



June 11, 2019

Mr. Peter Haid  
Senior Director of Environmental  
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Baltimore, Maryland 21219  
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**Re: Geotechnical Sampling and Testing - Revised  
Maintenance Dredging – Phase 2 – 13-WL-0966(R2)  
Sediment Sampling Program – Wetlands License Testing  
Sparrows Point, MD  
RBB Project No. 17246-0 MD**

Dear Mr. Haid:

The Robert B. Balter Company (Balter) has recently completed our drilling and laboratory services for the above-mentioned project. Our work was performed in accordance with our proposal and the supplied Scope of Work from Tradepoint Atlantic. The results of our field activities are provided below. This report has been revised to correct minor typographical errors.

### **Project Background**

Tradepoint Atlantic (TPA) is planning to perform maintenance dredging of the access channel and berthing areas in the Patapsco River between Sparrows Point Terminal and Brewerton Channel. The proposed dredge depths are between 40 feet to 45 feet below mean low water.

Physical and chemical characterization of the material to be dredged was required in order to satisfy the State Wetlands License (13-WL-0966[R2]), Special Condition “B” and the Maryland Port Administration.

This geotechnical data report provides the laboratory testing results for Phase 2 of the proposed dredge work. In total, there are 3 phases of dredging planned under the current license.

### **Scope of Work**

A total of nine (9) soil borings were performed as part of Phase 2 of this scope. The soil borings (B-1 through B-9) were drilled using a tracked-mounted drill rig. The drill rig was placed on a work barge with spuds and a drilling well that was provided by Corman Marine. Corman Marine navigated the barge to within approximately 10-20 feet of each specified boring location. However, one (1) Phase 2 boring location (B-1) was shifted slightly over 20 feet due to the presence of a docked ship. The approximate boring locations are shown on the attached **Plate 2**, Boring Location Plans.

The borings were located by Cormar Marine using a handheld GPS unit on the barge. GPS Coordinates for the planned Boring Locations are provided below on Table 1.

**Table 1 – Soil Boring Locations**

<i>Boring</i>	<i>Depth Sampled (ft.)<sup>(1)</sup></i>	<i>Northing<sup>(2)</sup></i>	<i>Easting<sup>(2)</sup></i>	<i>Comments</i>
B-1	45	560,286.8	1,458,983.8	---
B-2	45	559,311.1	1,459,184.6	Moved approx. 50 feet south
B-3	42	559,365.1	1,458,898.1	---
B-4	45	559,081.1	1,459,198.2	---
B-5	42	558,702.2	1,459,259.9	---
B-6	45	558,417.4	1,459,259.9	---
B-7	42	557,826.0	1,459,073.1	---
B-8	45	557,534.2	1,459,300.0	---
B-9	42	556,911.7	1,459,118.5	---

**Notes:** <sup>(1)</sup> Depth below Mean Low Water

<sup>(2)</sup> Coordinates provided are based on NAD83 Maryland State Plane Zone, US Foot MD83F

Soil borings were advanced to a maximum depth of 45 feet below mean low water, as directed in the scope of work. The borings were advanced in approximate 2-foot depth increments, once the bottom of the water was reached. The approximate depth below mean low water was determined by measuring the water depth with a weighted measuring tape, and recording the tide height at the time of sampling. Samples were collected using 3-inch diameter split spoon samplers, after advancing the 4-inch diameter casing to the required depths. After each advance, the sampler was withdrawn, and collected soils were removed and immediately sealed in a clean plastic bag marked with the location. A minimum volume of 0.5 gallons was recovered from each grab sample location. The collected soils were visually examined on site by our engineer who estimated their classifications and provided descriptions. Immediately after visual classification was complete, the bags were placed in a cooler with ice for return to Balter's laboratory.

Following return to Balter's laboratory, the samples were composited using a volumetric approach with approximately equal volumes from each boring location to create a composite sample. The samples were hand mixed in a stainless steel pan, which was placed over ice to retain sample temperature and minimize volatilization during mixing. The hand mixing process included a total volume of about 1.5 gallons and took approximately 5 to 20 minutes. All containers used for Volatile Organic Compound testing were filled first, and those samples were exposed no more than 5 minutes. Generally, samples were mixed within 24 hours of sample collection in a controlled environment at Balter's laboratory. As noted previously, the samples were kept in clean, sealed Ziploc plastic bags on ice from sample collection until the time of sample homogenization. The composited samples were then placed in the appropriate containers with laboratory recommended preservatives (airtight glass jars, vials with methanol, etc.) for the specified test method. The glass jars and other laboratory provided containers with the composite samples were then kept refrigerated or on ice in a cooler through transport to the environmental testing laboratory.



Phase 2 composite samples were mixed as follows:

- P2-1: Borings B-3, B-5, B-7, and B-9
- P2-2: Borings B-1, B-2, B-4, B-6, and B-8

Limited physical characteristic laboratory testing was performed on the composite soil samples in Balter's laboratory as well. Testing on the selected soil samples generally included Natural Moisture Contents, Atterberg limits, Sieve Analyses, Hydrometer analyses, and Specific Gravity testing.

Chemical characterization was provided by a National Environmental Laboratory Accreditation Program (NELAP)-certified laboratory, which was contracted directly through Tradepoint Atlantic. Tests within the Wetlands License scope of work included:

- Priority Pollutant Metals (including Mercury)
- Hexavalent Chromium
- TPH Diesel Range Organics
- TPH Gas Range Organics
- Oil and Grease
- Priority Pollutant Volatile Organic Compounds
- Priority Pollutant Semi-Volatile Organic Compounds
- PCBs
- Cyanide

All of the environmental testing was performed in accordance with the previously approved EPA Methods and Procedures, as coordinated between Tradepoint Atlantic and the contracted environmental laboratory, as reported to us. Proper Chain of Custody (COC) procedures were also used. Completed COC forms have been provided to TPA by their environmental laboratory. Samples collected from the Phase 2 area were transported to the testing laboratory within approximately 24-30 hours of collection, which is well within the specified holding times for testing.

### **Subsurface Conditions**

**General** - The subsurface conditions encountered during our exploration operations are indicative of the conditions at the field test locations at the time of the work. The soil stratigraphy shown on the attached subsurface logs is based on discrete soil and decomposed rock samples taken at the above listed sample intervals. The actual transition between soil types at the boring locations may be more gradual than indicated on the boring logs. Additionally, significant variations may occur outside the specific sample locations.

**Sediment Soils** – Sediment soils that have deposited within the channels were encountered in each of the borings within the studied areas. Based on visual observations of the collected soil samples, the natural soils consisted of very soft Silt (CL-ML, ML, MH), and Clay (CL, CL-ML). No unusual odors were detected during the time of drilling.

The attached boring logs include a description and visually estimated classification for each soil layer, SPT Values (where applicable) and boring depths. The method of classification used in preparing the strata descriptions is based on our interpretation of the Unified Soils Classification System (USCS). Visual classifications were performed by an experienced Geotechnical Engineer. Final descriptions on the Boring Logs reflect physical testing results.



It should be noted that the boring location plan and the boring log represent an integral part of this report, and separating these figures may lead to misinterpretation by others.

### Laboratory Results

**Geotechnical Testing** - Compositated samples were subjected to laboratory analyses to estimate their classifications according to the Unified Soils Classification System. This testing included natural moisture contents, Atterberg limits determinations, Grain size Analyses (Sieve and Hydrometer), and Specific Gravity. Those results are presented at the end of this letter report and are summarized in the following table.

**Table 2 - Classification Test Results for Soil**

Sample	USCS <sup>(1)</sup>	Moisture Content (%)	Specific Gravity	Atterberg Limits			+#200 Sieve (%)		-#200 Sieve (%)	
				LL	PL	PI	% Gravel	% Sand	% Silt	% Clay
P2-1	MH	270.4	2.684	97	47	50	0.0	0.7	36.6	62.7
P2-2	MH	268.6	2.723	93	47	46	0.0	1.9	38.1	60.0

Notes: <sup>(1)</sup> Organic content testing not included in scope of work

It should be noted that the samples were visually identified to contain organic material. However, organic content testing was not included in our scope of work. Therefore, lab testing could not identify whether the soils classify as Organic SILT (OH) materials.

**Environmental Testing** - Additionally, composite samples from the areas discussed above were subjected to environmental testing as required in the Scope of Work. It should be noted that constituents which are not present of priority pollutant lists were also reported. Those values are not shown in the tables below, but can be found in the attached appendices.

**Table 3 – Priority Pollutant Metals Test Results (EPA 6020A)**

	P2-1 (mg/kg)	P2-2 (mg/kg)
<i>Antimony</i>	ND <sup>(1)</sup>	ND
<i>Arsenic</i>	<b>19.6</b>	<b>24.1</b>
<i>Beryllium</i>	<b>1.8</b>	<b>2.0</b>
<i>Cadmium</i>	ND	<b>1.9</b>
<i>Chromium</i>	<b>100</b>	<b>129</b>
<i>Copper</i>	<b>59.7</b>	<b>82.9</b>
<i>Lead</i>	<b>95.8</b>	<b>141</b>
<i>Mercury</i>	<b>0.34</b>	<b>0.30</b>
<i>Nickel</i>	<b>48.7</b>	<b>58.1</b>
<i>Selenium</i>	ND	ND
<i>Silver</i>	ND	ND
<i>Thallium</i>	ND	ND
<i>Zinc</i>	<b>334</b>	<b>494</b>

Notes: <sup>(1)</sup> ND = Not detected at or above reporting limit



**Table 4 - Hexavalent Chromium Test Results (EPA 7196A)**

	<i>P2-1</i> (mg/kg)	<i>P2-2</i> (mg/kg)
<i>Hexavalent Chromium</i>	ND <sup>(1)</sup>	ND

**Notes:** <sup>(1)</sup> ND = Not detected at or above reporting limit

**Table 5 – Total Petroleum Hydrocarbons (EPA 8015)**

	<i>P2-1</i> (mg/kg)	<i>P2-2</i> (mg/kg)
<i>TPH Diesel Range Organics</i>	38.7	ND <sup>(1)</sup>
<i>TPH Gas Range Organics</i>	ND	ND

**Notes:** <sup>(1)</sup> ND = Not detected at or above reporting limit

**Table 6 – Inorganic Chemicals Test Results**

	<i>P2-1</i> (mg/kg)	<i>P2-2</i> (mg/kg)
<i>Cyanide (EPA 9014)</i>	ND <sup>(1)</sup>	ND

**Notes:** <sup>(1)</sup> ND = Not detected at or above reporting limit

**Table 7 – Organic Chemicals Test Results**

	<i>P2-1</i> (mg/kg)	<i>P2-2</i> (mg/kg)
<i>Oil and Grease (EPA 9071B)</i>	968	1,340
<i>PCBs (EPA 8082)</i>	ND <sup>(1)</sup>	ND

**Notes:** <sup>(1)</sup> ND = Not detected at or above reporting limit

**Table 8- Priority Pollutant Volatile Organic Compounds (EPA 8260B)**

	<i>P2-1</i> (µg/kg)	<i>P2-2</i> (µg/kg)
<i>1,1,1-Trichloroethane</i>	ND <sup>(1)</sup>	ND
<i>1,1,2,2-Tetrachloroethane</i>	ND	ND
<i>1,1,2-Trichloroethane</i>	ND	ND
<i>1,1-Dichloroethane</i>	ND	ND
<i>1,1-Dichloroethene</i>	ND	ND
<i>1,2,4-Trichlorobenzene</i>	ND	ND
<i>1,2-Dichlorobenzene</i>	ND	ND
<i>1,2-Dichloroethane</i>	ND	ND
<i>1,2-Dichloropropane</i>	ND	ND
<i>1,3-Dichlorobenzene</i>	ND	ND
<i>1,4-Dichlorobenzene</i>	ND	ND
<i>Benzene</i>	ND	ND
<i>Bromodichloromethane</i>	ND	ND
<i>Bromoform</i>	ND	ND
<i>Bromomethane</i>	ND	ND



**Table 8 (continued) - Priority Pollutant Volatile Organic Compounds (EPA 8260B)**

<i>Carbon tetrachloride</i>	ND	ND
<i>Chlorobenzene</i>	ND	ND
<i>Chloroethane</i>	ND	ND
<i>Chloroform</i>	ND	ND
<i>Chloromethane</i>	ND <sup>(1)</sup>	ND
<i>cis-1,3-Dichloropropene</i>	ND	ND
<i>Dibromochloromethane</i>	ND	ND
<i>Ethylbenzene</i>	ND	ND
<b><i>Methylene chloride</i></b>	<b>149</b>	ND
<i>Tetrachloroethene</i>	ND	ND
<i>Toluene</i>	ND	ND
<i>trans-1,2-Dichloroethene</i>	ND	ND
<i>trans-1,3- Dichloropropene</i>	ND	ND
<i>Trichloroethene</i>	ND	ND
<i>Trichlorofluoromethane</i>	ND	ND
<i>Vinyl chloride</i>	ND	ND

Notes: <sup>(1)</sup> ND = Not detected at or above reporting limit

**Table 9- Priority Pollutant Semi-Volatile Organic Compounds (EPA 8270D)**

	<b><i>P2-1</i></b> <b><i>(µg/kg)</i></b>	<b><i>P2-2</i></b> <b><i>(µg/kg)</i></b>
<i>2,4,6-Trichlorophenol</i>	ND <sup>(1)</sup>	ND
<i>2,4-Dichlorophenol</i>	ND	ND
<i>2,4-dimethylphenol</i>	ND	ND
<i>2,4-Dinitrophenol</i>	ND	ND
<i>2,4-Dinitrotoluene</i>	ND	ND
<i>2,6-Dinitrotoluene</i>	ND	ND
<i>2-Chloronaphthalene</i>	ND	ND
<i>2-Chlorophenol</i>	ND	ND
<i>2-Nitrophenol</i>	ND	ND
<i>3,3-Dichlorobenzidine</i>	ND	ND
<i>4-Chloro-3-methyl phenol</i>	ND	ND
<i>4-Chlorophenyl phenyl ether</i>	ND	ND
<i>4-Nitrophenol</i>	ND	ND
<i>Acenaphthene</i>	ND	ND
<i>Acenaphthylene</i>	ND	ND
<i>Anthracene</i>	ND	ND
<i>Benzo(a)anthracene</i>	ND	ND
<i>Benzo(a)pyrene</i>	ND	ND
<i>Benzo(b)fluoranthene</i>	ND	ND
<i>Benzo(g,h,i)perylene</i>	ND	ND
<i>Benzo(k)fluoranthene</i>	ND	ND



**Table 9 (continued) - Priority Pollutant Semi-Volatile Organic Compounds (EPA 8270D)**

<i>bis(2-chloroethoxy) methane</i>	ND <sup>(1)</sup>	ND
<i>bis(2-chloroethyl) ether</i>	ND	ND
<i>bis(2-chloroisopropyl) ether</i>	ND	ND
<i>bis(2-ethylhexyl) phthalate</i>	ND	ND
<i>Chrysene</i>	ND	ND
<i>Dibenz(a,h)anthracene</i>	ND	ND
<i>Diethyl phthalate</i>	ND	ND
<i>Dimethyl phthalate</i>	ND	ND
<i>Di-n-butyl phthalate</i>	ND	ND
<i>Di-n-octyl phthalate</i>	ND	ND
<i>Fluoranthene</i>	ND	ND
<i>Fluorene</i>	ND	ND
<i>Hexachlorobenzene</i>	ND	ND
<i>Hexachlorobutadiene</i>	ND	ND
<i>Hexachlorocyclopentadiene</i>	ND	ND
<i>Hexachloroethane</i>	ND	ND
<i>Indeno(1,2,3-c,d)Pyrene</i>	ND	ND
<i>Isophorone</i>	ND	ND
<i>Naphthalene</i>	ND	ND
<i>Nitrobenzene</i>	ND	ND
<i>N-Nitrosodi-n-propyl amine</i>	ND	ND
<i>N-Nitrosodiphenylamine</i>	ND	ND
<i>Pentachlorophenol</i>	ND	ND
<i>Phenanthrene</i>	ND	ND
<i>Phenol</i>	ND	ND
<i>Pyrene</i>	ND	ND

Notes: <sup>(1)</sup> ND = Not detected at or above reporting limit

Environmental recommendations or interpretation of test results was not included in Balter's scope of work.

We appreciated the opportunity to assist you with this project. If you should have any comments or questions, please feel free to contact us.


Sincerely,

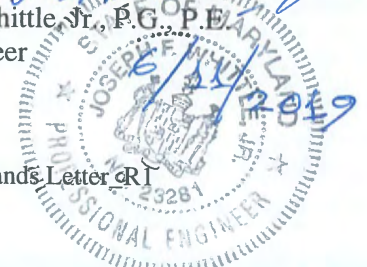
**THE ROBERT B. BALTER COMPANY**

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 48168, Expiration Date: 01/06/2020

