane	ND	ug/kg	8.2		1	4.1	01/12/12	01/13/12 17:47	1029
alpha-Chlordane	ND	ug/kg	8.2		1	4.1	01/12/12	01/13/12 17:47	1029
4,4-DDE	ND	ug/kg	8.2		1	4.1	01/12/12	01/13/12 17:47	1029
Endosulfan I	ND	ug/kg	8.2		1	4.1	01/12/12	01/13/12 17:47	1029
Dieldrin	ND	ug/kg	8.2		1	4.1	01/12/12	01/13/12 17:47	1029
Endrin	ND	ug/kg	8.2		1	4.1	01/12/12	01/13/12 17:47	1029
4,4-DDD	ND	ug/kg	8.2		1	4.1	01/12/12	01/13/12 17:47	1029
Endosulfan II	ND	ug/kg	8.2		1	4.1	01/12/12	01/13/12 17:47	1029
4,4-DDT	ND	ug/kg	8.2		1	4.1	01/12/12	01/13/12 17:47	1029
Endrin aldehyde	ND	ug/kg	8.2		1	4.1	01/12/12	01/13/12 17:47	1029
Methoxychlor	ND	ug/kg	8.2		1	4.1	01/12/12	01/13/12 17:47	1029
Endosulfan sulfate	ND	ug/kg	8.2		1	4.1	01/12/12	01/13/12 17:47	1029
Endrin ketone	ND	ug/kg	8.2		1	4.1	01/12/12	01/13/12 17:47	1029
Toxaphene	ND	ug/kg	210		1	100	01/12/12	01/13/12 17:47	1029
Chlordane	ND	ug/kg	210		1	100	01/12/12	01/13/12 17:47	1029

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Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede
Project Location: Patapsco River

Sample ID: S6 Upper | **Date/Time Sampled: 01/11/2012 14:30** | **PSS Sample ID: 12011111-004**
Matrix: SOIL | **Date/Time Received: 01/11/2012 16:52** | **% Solids: 97**

Polychlorinated Biphenyls — Analytical Method: SW-846 8082 A — Preparation Method: 3550
Clean up Method: SW846 3665A

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
PCB-1016	ND	mg/kg	0.10		1	0.051	01/12/12	01/13/12 11:27	1029
PCB-1221	ND	mg/kg	0.10		1	0.051	01/12/12	01/13/12 11:27	1029
PCB-1232	ND	mg/kg	0.10		1	0.051	01/12/12	01/13/12 11:27	1029
PCB-1242	ND	mg/kg	0.10		1	0.051	01/12/12	01/13/12 11:27	1029
PCB-1248	ND	mg/kg	0.10		1	0.051	01/12/12	01/13/12 11:27	1029
PCB-1254	ND	mg/kg	0.10		1	0.051	01/12/12	01/13/12 11:27	1029
PCB-1260	ND	mg/kg	0.10		1	0.051	01/12/12	01/13/12 11:27	1029

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February 16, 2012

Project Name: Bloede
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Sample ID: S6 Upper | **Date/Time Sampled: 01/11/2012 14:30** | **PSS Sample ID: 12011111-004**
Matrix: SOIL | **Date/Time Received: 01/11/2012 16:52** | **% Solids: 97**

TCL Volatile Organic Compounds | Analytical Method: SW-846 8260 B | Preparation Method: 5030

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Dichlorodifluoromethane	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
Chloromethane	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
Vinyl Chloride	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
Bromomethane	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
Chloroethane	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
Acetone	ND	ug/kg	21		1	10	01/14/12	01/14/12 15:41	1011
Cyclohexane	ND	ug/kg	21		1	10	01/14/12	01/14/12 15:41	1011
Trichlorofluoromethane	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
1,1-Dichloroethene	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
Methylene Chloride	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
trans-1,2-Dichloroethene	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
Methyl-t-butyl ether	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
1,1-Dichloroethane	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
2-Butanone (MEK)	ND	ug/kg	21		1	10	01/14/12	01/14/12 15:41	1011
cis-1,2-Dichloroethene	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
Bromochloromethane	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
Chloroform	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
1,1,1-Trichloroethane	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
1,2-Dichloroethane	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
Carbon Tetrachloride	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
Benzene	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
1,2-Dichloropropane	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
Carbon Disulfide	ND	ug/kg	10		1	5.2	01/14/12	01/14/12 15:41	1011
Methylcyclohexane	ND	ug/kg	21		1	10	01/14/12	01/14/12 15:41	1011
Trichloroethene	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
Methyl Acetate	ND	ug/kg	21		1	10	01/14/12	01/14/12 15:41	1011
Bromodichloromethane	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
cis-1,3-Dichloropropene	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
4-Methyl-2-Pentanone	ND	ug/kg	21		1	10	01/14/12	01/14/12 15:41	1011

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CERTIFICATE OF ANALYSIS

No: 12011111

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede
Project Location: Patapsco River

Sample ID: S6 Upper | **Date/Time Sampled: 01/11/2012 14:30** | **PSS Sample ID: 12011111-004**
Matrix: SOIL | **Date/Time Received: 01/11/2012 16:52** | **% Solids: 97**

TCL Volatile Organic Compounds | Analytical Method: SW-846 8260 B | Preparation Method: 5030

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
trans-1,3-Dichloropropene	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
1,1,2-Trichloroethane	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
Toluene	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
2-Hexanone	ND	ug/kg	21		1	10	01/14/12	01/14/12 15:41	1011
1,2-Dibromoethane (EDB)	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
Dibromochloromethane	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
Bromoform	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
Tetrachloroethene	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
Chlorobenzene	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
Ethylbenzene	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
m,p-Xylenes	ND	ug/kg	10		1	5.2	01/14/12	01/14/12 15:41	1011
Styrene	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
o-Xylene	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
Isopropylbenzene	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
1,3-Dichlorobenzene	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
1,4-Dichlorobenzene	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
1,2-Dichlorobenzene	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
1,2-Dibromo-3-Chloropropane	ND	ug/kg	42		1	21	01/14/12	01/14/12 15:41	1011
1,2,4-Trichlorobenzene	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
Naphthalene	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011
1,2,3-Trichlorobenzene	ND	ug/kg	5.2		1	2.6	01/14/12	01/14/12 15:41	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 12011111

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede
Project Location: Patapsco River

Sample ID: S6 Upper | **Date/Time Sampled: 01/11/2012 14:30** | **PSS Sample ID: 12011111-004**
Matrix: SOIL | **Date/Time Received: 01/11/2012 16:52** | **% Solids: 97**

TCL Semivolatile Organic Compounds | Analytical Method: SW-846 8270 C | Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Acenaphthene	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
Acenaphthylene	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
Acetophenone	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
Anthracene	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
Benzo(a)anthracene	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
Benzo(a)pyrene	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
Benzo(b)fluoranthene	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
Benzo(g,h,i)perylene	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
Benzo(k)fluoranthene	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
Biphenyl (Diphenyl)	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
Butyl benzyl phthalate	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
bis(2-chloroethoxy) methane	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
bis(2-chloroethyl) ether	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
bis(2-chloroisopropyl) ether	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
bis(2-ethylhexyl) phthalate	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
4-Bromophenylphenyl ether	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
Di-n-butyl phthalate	ND	ug/kg	340		1	170	01/13/12	01/14/12 23:54	1014
Carbazole	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
4-Chloro-3-methyl phenol	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
4-Chloroaniline	ND	ug/kg	340		1	170	01/13/12	01/14/12 23:54	1014
2-Chloronaphthalene	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
2-Chlorophenol	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
4-Chlorophenyl Phenyl ether	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
Chrysene	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
Dibenz(a,h)Anthracene	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
Dibenzofuran	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
3,3-Dichlorobenzidine	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
2,4-Dichlorophenol	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
Diethyl phthalate	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
Dimethyl phthalate	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 12011111

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede
Project Location: Patapsco River

Sample ID: S6 Upper | **Date/Time Sampled: 01/11/2012 14:30** | **PSS Sample ID: 12011111-004**
Matrix: SOIL | **Date/Time Received: 01/11/2012 16:52** | **% Solids: 97**

TCL Semivolatile Organic Compounds | Analytical Method: SW-846 8270 C | Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
2,4-Dimethylphenol	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
4,6-Dinitro-2-methyl phenol	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
2,4-Dinitrophenol	ND	ug/kg	340		1	170	01/13/12	01/14/12 23:54	1014
2,4-Dinitrotoluene	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
2,6-Dinitrotoluene	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
Fluoranthene	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
Fluorene	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
Hexachlorobenzene	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
Hexachlorobutadiene	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
Hexachlorocyclopentadiene	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
Hexachloroethane	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
Indeno(1,2,3-c,d)Pyrene	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
Isophorone	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
2-Methylnaphthalene	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
2-Methyl phenol	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
3&4-Methylphenol	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
Naphthalene	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
4-Nitroaniline	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
3-Nitroaniline	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
2-Nitroaniline	ND	ug/kg	340		1	170	01/13/12	01/14/12 23:54	1014
Nitrobenzene	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
2-Nitrophenol	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
4-Nitrophenol	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
N-Nitrosodi-n-propyl amine	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
N-Nitrosodiphenylamine	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
Di-n-octyl phthalate	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
Pentachlorophenol	ND	ug/kg	340		1	170	01/13/12	01/14/12 23:54	1014
Phenanthrene	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
Phenol	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
Atrazine	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 12011111

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede
Project Location: Patapsco River

Sample ID: S6 Upper | **Date/Time Sampled: 01/11/2012 14:30** | **PSS Sample ID: 12011111-004**
Matrix: SOIL | **Date/Time Received: 01/11/2012 16:52** | **% Solids: 97**

TCL Semivolatile Organic Compounds — Analytical Method: SW-846 8270 C — Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Pyrene	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
Pyridine	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
Caprolactam	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
2,4,6-Trichlorophenol	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014
2,4,5-Trichlorophenol	ND	ug/kg	170		1	85	01/13/12	01/14/12 23:54	1014

Cyanide — Analytical Method: SW-846 9014

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Cyanide, Total	ND	mg/kg	0.15		1	0.076	01/13/12	01/13/12 17:18	1044

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

PHASE SEPARATION SCIENCE, INC.

www.phaseonline.com
email: info@phaseonline.com

(1)

CLIENT: Maryland Geological Survey OFFICE LOC. Baltimore

PROJECT MGR: Rich Ortt PHONE NO.: (410) 554-5541

EMAIL: rortt@dnr.state.md.us FAX NO.: (410) 554-5502

PROJECT NAME: Bloede PROJECT NO.: Ø

SITE LOCATION: Patapsco River P.O. NO.: Ø

SAMPLERS: Rich Ortt, Beth Sylvia, Darlene Wells

PSS Work Order #: 12011111

PAGE 1 OF 1

Matrix Codes:
SW=Surface Wtr **DW**=Drinking Wrt **GW**=Ground Wtr **WW**=Waste Wtr **O**=Oil **S**=Soil **WL**=Waste Liquid **WS**=Waste Solid **W**= Wipe

(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX (See Codes)	No. CONTAINERS	SAMPLE TYPE C = COMP G = GRAB	VOC	SVOC	PCB	Pesticides	TAL Metals	GRO	DRO	Cyanide				REMARKS
Preservatives Used							4°C											
	S5 lower 57-114cm	11Jan12	11:30am	S	3	C	x	x	x	x	x	x	x	x				
	S5 upper 0-57cm	11Jan12	11:30am	S	3	C	x	x	x	x	x	x	x	x				
	S6 lower	11Jan12	2:30pm	S	3	C	x	x	x	x	x	x	x	x				
	S6 upper	11Jan12	2:30pm	S	3	C	x	x	x	x	x	x	x	x				

(3) Analysis/Method Required

(4)

Requested Turnaround Time
☒ 5-Day ☐ 3-Day ☐ 2-Day
☐ Next Day ☐ Emergency ☐ Other

Data Deliverables Required: Results, detection limits

# of Coolers: 1
Custody Seal: ABS
Ice Present: ICE PACKS Temp: 17°c
Shipping Carrier: CLIENT

Special Instructions:

(5)

Relinquished By: (1)	Date	Time	Received By:
Beth Sylvia	11Jan12	1652	[signature]
Relinquished By: (2)	Date	Time	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

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The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary.

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	12011111	**Received By**	Rachel Davis
Client Name	Maryland Geological Survey (MGS)	**Date Received**	01/11/2012 04:52:00 PM
Project Name	Bloede	**Delivered By**	Client
Project Number	N/A	**Tracking No**	Not Applicable
Disposal Date	02/15/2012	**Logged In By**	Rachel Davis

Shipping Container(s)

No. of Coolers	1	Ice	Ice Packs Used
		Temp (deg C)	17
Custody Seal(s) Intact?	N/A	Temp Blank Present	No
Seal(s) Signed / Dated?	N/A		

Documentation

		Sampler Name	Richard Ortt
		MD DW Cert. No.	N/A
COC agrees with sample labels?	Yes		
Chain of Custody	Yes		

Sample Container

		Custody Seal(s) Intact?	Not Applicable
Appropriate for Specified Analysis?	Yes	Seal(s) Signed / Dated	Not Applicable
Intact?	Yes		
Labeled and Labels Legible?	Yes		

Total No. of Samples Received 4

Total No. of Containers Received 12

Preservation

Metals	(pH<2)	N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, COD, Phenols	(ph<2)	N/A
TOX, TKN, NH3, Total Phos	(pH<2)	N/A
VOC, BTEX (VOA Vials Rcvd Preserved)	(pH<2)	N/A
Do VOA vials have zero headspace?		N/A

Comments: (Any "No" response must be detailed in the comments section below.)

For any improper preservation conditions, list sample ID, preservative added (reagent ID number) below as well as documentation of any client notification as well as client instructions. Samples for pH, chlorine and dissolved oxygen should be analyzed as soon as possible, preferably in the field at the time of sampling. Samples which require thermal preservation shall be considered acceptable when received at a temperature above freezing to 6°C. Samples that are hand delivered on the day that they are collected may not meet these criteria but shall be considered acceptable if there is evidence that the chilling process has begun such as arrival on ice.

Samples Inspected/Checklist Completed By: Rachel Davis — Date: 01/11/2012

PM Review and Approval: Lynn Moran — Date: 01/12/2012

Analytical Report for

Maryland Geological Survey (MGS)

Certificate of Analysis No.: 12012028

Project Manager: Richard Ortt

Project Name : Bloede Dam

Project Location: Patapsco River

February 16, 2012

Phase Separation Science, Inc.

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PHASE SEPARATION SCIENCE, INC.

February 16, 2012

Richard Ortt
Maryland Geological Survey (MGS)
2300 St. Paul Street
Baltimore, MD 21218

Reference: PSS Work Order No: **12012028**
Project Name: Bloede Dam
Project Location: Patapsco River

Dear Richard Ortt :

This report includes the analytical results from the analyses performed on the samples received under the project name referenced above and identified with the Phase Separation Science (PSS) Work Order numbered **12012028**.

All work reported herein has been performed in accordance with current NELAP standards referenced methodologies, PSS Standard Operating Procedures and the PSS Quality Assurance Manual unless otherwise noted in the Case Narrative Summary. PSS is limited in liability to the actual cost of the sample analysis done.

PSS reserves the right to return any unused samples, extracts or related solutions. Otherwise, the samples are scheduled for disposal, without any further notice, on February 24, 2012. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt , the request will be acknowledged by PSS, thus extending the storage period.

This report shall not be reproduced except in full, without the written approval of an authorized PSS representative. A copy of this report will be retained by PSS for at least 5 years, after which time it will be disposed without further notice, unless prior arrangements have been made.

We thank you for selecting Phase Separation Science, Inc. to serve your analytical needs. If you have any questions concerning this report, do not hesitate to contact us at 410-747-8770 or info@phaseonline.com.

Dan Prucnal
Laboratory Manager

Sample Summary

Client Name: Maryland Geological Survey (MGS)

Project Name: Bloede Dam

Project ID: N/A

Work Order Number: 12012028

The following samples were received under chain of custody by Phase Separation Science (PSS) on 01/20/2012 at 05:10 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
12012028-001	S8 Upper	SOIL	01/20/2012 12:00
12012028-002	S8 Lower	SOIL	01/20/2012 12:00
12012028-003	S9 C3 Upper	SOIL	01/20/2012 13:30
12012028-004	S9 C3 Lower	SOIL	01/20/2012 13:30

Please reference the Chain of Custody and Sample Receipt Checklist for specific container counts and preservatives. Any sample conditions not in compliance with sample acceptance criteria are described in Case Narrative Summary.

Notes:

1. The presence of common laboratory contaminants such as acetone, methylene chloride and phthalates, may be considered a possible laboratory artifact. Where observed, appropriate consideration of data should be taken.
2. The following analytical results are never reported on a dry weight basis: pH, flashpoint, moisture and paint filter test.
3. Drinking water samples collected for the purpose of compliance with SDWA may not be suitable for their intended use unless collected by a certified sampler [COMAR 26.08.05.07.C.2].

Standard Flags/Abbreviations:

B A target analyte or commone laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
C Results Pending Final Confirmation.
E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
Fail The result exceeds the regulatory level for Toxicity Characteristic (TCLP) as cited in 40 CFR 261.24 Table 1.
J The target analyte was positively identified below the reporting limit but greater than the LOD.
LOD Limit of Detection. An estimate of the minimum amount of a substance that an analytical process can reliably detect. An LOD is analyte and matrix specific.
ND Not Detected at or above the reporting limit.
RL PSS Reporting Limit.
U Not detected.

Case Narrative Summary

Client Name: Maryland Geological Survey (MGS)

Project Name: Bloede Dam

Project ID: N/A

Work Order Number: 12012028

Any holding time exceedances, deviations from the method specifications, regulatory requirements or variations to the procedures outlined in the PSS Quality Assurance Manual are outlined below.

Sample Receipt:

All sample receipt conditions were acceptable.

General Comments:

Revised report to include lower reporting limits per client request.

Analytical:

TCL Semivolatile Organic Compounds

Batch: 95603

Chrysene-d12 fell below 50% in sample -004.

NELAP accreditation was held for all analyses performed unless noted below. See www.phaseonline.com for complete PSS scope of accreditation.

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 12012028

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede Dam
Project Location: Patapsco River

Sample ID: S8 Upper | **Date/Time Sampled: 01/20/2012 12:00** | **PSS Sample ID: 12012028-001**
Matrix: SOIL | **Date/Time Received: 01/20/2012 17:10** | **% Solids: 96**

TAL Metals — Analytical Method: SW-846 6020 A — Preparation Method: 3050B

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Aluminum	**4800**	mg/kg	850		20	430	01/23/12	01/25/12 12:01	1034
Antimony	ND	mg/kg	2.1		1	1.1	01/23/12	01/24/12 15:52	1034
Arsenic	**0.83**	mg/kg	0.43		1	0.21	01/23/12	01/25/12 14:17	1034
Barium	**26**	mg/kg	2.1		1	1.1	01/23/12	01/24/12 15:52	1034
Beryllium	ND	mg/kg	2.1		1	1.1	01/23/12	01/24/12 15:52	1034
Cadmium	ND	mg/kg	2.1		1	1.1	01/23/12	01/24/12 15:52	1034
Calcium	**3500**	mg/kg	850		20	430	01/23/12	01/25/12 12:01	1034
Chromium	**15**	mg/kg	2.1		1	1.1	01/23/12	01/24/12 15:52	1034
Cobalt	**3.9**	mg/kg	2.1		1	1.1	01/23/12	01/25/12 14:17	1034
Copper	**5.7**	mg/kg	2.1		1	1.1	01/23/12	01/25/12 14:17	1034
Iron	**5700**	mg/kg	850		20	430	01/23/12	01/25/12 12:01	1034
Lead	**5.2**	mg/kg	2.1		1	1.1	01/23/12	01/24/12 15:52	1034
Magnesium	**2000**	mg/kg	850		20	430	01/23/12	01/25/12 12:01	1034
Manganese	**120**	mg/kg	43		20	21	01/23/12	01/25/12 12:01	1034
Mercury	ND	mg/kg	0.085		1	0.043	01/23/12	01/24/12 15:52	1034
Nickel	**6.9**	mg/kg	2.1		1	1.1	01/23/12	01/25/12 14:17	1034
Potassium	**1300**	mg/kg	850		20	430	01/23/12	01/25/12 12:01	1034
Selenium	ND	mg/kg	2.1		1	1.1	01/23/12	01/24/12 15:52	1034
Silver	ND	mg/kg	2.1		1	1.1	01/23/12	01/24/12 15:52	1034
Sodium	**140**	mg/kg	43		1	21	01/23/12	01/25/12 14:17	1034
Thallium	ND	mg/kg	1.7		1	0.85	01/23/12	01/24/12 15:52	1034
Vanadium	**9.6**	mg/kg	2.1		1	1.1	01/23/12	01/25/12 14:17	1034
Zinc	**13**	mg/kg	8.5		1	4.3	01/23/12	01/25/12 14:17	1034

Total Petroleum Hydrocarbons - DRO — Analytical Method: SW-846 8015 C — Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
TPH-DRO (Diesel Range Organics)	ND	mg/kg	4.1		1	4.1	01/26/12	01/26/12 16:23	1040

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 12012028

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede Dam
Project Location: Patapsco River

Sample ID: S8 Upper | **Date/Time Sampled: 01/20/2012 12:00** | **PSS Sample ID: 12012028-001**
Matrix: SOIL | **Date/Time Received: 01/20/2012 17:10** | **% Solids: 96**

Total Petroleum Hydrocarbons-GRO — Analytical Method: SW-846 8015C — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
TPH-GRO (Gasoline Range Organics)	ND	ug/kg	100		1	41	01/28/12	01/28/12 12:41	1035

Organochlorine Pesticides — Analytical Method: SW-846 8081 B — Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
alpha-BHC	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 16:46	1029
gamma-BHC (Lindane)	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 16:46	1029
beta-BHC	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 16:46	1029
delta-BHC	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 16:46	1029
Heptachlor	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 16:46	1029
Aldrin	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 16:46	1029
Heptachlor epoxide	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 16:46	1029
gamma-Chlordane	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 16:46	1029
alpha-Chlordane	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 16:46	1029
4,4-DDE	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 16:46	1029
Endosulfan I	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 16:46	1029
Dieldrin	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 16:46	1029
Endrin	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 16:46	1029
4,4-DDD	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 16:46	1029
Endosulfan II	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 16:46	1029
4,4-DDT	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 16:46	1029
Endrin aldehyde	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 16:46	1029
Methoxychlor	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 16:46	1029
Endosulfan sulfate	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 16:46	1029
Endrin ketone	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 16:46	1029
Toxaphene	ND	ug/kg	210		1	100	01/26/12	01/26/12 16:46	1029
Chlordane	ND	ug/kg	210		1	100	01/26/12	01/26/12 16:46	1029

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 12012028

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede Dam
Project Location: Patapsco River

Sample ID: S8 Upper | **Date/Time Sampled: 01/20/2012 12:00** | **PSS Sample ID: 12012028-001**
Matrix: SOIL | **Date/Time Received: 01/20/2012 17:10** | **% Solids: 96**

Polychlorinated Biphenyls

Analytical Method: SW-846 8082 A

Preparation Method: 3550
Clean up Method: SW846 3665A

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
PCB-1016	ND	mg/kg	0.10		1	0.052	01/24/12	01/24/12 22:50	1029
PCB-1221	ND	mg/kg	0.10		1	0.052	01/24/12	01/24/12 22:50	1029
PCB-1232	ND	mg/kg	0.10		1	0.052	01/24/12	01/24/12 22:50	1029
PCB-1242	ND	mg/kg	0.10		1	0.052	01/24/12	01/24/12 22:50	1029
PCB-1248	ND	mg/kg	0.10		1	0.052	01/24/12	01/24/12 22:50	1029
PCB-1254	ND	mg/kg	0.10		1	0.052	01/24/12	01/24/12 22:50	1029
PCB-1260	ND	mg/kg	0.10		1	0.052	01/24/12	01/24/12 22:50	1029

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Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede Dam
Project Location: Patapsco River

Sample ID: S8 Upper | **Date/Time Sampled: 01/20/2012 12:00** | **PSS Sample ID: 12012028-001**
Matrix: SOIL | **Date/Time Received: 01/20/2012 17:10** | **% Solids: 96**

TCL Volatile Organic Compounds | Analytical Method: SW-846 8260 B | Preparation Method: 5030

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Dichlorodifluoromethane	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
Chloromethane	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
Vinyl Chloride	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
Bromomethane	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
Chloroethane	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
Acetone	ND	ug/kg	20		1	10	01/23/12	01/23/12 18:36	1011
Cyclohexane	ND	ug/kg	20		1	10	01/23/12	01/23/12 18:36	1011
Trichlorofluoromethane	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
1,1-Dichloroethene	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
Methylene Chloride	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
trans-1,2-Dichloroethene	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
Methyl-t-butyl ether	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
1,1-Dichloroethane	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
2-Butanone (MEK)	ND	ug/kg	20		1	10	01/23/12	01/23/12 18:36	1011
cis-1,2-Dichloroethene	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
Bromochloromethane	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
Chloroform	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
1,1,1-Trichloroethane	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
1,2-Dichloroethane	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
Carbon Tetrachloride	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
Benzene	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
1,2-Dichloropropane	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
Carbon Disulfide	ND	ug/kg	10		1	5.1	01/23/12	01/23/12 18:36	1011
Methylcyclohexane	ND	ug/kg	20		1	10	01/23/12	01/23/12 18:36	1011
Trichloroethene	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
Methyl Acetate	ND	ug/kg	20		1	10	01/23/12	01/23/12 18:36	1011
Bromodichloromethane	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
cis-1,3-Dichloropropene	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
4-Methyl-2-Pentanone	ND	ug/kg	20		1	10	01/23/12	01/23/12 18:36	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 12012028

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede Dam
Project Location: Patapsco River

Sample ID: S8 Upper | **Date/Time Sampled: 01/20/2012 12:00** | **PSS Sample ID: 12012028-001**
Matrix: SOIL | **Date/Time Received: 01/20/2012 17:10** | **% Solids: 96**

TCL Volatile Organic Compounds | Analytical Method: SW-846 8260 B | Preparation Method: 5030

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
trans-1,3-Dichloropropene	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
1,1,2-Trichloroethane	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
Toluene	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
2-Hexanone	ND	ug/kg	20		1	10	01/23/12	01/23/12 18:36	1011
1,2-Dibromoethane (EDB)	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
Dibromochloromethane	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
Bromoform	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
Tetrachloroethene	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
Chlorobenzene	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
Ethylbenzene	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
m,p-Xylenes	ND	ug/kg	10		1	5.1	01/23/12	01/23/12 18:36	1011
Styrene	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
o-Xylene	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
Isopropylbenzene	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
1,3-Dichlorobenzene	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
1,4-Dichlorobenzene	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
1,2-Dichlorobenzene	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
1,2-Dibromo-3-Chloropropane	ND	ug/kg	41		1	20	01/23/12	01/23/12 18:36	1011
1,2,4-Trichlorobenzene	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
Naphthalene	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011
1,2,3-Trichlorobenzene	ND	ug/kg	5.1		1	2.5	01/23/12	01/23/12 18:36	1011