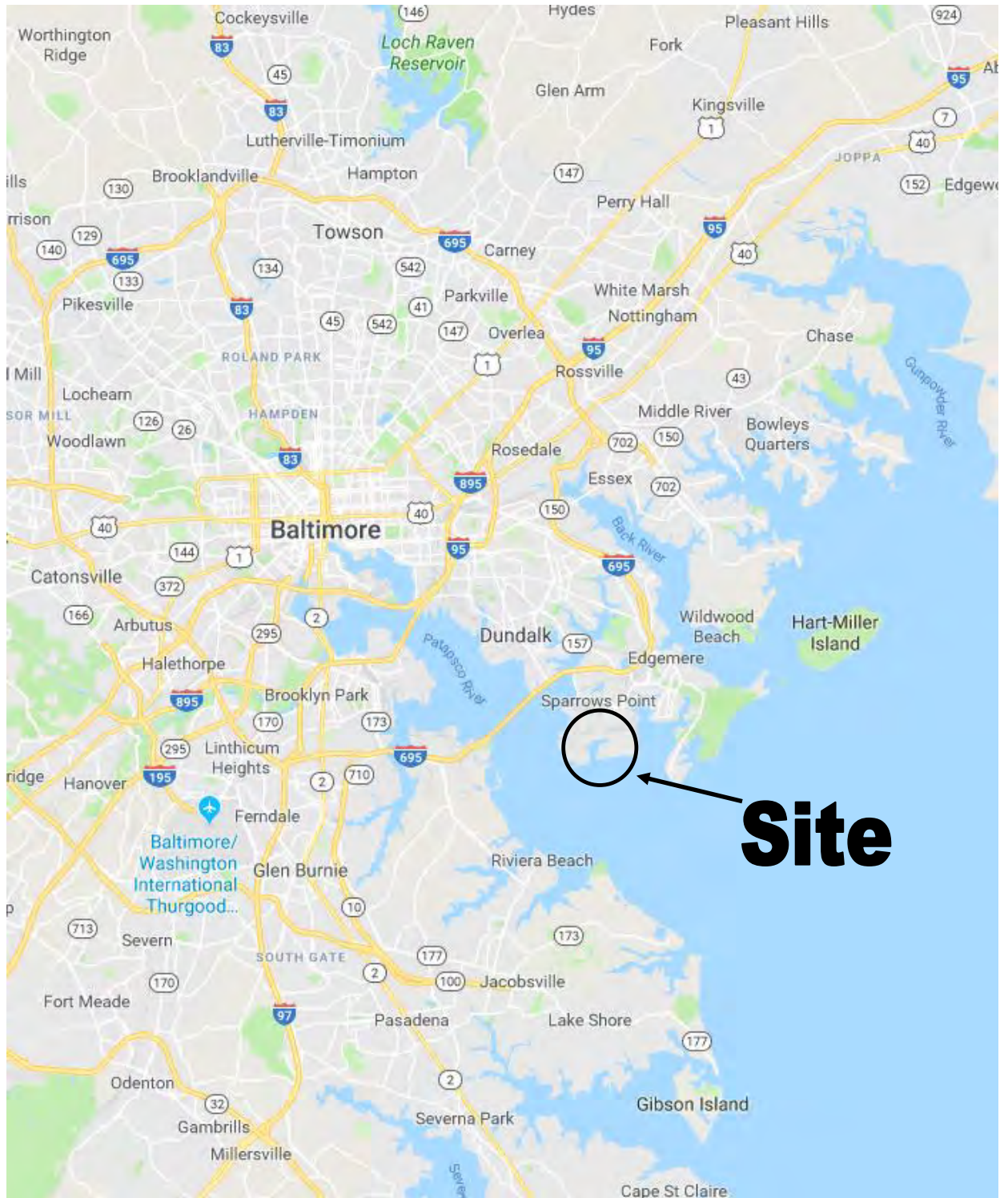
  
Matthew J. Leone, P.E.  
Senior Geotechnical Engineer



  
Joseph F. Whittle, Jr., P.E.  
Chief Engineer







**Sparrows Point Dredging  
Sparrows Point, MD**

**THE ROBERT B. BALTER COMPANY®**  
Geotechnical and Geo-environmental Engineers

**Site Vicinity Map**

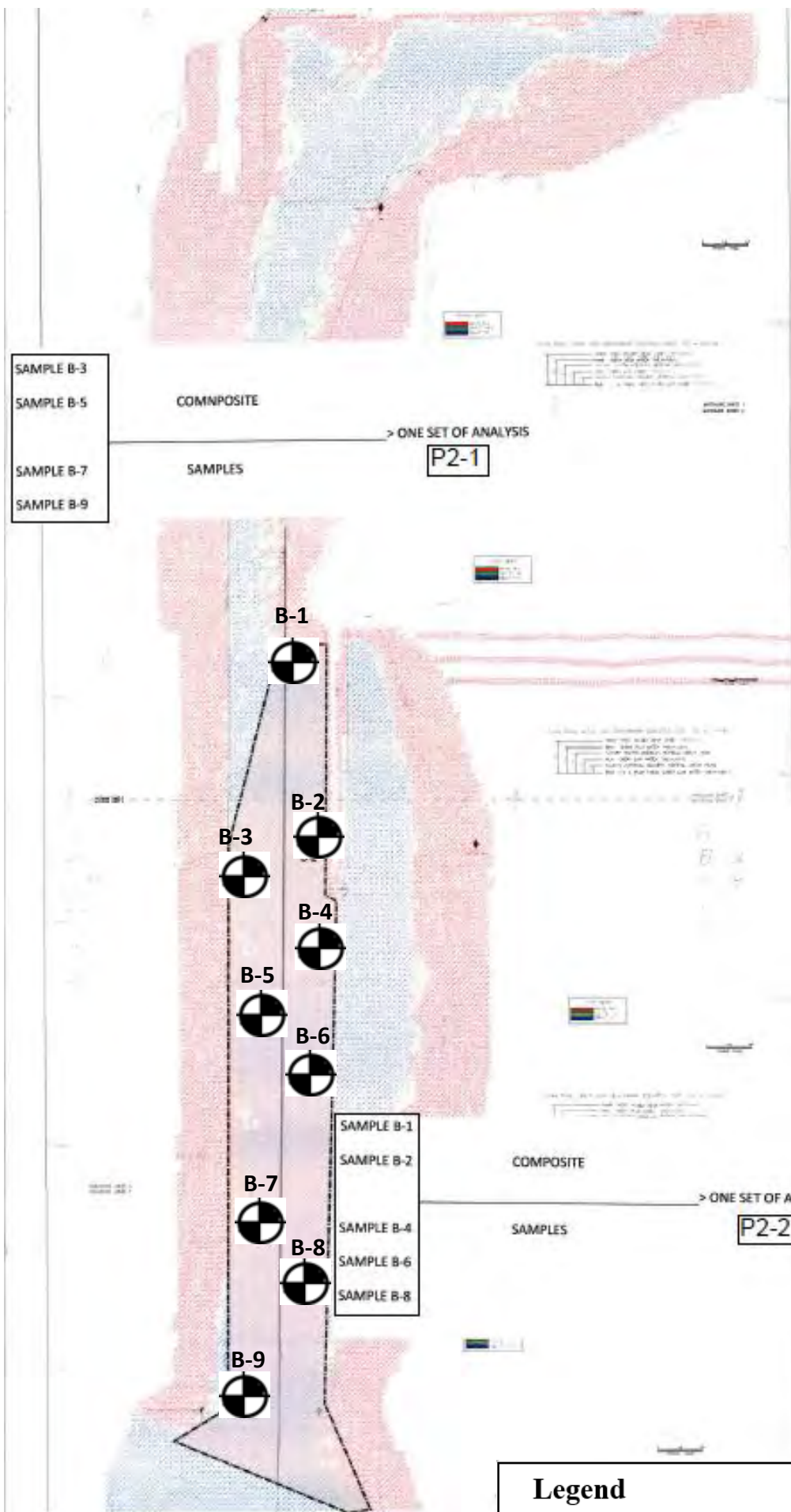
**Scale: None**

**Date: MAY 2019**

**Project No.  
17246-0 MD**

**PLATE 1**






SAMPLE B-3  
 SAMPLE B-5  
 SAMPLE B-7  
 SAMPLE B-9

COMPOSITE  
 > ONE SET OF ANALYSIS  
 P2-1  
 SAMPLES

SAMPLE B-1  
 SAMPLE B-2  
 SAMPLE B-4  
 SAMPLE B-6  
 SAMPLE B-8

COMPOSITE  
 > ONE SET OF AI  
 P2-2  
 SAMPLES

**Legend**  
 **B-X** Approx. Soil Boring Location  
 Base drawing and stakeout provided by TPA



THE ROBERT B. BALTER COMPANY®  
 Geotechnical and Geo-environmental Engineers

Subsurface Sampling  
 Sparrows Point Maint. Dredging  
 Sparrows Point, Maryland

Project No. 17246-0

PLATE 2  
 Boring Location Plan

**APPENDIX A - BORING LOGS**



**THE ROBERT B. BALTER COMPANY**  
**IDENTIFICATION OF SOIL SAMPLES**

Soils are described in the boring logs according to the following criteria with the principal constituents written in capital letters. Other constituents are preceded by descriptive terminology that is used to denote the percentage of weight of each component. Soil descriptions are determined visually except where laboratory classification test data are available. Classifications are based on The Robert B. Balter Company's interpretation of ASTM D 2487-00.

<b>COARSE GRAINED SOIL</b> > 50% Retained on No. 200 Sieve	<b>GRAVEL</b>	0 to 5% Fines	Well Graded		<b>GW</b>	GRAVEL
			Poorly Graded		<b>GP</b>	GRAVEL
		6 to 12% Fines	Silty Fines	Well Graded	<b>GW-GM</b>	GRAVEL with Silt
				Poorly Graded	<b>GP-GM</b>	GRAVEL with Silt
			Clayey Fines	Well Graded	<b>GW-GC</b>	GRAVEL with Clay
				Poorly Graded	<b>GP-GC</b>	GRAVEL with Clay
		13 to 50% Fines	Silty Fines		<b>GM</b>	Silty GRAVEL
			Silty Clay Fines		<b>GC-GM</b>	Silty, Clayey GRAVEL
			Clayey Fines		<b>GC</b>	Clayey GRAVEL
	<b>SAND</b>	0 to 5% Fines	Well Graded		<b>SW</b>	SAND
			Poorly Graded		<b>SP</b>	SAND
		6 to 12% Fines	Silty Fines	Well Graded	<b>SW-SM</b>	SAND with Silt
				Poorly Graded	<b>SP-SM</b>	SAND with Silt
			Clayey Fines	Well Graded	<b>SW-SC</b>	SAND with Clay
				Poorly Graded	<b>SP-SC</b>	SAND with Clay
		13 to 50% Fines	Silty Fines		<b>SM</b>	Silty SAND
Silty, Clayey Fines			<b>SC-SM</b>	Silty, Clayey SAND		
Clayey Fines			<b>SC</b>	Clayey SAND		
<b>FINE GRAINED SOIL</b> ≤ 50% Passing No. 200 Sieve	<b>SILT &amp; CLAY</b> ( <b>ILL</b> <50)	Low Plastic Fines, PI<4	Plots below "A" line		<b>ML</b>	SILT
		Low Plastic Fines, 4≤PI≤7	Plots on or above "A" line		<b>CL-ML</b>	Silty CLAY
		Plastic Fines, PI>7	Plots on or above "A" line		<b>CL</b>	Lean CLAY
		Significant Organics, PI<4	Plots below "A" line		<b>OL</b>	Organic SILT
		Significant Organics, PI≥4	Plots on or above "A" line		<b>OL</b>	Organic CLAY
	<b>SILT &amp; CLAY</b> ( <b>LL</b> ≥50)	Elastic Fines	Plots below "A" line		<b>MH</b>	Elastic SILT
		Plastic Fines	Plots on or above "A" line		<b>CH</b>	Fat CLAY
		Significant Organics	Plots below "A" line		<b>OH</b>	Organic SILT
		Significant Organics	Plots on or above "A" line		<b>OH</b>	Organic CLAY
<b>HIGHLY ORGANIC SOIL</b>		Dark, highly organic, decomposed vegetative tissue			<b>PT</b>	PEAT

**ADDITIONAL TERMINOLOGY:**

**Descriptive Components**

Descriptive Terms	Proportions
Trace	1 - 5%
Little (Sand, Gravel)	6 - 14%
With (Sand, Gravel)	15 - 30%
With (Silt, Clay)	6 - 12%
Adjective Form ( <b>Sandy, Gravelly</b> )	31 - 50%
Adjective Form ( <b>Silty, Clayey</b> )	13 - 50%

**Density or Consistency**

SAND and GRAVEL		SILT and CLAY	
N-Value	Density	N-Value	Consistency
0-4	Very Loose	0-1	Very Soft
5-10	Loose	2-4	Soft
11-30	Medium Dense	5-8	Medium Stiff
31-50	Dense	9-15	Stiff
> 50	Very Dense	16-30	Very Stiff
		> 30	Hard

**Fill materials** are placed by man, and may be identified by unnatural artifacts, unnatural mixed grain sizes or layering, or trustworthy documentation of fill placement.

**Possible Fill materials** are difficult to distinguish from natural soils, exhibiting minor distinctions.

**Decomposed Rock** consists of residual soil with SPT N-values between 50 blows per foot and blows per 4 inches (50/4").

**Highly Weathered Rock** consists of residual soil with SPT N-values between 50/3" and 50/1".



# BORING LOG

**CLIENT** Corman Kokosing **PROJECT NAME** Sparrows Point Sediment Sampling  
**PROJECT LOCATION** Sparrows Point, MD **PROJECT NUMBER** 16993-0 **DATE TESTED** \_\_\_\_\_

**RIG** Tracked Mobile B45 **METHOD** Rotary Wash **SAMPLER:** 3-in OD SS **HAMMER:** 140# **FALL:** 30" **AUTO?** Yes

**DATE STARTED** 10/23/18 **COMPLETED** 10/23/18

**DRILLER** Dustin Hurd **HELPER** Kenny Putman

**REVIEWED BY** Matt Leone **SITE DELAYS** \_\_\_\_\_

**LOCATION** As Staked **BULK SAMPLES** \_\_\_\_\_

WATER LEVELS						
DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)

DEPTH (ft)	SAMPLE TYPE AND NUMBER	SPT BLOWS/6" OR REC IN/IN %	N VALUE OR CORE RQD	STRATUM CHANGE DEPTH/EL (ft)	GRAPHIC LOG	USCS	WATER LEVEL	MATERIAL DESCRIPTION	PP (tsf)	NMC %	- #200	ATTERBERGS			REMARKS		
												PL	LL	PI			
								SURFACE EL = Unknown									
10								Water to 36' Below Mean Low Water									
20																	
30																	
36.0								Very Wet, Very Soft, Dark Gray and Black Elastic SILT with Clay and Organics									
40	S1	WOH	0			MH		Slightly stiffer at 38.5'									
	S2	WOH	0														
	S3	WOH	0														
	S4	WOH	0														
		WOH	0														
45.0		WOH						Terminated at 45.0 feet									

**REMARKS:**



The Robert B. Balter Company  
 Geotechnical and Environmental Engineers  
 Materials and Construction Inspection and Testing  
 Telephone No. (410) 363-1555  
 www.balterco.com

# BORING LOG

# BORING B-2

PAGE 1 OF 1

CLIENT Corman Kokosing PROJECT NAME Sparrows Point Sediment Sampling

PROJECT LOCATION Sparrows Point, MD PROJECT NUMBER 16993-0 DATE TESTED \_\_\_\_\_

RIG Tracked Mobile B45 METHOD Rotary Wash SAMPLER: 3-in OD SS HAMMER: 140# FALL: 30" AUTO? Yes

DATE STARTED 10/24/18 COMPLETED 10/24/18 WATER LEVELS

DRILLER Dustin Hurd HELPER Kenny Putman

REVIEWED BY Matt Leone SITE DELAYS \_\_\_\_\_

LOCATION As Staked BULK SAMPLES \_\_\_\_\_

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)

DEPTH (ft)	SAMPLE TYPE AND NUMBER	SPT BLOWS/6" OR REC IN/IN %	N VALUE OR CORE RQD	STRATUM CHANGE DEPTH/ELEV (ft)	GRAPHIC LOG	USCS	WATER LEVEL	MATERIAL DESCRIPTION	PP (tsf)	NMC %	- #200	ATTERBERGS			REMARKS
												PL	LL	PI	
								SURFACE EL = Unknown							
10								Water to 41' Below Mean Low Water							
20															
30															
40															
	S1	WOH	0	41.0		MH		Very Wet, Very Soft, Dark Gray and Black Elastic SILT with Clay and Organics							
	S2	WOH	0	45.0											
		WOH						Terminated at 45.0 feet							
		WOH													
		WOH													
		WOH													

REMARKS:

NEW GEOTECH BH LOG 16993-0 SPARROWS POINT SEDIMENT SAMPLING.GPJ MTA REDLINE.GDT 5/13/19



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 Geotechnical and Environmental Engineers  
 Materials and Construction Inspection and Testing  
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 www.balterco.com

# BORING LOG

**BORING B-3**  
 PAGE 1 OF 1

CLIENT Corman Kokosing PROJECT NAME Sparrows Point Sediment Sampling

PROJECT LOCATION Sparrows Point, MD PROJECT NUMBER 16993-0 DATE TESTED \_\_\_\_\_

RIG Tracked Mobile B45 METHOD Rotary Wash SAMPLER: 3-in OD SS HAMMER: 140# FALL: 30" AUTO? Yes

DATE STARTED 10/23/18 COMPLETED 10/23/18

DRILLER Dustin Hurd HELPER Kenny Putman

REVIEWED BY Matt Leone SITE DELAYS \_\_\_\_\_

LOCATION As Staked BULK SAMPLES \_\_\_\_\_

WATER LEVELS						
DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)

DEPTH (ft)	SAMPLE TYPE AND NUMBER	SPT BLOWS/6" OR REC IN/IN %	N VALUE OR CORE RQD	STRATUM CHANGE DEPTH/EL (ft)	GRAPHIC LOG	USCS	WATER LEVEL	MATERIAL DESCRIPTION	PP (tsf)	NMC %	- #200	ATTERBERGS			REMARKS
												PL	LL	PI	
								SURFACE EL = Unknown							
10								Water to 40.5' Below Mean Low Water							
20															
30															
40															
40.5															
42.0	S1	WOH- WOH- WOH- WOH/0"	0/0"	40.5 42.0		MH		Very Wet, Very Soft, Dark Gray and Black Elastic SILT with Clay and Organics Terminated at 42.0 feet							

REMARKS:

NEW GEOTECH BH LOG 16993-0 SPARROWS POINT SEDIMENT SAMPLING.GPJ MTA REDLINE.GDT 5/13/19





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# BORING LOG

**BORING B-4**  
 PAGE 1 OF 1

**CLIENT** Corman Kokosing **PROJECT NAME** Sparrows Point Sediment Sampling  
**PROJECT LOCATION** Sparrows Point, MD **PROJECT NUMBER** 16993-0 **DATE TESTED** \_\_\_\_\_

**RIG** Tracked Mobile B45 **METHOD** Rotary Wash **SAMPLER:** 3-in OD SS **HAMMER:** 140# **FALL:** 30" **AUTO?** Yes

**DATE STARTED** 10/23/18 **COMPLETED** 10/23/18

**DRILLER** Dustin Hurd **HELPER** Kenny Putman

**REVIEWED BY** Matt Leone **SITE DELAYS** \_\_\_\_\_

**LOCATION** As Staked **BULK SAMPLES** \_\_\_\_\_

**WATER LEVELS**

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)

DEPTH (ft)	SAMPLE TYPE AND NUMBER	SPT BLOWS/6" OR REC IN/IN %	N VALUE OR CORE RQD	STRATUM CHANGE DEPTH/EL (ft)	GRAPHIC LOG	USCS	WATER LEVEL	MATERIAL DESCRIPTION	PP (tsf)	NMC %	- #200	ATTERBERGS			REMARKS
												PL	LL	PI	
								SURFACE EL = Unknown							
10								Water to 40' Below Mean Low Water							
20															
30															
40															
	S1	WOH	0	40.0		MH		Very Wet, Very Soft, Dark Gray and Black Elastic SILT with Clay and Organics							
	S1	WOH	0	45.0				Terminated at 45.0 feet							
		WOH													
		WOH													
		WOH													
		WOH													
		WOH													

**REMARKS:**

NEW GEOTECH BH LOG 16993-0 SPARROWS POINT SEDIMENT SAMPLING.GPJ MTA REDLINE.GDT 5/13/19



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# BORING LOG

**BORING B-5**  
 PAGE 1 OF 1

**CLIENT** Corman Kokosing **PROJECT NAME** Sparrows Point Sediment Sampling  
**PROJECT LOCATION** Sparrows Point, MD **PROJECT NUMBER** 16993-0 **DATE TESTED** \_\_\_\_\_

**RIG** Tracked Mobile B45 **METHOD** Rotary Wash **SAMPLER:** 3-in OD SS **HAMMER:** 140# **FALL:** 30" **AUTO?** Yes

**DATE STARTED** 10/23/18 **COMPLETED** 10/23/18

**DRILLER** Dustin Hurd **HELPER** Kenny Putman

**REVIEWED BY** Matt Leone **SITE DELAYS** \_\_\_\_\_

**LOCATION** As Staked **BULK SAMPLES** \_\_\_\_\_

### WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)

DEPTH (ft)	SAMPLE TYPE AND NUMBER	SPT BLOWS/6" OR REC IN/IN %	N VALUE OR CORE RQD	STRATUM CHANGE DEPTH/EL (ft)	GRAPHIC LOG	USCS	WATER LEVEL	MATERIAL DESCRIPTION	PP (tsf)	NMC %	- #200	ATTERBERGS			REMARKS
												PL	LL	PI	
								SURFACE EL = Unknown							
10								Water to 40' Below Mean Low Water							
20															
30															
40															
				40.0		MH		Very Wet, Very Soft, Dark Gray and Black Elastic SILT with Clay and Organics							
				42.0				Terminated at 42.0 feet							

**REMARKS:**

NEW GEOTECH BH LOG 16993-0 SPARROWS POINT SEDIMENT SAMPLING.GPJ MTA REDLINE.GDT 5/13/19



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# BORING LOG

# BORING B-6

PAGE 1 OF 1

CLIENT Corman Kokosing PROJECT NAME Sparrows Point Sediment Sampling

PROJECT LOCATION Sparrows Point, MD PROJECT NUMBER 16993-0 DATE TESTED \_\_\_\_\_

RIG Tracked Mobile B45 METHOD Rotary Wash SAMPLER: 3-in OD SS HAMMER: 140# FALL: 30" AUTO? Yes

DATE STARTED 10/23/18 COMPLETED 10/23/18

DRILLER Dustin Hurd HELPER Kenny Putman

REVIEWED BY Matt Leone SITE DELAYS \_\_\_\_\_

LOCATION As Staked BULK SAMPLES \_\_\_\_\_

### WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)

DEPTH (ft)	SAMPLE TYPE AND NUMBER	SPT BLOWS/6" OR REC IN/IN %	N VALUE OR CORE RQD	STRATUM CHANGE DEPTH/EL (ft)	GRAPHIC LOG	USCS	WATER LEVEL	MATERIAL DESCRIPTION	PP (tsf)	NMC %	-#200	ATTERBERGS			REMARKS
												PL	LL	PI	
								SURFACE EL = Unknown							
10								Water to 43' Below Mean Low Water							
20															
30															
40															
43.0				43.0		MH		Very Wet, Very Soft, Dark Gray and Black Elastic SILT with Clay and Organics							
45.0				45.0				Terminated at 45.0 feet							

REMARKS:

NEW GEOTECH BH LOG 16993-0 SPARROWS POINT SEDIMENT SAMPLING.GPJ MTA REDLINE.GDT 5/13/19



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# BORING LOG

**BORING B-7**  
 PAGE 1 OF 1

**CLIENT** Corman Kokosing **PROJECT NAME** Sparrows Point Sediment Sampling  
**PROJECT LOCATION** Sparrows Point, MD **PROJECT NUMBER** 16993-0 **DATE TESTED** \_\_\_\_\_

**RIG** Tracked Mobile B45 **METHOD** Rotary Wash **SAMPLER:** 3-in OD SS **HAMMER:** 140# **FALL:** 30" **AUTO?** Yes

**DATE STARTED** 10/23/18 **COMPLETED** 10/23/18

**DRILLER** Dustin Hurd **HELPER** Kenny Putman

**REVIEWED BY** Matt Leone **SITE DELAYS** \_\_\_\_\_

**LOCATION** As Staked **BULK SAMPLES** \_\_\_\_\_

WATER LEVELS						
DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)

DEPTH (ft)	SAMPLE TYPE AND NUMBER	SPT BLOWS/6" OR REC IN/IN %	N VALUE OR CORE RQD	STRATUM CHANGE DEPTH/ELEV (ft)	GRAPHIC LOG	USCS	WATER LEVEL	MATERIAL DESCRIPTION	PP (tsf)	NMC %	- #200	ATTERBERGS			REMARKS
												PL	LL	PI	
								SURFACE EL = Unknown							
10								Water to 35' Below Mean Low Water							
20															
30															
35.0								Very Wet, Very Soft, Dark Gray and Black Elastic SILT with Clay and Organics							
40	S1	WOH- WOH- WOH-	0			MH									
42.0	S1	WOH- WOH- WOH- WOH- WOH- WOH- WOH- WOH-	0					Terminated at 42.0 feet							

**REMARKS:**

NEW GEOTECH BH LOG 16993-0 SPARROWS POINT SEDIMENT SAMPLING.GPJ MTA REDLINE.GDT 5/13/19



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# BORING LOG

**BORING B-8**  
 PAGE 1 OF 1

**CLIENT** Corman Kokosing **PROJECT NAME** Sparrows Point Sediment Sampling  
**PROJECT LOCATION** Sparrows Point, MD **PROJECT NUMBER** 16993-0 **DATE TESTED** \_\_\_\_\_

**RIG** Tracked Mobile B45 **METHOD** Rotary Wash **SAMPLER:** 3-in OD SS **HAMMER:** 140# **FALL:** 30" **AUTO?** Yes

**DATE STARTED** 10/23/18 **COMPLETED** 10/23/18

**DRILLER** Dustin Hurd **HELPER** Kenny Putman

**REVIEWED BY** Matt Leone **SITE DELAYS** \_\_\_\_\_

**LOCATION** As Staked **BULK SAMPLES** \_\_\_\_\_

**WATER LEVELS**

DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)

DEPTH (ft)	SAMPLE TYPE AND NUMBER	SPT BLOWS/6" OR REC IN/IN %	N VALUE OR CORE RQD	STRATUM CHANGE DEPTH/ELEV (ft)	GRAPHIC LOG	USCS	WATER LEVEL	MATERIAL DESCRIPTION	PP (tsf)	NMC %	- #200	ATTERBERGS			REMARKS
												PL	LL	PI	
								SURFACE EL = Unknown							
10								Water to 40' Below Mean Low Water							
20															
30															
40	S1 S1	WOH- WOH- WOH- WOH- WOH- WOH- WOH-	0 0	40.0	MH			Very Wet, Very Soft, Dark Gray and Black Elastic SILT with Clay and Organics							
				45.0				Terminated at 45.0 feet							

**REMARKS:**

NEW GEOTECH BH LOG 16993-0 SPARROWS POINT SEDIMENT SAMPLING.GPJ MTA REDLINE.GDT 5/13/19



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# BORING LOG

**BORING B-9**  
 PAGE 1 OF 1

**CLIENT** Corman Kokosing **PROJECT NAME** Sparrows Point Sediment Sampling  
**PROJECT LOCATION** Sparrows Point, MD **PROJECT NUMBER** 16993-0 **DATE TESTED** \_\_\_\_\_

**RIG** Tracked Mobile B45 **METHOD** Rotary Wash **SAMPLER:** 3-in OD SS **HAMMER:** 140# **FALL:** 30" **AUTO?** Yes

**DATE STARTED** 10/23/18 **COMPLETED** 10/23/18

**DRILLER** Dustin Hurd **HELPER** Kenny Putman

**REVIEWED BY** Matt Leone **SITE DELAYS** \_\_\_\_\_

**LOCATION** As Staked **BULK SAMPLES** \_\_\_\_\_

WATER LEVELS						
DATE	TIME	ELAPSED HOURS	CASING DEPTH (ft)	HOLE DEPTH (ft)	WATER DEPTH (ft)	WATER ELEV (ft)

DEPTH (ft)	SAMPLE TYPE AND NUMBER	SPT BLOWS/6" OR REC IN/IN %	N VALUE OR CORE RQD	STRATUM CHANGE DEPTH/ELEV (ft)	GRAPHIC LOG	USCS	WATER LEVEL	MATERIAL DESCRIPTION	PP (tsf)	NMC %	- #200	ATTERBERGS			REMARKS
												PL	LL	PI	
								SURFACE EL = Unknown							
10								Water to 40' Below Mean Low Water							
20															
30															
40															
40.0	S1	WOH- WOH- WOH-	0	40.0		MH		Very Wet, Very Soft, Dark Gray and Black Elastic SILT with Clay and Organics							
42.0				42.0				Terminated at 42.0 feet							

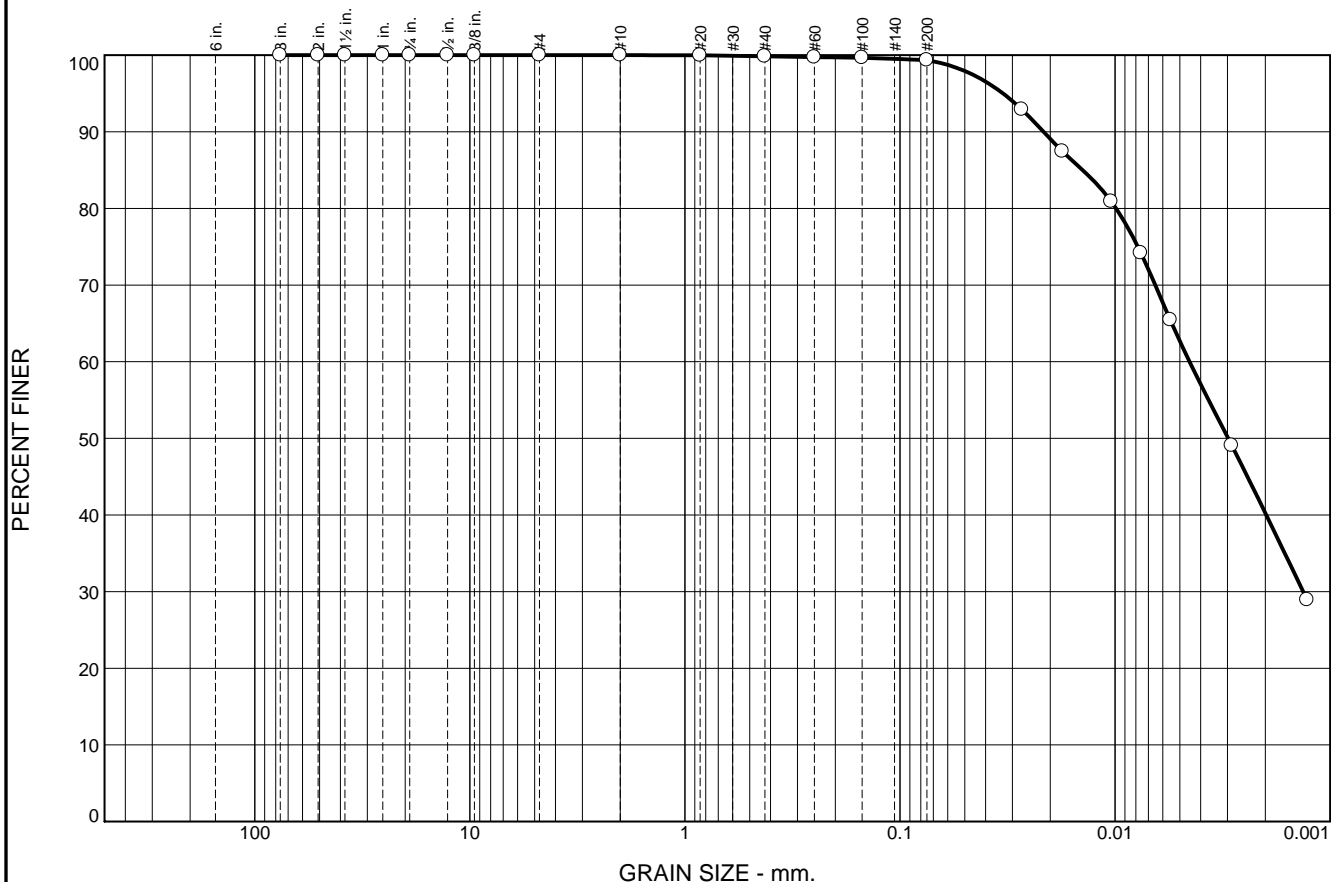
**REMARKS:**

NEW GEOTECH BH LOG 16993-0 SPARROWS POINT SEDIMENT SAMPLING.GPJ MTA REDLINE.GDT 5/13/19



**APPENDIX B - LABORATORY TEST RESULTS**

# Particle Size Distribution Report



%	+3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.2	0.5	36.6	62.7

%	LL	PL	D <sub>85</sub>	D <sub>60</sub>	D <sub>50</sub>	D <sub>30</sub>	D <sub>15</sub>	D <sub>10</sub>	C <sub>c</sub>	C <sub>u</sub>
○	97	47	0.0142	0.0045	0.0030	0.0013				

Material Description	USCS	AASHTO
○ Dark Gray Elastic Silt	MH	A-7-5(65)

**Project No.** 16993-0      **Client:** Corman Kokosing Construction, Inc  
**Project:** Sparrows Point Sediment  
**Source of Sample:** P2-1      **Depth:** Composite      **Sample Number:** 1

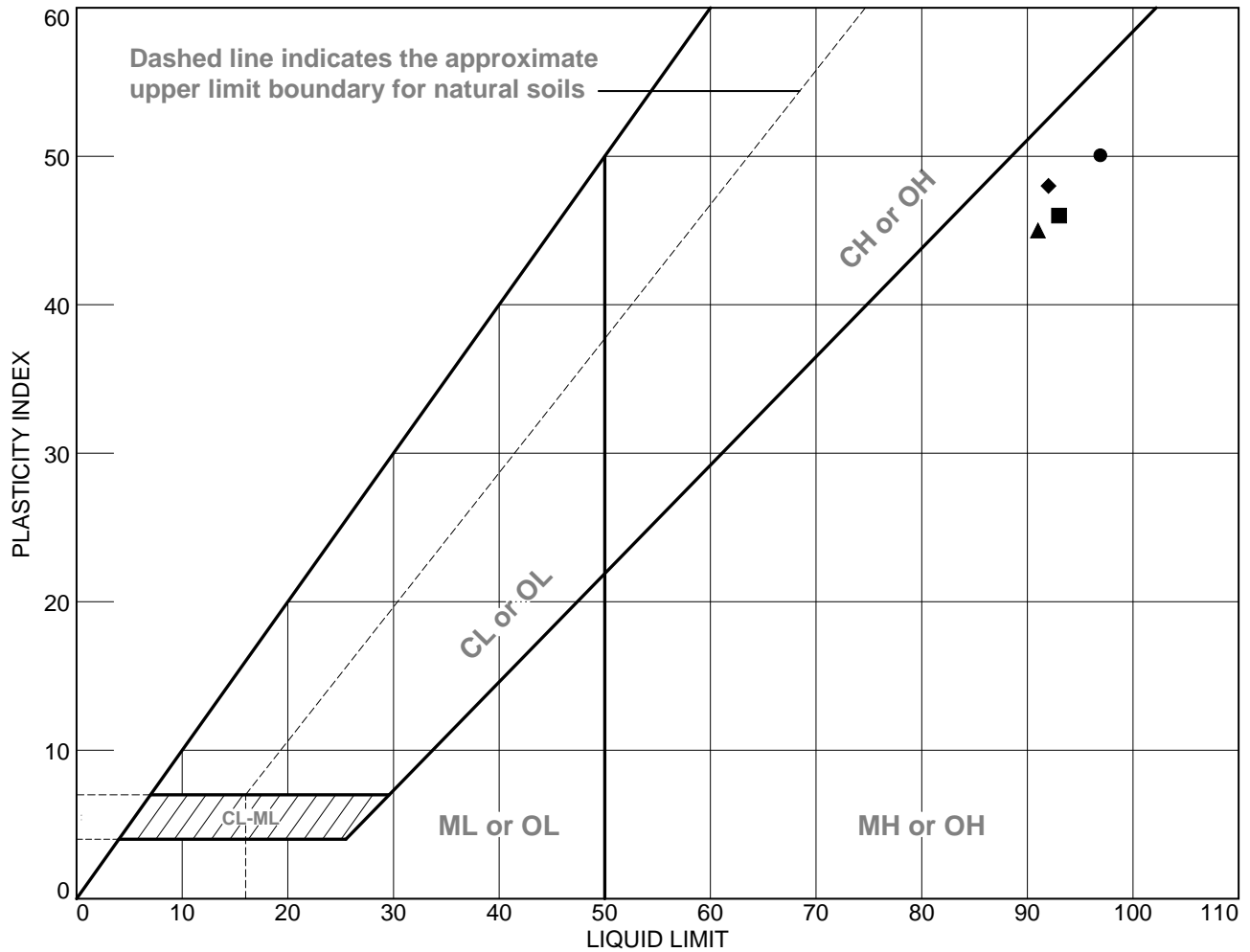
**Remarks:**  
 ○ Specific gravity = 2.684

## The Robert B. Balter Company

Figure

**Tested By:** TA \_\_\_\_\_      **Checked By:** SK \_\_\_\_\_

# LIQUID AND PLASTIC LIMITS TEST REPORT



## SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	P2-1	1	Composite	270.4	47	97	50	MH
■	P2-2	1	Composite	268.6	47	93	46	MH
▲	P3-1	1	Composite	270.4	46	91	45	MH
◆	P3-2	1	Composite	192.0	44	92	48	MH

**The Robert B. Balter Company**

**Client:** Corman Kokosing Construction, Inc

**Project:** Sparrows Point Sediment

**Project No.:** 16993-0

**Figure**

# Particle Size Distribution Report



%	+3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.5	1.4	38.1	60.0

×	LL	PL	D <sub>85</sub>	D <sub>60</sub>	D <sub>50</sub>	D <sub>30</sub>	D <sub>15</sub>	D <sub>10</sub>	C <sub>c</sub>	C <sub>u</sub>
○	93	47	0.0183	0.0050	0.0034	0.0014				

Material Description							USCS	AASHTO
○ Dark Gray Elastic Silt							MH	A-7-5(59)

<b>Project No.</b> 16993-0 <b>Client:</b> Corman Kokosing Construction, Inc <b>Project:</b> Sparrows Point Sediment	<b>Remarks:</b> ○ Specific gravity = 2.723
○ <b>Source of Sample:</b> P2-2 <b>Depth:</b> Composite <b>Sample Number:</b> 1	

## The Robert B. Balter Company

Figure

**Tested By:** TA \_\_\_\_\_ **Checked By:** SK \_\_\_\_\_

**APPENDIX C – ENVIRONMENTAL TESTING RESULTS**



June 11, 2019

Mr. Matt Newman  
Tradepoint Atlantic  
1600 Sparrows Point Blvd.  
Sparrows Point, MD 21219

## Certificate of Analysis

Revised Report - 6/11/2019 12:28:39 PM - See workorder comment section for explanation

Project Name:	<b>2018-SEDIMENTS - BALTIMORE MD</b>	Workorder:	<b>2346382</b>
Purchase Order:		Workorder ID:	<b>2018-SEDIMENTS - BALTIMORE MD</b>

Dear Mr. Newman:

Enclosed are the analytical results for samples received by the laboratory on Thursday, October 25, 2018.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Mrs. Vanessa N Badman (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at [www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads](http://www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads).

This laboratory report may not be reproduced, except in full, without the written approval of ALS Environmental.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

Mrs. Vanessa N Badman  
Project Coordinator

*This page is included as part of the Analytical Report and must be retained as a permanent record thereof.*

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**SAMPLE SUMMARY**

Workorder: 2346382 2018-SEDIMENTS - BALTIMORE MD

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2346382001	P2-1 Wetlands	Solid	10/23/2018 15:00	10/25/2018 21:30	Collected by Client
2346382002	P2-2 Wetlands	Solid	10/24/2018 16:00	10/25/2018 21:30	Collected by Client

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**SAMPLE SUMMARY**

Workorder: 2346382 2018-SEDIMENTS - BALTIMORE MD

**Notes**

- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are performed in the laboratory and are therefore analyzed out of hold time.
- Method references listed on this report beginning with the prefix "S" followed by a method number (such as S2310B-97) refer to methods from "Standard Methods for the Examination of Water and Wastewater".
- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

**Standard Acronyms/Flags**

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

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Vancouver Waterloo · Winnipeg · Yellowknife United States: Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York Mexico: Monterrey

## PROJECT SUMMARY

Workorder: 2346382 2018-SEDIMENTS - BALTIMORE MD

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### Workorder Comments

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Please see attached subcontracting from ALS Houston. VNB 11/2/18

Per client request, -005 and -006 were moved to their own WO. See WO 3005034. VNB 12/11/18

This Certificate of Analysis has been modified in order to edit the compound lists for 8260 and 8270 per client request. VNB 1/7/19

This Certificate of Analysis has been modified in order to move -003 and -004 to WO 3038852 per client request. VNB 6/11/19

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Vancouver Waterloo · Winnipeg · Yellowknife **United States:** Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York **Mexico:** Monterrey

**ANALYTICAL RESULTS**

Workorder: 2346382 2018-SEDIMENTS - BALTIMORE MD

Lab ID: **2346382001**  
Sample ID: **P2-1 Wetlands**

Date Collected: 10/23/2018 15:00 Matrix: Solid  
Date Received: 10/25/2018 21:30

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>GASOLINE RANGE ORGANICS</b>										
Gasoline Range Organics	ND		ug/kg	37400	SW846 8015D	10/23/18 15:00	DD	10/29/18 17:10	DD	H
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
a,a,a-Trifluorotoluene (S)	119		%	72 - 134	SW846 8015D	10/23/18 15:00	DD	10/29/18 17:10	DD	H
<b>VOLATILE ORGANICS</b>										
Acetone	149		ug/kg	63.3	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
Acrolein	ND		ug/kg	317	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
Acrylonitrile	ND		ug/kg	63.3	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
Benzene	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
Bromochloromethane	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
Bromodichloromethane	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
Bromoform	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
Bromomethane	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
2-Butanone	ND		ug/kg	63.3	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
Carbon Disulfide	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
Carbon Tetrachloride	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
Chlorobenzene	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
Chlorodibromomethane	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
Chloroethane	ND		ug/kg	31.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
2-Chloroethylvinyl ether	ND		ug/kg	950	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
Chloroform	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
Chloromethane	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
Cyclohexane	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
1,2-Dibromo-3-chloropropane	ND		ug/kg	31.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
1,2-Dibromoethane	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
1,2-Dichlorobenzene	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
1,3-Dichlorobenzene	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
1,4-Dichlorobenzene	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
Dichlorodifluoromethane	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
1,1-Dichloroethane	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
1,2-Dichloroethane	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
1,1-Dichloroethene	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
cis-1,2-Dichloroethene	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
trans-1,2-Dichloroethene	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
1,2-Dichloropropane	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
cis-1,3-Dichloropropene	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D