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February 16, 2012

Project Name: Bloede Dam
Project Location: Patapsco River

Sample ID: S8 Upper | **Date/Time Sampled: 01/20/2012 12:00** | **PSS Sample ID: 12012028-001**
Matrix: SOIL | **Date/Time Received: 01/20/2012 17:10** | **% Solids: 96**

TCL Semivolatile Organic Compounds | Analytical Method: SW-846 8270 C | Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Acenaphthene	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
Acenaphthylene	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
Acetophenone	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
Anthracene	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
Benzo(a)anthracene	**190**	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
Benzo(a)pyrene	**150**	ug/kg	170	J	1	86	01/25/12	01/26/12 16:30	1014
Benzo(b)fluoranthene	**170**	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
Benzo(g,h,i)perylene	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
Benzo(k)fluoranthene	**150**	ug/kg	170	J	1	86	01/25/12	01/26/12 16:30	1014
Biphenyl (Diphenyl)	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
Butyl benzyl phthalate	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
bis(2-chloroethoxy) methane	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
bis(2-chloroethyl) ether	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
bis(2-chloroisopropyl) ether	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
bis(2-ethylhexyl) phthalate	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
4-Bromophenylphenyl ether	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
Di-n-butyl phthalate	ND	ug/kg	350		1	170	01/25/12	01/26/12 16:30	1014
Carbazole	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
4-Chloro-3-methyl phenol	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
4-Chloroaniline	ND	ug/kg	350		1	170	01/25/12	01/26/12 16:30	1014
2-Chloronaphthalene	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
2-Chlorophenol	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
4-Chlorophenyl Phenyl ether	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
Chrysene	**210**	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
Dibenz(a,h)Anthracene	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
Dibenzofuran	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
3,3-Dichlorobenzidine	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
2,4-Dichlorophenol	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
Diethyl phthalate	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
Dimethyl phthalate	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 12012028

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede Dam
Project Location: Patapsco River

Sample ID: S8 Upper | **Date/Time Sampled: 01/20/2012 12:00** | **PSS Sample ID: 12012028-001**
Matrix: SOIL | **Date/Time Received: 01/20/2012 17:10** | **% Solids: 96**

TCL Semivolatile Organic Compounds | Analytical Method: SW-846 8270 C | Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
2,4-Dimethylphenol	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
4,6-Dinitro-2-methyl phenol	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
2,4-Dinitrophenol	ND	ug/kg	350		1	170	01/25/12	01/26/12 16:30	1014
2,4-Dinitrotoluene	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
2,6-Dinitrotoluene	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
Fluoranthene	**360**	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
Fluorene	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
Hexachlorobenzene	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
Hexachlorobutadiene	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
Hexachlorocyclopentadiene	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
Hexachloroethane	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
Indeno(1,2,3-c,d)Pyrene	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
Isophorone	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
2-Methylnaphthalene	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
2-Methyl phenol	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
3&4-Methylphenol	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
Naphthalene	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
4-Nitroaniline	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
3-Nitroaniline	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
2-Nitroaniline	ND	ug/kg	350		1	170	01/25/12	01/26/12 16:30	1014
Nitrobenzene	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
2-Nitrophenol	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
4-Nitrophenol	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
N-Nitrosodi-n-propyl amine	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
N-Nitrosodiphenylamine	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
Di-n-octyl phthalate	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
Pentachlorophenol	ND	ug/kg	350		1	170	01/25/12	01/26/12 16:30	1014
Phenanthrene	**290**	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
Phenol	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
Atrazine	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014

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CERTIFICATE OF ANALYSIS

No: 12012028

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede Dam
Project Location: Patapsco River

Sample ID: S8 Upper | **Date/Time Sampled: 01/20/2012 12:00** | **PSS Sample ID: 12012028-001**
Matrix: SOIL | **Date/Time Received: 01/20/2012 17:10** | **% Solids: 96**

TCL Semivolatile Organic Compounds — Analytical Method: SW-846 8270 C — Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Pyrene	**430**	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
Pyridine	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
Caprolactam	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
2,4,6-Trichlorophenol	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014
2,4,5-Trichlorophenol	ND	ug/kg	170		1	86	01/25/12	01/26/12 16:30	1014

Cyanide — Analytical Method: SW-846 9014

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Cyanide, Total	ND	mg/kg	0.061		1	0.03	01/27/12	01/27/12 14:43	1044

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CERTIFICATE OF ANALYSIS

No: 12012028

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede Dam
Project Location: Patapsco River

Sample ID: S8 Lower | **Date/Time Sampled: 01/20/2012 12:00** | **PSS Sample ID: 12012028-002**
Matrix: SOIL | **Date/Time Received: 01/20/2012 17:10** | **% Solids: 94**

TAL Metals — Analytical Method: SW-846 6020 A — Preparation Method: 3050B

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Aluminum	**4400**	mg/kg	950		20	470	01/23/12	01/25/12 12:06	1034
Antimony	ND	mg/kg	2.4		1	1.2	01/23/12	01/24/12 15:58	1034
Arsenic	**1.2**	mg/kg	0.47		1	0.24	01/23/12	01/25/12 14:23	1034
Barium	**29**	mg/kg	2.4		1	1.2	01/23/12	01/24/12 15:58	1034
Beryllium	ND	mg/kg	2.4		1	1.2	01/23/12	01/24/12 15:58	1034
Cadmium	ND	mg/kg	2.4		1	1.2	01/23/12	01/24/12 15:58	1034
Calcium	**1500**	mg/kg	47		1	24	01/23/12	01/24/12 15:58	1034
Chromium	**53**	mg/kg	2.4		1	1.2	01/23/12	01/24/12 15:58	1034
Cobalt	**4.3**	mg/kg	2.4		1	1.2	01/23/12	01/25/12 14:23	1034
Copper	**6.2**	mg/kg	2.4		1	1.2	01/23/12	01/25/12 14:23	1034
Iron	**8900**	mg/kg	950		20	470	01/23/12	01/25/12 12:06	1034
Lead	**5.9**	mg/kg	2.4		1	1.2	01/23/12	01/24/12 15:58	1034
Magnesium	**1800**	mg/kg	950		20	470	01/23/12	01/25/12 12:06	1034
Manganese	**110**	mg/kg	47		20	24	01/23/12	01/25/12 12:06	1034
Mercury	ND	mg/kg	0.095		1	0.047	01/23/12	01/24/12 15:58	1034
Nickel	**11**	mg/kg	2.4		1	1.2	01/23/12	01/25/12 14:23	1034
Potassium	**990**	mg/kg	950		20	470	01/23/12	01/25/12 12:06	1034
Selenium	ND	mg/kg	2.4		1	1.2	01/23/12	01/24/12 15:58	1034
Silver	ND	mg/kg	2.4		1	1.2	01/23/12	01/24/12 15:58	1034
Sodium	ND	mg/kg	47		1	24	01/23/12	01/25/12 14:23	1034
Thallium	ND	mg/kg	1.9		1	0.95	01/23/12	01/24/12 15:58	1034
Vanadium	**14**	mg/kg	2.4		1	1.2	01/23/12	01/25/12 14:23	1034
Zinc	**18**	mg/kg	9.5		1	4.7	01/23/12	01/25/12 14:23	1034

Total Petroleum Hydrocarbons - DRO — Analytical Method: SW-846 8015 C — Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
TPH-DRO (Diesel Range Organics)	ND	mg/kg	4.2		1	4.2	01/26/12	01/26/12 17:11	1040

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 12012028

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede Dam
Project Location: Patapsco River

Sample ID: S8 Lower | **Date/Time Sampled: 01/20/2012 12:00** | **PSS Sample ID: 12012028-002**
Matrix: SOIL | **Date/Time Received: 01/20/2012 17:10** | **% Solids: 94**

Total Petroleum Hydrocarbons-GRO — Analytical Method: SW-846 8015C — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
TPH-GRO (Gasoline Range Organics)	ND	ug/kg	100		1	41	01/28/12	01/28/12 13:08	1035

Organochlorine Pesticides — Analytical Method: SW-846 8081 B — Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
alpha-BHC	ND	ug/kg	8.5		1	4.2	01/26/12	01/26/12 17:14	1029
gamma-BHC (Lindane)	ND	ug/kg	8.5		1	4.2	01/26/12	01/26/12 17:14	1029
beta-BHC	ND	ug/kg	8.5		1	4.2	01/26/12	01/26/12 17:14	1029
delta-BHC	ND	ug/kg	8.5		1	4.2	01/26/12	01/26/12 17:14	1029
Heptachlor	ND	ug/kg	8.5		1	4.2	01/26/12	01/26/12 17:14	1029
Aldrin	ND	ug/kg	8.5		1	4.2	01/26/12	01/26/12 17:14	1029
Heptachlor epoxide	ND	ug/kg	8.5		1	4.2	01/26/12	01/26/12 17:14	1029
gamma-Chlordane	ND	ug/kg	8.5		1	4.2	01/26/12	01/26/12 17:14	1029
alpha-Chlordane	ND	ug/kg	8.5		1	4.2	01/26/12	01/26/12 17:14	1029
4,4-DDE	ND	ug/kg	8.5		1	4.2	01/26/12	01/26/12 17:14	1029
Endosulfan I	ND	ug/kg	8.5		1	4.2	01/26/12	01/26/12 17:14	1029
Dieldrin	ND	ug/kg	8.5		1	4.2	01/26/12	01/26/12 17:14	1029
Endrin	ND	ug/kg	8.5		1	4.2	01/26/12	01/26/12 17:14	1029
4,4-DDD	ND	ug/kg	8.5		1	4.2	01/26/12	01/26/12 17:14	1029
Endosulfan II	ND	ug/kg	8.5		1	4.2	01/26/12	01/26/12 17:14	1029
4,4-DDT	ND	ug/kg	8.5		1	4.2	01/26/12	01/26/12 17:14	1029
Endrin aldehyde	ND	ug/kg	8.5		1	4.2	01/26/12	01/26/12 17:14	1029
Methoxychlor	ND	ug/kg	8.5		1	4.2	01/26/12	01/26/12 17:14	1029
Endosulfan sulfate	ND	ug/kg	8.5		1	4.2	01/26/12	01/26/12 17:14	1029
Endrin ketone	ND	ug/kg	8.5		1	4.2	01/26/12	01/26/12 17:14	1029
Toxaphene	ND	ug/kg	210		1	110	01/26/12	01/26/12 17:14	1029
Chlordane	ND	ug/kg	210		1	110	01/26/12	01/26/12 17:14	1029

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Polychlorinated Biphenyls

Analytical Method: SW-846 8082 A

Preparation Method: 3550
Clean up Method: SW846 3665A

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
PCB-1016	ND	mg/kg	0.11		1	0.053	01/24/12	01/24/12 22:21	1029
PCB-1221	ND	mg/kg	0.11		1	0.053	01/24/12	01/24/12 22:21	1029
PCB-1232	ND	mg/kg	0.11		1	0.053	01/24/12	01/24/12 22:21	1029
PCB-1242	ND	mg/kg	0.11		1	0.053	01/24/12	01/24/12 22:21	1029
PCB-1248	ND	mg/kg	0.11		1	0.053	01/24/12	01/24/12 22:21	1029
PCB-1254	ND	mg/kg	0.11		1	0.053	01/24/12	01/24/12 22:21	1029
PCB-1260	ND	mg/kg	0.11		1	0.053	01/24/12	01/24/12 22:21	1029

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February 16, 2012

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Project Location: Patapsco River

Sample ID: S8 Lower | **Date/Time Sampled: 01/20/2012 12:00** | **PSS Sample ID: 12012028-002**
Matrix: SOIL | **Date/Time Received: 01/20/2012 17:10** | **% Solids: 94**

TCL Volatile Organic Compounds | Analytical Method: SW-846 8260 B | Preparation Method: 5030

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Dichlorodifluoromethane	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011
Chloromethane	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011
Vinyl Chloride	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011
Bromomethane	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011
Chloroethane	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011
Acetone	ND	ug/kg	21		1	11	01/23/12	01/23/12 19:06	1011
Cyclohexane	ND	ug/kg	21		1	11	01/23/12	01/23/12 19:06	1011
Trichlorofluoromethane	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011
1,1-Dichloroethene	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011
Methylene Chloride	**4.1**	ug/kg	5.3	J	1	2.7	01/23/12	01/23/12 19:06	1011
trans-1,2-Dichloroethene	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011
Methyl-t-butyl ether	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011
1,1-Dichloroethane	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011
2-Butanone (MEK)	ND	ug/kg	21		1	11	01/23/12	01/23/12 19:06	1011
cis-1,2-Dichloroethene	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011
Bromochloromethane	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011
Chloroform	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011
1,1,1-Trichloroethane	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011
1,2-Dichloroethane	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011
Carbon Tetrachloride	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011
Benzene	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011
1,2-Dichloropropane	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011
Carbon Disulfide	ND	ug/kg	11		1	5.3	01/23/12	01/23/12 19:06	1011
Methylcyclohexane	ND	ug/kg	21		1	11	01/23/12	01/23/12 19:06	1011
Trichloroethene	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011
Methyl Acetate	ND	ug/kg	21		1	11	01/23/12	01/23/12 19:06	1011
Bromodichloromethane	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011
cis-1,3-Dichloropropene	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011
4-Methyl-2-Pentanone	ND	ug/kg	21		1	11	01/23/12	01/23/12 19:06	1011

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CERTIFICATE OF ANALYSIS

No: 12012028

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede Dam
Project Location: Patapsco River

Sample ID: S8 Lower | **Date/Time Sampled: 01/20/2012 12:00** | **PSS Sample ID: 12012028-002**
Matrix: SOIL | **Date/Time Received: 01/20/2012 17:10** | **% Solids: 94**

TCL Volatile Organic Compounds | Analytical Method: SW-846 8260 B | Preparation Method: 5030

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
trans-1,3-Dichloropropene	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011
1,1,2-Trichloroethane	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011
Toluene	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011
2-Hexanone	ND	ug/kg	21		1	11	01/23/12	01/23/12 19:06	1011
1,2-Dibromoethane (EDB)	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011
Dibromochloromethane	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011
Bromoform	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011
Tetrachloroethene	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011
Chlorobenzene	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011
Ethylbenzene	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011
m,p-Xylenes	ND	ug/kg	11		1	5.3	01/23/12	01/23/12 19:06	1011
Styrene	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011
o-Xylene	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011
Isopropylbenzene	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011
1,3-Dichlorobenzene	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011
1,4-Dichlorobenzene	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011
1,2-Dichlorobenzene	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011
1,2-Dibromo-3-Chloropropane	ND	ug/kg	43		1	21	01/23/12	01/23/12 19:06	1011
1,2,4-Trichlorobenzene	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011
Naphthalene	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011
1,2,3-Trichlorobenzene	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:06	1011

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Project Name: Bloede Dam
Project Location: Patapsco River

Sample ID: S8 Lower | **Date/Time Sampled: 01/20/2012 12:00** | **PSS Sample ID: 12012028-002**
Matrix: SOIL | **Date/Time Received: 01/20/2012 17:10** | **% Solids: 94**

TCL Semivolatile Organic Compounds — Analytical Method: SW-846 8270 C — Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Acenaphthene	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
Acenaphthylene	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
Acetophenone	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
Anthracene	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
Benzo(a)anthracene	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
Benzo(a)pyrene	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
Benzo(b)fluoranthene	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
Benzo(g,h,i)perylene	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
Benzo(k)fluoranthene	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
Biphenyl (Diphenyl)	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
Butyl benzyl phthalate	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
bis(2-chloroethoxy) methane	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
bis(2-chloroethyl) ether	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
bis(2-chloroisopropyl) ether	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
bis(2-ethylhexyl) phthalate	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
4-Bromophenylphenyl ether	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
Di-n-butyl phthalate	ND	ug/kg	350		1	180	01/25/12	01/26/12 16:00	1014
Carbazole	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
4-Chloro-3-methyl phenol	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
4-Chloroaniline	ND	ug/kg	350		1	180	01/25/12	01/26/12 16:00	1014
2-Chloronaphthalene	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
2-Chlorophenol	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
4-Chlorophenyl Phenyl ether	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
Chrysene	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
Dibenz(a,h)Anthracene	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
Dibenzofuran	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
3,3-Dichlorobenzidine	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
2,4-Dichlorophenol	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
Diethyl phthalate	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
Dimethyl phthalate	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014

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February 16, 2012

Project Name: Bloede Dam
Project Location: Patapsco River

Sample ID: S8 Lower | **Date/Time Sampled: 01/20/2012 12:00** | **PSS Sample ID: 12012028-002**
Matrix: SOIL | **Date/Time Received: 01/20/2012 17:10** | **% Solids: 94**

TCL Semivolatile Organic Compounds | Analytical Method: SW-846 8270 C | Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
2,4-Dimethylphenol	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
4,6-Dinitro-2-methyl phenol	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
2,4-Dinitrophenol	ND	ug/kg	350		1	180	01/25/12	01/26/12 16:00	1014
2,4-Dinitrotoluene	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
2,6-Dinitrotoluene	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
Fluoranthene	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
Fluorene	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
Hexachlorobenzene	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
Hexachlorobutadiene	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
Hexachlorocyclopentadiene	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
Hexachloroethane	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
Indeno(1,2,3-c,d)Pyrene	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
Isophorone	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
2-Methylnaphthalene	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
2-Methyl phenol	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
3&4-Methylphenol	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
Naphthalene	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
4-Nitroaniline	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
3-Nitroaniline	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
2-Nitroaniline	ND	ug/kg	350		1	180	01/25/12	01/26/12 16:00	1014
Nitrobenzene	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
2-Nitrophenol	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
4-Nitrophenol	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
N-Nitrosodi-n-propyl amine	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
N-Nitrosodiphenylamine	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
Di-n-octyl phthalate	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
Pentachlorophenol	ND	ug/kg	350		1	180	01/25/12	01/26/12 16:00	1014
Phenanthrene	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
Phenol	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
Atrazine	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 12012028

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede Dam
Project Location: Patapsco River

Sample ID: S8 Lower | **Date/Time Sampled: 01/20/2012 12:00** | **PSS Sample ID: 12012028-002**
Matrix: SOIL | **Date/Time Received: 01/20/2012 17:10** | **% Solids: 94**

TCL Semivolatile Organic Compounds — Analytical Method: SW-846 8270 C — Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Pyrene	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
Pyridine	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
Caprolactam	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
2,4,6-Trichlorophenol	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014
2,4,5-Trichlorophenol	ND	ug/kg	180		1	89	01/25/12	01/26/12 16:00	1014

Cyanide — Analytical Method: SW-846 9014

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Cyanide, Total	ND	mg/kg	0.062		1	0.031	01/27/12	01/27/12 14:43	1044

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CERTIFICATE OF ANALYSIS

No: 12012028

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede Dam
Project Location: Patapsco River

Sample ID: S9 C3 Upper | **Date/Time Sampled: 01/20/2012 13:30** | **PSS Sample ID: 12012028-003**
Matrix: SOIL | **Date/Time Received: 01/20/2012 17:10** | **% Solids: 96**

TAL Metals — Analytical Method: SW-846 6020 A — Preparation Method: 3050B

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Aluminum	**4800**	mg/kg	920		20	460	01/23/12	01/25/12 12:12	1034
Antimony	ND	mg/kg	2.3		1	1.2	01/23/12	01/24/12 16:03	1034
Arsenic	**1.1**	mg/kg	0.46		1	0.23	01/23/12	01/25/12 14:28	1034
Barium	**31**	mg/kg	2.3		1	1.2	01/23/12	01/24/12 16:03	1034
Beryllium	ND	mg/kg	2.3		1	1.2	01/23/12	01/24/12 16:03	1034
Cadmium	ND	mg/kg	2.3		1	1.2	01/23/12	01/24/12 16:03	1034
Calcium	**1500**	mg/kg	46		1	23	01/23/12	01/24/12 16:03	1034
Chromium	**61**	mg/kg	2.3		1	1.2	01/23/12	01/24/12 16:03	1034
Cobalt	**5.1**	mg/kg	2.3		1	1.2	01/23/12	01/25/12 14:28	1034
Copper	**12**	mg/kg	2.3		1	1.2	01/23/12	01/25/12 14:28	1034
Iron	**8700**	mg/kg	920		20	460	01/23/12	01/25/12 12:12	1034
Lead	**16**	mg/kg	2.3		1	1.2	01/23/12	01/24/12 16:03	1034
Magnesium	**2100**	mg/kg	920		20	460	01/23/12	01/25/12 12:12	1034
Manganese	**140**	mg/kg	46		20	23	01/23/12	01/25/12 12:12	1034
Mercury	ND	mg/kg	0.092		1	0.046	01/23/12	01/24/12 16:03	1034
Nickel	**18**	mg/kg	2.3		1	1.2	01/23/12	01/25/12 14:28	1034
Potassium	**800**	mg/kg	46		1	23	01/23/12	01/25/12 14:28	1034
Selenium	ND	mg/kg	2.3		1	1.2	01/23/12	01/24/12 16:03	1034
Silver	ND	mg/kg	2.3		1	1.2	01/23/12	01/24/12 16:03	1034
Sodium	**150**	mg/kg	46		1	23	01/23/12	01/25/12 14:28	1034
Thallium	ND	mg/kg	1.8		1	0.92	01/23/12	01/24/12 16:03	1034
Vanadium	**17**	mg/kg	2.3		1	1.2	01/23/12	01/25/12 14:28	1034
Zinc	**17**	mg/kg	9.2		1	4.6	01/23/12	01/25/12 14:28	1034

Total Petroleum Hydrocarbons - DRO — Analytical Method: SW-846 8015 C — Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
TPH-DRO (Diesel Range Organics)	ND	mg/kg	4.1		1	4.1	01/26/12	01/26/12 17:11	1040

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CERTIFICATE OF ANALYSIS

No: 12012028

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede Dam
Project Location: Patapsco River

Sample ID: S9 C3 Upper | **Date/Time Sampled: 01/20/2012 13:30** | **PSS Sample ID: 12012028-003**
Matrix: SOIL | **Date/Time Received: 01/20/2012 17:10** | **% Solids: 96**

Total Petroleum Hydrocarbons-GRO — Analytical Method: SW-846 8015C — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
TPH-GRO (Gasoline Range Organics)	ND	ug/kg	100		1	41	01/28/12	01/28/12 13:35	1035

Organochlorine Pesticides — Analytical Method: SW-846 8081 B — Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
alpha-BHC	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 17:41	1029
gamma-BHC (Lindane)	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 17:41	1029
beta-BHC	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 17:41	1029
delta-BHC	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 17:41	1029
Heptachlor	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 17:41	1029
Aldrin	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 17:41	1029
Heptachlor epoxide	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 17:41	1029
gamma-Chlordane	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 17:41	1029
alpha-Chlordane	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 17:41	1029
4,4-DDE	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 17:41	1029
Endosulfan I	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 17:41	1029
Dieldrin	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 17:41	1029
Endrin	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 17:41	1029
4,4-DDD	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 17:41	1029
Endosulfan II	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 17:41	1029
4,4-DDT	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 17:41	1029
Endrin aldehyde	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 17:41	1029
Methoxychlor	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 17:41	1029
Endosulfan sulfate	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 17:41	1029
Endrin ketone	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 17:41	1029
Toxaphene	ND	ug/kg	210		1	100	01/26/12	01/26/12 17:41	1029
Chlordane	ND	ug/kg	210		1	100	01/26/12	01/26/12 17:41	1029

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CERTIFICATE OF ANALYSIS

No: 12012028

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede Dam
Project Location: Patapsco River

Sample ID: S9 C3 Upper | **Date/Time Sampled: 01/20/2012 13:30** | **PSS Sample ID: 12012028-003**
Matrix: SOIL | **Date/Time Received: 01/20/2012 17:10** | **% Solids: 96**

Polychlorinated Biphenyls

Analytical Method: SW-846 8082 A

Preparation Method: 3550
Clean up Method: SW846 3665A

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
PCB-1016	ND	mg/kg	0.10		1	0.052	01/24/12	01/24/12 21:52	1029
PCB-1221	ND	mg/kg	0.10		1	0.052	01/24/12	01/24/12 21:52	1029
PCB-1232	ND	mg/kg	0.10		1	0.052	01/24/12	01/24/12 21:52	1029
PCB-1242	ND	mg/kg	0.10		1	0.052	01/24/12	01/24/12 21:52	1029
PCB-1248	ND	mg/kg	0.10		1	0.052	01/24/12	01/24/12 21:52	1029
PCB-1254	ND	mg/kg	0.10		1	0.052	01/24/12	01/24/12 21:52	1029
PCB-1260	ND	mg/kg	0.10		1	0.052	01/24/12	01/24/12 21:52	1029

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No: 12012028

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede Dam
Project Location: Patapsco River

Sample ID: S9 C3 Upper | **Date/Time Sampled: 01/20/2012 13:30** | **PSS Sample ID: 12012028-003**
Matrix: SOIL | **Date/Time Received: 01/20/2012 17:10** | **% Solids: 96**

TCL Volatile Organic Compounds | Analytical Method: SW-846 8260 B | Preparation Method: 5030

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Dichlorodifluoromethane	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
Chloromethane	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
Vinyl Chloride	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
Bromomethane	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
Chloroethane	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
Acetone	ND	ug/kg	21		1	11	01/23/12	01/23/12 19:35	1011
Cyclohexane	ND	ug/kg	21		1	11	01/23/12	01/23/12 19:35	1011
Trichlorofluoromethane	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
1,1-Dichloroethene	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
Methylene Chloride	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
trans-1,2-Dichloroethene	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
Methyl-t-butyl ether	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
1,1-Dichloroethane	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
2-Butanone (MEK)	ND	ug/kg	21		1	11	01/23/12	01/23/12 19:35	1011
cis-1,2-Dichloroethene	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
Bromochloromethane	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
Chloroform	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
1,1,1-Trichloroethane	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
1,2-Dichloroethane	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
Carbon Tetrachloride	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
Benzene	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
1,2-Dichloropropane	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
Carbon Disulfide	ND	ug/kg	11		1	5.3	01/23/12	01/23/12 19:35	1011
Methylcyclohexane	ND	ug/kg	21		1	11	01/23/12	01/23/12 19:35	1011
Trichloroethene	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
Methyl Acetate	ND	ug/kg	21		1	11	01/23/12	01/23/12 19:35	1011
Bromodichloromethane	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
cis-1,3-Dichloropropene	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
4-Methyl-2-Pentanone	ND	ug/kg	21		1	11	01/23/12	01/23/12 19:35	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 12012028

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede Dam
Project Location: Patapsco River

Sample ID: S9 C3 Upper | **Date/Time Sampled: 01/20/2012 13:30** | **PSS Sample ID: 12012028-003**
Matrix: SOIL | **Date/Time Received: 01/20/2012 17:10** | **% Solids: 96**

TCL Volatile Organic Compounds | Analytical Method: SW-846 8260 B | Preparation Method: 5030