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Vancouver Waterloo · Winnipeg · Yellowknife United States: Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York Mexico: Monterrey

**ANALYTICAL RESULTS**

Workorder: 2346382 2018-SEDIMENTS - BALTIMORE MD

 Lab ID: **2346382001** Date Collected: 10/23/2018 15:00 Matrix: Solid  
 Sample ID: **P2-1 Wetlands** Date Received: 10/25/2018 21:30

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
trans-1,3-Dichloropropene	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
1,4-Dioxane	ND		ug/kg	475	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
Ethylbenzene	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
Freon 113	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
2-Hexanone	ND		ug/kg	63.3	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
Isopropylbenzene	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
Methyl acetate	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
Methyl cyclohexane	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
Methyl t-Butyl Ether	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
4-Methyl-2-Pentanone(MIBK)	ND		ug/kg	63.3	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
Methylene Chloride	149	2	ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
Styrene	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
1,1,2,2-Tetrachloroethane	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
Tetrachloroethene	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
Toluene	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
Total Xylenes	ND		ug/kg	38.0	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
1,2,3-Trichlorobenzene	ND		ug/kg	31.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
1,2,4-Trichlorobenzene	ND		ug/kg	31.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
1,1,1-Trichloroethane	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
1,1,2-Trichloroethane	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
Trichloroethene	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
Trichlorofluoromethane	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
Vinyl Chloride	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
o-Xylene	ND		ug/kg	12.7	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
mp-Xylene	ND		ug/kg	25.3	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
Surrogate Recoveries	Results	Flag	Units	Limits	Method	Prepared	By	Analyzed	By	Cntr
1,2-Dichloroethane-d4 (S)	92.3		%	56 - 124	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
4-Bromofluorobenzene (S)	104		%	51 - 128	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
Dibromofluoromethane (S)	102		%	62 - 123	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
Toluene-d8 (S)	102		%	59 - 131	SW846 8260B	10/23/18 15:00	PDK	10/30/18 06:31	PDK	D
<b>SEMIVOLATILES</b>										
Acenaphthene	ND		ug/kg	162	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
Acenaphthylene	ND		ug/kg	162	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
Acetophenone	ND		ug/kg	324	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
Anthracene	ND		ug/kg	162	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
Atrazine	ND		ug/kg	324	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
Benzaldehyde	ND		ug/kg	648	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A

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**ANALYTICAL RESULTS**

Workorder: 2346382 2018-SEDIMENTS - BALTIMORE MD

Lab ID: **2346382001**  
Sample ID: **P2-1 Wetlands**

Date Collected: 10/23/2018 15:00 Matrix: Solid  
Date Received: 10/25/2018 21:30

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
Benzidine	ND		ug/kg	648	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
Benzo(a)anthracene	ND		ug/kg	162	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
Benzo(a)pyrene	ND		ug/kg	162	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
Benzo(b)fluoranthene	ND		ug/kg	162	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
Benzo(g,h,i)perylene	ND		ug/kg	162	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
Benzo(k)fluoranthene	ND		ug/kg	162	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
Biphenyl	ND		ug/kg	324	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
4-Bromophenyl-phenylether	ND		ug/kg	324	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
Butylbenzylphthalate	ND		ug/kg	324	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
Caprolactam	ND		ug/kg	648	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
Carbazole	ND		ug/kg	324	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
4-Chloro-3-methylphenol	ND		ug/kg	648	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
4-Chloroaniline	ND		ug/kg	648	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
bis(2-Chloroethoxy)methane	ND		ug/kg	324	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
bis(2-Chloroethyl)ether	ND		ug/kg	324	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
bis(2-Chloroisopropyl)ether	ND		ug/kg	324	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
2-Chloronaphthalene	ND		ug/kg	324	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
2-Chlorophenol	ND		ug/kg	648	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
4-Chlorophenyl-phenylether	ND		ug/kg	324	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
Chrysene	ND		ug/kg	162	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
mp-Cresol	ND		ug/kg	648	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
o-Cresol	ND		ug/kg	648	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
Di-n-Butylphthalate	ND		ug/kg	324	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
Di-n-Octylphthalate	ND		ug/kg	324	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
Dibenzo(a,h)anthracene	ND		ug/kg	162	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
Dibenzofuran	ND		ug/kg	324	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
3,3-Dichlorobenzidine	ND		ug/kg	648	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
2,4-Dichlorophenol	ND		ug/kg	648	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
Diethylphthalate	ND		ug/kg	324	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
2,4-Dimethylphenol	ND		ug/kg	648	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
Dimethylphthalate	ND		ug/kg	324	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
2,4-Dinitrophenol	ND		ug/kg	1300	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
2,4-Dinitrotoluene	ND		ug/kg	324	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
2,6-Dinitrotoluene	ND		ug/kg	324	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
1,4-Dioxane	ND		ug/kg	324	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
1,2-Diphenylhydrazine	ND		ug/kg	324	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
bis(2-Ethylhexyl)phthalate	ND		ug/kg	324	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
Fluoranthene	ND		ug/kg	162	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A

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**ANALYTICAL RESULTS**

Workorder: 2346382 2018-SEDIMENTS - BALTIMORE MD

Lab ID: **2346382001**  
Sample ID: **P2-1 Wetlands**

Date Collected: 10/23/2018 15:00 Matrix: Solid  
Date Received: 10/25/2018 21:30

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
Fluorene	ND		ug/kg	162	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
Hexachlorobenzene	ND		ug/kg	324	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
Hexachlorobutadiene	ND		ug/kg	324	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
Hexachlorocyclopentadiene	ND		ug/kg	648	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
Hexachloroethane	ND		ug/kg	324	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
Indeno(1,2,3-cd)pyrene	ND		ug/kg	162	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
Isophorone	ND		ug/kg	324	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
2-Methyl-4,6-dinitrophenol	ND		ug/kg	648	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
2-Methylnaphthalene	ND		ug/kg	324	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
Naphthalene	ND		ug/kg	162	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
2-Nitroaniline	ND		ug/kg	648	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
3-Nitroaniline	ND		ug/kg	648	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
4-Nitroaniline	ND		ug/kg	648	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
Nitrobenzene	ND		ug/kg	324	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
2-Nitrophenol	ND		ug/kg	648	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
4-Nitrophenol	ND		ug/kg	648	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
N-Nitrosodimethylamine	ND		ug/kg	324	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
N-Nitroso-di-n-propylamine	ND		ug/kg	324	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
N-Nitrosodiphenylamine	ND		ug/kg	324	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
Pentachlorophenol	ND		ug/kg	648	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
Phenanthrene	ND		ug/kg	162	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
Phenol	ND		ug/kg	648	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
Pyrene	ND		ug/kg	162	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
1,2,4,5-Tetrachlorobenzene	ND		ug/kg	324	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
2,3,4,6-Tetrachlorophenol	ND		ug/kg	648	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
2,4,5-Trichlorophenol	ND		ug/kg	648	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
2,4,6-Trichlorophenol	ND		ug/kg	648	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
2,4,6-Tribromophenol (S)	77.1		%	19 - 132	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
2-Fluorobiphenyl (S)	76.5		%	40 - 110	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
2-Fluorophenol (S)	77.1		%	26 - 116	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
Nitrobenzene-d5 (S)	75.4		%	38 - 112	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
Phenol-d5 (S)	75.4		%	35 - 111	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
Terphenyl-d14 (S)	85.9		%	45 - 126	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:17	CGS	A
<b>PCBs</b>										
Total Polychlorinated Biphenyl	ND		mg/kg	1.0	SW846 8082A	10/27/18 10:20	J1H	10/31/18 05:52	EGO	F
Aroclor-1016	ND		mg/kg	0.11	SW846 8082A	10/27/18 10:20	J1H	10/31/18 05:52	EGO	F

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**ANALYTICAL RESULTS**

Workorder: 2346382 2018-SEDIMENTS - BALTIMORE MD

Lab ID: **2346382001**  
Sample ID: **P2-1 Wetlands**

Date Collected: 10/23/2018 15:00 Matrix: Solid  
Date Received: 10/25/2018 21:30

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
Aroclor-1221	ND		mg/kg	0.11	SW846 8082A	10/27/18 10:20	J1H	10/31/18 05:52	EGO	F
Aroclor-1232	ND		mg/kg	0.11	SW846 8082A	10/27/18 10:20	J1H	10/31/18 05:52	EGO	F
Aroclor-1242	ND		mg/kg	0.11	SW846 8082A	10/27/18 10:20	J1H	10/31/18 05:52	EGO	F
Aroclor-1248	ND		mg/kg	0.11	SW846 8082A	10/27/18 10:20	J1H	10/31/18 05:52	EGO	F
Aroclor-1254	ND		mg/kg	0.11	SW846 8082A	10/27/18 10:20	J1H	10/31/18 05:52	EGO	F
Aroclor-1260	ND		mg/kg	0.11	SW846 8082A	10/27/18 10:20	J1H	10/31/18 05:52	EGO	F
Aroclor-1262	ND		mg/kg	0.11	SW846 8082A	10/27/18 10:20	J1H	10/31/18 05:52	EGO	F
Aroclor-1268	ND		mg/kg	0.11	SW846 8082A	10/27/18 10:20	J1H	10/31/18 05:52	EGO	F
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
Decachlorobiphenyl (S)	52.4		%	49 - 115	SW846 8082A	10/27/18 10:20	J1H	10/31/18 05:52	EGO	F
Tetrachloro-m-xylene (S)	55.1		%	27 - 137	SW846 8082A	10/27/18 10:20	J1H	10/31/18 05:52	EGO	F
<b>PETROLEUM HC's</b>										
Diesel Range Organics C10-C28	38.7		mg/kg	34.4	SW846 8015D	10/27/18 11:35	JTH	10/29/18 19:09	BS	A
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
o-Terphenyl (S)	50.6		%	36 - 122	SW846 8015D	10/27/18 11:35	JTH	10/29/18 19:09	BS	A
<b>WET CHEMISTRY</b>										
Hexane Extractable Material	968		mg/kg	692	SW846 9071B			10/30/18 06:15	MPP	A
Hexavalent Chromium	ND		mg/kg	6.9	SW846 7196A	10/29/18 14:45	VXF	10/30/18 20:00	VXF	A
Moisture	71.1		%	0.1	S2540G-11			10/29/18 12:00	AXD	
Total Solids	28.9		%	0.1	S2540G-11			10/29/18 12:00	AXD	
<b>METALS</b>										
Aluminum, Total	28500		mg/kg	118	SW846 6020A	10/26/18 16:45	AHI	10/29/18 14:33	MO	A1
Antimony, Total	ND		mg/kg	2.9	SW846 6020A	10/26/18 16:45	AHI	10/29/18 14:33	MO	A1
Arsenic, Total	19.6		mg/kg	4.4	SW846 6020A	10/26/18 16:45	AHI	10/29/18 14:33	MO	A1
Barium, Total	93.9		mg/kg	7.4	SW846 6020A	10/26/18 16:45	AHI	10/29/18 14:33	MO	A1
Beryllium, Total	1.8		mg/kg	1.5	SW846 6020A	10/26/18 16:45	AHI	10/29/18 14:33	MO	A1
Cadmium, Total	ND		mg/kg	1.5	SW846 6020A	10/26/18 16:45	AHI	10/29/18 14:33	MO	A1
Calcium, Total	2020		mg/kg	147	SW846 6020A	10/26/18 16:45	AHI	10/29/18 14:33	MO	A1
Chromium, Total	100		mg/kg	2.9	SW846 6020A	10/26/18 16:45	AHI	10/29/18 14:33	MO	A1
Cobalt, Total	29.6		mg/kg	7.4	SW846 6020A	10/26/18 16:45	AHI	10/29/18 14:33	MO	A1
Copper, Total	59.7		mg/kg	7.4	SW846 6020A	10/26/18 16:45	AHI	10/29/18 14:33	MO	A1
Iron, Total	47800		mg/kg	73.5	SW846 6020A	10/26/18 16:45	AHI	10/29/18 14:33	MO	A1
Lead, Total	95.8		mg/kg	2.9	SW846 6020A	10/26/18 16:45	AHI	10/29/18 14:33	MO	A1
Magnesium, Total	7420		mg/kg	147	SW846 6020A	10/26/18 16:45	AHI	10/29/18 14:33	MO	A1
Manganese, Total	2170		mg/kg	7.4	SW846 6020A	10/26/18 16:45	AHI	10/29/18 14:33	MO	A1

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### ANALYTICAL RESULTS

Workorder: 2346382 2018-SEDIMENTS - BALTIMORE MD

Lab ID: **2346382001** Date Collected: 10/23/2018 15:00 Matrix: Solid  
 Sample ID: **P2-1 Wetlands** Date Received: 10/25/2018 21:30

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
Mercury, Total	0.34		mg/kg	0.16	SW846 7471B	10/30/18 11:35	AXC	10/30/18 14:21	AXC	A2
Nickel, Total	48.7		mg/kg	7.4	SW846 6020A	10/26/18 16:45	AHI	10/29/18 14:33	MO	A1
Potassium, Total	5320		mg/kg	147	SW846 6020A	10/26/18 16:45	AHI	10/29/18 14:33	MO	A1
Selenium, Total	ND		mg/kg	7.4	SW846 6020A	10/26/18 16:45	AHI	10/29/18 14:33	MO	A1
Silver, Total	ND		mg/kg	2.9	SW846 6020A	10/26/18 16:45	AHI	10/29/18 14:33	MO	A1
Sodium, Total	11000		mg/kg	147	SW846 6020A	10/26/18 16:45	AHI	10/29/18 14:33	MO	A1
Thallium, Total	ND		mg/kg	1.5	SW846 6020A	10/26/18 16:45	AHI	10/29/18 14:33	MO	A1
Vanadium, Total	79.9		mg/kg	2.9	SW846 6020A	10/26/18 16:45	AHI	10/29/18 14:33	MO	A1
Zinc, Total	334		mg/kg	7.4	SW846 6020A	10/26/18 16:45	AHI	10/29/18 14:33	MO	A1

**SUBCONTRACTED ANALYSIS**

Subcontracted Analysis See attached. Subcontract 10/23/18 15:00 SUB I

*Vanessa N. Badman*  
 Mrs. Vanessa N Badman  
 Project Coordinator

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**ANALYTICAL RESULTS**

Workorder: 2346382 2018-SEDIMENTS - BALTIMORE MD

Lab ID: **2346382002** Date Collected: 10/24/2018 16:00 Matrix: Solid  
Sample ID: **P2-2 Wetlands** Date Received: 10/25/2018 21:30

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
<b>GASOLINE RANGE ORGANICS</b>										
Gasoline Range Organics	ND		ug/kg	36700	SW846 8015D	10/23/18 16:00	DD	10/29/18 17:41	DD	H
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
a,a,a-Trifluorotoluene (S)	123		%	72 - 134	SW846 8015D	10/23/18 16:00	DD	10/29/18 17:41	DD	H
<b>VOLATILE ORGANICS</b>										
Acetone	161		ug/kg	61.8	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
Acrolein	ND		ug/kg	309	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
Acrylonitrile	ND		ug/kg	61.8	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
Benzene	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
Bromochloromethane	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
Bromodichloromethane	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
Bromoform	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
Bromomethane	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
2-Butanone	ND		ug/kg	61.8	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
Carbon Disulfide	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
Carbon Tetrachloride	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
Chlorobenzene	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
Chlorodibromomethane	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
Chloroethane	ND		ug/kg	30.9	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
2-Chloroethylvinyl ether	ND		ug/kg	927	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
Chloroform	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
Chloromethane	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
Cyclohexane	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
1,2-Dibromo-3-chloropropane	ND		ug/kg	30.9	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
1,2-Dibromoethane	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
1,2-Dichlorobenzene	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
1,3-Dichlorobenzene	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
1,4-Dichlorobenzene	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
Dichlorodifluoromethane	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
1,1-Dichloroethane	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
1,2-Dichloroethane	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
1,1-Dichloroethene	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
cis-1,2-Dichloroethene	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
trans-1,2-Dichloroethene	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
1,2-Dichloropropane	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
cis-1,3-Dichloropropene	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E

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**ANALYTICAL RESULTS**

Workorder: 2346382 2018-SEDIMENTS - BALTIMORE MD

Lab ID: **2346382002** Date Collected: 10/24/2018 16:00 Matrix: Solid  
Sample ID: **P2-2 Wetlands** Date Received: 10/25/2018 21:30

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
trans-1,3-Dichloropropene	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
1,4-Dioxane	ND		ug/kg	463	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
Ethylbenzene	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
Freon 113	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
2-Hexanone	ND		ug/kg	61.8	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
Isopropylbenzene	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
Methyl acetate	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
Methyl cyclohexane	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
Methyl t-Butyl Ether	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
4-Methyl-2-Pentanone(MIBK)	ND		ug/kg	61.8	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
Methylene Chloride	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
Styrene	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
1,1,2,2-Tetrachloroethane	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
Tetrachloroethene	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
Toluene	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
Total Xylenes	ND		ug/kg	37.1	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
1,2,3-Trichlorobenzene	ND		ug/kg	30.9	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
1,2,4-Trichlorobenzene	ND		ug/kg	30.9	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
1,1,1-Trichloroethane	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
1,1,2-Trichloroethane	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
Trichloroethene	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
Trichlorofluoromethane	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
Vinyl Chloride	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
o-Xylene	ND		ug/kg	12.4	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
mp-Xylene	ND		ug/kg	24.7	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	92		%	56 - 124	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
4-Bromofluorobenzene (S)	105		%	51 - 128	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
Dibromofluoromethane (S)	104		%	62 - 123	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
Toluene-d8 (S)	104		%	59 - 131	SW846 8260B	10/23/18 16:00	PDK	10/30/18 06:56	PDK	E
<b>SEMIVOLATILES</b>										
Acenaphthene	ND		ug/kg	179	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
Acenaphthylene	ND		ug/kg	179	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
Acetophenone	ND		ug/kg	358	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
Anthracene	ND		ug/kg	179	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
Atrazine	ND		ug/kg	358	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
Benzaldehyde	ND		ug/kg	717	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A

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**ANALYTICAL RESULTS**

Workorder: 2346382 2018-SEDIMENTS - BALTIMORE MD

 Lab ID: **2346382002** Date Collected: 10/24/2018 16:00 Matrix: Solid  
 Sample ID: **P2-2 Wetlands** Date Received: 10/25/2018 21:30

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
Benzidine	ND		ug/kg	717	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
Benzo(a)anthracene	ND		ug/kg	179	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
Benzo(a)pyrene	ND		ug/kg	179	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
Benzo(b)fluoranthene	ND		ug/kg	179	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
Benzo(g,h,i)perylene	ND		ug/kg	179	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
Benzo(k)fluoranthene	ND		ug/kg	179	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
Biphenyl	ND		ug/kg	358	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
4-Bromophenyl-phenylether	ND		ug/kg	358	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
Butylbenzylphthalate	ND		ug/kg	358	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
Caprolactam	ND		ug/kg	717	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
Carbazole	ND		ug/kg	358	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
4-Chloro-3-methylphenol	ND		ug/kg	717	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
4-Chloroaniline	ND		ug/kg	717	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
bis(2-Chloroethoxy)methane	ND		ug/kg	358	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
bis(2-Chloroethyl)ether	ND		ug/kg	358	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
bis(2-Chloroisopropyl)ether	ND		ug/kg	358	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
2-Chloronaphthalene	ND		ug/kg	358	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
2-Chlorophenol	ND		ug/kg	717	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
4-Chlorophenyl-phenylether	ND		ug/kg	358	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
Chrysene	ND		ug/kg	179	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
mp-Cresol	ND		ug/kg	717	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
o-Cresol	ND		ug/kg	717	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
Di-n-Butylphthalate	ND		ug/kg	358	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
Di-n-Octylphthalate	ND		ug/kg	358	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
Dibenzo(a,h)anthracene	ND		ug/kg	179	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
Dibenzofuran	ND		ug/kg	358	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
3,3-Dichlorobenzidine	ND		ug/kg	717	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
2,4-Dichlorophenol	ND		ug/kg	717	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
Diethylphthalate	ND		ug/kg	358	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
2,4-Dimethylphenol	ND		ug/kg	717	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
Dimethylphthalate	ND		ug/kg	358	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
2,4-Dinitrophenol	ND		ug/kg	1430	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
2,4-Dinitrotoluene	ND		ug/kg	358	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
2,6-Dinitrotoluene	ND		ug/kg	358	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
1,4-Dioxane	ND		ug/kg	358	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
1,2-Diphenylhydrazine	ND		ug/kg	358	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
bis(2-Ethylhexyl)phthalate	ND		ug/kg	358	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
Fluoranthene	ND		ug/kg	179	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A

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**ANALYTICAL RESULTS**

Workorder: 2346382 2018-SEDIMENTS - BALTIMORE MD

Lab ID: **2346382002**  
Sample ID: **P2-2 Wetlands**

Date Collected: 10/24/2018 16:00 Matrix: Solid  
Date Received: 10/25/2018 21:30

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
Fluorene	ND		ug/kg	179	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
Hexachlorobenzene	ND		ug/kg	358	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
Hexachlorobutadiene	ND		ug/kg	358	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
Hexachlorocyclopentadiene	ND		ug/kg	717	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
Hexachloroethane	ND		ug/kg	358	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
Indeno(1,2,3-cd)pyrene	ND		ug/kg	179	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
Isophorone	ND		ug/kg	358	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
2-Methyl-4,6-dinitrophenol	ND		ug/kg	717	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
2-Methylnaphthalene	ND		ug/kg	358	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
Naphthalene	ND		ug/kg	179	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
2-Nitroaniline	ND		ug/kg	717	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
3-Nitroaniline	ND		ug/kg	717	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
4-Nitroaniline	ND		ug/kg	717	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
Nitrobenzene	ND		ug/kg	358	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
2-Nitrophenol	ND		ug/kg	717	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
4-Nitrophenol	ND		ug/kg	717	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
N-Nitrosodimethylamine	ND		ug/kg	358	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
N-Nitroso-di-n-propylamine	ND		ug/kg	358	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
N-Nitrosodiphenylamine	ND		ug/kg	358	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
Pentachlorophenol	ND		ug/kg	717	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
Phenanthrene	ND		ug/kg	179	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
Phenol	ND		ug/kg	717	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
Pyrene	ND		ug/kg	179	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
1,2,4,5-Tetrachlorobenzene	ND		ug/kg	358	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
2,3,4,6-Tetrachlorophenol	ND		ug/kg	717	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
2,4,5-Trichlorophenol	ND		ug/kg	717	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
2,4,6-Trichlorophenol	ND		ug/kg	717	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
Surrogate Recoveries	Results	Flag	Units	Limits	Method	Prepared	By	Analyzed	By	Cntr
2,4,6-Tribromophenol (S)	69.9		%	19 - 132	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
2-Fluorobiphenyl (S)	38	1	%	40 - 110	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
2-Fluorophenol (S)	80.6		%	26 - 116	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
Nitrobenzene-d5 (S)	61.7		%	38 - 112	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
Phenol-d5 (S)	80.1		%	35 - 111	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
Terphenyl-d14 (S)	55.6		%	45 - 126	SW846 8270D	10/29/18 04:30	JTH	10/29/18 15:42	CGS	A
<b>PCBs</b>										
Total Polychlorinated Biphenyl	ND		mg/kg	1.1	SW846 8082A	10/27/18 10:20	J1H	10/29/18 01:59	EGO	F
Aroclor-1016	ND		mg/kg	0.12	SW846 8082A	10/27/18 10:20	J1H	10/29/18 01:59	EGO	F

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**ANALYTICAL RESULTS**

Workorder: 2346382 2018-SEDIMENTS - BALTIMORE MD

Lab ID: **2346382002** Date Collected: 10/24/2018 16:00 Matrix: Solid  
Sample ID: **P2-2 Wetlands** Date Received: 10/25/2018 21:30

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
Aroclor-1221	ND		mg/kg	0.12	SW846 8082A	10/27/18 10:20	J1H	10/29/18 01:59	EGO	F
Aroclor-1232	ND		mg/kg	0.12	SW846 8082A	10/27/18 10:20	J1H	10/29/18 01:59	EGO	F
Aroclor-1242	ND		mg/kg	0.12	SW846 8082A	10/27/18 10:20	J1H	10/29/18 01:59	EGO	F
Aroclor-1248	ND		mg/kg	0.12	SW846 8082A	10/27/18 10:20	J1H	10/29/18 01:59	EGO	F
Aroclor-1254	ND		mg/kg	0.12	SW846 8082A	10/27/18 10:20	J1H	10/29/18 01:59	EGO	F
Aroclor-1260	ND		mg/kg	0.12	SW846 8082A	10/27/18 10:20	J1H	10/29/18 01:59	EGO	F
Aroclor-1262	ND		mg/kg	0.12	SW846 8082A	10/27/18 10:20	J1H	10/29/18 01:59	EGO	F
Aroclor-1268	ND		mg/kg	0.12	SW846 8082A	10/27/18 10:20	J1H	10/29/18 01:59	EGO	F
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
Decachlorobiphenyl (S)	49.9		%	49 - 115	SW846 8082A	10/27/18 10:20	J1H	10/29/18 01:59	EGO	F
Tetrachloro-m-xylene (S)	62.9		%	27 - 137	SW846 8082A	10/27/18 10:20	J1H	10/29/18 01:59	EGO	F
<b>PETROLEUM HC's</b>										
Diesel Range Organics C10-C28	ND		mg/kg	37.5	SW846 8015D	10/27/18 11:35	JTH	10/29/18 19:43	BS	A
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>	<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
o-Terphenyl (S)	44.9		%	36 - 122	SW846 8015D	10/27/18 11:35	JTH	10/29/18 19:43	BS	A
<b>WET CHEMISTRY</b>										
Hexane Extractable Material	1340		mg/kg	722	SW846 9071B			10/30/18 06:15	MPP	A
Hexavalent Chromium	ND		mg/kg	7.0	SW846 7196A	10/29/18 14:45	VXF	10/30/18 20:00	VXF	A
Moisture	72.3		%	0.1	S2540G-11			10/29/18 12:00	AXD	
Total Solids	27.7		%	0.1	S2540G-11			10/29/18 12:00	AXD	
<b>METALS</b>										
Aluminum, Total	24100		mg/kg	139	SW846 6020A	10/26/18 16:45	AHI	10/30/18 18:05	MO	A1
Antimony, Total	ND		mg/kg	3.5	SW846 6020A	10/26/18 16:45	AHI	10/30/18 18:05	MO	A1
Arsenic, Total	24.1		mg/kg	5.2	SW846 6020A	10/26/18 16:45	AHI	10/30/18 18:05	MO	A1
Barium, Total	88.5		mg/kg	8.7	SW846 6020A	10/26/18 16:45	AHI	10/30/18 18:05	MO	A1
Beryllium, Total	2.0		mg/kg	1.7	SW846 6020A	10/26/18 16:45	AHI	10/30/18 18:05	MO	A1
Cadmium, Total	1.9		mg/kg	1.7	SW846 6020A	10/26/18 16:45	AHI	10/30/18 18:05	MO	A1
Calcium, Total	3380		mg/kg	174	SW846 6020A	10/26/18 16:45	AHI	10/30/18 18:05	MO	A1
Chromium, Total	129		mg/kg	3.5	SW846 6020A	10/26/18 16:45	AHI	10/30/18 18:05	MO	A1
Cobalt, Total	38.6		mg/kg	8.7	SW846 6020A	10/26/18 16:45	AHI	10/30/18 18:05	MO	A1
Copper, Total	82.9		mg/kg	8.7	SW846 6020A	10/26/18 16:45	AHI	10/30/18 18:05	MO	A1
Iron, Total	64000		mg/kg	86.9	SW846 6020A	10/26/18 16:45	AHI	10/30/18 18:05	MO	A1
Lead, Total	141		mg/kg	3.5	SW846 6020A	10/26/18 16:45	AHI	10/30/18 18:05	MO	A1
Magnesium, Total	9170		mg/kg	174	SW846 6020A	10/26/18 16:45	AHI	10/30/18 18:05	MO	A1
Manganese, Total	2730		mg/kg	8.7	SW846 6020A	10/26/18 16:45	AHI	10/30/18 18:05	MO	A1

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### ANALYTICAL RESULTS

Workorder: 2346382 2018-SEDIMENTS - BALTIMORE MD

Lab ID: **2346382002** Date Collected: 10/24/2018 16:00 Matrix: Solid  
 Sample ID: **P2-2 Wetlands** Date Received: 10/25/2018 21:30

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
Mercury, Total	0.30		mg/kg	0.16	SW846 7471B	10/30/18 11:35	AXC	10/30/18 14:22	AXC	A2
Nickel, Total	58.1		mg/kg	8.7	SW846 6020A	10/26/18 16:45	AHI	10/30/18 18:05	MO	A1
Potassium, Total	4250		mg/kg	174	SW846 6020A	10/26/18 16:45	AHI	10/30/18 18:05	MO	A1
Selenium, Total	ND		mg/kg	8.7	SW846 6020A	10/26/18 16:45	AHI	10/30/18 18:05	MO	A1
Silver, Total	ND		mg/kg	3.5	SW846 6020A	10/26/18 16:45	AHI	10/30/18 18:05	MO	A1
Sodium, Total	14900		mg/kg	174	SW846 6020A	10/26/18 16:45	AHI	10/30/18 18:05	MO	A1
Thallium, Total	ND		mg/kg	1.7	SW846 6020A	10/26/18 16:45	AHI	10/30/18 18:05	MO	A1
Vanadium, Total	93.8		mg/kg	3.5	SW846 6020A	10/26/18 16:45	AHI	10/30/18 18:05	MO	A1
Zinc, Total	494		mg/kg	8.7	SW846 6020A	10/26/18 16:45	AHI	10/30/18 18:05	MO	A1

**SUBCONTRACTED ANALYSIS**

Subcontracted Analysis See attached. Subcontract 10/24/18 16:00 SUB I

*Vanessa N. Badman*  
 Mrs. Vanessa N Badman  
 Project Coordinator

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### ANALYTICAL RESULTS

Workorder: 2346382 2018-SEDIMENTS - BALTIMORE MD

#### PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
<b>2346382001</b>	2	P2-1 Wetlands	SW846 8260B	Methylene Chloride
The QC sample type LCSD for method SW846 8260B was outside the control limits for the analyte Methylene Chloride. The % Recovery was reported as 139 and the control limits were 68 to 133.				
<b>2346382002</b>	1	P2-2 Wetlands	SW846 8270D	2-Fluorobiphenyl
The surrogate 2-Fluorobiphenyl for method SW846 8270D was outside of control limits. The % Recovery was reported as 38 and the control limits were 40 to 110. This result was reported at a dilution of 1.				

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### ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 2346382 2018-SEDIMENTS - BALTIMORE MD

Lab ID	Sample ID	Analysis Method	Prep Method
2346382001	P2-1 Wetlands	S2540G-11	
2346382001	P2-1 Wetlands	SW846 6020A	SW846 3051
2346382001	P2-1 Wetlands	SW846 7196A	SW846 3060A
2346382001	P2-1 Wetlands	SW846 7471B	SW846 7471B
2346382001	P2-1 Wetlands	SW846 8015D	SW846 3546
2346382001	P2-1 Wetlands	SW846 8015D	SW846 5035
2346382001	P2-1 Wetlands	SW846 8082A	SW846 3546
2346382001	P2-1 Wetlands	SW846 8260B	SW846 5035
2346382001	P2-1 Wetlands	SW846 8270D	SW846 3546
2346382001	P2-1 Wetlands	SW846 9071B	
2346382001	P2-1 Wetlands	Subcontract	
2346382002	P2-2 Wetlands	S2540G-11	
2346382002	P2-2 Wetlands	SW846 6020A	SW846 3051
2346382002	P2-2 Wetlands	SW846 7196A	SW846 3060A
2346382002	P2-2 Wetlands	SW846 7471B	SW846 7471B
2346382002	P2-2 Wetlands	SW846 8015D	SW846 3546
2346382002	P2-2 Wetlands	SW846 8015D	SW846 5035
2346382002	P2-2 Wetlands	SW846 8082A	SW846 3546
2346382002	P2-2 Wetlands	SW846 8260B	SW846 5035
2346382002	P2-2 Wetlands	SW846 8270D	SW846 3546
2346382002	P2-2 Wetlands	SW846 9071B	
2346382002	P2-2 Wetlands	Subcontract	

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**QUALITY CONTROL DATA**

Workorder: 2346382 2018-SEDIMENTS - BALTIMORE MD

Aroclor-1242	0	mg/kg	0	NC	40
Aroclor-1248	0	mg/kg	0	NC	40
Aroclor-1254	.03602	mg/kg	.03574	.78	40
Aroclor-1260	.04323	mg/kg	.04735	9.1	40

MATRIX SPIKE SAMPLE: 2835633 ORIGINAL: 2346564001

\*\*\*\*NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MS % Rec	% Rec Limit
Aroclor-1016	0	mg/kg	.32	.24394	75.1	43 - 132
Aroclor-1260	.0429	mg/kg	.32	.25318	64.8	53 - 134
Decachlorobiphenyl (S)	56.2	%				49 - 115
Tetrachloro-m-xylene (S)	63.5	%				27 - 137

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**QUALITY CONTROL DATA**

Workorder: 2346382 2018-SEDIMENTS - BALTIMORE MD

**QC Batch:** EXTR/54219 **Analysis Method:** SW846 8015D

**QC Batch Method:** SW846 3546

**Associated Lab Samples:** 2346382001, 2346382002

**METHOD BLANK: 2835646**

Parameter	Blank Result	Units	Reporting Limit
Diesel Range Organics C10-C28	ND	mg/kg	10.6
o-Terphenyl (S)	80.3	%	36 - 122

**LABORATORY CONTROL SAMPLE: 2835647**

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Diesel Range Organics C10-C28	74	mg/kg	33.3	24.7	38 - 132
o-Terphenyl (S)	84.9	%			36 - 122

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**QUALITY CONTROL DATA**

Workorder: 2346382 2018-SEDIMENTS - BALTIMORE MD

2,4-Dinitrophenol	ND	ug/kg	400
2,4-Dinitrotoluene	ND	ug/kg	100
2,6-Dinitrotoluene	ND	ug/kg	100
1,4-Dioxane	ND	ug/kg	100
1,2-Diphenylhydrazine	ND	ug/kg	100
bis(2-Ethylhexyl)phthalate	ND	ug/kg	100
Fluoranthene	ND	ug/kg	50.0
Fluorene	ND	ug/kg	50.0
Hexachlorobenzene	ND	ug/kg	100
Hexachlorobutadiene	ND	ug/kg	100
Hexachlorocyclopentadiene	ND	ug/kg	200
Hexachloroethane	ND	ug/kg	100
Indeno(1,2,3-cd)pyrene	ND	ug/kg	50.0
Isophorone	ND	ug/kg	100
2-Methyl-4,6-dinitrophenol	ND	ug/kg	200
2-Methylnaphthalene	ND	ug/kg	100
Naphthalene	ND	ug/kg	50.0
2-Nitroaniline	ND	ug/kg	200
3-Nitroaniline	ND	ug/kg	200
4-Nitroaniline	ND	ug/kg	200
Nitrobenzene	ND	ug/kg	100
2-Nitrophenol	ND	ug/kg	200
4-Nitrophenol	ND	ug/kg	200
N-Nitrosodimethylamine	ND	ug/kg	100
N-Nitroso-di-n-propylamine	ND	ug/kg	100
N-Nitrosodiphenylamine	ND	ug/kg	100
Pentachlorophenol	ND	ug/kg	200
Phenanthrene	ND	ug/kg	50.0
Phenol	ND	ug/kg	200
Pyrene	ND	ug/kg	50.0
1,2,4,5-Tetrachlorobenzene	ND	ug/kg	100
2,3,4,6-Tetrachlorophenol	ND	ug/kg	200
2,4,5-Trichlorophenol	ND	ug/kg	200
2,4,6-Trichlorophenol	ND	ug/kg	200
2,4,6-Tribromophenol (S)	87.1	%	19 - 132
2-Fluorobiphenyl (S)	81.8	%	40 - 110
2-Fluorophenol (S)	85.2	%	26 - 116
Nitrobenzene-d5 (S)	79.7	%	38 - 112
Phenol-d5 (S)	84.3	%	35 - 111
Terphenyl-d14 (S)	97.1	%	45 - 126

LABORATORY CONTROL SAMPLE: 2836032

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Acenaphthene	82.8	ug/kg	3330	2760	59 - 115

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**QUALITY CONTROL DATA**

Workorder: 2346382 2018-SEDIMENTS - BALTIMORE MD

Acenaphthylene	82.9	ug/kg	3330	2760	59 - 114
Acetophenone	68.9	ug/kg	3330	2300	45 - 87
Anthracene	80.3	ug/kg	3330	2680	63 - 112
Atrazine	69.8	ug/kg	3330	2330	54 - 128
Benzaldehyde	107	ug/kg	3330	3560	52 - 108
Benzidine	45.1	ug/kg	6670	3010	10 - 114
Benzo(a)anthracene	78.7	ug/kg	3330	2620	61 - 118
Benzo(a)pyrene	79	ug/kg	3330	2630	61 - 114
Benzo(b)fluoranthene	79.9	ug/kg	3330	2660	64 - 113
Benzo(g,h,i)perylene	80.2	ug/kg	3330	2670	61 - 118
Benzo(k)fluoranthene	80.5	ug/kg	3330	2680	62 - 113
Biphenyl	78.1	ug/kg	3330	2600	60 - 111
4-Bromophenyl-phenylether	86.1	ug/kg	3330	2870	60 - 111
Butylbenzylphthalate	81.7	ug/kg	3330	2720	56 - 126
Caprolactam	64.1	ug/kg	3330	2140	38 - 129
Carbazole	77.7	ug/kg	3330	2590	65 - 117
4-Chloro-3-methylphenol	74.4	ug/kg	6670	4960	65 - 118
4-Chloroaniline	57.6	ug/kg	3330	1920	21 - 115
bis(2-Chloroethoxy)methane	78.7	ug/kg	3330	2620	56 - 108
bis(2-Chloroethyl)ether	85	ug/kg	3330	2830	51 - 105
bis(2-Chloroisopropyl)ether	81.7	ug/kg	3330	2720	34 - 126
2-Chloronaphthalene	81.6	ug/kg	3330	2720	55 - 111
2-Chlorophenol	83.3	ug/kg	6670	5550	61 - 111
4-Chlorophenyl-phenylether	81.2	ug/kg	3330	2710	58 - 112
Chrysene	81.1	ug/kg	3330	2700	63 - 111
mp-Cresol	81.1	ug/kg	6670	5400	60 - 112
o-Cresol	81	ug/kg	6670	5400	62 - 113
Di-n-Butylphthalate	81.3	ug/kg	3330	2710	58 - 118
Di-n-Octylphthalate	83.8	ug/kg	3330	2790	45 - 128
Dibenzo(a,h)anthracene	81.2	ug/kg	3330	2710	64 - 117
Dibenzofuran	78.3	ug/kg	3330	2610	61 - 111
3,3-Dichlorobenzidine	56.6	ug/kg	6670	3770	27 - 106
2,4-Dichlorophenol	77.1	ug/kg	6670	5140	65 - 111
Diethylphthalate	79.6	ug/kg	3330	2650	59 - 112
2,4-Dimethylphenol	79.5	ug/kg	6670	5300	65 - 114
Dimethylphthalate	79.8	ug/kg	3330	2660	59 - 111
2,4-Dinitrophenol	73.6	ug/kg	6670	4900	36 - 131
2,4-Dinitrotoluene	80.8	ug/kg	3330	2690	61 - 117
2,6-Dinitrotoluene	81.9	ug/kg	3330	2730	61 - 115
1,4-Dioxane	55.6	ug/kg	3330	1850	37 - 98
1,2-Diphenylhydrazine	82	ug/kg	3330	2730	59 - 122
bis(2-Ethylhexyl)phthalate	82.2	ug/kg	3330	2740	51 - 126
Fluoranthene	77.3	ug/kg	3330	2580	61 - 116
Fluorene	82	ug/kg	3330	2730	61 - 112
Hexachlorobenzene	85.9	ug/kg	3330	2860	59 - 109
Hexachlorobutadiene	90.3	ug/kg	3330	3010	58 - 123