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
trans-1,3-Dichloropropene	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
1,1,2-Trichloroethane	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
Toluene	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
2-Hexanone	ND	ug/kg	21		1	11	01/23/12	01/23/12 19:35	1011
1,2-Dibromoethane (EDB)	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
Dibromochloromethane	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
Bromoform	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
Tetrachloroethene	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
Chlorobenzene	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
Ethylbenzene	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
m,p-Xylenes	ND	ug/kg	11		1	5.3	01/23/12	01/23/12 19:35	1011
Styrene	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
o-Xylene	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
Isopropylbenzene	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
1,3-Dichlorobenzene	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
1,4-Dichlorobenzene	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
1,2-Dichlorobenzene	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
1,2-Dibromo-3-Chloropropane	ND	ug/kg	42		1	21	01/23/12	01/23/12 19:35	1011
1,2,4-Trichlorobenzene	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
Naphthalene	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011
1,2,3-Trichlorobenzene	ND	ug/kg	5.3		1	2.7	01/23/12	01/23/12 19:35	1011

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No: 12012028

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede Dam
Project Location: Patapsco River

Sample ID: S9 C3 Upper | **Date/Time Sampled: 01/20/2012 13:30** | **PSS Sample ID: 12012028-003**
Matrix: SOIL | **Date/Time Received: 01/20/2012 17:10** | **% Solids: 96**

TCL Semivolatile Organic Compounds | Analytical Method: SW-846 8270 C | Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Acenaphthene	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
Acenaphthylene	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
Acetophenone	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
Anthracene	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
Benzo(a)anthracene	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
Benzo(a)pyrene	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
Benzo(b)fluoranthene	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
Benzo(g,h,i)perylene	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
Benzo(k)fluoranthene	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
Biphenyl (Diphenyl)	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
Butyl benzyl phthalate	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
bis(2-chloroethoxy) methane	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
bis(2-chloroethyl) ether	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
bis(2-chloroisopropyl) ether	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
bis(2-ethylhexyl) phthalate	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
4-Bromophenylphenyl ether	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
Di-n-butyl phthalate	ND	ug/kg	350		1	170	01/25/12	01/26/12 14:02	1014
Carbazole	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
4-Chloro-3-methyl phenol	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
4-Chloroaniline	ND	ug/kg	350		1	170	01/25/12	01/26/12 14:02	1014
2-Chloronaphthalene	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
2-Chlorophenol	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
4-Chlorophenyl Phenyl ether	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
Chrysene	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
Dibenz(a,h)Anthracene	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
Dibenzofuran	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
3,3-Dichlorobenzidine	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
2,4-Dichlorophenol	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
Diethyl phthalate	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
Dimethyl phthalate	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 12012028

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede Dam
Project Location: Patapsco River

Sample ID: S9 C3 Upper | **Date/Time Sampled: 01/20/2012 13:30** | **PSS Sample ID: 12012028-003**
Matrix: SOIL | **Date/Time Received: 01/20/2012 17:10** | **% Solids: 96**

TCL Semivolatile Organic Compounds | Analytical Method: SW-846 8270 C | Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
2,4-Dimethylphenol	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
4,6-Dinitro-2-methyl phenol	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
2,4-Dinitrophenol	ND	ug/kg	350		1	170	01/25/12	01/26/12 14:02	1014
2,4-Dinitrotoluene	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
2,6-Dinitrotoluene	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
Fluoranthene	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
Fluorene	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
Hexachlorobenzene	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
Hexachlorobutadiene	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
Hexachlorocyclopentadiene	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
Hexachloroethane	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
Indeno(1,2,3-c,d)Pyrene	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
Isophorone	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
2-Methylnaphthalene	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
2-Methyl phenol	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
3&4-Methylphenol	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
Naphthalene	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
4-Nitroaniline	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
3-Nitroaniline	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
2-Nitroaniline	ND	ug/kg	350		1	170	01/25/12	01/26/12 14:02	1014
Nitrobenzene	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
2-Nitrophenol	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
4-Nitrophenol	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
N-Nitrosodi-n-propyl amine	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
N-Nitrosodiphenylamine	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
Di-n-octyl phthalate	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
Pentachlorophenol	ND	ug/kg	350		1	170	01/25/12	01/26/12 14:02	1014
Phenanthrene	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
Phenol	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
Atrazine	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 12012028

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede Dam
Project Location: Patapsco River

Sample ID: S9 C3 Upper | **Date/Time Sampled: 01/20/2012 13:30** | **PSS Sample ID: 12012028-003**
Matrix: SOIL | **Date/Time Received: 01/20/2012 17:10** | **% Solids: 96**

TCL Semivolatile Organic Compounds — Analytical Method: SW-846 8270 C — Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Pyrene	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
Pyridine	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
Caprolactam	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
2,4,6-Trichlorophenol	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014
2,4,5-Trichlorophenol	ND	ug/kg	170		1	87	01/25/12	01/26/12 14:02	1014

Cyanide — Analytical Method: SW-846 9014

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Cyanide, Total	ND	mg/kg	0.063		1	0.031	01/27/12	01/27/12 14:43	1044

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No: 12012028

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede Dam
Project Location: Patapsco River

Sample ID: S9 C3 Lower | **Date/Time Sampled: 01/20/2012 13:30** | **PSS Sample ID: 12012028-004**
Matrix: SOIL | **Date/Time Received: 01/20/2012 17:10** | **% Solids: 96**

TAL Metals — Analytical Method: SW-846 6020 A — Preparation Method: 3050B

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Aluminum	**3100**	mg/kg	740		20	370	01/23/12	01/25/12 12:18	1034
Antimony	ND	mg/kg	1.9		1	0.93	01/23/12	01/24/12 16:09	1034
Arsenic	**0.82**	mg/kg	0.37		1	0.19	01/23/12	01/25/12 14:34	1034
Barium	**26**	mg/kg	1.9		1	0.93	01/23/12	01/24/12 16:09	1034
Beryllium	ND	mg/kg	1.9		1	0.93	01/23/12	01/24/12 16:09	1034
Cadmium	ND	mg/kg	1.9		1	0.93	01/23/12	01/24/12 16:09	1034
Calcium	**960**	mg/kg	37		1	19	01/23/12	01/24/12 16:09	1034
Chromium	**32**	mg/kg	1.9		1	0.93	01/23/12	01/24/12 16:09	1034
Cobalt	**3.7**	mg/kg	1.9		1	0.93	01/23/12	01/25/12 14:34	1034
Copper	**9.2**	mg/kg	1.9		1	0.93	01/23/12	01/25/12 14:34	1034
Iron	**8300**	mg/kg	740		20	370	01/23/12	01/25/12 12:18	1034
Lead	**7.8**	mg/kg	1.9		1	0.93	01/23/12	01/24/12 16:09	1034
Magnesium	**1200**	mg/kg	740		20	370	01/23/12	01/25/12 12:18	1034
Manganese	**100**	mg/kg	37		20	19	01/23/12	01/25/12 12:18	1034
Mercury	ND	mg/kg	0.074		1	0.037	01/23/12	01/24/12 16:09	1034
Nickel	**6.7**	mg/kg	1.9		1	0.93	01/23/12	01/25/12 14:34	1034
Potassium	**670**	mg/kg	37		1	19	01/23/12	01/25/12 14:34	1034
Selenium	ND	mg/kg	1.9		1	0.93	01/23/12	01/24/12 16:09	1034
Silver	ND	mg/kg	1.9		1	0.93	01/23/12	01/24/12 16:09	1034
Sodium	ND	mg/kg	37		1	19	01/23/12	01/25/12 14:34	1034
Thallium	ND	mg/kg	1.5		1	0.74	01/23/12	01/24/12 16:09	1034
Vanadium	**15**	mg/kg	1.9		1	0.93	01/23/12	01/25/12 14:34	1034
Zinc	**16**	mg/kg	7.4		1	3.7	01/23/12	01/25/12 14:34	1034

Total Petroleum Hydrocarbons - DRO — Analytical Method: SW-846 8015 C — Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
TPH-DRO (Diesel Range Organics)	ND	mg/kg	4.1		1	4.1	01/26/12	01/26/12 15:59	1040

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February 16, 2012

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Project Location: Patapsco River

Sample ID: S9 C3 Lower | **Date/Time Sampled: 01/20/2012 13:30** | **PSS Sample ID: 12012028-004**
Matrix: SOIL | **Date/Time Received: 01/20/2012 17:10** | **% Solids: 96**

Total Petroleum Hydrocarbons-GRO — Analytical Method: SW-846 8015C — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
TPH-GRO (Gasoline Range Organics)	ND	ug/kg	100		1	41	01/28/12	01/28/12 14:02	1035

Organochlorine Pesticides — Analytical Method: SW-846 8081 B — Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
alpha-BHC	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 18:10	1029
gamma-BHC (Lindane)	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 18:10	1029
beta-BHC	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 18:10	1029
delta-BHC	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 18:10	1029
Heptachlor	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 18:10	1029
Aldrin	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 18:10	1029
Heptachlor epoxide	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 18:10	1029
gamma-Chlordane	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 18:10	1029
alpha-Chlordane	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 18:10	1029
4,4-DDE	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 18:10	1029
Endosulfan I	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 18:10	1029
Dieldrin	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 18:10	1029
Endrin	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 18:10	1029
4,4-DDD	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 18:10	1029
Endosulfan II	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 18:10	1029
4,4-DDT	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 18:10	1029
Endrin aldehyde	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 18:10	1029
Methoxychlor	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 18:10	1029
Endosulfan sulfate	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 18:10	1029
Endrin ketone	ND	ug/kg	8.3		1	4.2	01/26/12	01/26/12 18:10	1029
Toxaphene	ND	ug/kg	210		1	100	01/26/12	01/26/12 18:10	1029
Chlordane	ND	ug/kg	210		1	100	01/26/12	01/26/12 18:10	1029

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February 16, 2012

Project Name: Bloede Dam
Project Location: Patapsco River

Sample ID: S9 C3 Lower | **Date/Time Sampled: 01/20/2012 13:30** | **PSS Sample ID: 12012028-004**
Matrix: SOIL | **Date/Time Received: 01/20/2012 17:10** | **% Solids: 96**

Polychlorinated Biphenyls — Analytical Method: SW-846 8082 A — Preparation Method: 3550
Clean up Method: SW846 3665A

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
PCB-1016	ND	mg/kg	0.10		1	0.052	01/24/12	01/24/12 21:23	1029
PCB-1221	ND	mg/kg	0.10		1	0.052	01/24/12	01/24/12 21:23	1029
PCB-1232	ND	mg/kg	0.10		1	0.052	01/24/12	01/24/12 21:23	1029
PCB-1242	ND	mg/kg	0.10		1	0.052	01/24/12	01/24/12 21:23	1029
PCB-1248	ND	mg/kg	0.10		1	0.052	01/24/12	01/24/12 21:23	1029
PCB-1254	ND	mg/kg	0.10		1	0.052	01/24/12	01/24/12 21:23	1029
PCB-1260	ND	mg/kg	0.10		1	0.052	01/24/12	01/24/12 21:23	1029

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February 16, 2012

Project Name: Bloede Dam
Project Location: Patapsco River

Sample ID: S9 C3 Lower | **Date/Time Sampled: 01/20/2012 13:30** | **PSS Sample ID: 12012028-004**
Matrix: SOIL | **Date/Time Received: 01/20/2012 17:10** | **% Solids: 96**

TCL Volatile Organic Compounds | Analytical Method: SW-846 8260 B | Preparation Method: 5030

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Dichlorodifluoromethane	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
Chloromethane	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
Vinyl Chloride	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
Bromomethane	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
Chloroethane	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
Acetone	ND	ug/kg	22		1	11	01/23/12	01/23/12 20:05	1011
Cyclohexane	ND	ug/kg	22		1	11	01/23/12	01/23/12 20:05	1011
Trichlorofluoromethane	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
1,1-Dichloroethene	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
Methylene Chloride	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
trans-1,2-Dichloroethene	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
Methyl-t-butyl ether	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
1,1-Dichloroethane	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
2-Butanone (MEK)	ND	ug/kg	22		1	11	01/23/12	01/23/12 20:05	1011
cis-1,2-Dichloroethene	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
Bromochloromethane	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
Chloroform	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
1,1,1-Trichloroethane	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
1,2-Dichloroethane	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
Carbon Tetrachloride	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
Benzene	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
1,2-Dichloropropane	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
Carbon Disulfide	ND	ug/kg	11		1	5.4	01/23/12	01/23/12 20:05	1011
Methylcyclohexane	ND	ug/kg	22		1	11	01/23/12	01/23/12 20:05	1011
Trichloroethene	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
Methyl Acetate	ND	ug/kg	22		1	11	01/23/12	01/23/12 20:05	1011
Bromodichloromethane	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
cis-1,3-Dichloropropene	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
4-Methyl-2-Pentanone	ND	ug/kg	22		1	11	01/23/12	01/23/12 20:05	1011

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CERTIFICATE OF ANALYSIS

No: 12012028

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede Dam
Project Location: Patapsco River

Sample ID: S9 C3 Lower	**Date/Time Sampled: 01/20/2012 13:30**	**PSS Sample ID: 12012028-004**
Matrix: SOIL	**Date/Time Received: 01/20/2012 17:10**	**% Solids: 96**

TCL Volatile Organic Compounds — Analytical Method: SW-846 8260 B — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
trans-1,3-Dichloropropene	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
1,1,2-Trichloroethane	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
Toluene	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
2-Hexanone	ND	ug/kg	22		1	11	01/23/12	01/23/12 20:05	1011
1,2-Dibromoethane (EDB)	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
Dibromochloromethane	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
Bromoform	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
Tetrachloroethene	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
Chlorobenzene	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
Ethylbenzene	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
m,p-Xylenes	ND	ug/kg	11		1	5.4	01/23/12	01/23/12 20:05	1011
Styrene	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
o-Xylene	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
Isopropylbenzene	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
1,3-Dichlorobenzene	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
1,4-Dichlorobenzene	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
1,2-Dichlorobenzene	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
1,2-Dibromo-3-Chloropropane	ND	ug/kg	43		1	22	01/23/12	01/23/12 20:05	1011
1,2,4-Trichlorobenzene	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
Naphthalene	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011
1,2,3-Trichlorobenzene	ND	ug/kg	5.4		1	2.7	01/23/12	01/23/12 20:05	1011

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Project Name: Bloede Dam
Project Location: Patapsco River

Sample ID: S9 C3 Lower **Date/Time Sampled: 01/20/2012 13:30** **PSS Sample ID: 12012028-004**
Matrix: SOIL **Date/Time Received: 01/20/2012 17:10** **% Solids: 96**

TCL Semivolatile Organic Compounds Analytical Method: SW-846 8270 C Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Acenaphthene	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
Acenaphthylene	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
Acetophenone	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
Anthracene	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
Benzo(a)anthracene	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
Benzo(a)pyrene	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
Benzo(b)fluoranthene	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
Benzo(g,h,i)perylene	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
Benzo(k)fluoranthene	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
Biphenyl (Diphenyl)	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
Butyl benzyl phthalate	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
bis(2-chloroethoxy) methane	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
bis(2-chloroethyl) ether	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
bis(2-chloroisopropyl) ether	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
bis(2-ethylhexyl) phthalate	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
4-Bromophenylphenyl ether	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
Di-n-butyl phthalate	ND	ug/kg	350		1	170	01/25/12	01/26/12 15:31	1014
Carbazole	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
4-Chloro-3-methyl phenol	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
4-Chloroaniline	ND	ug/kg	350		1	170	01/25/12	01/26/12 15:31	1014
2-Chloronaphthalene	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
2-Chlorophenol	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
4-Chlorophenyl Phenyl ether	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
Chrysene	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
Dibenz(a,h)Anthracene	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
Dibenzofuran	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
3,3-Dichlorobenzidine	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
2,4-Dichlorophenol	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
Diethyl phthalate	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
Dimethyl phthalate	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014

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ROUTE 40 WEST
BALTIMORE, MD 21228
410-747-8770
800-932-9047
FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 12012028

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede Dam
Project Location: Patapsco River

Sample ID: S9 C3 Lower | **Date/Time Sampled: 01/20/2012 13:30** | **PSS Sample ID: 12012028-004**
Matrix: SOIL | **Date/Time Received: 01/20/2012 17:10** | **% Solids: 96**

TCL Semivolatile Organic Compounds | Analytical Method: SW-846 8270 C | Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
2,4-Dimethylphenol	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
4,6-Dinitro-2-methyl phenol	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
2,4-Dinitrophenol	ND	ug/kg	350		1	170	01/25/12	01/26/12 15:31	1014
2,4-Dinitrotoluene	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
2,6-Dinitrotoluene	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
Fluoranthene	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
Fluorene	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
Hexachlorobenzene	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
Hexachlorobutadiene	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
Hexachlorocyclopentadiene	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
Hexachloroethane	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
Indeno(1,2,3-c,d)Pyrene	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
Isophorone	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
2-Methylnaphthalene	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
2-Methyl phenol	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
3&4-Methylphenol	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
Naphthalene	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
4-Nitroaniline	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
3-Nitroaniline	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
2-Nitroaniline	ND	ug/kg	350		1	170	01/25/12	01/26/12 15:31	1014
Nitrobenzene	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
2-Nitrophenol	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
4-Nitrophenol	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
N-Nitrosodi-n-propyl amine	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
N-Nitrosodiphenylamine	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
Di-n-octyl phthalate	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
Pentachlorophenol	ND	ug/kg	350		1	170	01/25/12	01/26/12 15:31	1014
Phenanthrene	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
Phenol	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
Atrazine	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 12012028

Maryland Geological Survey (MGS), Baltimore, MD

February 16, 2012

Project Name: Bloede Dam
Project Location: Patapsco River

Sample ID: S9 C3 Lower | **Date/Time Sampled: 01/20/2012 13:30** | **PSS Sample ID: 12012028-004**
Matrix: SOIL | **Date/Time Received: 01/20/2012 17:10** | **% Solids: 96**

TCL Semivolatile Organic Compounds — Analytical Method: SW-846 8270 C — Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Pyrene	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
Pyridine	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
Caprolactam	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
2,4,6-Trichlorophenol	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014
2,4,5-Trichlorophenol	ND	ug/kg	170		1	87	01/25/12	01/26/12 15:31	1014

Cyanide — Analytical Method: SW-846 9014

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Cyanide, Total	ND	mg/kg	0.062		1	0.031	01/27/12	01/27/12 14:43	1044

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

PHASE SEPARATION SCIENCE, INC.

www.phaseonline.com
email: info@phaseonline.com

(1)

CLIENT: Maryland Geological Survey OFFICE LOC. Baltimore

PROJECT MGR: Rich Ortt PHONE NO.: (410) 554-5541

EMAIL: rortt@dnr.state.md.us FAX NO.: (410) 554-5502

PROJECT NAME: Bloede Dam PROJECT NO.: Ø

SITE LOCATION: Patapsco River P.O. NO.: Ø

SAMPLERS: Rich Ortt, Darlene Wells, Beth Sylvia

PSS Work Order #: 12012028 PAGE _____ OF _____

Matrix Codes:
SW=Surface Wtr **DW**=Drinking Wrt **GW**=Ground Wtr **WW**=Waste Wtr **O**=Oil **S**=Soil **WL**=Waste Liquid **WS**=Waste Solid **W**= Wipe

(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX (See Codes)	No. CONTAINERS	SAMPLE TYPE C = COMP G = GRAB	VOC	SVOC	PCB	Pesticides	TAL metals	GRO	DRO	Cyanide				REMARKS
						Preservatives Used												
						(3) Analysis/ Method Required												
1	S8 upper	1/20/12	12:00pm	S	3	C	X	X	X	X	X	X	X	X				
2	S8 lower	1/20/12	12:00pm	S	3	C	X	X	X	X	X	X	X	X				
3	S9 C3 upper	1/20/12	1:30pm	S	3	C	X	X	X	X	X	X	X	X				
4	S9 C3 lower	1/20/12	1:30pm	S	3	C	X	X	X	X	X	X	X	X				

(5)

Relinquished By: (1)	Date	Time	Received By:
Beth Sylvia	1/20/12	510	Sara R
Relinquished By: (2)	Date	Time	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

(4)

Requested Turnaround Time
☒ 5-Day ☐ 3-Day ☐ 2-Day
☐ Next Day ☐ Emergency ☐ Other

Data Deliverables Required:
Results, Detection limits

# of Coolers:
Custody Seal: ABS
Ice Present: PRES Temp: 9°
Shipping Carrier: CLIENT

Special Instructions:

6630 Baltimore National Pike • Route 40 West • Baltimore, Maryland 21228 • (410) 747-8770 • (800) 932-9047 • Fax (410) 788-8723

The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary.

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	12012028	**Received By**	Sara Dorr
Client Name	Maryland Geological Survey (MGS)	**Date Received**	01/20/2012 05:10:00 PM
Project Name	Bloede Dam	**Delivered By**	Client
Project Number	N/A	**Tracking No**	Not Applicable
Disposal Date	02/24/2012	**Logged In By**	Rachel Davis

Shipping Container(s)

No. of Coolers	1	Ice	Present
		Temp (deg C)	9
Custody Seal(s) Intact?	N/A	Temp Blank Present	No
Seal(s) Signed / Dated?	N/A		

Documentation

		Sampler Name	Richard Ortt
		MD DW Cert. No.	N/A
COC agrees with sample labels?	Yes		
Chain of Custody	Yes		

Sample Container

		Custody Seal(s) Intact?	Not Applicable
Appropriate for Specified Analysis?	Yes	Seal(s) Signed / Dated	Not Applicable
Intact?	Yes		
Labeled and Labels Legible?	Yes		

Total No. of Samples Received 4

Total No. of Containers Received 12

Preservation

Metals	(pH<2)	N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, COD, Phenols	(ph<2)	N/A
TOX, TKN, NH3, Total Phos	(pH<2)	N/A
VOC, BTEX (VOA Vials Rcvd Preserved)	(pH<2)	N/A
Do VOA vials have zero headspace?		N/A

Comments: (Any "No" response must be detailed in the comments section below.)

For any improper preservation conditions, list sample ID, preservative added (reagent ID number) below as well as documentation of any client notification as well as client instructions. Samples for pH, chlorine and dissolved oxygen should be analyzed as soon as possible, preferably in the field at the time of sampling. Samples which require thermal preservation shall be considered acceptable when received at a temperature above freezing to 6°C. Samples that are hand delivered on the day that they are collected may not meet these criteria but shall be considered acceptable if there is evidence that the chilling process has begun such as arrival on ice.

Samples Inspected/Checklist Completed By: Rachel Davis — Date: 01/23/2012

PM Review and Approval: Lynn Moran — Date: 01/24/2012

Analytical Report for

Maryland Geological Survey (MGS)

Certificate of Analysis No.: 12013121

Project Manager: Richard Ortt

Project Name : Bloede Dam

Project Location: Patapsco River

February 7, 2012

Phase Separation Science, Inc.

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Baltimore, MD 21228
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PHASE SEPARATION SCIENCE, INC.

February 7, 2012

Richard Ortt
Maryland Geological Survey (MGS)
2300 St. Paul Street
Baltimore, MD 21218

Reference: PSS Work Order No: **12013121**
Project Name: Bloede Dam
Project Location: Patapsco River

Dear Richard Ortt :

This report includes the analytical results from the analyses performed on the samples received under the project name referenced above and identified with the Phase Separation Science (PSS) Work Order numbered **12013121**.

All work reported herein has been performed in accordance with current NELAP standards referenced methodologies, PSS Standard Operating Procedures and the PSS Quality Assurance Manual unless otherwise noted in the Case Narrative Summary. PSS is limited in liability to the actual cost of the sample analysis done.

PSS reserves the right to return any unused samples, extracts or related solutions. Otherwise, the samples are scheduled for disposal, without any further notice, on March 6, 2012. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt , the request will be acknowledged by PSS, thus extending the storage period.

This report shall not be reproduced except in full, without the written approval of an authorized PSS representative. A copy of this report will be retained by PSS for at least 5 years, after which time it will be disposed without further notice, unless prior arrangements have been made.

We thank you for selecting Phase Separation Science, Inc. to serve your analytical needs. If you have any questions concerning this report, do not hesitate to contact us at 410-747-8770 or info@phaseonline.com.

Sincerely,

Dan Prucnal
Laboratory Manager

Sample Summary

Client Name: Maryland Geological Survey (MGS)

Project Name: Bloede Dam

Project ID: N/A

Work Order Number: 12013121

The following samples were received under chain of custody by Phase Separation Science (PSS) on 01/31/2012 at 04:30 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
12013121-001	58 Upper DUP	SOIL	01/31/2012 15:30

Please reference the Chain of Custody and Sample Receipt Checklist for specific container counts and preservatives. Any sample conditions not in compliance with sample acceptance criteria are described in Case Narrative Summary.

Notes:

1. The presence of common laboratory contaminants such as acetone, methylene chloride and phthalates, may be considered a possible laboratory artifact. Where observed, appropriate consideration of data should be taken.
2. The following analytical results are never reported on a dry weight basis: pH, flashpoint, moisture and paint filter test.
3. Drinking water samples collected for the purpose of compliance with SDWA may not be suitable for their intended use unless collected by a certified sampler [COMAR 26.08.05.07.C.2].

Standard Flags/Abbreviations:

B A target analyte or commone laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
C Results Pending Final Confirmation.
E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
Fail The result exceeds the regulatory level for Toxicity Characteristic (TCLP) as cited in 40 CFR 261.24 Table 1.
J The target analyte was positively identified below the reporting limit but greater than the LOD.
LOD Limit of Detection. An estimate of the minimum amount of a substance that an analytical process can reliably detect. An LOD is analyte and matrix specific.
ND Not Detected at or above the reporting limit.
RL PSS Reporting Limit.
U Not detected.

Case Narrative Summary

Client Name: Maryland Geological Survey (MGS)

Project Name: Bloede Dam

Project ID: N/A

Work Order Number: 12013121

Any holding time exceedances, deviations from the method specifications, regulatory requirements or variations to the procedures outlined in the PSS Quality Assurance Manual are outlined below.

Sample Receipt:

All sample receipt conditions were acceptable.

Analytical:

TCL Semivolatile Organic Compounds

Batch: 95759

Laboratory control sample and/or laboratory control sample duplicate (LCS/LCSD) exceedances identified; see LCS summary form. Exceedances meet marginal exceedance criteria.
Surrogate exceedances identified; see surrogate summary form.

NELAP accreditation was held for all analyses performed unless noted below. See www.phaseonline.com for complete PSS scope of accreditation.