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**QUALITY CONTROL DATA**

Workorder: 2346382 2018-SEDIMENTS - BALTIMORE MD

Hexachlorocyclopentadiene	62.4	ug/kg	3330	2080	33 - 109
Hexachloroethane	83.1	ug/kg	3330	2770	50 - 103
Indeno(1,2,3-cd)pyrene	79.3	ug/kg	3330	2640	62 - 113
Isophorone	76.3	ug/kg	3330	2540	51 - 112
2-Methyl-4,6-dinitrophenol	67.8	ug/kg	6670	4520	53 - 131
2-Methylnaphthalene	73.1	ug/kg	3330	2440	58 - 96
Naphthalene	76	ug/kg	3330	2530	56 - 105
2-Nitroaniline	79.6	ug/kg	3330	2650	61 - 120
3-Nitroaniline	74.5	ug/kg	3330	2480	52 - 115
4-Nitroaniline	67.4	ug/kg	3330	2250	50 - 106
Nitrobenzene	75.3	ug/kg	3330	2510	53 - 108
2-Nitrophenol	76.1	ug/kg	6670	5070	61 - 114
4-Nitrophenol	71.5	ug/kg	6670	4770	49 - 134
N-Nitrosodimethylamine	76.3	ug/kg	3330	2540	48 - 105
N-Nitroso-di-n-propylamine	79.2	ug/kg	3330	2640	55 - 109
N-Nitrosodiphenylamine	98.1	ug/kg	3330	3270	65 - 134
Pentachlorophenol	94.1	ug/kg	6670	6270	60 - 145
Phenanthrene	81.2	ug/kg	3330	2710	62 - 109
Phenol	80.5	ug/kg	6670	5370	53 - 118
Pyrene	84.3	ug/kg	3330	2810	60 - 114
1,2,4,5-Tetrachlorobenzene	78.2	ug/kg	3330	2610	56 - 107
2,3,4,6-Tetrachlorophenol	74.5	ug/kg	6670	4970	60 - 111
2,4,5-Trichlorophenol	81.3	ug/kg	6670	5420	68 - 121
2,4,6-Trichlorophenol	79.9	ug/kg	6670	5330	68 - 119
2,4,6-Tribromophenol (S)	80.2	%			19 - 132
2-Fluorobiphenyl (S)	73.8	%			40 - 110
2-Fluorophenol (S)	76.7	%			26 - 116
Nitrobenzene-d5 (S)	70.3	%			38 - 112
Phenol-d5 (S)	75.9	%			35 - 111
Terphenyl-d14 (S)	86.1	%			45 - 126

MATRIX SPIKE: 2836033 DUPLICATE: 2836034 ORIGINAL: 2346562001

\*\*\*\*NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Acenaphthene	0	ug/kg	3250	3002.03	3094.96	92.5	95.3	59 - 115	3.05	17
Acenaphthylene	22.4176	ug/kg	3250	2973.55	3098.41	90.9	94.7	59 - 114	4.11	17
Acetophenone	0	ug/kg	3250	2329.84	2416.93	71.8	74.4	45 - 87	3.67	21
Anthracene	24.4792	ug/kg	3250	3009.03	2930.46	91.9	89.5	63 - 112	2.65	20
Atrazine	0	ug/kg	3250	2494.15	2509.49	76.8	77.3	54 - 128	.61	22
Benzaldehyde	0	ug/kg	3250	3507.96	3588.52	108	111*	52 - 108	2.27	30
Benzo(a)anthracene	71.0254	ug/kg	3250	2904.79	2902.84	87.3	87.2	61 - 118	.07	22
Benzo(a)pyrene	69.1599	ug/kg	3250	2952.97	2941.99	88.8	88.5	61 - 114	.37	24
Benzo(b)fluoranthene	102.114	ug/kg	3250	3039.75	3112.01	90.5	92.7	64 - 113	2.35	28

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**QUALITY CONTROL DATA**

Workorder: 2346382 2018-SEDIMENTS - BALTIMORE MD

Benzo(g,h,i)perylene	50.8534	ug/kg	3250	2588.62	2694.43	78.2	81.4	61 - 118	4.01	30
Benzo(k)fluoranthene	34.0395	ug/kg	3250	3014.57	3053.14	91.8	93	62 - 113	1.27	22
Biphenyl	403.783	ug/kg	3250	3078.12	3600.97	82.4	98.5	60 - 111	15.7	14
4-Bromophenyl-phenylether	0	ug/kg	3250	3086.32	3079.55	95.1	94.9	60 - 111	.22	21
Butylbenzylphthalate	0	ug/kg	3250	2946.57	3025.04	90.8	93.2	56 - 126	2.63	18
Caprolactam	0	ug/kg	3250	2244.75	2225.21	69.1	68.5	38 - 129	.87	23
Carbazole	0	ug/kg	3250	2888.96	2811.55	89	86.6	65 - 117	2.72	20
4-Chloro-3-methylphenol	0	ug/kg	6490	5450.71	5589.46	83.9	86.1	65 - 118	2.51	20
4-Chloroaniline	0	ug/kg	3250	1403.18	1692.93	43.2	52.1	21 - 115	18.7	22
bis(2-Chloroethoxy)methane	0	ug/kg	3250	2842.54	2925.33	87.6	90.1	56 - 108	2.87	18
bis(2-Chloroethyl)ether	0	ug/kg	3250	2866.01	2949.47	88.3	90.8	51 - 105	2.87	24
bis(2-Chloroisopropyl)ether	0	ug/kg	3250	2742.73	2846.45	84.5	87.7	34 - 126	3.71	22
2-Chloronaphthalene	0	ug/kg	3250	2984.87	3082.26	91.9	94.9	55 - 111	3.21	19
2-Chlorophenol	0	ug/kg	6490	5563.5	5836.15	85.7	89.9	61 - 111	4.78	22
4-Chlorophenyl-phenylether	0	ug/kg	3250	2958.49	3101.21	91.1	95.5	58 - 112	4.71	18
Chrysene	78.4205	ug/kg	3250	2972.05	3032.57	89.1	91	63 - 111	2.02	20
mp-Cresol	11.5512	ug/kg	6490	5505.14	5699.07	84.6	87.6	60 - 112	3.46	20
o-Cresol	0	ug/kg	6490	5457.11	5697.36	84	87.7	62 - 113	4.31	21
Di-n-Butylphthalate	0	ug/kg	3250	2921.17	2874.85	90	88.5	58 - 118	1.6	20
Di-n-Octylphthalate	0	ug/kg	3250	3047.09	3069.89	93.9	94.6	45 - 128	.75	20
Dibenzo(a,h)anthracene	12.0109	ug/kg	3250	2704.56	2724.3	82.9	83.5	64 - 117	.73	28
Dibenzofuran	0	ug/kg	3250	2866.77	2996.5	88.3	92.3	61 - 111	4.43	18
3,3-Dichlorobenzidine	0	ug/kg	6490	3942.53	2934.55	60.7	45.2	27 - 106	29.3	26
2,4-Dichlorophenol	0	ug/kg	6490	5554.93	5798.66	85.5	89.3	65 - 111	4.29	20
Diethylphthalate	0	ug/kg	3250	2881.74	2980.15	88.8	91.8	59 - 112	3.36	18
2,4-Dimethylphenol	0	ug/kg	6490	5588.37	5699.97	86.1	87.8	65 - 114	1.98	23
Dimethylphthalate	0	ug/kg	3250	2831.89	2971.59	87.2	91.5	59 - 111	4.81	18
2,4-Dinitrophenol	0	ug/kg	6490	386.919	420.557	5.96*	6.48*	36 - 131	8.33	30
2,4-Dinitrotoluene	0	ug/kg	3250	2863.76	2929.65	88.2	90.2	61 - 117	2.27	21
2,6-Dinitrotoluene	0	ug/kg	3250	2930.82	2911.19	90.3	89.7	61 - 115	.67	20
1,4-Dioxane	0	ug/kg	3250	2017.53	2011.27	62.1	61.9	37 - 98	.31	30
bis(2-Ethylhexyl)phthalate	22.6786	ug/kg	3250	2983.62	3079.88	91.2	94.2	51 - 126	3.18	21
Fluoranthene	173.313	ug/kg	3250	2982.44	2889.35	86.5	83.7	61 - 116	3.17	21
Fluorene	10.8143	ug/kg	3250	3008.26	3080.29	92.3	94.5	61 - 112	2.37	16
Hexachlorobenzene	0	ug/kg	3250	3075.5	2998.6	94.7	92.4	59 - 109	2.53	21
Hexachlorobutadiene	0	ug/kg	3250	3203.95	3370.49	98.7	104	58 - 123	5.07	22
Hexachlorocyclopentadiene	0	ug/kg	3250	810.217	605.474	25*	18.6*	33 - 109	28.9	29
Hexachloroethane	0	ug/kg	3250	2600.73	2648.15	80.1	81.6	50 - 103	1.81	28
Indeno(1,2,3-cd)pyrene	48.2135	ug/kg	3250	2585.35	2618.93	78.1	79.2	62 - 113	1.29	30
Isophorone	0	ug/kg	3250	2699.92	2803.87	83.2	86.4	51 - 112	3.78	19
2-Methyl-4,6-dinitrophenol	0	ug/kg	6490	1501.12	1321.45	23.1*	20.4*	53 - 131	12.7	30
2-Methylnaphthalene	0	ug/kg	3250	2619.88	2730.41	80.7	84.1	58 - 96	4.13	21
Naphthalene	0	ug/kg	3250	2737.44	2843.91	84.3	87.6	56 - 105	3.82	21
2-Nitroaniline	0	ug/kg	3250	2963.29	3085.92	91.3	95	61 - 120	4.05	19
3-Nitroaniline	0	ug/kg	3250	2813.33	2780.15	86.7	85.6	52 - 115	1.19	22
4-Nitroaniline	0	ug/kg	3250	2697.92	2662.43	83.1	82	50 - 106	1.32	19

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**QUALITY CONTROL DATA**

Workorder: 2346382 2018-SEDIMENTS - BALTIMORE MD

Nitrobenzene	0	ug/kg	3250	2728.18	2823.13	84	87	53 - 108	3.42	20
2-Nitrophenol	0	ug/kg	6490	5367.87	5574.32	82.7	85.8	61 - 114	3.77	23
4-Nitrophenol	0	ug/kg	6490	5085.1	5136.51	78.3	79.1	49 - 134	1.01	21
N-Nitroso-di-n-propylamine	0	ug/kg	3250	2719.48	2772.46	83.8	85.4	55 - 109	1.93	20
N-Nitrosodiphenylamine	0	ug/kg	3250	3427.77	3379.07	106	104	65 - 134	1.43	21
Pentachlorophenol	0	ug/kg	6490	5758.95	5639.74	88.7	86.9	60 - 145	2.09	25
Phenanthrene	101.703	ug/kg	3250	3023.87	2948.41	90	87.7	62 - 109	2.53	20
Phenol	0	ug/kg	6490	5507.58	5662.41	84.8	87.2	53 - 118	2.77	23
Pyrene	206.599	ug/kg	3250	3079.37	3134.15	88.5	90.2	60 - 114	1.76	20
1,2,4,5-Tetrachlorobenzene	0	ug/kg	3250	2808.92	2963.79	86.5	91.3	56 - 107	5.37	19
2,3,4,6-Tetrachlorophenol	0	ug/kg	6490	5048.89	5320.45	77.8	81.9	60 - 111	5.24	20
2,4,5-Trichlorophenol	0	ug/kg	6490	5745.36	6030.02	88.5	92.9	68 - 121	4.83	22
2,4,6-Trichlorophenol	0	ug/kg	6490	5673.79	6025.08	87.4	92.8	68 - 119	6.01	20
2,4,6-Tribromophenol (S)	89.1	%				89.1	89.8	19 - 132		
2-Fluorobiphenyl (S)	81.2	%				81.2	86.4	40 - 110		
2-Fluorophenol (S)	79.2	%				79.2	82.3	26 - 116		
Nitrobenzene-d5 (S)	77	%				77	81	38 - 112		
Phenol-d5 (S)	78.6	%				78.6	81.2	35 - 111		
Terphenyl-d14 (S)	94	%				94	97.4	45 - 126		

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### QUALITY CONTROL DATA

Workorder: 2346382 2018-SEDIMENTS - BALTIMORE MD

**QC Batch:** MDIG/74487 **Analysis Method:** SW846 6020A  
**QC Batch Method:** SW846 3051  
**Associated Lab Samples:** 2346382001

**METHOD BLANK: 2835129**

Parameter	Blank Result	Units	Reporting Limit
Aluminum, Total	ND	mg/kg	40.0
Antimony, Total	ND	mg/kg	1.0
Arsenic, Total	ND	mg/kg	1.5
Barium, Total	ND	mg/kg	2.5
Beryllium, Total	ND	mg/kg	0.50
Cadmium, Total	ND	mg/kg	0.50
Calcium, Total	ND	mg/kg	50.0
Chromium, Total	ND	mg/kg	1.0
Cobalt, Total	ND	mg/kg	2.5
Copper, Total	ND	mg/kg	2.5
Iron, Total	ND	mg/kg	25.0
Lead, Total	ND	mg/kg	1.0
Magnesium, Total	ND	mg/kg	50.0
Manganese, Total	ND	mg/kg	2.5
Nickel, Total	ND	mg/kg	2.5
Potassium, Total	ND	mg/kg	50.0
Selenium, Total	ND	mg/kg	2.5
Silver, Total	ND	mg/kg	1.0
Sodium, Total	ND	mg/kg	50.0
Thallium, Total	ND	mg/kg	0.50
Vanadium, Total	ND	mg/kg	1.0
Zinc, Total	ND	mg/kg	2.5

**LABORATORY CONTROL SAMPLE: 2835131**

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Aluminum, Total	105	mg/kg	200	210	80 - 120
Antimony, Total	107	mg/kg	20	21.5	80 - 120
Arsenic, Total	107	mg/kg	20	21.4	80 - 120
Barium, Total	108	mg/kg	200	216	80 - 120
Beryllium, Total	94.6	mg/kg	20	18.9	80 - 120
Cadmium, Total	106	mg/kg	20	21.2	80 - 120
Calcium, Total	108	mg/kg	200	216	80 - 120
Chromium, Total	103	mg/kg	20	20.5	80 - 120
Cobalt, Total	104	mg/kg	20	20.8	80 - 120

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**QUALITY CONTROL DATA**

Workorder: 2346382 2018-SEDIMENTS - BALTIMORE MD

Copper, Total	103	mg/kg	20	20.6	80 - 120
Iron, Total	113	mg/kg	200	226	80 - 120
Lead, Total	110	mg/kg	20	22.0	80 - 120
Magnesium, Total	111	mg/kg	200	222	80 - 120
Manganese, Total	105	mg/kg	20	21.1	80 - 120
Nickel, Total	105	mg/kg	20	20.9	80 - 120
Potassium, Total	111	mg/kg	200	222	80 - 120
Selenium, Total	90.4	mg/kg	20	18.1	80 - 120
Silver, Total	115	mg/kg	10	11.5	80 - 120
Sodium, Total	115	mg/kg	200	230	80 - 120
Thallium, Total	104	mg/kg	20	20.8	80 - 120
Vanadium, Total	103	mg/kg	20	20.5	80 - 120
Zinc, Total	97.4	mg/kg	200	195	80 - 120

MATRIX SPIKE: 2835132 DUPLICATE: 2835133 ORIGINAL: 2346045001

\*\*\*\*NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Arsenic, Total	2.56214	mg/kg	19.8	27.79604	19.78337	127*	86.5	75 - 125	33.7	20
Barium, Total	83.34061	mg/kg	198	359.9094	309.1299	140*	113	75 - 125	15.2	20
Cadmium, Total	.15512	mg/kg	19.8	21.28614	19.38247	107	96.5	75 - 125	9.36	20
Chromium, Total	18.00522	mg/kg	19.8	56.89604	47.36255	196*	147*	75 - 125	18.3	20
Lead, Total	17.65323	mg/kg	19.8	70.44356	51.91982	267*	172*	75 - 125	30.3	20
Selenium, Total	.75	mg/kg	19.8	20.8495	15.83616	102	75.7	75 - 125	27.3	20
Silver, Total	.02562	mg/kg	9.9	11.2297	10.33466	113	104	75 - 125	8.3	20

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### QUALITY CONTROL DATA

Workorder: 2346382 2018-SEDIMENTS - BALTIMORE MD

**QC Batch:** MDIG/74488 **Analysis Method:** SW846 6020A  
**QC Batch Method:** SW846 3051  
**Associated Lab Samples:** 2346382002

**METHOD BLANK: 2835136**

Parameter	Blank Result	Units	Reporting Limit
Aluminum, Total	ND	mg/kg	40.0
Antimony, Total	ND	mg/kg	1.0
Arsenic, Total	ND	mg/kg	1.5
Barium, Total	ND	mg/kg	2.5
Beryllium, Total	ND	mg/kg	0.50
Cadmium, Total	ND	mg/kg	0.50
Calcium, Total	ND	mg/kg	50.0
Chromium, Total	ND	mg/kg	1.0
Cobalt, Total	ND	mg/kg	2.5
Copper, Total	ND	mg/kg	2.5
Iron, Total	ND	mg/kg	25.0
Lead, Total	ND	mg/kg	1.0
Magnesium, Total	ND	mg/kg	50.0
Manganese, Total	ND	mg/kg	2.5
Nickel, Total	ND	mg/kg	2.5
Potassium, Total	ND	mg/kg	50.0
Selenium, Total	ND	mg/kg	2.5
Silver, Total	ND	mg/kg	1.0
Sodium, Total	ND	mg/kg	50.0
Thallium, Total	ND	mg/kg	0.50
Vanadium, Total	ND	mg/kg	1.0
Zinc, Total	ND	mg/kg	2.5

**LABORATORY CONTROL SAMPLE: 2835137**

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Aluminum, Total	104	mg/kg	200	209	80 - 120
Antimony, Total	104	mg/kg	20	20.8	80 - 120
Arsenic, Total	103	mg/kg	20	20.6	80 - 120
Barium, Total	106	mg/kg	200	213	80 - 120
Beryllium, Total	95.6	mg/kg	20	19.1	80 - 120
Cadmium, Total	104	mg/kg	20	20.7	80 - 120
Calcium, Total	104	mg/kg	200	208	80 - 120
Chromium, Total	107	mg/kg	20	21.4	80 - 120
Cobalt, Total	106	mg/kg	20	21.3	80 - 120

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**QUALITY CONTROL DATA**

Workorder: 2346382 2018-SEDIMENTS - BALTIMORE MD

Copper, Total	105	mg/kg	20	21.0	80 - 120
Iron, Total	113	mg/kg	200	225	80 - 120
Lead, Total	107	mg/kg	20	21.3	80 - 120
Magnesium, Total	105	mg/kg	200	211	80 - 120
Manganese, Total	108	mg/kg	20	21.6	80 - 120
Nickel, Total	105	mg/kg	20	20.9	80 - 120
Potassium, Total	104	mg/kg	200	209	80 - 120
Selenium, Total	103	mg/kg	20	20.7	80 - 120
Silver, Total	107	mg/kg	10	10.7	80 - 120
Sodium, Total	106	mg/kg	200	213	80 - 120
Thallium, Total	107	mg/kg	20	21.4	80 - 120
Vanadium, Total	107	mg/kg	20	21.5	80 - 120
Zinc, Total	99.3	mg/kg	200	199	80 - 120

MATRIX SPIKE: 2835138 DUPLICATE: 2835139 ORIGINAL: 2346385002

\*\*\*\*NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Aluminum, Total	1184.9753	mg/kg	183	1988.563	2270.216	NC	NC	75 - 125	13.2	20
Antimony, Total	2.5555	mg/kg	18.3	22.06822	20.88931	107	109	75 - 125	5.49	20
Arsenic, Total	44.66651	mg/kg	18.3	115.4757	90.39689	387*	272*	75 - 125	24.4	20
Barium, Total	19.63127	mg/kg	183	221.2825	204.5867	110	110	75 - 125	7.84	20
Beryllium, Total	.11149	mg/kg	18.3	17.34203	16.60564	94.1	98	75 - 125	4.34	20
Cadmium, Total	.25386	mg/kg	18.3	18.57967	17.8851	100	105	75 - 125	3.81	20
Calcium, Total	7808.8180	mg/kg	183	24196.98	13618.27	NC	NC	75 - 125	55.9	20
Chromium, Total	106.59701	mg/kg	18.3	152.8681	169.2041	NC	NC	75 - 125	10.1	20
Cobalt, Total	3.49952	mg/kg	18.3	21.50366	21.56019	98.3	107	75 - 125	.26	20
Copper, Total	34.13417	mg/kg	18.3	72.28205	133.2453	208*	589*	75 - 125	59.3	20
Iron, Total	8770.2673	mg/kg	183	13325.55	15522.56	NC	NC	75 - 125	15.2	20
Lead, Total	141.24952	mg/kg	18.3	812.6652	139.2154	NC	NC	75 - 125	141	20
Magnesium, Total	2543.7152	mg/kg	183	4373.953	4072.412	NC	NC	75 - 125	7.14	20
Manganese, Total	178.62017	mg/kg	18.3	250.7481	286.2563	NC	NC	75 - 125	13.2	20
Nickel, Total	15.32481	mg/kg	18.3	35.70238	31.06145	111	93.5	75 - 125	13.9	20
Potassium, Total	139.3499	mg/kg	183	411.5228	516.9532	149*	224*	75 - 125	22.7	20
Selenium, Total	.56467	mg/kg	18.3	15.94139	16.02483	84	91.8	75 - 125	.52	20
Silver, Total	.23745	mg/kg	9.2	9.59478	9.12121	102	106	75 - 125	5.06	20
Sodium, Total	305.24035	mg/kg	183	694.6996	577.2234	213*	162*	75 - 125	18.5	20
Thallium, Total	.1028	mg/kg	18.3	18.83608	18.18308	102	107	75 - 125	3.53	20
Vanadium, Total	40.67471	mg/kg	18.3	77.04762	87.36195	199*	277*	75 - 125	12.5	20
Zinc, Total	99.47201	mg/kg	183	332.5993	348.8918	127*	148*	75 - 125	4.78	20

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**QUALITY CONTROL DATA**

Workorder: 2346382 2018-SEDIMENTS - BALTIMORE MD

**QC Batch:** MDIG/74517 **Analysis Method:** SW846 7471B

**QC Batch Method:** SW846 7471B

**Associated Lab Samples:** 2346382001, 2346382002

**METHOD BLANK: 2836130**

Parameter	Blank Result	Units	Reporting Limit
Mercury, Total	ND	mg/kg	0.050

**LABORATORY CONTROL SAMPLE: 2836131**

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Mercury, Total	107	mg/kg	.4	0.43	80 - 120

**MATRIX SPIKE: 2836132 DUPLICATE: 2836133 ORIGINAL: 2346382002**

\*\*\*\*NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Mercury, Total	.082	mg/kg	.89	.9875	.99286	101	102	80 - 120	.54	20

**MATRIX SPIKE: 2836134 DUPLICATE: 2836135 ORIGINAL: 2346564003**

\*\*\*\*NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Mercury, Total	.17094	mg/kg	.96	1.20577	1.18846	108	106	80 - 120	1.45	20

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**QUALITY CONTROL DATA**

Workorder: 2346382 2018-SEDIMENTS - BALTIMORE MD

**QC Batch:** VOGC/9986 **Analysis Method:** SW846 8015D

**QC Batch Method:** SW846 5035

**Associated Lab Samples:** 2346382001, 2346382002

**METHOD BLANK: 2836356**

Parameter	Blank Result	Units	Reporting Limit
Gasoline Range Organics	ND	ug/kg	10000
a,a,a-Trifluorotoluene (S)	120	%	72 - 134

**LABORATORY CONTROL SAMPLE: 2836357**

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Gasoline Range Organics	105	ug/kg	100000	105000	73 - 133
a,a,a-Trifluorotoluene (S)	104	%			72 - 134

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**QUALITY CONTROL DATA**

Workorder: 2346382 2018-SEDIMENTS - BALTIMORE MD

**QC Batch:** VOMS/48485 **Analysis Method:** SW846 8260B

**QC Batch Method:** SW846 5035

**Associated Lab Samples:** 2346382001, 2346382002

METHOD BLANK: 2836644

Parameter	Blank Result	Units	Reporting Limit
Acetone	ND	ug/kg	10.0
Acrolein	ND	ug/kg	50.0
Acrylonitrile	ND	ug/kg	10.0
Benzene	ND	ug/kg	2.0
Bromochloromethane	ND	ug/kg	2.0
Bromodichloromethane	ND	ug/kg	2.0
Bromoform	ND	ug/kg	2.0
Bromomethane	ND	ug/kg	2.0
2-Butanone	ND	ug/kg	10.0
Carbon Disulfide	ND	ug/kg	2.0
Carbon Tetrachloride	ND	ug/kg	2.0
Chlorobenzene	ND	ug/kg	2.0
Chlorodibromomethane	ND	ug/kg	2.0
Chloroethane	ND	ug/kg	5.0
2-Chloroethylvinyl ether	ND	ug/kg	150
Chloroform	ND	ug/kg	2.0
Chloromethane	ND	ug/kg	2.0
Cyclohexane	ND	ug/kg	2.0
1,2-Dibromo-3-chloropropane	ND	ug/kg	5.0
1,2-Dibromoethane	ND	ug/kg	2.0
1,2-Dichlorobenzene	ND	ug/kg	2.0
1,3-Dichlorobenzene	ND	ug/kg	2.0
1,4-Dichlorobenzene	ND	ug/kg	2.0
Dichlorodifluoromethane	ND	ug/kg	2.0
1,1-Dichloroethane	ND	ug/kg	2.0
1,2-Dichloroethane	ND	ug/kg	2.0
1,1-Dichloroethene	ND	ug/kg	2.0
cis-1,2-Dichloroethene	ND	ug/kg	2.0
trans-1,2-Dichloroethene	ND	ug/kg	2.0
1,2-Dichloropropane	ND	ug/kg	2.0
cis-1,3-Dichloropropene	ND	ug/kg	2.0
trans-1,3-Dichloropropene	ND	ug/kg	2.0
1,4-Dioxane	ND	ug/kg	75.0
Ethylbenzene	ND	ug/kg	2.0
Freon 113	ND	ug/kg	2.0
2-Hexanone	ND	ug/kg	10.0
Isopropylbenzene	ND	ug/kg	2.0

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**QUALITY CONTROL DATA**

Workorder: 2346382 2018-SEDIMENTS - BALTIMORE MD

Methyl acetate	ND	ug/kg	2.0
Methyl cyclohexane	ND	ug/kg	2.0
Methyl t-Butyl Ether	ND	ug/kg	2.0
4-Methyl-2-Pentanone(MIBK)	ND	ug/kg	10.0
Methylene Chloride	ND	ug/kg	2.0
Styrene	ND	ug/kg	2.0
1,1,2,2-Tetrachloroethane	ND	ug/kg	2.0
Tetrachloroethene	ND	ug/kg	2.0
Toluene	ND	ug/kg	2.0
Total Xylenes	ND	ug/kg	6.0
1,2,3-Trichlorobenzene	ND	ug/kg	5.0
1,2,4-Trichlorobenzene	ND	ug/kg	5.0
1,1,1-Trichloroethane	ND	ug/kg	2.0
1,1,2-Trichloroethane	ND	ug/kg	2.0
Trichloroethene	ND	ug/kg	2.0
Trichlorofluoromethane	ND	ug/kg	2.0
Vinyl Chloride	ND	ug/kg	2.0
o-Xylene	ND	ug/kg	2.0
mp-Xylene	ND	ug/kg	4.0
1,2-Dichloroethane-d4 (S)	94.6	%	56 - 124
4-Bromofluorobenzene (S)	103	%	51 - 128
Dibromofluoromethane (S)	105	%	62 - 123
Toluene-d8 (S)	90.8	%	59 - 131

LABORATORY CONTROL SAMPLE: 2836645 DUPLICATE: 2836646

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	LCSD Result	LCSD % Rec	% Rec Limit	RPD	Max
Acetone	109	ug/kg	100	109	107	107	58 - 146	2.42	40
Acrolein	103	ug/kg	150	155	171	114	18 - 139	9.64	40
Acrylonitrile	119	ug/kg	100	119	119	119	64 - 148	.26	40
Benzene	103	ug/kg	20	20.6	20.3	102	75 - 132	1.16	40
Bromochloromethane	101	ug/kg	20	20.3	21.6	108	71 - 120	6.25	40
Bromodichloromethane	101	ug/kg	20	20.2	20.1	101	74 - 127	.41	40
Bromoform	101	ug/kg	20	20.1	21.1	105	68 - 131	4.69	40
Bromomethane	105	ug/kg	20	21.0	24.3	121	43 - 148	14.3	40
2-Butanone	105	ug/kg	100	105	107	107	64 - 148	1.63	40
Carbon Disulfide	104	ug/kg	20	20.8	22.9	114	47 - 144	9.38	40
Carbon Tetrachloride	111	ug/kg	20	22.2	23.3	116	64 - 136	4.7	40
Chlorobenzene	96.9	ug/kg	20	19.4	20.1	101	76 - 125	3.77	40
Chlorodibromomethane	94.9	ug/kg	20	19.0	20.5	103	75 - 124	7.87	40
Chloroethane	90.7	ug/kg	20	18.1	19.1	95.7	1 - 141	5.44	40
2-Chloroethylvinyl ether	122	ug/kg	20	ND	ND	127	0 - 200	4.22	40
Chloroform	104	ug/kg	20	20.7	20.9	105	73 - 126	.81	40
Chloromethane	109	ug/kg	20	21.7	24.1	121	44 - 139	10.4	40

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**QUALITY CONTROL DATA**

Workorder: 2346382 2018-SEDIMENTS - BALTIMORE MD

Cyclohexane	129	ug/kg	20	25.9	25.8	129	62 - 143	.48	40
1,2-Dibromo-3-chloropropane	107	ug/kg	20	21.5	22.4	112	52 - 151	4.38	40
1,2-Dibromoethane	101	ug/kg	20	20.2	20.7	104	76 - 127	2.41	40
1,2-Dichlorobenzene	101	ug/kg	20	20.2	20.6	103	75 - 126	1.74	40
1,3-Dichlorobenzene	102	ug/kg	20	20.3	20.5	103	72 - 127	1.05	40
1,4-Dichlorobenzene	99.7	ug/kg	20	19.9	20.0	100	72 - 126	.5	40
Dichlorodifluoromethane	95.3	ug/kg	20	19.1	21.3	107	16 - 152	11.2	40
1,1-Dichloroethane	109	ug/kg	20	21.9	21.0	105	74 - 131	4.23	40
1,2-Dichloroethane	105	ug/kg	20	21.0	20.5	103	69 - 132	2.21	40
1,1-Dichloroethene	103	ug/kg	20	20.7	23.0	115	59 - 139	10.8	40
cis-1,2-Dichloroethene	104	ug/kg	20	20.8	21.5	107	75 - 128	3.01	40
trans-1,2-Dichloroethene	112	ug/kg	20	22.4	22.2	111	66 - 133	.72	40
1,2-Dichloropropane	107	ug/kg	20	21.4	21.1	105	78 - 131	1.22	40
cis-1,3-Dichloropropene	95.3	ug/kg	20	19.1	18.8	94	76 - 123	1.34	40
trans-1,3-Dichloropropene	99.2	ug/kg	20	19.8	19.8	99.2	77 - 123	.05	40
1,4-Dioxane	117	ug/kg	500	583	582	116	9 - 267	.23	40
Ethylbenzene	100	ug/kg	20	20.1	20.2	101	73 - 133	.79	40
Freon 113	108	ug/kg	20	21.7	24.2	121*	40 - 109	11.1	40
2-Hexanone	110	ug/kg	100	110	112	112	62 - 147	2.03	40
Isopropylbenzene	110	ug/kg	20	22.0	21.3	107	71 - 137	3.28	40
Methyl acetate	121	ug/kg	20	24.1	24.3	121	70 - 130	.59	40
Methyl cyclohexane	111	ug/kg	20	22.2	22.2	111	70 - 130	.24	40
Methyl t-Butyl Ether	106	ug/kg	20	21.2	21.3	107	70 - 118	.64	40
4-Methyl-2-Pentanone(MIBK)	105	ug/kg	100	105	109	109	64 - 143	3.35	40
Methylene Chloride	127	ug/kg	20	25.4	27.8	139*	68 - 133	8.97	40
Styrene	105	ug/kg	20	20.9	20.1	100	77 - 130	4.31	40
1,1,1,2,2-Tetrachloroethane	108	ug/kg	20	21.7	20.7	104	72 - 134	4.5	40
Tetrachloroethene	97.9	ug/kg	20	19.6	21.8	109	58 - 137	10.7	40
Toluene	97	ug/kg	20	19.4	19.8	98.9	73 - 129	1.91	40
Total Xylenes	99.5	ug/kg	60	59.7	61.1	102	73 - 130	2.32	40
1,2,3-Trichlorobenzene	101	ug/kg	20	20.1	21.6	108	68 - 129	6.85	40
1,2,4-Trichlorobenzene	102	ug/kg	20	20.3	22.5	113	63 - 132	10.1	40
1,1,1-Trichloroethane	107	ug/kg	20	21.5	22.2	111	68 - 131	3.25	40
1,1,2-Trichloroethane	94.5	ug/kg	20	18.9	18.8	93.9	79 - 123	.64	40
Trichloroethene	102	ug/kg	20	20.4	20.6	103	72 - 129	.76	40
Trichlorofluoromethane	102	ug/kg	20	20.3	22.8	114	40 - 130	11.3	40
Vinyl Chloride	116	ug/kg	20	23.2	26.2	131	53 - 141	12.3	40
o-Xylene	99.8	ug/kg	20	20.0	20.7	103	75 - 129	3.44	40
mp-Xylene	99.4	ug/kg	40	39.8	40.5	101	72 - 130	1.75	40
1,2-Dichloroethane-d4 (S)	99.4	%			99.4		56 - 124		
4-Bromofluorobenzene (S)	102	%			102		51 - 128		
Dibromofluoromethane (S)	102	%			102		62 - 123		
Toluene-d8 (S)	98.5	%			98.5		59 - 131		

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**QUALITY CONTROL DATA**

Workorder: 2346382 2018-SEDIMENTS - BALTIMORE MD

**QC Batch:** WCPR/45277 **Analysis Method:** SW846 7196A

**QC Batch Method:** SW846 3060A

**Associated Lab Samples:** 2346382001, 2346382002

**METHOD BLANK: 2836396**

Parameter	Blank Result	Units	Reporting Limit
Hexavalent Chromium	ND	mg/kg	2.0

**LABORATORY CONTROL SAMPLE: 2836397**

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Hexavalent Chromium	88.6	mg/kg	19.9	17.6	80 - 120

**SAMPLE DUPLICATE: 2836398 ORIGINAL: 2346075002**

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Hexavalent Chromium	.10236	mg/kg	.304	99.2*	20

**MATRIX SPIKE SAMPLE: 2836399 ORIGINAL: 2346075002**

\*\*\*\*NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MS % Rec	% Rec Limit
Hexavalent Chromium	.10236	mg/kg	39.4	17.83465	45*	75 - 125

**MATRIX SPIKE SAMPLE: 2836400 ORIGINAL: 2346075002**

\*\*\*\*NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MS % Rec	% Rec Limit
Hexavalent Chromium	.10236	mg/kg	635	438.2222	69*	75 - 125

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**QUALITY CONTROL DATA**

Workorder: 2346382 2018-SEDIMENTS - BALTIMORE MD

MATRIX SPIKE SAMPLE: 2836401 ORIGINAL: 2346075002

\*\*\*\*NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MS % Rec	% Rec Limit
Hexavalent Chromium	.10236	mg/kg	39.4	34.66142	87.8	85 - 115

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**QUALITY CONTROL DATA**

Workorder: 2346382 2018-SEDIMENTS - BALTIMORE MD

**QC Batch:** WETC/212524 **Analysis Method:** S2540G-11

**QC Batch Method:** S2540G-11

**Associated Lab Samples:** 2346382001, 2346382002

SAMPLE DUPLICATE: 2836359 ORIGINAL: 2346456003

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Moisture	97.3272	%	97.3033	.02	10
Total Solids	2.6727	%	2.6966	.89	5

SAMPLE DUPLICATE: 2836360 ORIGINAL: 2346564003

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Moisture	10.5809	%	10.2096	3.57	10
Total Solids	89.419	%	89.7903	.41	5

SAMPLE DUPLICATE: 2836361 ORIGINAL: 2346402001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Moisture	76.535	%	76.8831	.45	10
Total Solids	23.4649	%	23.1168	1.49	5

SAMPLE DUPLICATE: 2836362 ORIGINAL: 2346385003

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Moisture	16.3582	%	18.3775	11.6*	10
Total Solids	83.6417	%	81.6224	2.44	5

SAMPLE DUPLICATE: 2836363 ORIGINAL: 2346385013

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Moisture	23.2886	%	27.1698	15.4*	10
Total Solids	76.7113	%	72.8301	5.19*	5

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**QUALITY CONTROL DATA**

Workorder: 2346382 2018-SEDIMENTS - BALTIMORE MD

SAMPLE DUPLICATE: 2836365 ORIGINAL: 2346731001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Moisture	99.0451	%	99.0039	.04	10
Total Solids	.9548	%	.996	4.22	5

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**QUALITY CONTROL DATA**

Workorder: 2346382 2018-SEDIMENTS - BALTIMORE MD

**QC Batch:** WETC/212566 **Analysis Method:** SW846 9071B  
**QC Batch Method:** SW846 9071B  
**Associated Lab Samples:** 2346382001, 2346382002

## METHOD BLANK: 2836787

Parameter	Blank Result	Units	Reporting Limit
Hexane Extractable Material	ND	mg/kg	200

## LABORATORY CONTROL SAMPLE: 2836788

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Hexane Extractable Material	100	mg/kg	4000	4010	78 - 114

## MATRIX SPIKE SAMPLE: 2836789 ORIGINAL: 2346297001

\*\*\*\*NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MS % Rec	% Rec Limit
Hexane Extractable Material	220	mg/kg	3920	5901.960	145*	78 - 114

## SAMPLE DUPLICATE: 2836790 ORIGINAL: 2346297001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Hexane Extractable Material	220	mg/kg	220	0	18

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### QUALITY CONTROL DATA QUALIFIERS

Workorder: 2346382 2018-SEDIMENTS - BALTIMORE MD

#### QUALITY CONTROL PARAMETER QUALIFIERS

Lab ID	#	Sample Type	Analytical Method	Analyte
<b>2835138</b>	1	Matrix Spike	SW846 6020A	Aluminum, Total
The concentration of this analyte was greater than 4 times the concentration of the spike added to the matrix spike. According to protocol, the calculation for percent recovery of the matrix spike is not valid.				
<b>2835138</b>	2	Matrix Spike	SW846 6020A	Manganese, Total
The concentration of this analyte was greater than 4 times the concentration of the spike added to the matrix spike. According to protocol, the calculation for percent recovery of the matrix spike is not valid.				
<b>2835138</b>	3	Matrix Spike	SW846 6020A	Chromium, Total
The concentration of this analyte was greater than 4 times the concentration of the spike added to the matrix spike. According to protocol, the calculation for percent recovery of the matrix spike is not valid.				
<b>2835138</b>	4	Matrix Spike	SW846 6020A	Lead, Total
The concentration of this analyte was greater than 4 times the concentration of the spike added to the matrix spike. According to protocol, the calculation for percent recovery of the matrix spike is not valid.				
<b>2835138</b>	5	Matrix Spike	SW846 6020A	Magnesium, Total
The concentration of this analyte was greater than 4 times the concentration of the spike added to the matrix spike. According to protocol, the calculation for percent recovery of the matrix spike is not valid.				
<b>2835138</b>	6	Matrix Spike	SW846 6020A	Calcium, Total
The concentration of this analyte was greater than 4 times the concentration of the spike added to the matrix spike. According to protocol, the calculation for percent recovery of the matrix spike is not valid.				
<b>2835138</b>	7	Matrix Spike	SW846 6020A	Iron, Total
The concentration of this analyte was greater than 4 times the concentration of the spike added to the matrix spike. According to protocol, the calculation for percent recovery of the matrix spike is not valid.				