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 12013121

Maryland Geological Survey (MGS), Baltimore, MD

February 7, 2012

Project Name: Bloede Dam
Project Location: Patapsco River

Sample ID: 58 Upper DUP | **Date/Time Sampled: 01/31/2012 15:30** | **PSS Sample ID: 12013121-001**
Matrix: SOIL | **Date/Time Received: 01/31/2012 16:30** | **% Solids: 97**

TCL Semivolatile Organic Compounds | Analytical Method: SW-846 8270 C | Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Acenaphthene	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
Acenaphthylene	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
Acetophenone	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
Anthracene	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
Benzo(a)anthracene	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
Benzo(a)pyrene	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
Benzo(b)fluoranthene	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
Benzo(g,h,i)perylene	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
Benzo(k)fluoranthene	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
Biphenyl (Diphenyl)	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
Butyl benzyl phthalate	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
bis(2-chloroethoxy) methane	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
bis(2-chloroethyl) ether	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
bis(2-chloroisopropyl) ether	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
bis(2-ethylhexyl) phthalate	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
4-Bromophenylphenyl ether	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
Di-n-butyl phthalate	ND	ug/kg	340		1	170	02/02/12	02/03/12 04:18	1014
Carbazole	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
4-Chloro-3-methyl phenol	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
4-Chloroaniline	ND	ug/kg	340		1	170	02/02/12	02/03/12 04:18	1014
2-Chloronaphthalene	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
2-Chlorophenol	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
4-Chlorophenyl Phenyl ether	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
Chrysene	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
Dibenz(a,h)Anthracene	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
Dibenzofuran	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
3,3-Dichlorobenzidine	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
2,4-Dichlorophenol	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
Diethyl phthalate	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
Dimethyl phthalate	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 12013121

Maryland Geological Survey (MGS), Baltimore, MD

February 7, 2012

Project Name: Bloede Dam
Project Location: Patapsco River

Sample ID: 58 Upper DUP | **Date/Time Sampled: 01/31/2012 15:30** | **PSS Sample ID: 12013121-001**
Matrix: SOIL | **Date/Time Received: 01/31/2012 16:30** | **% Solids: 97**

TCL Semivolatile Organic Compounds | Analytical Method: SW-846 8270 C | Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
2,4-Dimethylphenol	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
4,6-Dinitro-2-methyl phenol	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
2,4-Dinitrophenol	ND	ug/kg	340		1	170	02/02/12	02/03/12 04:18	1014
2,4-Dinitrotoluene	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
2,6-Dinitrotoluene	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
Fluoranthene	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
Fluorene	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
Hexachlorobenzene	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
Hexachlorobutadiene	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
Hexachlorocyclopentadiene	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
Hexachloroethane	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
Indeno(1,2,3-c,d)Pyrene	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
Isophorone	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
2-Methylnaphthalene	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
2-Methyl phenol	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
3&4-Methylphenol	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
Naphthalene	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
4-Nitroaniline	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
3-Nitroaniline	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
2-Nitroaniline	ND	ug/kg	340		1	170	02/02/12	02/03/12 04:18	1014
Nitrobenzene	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
2-Nitrophenol	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
4-Nitrophenol	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
N-Nitrosodi-n-propyl amine	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
N-Nitrosodiphenylamine	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
Di-n-octyl phthalate	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
Pentachlorophenol	ND	ug/kg	340		1	170	02/02/12	02/03/12 04:18	1014
Phenanthrene	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
Phenol	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
Atrazine	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014

OFFICES:
6630 BALTIMORE NATIONAL PIKE
ROUTE 40 WEST
BALTIMORE, MD 21228
410-747-8770
800-932-9047
FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 12013121

Maryland Geological Survey (MGS), Baltimore, MD

February 7, 2012

Project Name: Bloede Dam
Project Location: Patapsco River

Sample ID: 58 Upper DUP | **Date/Time Sampled: 01/31/2012 15:30** | **PSS Sample ID: 12013121-001**
Matrix: SOIL | **Date/Time Received: 01/31/2012 16:30** | **% Solids: 97**

TCL Semivolatile Organic Compounds | Analytical Method: SW-846 8270 C | Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Pyrene	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
Pyridine	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
Caprolactam	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
2,4,6-Trichlorophenol	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014
2,4,5-Trichlorophenol	ND	ug/kg	170		1	86	02/02/12	02/03/12 04:18	1014

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

PHASE SEPARATION SCIENCE, INC.

www.phaseonline.com
email: info@phaseonline.com

(1)

CLIENT: Maryland Geological OFFICE LOC. Baltimore

PROJECT MGR: Rich Ortt PHONE NO.: (410) 554-5541

EMAIL: rortt@dnr.state.md.us FAX NO.: (410) 554-5502

PROJECT NAME: Bloede Dam PROJECT NO.: Ø

SITE LOCATION: Patapsco River P.O. NO.: Ø

SAMPLERS: Rich Ortt, Beth Sylvia

PSS Work Order #: 12013121 PAGE 1 OF 1

Matrix Codes: **SW**=Surface Wtr **DW**=Drinking Wrt **GW**=Ground Wtr **WW**=Waste Wtr **O**=Oil **S**=Soil **WL**=Waste Liquid **WS**=Waste Solid **W**= Wipe

(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX (See Codes)	No. CONTAINERS	SAMPLE TYPE C = COMP G = GRAB	Preservatives Used: 4°C / Analysis/ Method Required (3): SVOC	REMARKS
	58 Upper DUP	31 Jan 12	1530	S	~~2~~ 1	C	X	

(5)

Relinquished By: (1)	Date	Time	Received By:
X Beth Sylvia	1/31/12	1630	[signature]
Relinquished By: (2)	Date	Time	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

(4)

Requested Turnaround Time
- [x] 5-Day
- [ ] 3-Day
- [ ] 2-Day
- [ ] Next Day
- [ ] Emergency
- [ ] Other

Data Deliverables Required: Results

# of Coolers: 1

Custody Seal: ABS

Ice Present: Yes Temp: 1.6°C

Shipping Carrier: CLIENT

Special Instructions:

6630 Baltimore National Pike • Route 40 West • Baltimore, Maryland 21228 • (410) 747-8770 • (800) 932-9047 • Fax (410) 788-8723

The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary.

LCS/LCSD Recoveries

Project Name: Bloede Dam

Work Order #: 12013121 **Project ID:** N/A

Prep Batch #: 40187 **Date Prepared:** 02/02/2012 **Sample:** 40187-1-BKS **Analyst:** 1014

Lab Batch ID: 95759 **Date Analyzed:** 02/02/2012 **Method:** SW3550 / SW8270C **Matrix:** Solid

Units: ug/kg

TCL Semivolatile Organic Compounds Analytes	BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY										
	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Acenaphthene	<83.31	1333	1507	113	1333	1491	112	1	78-118	25	
Acenaphthylene	<83.31	1333	1514	114	1333	1552	117	2	80-117	25	
Acetophenone	<83.31	1333	1552	116	1333	1475	111	5	75-127	25	
Anthracene	<83.31	1333	1551	116	1333	1513	114	2	76-122	25	
Benzo(a)anthracene	<83.31	1333	1506	113	1333	1481	111	2	77-121	25	
Benzo(a)pyrene	<83.31	1333	1247	94	1333	1233	93	1	78-127	25	
Benzo(b)fluoranthene	<83.31	1333	1220	92	1333	1214	91	0	74-134	25	
Benzo(g,h,i)perylene	<83.31	1333	1540	116	1333	1616	121	5	56-136	25	
Benzo(k)fluoranthene	<83.31	1333	1219	91	1333	1147	86	6	72-129	25	
Biphenyl (Diphenyl)	<83.31	1333	1329	100	1333	1281	96	4	74-120	25	
Butyl benzyl phthalate	<83.31	1333	1321	99	1333	1256	94	5	68-146	25	
bis(2-chloroethoxy) methane	<83.31	1333	1364	102	1333	1335	100	2	61-114	25	
bis(2-chloroethyl) ether	<83.31	1333	1514	114	1333	1496	112	1	64-108	25	H
bis(2-chloroisopropyl) ether	<83.31	1333	1527	115	1333	1487	112	3	64-109	25	H
bis(2-ethylhexyl) phthalate	<83.31	1333	1354	102	1333	1296	97	4	69-141	25	
4-Bromophenylphenyl ether	<83.31	1333	1185	89	1333	1200	90	1	59-114	25	
Di-n-butyl phthalate	<166.6	1333	1426	107	1333	1471	110	3	72-139	25	
Carbazole	<83.31	1333	1514	114	1333	1498	112	1	74-125	25	
4-Chloro-3-methyl phenol	<83.31	1333	1234	93	1333	1198	90	3	76-122	25	
4-Chloroaniline	<166.6	1333	1217	91	1333	1225	92	1	72-123	25	

Relative Percent Difference RPD = 200*|(D-G)/(D+G)|
Laboratory Control Sample (LCS) Percent Recovery [D] = 100*(C)/[B]
Laboratory Control Sample Duplicate (LCSD) Percent Recovery [G] = 100*(F)/[E]

Phase Separation Science, Inc.
6630 Baltimore National Pike
Baltimore, MD 21228

H= Recovery of BS,BSD or both exceeded the laboratory control limits
F = RPD exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

LCS/LCSD Recoveries

Project Name: Bloede Dam

Work Order #: 12013121 **Project ID:** N/A

Prep Batch #: 40187 **Date Prepared:** 02/02/2012 **Sample:** 40187-1-BKS **Analyst:** 1014

Lab Batch ID: 95759 **Date Analyzed:** 02/02/2012 **Method:** SW3550 / SW8270C **Matrix:** Solid

Units: ug/kg

TCL Semivolatile Organic Compounds Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
2-Chloronaphthalene	<83.31	1333	1485	111	1333	1451	109	2	78-113	25	
2-Chlorophenol	<83.31	1333	1546	116	1333	1502	113	3	71-119	25	
4-Chlorophenyl Phenyl ether	<83.31	1333	1467	110	1333	1431	107	2	64-112	25	
Chrysene	<83.31	1333	1512	113	1333	1474	111	3	77-120	25	
Dibenz(a,h)Anthracene	<83.31	1333	1547	116	1333	1565	117	1	66-133	25	
Dibenzofuran	<83.31	1333	1424	107	1333	1439	108	1	80-118	25	
3,3-Dichlorobenzidine	<83.31	1333	1414	106	1333	1425	107	1	72-124	25	
2,4-Dichlorophenol	<83.31	1333	1316	99	1333	1267	95	4	74-122	25	
Diethyl phthalate	<83.31	1333	1412	106	1333	1419	107	0	74-136	25	
Dimethyl phthalate	<83.31	1333	1417	106	1333	1327	100	7	77-134	25	
2,4-Dimethylphenol	<83.31	1333	1236	93	1333	1204	90	3	72-123	25	
4,6-Dinitro-2-methyl phenol	<83.31	1333	1348	101	1333	1305	98	3	46-121	25	
2,4-Dinitrophenol	<166.6	1333	1263	95	1333	1229	92	3	27-129	25	
2,4-Dinitrotoluene	<83.31	1333	1299	97	1333	1302	98	0	76-126	25	
2,6-Dinitrotoluene	<83.31	1333	1294	97	1333	1300	98	0	79-126	25	
Fluoranthene	<83.31	1333	1568	118	1333	1523	114	3	72-130	25	
Fluorene	<83.31	1333	1580	119	1333	1536	115	3	79-118	25	H
Hexachlorobenzene	<83.31	1333	1365	102	1333	1424	107	4	77-128	25	
Hexachlorobutadiene	<83.31	1333	1383	104	1333	1392	105	1	77-122	25	
Hexachlorocyclopentadiene	<83.31	1333	1262	95	1333	1292	97	2	61-130	25	

Relative Percent Difference RPD = 200*|(D-G)/(D+G)|
Laboratory Control Sample (LCS) Percent Recovery [D] = 100*(C)/[B]
Laboratory Control Sample Duplicate (LCSD) Percent Recovery [G] = 100*(F)/[E]

Phase Separation Science, Inc.
6630 Baltimore National Pike
Baltimore, MD 21228

H= Recovery of BS,BSD or both exceeded the laboratory control limits
F = RPD exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

LCS/LCSD Recoveries

Project Name: Bloede Dam

Work Order #: 12013121 **Project ID:** N/A

Prep Batch #: 40187 **Date Prepared:** 02/02/2012 **Sample:** 40187-1-BKS **Analyst:** 1014

Lab Batch ID: 95759 **Date Analyzed:** 02/02/2012 **Method:** SW3550 / SW8270C **Matrix:** Solid

Units: ug/kg

TCL Semivolatile Organic Compounds Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Hexachloroethane	<83.31	1333	1526	114	1333	1456	109	5	81-115	25	
Indeno(1,2,3-c,d)Pyrene	<83.31	1333	1485	111	1333	1505	113	1	56-139	25	
Isophorone	<83.31	1333	1402	105	1333	1363	102	3	74-117	25	
2-Methylnaphthalene	<83.31	1333	1501	113	1333	1440	108	4	76-120	25	
2-Methyl phenol	<83.31	1333	1529	115	1333	1508	113	1	73-121	25	
3&4-Methylphenol	<83.31	1333	1499	112	1333	1491	112	1	72-121	25	
Naphthalene	<83.31	1333	1540	116	1333	1522	114	1	77-119	25	
4-Nitroaniline	<83.31	1333	1267	95	1333	1226	92	3	64-130	25	
3-Nitroaniline	<83.31	1333	1275	96	1333	1300	98	2	71-124	25	
2-Nitroaniline	<166.6	1333	1375	103	1333	1302	98	5	76-124	25	
Nitrobenzene	<83.31	1333	1373	103	1333	1359	102	1	77-117	25	
2-Nitrophenol	<83.31	1333	1263	95	1333	1233	93	2	75-120	25	
4-Nitrophenol	<83.31	1333	1319	99	1333	1283	96	3	66-138	25	
N-Nitrosodi-n-propyl amine	<83.31	1333	1545	116	1333	1493	112	3	74-122	25	
N-Nitrosodiphenylamine	<83.31	1333	1532	115	1333	1515	114	1	77-117	25	
Di-n-octyl phthalate	<83.31	1333	939.7	70	1333	958	72	2	68-152	25	
Pentachlorophenol	<166.6	1333	1133	85	1333	1127	85	1	66-130	25	
Phenanthrene	<83.31	1333	1539	115	1333	1548	116	1	78-117	25	
Phenol	<83.31	1333	1430	107	1333	1475	111	3	69-115	25	
Atrazine	<83.31	1333	834.1	63	1333	833.4	63	0	56-145	25	

Relative Percent Difference RPD = 200*|(D-G)/(D+G)|
Laboratory Control Sample (LCS) Percent Recovery [D] = 100*(C)/[B]
Laboratory Control Sample Duplicate (LCSD) Percent Recovery [G] = 100*(F)/[E]

Phase Separation Science, Inc.
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Baltimore, MD 21228

H= Recovery of BS,BSD or both exceeded the laboratory control limits
F = RPD exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

LCS/LCSD Recoveries

Project Name: Bloede Dam

Work Order #: 12013121 **Project ID:** N/A

Prep Batch #: 40187 **Date Prepared:** 02/02/2012 **Sample:** 40187-1-BKS **Analyst:** 1014

Lab Batch ID: 95759 **Date Analyzed:** 02/02/2012 **Method:** SW3550 / SW8270C **Matrix:** Solid

Units: ug/kg

TCL Semivolatile Organic Compounds Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Pyrene	<83.31	1333	1550	116	1333	1619	122	4	71-124	25	
Pyridine	<83.31	1333	1437	108	1333	1429	107	1	73-125	25	
Caprolactam	<83.31	1333	1384	104	1333	1394	105	1	67-130	25	
2,4,6-Trichlorophenol	<83.31	1333	1404	105	1333	1415	106	1	78-122	25	
2,4,5-Trichlorophenol	<83.31	1333	1482	111	1333	1375	103	7	79-119	25	

Relative Percent Difference RPD = 200*|(D-G)/(D+G)|
Laboratory Control Sample (LCS) Percent Recovery [D] = 100*(C)/[B]
Laboratory Control Sample Duplicate (LCSD) Percent Recovery [G] = 100*(F)/[E]

Phase Separation Science, Inc.
6630 Baltimore National Pike
Baltimore, MD 21228

H= Recovery of BS,BSD or both exceeded the laboratory control limits
F = RPD exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

Form 2 - Surrogate Recoveries

Project Name: Bloede Dam

02/07/2012

Work Order #: 12013121 **Project ID:** N/A

Lab Batch #: 95759 **Sample:** 12012712-004 S / MS **Matrix:** Soil

Units: ug/kg

TCL Semivolatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
2-Fluorobiphenyl	711	665	107	72-111	
2-Fluorophenol	1290	1330	97	56-107	
Nitrobenzene-d5	664	665	100	65-115	
Phenol-d6	1430	1330	107	59-106	*
Terphenyl-D14	635	665	96	66-124	
2,4,6-Tribromophenol	1480	1330	111	63-133	

Lab Batch #: 95759 **Sample:** 12012712-004 SD / MSD **Matrix:** Soil

Units: ug/kg

TCL Semivolatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
2-Fluorobiphenyl	753	664	113	72-111	*
2-Fluorophenol	1370	1330	103	56-107	
Nitrobenzene-d5	708	664	107	65-115	
Phenol-d6	1510	1330	113	59-106	*
Terphenyl-D14	692	664	104	66-124	
2,4,6-Tribromophenol	1540	1330	116	63-133	

Lab Batch #: 95759 **Sample:** 12013121-001 / SMP **Matrix:** Soil

Units: ug/kg

TCL Semivolatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
2-Fluorobiphenyl	730	664	111	72-111	
2-Fluorophenol	1000	1330	77	56-107	
Nitrobenzene-d5	660	664	100	65-115	
Phenol-d6	1200	1330	90	59-106	
Terphenyl-D14	710	664	106	66-124	
2,4,6-Tribromophenol	1200	1330	89	63-133	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

Phase Separation Science, Inc.
6630 Baltimore National Pike
Baltimore, MD 21228

Form 2 - Surrogate Recoveries

Project Name: Bloede Dam

02/07/2012

Work Order #: 12013121 **Project ID:** N/A

Lab Batch #: 95759 **Sample:** 40187-1-BKS / BKS **Matrix:** Solid

Units: ug/kg

TCL Semivolatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
2-Fluorobiphenyl	775	666	116	72-111	*
2-Fluorophenol	1570	1330	117	56-107	*
Nitrobenzene-d5	733	666	110	65-115	
Phenol-d6	1620	1330	121	59-106	*
Terphenyl-D14	616	666	92	66-124	
2,4,6-Tribromophenol	1550	1330	117	63-133	

Lab Batch #: 95759 **Sample:** 40187-1-BLK / BLK **Matrix:** Solid

Units: ug/kg

TCL Semivolatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
2-Fluorobiphenyl	785	667	118	72-111	*
2-Fluorophenol	1460	1330	109	56-107	*
Nitrobenzene-d5	753	667	113	65-115	
Phenol-d6	1530	1330	115	59-106	*
Terphenyl-D14	630	667	95	66-124	
2,4,6-Tribromophenol	1440	1330	108	63-133	

Lab Batch #: 95759 **Sample:** 40187-1-BSD / BSD **Matrix:** Solid

Units: ug/kg

TCL Semivolatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
2-Fluorobiphenyl	789	666	118	72-111	*
2-Fluorophenol	1640	1330	123	56-107	*
Nitrobenzene-d5	744	666	112	65-115	
Phenol-d6	1710	1330	129	59-106	*
Terphenyl-D14	699	666	105	66-124	
2,4,6-Tribromophenol	1530	1330	115	63-133	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

Phase Separation Science, Inc.
6630 Baltimore National Pike
Baltimore, MD 21228

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	12013121	**Received By**	Rachel Davis
Client Name	Maryland Geological Survey (MGS)	**Date Received**	01/31/2012 04:30:00 PM
Project Name	Bloede Dam	**Delivered By**	Client
Project Number	N/A	**Tracking No**	Not Applicable
Disposal Date	03/06/2012	**Logged In By**	Rachel Davis

Shipping Container(s)

No. of Coolers	1	Ice	Present
		Temp (deg C)	16
Custody Seal(s) Intact?	N/A	Temp Blank Present	No
Seal(s) Signed / Dated?	N/A		

Documentation

		Sampler Name	Richard Ortt
		MD DW Cert. No.	N/A
COC agrees with sample labels?	Yes		
Chain of Custody	Yes		

Sample Container

		Custody Seal(s) Intact?	Not Applicable
Appropriate for Specified Analysis?	Yes	Seal(s) Signed / Dated	Not Applicable
Intact?	Yes		
Labeled and Labels Legible?	Yes		

Total No. of Samples Received 1

Total No. of Containers Received 1

Preservation

Metals	(pH<2)	N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, COD, Phenols	(ph<2)	N/A
TOX, TKN, NH3, Total Phos	(pH<2)	N/A
VOC, BTEX (VOA Vials Rcvd Preserved)	(pH<2)	N/A
Do VOA vials have zero headspace?		N/A

Comments: (Any "No" response must be detailed in the comments section below.)

For any improper preservation conditions, list sample ID, preservative added (reagent ID number) below as well as documentation of any client notification as well as client instructions. Samples for pH, chlorine and dissolved oxygen should be analyzed as soon as possible, preferably in the field at the time of sampling. Samples which require thermal preservation shall be considered acceptable when received at a temperature above freezing to 6°C. Samples that are hand delivered on the day that they are collected may not meet these criteria but shall be considered acceptable if there is evidence that the chilling process has begun such as arrival on ice.

Samples Inspected/Checklist Completed By: Rachel Davis — Date: 01/31/2012

PM Review and Approval: Lynn Moran — Date: 02/01/2012

Analytical Report for

Maryland Geological Survey (MGS)

Certificate of Analysis No.: 12020236

Project Manager: Richard Ortt

Project Name : Bloede Dam

Project Location: Patapsco River

February 9, 2012

Phase Separation Science, Inc.

6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
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PHASE SEPARATION SCIENCE, INC.

February 9, 2012

Richard Ortt
Maryland Geological Survey (MGS)
2300 St. Paul Street
Baltimore, MD 21218

Reference: PSS Work Order No: **12020236**
Project Name: Bloede Dam
Project Location: Patapsco River

Dear Richard Ortt :

This report includes the analytical results from the analyses performed on the samples received under the project name referenced above and identified with the Phase Separation Science (PSS) Work Order numbered **12020236**.

All work reported herein has been performed in accordance with current NELAP standards referenced methodologies, PSS Standard Operating Procedures and the PSS Quality Assurance Manual unless otherwise noted in the Case Narrative Summary. PSS is limited in liability to the actual cost of the sample analysis done.

PSS reserves the right to return any unused samples, extracts or related solutions. Otherwise, the samples are scheduled for disposal, without any further notice, on March 8, 2012. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt , the request will be acknowledged by PSS, thus extending the storage period.

This report shall not be reproduced except in full, without the written approval of an authorized PSS representative. A copy of this report will be retained by PSS for at least 5 years, after which time it will be disposed without further notice, unless prior arrangements have been made.

We thank you for selecting Phase Separation Science, Inc. to serve your analytical needs. If you have any questions concerning this report, do not hesitate to contact us at 410-747-8770 or info@phaseonline.com.

Sincerely,

Dan Prucnal
Laboratory Manager

Sample Summary

Client Name: Maryland Geological Survey (MGS)

Project Name: Bloede Dam

Project ID: N/A

Work Order Number: 12020236

The following samples were received under chain of custody by Phase Separation Science (PSS) on 02/02/2012 at 03:50 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
12020236-001	S8 Upstream	SOIL	02/02/2012 12:45
12020236-002	S8 Downstream	SOIL	02/02/2012 12:45

Please reference the Chain of Custody and Sample Receipt Checklist for specific container counts and preservatives. Any sample conditions not in compliance with sample acceptance criteria are described in Case Narrative Summary.

Notes:

1. The presence of common laboratory contaminants such as acetone, methylene chloride and phthalates, may be considered a possible laboratory artifact. Where observed, appropriate consideration of data should be taken.
2. The following analytical results are never reported on a dry weight basis: pH, flashpoint, moisture and paint filter test.
3. Drinking water samples collected for the purpose of compliance with SDWA may not be suitable for their intended use unless collected by a certified sampler [COMAR 26.08.05.07.C.2].

Standard Flags/Abbreviations:

B A target analyte or commone laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
C Results Pending Final Confirmation.
E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
Fail The result exceeds the regulatory level for Toxicity Characteristic (TCLP) as cited in 40 CFR 261.24 Table 1.
J The target analyte was positively identified below the reporting limit but greater than the LOD.
LOD Limit of Detection. An estimate of the minimum amount of a substance that an analytical process can reliably detect. An LOD is analyte and matrix specific.
ND Not Detected at or above the reporting limit.
RL PSS Reporting Limit.
U Not detected.

Case Narrative Summary

Client Name: Maryland Geological Survey (MGS)

Project Name: Bloede Dam

Project ID: N/A

Work Order Number: 12020236

Any holding time exceedances, deviations from the method specifications, regulatory requirements or variations to the procedures outlined in the PSS Quality Assurance Manual are outlined below.

Sample Receipt:

All sample receipt conditions were acceptable.

Analytical:

Total Petroleum Hydrocarbons-GRO

Batch: 95788

Surrogate exceedances identified; see surrogate summary form.

TCL Semivolatile Organic Compounds

Batch: 95823

Laboratory control sample and/or laboratory control sample duplicate (LCS/LCSD) exceedances identified; see LCS summary form.

Surrogate exceedances identified; see surrogate summary form

NELAP accreditation was held for all analyses performed unless noted below. See www.phaseonline.com for complete PSS scope of accreditation.

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 12020236

Maryland Geological Survey (MGS), Baltimore, MD

February 9, 2012

Project Name: Bloede Dam
Project Location: Patapsco River

Sample ID: S8 Upstream | **Date/Time Sampled: 02/02/2012 12:45** | **PSS Sample ID: 12020236-001**
Matrix: SOIL | **Date/Time Received: 02/02/2012 15:50** | **% Solids: 97**

Total Petroleum Hydrocarbons - DRO — Analytical Method: SW-846 8015 C — Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
TPH-DRO (Diesel Range Organics)	ND	mg/kg	4.1		1	4.1	02/05/12	02/06/12 20:01	1040

Total Petroleum Hydrocarbons-GRO — Analytical Method: SW-846 8015C — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
TPH-GRO (Gasoline Range Organics)	ND	ug/kg	100		1	41	02/03/12	02/03/12 13:01	1035

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CERTIFICATE OF ANALYSIS

No: 12020236

Maryland Geological Survey (MGS), Baltimore, MD

February 9, 2012

Project Name: Bloede Dam
Project Location: Patapsco River

Sample ID: S8 Upstream **Date/Time Sampled: 02/02/2012 12:45** **PSS Sample ID: 12020236-001**
Matrix: SOIL **Date/Time Received: 02/02/2012 15:50** **% Solids: 97**

TCL Semivolatile Organic Compounds Analytical Method: SW-846 8270 C Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Acenaphthene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
Acenaphthylene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
Acetophenone	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
Anthracene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
Benzo(a)anthracene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
Benzo(a)pyrene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
Benzo(b)fluoranthene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
Benzo(g,h,i)perylene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
Benzo(k)fluoranthene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
Biphenyl (Diphenyl)	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
Butyl benzyl phthalate	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
bis(2-chloroethoxy) methane	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
bis(2-chloroethyl) ether	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
bis(2-chloroisopropyl) ether	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
bis(2-ethylhexyl) phthalate	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
4-Bromophenylphenyl ether	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
Di-n-butyl phthalate	ND	ug/kg	340		1	170	02/03/12	02/07/12 02:59	1014
Carbazole	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
4-Chloro-3-methyl phenol	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
4-Chloroaniline	ND	ug/kg	340		1	170	02/03/12	02/07/12 02:59	1014
2-Chloronaphthalene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
2-Chlorophenol	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
4-Chlorophenyl Phenyl ether	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
Chrysene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
Dibenz(a,h)Anthracene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
Dibenzofuran	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
3,3-Dichlorobenzidine	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
2,4-Dichlorophenol	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
Diethyl phthalate	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
Dimethyl phthalate	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 12020236

Maryland Geological Survey (MGS), Baltimore, MD

February 9, 2012

Project Name: Bloede Dam
Project Location: Patapsco River

Sample ID: S8 Upstream | **Date/Time Sampled: 02/02/2012 12:45** | **PSS Sample ID: 12020236-001**
Matrix: SOIL | **Date/Time Received: 02/02/2012 15:50** | **% Solids: 97**

TCL Semivolatile Organic Compounds | Analytical Method: SW-846 8270 C | Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
2,4-Dimethylphenol	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
4,6-Dinitro-2-methyl phenol	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
2,4-Dinitrophenol	ND	ug/kg	340		1	170	02/03/12	02/07/12 02:59	1014
2,4-Dinitrotoluene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
2,6-Dinitrotoluene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
Fluoranthene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
Fluorene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
Hexachlorobenzene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
Hexachlorobutadiene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
Hexachlorocyclopentadiene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
Hexachloroethane	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
Indeno(1,2,3-c,d)Pyrene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
Isophorone	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
2-Methylnaphthalene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
2-Methyl phenol	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
3&4-Methylphenol	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
Naphthalene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
4-Nitroaniline	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
3-Nitroaniline	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
2-Nitroaniline	ND	ug/kg	340		1	170	02/03/12	02/07/12 02:59	1014
Nitrobenzene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
2-Nitrophenol	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
4-Nitrophenol	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
N-Nitrosodi-n-propyl amine	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
N-Nitrosodiphenylamine	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
Di-n-octyl phthalate	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
Pentachlorophenol	ND	ug/kg	340		1	170	02/03/12	02/07/12 02:59	1014
Phenanthrene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
Phenol	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
Atrazine	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 12020236

Maryland Geological Survey (MGS), Baltimore, MD

February 9, 2012

Project Name: Bloede Dam
Project Location: Patapsco River

Sample ID: S8 Upstream | **Date/Time Sampled: 02/02/2012 12:45** | **PSS Sample ID: 12020236-001**
Matrix: SOIL | **Date/Time Received: 02/02/2012 15:50** | **% Solids: 97**

TCL Semivolatile Organic Compounds | Analytical Method: SW-846 8270 C | Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Pyrene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
Pyridine	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
Caprolactam	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
2,4,6-Trichlorophenol	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014
2,4,5-Trichlorophenol	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:59	1014

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CERTIFICATE OF ANALYSIS

No: 12020236

Maryland Geological Survey (MGS), Baltimore, MD

February 9, 2012

Project Name: Bloede Dam
Project Location: Patapsco River

Sample ID: S8 Downstream | **Date/Time Sampled: 02/02/2012 12:45** | **PSS Sample ID: 12020236-002**
Matrix: SOIL | **Date/Time Received: 02/02/2012 15:50** | **% Solids: 96**

Total Petroleum Hydrocarbons - DRO — Analytical Method: SW-846 8015 C — Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
TPH-DRO (Diesel Range Organics)	ND	mg/kg	4.2		1	4.2	02/05/12	02/06/12 20:01	1040

Total Petroleum Hydrocarbons-GRO — Analytical Method: SW-846 8015C — Preparation Method: 5030

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
TPH-GRO (Gasoline Range Organics)	ND	ug/kg	100		1	41	02/03/12	02/03/12 13:28	1035

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No: 12020236

Maryland Geological Survey (MGS), Baltimore, MD

February 9, 2012

Project Name: Bloede Dam
Project Location: Patapsco River

Sample ID: S8 Downstream | **Date/Time Sampled: 02/02/2012 12:45** | **PSS Sample ID: 12020236-002**
Matrix: SOIL | **Date/Time Received: 02/02/2012 15:50** | **% Solids: 96**

TCL Semivolatile Organic Compounds | Analytical Method: SW-846 8270 C | Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Acenaphthene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
Acenaphthylene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
Acetophenone	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
Anthracene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
Benzo(a)anthracene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
Benzo(a)pyrene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
Benzo(b)fluoranthene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
Benzo(g,h,i)perylene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
Benzo(k)fluoranthene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
Biphenyl (Diphenyl)	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
Butyl benzyl phthalate	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
bis(2-chloroethoxy) methane	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
bis(2-chloroethyl) ether	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
bis(2-chloroisopropyl) ether	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
bis(2-ethylhexyl) phthalate	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
4-Bromophenylphenyl ether	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
Di-n-butyl phthalate	ND	ug/kg	350		1	170	02/03/12	02/07/12 02:29	1014
Carbazole	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
4-Chloro-3-methyl phenol	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
4-Chloroaniline	ND	ug/kg	350		1	170	02/03/12	02/07/12 02:29	1014
2-Chloronaphthalene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
2-Chlorophenol	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
4-Chlorophenyl Phenyl ether	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
Chrysene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
Dibenz(a,h)Anthracene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
Dibenzofuran	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
3,3-Dichlorobenzidine	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
2,4-Dichlorophenol	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
Diethyl phthalate	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
Dimethyl phthalate	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014

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CERTIFICATE OF ANALYSIS

No: 12020236

Maryland Geological Survey (MGS), Baltimore, MD

February 9, 2012

Project Name: Bloede Dam
Project Location: Patapsco River

Sample ID: S8 Downstream | **Date/Time Sampled: 02/02/2012 12:45** | **PSS Sample ID: 12020236-002**
Matrix: SOIL | **Date/Time Received: 02/02/2012 15:50** | **% Solids: 96**

TCL Semivolatile Organic Compounds | Analytical Method: SW-846 8270 C | Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
2,4-Dimethylphenol	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
4,6-Dinitro-2-methyl phenol	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
2,4-Dinitrophenol	ND	ug/kg	350		1	170	02/03/12	02/07/12 02:29	1014
2,4-Dinitrotoluene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
2,6-Dinitrotoluene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
Fluoranthene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
Fluorene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
Hexachlorobenzene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
Hexachlorobutadiene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
Hexachlorocyclopentadiene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
Hexachloroethane	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
Indeno(1,2,3-c,d)Pyrene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
Isophorone	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
2-Methylnaphthalene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
2-Methyl phenol	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
3&4-Methylphenol	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
Naphthalene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
4-Nitroaniline	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
3-Nitroaniline	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
2-Nitroaniline	ND	ug/kg	350		1	170	02/03/12	02/07/12 02:29	1014
Nitrobenzene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
2-Nitrophenol	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
4-Nitrophenol	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
N-Nitrosodi-n-propyl amine	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
N-Nitrosodiphenylamine	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
Di-n-octyl phthalate	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
Pentachlorophenol	ND	ug/kg	350		1	170	02/03/12	02/07/12 02:29	1014
Phenanthrene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
Phenol	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
Atrazine	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014

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800-932-9047
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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 12020236

Maryland Geological Survey (MGS), Baltimore, MD

February 9, 2012

Project Name: Bloede Dam
Project Location: Patapsco River

Sample ID: S8 Downstream | **Date/Time Sampled: 02/02/2012 12:45** | **PSS Sample ID: 12020236-002**
Matrix: SOIL | **Date/Time Received: 02/02/2012 15:50** | **% Solids: 96**

TCL Semivolatile Organic Compounds | Analytical Method: SW-846 8270 C | Preparation Method: 3550

	Result	Units	RL	Flag	Dil	LOD	Prepared	Analyzed	Analyst
Pyrene	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
Pyridine	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
Caprolactam	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
2,4,6-Trichlorophenol	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014
2,4,5-Trichlorophenol	ND	ug/kg	170		1	86	02/03/12	02/07/12 02:29	1014

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

PHASE SEPARATION SCIENCE, INC.

www.phaseonline.com
email: info@phaseonline.com

(1)

CLIENT: MD Geological Survey OFFICE LOC. Baltimore
PROJECT MGR: Rich Ortt PHONE NO.: (410) 554-5541
EMAIL: rortt@dnr.state.md.us FAX NO.: (410) 554-5502
PROJECT NAME: Bloede Dam PROJECT NO.: Ø
SITE LOCATION: Patapsco River P.O. NO.:
SAMPLERS: Rich Ortt, Beth Sylvia

PSS Work Order #: 12020236 PAGE 1 OF 1

Matrix Codes:
SW=Surface Wtr **DW**=Drinking Wrt **GW**=Ground Wtr **WW**=Waste Wtr **O**=Oil **S**=Soil **WL**=Waste Liquid **WS**=Waste Solid **W**= Wipe

(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX (See Codes)	No. CONTAINERS	SAMPLE TYPE C = COMP G = GRAB	SVOC	TPH-GRO	TPH-DRO									REMARKS
Preservatives Used							4°C →											
(3) Analysis/ Method Required																		
	S8 Upstream	2 Feb 12	1245	S	1	C	X	X	X									
	S8 Downstream	2 Feb 12	1245	S	1	C	X	X	X									

(5)

Relinquished By: (1)	Date	Time	Received By:
Beth Sylvia	2/2/12	350	Sara R
Relinquished By: (2)	Date	Time	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

(4)

Requested Turnaround Time
☒ 5-Day ☐ 3-Day ☐ 2-Day
☐ Next Day ☐ Emergency ☐ Other

Data Deliverables Required:
Results, Detection Limits

# of Coolers: 1
Custody Seal: ABS
Ice Present: PRES Temp: 8
Shipping Carrier: CLIENT

Special Instructions:
J Flag Reporting

6630 Baltimore National Pike • Route 40 West • Baltimore, Maryland 21228 • (410) 747-8770 • (800) 932-9047 • Fax (410) 788-8723

The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary.

LCS/LCSD Recoveries

Project Name: Bloede Dam

Work Order #: 12020236 **Project ID:** N/A

Prep Batch #: 40213 **Date Prepared:** 02/05/2012 **Sample:** 40213-1-BKS **Analyst:** 1040

Lab Batch ID: 95816 **Date Analyzed:** 02/06/2012 **Method:** SW3550 / SW8015DRO **Matrix:** Solid

Units: mg/kg

Total Petroleum Hydrocarbons - DRO	BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY										
Analytes	**Blank Sample Result [A]**	**Spike Added [B]**	**Blank Spike Result [C]**	**Blank Spike %R [D]**	**Spike Added [E]**	**Blank Spike Duplicate Result [F]**	**Blk. Spk Dup. %R [G]**	**RPD %**	**Control Limits %R**	**Control Limits %RPD**	**Flag**
TPH-DRO (Diesel Range Organics)	<3.997	33.31	25.63	77	33.31	25.24	76	2	60-95	25	

Relative Percent Difference RPD = 200*|(D-G)/(D+G)|
Laboratory Control Sample (LCS) Percent Recovery [D] = 100*(C)/[B]
Laboratory Control Sample Duplicate (LCSD) Percent Recovery [G] = 100*(F)/[E]

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H= Recovery of BS,BSD or both exceeded the laboratory control limits
F = RPD exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

LCS/LCSD Recoveries

Project Name: Bloede Dam

Work Order #: 12020236 **Project ID:** N/A

Prep Batch #: 40205 **Date Prepared:** 02/03/2012 **Sample:** 40205-1-BKS **Analyst:** 1014

Lab Batch ID: 95815 **Date Analyzed:** 02/06/2012 **Method:** SW3550 / SW8270C **Matrix:** Solid

Units: ug/kg

TCL Semivolatile Organic Compounds Analytes	BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY										
	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Acenaphthene	<83.28	1332	1379	104	1332	1321	99	4	78-118	25	
Acenaphthylene	<83.28	1332	1372	103	1332	1308	98	5	80-117	25	
Acetophenone	<83.28	1332	1451	109	1332	1394	105	4	75-127	25	
Anthracene	<83.28	1332	1421	107	1332	1341	101	6	76-122	25	
Benzo(a)anthracene	<83.28	1332	1510	113	1332	1449	109	4	77-121	25	
Benzo(a)pyrene	<83.28	1332	1539	116	1332	1513	114	2	78-127	25	
Benzo(b)fluoranthene	<83.28	1332	1247	94	1332	1229	92	1	74-134	25	
Benzo(g,h,i)perylene	<83.28	1332	1554	117	1332	1475	111	5	56-136	25	
Benzo(k)fluoranthene	<83.28	1332	1493	112	1332	1500	113	0	72-129	25	
Biphenyl (Diphenyl)	<83.28	1332	1606	121	1332	1573	118	2	74-120	25	,H,H,
Butyl benzyl phthalate	<83.28	1332	1302	98	1332	1253	94	4	68-146	25	
bis(2-chloroethoxy) methane	<83.28	1332	1348	101	1332	1278	96	5	61-114	25	
bis(2-chloroethyl) ether	<83.28	1332	1329	100	1332	1298	98	2	64-108	25	
bis(2-chloroisopropyl) ether	<83.28	1332	1403	105	1332	1335	100	5	64-109	25	
bis(2-ethylhexyl) phthalate	<83.28	1332	1393	105	1332	1328	100	5	69-141	25	
4-Bromophenylphenyl ether	<83.28	1332	1319	99	1332	1262	95	4	59-114	25	
Di-n-butyl phthalate	<166.6	1332	1414	106	1332	1351	102	5	72-139	25	
Carbazole	<83.28	1332	1739	131	1332	1667	125	4	74-125	25	,H,H,
4-Chloro-3-methyl phenol	<83.28	1332	1326	100	1332	1216	91	9	76-122	25	
4-Chloroaniline	<166.6	1332	1318	99	1332	1262	95	4	72-123	25	

Relative Percent Difference RPD = 200*|(D-G)/(D+G)|
Laboratory Control Sample (LCS) Percent Recovery [D] = 100*(C)/[B]
Laboratory Control Sample Duplicate (LCSD) Percent Recovery [G] = 100*(F)/[E]

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H= Recovery of BS,BSD or both exceeded the laboratory control limits
F = RPD exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

LCS/LCSD Recoveries

Project Name: Bloede Dam

Work Order #: 12020236 **Project ID:** N/A

Prep Batch #: 40205 **Date Prepared:** 02/03/2012 **Sample:** 40205-1-BKS **Analyst:** 1014

Lab Batch ID: 95815 **Date Analyzed:** 02/06/2012 **Method:** SW3550 / SW8270C **Matrix:** Solid

Units: ug/kg

TCL Semivolatile Organic Compounds Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
2-Chloronaphthalene	<83.28	1332	1589	119	1332	1542	116	3	78-113	25	,H,H,
2-Chlorophenol	<83.28	1332	1410	106	1332	1375	103	3	71-119	25	
4-Chlorophenyl Phenyl ether	<83.28	1332	1472	111	1332	1329	100	10	64-112	25	
Chrysene	<83.28	1332	1498	112	1332	1477	111	1	77-120	25	
Dibenz(a,h)Anthracene	<83.28	1332	1709	128	1332	1640	123	4	66-133	25	
Dibenzofuran	<83.28	1332	1314	99	1332	1259	95	4	80-118	25	
3,3-Dichlorobenzidine	<83.28	1332	1632	123	1332	1462	110	11	72-124	25	
2,4-Dichlorophenol	<83.28	1332	1347	101	1332	1267	95	6	74-122	25	
Diethyl phthalate	<83.28	1332	1383	104	1332	1279	96	8	74-136	25	
Dimethyl phthalate	<83.28	1332	1274	96	1332	1208	91	5	77-134	25	
2,4-Dimethylphenol	<83.28	1332	1298	97	1332	1280	96	1	72-123	25	
4,6-Dinitro-2-methyl phenol	<83.28	1332	1441	108	1332	1282	96	12	46-121	25	
2,4-Dinitrophenol	<166.6	1332	1147	86	1332	1049	79	9	27-129	25	
2,4-Dinitrotoluene	<83.28	1332	1190	89	1332	1124	84	6	76-126	25	
2,6-Dinitrotoluene	<83.28	1332	1222	92	1332	1159	87	5	79-126	25	
Fluoranthene	<83.28	1332	1419	107	1332	1329	100	7	72-130	25	
Fluorene	<83.28	1332	1593	120	1332	1479	111	7	79-118	25	,H,H,
Hexachlorobenzene	<83.28	1332	1364	102	1332	1304	98	4	77-128	25	
Hexachlorobutadiene	<83.28	1332	1460	110	1332	1402	105	4	77-122	25	
Hexachlorocyclopentadiene	<83.28	1332	997.7	75	1332	860.2	65	15	61-130	25	

Relative Percent Difference RPD = 200*|(D-G)/(D+G)|
Laboratory Control Sample (LCS) Percent Recovery [D] = 100*(C)/[B]
Laboratory Control Sample Duplicate (LCSD) Percent Recovery [G] = 100*(F)/[E]

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H= Recovery of BS,BSD or both exceeded the laboratory control limits
F = RPD exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

LCS/LCSD Recoveries

Project Name: Bloede Dam

Work Order #: 12020236 **Project ID:** N/A

Prep Batch #: 40205 **Date Prepared:** 02/03/2012 **Sample:** 40205-1-BKS **Analyst:** 1014

Lab Batch ID: 95815 **Date Analyzed:** 02/06/2012 **Method:** SW3550 / SW8270C **Matrix:** Solid

Units: ug/kg

TCL Semivolatile Organic Compounds Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Hexachloroethane	<83.28	1332	1333	100	1332	1257	94	6	81-115	25	
Indeno(1,2,3-c,d)Pyrene	<83.28	1332	1377	103	1332	1264	95	9	56-139	25	
Isophorone	<83.28	1332	1298	97	1332	1266	95	2	74-117	25	
2-Methylnaphthalene	<83.28	1332	1401	105	1332	1358	102	3	76-120	25	
2-Methyl phenol	<83.28	1332	1430	107	1332	1396	105	2	73-121	25	
3&4-Methylphenol	<83.28	1332	1452	109	1332	1380	104	5	72-121	25	
Naphthalene	<83.28	1332	1405	105	1332	1369	103	3	77-119	25	
4-Nitroaniline	<83.28	1332	1408	106	1332	1565	118	11	64-130	25	
3-Nitroaniline	<83.28	1332	1125	84	1332	1092	82	3	71-124	25	
2-Nitroaniline	<166.6	1332	1242	93	1332	1189	89	4	76-124	25	
Nitrobenzene	<83.28	1332	1312	98	1332	1230	92	6	77-117	25	
2-Nitrophenol	<83.28	1332	1076	81	1332	1044	78	3	75-120	25	
4-Nitrophenol	<83.28	1332	1161	87	1332	1083	81	7	66-138	25	
N-Nitrosodi-n-propyl amine	<83.28	1332	1453	109	1332	1372	103	6	74-122	25	
N-Nitrosodiphenylamine	<83.28	1332	1721	129	1332	1609	121	7	77-117	25	,H,H,
Di-n-octyl phthalate	<83.28	1332	1379	104	1332	1356	102	2	68-152	25	
Pentachlorophenol	<166.6	1332	1169	88	1332	1109	83	5	66-130	25	
Phenanthrene	<83.28	1332	1547	116	1332	1485	112	4	78-117	25	
Phenol	<83.28	1332	1410	106	1332	1230	92	14	69-115	25	
Atrazine	<83.28	1332	698.5	52	1332	665.2	50	5	56-145	25	,L,L,

Relative Percent Difference RPD = 200*|(D-G)/(D+G)|
Laboratory Control Sample (LCS) Percent Recovery [D] = 100*(C)/[B]
Laboratory Control Sample Duplicate (LCSD) Percent Recovery [G] = 100*(F)/[E]

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H= Recovery of BS,BSD or both exceeded the laboratory control limits
F = RPD exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

LCS/LCSD Recoveries

Project Name: Bloede Dam

Work Order #: 12020236 **Project ID:** N/A

Prep Batch #: 40205 **Date Prepared:** 02/03/2012 **Sample:** 40205-1-BKS **Analyst:** 1014

Lab Batch ID: 95815 **Date Analyzed:** 02/06/2012 **Method:** SW3550 / SW8270C **Matrix:** Solid

Units: ug/kg

TCL Semivolatile Organic Compounds Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Pyrene	<83.28	1332	1430	107	1332	1411	106	1	71-124	25	
Pyridine	<83.28	1332	1289	97	1332	1366	103	6	73-125	25	
Caprolactam	<83.28	1332	1291	97	1332	1391	105	7	67-130	25	
2,4,6-Trichlorophenol	<83.28	1332	1267	95	1332	1199	90	6	78-122	25	
2,4,5-Trichlorophenol	<83.28	1332	1420	107	1332	1333	100	6	79-119	25	

Relative Percent Difference RPD = 200*|(D-G)/(D+G)|
Laboratory Control Sample (LCS) Percent Recovery [D] = 100*(C)/[B]
Laboratory Control Sample Duplicate (LCSD) Percent Recovery [G] = 100*(F)/[E]

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F = RPD exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

Form 2 - Surrogate Recoveries

Project Name: Bloede Dam

02/09/2012

Work Order #: 12020236 **Project ID:** N/A

Lab Batch #: 95816 **Sample:** 12020211-001 S / MS **Matrix:** Soil

Units: mg/kg

Total Petroleum Hydrocarbons - DRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
o-Terphenyl	37.6	33.30	113	43-126	

Lab Batch #: 95816 **Sample:** 12020211-001 SD / MSD **Matrix:** Soil

Units: mg/kg

Total Petroleum Hydrocarbons - DRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
o-Terphenyl	35.9	33.30	108	43-126	

Lab Batch #: 95816 **Sample:** 12020236-001 / SMP **Matrix:** Soil

Units: mg/kg

Total Petroleum Hydrocarbons - DRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
o-Terphenyl	27.0	33.20	82	43-126	

Lab Batch #: 95816 **Sample:** 12020236-002 / SMP **Matrix:** Soil

Units: mg/kg

Total Petroleum Hydrocarbons - DRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
o-Terphenyl	33.0	33.30	100	43-126	

Lab Batch #: 95816 **Sample:** 40213-1-BKS / BKS **Matrix:** Solid

Units: mg/kg

Total Petroleum Hydrocarbons - DRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
o-Terphenyl	27.5	33.30	82	43-126	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

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Form 2 - Surrogate Recoveries

Project Name: Bloede Dam

02/09/2012

Work Order #: 12020236 **Project ID:** N/A

Lab Batch #: 95816 **Sample:** 40213-1-BLK / BLK **Matrix:** Solid

Units: mg/kg

Total Petroleum Hydrocarbons - DRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
o-Terphenyl	26.6	33.30	80	43-126	

Lab Batch #: 95816 **Sample:** 40213-1-BSD / BSD **Matrix:** Solid

Units: mg/kg

Total Petroleum Hydrocarbons - DRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
o-Terphenyl	27.3	33.30	82	43-126	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

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Form 2 - Surrogate Recoveries

Project Name: Bloede Dam

02/09/2012

Work Order #: 12020236 **Project ID:** N/A

Lab Batch #: 95788 **Sample:** 12020224-010 S / MS **Matrix:** Soil

Units: ug/kg

Total Petroleum Hydrocarbons-GRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
a,a,a-Trifluorotoluene	89.9	100	90	85-160	

Lab Batch #: 95788 **Sample:** 12020224-010 SD / MSD **Matrix:** Soil

Units: ug/kg

Total Petroleum Hydrocarbons-GRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
a,a,a-Trifluorotoluene	89.8	100	90	85-160	

Lab Batch #: 95788 **Sample:** 12020236-001 / SMP **Matrix:** Soil

Units: ug/kg

Total Petroleum Hydrocarbons-GRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
a,a,a-Trifluorotoluene	74.0	100	74	85-160	*

Lab Batch #: 95788 **Sample:** 12020236-002 / SMP **Matrix:** Soil

Units: ug/kg

Total Petroleum Hydrocarbons-GRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
a,a,a-Trifluorotoluene	73.0	100	73	85-160	*

Lab Batch #: 95788 **Sample:** 40211-2-BKS / BKS **Matrix:** Solid

Units: ug/kg

Total Petroleum Hydrocarbons-GRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
a,a,a-Trifluorotoluene	85.3	100	85	85-160	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

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Baltimore, MD 21228

Form 2 - Surrogate Recoveries

Project Name: Bloede Dam

02/09/2012

Work Order #: 12020236 **Project ID:** N/A

Lab Batch #: 95788 **Sample:** 40211-2-BLK / BLK **Matrix:** Solid

Units: ug/kg

Total Petroleum Hydrocarbons-GRO Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
a,a,a-Trifluorotoluene	78.3	100	78	85-160	*

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

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Baltimore, MD 21228

Form 2 - Surrogate Recoveries

Project Name: Bloede Dam

02/09/2012

Work Order #: 12020236 **Project ID:** N/A

Lab Batch #: 95815 **Sample:** 12020211-001 S / MS **Matrix:** Soil

Units: ug/kg

TCL Semivolatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
2-Fluorobiphenyl	679	665	102	72-111	
2-Fluorophenol	846	1330	64	56-107	
Nitrobenzene-d5	512	665	77	65-115	
Phenol-d6	1100	1330	83	59-106	
Terphenyl-D14	575	665	86	66-124	
2,4,6-Tribromophenol	1440	1330	108	63-133	

Lab Batch #: 95815 **Sample:** 12020211-001 SD / MSD **Matrix:** Soil

Units: ug/kg

TCL Semivolatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
2-Fluorobiphenyl	817	664	123	72-111	*
2-Fluorophenol	949	1330	71	56-107	
Nitrobenzene-d5	601	664	90	65-115	
Phenol-d6	1290	1330	97	59-106	
Terphenyl-D14	715	664	108	66-124	
2,4,6-Tribromophenol	1680	1330	127	63-133	

Lab Batch #: 95815 **Sample:** 40205-1-BKS / BKS **Matrix:** Solid

Units: ug/kg

TCL Semivolatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
2-Fluorobiphenyl	713	666	107	72-111	
2-Fluorophenol	1100	1330	83	56-107	
Nitrobenzene-d5	651	666	98	65-115	
Phenol-d6	1340	1330	100	59-106	
Terphenyl-D14	650	666	98	66-124	
2,4,6-Tribromophenol	1390	1330	104	63-133	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

Phase Separation Science, Inc.
6630 Baltimore National Pike
Baltimore, MD 21228

Form 2 - Surrogate Recoveries

Project Name: Bloede Dam

02/09/2012

Work Order #: 12020236 **Project ID:** N/A

Lab Batch #: 95815 **Sample:** 40205-1-BLK / BLK **Matrix:** Solid

Units: ug/kg

TCL Semivolatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
2-Fluorobiphenyl	629	666	94	72-111	
2-Fluorophenol	949	1330	71	56-107	
Nitrobenzene-d5	538	666	81	65-115	
Phenol-d6	1150	1330	86	59-106	
Terphenyl-D14	566	666	85	66-124	
2,4,6-Tribromophenol	1110	1330	83	63-133	

Lab Batch #: 95815 **Sample:** 40205-1-BSD / BSD **Matrix:** Solid

Units: ug/kg

TCL Semivolatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
2-Fluorobiphenyl	691	666	104	72-111	
2-Fluorophenol	1140	1330	85	56-107	
Nitrobenzene-d5	630	666	95	65-115	
Phenol-d6	1360	1330	102	59-106	
Terphenyl-D14	623	666	94	66-124	
2,4,6-Tribromophenol	1320	1330	99	63-133	

Lab Batch #: 95823 **Sample:** 12020236-001 / SMP **Matrix:** Soil

Units: ug/kg

TCL Semivolatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
2-Fluorobiphenyl	740	666	111	72-111	
2-Fluorophenol	980	1330	73	56-107	
Nitrobenzene-d5	640	666	96	65-115	
Phenol-d6	1200	1330	93	59-106	
Terphenyl-D14	770	666	116	66-124	
2,4,6-Tribromophenol	1400	1330	107	63-133	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

Phase Separation Science, Inc.
6630 Baltimore National Pike
Baltimore, MD 21228

Form 2 - Surrogate Recoveries

Project Name: Bloede Dam

02/09/2012

Work Order #: 12020236 **Project ID:** N/A

Lab Batch #: 95823 **Sample:** 12020236-002 / SMP **Matrix:** Soil

Units: ug/kg

TCL Semivolatile Organic Compounds Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [C]	Control Limits %R	Flags
2-Fluorobiphenyl	620	664	94	72-111	
2-Fluorophenol	740	1330	56	56-107	
Nitrobenzene-d5	560	664	84	65-115	
Phenol-d6	1000	1330	78	59-106	
Terphenyl-D14	690	664	104	66-124	
2,4,6-Tribromophenol	1100	1330	84	63-133	

* Surrogate outside of Laboratory QC limits

Surrogate Recovery [C] = 100 * A / B

Phase Separation Science, Inc.
6630 Baltimore National Pike
Baltimore, MD 21228

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	12020236	**Received By**	Sara Dorr
Client Name	Maryland Geological Survey (MGS)	**Date Received**	02/02/2012 03:50:00 PM
Project Name	Bloede Dam	**Delivered By**	Client
Project Number	N/A	**Tracking No**	Not Applicable
Disposal Date	03/08/2012	**Logged In By**	Sara Dorr

Shipping Container(s)

No. of Coolers	1	Ice	Present
		Temp (deg C)	8
Custody Seal(s) Intact?	N/A	Temp Blank Present	No
Seal(s) Signed / Dated?	N/A		

Documentation

		Sampler Name	Richard Ortt
		MD DW Cert. No.	N/A
COC agrees with sample labels?	Yes		
Chain of Custody	Yes		

Sample Container

		Custody Seal(s) Intact?	Not Applicable
Appropriate for Specified Analysis?	Yes	Seal(s) Signed / Dated	Not Applicable
Intact?	Yes		
Labeled and Labels Legible?	Yes		

Total No. of Samples Received 2

Total No. of Containers Received 2

Preservation

Metals	(pH<2)	N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, COD, Phenols	(ph<2)	N/A
TOX, TKN, NH3, Total Phos	(pH<2)	N/A
VOC, BTEX (VOA Vials Rcvd Preserved)	(pH<2)	N/A
Do VOA vials have zero headspace?		N/A

Comments: (Any "No" response must be detailed in the comments section below.)

For any improper preservation conditions, list sample ID, preservative added (reagent ID number) below as well as documentation of any client notification as well as client instructions. Samples for pH, chlorine and dissolved oxygen should be analyzed as soon as possible, preferably in the field at the time of sampling. Samples which require thermal preservation shall be considered acceptable when received at a temperature above freezing to 6°C. Samples that are hand delivered on the day that they are collected may not meet these criteria but shall be considered acceptable if there is evidence that the chilling process has begun such as arrival on ice.

Samples Inspected/Checklist Completed By: Sara Dorr — Date: 02/02/2012

PM Review and Approval: Lynn Moran — Date: 02/07/2012

Appendix C: Pollutant Summary Tables

Table C-1. Pollutant Summary Table. Abbreviations used: RL= Reporting Limit, LOD= Limit of Detection.

		Core #1 Upper			Core #1 Lower			Core #3			Core #5 Upper			Core #5 Lower		
Compound	Units	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result
TAL Metals																
Aluminum	mg/kg	850	510	20000	1500	770	37000	450	220	3500	460	230	4000	510	260	3000
Antimony	mg/kg	2.1	1.3	ND	3.9	1.9	ND	2.2	1.1	ND	2.3	1.2	3.2	2.6	1.3	ND
Arsenic	mg/kg	0.43	0.26	3.5	0.77	0.39	6.2	0.45	0.22	2.9	0.46	0.23	0.9	0.51	0.26	0.7
Barium	mg/kg	2.1	1.3	120	3.9	1.9	200	2.2	1.1	23	2.3	1.2	20	2.6	1.3	20
Beryllium	mg/kg	2.1	1.3	ND	3.9	1.9	ND	2.2	1.1	ND	2.3	1.2	ND	2.6	1.3	ND
Cadmium	mg/kg	2.1	1.3	ND	3.9	1.9	ND	2.2	1.1	ND	2.3	1.2	ND	2.6	1.3	ND
Calcium	mg/kg	850	510	2000	1500	770	3000	45	22	1900	460	230	1800	510	260	2900
Chromium	mg/kg	2.1	1.3	48	3.9	1.9	71	2.2	1.1	61	2.3	1.2	20	2.6	1.3	16
Cobalt	mg/kg	2.1	1.3	13	3.9	1.9	22	2.2	1.1	11	2.3	1.2	4.5	2.6	1.3	3.4
Copper	mg/kg	2.1	1.3	28	3.9	1.9	51	2.2	1.1	5.5	2.3	1.2	13	2.6	1.3	6.3
Iron	mg/kg	850	510	25000	1500	770	40000	450	220	18000	460	230	5000	510	260	6800
Lead	mg/kg	2.1	1.3	31	3.9	1.9	63	2.2	1.1	3.6	2.3	1.2	53	2.6	1.3	4.9
Magnesium	mg/kg	850	510	5100	1500	770	6900	45	22	1400	46	23	1600	51	26	2300
Mangaese	mg/kg	43	26	370	77	39	650	22	11	290	2.3	1.2	120	2.6	1.3	110
Mercury	mg/kg	0.085	0.051	ND	0.15	0.077	0.18	0.089	0.045	ND	0.093	0.046	ND	0.1	0.051	ND
Nickel	mg/kg	2.1	1.3	28	3.9	1.9	39	2.2	1.1	41	2.3	1.2	14	2.6	1.3	8.5
Potassium	mg/kg	850	510	2700	77	39	3500	45	22	540	460	230	570	510	260	850
Selenium	mg/kg	2.1	1.3	ND	3.9	1.9	ND	2.2	1.1	ND	2.3	1.2	ND	2.6	1.3	ND
Silver	mg/kg	2.1	1.3	ND	3.9	1.9	ND	2.2	1.1	ND	2.3	1.2	ND	2.6	1.3	ND
Sodium	mg/kg	43	26	84	77	39	140	45	22	88	46	23	71	51	26	ND
Thallium	mg/kg	1.7	1	ND	3.1	1.5	ND	1.8	0.89	ND	1.9	0.93	ND	2	1	ND
Vanadium	mg/kg	2.1	1.3	40	3.9	1.9	59	2.2	1.1	13	2.3	1.2	7.8	2.6	1.3	10
Zinc	mg/kg	8.5	5.1	61	15	7.7	110	8.9	4.5	25	9.3	4.6	11	10	5.1	11
Total Petroleum Hydrocarbons -- Diesel Range Organics (DRO)																
TPH-DRO	mg/kg	4.9	4.9	ND	6.6	6.6	24	4.1	4.1	ND	4.1	4.1	ND	4.2	1.2	ND
Total Petroleum Hydrocarbons -- Gasoline Range Organics (GRO)																
TPH-GRO	ug/kg	120	48	ND	160	65	ND	100	40	ND	100	41	ND	100	41	ND
Organochlorine Pesticides																
alpha-BHC	ug/kg	9.7	4.8	ND	13	6.6	ND	8.2	4.1	ND	8.2	4.1	ND	8.3	4.2	ND
gamma-BHC (Lindane)	ug/kg	9.7	4.8	ND	13	6.6	ND	8.2	4.1	ND	8.2	4.1	ND	8.3	4.2	ND
beta-BHC	ug/kg	9.7	4.8	ND	13	6.6	ND	8.2	4.1	ND	8.2	4.1	ND	8.3	4.2	ND
delta-BHC	ug/kg	9.7	4.8	ND	13	6.6	ND	8.2	4.1	ND	8.2	4.1	ND	8.3	4.2	ND

Table C-1. Pollutant Summary Table. Abbreviations used: RL= Reporting Limit, LOD= Limit of Detection.

		Core #1 Upper			Core #1 Lower			Core #3			Core #5 Upper			Core #5 Lower		
Compound	Units	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result
Heptachlor	ug/kg	9.7	4.8	ND	13	6.6	ND	8.2	4.1	ND	8.2	4.1	ND	8.3	4.2	ND
Aldrin	ug/kg	9.7	4.8	ND	13	6.6	ND	8.2	4.1	ND	8.2	4.1	ND	8.3	4.2	ND
Hyptachlor epoxide	ug/kg	9.7	4.8	ND	13	6.6	ND	8.2	4.1	ND	8.2	4.1	ND	8.3	4.2	ND
gamma-Chlordane	ug/kg	9.7	4.8	ND	13	6.6	ND	8.2	4.1	ND	8.2	4.1	ND	8.3	4.2	ND
alpha-Chlorodane	ug/kg	9.7	4.8	ND	13	6.6	ND	8.2	4.1	ND	8.2	4.1	ND	8.3	4.2	ND
4,4-DDE	ug/kg	9.7	4.8	ND	13	6.6	ND	8.2	4.1	ND	8.2	4.1	ND	8.3	4.2	ND
Endosulfan I	ug/kg	9.7	4.8	ND	13	6.6	ND	8.2	4.1	ND	8.2	4.1	ND	8.3	4.2	ND
Dieldrin	ug/kg	9.7	4.8	ND	13	6.6	ND	8.2	4.1	ND	8.2	4.1	ND	8.3	4.2	ND
Endrin	ug/kg	9.7	4.8	ND	13	6.6	ND	8.2	4.1	ND	8.2	4.1	ND	8.3	4.2	ND
4,4-DDD	ug/kg	9.7	4.8	ND	13	6.6	ND	8.2	4.1	ND	8.2	4.1	ND	8.3	4.2	ND
Endosulfan II	ug/kg	9.7	4.8	ND	13	6.6	ND	8.2	4.1	ND	8.2	4.1	ND	8.3	4.2	ND
4,4-DDT	ug/kg	9.7	4.8	ND	13	6.6	ND	8.2	4.1	ND	8.2	4.1	ND	8.3	4.2	ND
Endrin aldehyde	ug/kg	9.7	4.8	ND	13	6.6	ND	8.2	4.1	ND	8.2	4.1	ND	8.3	4.2	ND
Methoxychlor	ug/kg	9.7	4.8	ND	13	6.6	ND	8.2	4.1	ND	8.2	4.1	ND	8.3	4.2	ND
Endosulfan sulfate	ug/kg	9.7	4.8	ND	13	6.6	ND	8.2	4.1	ND	8.2	4.1	ND	8.3	4.2	ND
Endrin ketone	ug/kg	9.7	4.8	ND	13	6.6	ND	8.2	4.1	ND	8.2	4.1	ND	8.3	4.2	ND
Toxaphene	ug/kg	240	120	ND	330	170	ND	210	100	ND	210	100	ND	210	100	ND
Chlordane	ug/kg	240	120	ND	330	170	ND	210	100	ND	210	100	ND	210	100	ND
Polychlorinated Biphenyls																
PCB-1016	mg/kg	0.12	0.061	ND	0.17	0.083	ND	0.1	0.051	ND	0.1	0.051	ND	0.1	0.052	ND
PCB-1221	mg/kg	0.12	0.061	ND	0.17	0.083	ND	0.1	0.051	ND	0.1	0.051	ND	0.1	0.052	ND
PCB-1232	mg/kg	0.12	0.061	ND	0.17	0.083	ND	0.1	0.051	ND	0.1	0.051	ND	0.1	0.052	ND
PCB-1242	mg/kg	0.12	0.061	ND	0.17	0.083	ND	0.1	0.051	ND	0.1	0.051	ND	0.1	0.052	ND
PCB-1248	mg/kg	0.12	0.061	ND	0.17	0.083	ND	0.1	0.051	ND	0.1	0.051	ND	0.1	0.052	ND
PCB-1254	mg/kg	0.12	0.061	ND	0.17	0.083	ND	0.1	0.051	ND	0.1	0.051	ND	0.1	0.052	ND
PCB-1260	mg/kg	0.12	0.061	ND	0.17	0.083	ND	0.1	0.051	ND	0.1	0.051	ND	0.1	0.052	ND
Volatile Organic Compounds (VOC)																
Dichlorodifluor omethane	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND
Chloromethan	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND

Table C-1. Pollutant Summary Table. Abbreviations used: RL= Reporting Limit, LOD= Limit of Detection.

		Core #1 Upper			Core #1 Lower			Core #3			Core #5 Upper			Core #5 Lower		
Compound	Units	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result
e																
1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND
Vinyl Chloride	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND
Bromomethane	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND
Chloroethane	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND
Acetone	ug/kg	24	12	ND	34	17	110	20	10	ND	20	10	ND	21	10	ND
Cyclohexane	ug/kg	24	12	ND	34	17	ND	20	10	ND	20	10	ND	21	10	ND
Trichlorofluoromethane	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND
1,1-Dichloroethene	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND
Methylene Chloride	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND
trans-1,2-Dichloroethene	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND
Methyl-t-butyl ether	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND
1,1-Dichloroethane	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND
2-Butanone (MEK)	ug/kg	24	12	ND	34	17	27	20	10	ND	20	10	ND	21	10	ND
cis-1,2-Dichloroethene	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND
Bromochloromethane	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND
Chloroform	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND
1,1,1-	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND

Table C-1. Pollutant Summary Table. Abbreviations used: RL= Reporting Limit, LOD= Limit of Detection.

		Core #1 Upper			Core #1 Lower			Core #3			Core #5 Upper			Core #5 Lower		
Compound	Units	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result
Trichloroethane																
1,2-Dichloroethane	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND
Carbon Tetrachloride	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND
Benzene	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND
1,2-Dichloropropane	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND
Carbon Disulfide	ug/kg	12	6.1	ND	17	8.5	ND	10	5.1	ND	10	5.1	ND	10	5.2	ND
Methylcyclohexane	ug/kg	24	12	ND	34	17	ND	20	10	ND	20	10	ND	21	10	ND
Trichloroethene	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND
Methyl Acetate	ug/kg	24	12	ND	34	17	ND	20	10	ND	20	10	ND	21	10	ND
Bromodichloromethane	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND
cis-1,3-Dichloropropene	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND
4-Methyl-2-Pentanone	ug/kg	24	12	ND	34	17	ND	20	10	ND	20	10	ND	21	10	ND
trans-1,3-Dichloropropene	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND
1,1,2-Trichloroethane	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND
Toluene	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND
2-Hexanone	ug/kg	24	12	ND	34	17	ND	20	10	ND	20	10	ND	21	10	ND
1,2-Dibromoethan	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND

Table C-1. Pollutant Summary Table. Abbreviations used: RL= Reporting Limit, LOD= Limit of Detection.

		Core #1 Upper			Core #1 Lower			Core #3			Core #5 Upper			Core #5 Lower		
Compound	Units	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result
e (EDB)																
Dibromochloromethane	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND
Bromoform	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND
Tetrachloroethene	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND
Chlorobenzene	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND
Ethylbenzene	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND
m,p-Xylenes	ug/kg	12	6.1	ND	17	8.5	ND	10	5.1	ND	10	5.1	ND	10	5.2	ND
Styrene	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND
1,1,2,2-Tetrachloroethane	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND
o-Xylene	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND
Isopropylbenzene	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND
1,3-Dichlorobenzene	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND
1,4-Dichlorobenzene	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND
1,2-Dichlorobenzene	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND
1,2-Dibromo-3-Chloropropane	ug/kg	48	24	ND	68	34	ND	40	20	ND	41	20	ND	42	21	ND
1,2,4-Trichlorobenzene	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND
Naphthalene	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND
1,2,3-Trichlorobenz	ug/kg	6.1	3	ND	8.5	4.2	ND	5.1	2.5	ND	5.1	2.5	ND	5.2	2.6	ND

Table C-1. Pollutant Summary Table. Abbreviations used: RL= Reporting Limit, LOD= Limit of Detection.

		Core #1 Upper			Core #1 Lower			Core #3			Core #5 Upper			Core #5 Lower		
Compound	Units	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result
ene																
Semi-Volatile Organic Compounds (SVOC)																
Acenaphthene	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
Acenaphthylene	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
Acetophenone	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
Anthracene	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
Benzo(a)anthracene	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
Benzo(a)pyrene	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
Benzo(b)fluoranthene	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
Benzo(g,h,i)perylene	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
Benzo(k)fluoranthene	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
Biphenyl (Diphenyl)	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
Butyl benzyl phthalate	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
bis(2-chloroethoxy) methane	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
bis(2-chloroethyl) ether	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
bis(2-chloroisopropyl) ether	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
bis(2-ethylhexyl) phthalate	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
4-Bromophenylphenyl ether	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND

Table C-1. Pollutant Summary Table. Abbreviations used: RL= Reporting Limit, LOD= Limit of Detection.

		Core #1 Upper			Core #1 Lower			Core #3			Core #5 Upper			Core #5 Lower		
Compound	Units	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result
Di-n-butyl phthalate	ug/kg	400	200	ND	550	280	ND	340	170	ND	340	170	ND	350	170	ND
Carbazole	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
4-Chloro-3-methyl phenol	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
4-Chloroaniline	ug/kg	400	200	ND	550	280	ND	340	170	ND	340	170	ND	350	170	ND
2-Chloronaphthalene	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
2-Chlorophenol	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
4-Chlorophenyl Phenyl ether	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
Chrysene	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
Dibenz(a,h)Anthracene	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
Dibenzofuran	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
3,3-Dichlorobenzidine	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
2,4-Dichlorophenol	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
Diethyl phthalate	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
Dimethyl phthalate	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
2,4-Dimethylphenol	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
4,6-Dinitro-2-methyl phenol	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
2,4-Dinitrophenol	ug/kg	400	200	ND	550	280	ND	340	170	ND	340	170	ND	350	170	ND

Table C-1. Pollutant Summary Table. Abbreviations used: RL= Reporting Limit, LOD= Limit of Detection.

		Core #1 Upper			Core #1 Lower			Core #3			Core #5 Upper			Core #5 Lower		
Compound	Units	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result
2,4-Dinitrotoluene	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
2,6-Dinitrotoluene	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
Fluoranthene	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
Fluorene	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
Hexachlorobenzene	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
Hexachlorobutadiene	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
Hexachlorocyclopentadiene	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
Hexachloroethane	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
Indeno(1,2,3-c,d)Pyrene	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
Isophorone	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
2-Methylnaphthalene	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
2-Methyl phenol	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
3&4-Methylphenol	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
Naphthalene	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
4-Nitroaniline	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
3-Nitroaniline	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
2-Nitroaniline	ug/kg	400	200	ND	550	280	ND	340	170	ND	340	170	ND	350	170	ND
Nitrobenzene	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
2-Nitrophenol	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
4-Nitrophenol	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
N-Nitrosodi-n-propyl amine	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
N-Nitrosodiphenylamine	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND

Table C-1. Pollutant Summary Table. Abbreviations used: RL= Reporting Limit, LOD= Limit of Detection.

		Core #1 Upper			Core #1 Lower			Core #3			Core #5 Upper			Core #5 Lower		
Compound	Units	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result
Di-n-octyl phthalate	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
Pentachlorophenol	ug/kg	400	200	ND	550	280	ND	340	170	ND	340	170	ND	350	170	ND
Phenanthrene	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
Phenol	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
Atrazine	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
Pyrene	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
Pyridine	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
Caprolactam	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
2,4,6-Trichlorophenol	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
2,4,5-Trichlorophenol	ug/kg	200	100	ND	280	140	ND	170	86	ND	170	86	ND	170	87	ND
Cyanide																
Cyanide	mg/kg	0.18	0.091	0.29	0.25	0.12	0.17	0.15	0.077	ND	0.15	0.076	ND	0.15	0.077	ND

Table C-1. Pollutant Summary Table. Abbreviations used: RL=Reporting Limit, LOD=Limit of Detection																
		Core #6 Upper			Core #6 Lower			Core #8 Upper			Core #8 Lower			Core #9 (3) Upper		
Compound	Units	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result
TAL Metals																
Aluminum	mg/kg	380	190	3000	440	220	3800	850	430	4800	950	470	4400	920	460	4800
Antimony	mg/kg	1.9	0.96	ND	2.2	1.1	ND	2.1	1.1	ND	2.4	1.2	ND	2.3	1.2	ND
Arsenic	mg/kg	0.38	0.19	1.3	0.44	0.22	2.5	0.43	0.21	0.83	0.47	0.24	1.2	0.46	0.23	1.1
Barium	mg/kg	1.9	0.96	24	2.2	1.1	25	2.1	1.1	26	2.4	1.2	29	2.3	1.2	31
Beryllium	mg/kg	1.9	0.96	ND	2.2	1.1	ND	2.1	1.1	ND	2.4	1.2	ND	2.3	1.2	ND
Cadmium	mg/kg	1.9	0.96	ND	2.2	1.1	ND	2.1	1.1	ND	2.4	1.2	ND	2.3	1.2	ND
Calcium	mg/kg	380	190	1000	440	220	7800	850	430	3500	47	24	1500	46	23	1500
Chromium	mg/kg	1.9	0.96	84	2.2	1.1	55	2.1	1.1	15	2.4	1.2	53	2.3	1.2	61
Cobalt	mg/kg	1.9	0.96	4.4	2.2	1.1	5.2	2.1	1.1	3.9	2.4	1.2	4.3	2.3	1.2	5.1
Copper	mg/kg	1.9	0.96	5.6	2.2	1.1	26	2.1	1.1	5.7	2.4	1.2	6.2	2.3	1.2	12
Iron	mg/kg	380	190	8500	440	220	19000	850	430	5700	950	470	8900	920	460	8700
Lead	mg/kg	1.9	0.96	7.6	2.2	1.1	6.2	2.1	1.1	5.2	2.4	1.2	5.9	2.3	1.2	16
Magnesium	mg/kg	38	19	1300	440	220	3200	850	430	2000	950	470	1800	920	460	2100
Manganese	mg/kg	1.9	0.96	120	2.2	1.1	170	43	21	120	47	24	110	46	23	140
Mercury	mg/kg	0.08	0.04	ND	0.09	0.04	ND	0.09	0.04	ND	0.1	0.05	ND	0.09	0.05	ND
Nickel	mg/kg	1.9	0.96	11	2.2	1.1	20	2.1	1.1	6.9	2.4	1.2	11	2.3	1.2	18
Potassium	mg/kg	380	190	740	440	220	1100	850	430	1300	950	470	990	46	23	800
Selenium	mg/kg	1.9	0.96	ND	2.2	1.1	ND	2.1	1.1	ND	2.4	1.2	ND	2.3	1.2	ND
Silver	mg/kg	1.9	0.96	ND	2.2	1.1	ND	2.1	1.1	ND	2.4	1.2	ND	2.3	1.2	ND
Sodium	mg/kg	38	19	ND	44	22	ND	43	21	140	47	24	ND	46	23	150
Thallium	mg/kg	1.5	0.76	ND	1.8	0.89	ND	1.7	0.85	ND	1.9	0.95	ND	1.8	0.92	ND
Vanadium	mg/kg	1.9	0.96	15	2.2	1.1	21	2.1	1.1	9.6	2.4	1.2	14	2.3	1.2	17
Zinc	mg/kg	7.6	3.8	13	8.9	4.4	18	8.5	4.3	13	9.5	4.7	18	9.2	4.6	17
Total Petroleum Hydrocarbons -- Diesel Range Organics (DRO)																
TPH-DRO	mg/kg	4.1	4.1	ND	4.2	4.2	ND	4.1	4.1	ND	4.2	4.2	ND	4.1	4.1	ND
Total Petroleum Hydrocarbons -- Gasoline Range Organics (GRO)																
TPH-GRO	ug/kg	100	41	ND	100	42	ND	100	41	ND	100	41	ND	100	41	ND
Organochlorine Pesticides																

Table C-1. Pollutant Summary Table. Abbreviations used: RL=Reporting Limit, LOD=Limit of Detection																
		Core #6 Upper			Core #6 Lower			Core #8 Upper			Core #8 Lower			Core #9 (3) Upper		
Compound	Units	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result
alpha-BHC	ug/kg	8.2	4.1	ND	8.3	4.2	ND	8.3	4.2	ND	8.5	4.2	ND	8.3	4.2	ND
gamma-BHC (Lindane)	ug/kg	8.2	4.1	ND	8.3	4.2	ND	8.3	4.2	ND	8.5	4.2	ND	8.3	4.2	ND
beta-BHC	ug/kg	8.2	4.1	ND	8.3	4.2	ND	8.3	4.2	ND	8.5	4.2	ND	8.3	4.2	ND
delta-BHC	ug/kg	8.2	4.1	ND	8.3	4.2	ND	8.3	4.2	ND	8.5	4.2	ND	8.3	4.2	ND
Heptachlor	ug/kg	8.2	4.1	ND	8.3	4.2	ND	8.3	4.2	ND	8.5	4.2	ND	8.3	4.2	ND
Aldrin	ug/kg	8.2	4.1	ND	8.3	4.2	ND	8.3	4.2	ND	8.5	4.2	ND	8.3	4.2	ND
Hyptachlor epoxide	ug/kg	8.2	4.1	ND	8.3	4.2	ND	8.3	4.2	ND	8.5	4.2	ND	8.3	4.2	ND
gamma-Chlordane	ug/kg	8.2	4.1	ND	8.3	4.2	ND	8.3	4.2	ND	8.5	4.2	ND	8.3	4.2	ND
alpha-Chlorodane	ug/kg	8.2	4.1	ND	8.3	4.2	ND	8.3	4.2	ND	8.5	4.2	ND	8.3	4.2	ND
4,4-DDE	ug/kg	8.2	4.1	ND	8.3	4.2	ND	8.3	4.2	ND	8.5	4.2	ND	8.3	4.2	ND
Endosulfan I	ug/kg	8.2	4.1	ND	8.3	4.2	ND	8.3	4.2	ND	8.5	4.2	ND	8.3	4.2	ND
Dieldrin	ug/kg	8.2	4.1	ND	8.3	4.2	ND	8.3	4.2	ND	8.5	4.2	ND	8.3	4.2	ND
Endrin	ug/kg	8.2	4.1	ND	8.3	4.2	ND	8.3	4.2	ND	8.5	4.2	ND	8.3	4.2	ND
4,4-DDD	ug/kg	8.2	4.1	ND	8.3	4.2	ND	8.3	4.2	ND	8.5	4.2	ND	8.3	4.2	ND
Endosulfan II	ug/kg	8.2	4.1	ND	8.3	4.2	ND	8.3	4.2	ND	8.5	4.2	ND	8.3	4.2	ND
4,4-DDT	ug/kg	8.2	4.1	ND	8.3	4.2	ND	8.3	4.2	ND	8.5	4.2	ND	8.3	4.2	ND
Endrin aldehyde	ug/kg	8.2	4.1	ND	8.3	4.2	ND	8.3	4.2	ND	8.5	4.2	ND	8.3	4.2	ND
Methoxychlor	ug/kg	8.2	4.1	ND	8.3	4.2	ND	8.3	4.2	ND	8.5	4.2	ND	8.3	4.2	ND
Endosulfan sulfate	ug/kg	8.2	4.1	ND	8.3	4.2	ND	8.3	4.2	ND	8.5	4.2	ND	8.3	4.2	ND
Endrin ketone	ug/kg	8.2	4.1	ND	8.3	4.2	ND	8.3	4.2	ND	8.5	4.2	ND	8.3	4.2	ND
Toxaphene	ug/kg	210	100	ND	210	100	ND	210	100	ND	210	110	ND	210	100	ND
Chlordane	ug/kg	210	100	ND	210	100	ND	210	100	ND	210	110	ND	210	100	ND
Polychlorinated Biphenyls																
PCB-1016	mg/kg	0.1	0.05	ND	0.1	0.05	ND	0.1	0.05	ND	0.11	0.05	ND	0.1	0.05	ND
PCB-1221	mg/kg	0.1	0.05	ND	0.1	0.05	ND	0.1	0.05	ND	0.11	0.05	ND	0.1	0.05	ND
PCB-1232	mg/kg	0.1	0.05	ND	0.1	0.05	ND	0.1	0.05	ND	0.11	0.05	ND	0.1	0.05	ND

Table C-1. Pollutant Summary Table. Abbreviations used: RL=Reporting Limit, LOD=Limit of Detection																
		Core #6 Upper			Core #6 Lower			Core #8 Upper			Core #8 Lower			Core #9 (3) Upper		
Compound	Units	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result
PCB-1242	mg/kg	0.1	0.05	ND	0.1	0.05	ND	0.1	0.05	ND	0.11	0.05	ND	0.1	0.05	ND
PCB-1248	mg/kg	0.1	0.05	ND	0.1	0.05	ND	0.1	0.05	ND	0.11	0.05	ND	0.1	0.05	ND
PCB-1254	mg/kg	0.1	0.05	ND	0.1	0.05	ND	0.1	0.05	ND	0.11	0.05	ND	0.1	0.05	ND
PCB-1260	mg/kg	0.1	0.05	ND	0.1	0.05	ND	0.1	0.05	ND	0.11	0.05	ND	0.1	0.05	ND
Volatile Organic Compounds (VOC)																
Dichlorodifluoromethane	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND
Chloromethane	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND
1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND
Vinyl Chloride	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND
Bromomethane	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND
Chloroethane	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND
Acetone	ug/kg	21	10	ND	21	10	ND	20	10	ND	21	11	ND	21	11	ND
Cyclohexane	ug/kg	21	10	ND	21	10	ND	20	10	ND	21	11	ND	21	11	ND
Trichlorofluoromethane	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND
1,1-Dichloroethene	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND
Methylene Chloride	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	4.1	5.3	2.7	ND
trans-1,2-Dichloroethene	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND
Methyl-t-butyl ether	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND
1,1-Dichloroethan	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND

Table C-1. Pollutant Summary Table. Abbreviations used: RL=Reporting Limit, LOD=Limit of Detection																
		Core #6 Upper			Core #6 Lower			Core #8 Upper			Core #8 Lower			Core #9 (3) Upper		
Compound	Units	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result
e																
2-Butanone (MEK)	ug/kg	21	10	ND	21	10	ND	20	10	ND	21	11	ND	21	11	ND
cis-1,2-Dichloroethene	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND
Bromochloromethane	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND
Chloroform	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND
1,1,1-Trichloroethane	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND
1,2-Dichloroethane	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND
Carbon Tetrachloride	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND
Benzene	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND
1,2-Dichloropropane	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND
Carbon Disulfide	ug/kg	10	5.2	ND	10	5.2	ND	10	5.1	ND	11	5.3	ND	11	5.3	ND
Methylcyclohexane	ug/kg	21	10	ND	21	10	ND	20	10	ND	21	11	ND	21	11	ND
Trichloroethene	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND
Methyl Acetate	ug/kg	21	10	ND	21	10	ND	20	10	ND	21	11	ND	21	11	ND
Bromodichloromethane	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND
cis-1,3-Dichloropropene	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND
4-Methyl-2-Pentanone	ug/kg	21	10	ND	21	10	ND	20	10	ND	21	11	ND	21	11	ND

Table C-1. Pollutant Summary Table. Abbreviations used: RL=Reporting Limit, LOD=Limit of Detection																
		Core #6 Upper			Core #6 Lower			Core #8 Upper			Core #8 Lower			Core #9 (3) Upper		
Compound	Units	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result
trans-1,3-Dichloropropene	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND
1,1,2-Trichloroethane	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND
Toluene	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND
2-Hexanone	ug/kg	21	10	ND	21	10	ND	20	10	ND	21	11	ND	21	11	ND
1,2-Dibromoethane (EDB)	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND
Dibromochloromethane	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND
Bromoform	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND
Tetrachloroethene	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND
Chlorobenzene	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND
Ethylbenzene	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND
m,p-Xylenes	ug/kg	10	5.2	ND	10	5.2	ND	10	5.1	ND	11	5.3	ND	11	5.3	ND
Styrene	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND
1,1,2,2-Tetrachloroethane	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND
o-Xylene	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND
Isopropylbenzene	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND
1,3-Dichlorobenzene	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND
1,4-Dichlorobenzene	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND
1,2-	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND

Table C-1. Pollutant Summary Table. Abbreviations used: RL=Reporting Limit, LOD=Limit of Detection																
		Core #6 Upper			Core #6 Lower			Core #8 Upper			Core #8 Lower			Core #9 (3) Upper		
Compound	Units	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result
Dichlorobenzene																
1,2-Dibromo-3-Chloropropane	ug/kg	42	21	ND	42	21	ND	41	20	ND	43	21	ND	42	21	ND
1,2,4-Trichlorobenzene	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND
Naphthalene	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND
1,2,3-Trichlorobenzene	ug/kg	5.2	2.6	ND	5.2	2.6	ND	5.1	2.5	ND	5.3	2.7	ND	5.3	2.7	ND
Semi-Volatile Organic Compounds (SVOC)																
Acenaphthene	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
Acenaphthylene	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
Acetophenone	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
Anthracene	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
Benzo(a)anthracene	ug/kg	170	85	ND	170	87	ND	170	86	190	180	89	ND	170	87	ND
Benzo(a)pyrene	ug/kg	170	85	ND	170	87	ND	170	86	150	180	89	ND	170	87	ND
Benzo(b)fluoranthene	ug/kg	170	85	ND	170	87	ND	170	86	170	180	89	ND	170	87	ND
Benzo(g,h,i)perylene	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
Benzo(k)fluoranthene	ug/kg	170	85	ND	170	87	ND	170	86	150	180	89	ND	170	87	ND
Biphenyl (Diphenyl)	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
Butyl benzyl phthalate	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
bis(2-chloroethoxy) methane	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND

Table C-1. Pollutant Summary Table. Abbreviations used: RL=Reporting Limit, LOD=Limit of Detection																
		Core #6 Upper			Core #6 Lower			Core #8 Upper			Core #8 Lower			Core #9 (3) Upper		
Compound	Units	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result
bis(2-chloroethyl) ether	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
bis(2-chloroisopropyl) ether	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
bis(2-ethylhexyl) phthalate	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
4-Bromophenylphenyl ether	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
Di-n-butyl phthalate	ug/kg	340	170	ND	350	170	ND	350	170	ND	350	180	ND	350	170	ND
Carbazole	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
4-Chloro-3-methyl phenol	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
4-Chloroaniline	ug/kg	340	170	ND	350	170	ND	350	170	ND	350	180	ND	350	170	ND
2-Chloronaphthalene	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
2-Chlorophenol	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
4-Chlorophenyl Phenyl ether	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
Chrysene	ug/kg	170	85	ND	170	87	ND	170	86	210	180	89	ND	170	87	ND
Dibenz(a,h)Anthracene	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
Dibenzofuran	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
3,3-Dichlorobenzidine	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
2,4-	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND

Table C-1. Pollutant Summary Table. Abbreviations used: RL=Reporting Limit, LOD=Limit of Detection																
		Core #6 Upper			Core #6 Lower			Core #8 Upper			Core #8 Lower			Core #9 (3) Upper		
Compound	Units	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result
Dichlorophenol																
Diethyl phthalate	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
Dimethyl phthalate	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
2,4-Dimethylphenol	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
4,6-Dinitro-2-methyl phenol	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
2,4-Dinitrophenol	ug/kg	340	170	ND	350	170	ND	350	170	ND	350	180	ND	350	170	ND
2,4-Dinitrotoluene	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
2,6-Dinitrotoluene	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
Fluoranthene	ug/kg	170	85	ND	170	87	ND	170	86	360	180	89	ND	170	87	ND
Fluorene	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
Hexachlorobenzene	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
Hexachlorobutadiene	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
Hexachlorocyclopentadiene	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
Hexachloroethane	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
Indeno(1,2,3-c,d)Pyrene	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
Isophorone	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
2-Methylnaphthalene	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
2-Methyl phenol	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
3&4-	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND

Table C-1. Pollutant Summary Table. Abbreviations used: RL=Reporting Limit, LOD=Limit of Detection																
		Core #6 Upper			**Core #6 Lower**			**Core #8 Upper**			**Core #8 Lower**			**Core #9 (3) Upper**		
Compound	Units	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result	RL	LOD	Result
Methylphenol																
Naphthalene	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
4-Nitroaniline	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
3-Nitroaniline	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
2-Nitroaniline	ug/kg	340	170	ND	350	170	ND	350	170	ND	350	180	ND	350	170	ND
Nitrobenzene	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
2-Nitrophenol	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
4-Nitrophenol	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
N-Nitrosodi-n-propyl amine	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
N-Nitrosodiphenylamine	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
Di-n-octyl phthalate	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
Pentachlorophenol	ug/kg	340	170	ND	350	170	ND	350	170	ND	350	180	ND	350	170	ND
Phenanthrene	ug/kg	170	85	ND	170	87	ND	170	86	290	180	89	ND	170	87	ND
Phenol	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
Atrazine	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
Pyrene	ug/kg	170	85	ND	170	87	ND	170	86	430	180	89	ND	170	87	ND
Pyridine	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
Caprolactam	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
2,4,6-Trichlorophenol	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
2,4,5-Trichlorophenol	ug/kg	170	85	ND	170	87	ND	170	86	ND	180	89	ND	170	87	ND
Cyanide																
Cyanide	mg/kg	0.15	0.08	ND	0.15	0.08	ND	0.06	0.03	ND	0.06	0.03	ND	0.06	0.03	ND

Table C-1. Pollutant Summary Table. Abbreviations used: RL=Reporting Limit, LOD = Limit of Detection													
		Core #9 (3) Lower			**Core #8 Duplicate**			**Core #8 Upstream**			**Core #8 Downstream**		
Compound	Units	Reporting Limit	Limit of Detection	Results	Reporting Limit	Limit of Detection	Results	Reporting Limit	Limit of Detection	Results	Reporting Limit	Limit of Detection	Results
TAL Metals													
Aluminum	mg/kg	740	370	3100									
Antimony	mg/kg	1.9	0.93	ND									
Arsenic	mg/kg	0.37	0.19	0.82									
Barium	mg/kg	1.9	0.93	26									
Beryllium	mg/kg	1.9	0.93	ND									
Cadmium	mg/kg	1.9	0.93	ND									
Calcium	mg/kg	37	19	960									
Chromium	mg/kg	1.9	0.93	32									
Cobalt	mg/kg	1.9	0.93	3.7									
Copper	mg/kg	1.9	0.93	9.2									
Iron	mg/kg	740	370	8300									
Lead	mg/kg	1.9	0.93	7.8									
Magnesium	mg/kg	740	370	1200									
Manganese	mg/kg	37	19	100									
Mercury	mg/kg	0.07	0.04	ND									
Nickel	mg/kg	1.9	0.93	6.7									
Potassium	mg/kg	37	19	670									
Selenium	mg/kg	1.9	0.93	ND									
Silver	mg/kg	1.9	0.93	ND									
Sodium	mg/kg	37	19	ND									
Thallium	mg/kg	1.5	0.74	ND									
Vanadium	mg/kg	1.9	0.93	15									
Zinc	mg/kg	7.4	3.7	16									
Total Petroleum Hydrocarbons -- Diesel Range Organics (DRO)													
TPH-DRO	mg/kg	4.1	4.1	ND				4.1	4.1	ND	4.2	4.2	ND
Total Petroleum Hydrocarbons -- Gasoline Range Organics (GRO)													
TPH-GRO	ug/kg	100	41	ND				100	41	ND	100	41	ND
Organochlorine Pesticides													

Table C-1. Pollutant Summary Table. Abbreviations used: RL=Reporting Limit, LOD = Limit of Detection													
		Core #9 (3) Lower			Core #8 Duplicate			Core #8 Upstream			Core #8 Downstream		
alpha-BHC	ug/kg	8.3	4.2	ND									
gamma-BHC (Lindane)	ug/kg	8.3	4.2	ND									
beta-BHC	ug/kg	8.3	4.2	ND									
delta-BHC	ug/kg	8.3	4.2	ND									
Heptachlor	ug/kg	8.3	4.2	ND									
Aldrin	ug/kg	8.3	4.2	ND									
Hyptachlor epoxide	ug/kg	8.3	4.2	ND									
gamma-Chlordane	ug/kg	8.3	4.2	ND									
alpha-Chlorodane	ug/kg	8.3	4.2	ND									
4,4-DDE	ug/kg	8.3	4.2	ND									
Endosulfan I	ug/kg	8.3	4.2	ND									
Dieldrin	ug/kg	8.3	4.2	ND									
Endrin	ug/kg	8.3	4.2	ND									
4,4-DDD	ug/kg	8.3	4.2	ND									
Endosulfan II	ug/kg	8.3	4.2	ND									
4,4-DDT	ug/kg	8.3	4.2	ND									
Endrin aldehyde	ug/kg	8.3	4.2	ND									
Methoxychlor	ug/kg	8.3	4.2	ND									
Endosulfan sulfate	ug/kg	8.3	4.2	ND									
Endrin ketone	ug/kg	8.3	4.2	ND									
Toxaphene	ug/kg	210	100	ND									
Chlordane	ug/kg	210	100	ND									
Polychlorinated Biphenyls													
PCB-1016	mg/kg	0.1	0.05	ND									
PCB-1221	mg/kg	0.1	0.05	ND									
PCB-1232	mg/kg	0.1	0.05	ND									
PCB-1242	mg/kg	0.1	0.05	ND									
PCB-1248	mg/kg	0.1	0.05	ND									

Table C-1. Pollutant Summary Table. Abbreviations used: RL=Reporting Limit, LOD = Limit of Detection													
		Core #9 (3) Lower			Core #8 Duplicate			Core #8 Upstream			Core #8 Downstream		
PCB-1254	mg/kg	0.1	0.05	ND									
PCB-1260	mg/kg	0.1	0.05	ND									
Volatile Organic Compounds (VOC)													
Dichlorodifluoromethane	ug/kg	5.4	2.7	ND									
Chloromethane	ug/kg	5.4	2.7	ND									
1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/kg	5.4	2.7	ND									
Vinyl Chloride	ug/kg	5.4	2.7	ND									
Bromomethane	ug/kg	5.4	2.7	ND									
Chloroethane	ug/kg	5.4	2.7	ND									
Acetone	ug/kg	22	11	ND									
Cyclohexane	ug/kg	22	11	ND									
Trichlorofluoromethane	ug/kg	5.4	2.7	ND									
1,1-Dichloroethene	ug/kg	5.4	2.7	ND									
Methylene Chloride	ug/kg	5.4	2.7	ND									
trans-1,2-Dichloroethene	ug/kg	5.4	2.7	ND									
Methyl-t-butyl ether	ug/kg	5.4	2.7	ND									
1,1-Dichloroethane	ug/kg	5.4	2.7	ND									
2-Butanone (MEK)	ug/kg	22	11	ND									
cis-1,2-	ug/kg	5.4	2.7	ND									

Table C-1. Pollutant Summary Table. Abbreviations used: RL=Reporting Limit, LOD = Limit of Detection													
		Core #9 (3) Lower			Core #8 Duplicate			Core #8 Upstream			Core #8 Downstream		
Dichloroethene													
Bromochloromethane	ug/kg	5.4	2.7	ND									
Chloroform	ug/kg	5.4	2.7	ND									
1,1,1-Trichloroethane	ug/kg	5.4	2.7	ND									
1,2-Dichloroethane	ug/kg	5.4	2.7	ND									
Carbon Tetrachloride	ug/kg	5.4	2.7	ND									
Benzene	ug/kg	5.4	2.7	ND									
1,2-Dichloropropane	ug/kg	5.4	2.7	ND									
Carbon Disulfide	ug/kg	11	5.4	ND									
Methylcyclohexane	ug/kg	22	11	ND									
Trichloroethene	ug/kg	5.4	2.7	ND									
Methyl Acetate	ug/kg	22	11	ND									
Bromodichloromethane	ug/kg	5.4	2.7	ND									
cis-1,3-Dichloropropene	ug/kg	5.4	2.7	ND									
4-Methyl-2-Pentanone	ug/kg	22	11	ND									
trans-1,3-Dichloropropene	ug/kg	5.4	2.7	ND									
1,1,2-Trichloroetha	ug/kg	5.4	2.7	ND									

Table C-1. Pollutant Summary Table. Abbreviations used: RL=Reporting Limit, LOD = Limit of Detection													
		Core #9 (3) Lower			Core #8 Duplicate			Core #8 Upstream			Core #8 Downstream		
ne													
Toluene	ug/kg	5.4	2.7	ND									
2-Hexanone	ug/kg	22	11	ND									
1,2-Dibromoethane (EDB)	ug/kg	5.4	2.7	ND									
Dibromochloromethane	ug/kg	5.4	2.7	ND									
Bromoform	ug/kg	5.4	2.7	ND									
Tetrachloroethene	ug/kg	5.4	2.7	ND									
Chlorobenzene	ug/kg	5.4	2.7	ND									
Ethylbenzene	ug/kg	5.4	2.7	ND									
m,p-Xylenes	ug/kg	11	5.4	ND									
Styrene	ug/kg	5.4	2.7	ND									
1,1,2,2-Tetrachloroethane	ug/kg	5.4	2.7	ND									
o-Xylene	ug/kg	5.4	2.7	ND									
Isopropylbenzene	ug/kg	5.4	2.7	ND									
1,3-Dichlorobenzene	ug/kg	5.4	2.7	ND									
1,4-Dichlorobenzene	ug/kg	5.4	2.7	ND									
1,2-Dichlorobenzene	ug/kg	5.4	2.7	ND									
1,2-Dibromo-3-Chloropropane	ug/kg	43	22	ND									
1,2,4-	ug/kg	5.4	2.7	ND									

Table C-1. Pollutant Summary Table. Abbreviations used: RL=Reporting Limit, LOD = Limit of Detection													
		Core #9 (3) Lower			Core #8 Duplicate			Core #8 Upstream			Core #8 Downstream		
Trichlorobenzene													
Naphthalene	ug/kg	5.4	2.7	ND									
1,2,3-Trichlorobenzene	ug/kg	5.4	2.7	ND									
Semi-Volatile Organic Compounds (SVOC)													
Acenaphthene	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
Acenaphthylene	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
Acetophenone	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
Anthracene	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
Benzo(a)anthracene	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
Benzo(a)pyrene	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
Benzo(b)fluoranthene	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
Benzo(g,h,i)perylene	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
Benzo(k)fluoranthene	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
Biphenyl (Diphenyl)	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
Butyl benzyl phthalate	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
bis(2-chloroethoxy) methane	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
bis(2-chloroethyl) ether	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
bis(2-chloroisopropyl) ether	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND

Table C-1. Pollutant Summary Table. Abbreviations used: RL=Reporting Limit, LOD = Limit of Detection													
		Core #9 (3) Lower			Core #8 Duplicate			Core #8 Upstream			Core #8 Downstream		
bis(2-ethylhexyl) phthalate	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
4-Bromophenyl phenyl ether	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
Di-n-butyl phthalate	ug/kg	350	170	ND	340	170	ND	340	170	ND	350	170	ND
Carbazole	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
4-Chloro-3-methyl phenol	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
4-Chloroaniline	ug/kg	350	170	ND	340	170	ND	340	170	ND	350	170	ND
2-Chloronaphthalene	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
2-Chlorophenol	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
4-Chlorophenyl Phenyl ether	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
Chrysene	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
Dibenz(a,h)Anthracene	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
Dibenzofuran	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
3,3-Dichlorobenzidine	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
2,4-Dichlorophenol	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
Diethyl phthalate	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
Dimethyl phthalate	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
2,4-Dimethylphen	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND

Table C-1. Pollutant Summary Table. Abbreviations used: RL=Reporting Limit, LOD = Limit of Detection													
		Core #9 (3) Lower			Core #8 Duplicate			Core #8 Upstream			Core #8 Downstream		
ol													
4,6-Dinitro-2-methyl phenol	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
2,4-Dinitrophenol	ug/kg	350	170	ND	340	170	ND	340	170	ND	350	170	ND
2,4-Dinitrotoluene	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
2,6-Dinitrotoluene	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
Fluoranthene	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
Fluorene	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
Hexachlorobenzene	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
Hexachlorobutadiene	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
Hexachlorocyclopentadiene	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
Hexachloroethane	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
Indeno(1,2,3-c,d)Pyrene	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
Isophorone	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
2-Methylnaphthalene	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
2-Methyl phenol	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
3&4-Methylphenol	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
Naphthalene	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
4-Nitroaniline	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
3-Nitroaniline	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
2-Nitroaniline	ug/kg	350	170	ND	340	170	ND	340	170	ND	350	170	ND
Nitrobenzene	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
2-Nitrophenol	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
4-Nitrophenol	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND

Table C-1. Pollutant Summary Table. Abbreviations used: RL=Reporting Limit, LOD = Limit of Detection													
		Core #9 (3) Lower			**Core #8 Duplicate**			**Core #8 Upstream**			**Core #8 Downstream**		
N-Nitrosodi-n-propyl amine	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
N-Nitrosodiphenylamine	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
Di-n-octyl phthalate	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
Pentachlorophenol	ug/kg	350	170	ND	340	170	ND	340	170	ND	350	170	ND
Phenanthrene	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
Phenol	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
Atrazine	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
Pyrene	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
Pyridine	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
Caprolactam	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
2,4,6-Trichlorophenol	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
2,4,5-Trichlorophenol	ug/kg	170	87	ND	170	86	ND	170	86	ND	170	86	ND
Cyanide													
Cyanide	mg/kg	0.06	0.03	ND									

Appendix D: Physical Properties of Sediment

Table D-1. Physical properties of core samples. Grain size is in % by weight. Core Depth is the actual interval measurement on the collected core. Sample depth is the adjusted depth due to core compaction and is an approximation to the actual depth below the surface.

Core	Core Depth (M)		Sample Depth (M)		Water	Bulk Density	Gravel	Sand	Silt	Clay	Mud	>62 microns	<62 microns	Folk Classification
	Top	Bottom	Top	Bottom	%	g/cm3	%	%	%	%	%	%	%	
Core #1	0.00	0.23	0.00	0.24	22.18	1.97	0.00	65.03	25.07	9.89	34.97	65.03	34.97	Muddy Sand
Core #1	0.23	0.55	0.24	0.59	4.39	2.53	2.70	94.02	2.41	0.86	3.28	96.72	3.28	Sand
Core #1	0.55	1.21	0.59	1.29	23.61	1.93	0.00	46.12	35.73	18.15	53.88	46.12	53.88	Sandy Mud
Core #1	1.21	2.15	1.29	2.29	35.71	1.69	0.00	14.25	51.31	34.44	85.75	14.25	85.75	Sandy Mud
Core #1	2.15	2.21	2.29	2.35	20.66	2.01	0.00	94.76	3.97	1.27	5.24	94.76	5.24	Sand
Core #1	0	1.21	0.00	1.29	15.79	2.14	4.98	67.69	18.59	8.74	27.33	72.67	27.33	Muddy Sand
Core #1	1.21	2.21	1.29	2.35	34.46	1.71	0.00	31.78	44.42	23.80	68.22	31.78	68.22	Sandy Mud
Core #2	0	0.2	0.00	0.22	8.44	2.38	5.23	91.97	2.02	0.77	2.80	97.20	2.80	Gravelly Sand
Core #2	0.2	0.58	0.22	0.64	10.89	2.29	8.92	86.30	3.58	1.21	4.79	95.21	4.79	Gravelly Sand
Core #2	0.58	0.76	0.64	0.84	12.94	2.22	7.50	81.00	8.31	3.19	11.50	88.50	11.50	Gravelly Muddy Sand
Core #2	0.76	1	0.84	1.11	26.72	1.86	0.00	29.34	46.79	23.87	70.66	29.34	70.66	Sandy Mud
Core #2	1.38	2.08	1.38	2.08	29.26	1.81	0.00	18.32	51.27	30.41	81.68	18.32	81.68	Sandy Mud
Core #2	2.08	2.43	2.08	2.43	30.66	1.78	0.00	10.98	62.07	26.95	89.02	10.98	89.02	Sandy Mud
Core #2	2.43	2.57	2.43	2.57	27.93	1.84	0.00	39.21	40.39	20.39	60.79	39.21	60.79	Sandy Mud
Core #2	2.57	3.07	2.57	3.07	32.37	1.75	0.00	22.01	53.42	24.58	77.99	22.01	77.99	Sandy Mud
Core #3	0	0.58	0.00	0.92	3.38	2.57	27.41	71.49	0.90	0.20	1.10	98.90	1.10	Gravelly Sand
Core #4	0	0.24	0.00	0.56	3.33	2.57	65.12	33.20	1.47	0.20	1.68	98.32	1.68	Sandy Gravel
Core #4	0.24	0.45	0.56	1.06	1.74	2.64	77.50	21.85	0.81	-0.16	0.65	99.35	0.65	Sandy Gravel
Core #5	0	1.14	0.00	2.47	3.29	2.57	21.72	76.86	1.09	0.33	1.42	98.58	1.42	Gravelly Sand
Core #6	0	0.6	0.00	1.53	3.44	2.57	30.13	68.44	1.16	0.28	1.43	98.57	1.43	Sandy Gravel
Core #6	0.6	0.96	1.53	2.45	4.37	2.53	42.33	56.43	0.89	0.35	1.24	98.76	1.24	Sandy Gravel
Core #7	0	0.4	0.00	0.87	3.28	2.57	47.77	51.50	1.02	-0.30	0.73	99.27	0.73	Sandy Gravel
Core #7	0.4	0.67	0.87	1.46	2.53	2.61	65.96	33.62	0.74	-0.33	0.41	99.59	0.41	Sandy Gravel
Core #8	0.12	0.23	0.28	0.53	4.16	2.54	27.31	71.38	1.40	-0.09	1.31	98.69	1.31	Gravelly Sand

Table D-1. Physical properties of core samples. Grain size is in % by weight. Core Depth is the actual interval measurement on the collected core. Sample depth is the adjusted depth due to core compaction and is an approximation to the actual depth below the surface.

Core	Core Depth (M)		Sample Depth (M)		Water	Bulk Density	Gravel	Sand	Silt	Clay	Mud	>62 microns	<62 microns	Folk Classification
	Top	Bottom	Top	Bottom	%	g/cm3	%	%	%	%	%	%	%	
Core #8	0.616	0.675	1.41	1.55	2.95	2.59	36.81	62.50	0.95	-0.25	0.69	99.31	0.69	Sandy Gravel
Core #8	0.75	0.84	1.72	1.93	5.54	2.48	19.41	79.93	0.86	-0.21	0.66	99.34	0.66	Gravelly Sand
Core #8	0.84	1	1.93	2.29	7.45	2.41	20.22	78.43	1.18	0.17	1.34	98.66	1.34	Gravelly Sand
Core #8	0	0.675	0.00	1.55	3.36	2.57	25.13	73.83	0.88	0.15	1.03	98.97	1.03	Gravelly Sand
Core #8	0.675	1.09	1.55	2.50	6.69	2.44	26.78	72.31	1.11	-0.20	0.92	99.08	0.92	Gravelly Sand
Core #9(3)	0.1	0.2	0.24	0.49	3.33	2.57	24.05	75.01	1.12	-0.19	0.93	99.07	0.93	Gravelly Sand
Core #9(3)	0.7	0.8	1.70	1.94	4.07	2.54	24.39	74.68	1.01	-0.08	0.93	99.07	0.93	Gravelly Sand
Core #9(3)	0.9	1	2.18	2.43	3.41	2.57	47.19	51.98	0.99	-0.16	0.83	99.17	0.83	Sandy Gravel
Core #9(3)	1.1	1.2	2.67	2.91	4.27	2.53	66.07	33.43	0.69	-0.20	0.49	99.51	0.49	Sandy Gravel
Core #9(3)	0.06	0.84	0.15	2.04	3.42	2.57	29.20	70.07	0.81	-0.07	0.74	99.26	0.74	Gravelly Sand
Core #9(3)	0.84	1.27	2.04	3.08	4.48	2.53	51.28	47.92	0.92	-0.12	0.81	99.19	0.81	Sandy Gravel
Core #9(4)	0.1	0.2	0.27	0.53	3.10	2.58	4.08	95.06	0.97	-0.11	0.86	99.14	0.86	Sand
Core #9(4)	0.41	0.51	1.09	1.36	3.09	2.58	36.22	63.11	0.87	-0.19	0.67	99.33	0.67	Sandy Gravel
Core #9(4)	0.70	0.8	1.86	2.13	3.16	2.58	67.00	32.70	0.62	-0.32	0.30	99.70	0.30	Sandy Gravel
Core #9(4)	0.91	1.01	2.42	2.69	5.18	2.50	58.25	41.51	0.66	-0.42	0.24	99.76	0.24	Sandy Gravel
Core #8 Duplicate	0	0.675	0.00	1.55	3.20	2.58	29.69	69.20	1.08	0.03	1.11	98.89	1.11	Gravelly Sand
Core #8a Upstream	0	0.3	0.00	0.64	3.38	2.57	21.83	77.28	0.99	-0.10	0.89	99.11	0.89	Gravelly Sand
Core #8b Downstream	0	0.52	0.00	0.90	3.76	2.55	26.95	72.21	0.92	-0.09	0.84	99.16	0.84	Gravelly Sand

Appendix E: Elemental Properties of Sediment

Core	Core Depth (M)		Sample Depth (M)		FOLK CLASS	Ag	Al (%)	As	Au	Ba	Be	Bi	Br	Ca	Cd	Ce	Co	Cr	Cs	Cu	Eu	Fe	Hf	Hg	Ir	K	La	Li	Lu	Mg	Mn
	Top	Bottom	Top	Bottom		ppm	ppm	ppm	ppb	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppb	%	ppm	ppm	ppm	%	ppm
Core #1	0.00	0.23	0.00	0.24	Muddy Sand	< 0.3	5.2	4.3	< 2	800	2	< 2	6	2.08	0.4	100	24	250	3	36	2	5.05	14	< 1	< 5	2.17	52	29	0.72	1.86	1090
Core #1	0.23	0.55	0.24	0.59	Sand	< 0.3	3.02	2.1	< 2	820	2	< 2	2.4	1.33	< 0.3	52	10	260	< 1	15	1	3.27	7	< 1	< 5	1.96	24	11	0.5	0.84	581
Core #1	0.55	1.21	0.59	1.29	Sandy Mud	0.4	9.83	4	< 2	920	3	< 2	5.7	1.9	0.4	110	23	270	3	36	2.3	4.91	13	< 1	< 5	2.48	56	31	0.86	1.76	1000
Core #1	1.21	2.15	1.29	2.29	Sandy Mud	0.4	7.53	6.6	3	880	3	< 2	6	1.06	0.7	160	29	190	3	60	2.9	5.6	12	< 1	< 5	2.4	73	43	1.04	1.26	1080
Core #1	2.15	2.21	2.29	2.35	Sand	< 0.3	2.93	1.8	< 2	570	1	< 2	< 0.5	1.66	< 0.3	64	14	370	1	16	1.4	4.08	10	< 1	< 5	1.33	30	11	0.61	1.16	715
Core #1	0	1.21	0.00	1.29	Muddy Sand	< 0.3	4.16	3.4	< 2	810	2	< 2	3	1.38	< 0.3	92	16	300	3	26	1.7	3.86	10	< 1	< 5	2.01	42	22	0.61	1.1	778
Core #1	1.21	2.21	1.29	2.35	Sandy Mud	< 0.3	6.26	6	6	730	3	< 2	5	1	0.5	140	25	180	5	56	2.6	5.15	11	< 1	< 5	2.26	68	40	1	1.16	899
Core #2	0	0.2	0.00	0.22	Gravelly Sand	< 0.3	3	2.3	4	910	2	< 2	2.1	1.29	< 0.3	44	10	190	< 1	14	0.9	2.71	5	< 1	< 5	1.99	20	11	0.33	0.74	475
Core #2	0.2	0.58	0.22	0.64	Gravelly Sand	< 0.3	3.84	3.2	< 2	1000	2	< 2	2.3	1.56	0.3	67	18	340	1	31	1.2	3.72	8	< 1	< 5	2.11	30	18	0.42	1.02	609
Core #2	0.58	0.76	0.64	0.84	Gravelly Muddy Sand	< 0.3	3.83	2.6	< 2	980	2	< 2	< 0.5	1.39	0.4	66	16	170	3	30	1.3	3.92	7	< 1	< 5	1.99	31	19	0.48	0.89	564
Core #2	0.76	1	0.84	1.11	Sandy Mud	0.4	9.81	4.3	< 2	880	3	< 2	4.7	1.49	0.4	130	26	170	3	43	2.8	5.34	14	< 1	< 5	1.96	68	37	0.98	1.61	1050
Core #2	1.38	2.08	1.38	2.08	Sandy Mud	< 0.3	5.64	6.1	17	840	3	< 2	< 0.5	0.58	0.5	150	29	160	4	49	3.1	5.08	12	< 1	< 5	1.2	73	40	1.16	0.94	1340
Core #2	2.08	2.43	2.08	2.43	Sandy Mud	< 0.3	6.77	5.2	< 2	860	4	< 2	3.7	0.46	< 0.3	160	27	120	5	45	3.3	4.98	13	< 1	< 5	2.08	81	44	1.33	0.95	1330
Core #2	2.43	2.57	2.43	2.57	Sandy Mud	< 0.3	5.8	3.5	< 2	770	3	< 2	< 0.5	0.86	0.4	120	23	160	4	38	2.7	4.75	12	< 1	< 5	2.23	62	36	1.01	1.14	1130
Core #2	2.57	3.07	2.57	3.07	Sandy Mud	< 0.3	6.05	3.1	< 2	920	3	< 2	3.7	0.91	0.5	140	29	240	4	45	3	5.38	14	< 1	< 5	2.3	72	39	1.2	1.39	1320
Core #3	0	0.58	0.00	0.92	Gravelly Sand	< 0.3	3.4	1.7	< 2	1400	1	< 2	< 0.5	1.39	< 0.3	32	11	160	1	11	0.7	2.72	3	< 1	< 5	2.4	15	10	0.18	0.99	358
Core #4	0	0.24	0.00	0.56	Sandy Gravel	< 0.3	2.17	1.2	< 2	550	< 1	< 2	< 0.5	0.87	< 0.3	18	6	100	< 1	6	0.5	1.52	2	< 1	< 5	1.19	8.1	5	0.21	0.39	264
Core #4	0.24	0.45	0.56	1.06	Sandy Gravel	< 0.3	2.96	< 0.5	< 2	1300	< 1	< 2	< 0.5	1.28	< 0.3	24	7	260	< 1	21	0.5	1.62	3	< 1	< 5	2.07	10	7	0.14	0.98	379
Core #5	0	1.14	0.00	2.47	Gravelly Sand	< 0.3	2.9	19.75	< 2	1400	1	< 2	< 0.5	1.11	< 0.3	27	7	155	< 1	10.5	0.6	2.18	3	< 1	< 5	2.435	12.4	6.5	0.17	0.605	358.5
Core #6	0	0.6	0.00	1.53	Sandy Gravel	< 0.3	3.53	< 0.5	3	1100	1	< 2	1	1.1	< 0.3	46	10	150	< 1	8	0.8	2.03	4	< 1	< 5	2.32	21	19	0.37	0.52	364
Core #6	0.6	0.96	1.53	2.45	Sandy Gravel	< 0.3	2.94	2	< 2	990	1	< 2	< 0.5	1.39	< 0.3	27	7	230	< 1	12	0.7	1.88	3	< 1	< 5	2.05	14	8	0.19	0.68	281
Core #7	0	0.4	0.00	0.87	Sandy Gravel	< 0.3	2.94	1	< 2	1350	1	< 2	< 0.5	1.78	< 0.3	30.5	7	125	< 1	9.5	0.5	1.875	3	< 1	< 5	1.805	15	8	0.18	0.62	350
Core #7	0.4	0.67	0.87	1.46	Sandy Gravel	< 0.3	2.88	< 0.5	< 2	1600	1	< 2	< 0.5	0.65	< 0.3	26	5	83	< 1	6	0.5	1.47	2	< 1	< 5	2.24	13	7	0.16	0.34	205
Core #8	0.12	0.23	0.28	0.53	Gravelly Sand	< 0.3	2.81	1.6	< 2	1300	1	< 2	< 0.5	1.92	< 0.3	28	6	250	< 1	10	0.5	1.84	3	< 1	< 5	2.28	14	8	0.19	0.52	294
Core #8	0.616	0.675	1.41	1.55	Sandy Gravel	< 0.3	3.165	13	< 2	1450	1	< 2	1.5	2.3	< 0.3	35.5	6	245	< 1	10	0.55	1.855	3.5	< 1	< 5	2.165	15	8.5	0.19	1.135	297
Core #8	0.75	0.84	1.72	1.93	Gravelly Sand	< 0.3	2.68	15	< 2	1100	1	< 2	< 0.5	1.59	< 0.3	33	9	170	< 1	9	0.5	2.08	3	< 1	< 5	2.08	15	6	0.19	0.79	485
Core #8	0.84	1	1.93	2.29	Gravelly Sand	< 0.3	2.95	1.1	< 2	1000	2	< 2	< 0.5	2.17	< 0.3	35	7	250	2	8	0.6	1.76	3	< 1	< 5	2.36	15	9	0.19	0.59	295
Core #8	0	0.675	0.00	1.55	Gravelly Sand	< 0.3	3.11	2.7	< 2	1400	1	< 2	< 0.5	1	< 0.3	30	6	140	< 1	9	0.5	1.84	3	< 1	< 5	2.7	13	8	0.17	0.51	317
Core #8	0.675	1.09	1.55	2.50	Gravelly Sand	< 0.3	2.9	1.7	< 2	1100	1	< 2	< 0.5	1.33	< 0.3	35	9	170	< 1	10	0.6	2.29	3	< 1	< 5	2.11	15	9	0.25	0.72	351
Core #9(3)	0.1	0.2	0.24	0.49	Gravelly Sand	< 0.3	3.01	68	< 2	1300	1	< 2	< 0.5	1.19	< 0.3	30	8	240	< 1	11	0.6	1.89	3	< 1	< 5	2.65	14	7	0.16	0.49	264
Core #9(3)	0.7	0.8	1.70	1.94	Gravelly Sand	< 0.3	2.9	1.7	< 2	1150	1	< 2	1.1	1.005	< 0.3	29	7.5	145	1	10	0.65	2.26	2.5	< 1	< 5	2.165	13	7	0.215	0.605	324.5
Core #9(3)	0.9	1	2.18	2.43	Sandy Gravel	< 0.3	3.07	2	< 2	790	1	< 2	< 0.5	1.77	< 0.3	23	11	68	2	17	0.5	2.77	2	< 1	< 5	1.48	10	15	0.18	0.59	342
Core #9(3)	1.1	1.2	2.67	2.91	Sandy Gravel	< 0.3	3.25	2.1	< 2	1200	2	< 2	< 0.5	0.97	< 0.3	32	8	210	2	38	0.7	2.48	3	< 1	< 5	1.76	15	14	0.24	0.37	224
Core #9(3)	0.06	0.84	0.15	2.04	Gravelly Sand	< 0.3	2.97	2	< 2	1500	1	< 2	< 0.5	1.8	< 0.3	32	7	140	< 1	10	0.7	1.97	3	< 1	< 5	1.83	15	8	0.22	0.58	292
Core #9(3)	0.84	1.27	2.04	3.08	Sandy Gravel	< 0.3	3.97	3	< 2	1300	2	< 2	< 0.5	1.71	< 0.3	41	10	110	2	21	0.8	2.74	3	< 1	< 5	2.37	21	17	0.31	0.89	366
Core #9(4)	0.1	0.2	0.27	0.53	Sand	< 0.3	2.95	< 0.5	< 2	1100	1	< 2	1.8	1.09	< 0.3	36	7	330	1	10	0.6	2.37	3	< 1	< 5	2.2	16	8	0.27	0.67	391
Core #9(4)	0.41	0.51	1.09	1.36	Sandy Gravel	< 0.3	3.02	3	< 2	1200	1	< 2	< 0.5	2.35	< 0.3	41	7	250	< 1	172	0.8	2.74	4	< 1	< 5	2.39	17	11	0.26	0.8	373
Core #9(4)	0.70	0.8	1.86	2.13	Sandy Gravel	< 0.3	3.47	< 0.5	< 2	1200	< 1	< 2	< 0.5	0.79	< 0.3	25	7	55	2	11	0.7	1.95	2	< 1	< 5	2.8	9.4	9	0.15	0.38	224
Core #9(4)	0.91	1.01	2.42	2.69	Sandy Gravel	< 0.3	3.49	2.2	< 2	1600	1	< 2	< 0.5	1.17	< 0.3	28	7	200	< 1	14	0.6	1.91	2	< 1	< 5	2.96	13	11	0.16	0.48	278

Core	Core Depth (M)		Sample Depth (M)		FOLK CLASS	Mo	Na	Nd	Ni	P	Pb	Rb	S	Sb	Sc	Se	Sm	Sn	Sr	Ta	Tb	Th	Ti	U	V	W	Y	Yb	Zn
	Top	Bottom	Top	Bottom		ppm	%	ppm	ppm	%	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm
Core #1	0.00	0.23	0.00	0.24	Muddy Sand	< 1	0.86	34	67	0.053	45	74	0.02	0.9	18	< 3	7.1	< 0.01	164	< 0.5	1.6	12	0.33	3	73	< 1	28	4	110
Core #1	0.23	0.55	0.24	0.59	Sand	< 1	0.78	15	35	0.019	58	63	< 0.01	1.1	8.8	< 3	3.4	< 0.01	195	< 0.5	< 0.5	6.6	0.2	< 0.5	29	< 1	18	2.6	49
Core #1	0.55	1.21	0.59	1.29	Sandy Mud	7	0.76	37	51	0.066	34	87	0.02	1.7	17	< 3	7.8	< 0.01	185	< 0.5	1.4	12	0.78	2.1	113	< 1	67	4.8	103
Core #1	1.21	2.15	1.29	2.29	Sandy Mud	< 1	0.57	55	66	0.078	57	160	0.07	3	20	< 3	10	< 0.01	129	< 0.5	1.3	14	0.75	5	132	< 1	51	5.9	152
Core #1	2.15	2.21	2.29	2.35	Sand	< 1	0.65	22	42	0.018	35	30	< 0.01	0.3	12	< 3	4.1	< 0.01	114	< 0.5	< 0.5	7.9	0.13	1.7	19	< 1	19	3	60
Core #1	0	1.21	0.00	1.29	Muddy Sand	< 1	0.76	31	49	0.035	38	84	0.01	1.1	13	< 3	5.5	< 0.01	168	< 0.5	< 0.5	11	0.1	2.3	29	< 1	24	3.2	85
Core #1	1.21	2.21	1.29	2.35	Sandy Mud	< 1	0.56	49	64	0.069	62	120	0.04	2.5	18	< 3	9.4	< 0.01	120	< 0.5	< 0.5	13	0.47	3.9	105	< 1	42	5.5	147
Core #2	0	0.2	0.00	0.22	Gravelly Sand	< 1	0.77	13	31	0.027	39	63	0.01	0.5	7.5	< 3	2.7	< 0.01	221	1.5	< 0.5	6	0.13	< 0.5	24	< 1	12	1.6	48
Core #2	0.2	0.58	0.22	0.64	Gravelly Sand	2	0.92	21	44	0.033	48	88	0.02	0.9	12	< 3	4.1	< 0.01	253	< 0.5	< 0.5	8	0.1	2.5	28	< 1	17	2.2	63
Core #2	0.58	0.76	0.64	0.84	Gravelly Muddy Sand	< 1	0.8	21	40	0.031	48	70	0.03	1.4	11	< 3	4	< 0.01	231	< 0.5	< 0.5	7	0.07	2.7	22	< 1	17	2.4	67
Core #2	0.76	1	0.84	1.11	Sandy Mud	1	0.63	43	59	0.071	39	150	0.02	2.6	19	< 3	9.7	< 0.01	164	< 0.5	< 0.5	13	0.83	3.1	124	< 1	68	5.7	121
Core #2	1.38	2.08	1.38	2.08	Sandy Mud	< 1	0.53	53	60	0.058	48	140	< 0.01	1.2	17	< 3	10	< 0.01	95	< 0.5	2.1	14	0.25	3.1	75	< 1	49	5.9	129
Core #2	2.08	2.43	2.08	2.43	Sandy Mud	< 1	0.47	51	62	0.054	31	150	0.01	0.7	18	< 3	12	< 0.01	91	< 0.5	2.5	15	0.16	4.3	66	< 1	61	7.4	121
Core #2	2.43	2.57	2.43	2.57	Sandy Mud	< 1	0.62	49	62	0.047	32	98	< 0.01	0.6	16	< 3	8.9	< 0.01	113	< 0.5	2.3	13	0.15	2.5	45	< 1	46	5.4	107
Core #2	2.57	3.07	2.57	3.07	Sandy Mud	< 1	0.63	47	91	0.047	35	130	0.02	0.9	20	< 3	10	< 0.01	107	< 0.5	2.5	13	0.16	3.1	51	< 1	50	6.5	114
Core #3	0	0.58	0.00	0.92	Gravelly Sand	< 1	0.88	8	49	0.017	23	55	< 0.01	0.4	8.4	< 3	1.9	< 0.01	280	< 0.5	< 0.5	4.2	0.2	1.5	69	< 1	8	1	28
Core #4	0	0.24	0.00	0.56	Sandy Gravel	< 1	0.72	7	30	0.014	10	29	< 0.01	0.3	4.1	< 3	1.2	< 0.01	135	< 0.5	< 0.5	2.4	0.11	< 0.5	23	< 1	8	1.2	22
Core #4	0.24	0.45	0.56	1.06	Sandy Gravel	10	0.84	< 5	28	0.021	16	60	< 0.01	0.3	5.1	< 3	1.1	< 0.01	267	< 0.5	< 0.5	6.5	0.12	< 0.5	34	< 1	5	0.7	24
Core #5	0	1.14	0.00	2.47	Gravelly Sand	3	1.08	7	25	0.015	40.5	53	0.01	1.3	4.35	< 3	1.6	< 0.01	272	< 0.5	< 0.5	3.5	0.14	0.9	29	< 1	6	0.85	24
Core #6	0	0.6	0.00	1.53	Sandy Gravel	< 1	0.97	17	24	0.014	21	39	< 0.01	< 0.1	7.4	< 3	2.6	< 0.01	225	< 0.5	< 0.5	6.5	0.06	1.6	14	< 1	15	2.1	31
Core #6	0.6	0.96	1.53	2.45	Sandy Gravel	12	0.74	13	25	0.023	21	45	0.06	0.4	5.5	< 3	1.6	< 0.01	246	< 0.5	< 0.5	3.6	0.2	1	46	< 1	7	0.9	25
Core #7	0	0.4	0.00	0.87	Sandy Gravel	1	0.785	7.5	25.5	0.0165	26.5	63	< 0.01	0.25	4.7	< 3	1.8	< 0.01	267	1.4	< 0.5	3.7	0.115	< 0.5	31	< 1	6	0.95	24.5
Core #7	0.4	0.67	0.87	1.46	Sandy Gravel	1	0.81	12	17	0.02	26	72	< 0.01	0.2	3.2	< 3	1.7	< 0.01	292	0.6	< 0.5	4.6	0.11	0.7	27	< 1	6	0.8	19
Core #8	0.12	0.23	0.28	0.53	Gravelly Sand	11	0.76	9	24	0.018	23	50	< 0.01	0.3	4.2	< 3	1.6	< 0.01	290	< 0.5	< 0.5	3.7	0.13	< 0.5	32	< 1	7	0.9	24
Core #8	0.616	0.675	1.41	1.55	Sandy Gravel	14	0.975	10	27	0.018	25.5	82	0.02	0.3	4.2	< 3	1.6	< 0.01	319.5	< 0.5	< 0.5	3.95	0.135	< 0.5	31.5	< 1	6	0.85	28
Core #8	0.75	0.84	1.72	1.93	Gravelly Sand	< 1	1.04	7	26	0.019	28	< 15	0.01	2.3	5.1	< 3	2	< 0.01	218	< 0.5	< 0.5	4.4	0.16	< 0.5	26	< 1	8	0.9	36
Core #8	0.84	1	1.93	2.29	Gravelly Sand	11	0.81	15	27	0.02	23	37	< 0.01	0.2	4.9	< 3	1.9	< 0.01	245	< 0.5	< 0.5	3.9	0.17	1.3	40	< 1	8	1	25
Core #8	0	0.675	0.00	1.55	Gravelly Sand	< 1	0.8	12	28	0.018	26	65	0.01	0.2	4.4	< 3	1.5	< 0.01	300	< 0.5	< 0.5	3.7	0.14	1.5	32	3	7	1	25
Core #8	0.675	1.09	1.55	2.50	Gravelly Sand	< 1	0.73	14	29	0.02	21	49	< 0.01	0.3	6.9	< 3	2	< 0.01	247	< 0.5	< 0.5	4.8	0.2	< 0.5	42	< 1	9	1.4	30
Core #9(3)	0.1	0.2	0.24	0.49	Gravelly Sand	11	1.2	9	26	0.019	35	43	0.01	1.1	4.4	< 3	1.8	< 0.01	331	< 0.5	< 0.5	3.5	0.14	1.3	35	< 1	7	0.9	40
Core #9(3)	0.7	0.8	1.70	1.94	Gravelly Sand	2	0.665	12	30.5	0.0175	28	59.5	< 0.01	0.25	4.9	< 3	1.85	< 0.01	237	< 0.5	< 0.5	3.75	0.17	1.45	35	< 1	7.5	1.05	35.5
Core #9(3)	0.9	1	2.18	2.43	Sandy Gravel	3	0.98	7	20	0.023	36	< 15	0.05	0.4	6.6	< 3	1.5	< 0.01	230	< 0.5	< 0.5	3.2	0.19	< 0.5	59	< 1	6	1	26
Core #9(3)	1.1	1.2	2.67	2.91	Sandy Gravel	11	0.92	11	18	0.018	72	80	0.02	0.3	5.3	< 3	2.1	< 0.01	292	< 0.5	< 0.5	4.2	0.17	1.2	45	< 1	9	1.3	28
Core #9(3)	0.06	0.84	0.15	2.04	Gravelly Sand	2	0.8	12	22	0.019	50	73	0.01	1.6	5	< 3	1.8	< 0.01	267	< 0.5	< 0.5	4.6	0.17	1.1	37	< 1	7	1.1	26
Core #9(3)	0.84	1.27	2.04	3.08	Sandy Gravel	< 1	1.28	13	24	0.019	33	100	0.03	< 0.1	9.5	< 3	2.5	< 0.01	276	< 0.5	< 0.5	6.6	0.18	2	68	< 1	12	1.5	31
Core #9(4)	0.1	0.2	0.27	0.53	Sand	4	0.74	14	34	0.017	57	63	< 0.01	0.3	5.9	< 3	2	< 0.01	234	< 0.5	< 0.5	5.1	0.16	1.4	25	< 1	8	1	32
Core #9(4)	0.41	0.51	1.09	1.36	Sandy Gravel	< 1	0.85	12	22	0.02	49	66	0.01	0.7	7.5	< 3	2.3	< 0.01	289	< 0.5	< 0.5	5.6	0.22	1.8	46	< 1	10	1.5	32
Core #9(4)	0.70	0.8	1.86	2.13	Sandy Gravel	< 1	0.83	5	15	0.016	70	79	0.03	3.5	3.8	< 3	1.2	< 0.01	294	< 0.5	< 0.5	2.8	0.13	< 0.5	36	< 1	5	0.8	26
Core #9(4)	0.91	1.01	2.42	2.69	Sandy Gravel	12	0.92	11	23	0.021	34	43	0.05	0.5	4.5	< 3	1.6	< 0.01	358	< 0.5	< 0.5	3.7	0.14	< 0.5	39	< 1	7	0.8	33