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**QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Workorder: 2346382 2018-SEDIMENTS - BALTIMORE MD

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
2346382001	P2-1 Wetlands	SW846 3051	MDIG/74487	SW846 6020A	META/64449
2346382002	P2-2 Wetlands	SW846 3051	MDIG/74488	SW846 6020A	META/64460
2346382001	P2-1 Wetlands	SW846 3546	EXTR/54217	SW846 8082A	SVGC/51076
2346382002	P2-2 Wetlands	SW846 3546	EXTR/54217	SW846 8082A	SVGC/51076
2346382001	P2-1 Wetlands	SW846 3546	EXTR/54219	SW846 8015D	SVGC/51082
2346382002	P2-2 Wetlands	SW846 3546	EXTR/54219	SW846 8015D	SVGC/51082
2346382001	P2-1 Wetlands	SW846 3546	EXTR/54228	SW846 8270D	SVMS/31763
2346382002	P2-2 Wetlands	SW846 3546	EXTR/54228	SW846 8270D	SVMS/31763
2346382001	P2-1 Wetlands	SW846 7471B	MDIG/74517	SW846 7471B	META/64476
2346382002	P2-2 Wetlands	SW846 7471B	MDIG/74517	SW846 7471B	META/64476
2346382001	P2-1 Wetlands	SW846 5035	VOGC/9986	SW846 8015D	VOGC/9987
2346382002	P2-2 Wetlands	SW846 5035	VOGC/9986	SW846 8015D	VOGC/9987
2346382001	P2-1 Wetlands			S2540G-11	WETC/212524
2346382002	P2-2 Wetlands			S2540G-11	WETC/212524
2346382001	P2-1 Wetlands	SW846 3060A	WCPR/45277	SW846 7196A	WETC/212550
2346382002	P2-2 Wetlands	SW846 3060A	WCPR/45277	SW846 7196A	WETC/212550
2346382001	P2-1 Wetlands	SW846 5035	VOMS/48485	SW846 8260B	VOMS/48486
2346382002	P2-2 Wetlands	SW846 5035	VOMS/48485	SW846 8260B	VOMS/48486
2346382001	P2-1 Wetlands			SW846 9071B	WETC/212566
2346382002	P2-2 Wetlands			SW846 9071B	WETC/212566

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 Vancouver Waterloo · Winnipeg · Yellowknife United States: Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York Mexico: Monterrey



34 Dogwood Lane  
Middletown, PA 17057  
P. 717-944-5541  
F. 717-944-1430

**Environmental**

Client Name: Tradepoint Atlantic (TPA)

Address: 1600 Sparrows Point Boulevard

Baltimore, Maryland 21219

Contact: Matthew Newman, P.E.

Phone#: 443.649.5063

Project Name#: Sparrows Point Sediment Sampling

Bill To: Tradepoint Atlantic

TAT  Normal-Standard TAT is 10-12 business days.  
 Rush-Subject to ALS approval and surcharges.  
 Date Required: Standard TAT Approved?  
 Email?  Y mnewman@tradepointatlantic.com  
 Fax?  Y No.:

Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	G or C	Matrix
P2-1 - Wetlands	10/23/2018	11a-3p	C	SO
P2-2 - Wetlands	10/24/2018	4p	C	SO
P3-1 - Wetlands	10/24/2018	12p	C	SO
P3-2 Wetlands	10/24/2018	3p	C	SO
D-1 Wetlands	10/24/2018	5p	C	SO
D-2 - Wetlands	10/24/2018	6:30p	C	SO

Project Comments: 3 4-oz. jars and 1 terracova kit per sample

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
<i>Matthew Newman</i>	10/25/18	1050	<i>Matthew Newman</i>	10/25	1056
<i>Matthew Newman</i>	10/25	1743	COMMON COURIER/ALS COURIER	10/25/2018	2130
COMMON COURIER/ALS COURIER					

**CHAIN OF CUSTODY/  
REQUEST FOR ANALYSIS**  
ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT/  
SAMPLER. INSTRUCTIONS ON THE BACK.

Container Type	Container Size	Preservative	Hexavalent Chromium (EPA 7196A)	TPH (EPA 8015C) DRO	Oil and Grease (EPA 9071B)	PP VOC (EPA 8260B)	PP SVOC (EPA 8270C)	PCBs (EPA 8082)	Cyanide (EPA 9014)	TPH (EPA 8015C) GRO
			X	X	X	X	X	X	X	X
			X	X	X	X	X	X	X	X
			X	X	X	X	X	X	X	X
			X	X	X	X	X	X	X	X
			X	X	X	X	X	X	X	X
			X	X	X	X	X	X	X	X

Deliverables	Standard	CLP-like	USACE	USACE	State Samples Collected In
					NY <input type="checkbox"/> NJ <input type="checkbox"/> PA <input type="checkbox"/> NC <input type="checkbox"/> MD <input checked="" type="checkbox"/>
Reportable to PADEP?	Yes <input type="checkbox"/>				
PWSID #					
EDDS: Format Type- Confirm with TPA					

Cooler Temp: 5°C Therm ID: 403  
 No. of Coolers: Y N Initial KM  
 Custom Seals Present?   
 (if present) Seals Intact?   
 Received on Ice?   
 COC/Labels Complete/Accurate?   
 Cont. in Good Cond.?   
 Correct Containers?   
 Correct Sample Volumes?   
 Correct Preservation?   
 Headspace/Volatiles?   
 Courier/Tracking #: MDX 1025002  
 Sample/COC Comments

COC 1 of 1  
 ALS 1  
 \* 2 3 4 5 6 7 8 9 \*





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10450 Stancliff Rd. Suite 210  
Houston, TX 77099  
T: +1 281 530 5656  
F: +1 281 530 5887

November 01, 2018

Vanessa Badman  
ALS Environmental  
34 Dogwood Lane  
Middletown, PA 17057

Work Order: **HS18101614**

Laboratory Results for: **2346382**

Dear Vanessa,

ALS Environmental received 6 sample(s) on Oct 30, 2018 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOK E.LAWAL  
RJ Modashia  
Project Manager

**Client:** ALS Environmental  
**Project:** 2346382  
**Work Order:** HS18101614

**SAMPLE SUMMARY**

Lab Samp ID	Client Sample ID	Matrix	Taglio	Collection Date	Date Received	Hold
HS18101614-01	2346382 001	Soil		23-Oct-2018 15:00	30-Oct-2018 08:58	<input type="checkbox"/>
HS18101614-02	2346382 002	Soil		24-Oct-2018 16:00	30-Oct-2018 08:58	<input type="checkbox"/>
HS18101614-03	2346382 003	Soil		24-Oct-2018 12:00	30-Oct-2018 08:58	<input type="checkbox"/>
HS18101614-04	2346382 004	Soil		24-Oct-2018 15:00	30-Oct-2018 08:58	<input type="checkbox"/>
HS18101614-05	2346382 005	Soil		24-Oct-2018 17:00	30-Oct-2018 08:58	<input type="checkbox"/>
HS18101614-06	2346382 006	Soil		24-Oct-2018 17:00	30-Oct-2018 08:58	<input type="checkbox"/>

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**Client:** ALS Environmental  
**Project:** 2346382  
**Work Order:** HS18101614

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**CASE NARRATIVE**

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**WetChemistry by Method SW3550**

**Batch ID: R326547**

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

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**WetChemistry by Method SW9014**

**Batch ID: 134134**

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

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Client: ALS Environmental  
 Project: 2346382  
 Sample ID: 2346382 001  
 Collection Date: 23-Oct-2018 15:00

**ANALYTICAL REPORT**  
 WorkOrder:HS18101614  
 Lab ID:HS18101614-01  
 Matrix:Soil

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>MOISTURE</b>		<b>Method:SW3550</b>				Analyst: DFF
Percent Moisture	69.2		0.0100	wt%	1	31-Oct-2018 11:18
<b>CYANIDE</b>		<b>Method:SW9014</b>				Analyst: KVL
Cyanide	ND		1.85	mg/Kg	1	01-Nov-2018 12:20
Cyanide, Amenable to Chlorination	ND		1.85	mg/Kg	1	01-Nov-2018 12:20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: ALS Environmental  
 Project: 2346382  
 Sample ID: 2346382 002  
 Collection Date: 24-Oct-2018 16:00

**ANALYTICAL REPORT**  
 WorkOrder:HS18101614  
 Lab ID:HS18101614-02  
 Matrix:Soil

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>MOISTURE</b>		<b>Method:SW3550</b>				Analyst: DFF
Percent Moisture	71.9		0.0100	wt%	1	31-Oct-2018 11:18
<b>CYANIDE</b>		<b>Method:SW9014</b>				Analyst: KVL
Cyanide	ND		1.92	mg/Kg	1	01-Nov-2018 12:20
Cyanide, Amenable to Chlorination	ND		1.92	mg/Kg	1	01-Nov-2018 12:20

Note: See Qualifiers Page for a list of qualifiers and their explanation.



Client: ALS Environmental  
 Project: 2346382  
 Sample ID: 2346382 003  
 Collection Date: 24-Oct-2018 12:00

**ANALYTICAL REPORT**  
 WorkOrder:HS18101614  
 Lab ID:HS18101614-03  
 Matrix:Soil

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>MOISTURE</b>		<b>Method:SW3550</b>				Analyst: DFF
Percent Moisture	72.9		0.0100	wt%	1	31-Oct-2018 11:18
<b>CYANIDE</b>		<b>Method:SW9014</b>			Prep:SW9010C / 01-Nov-2018	Analyst: KVL
Cyanide	ND		1.94	mg/Kg	1	01-Nov-2018 12:20
Cyanide, Amenable to Chlorination	ND		1.94	mg/Kg	1	01-Nov-2018 12:20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: ALS Environmental  
 Project: 2346382  
 Sample ID: 2346382 004  
 Collection Date: 24-Oct-2018 15:00

**ANALYTICAL REPORT**  
 WorkOrder:HS18101614  
 Lab ID:HS18101614-04  
 Matrix:Soil

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>MOISTURE</b>		<b>Method:SW3550</b>				Analyst: DFF
Percent Moisture	64.4		0.0100	wt%	1	31-Oct-2018 11:18
<b>CYANIDE</b>		<b>Method:SW9014</b>			Prep:SW9010C / 01-Nov-2018	Analyst: KVL
Cyanide	ND		1.93	mg/Kg	1	01-Nov-2018 12:20
Cyanide, Amenable to Chlorination	ND		1.93	mg/Kg	1	01-Nov-2018 12:20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: ALS Environmental  
 Project: 2346382  
 Sample ID: 2346382 005  
 Collection Date: 24-Oct-2018 17:00

**ANALYTICAL REPORT**

WorkOrder:HS18101614  
 Lab ID:HS18101614-05  
 Matrix:Soil

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>MOISTURE</b>		<b>Method:SW3550</b>				Analyst: DFF
Percent Moisture	60.8		0.0100	wt%	1	31-Oct-2018 11:18
<b>CYANIDE</b>		<b>Method:SW9014</b>				Analyst: KVL
Cyanide	ND		1.82	mg/Kg	1	01-Nov-2018 12:20
Cyanide, Amenable to Chlorination	ND		1.82	mg/Kg	1	01-Nov-2018 12:20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: ALS Environmental  
 Project: 2346382  
 Sample ID: 2346382 006  
 Collection Date: 24-Oct-2018 17:00

**ANALYTICAL REPORT**  
 WorkOrder:HS18101614  
 Lab ID:HS18101614-06  
 Matrix:Soil

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>MOISTURE</b>		<b>Method:SW3550</b>				Analyst: DFF
Percent Moisture	63.0		0.0100	wt%	1	31-Oct-2018 11:18
<b>CYANIDE</b>		<b>Method:SW9014</b>				Analyst: KVL
Cyanide	ND		2.01	mg/kg	1	01-Nov-2018 12:20
Cyanide, Amenable to Chlorination	ND		2.01	mg/kg	1	01-Nov-2018 12:20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

**WEIGHT LOG**

**Client:** ALS Environmental  
**Project:** 2346382  
**WorkOrder:** HS18101614

**Batch ID:** 134134      **Method:** CYANIDE      **Prep:** CN\_TS\_PR

SampleID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18101614-01	1	1.0819	50 (mL)	46.21
HS18101614-02	1	1.0423	50 (mL)	47.97
HS18101614-03	1	1.0323	50 (mL)	48.44
HS18101614-04	1	1.0351	50 (mL)	48.3
HS18101614-05	1	1.0994	50 (mL)	45.48
HS18101614-06	1	0.9965	50 (mL)	50.18

**Client:** ALS Environmental  
**Project:** 2346382  
**WorkOrder:** HS18101614

**DATES REPORT**

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
<b>Batch ID</b> 134134		<b>Test Name:</b> CYANIDE		<b>Matrix:</b> Soil		
HS18101614-01	2346382 001	23 Oct 2018 15:00		01 Nov 2018 10:08	01 Nov 2018 12:20	1
HS18101614-02	2346382 002	24 Oct 2018 16:00		01 Nov 2018 10:08	01 Nov 2018 12:20	1
HS18101614-03	2346382 003	24 Oct 2018 12:00		01 Nov 2018 10:08	01 Nov 2018 12:20	1
HS18101614-04	2346382 004	24 Oct 2018 15:00		01 Nov 2018 10:08	01 Nov 2018 12:20	1
HS18101614-05	2346382 005	24 Oct 2018 17:00		01 Nov 2018 10:08	01 Nov 2018 12:20	1
HS18101614-06	2346382 006	24 Oct 2018 17:00		01 Nov 2018 10:08	01 Nov 2018 12:20	1
<b>Batch ID</b> R326547		<b>Test Name:</b> MOISTURE		<b>Matrix:</b> Soil		
HS18101614-01	2346382 001	23 Oct 2018 15:00			31 Oct 2018 11:18	1
HS18101614-02	2346382 002	24 Oct 2018 16:00			31 Oct 2018 11:18	1
HS18101614-03	2346382 003	24 Oct 2018 12:00			31 Oct 2018 11:18	1
HS18101614-04	2346382 004	24 Oct 2018 15:00			31 Oct 2018 11:18	1
HS18101614-05	2346382 005	24 Oct 2018 17:00			31 Oct 2018 11:18	1
HS18101614-06	2346382 006	24 Oct 2018 17:00			31 Oct 2018 11:18	1



**Client:** ALS Environmental  
**Project:** 2346382  
**WorkOrder:** HS18101614

**QC BATCH REPORT**

**Batch ID:** 134134      **Instrument:** UV-2450      **Method:** SW9014

MBLK		Sample ID:	MBLK-134134		Units:	mg/Kg		Analysis Date:			01-Nov-2018 12:20		
Client ID:		Run ID:		UV-2450_326625		SeqNo:		4800227		PrepDate:		01-Nov-2018	DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual			
Cyanide	ND	2.00											
Cyanide, Amenable to Chlorination	ND	2.00											

LCS		Sample ID:	LCS-134134		Units:	mg/Kg		Analysis Date:			01-Nov-2018 12:20		
Client ID:		Run ID:		UV-2450_326625		SeqNo:		4800226		PrepDate:		01-Nov-2018	DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual			
Cyanide	8.65	2.00	10	0	86.5	80 -120							
Cyanide, Amenable to Chlorination	8.65	2.00	10	0	86.5	80 -120							

MS		Sample ID:	HS18101672-04MS		Units:	mg/Kg		Analysis Date:			01-Nov-2018 12:20		
Client ID:		Run ID:		UV-2450_326625		SeqNo:		4800224		PrepDate:		01-Nov-2018	DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual			
Cyanide	8.207	1.94	9.713	0.2885	81.5	75 -125							
Cyanide, Amenable to Chlorination	8.207	1.94	9.713	0	84.5	75 -125							

MSD		Sample ID:	HS18101672-04MSD		Units:	mg/Kg		Analysis Date:			01-Nov-2018 12:20		
Client ID:		Run ID:		UV-2450_326625		SeqNo:		4800225		PrepDate:		01-Nov-2018	DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual			
Cyanide	8.397	2.01	10.06	0.2885	80.6	75 -125	8.207	2.29	30				
Cyanide, Amenable to Chlorination	8.397	2.01	10.06	0	83.5	75 -125	8.207	2.29	30				

The following samples were analyzed in this batch: HS18101614-01    HS18101614-02    HS18101614-03    HS18101614-04  
 HS18101614-05    HS18101614-06

Client: ALS Environmental  
Project: 2346382  
WorkOrder: HS18101614

QC BATCH REPORT

Batch ID: R326547 Instrument: Balance1 Method: SW3550

<b>DUP</b>	Sample ID: <b>HS18101614-02DUP</b>	Units: <b>wt%</b>	Analysis Date: <b>31-Oct-2018 11:18</b>							
Client ID: <b>2346382 002</b>	Run ID: <b>Balance1_326547</b>	SeqNo: <b>4798655</b>	PrepDate:	DF: <b>1</b>						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Percent Moisture	73.3	0.0100					71.9	1.93	20	

The following samples were analyzed in this batch:

HS18101614-01	HS18101614-02	HS18101614-03	HS18101614-04
HS18101614-05	HS18101614-06		





**Client:** ALS Environmental  
**Project:** 2346382  
**WorkOrder:** HS18101614

**QUALIFIERS,  
ACRONYMS, UNITS**

<b>Qualifier</b>	<b>Description</b>
I	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

<b>Acronym</b>	<b>Description</b>
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

**CERTIFICATIONS,ACCREDITATIONS & LICENSES**

<b>Agency</b>	<b>Number</b>	<b>Expire Date</b>
North Carolina	624-2018	31-Dec-2018
Arkansas	88-0356	27-Mar-2019
Texas	T1 0470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	22-Dec-2018
Kentucky	123043 -2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019

Sample Receipt Checklist

Client Name: ALS Middletown  
Work Order: HS18101614

Date/Time Received: 30-Oct-2018 08:58  
Received by: JRM

Checklist completed by: Jared R. Makan eSignature 30-Oct-2018 Date  
Reviewed by: RJ Modashia eSignature 30-Oct-2018 Date

Matrices: Water Carrier name: FedEx Priority Overnight

- Shipping container/cooler in good condition? Yes  No  Not Present
- Custody seals intact on shipping container/cooler? Yes  No  Not Present
- Custody seals intact on sample bottles? Yes  No  Not Present
- Chain of custody present? Yes  No
- Chain of custody signed when relinquished and received? Yes  No
- Chain of custody agrees with sample labels? Yes  No
- Samples in proper container/bottle? Yes  No
- Sample containers intact? Yes  No
- TX1005 solids received in hermetically sealed vials? Yes  No  N/A
- Sufficient sample volume for indicated test? Yes  No
- All samples received within holding time? Yes  No
- Container/Temp Blank: temperature in compliance? Yes  No

Temperature(s)/Thermometer(s): 1.4c/1.0c UC/C R11

Cooler(s)/Kit(s): Blue

Date/Time sample(s) sent to storage: 10/30/2018 12:20

Water - VOA vials have zero headspace? Yes  No  No VOA vials submitted

Water - pH acceptable upon receipt? Yes  No  N/A

pH adjusted? Yes  No  N/A

pH adjusted by:

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:





