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April 24, 2018

U.S. Environmental Protection Agency Region III
Ms. Ruth Scharr
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Subject: Final Trip Report — Sediment Assessment-Second Round of Sample Collection
July 2017 Mobilization

Project: Sparrows Point Southeast Area
EPA Contract No.: EP-S3-15-02
TDD No.: W501-15-08-003

Document Control No.: W0053.1A.02313

Dear Ms. Scharr:

Weston Solutions, Inc. (WESTON®) is submitting the Final Trip Report for the sediment assessment conducted at the Sparrows Point Southeast Area Site (the Site). This Trip Report summarizes the field activities and analytical results of the second round of sediment sampling conducted at the Site from July 10 to 12, 2017. Additionally, this Trip Report includes a summary of the analytical results of the first round of sediment sampling conducted at the Site in June 2016. If you have any questions regarding this report, please call me at (610) 701-3490.

Sincerely,

WESTON SOLUTIONS, INC.,

A handwritten signature in black ink that reads "Charles Rapone".

Charles Rapone
Project Task Lead

Enclosure

cc: TDD File
Mr. Robert McGlade (START Program Manager)

FINAL TRIP REPORT

SPARROWS POINT SOUTHEAST AREA SEDIMENT ASSESSMENT SECOND ROUND OF SAMPLE COLLECTION BALTIMORE, MARYLAND

**EPA CONTRACT NO.: EP-S3-15-02
TECHNICAL DIRECTION DOCUMENT NO.: W501-15-08-003
DOCUMENT CONTROL NO.: W0053.1A.02313**

Prepared For:



**U.S. Environmental Protection Agency Region III
Hazardous Site Cleanup Division
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Philadelphia, PA 19103**

Prepared By:



**Weston Solutions, Inc.
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April 2018

FINAL TRIP REPORT

SPARROWS POINT SOUTHEAST AREA SEDIMENT ASSESSMENT SECOND ROUND OF SAMPLE COLLECTION BALTIMORE, MARYLAND



WESTON – Project Task Lead
Charles Rapone

04/23/2018

Date



WESTON – Region III START Program Manager
Robert McGlade, PMP

04/23/2018

Date

USEPA – On-Scene Coordinator
Ruth Scharr

Date



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LIST OF ACRONYMS AND ABBREVIATIONS

ΣSEM	sum simultaneously extracted metals
μmol/g	micromoles per gram
μg/kg	micrograms per kilogram
AOC	Area of Concern
AVS/SEM	acid volatile sulfide-simultaneously extracted metals
BERA	Baseline Environmental Risk Assessment
BSC	Bethlehem Steel Corporation
BTAG	Biological Technical Assistance Group
CLP	Contract Laboratory Program
DAS	Delivery of Analytical Services
DCC	Description of Current Conditions
EAG	EnviroAnalytics Group
EPA	United States Environmental Protection Agency
ESAT	Environmental Services Assistance Team
ESB	equilibrium partitioning sediment benchmark
f _{oc}	fraction organic carbon
FSP	Field Sampling and Analysis Plan
ft	feet
GC/MS	Gas Chromatography/Mass Spectrometry
HHRE	Human Health Risk Evaluation
HRP	HRP Sparrows Point LLC
ISG	International Steel Group
ISM02.4	CLP SOW Inorganic Superfund Method
MDE	Maryland Department of the Environment
mg/kg	milligrams per kilogram
NOAA	National Oceanic and Atmospheric Administration
OASQA	Office of Analytical Services and Quality Assurance
OLEM	Office of Land and Emergency Management
OSC	On-Scene Coordinator
OSWER	Office of Solid Waste and Emergency Response
PAH	polyaromatic hydrocarbons
PCB	polychlorinated biphenyl



LIST OF ACRONYMS LISTAND ABBREVIATIONS (CONTINUED)

PEC	Probable Effect Concentration
PEL	Probable Effect Levels
PID	photoionization detector
ppm	parts per million
PSA	Purchase Sale Agreement
RAS	Routine Analytical Services
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RSC	Release Site Characterization
Rust	Rust Environment and Infrastructure
SCCP	Site Conceptual Cleanup Plan
SD	surface sediment
SEL	Severe Effect Levels
SIM	selective ion monitoring
SOM02.4	CLP SOW Organic Superfund Method
SOP	Standard Operating Procedure
SOW	Statement of Work
SQuiRT	Screening Quick Reference Tables
SS	subsurface sediment
SSA	Special Study Area
START	Superfund Technical Assessment and Response Team
SU	standard unit
SVOC	semivolatile organic compound
SWI	Site-Wide Investigation
SWMU	solid waste management unit
TAL	Target Analyte List
TDD	Technical Direction Document
TOC	total organic carbon
UFP-QAPP	Uniform Federal Policy-Quality Assurance Project Plan
URS	URS Corporation
VCP	Voluntary Cleanup Program



LIST OF ACRONYMS LISTAND ABBREVIATIONS (CONTINUED)

VOC volatile organic compound
WESTON® Weston Solutions, Inc.



1.0 INTRODUCTION

Under the Eastern Area Superfund Technical Assessment and Response Team (START) Contract No. EP-S3-15-02, Technical Direction Document (TDD) No. W501-15-08-003, the U.S. Environmental Protection Agency (EPA) Region III tasked Weston Solutions, Inc. (WESTON®) to conduct a removal assessment for the offshore investigation of sediment along the southeast shoreline of the Sparrows Point Southeast Area Site (the Site) located on Sparrows Point peninsula in Baltimore County, Maryland. The sampling focused on the area along the southern and eastern shores of the former Bethlehem Steel Corporation (BSC) facility located on the southern and eastern portion of the Sparrows Point Industrial Complex.

The objective of the assessment was to characterize the offshore sediment located along the Site shoreline to determine whether contaminants are present in sediment at concentrations that present, or may present, a risk to human health or the environment. The areas that were sampled included sediment along the southeast shoreline at the Site located along the southern and eastern shores of the former BSC facility on the Sparrows Point peninsula within the Patapsco River, Old Road Bay and Jones Creek.

The assessment was conducted during two rounds of sediment sampling. The first round was completed in June 2016 and summarized in the Final Trip Report, Sparrows Point Southeast Area Sediment Assessment June 2017 (Weston, 2017a). The second round of sediment sampling was completed in July 2017. This Trip Report summarizes the field activities that were conducted at the site in July 2017. The data summary section of this report (Section 6.0) includes Round 1 and Round 2 data.

The second round of sediment sampling, conducted in July 2017, included the collection of additional surface and subsurface sediment samples from locations along the southern and eastern shores of the Site, which is surrounded by the Patapsco River, Old Road Bay and Jones Creek. Subsurface sample locations were selected based on the analytical results of the June 2016 sediment sampling to determine the vertical extent of contamination, providing further characterization of the nature and extent of contamination.



This Trip Report provides a summary of the activities conducted at the Site by WESTON. Unless otherwise specified in this report, all activities were conducted in accordance with the Final Field Sampling and Analysis Plan (FSP) (WESTON, 2017b) and the *EPA Region III START 5 Program-Wide Uniform Federal Policy-Quality Assurance Project Plan (UFP-QAPP)* (WESTON, 2015a).

2.0 BACKGROUND

This section presents a description of the site location and Site and a discussion of the site history.

2.1 SITE LOCATION

As shown on Figure 1, Site Location Map, the Site is located adjacent to the Sparrows Point Industrial Complex in Baltimore County, Maryland, and includes the shoreline areas of the peninsula immediately surrounding the Sparrows Point Industrial Complex, which is bounded to the west by Bear Creek; to the south by the Patapsco River; and to the east by Old Road Bay, Jones Creek, and residential areas of the City of Edgemere. The approximate geographic coordinates of the center of the Sparrows Point Industrial Complex are 39.21264° north latitude and 76.46974° west longitude. As shown in Figure 2, Site Layout Map, the southeast shoreline of the peninsula surrounding the Sparrows Point Industrial Complex, where this assessment was conducted, is located adjacent to the former BSC plant on Sparrows Point. The BSC facility comprises approximately 3,100 acres on the north side of the Patapsco River within the Sparrows Point Industrial Complex.

2.2 SITE DESCRIPTION

The Site, consisting of the shoreline areas of the peninsula immediately surrounding the Sparrows Point Industrial Complex, has been impacted by former operations conducted on the peninsula; in particular by the former BSC facility, which is adjacent to the Patapsco River, Old Road Bay, and Jones Creek. Most buildings within the former BSC facility at Sparrows Point have been demolished. Concrete slabs, if present, remain on grade (Rust Environment and Infrastructure [Rust], 1998). The existing ground surface is relatively flat; however, it contains manmade



features such as buildings, landfills, and material stockpiles. Land reclamation and fill placement activities have been conducted at the BSC facility since the early 1900s. Fill deposited at the facility consists primarily of iron- and steel-making slag and waste byproduct materials that have been placed for grade-leveling. In general, fill placement occurred in three areas: (1) into stream channels and estuaries that originally had extended into the Sparrows Point peninsula; (2) over the entire southern shoreline of the peninsula, which was expanded southward into the Patapsco River; and (3) throughout the property to level grades (EnviroAnalytics Group [EAG], 2015a).

2.3 SITE HISTORY

From the late 1800s until 2012, steel production and manufacturing was conducted at Sparrows Point. Pennsylvania Steel built the first furnace at Sparrows Point in 1887. BSC purchased the facility in 1916 and constructed mills to produce hot rolled sheet, cold rolled sheet, galvanized sheet tin mill products, and steel plate. During peak steel production in 1959, the facility operated 12 coke-oven batteries, 10 blast furnaces, and four open-hearth furnaces (EAG, 2014). Iron and steel production operations and processes at Sparrows Point included raw material handling, coke production, sinter production, iron production, steel production, and semi-finished and finished product preparation. In 1970, BSC at Sparrows Point was the largest steel facility in the United States, producing hot and cold rolled sheets, coated materials, pipes, plates, and rod and wire. The steelmaking operations at the facility ceased in fall 2012 (EAG, 2014).

According to the Description of Current Conditions (DCC) Report produced by Rust, the BSC was formerly occupied by businesses conducting iron and steel production operations within areas generally referred to as the Open Hearth Furnace Area, Primary Rolling Mills Area, and Blast Furnace Area. Other former operations include a power generation building and associated oil storage facilities, a vehicle maintenance area, and areas occupied by a former employee town (Rust, 1998).

On September 11, 2014, the BSC facility was accepted into the Maryland Department of the Environment (MDE) Voluntary Cleanup Program (VCP). The Site's current and anticipated future



use is Tier 3 (Industrial), and plans for the Site include demolition of existing structures and redevelopment over the next several years.

2.4 PREVIOUS INVESTIGATIONS

In August 1993, potential sources of releases of hazardous substances to the environment from the BSC facility were identified in a final Resource Conservation and Recovery Act (RCRA) Facility Assessment Phase II Report (RFA Report) prepared for EPA by A.T. Kearney (Kearney, 1993). The RFA Report provided an updated summary for the facility from an initial draft RFA Report prepared by PRC Environmental Management on April 12, 1988. The Final RFA identified 203 Solid Waste Management Units (SWMUs) and 28 Areas of Concern (AOCs) where a release occurred or that had the potential to release hazardous wastes or hazardous waste constituents to various media (EAG, 2014).

On October 10, 1997, EPA and MDE filed a multimedia Consent Decree through the U.S District Court for the Court of Maryland seeking relief from alleged endangerment to public health, welfare, or the environment from contamination at and around the BSC Sparrows Point Facility. Pursuant to the requirements of the 1997 Consent Decree, a Site-Wide Investigation (SWI) and associated environmental assessments have been performed at the Site. The SWI focused on characterizing the nature and extent of releases from the facility. As part of the SWI, work has been completed to implement an investigation and screening process to evaluate potential source areas of releases to the environment and determine whether further action (or no further action) is necessary.

Numerous investigations have been completed at the former BSC facility as part of the SWI program required by the Consent Decree. Major submittals completed to date as part of the SWI include the following:

- Description of Current Conditions (Rust, 1998).
- Site-Wide Investigation Work Plan (CH2M Hill, 2000).
- Site-Wide Investigation Groundwater Study Report (CH2M Hill, 2001).

- Site-Wide Investigation Release Site Characterization Study (RCS) (CH2M Hill, 2002).
- CA725 Facility Investigation and Human Health Risk Evaluation (HHRE) Findings, International Steel Group (ISG) Sparrows Point, June 9, 2005 (URS Corporation [URS], 2005).
- Ecological Risk Assessment Strategy Document; ISG Sparrows Point Facility (URS, 2006).
- Site-Wide Investigation: Report of Nature & Extent of Releases to Groundwater from the Special Study Areas (SSAs) (URS, 2007a).
- Final Ecological Risk Assessment Work Plan for On-Site Areas (URS, 2007b).
- Screening Level Ecological Risk Assessment for On-Site Areas Final (URS, 2009a).
- Supplemental Report: County Lands Parcel 1B Ponds Final (URS, 2009b).
- Final Baseline Ecological Risk Assessment for On-Site Areas (BERA) Report (URS, 2011).
- Quality Assurance Project Plan-Sparrows Point Terminal Site, Prepared by ARM Group (EAG, 2015b).

In 2014, a Site Conceptual Cleanup Plan (SCCP) of the BSC facility was prepared by EAG on behalf of the current owner and seller, Sparrows Point LLC. The SCCP is intended to provide an agreed upon course of action for further investigation, remediation, closure, and pathway exclusion of applicable areas for the Site pursuant to the December 14, 2013 Purchase Sale Agreement (PSA) between HRP Sparrows Point LLC (HRP or Purchaser) and Sparrows Point LLC. The SCCP outlines the objectives, approach, methods, and schedule to complete the investigation and remediation and achieve “closure” of environmental obligations of the Site (EAG, 2014).

2.5 PREVIOUS SEDIMENT ASSESSMENT

In June 2016, EPA tasked WESTON to collect 39 sediment samples from 13 transects along the southeast shoreline of the Sparrows Point peninsula in Baltimore County, Maryland. As depicted in Figure 3, Round 1 Sediment Sample Locations, four transects were located within the Patapsco River, five transects were located within Old Road Bay, and four transects were located within

Jones Creek. Three sediment samples were collected from each transect. Each sediment sample was collected to a maximum depth of 6 inches using a Petite Ponar dredge that was operated from a 16-foot Jon boat.

The collected sediment samples were analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs); polychlorinated biphenyls (PCBs); and inorganics, including mercury and cyanide. Sediment analytical results were compared to their respective National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Table (SQuiRT) Probable Effect Concentrations (PECs) screening benchmarks for freshwater sediment and EPA Biological Technical Assistance Group (BTAG) screening benchmarks for freshwater sediment (NOAA, 2008; EPA, 2006).

PCBs were not detected in any of the sediment samples collected from the southeast shoreline at the Site. One VOC, carbon disulfide, was detected at concentrations exceeding the BTAG screening benchmark for freshwater sediment in seven samples collected from Patapsco River and in one sample collected from Transect E in Old Road Bay. Concentrations of VOCs did not exceed applicable NOAA SQuiRT PEC screening benchmarks for freshwater in any sediment samples. Concentrations of numerous polyaromatic hydrocarbons (PAHs) and metals were detected above applicable BTAG screening benchmarks and NOAA SQuiRT PEC screening benchmarks in samples collected from all three sampling areas. The majority of metals and PAHs containing the highest concentrations that exceeded their respective BTAG and NOAA SQuiRT PEC benchmarks were collected from sample location K03 located within Jones Creek adjacent to Outfall 17.

3.0 SITE ACTIVITIES

From July 10 to July 12, 2017, WESTON collected sediment samples from the Site as proposed in the FSP (WESTON, 2017b), with the exception of those deviations discussed in Section 4.0. WESTON documented site activities in accordance with WESTON Standard Operating Procedure (SOP) No. 101, Logbook Documentation (WESTON, 2015b). This section discusses sampling activities conducted during this assessment.

3.1 SEDIMENT SAMPLING

WESTON collected 34 surface sediment samples and 10 subsurface sediment samples during the subsequent sampling conducted for the southeast shoreline offshore investigation. Sediment sample locations are depicted on Figure 4, Round 2 Sediment Sample Locations. The primary locations of sediment samples were organized into nine transects consisting of sample locations within Jones Creek and assigned transect identifiers N through V from the south to north. Additionally, 10 subsurface sediment samples were collected from locations within Patapsco River, Old Road Bay, and Jones Creek. Sediment samples were analyzed for SVOCs (including PAHs by selected ion monitoring [SIM]), PCBs, and target analyte list (TAL) metals (including mercury and cyanide). An additional 10 surface sediment samples were collected at the same locations as the 10 subsurface samples within Patapsco River, Old Road Bay, and Jones Creek, and analyzed for VOCs and ancillary parameters including grain size analysis, pH, total organic carbon (TOC), and acid volatile sulfide-simultaneously extracted metals (AVS/SEM).

Subsurface sample locations were selected based on the analytical results of the June 2016 sediment sampling to determine the vertical extent of contamination, providing further characterization of the nature and extent of contamination. Subsurface sediment cores were collected using a Wildco® Ogeechee core sampler to approximately 2.5 feet (ft) below the sediment surface.

Sediment samples were collected as discrete grab samples from the southeast shoreline area of Sparrows Point in accordance with WESTON SOP No. 303, Sediment Sampling (WESTON, 2015c). Surface sediment samples were collected using a Wildco® Petite Ponar dredge operated from a 16-ft Jon boat. Each sample consisted of one successful Ponar grab, in which the dredge is lowered through the water to the sediment surface and is recovered with a full receptacle of sediment. Sediment samples were targeted from the sediment surface to a maximum depth of 6 inches. Ponar grabs that did not achieve sufficient penetration depth were discarded. Additional attempts were made until the desired penetration was achieved. The subsurface sediment samples were collected using an Ogeechee core sampler with dedicated plastic liners. The Ogeechee was hand-driven into the surface bottom in an attempt to collect a 4-foot core sample from the top of

the sediment. A slide hammer was used in conjunction with the core sampler to assist with the removal of the sampler from the sediment. Sediment core lithology from the Ogeechee was documented by recording the boring logs in a field logbook and taking digital photographs prior to sample collection. Along with visual screening, a photoionization detector (PID) was used to screen the sediment core. Any observed staining and/or organic vapor readings were recorded for each sediment boring.

Sediment from the Ponar and the Ogeechee were placed into an aluminum pan. Sediment samples for VOC analysis were collected first using 5-gram Terracore[®] sampling devices. The sediment was then homogenized with a disposable hand trowel, and all extraneous material (i.e., pebbles, plant material, shells) were removed to the greatest extent practicable. During this process, the sediment was screened using a PID. Homogenized materials were then placed directly into the appropriate sample containers for analysis. Sediment sampling field notes were compiled in the log book and included the PID measurements, texture, location, date/time of collection, and observations of the material recovered for each sampling location.

Sediment samples were analyzed for SVOCs (including PAHs by SIM), PCBs, and TAL metals (including mercury and cyanide). Additionally, at the discretion of the On-Scene Coordinator (OSC), 10 samples were analyzed for VOCs and ancillary parameters, including grain size analysis, pH, TOC, and AVS/SEM.

Sediment samples were submitted to WESTON-procured Tier IV laboratories for the analysis of VOCs, SVOCs, PCBs, PAHs by SIM, and ancillary parameters (pH, TOC, AVS/SEM) under Delivery of Analytical Services (DAS) case number R35186. The sediment samples were also submitted for analysis of grain size, TAL metals, mercury, and cyanide under Contract Laboratory Program (CLP) Routine Analytical Services (RAS) case number 47079.

A description of each sediment sample is provided in Table 1 and includes the following information: the PID screening measurements, sediment texture, sample transect and location, sample date/time, the depth of the water at each location, and observations of the recovered material. A photographic log of the sediment samples collected is provided in Appendix B.

3.2 SAMPLE MANAGEMENT

All samples collected during the July 2017 sampling event were handled and packaged in accordance with the *Contract Laboratory Program Guidance for Field Samplers* (EPA, 2014). All shipping containers were properly sealed with EPA chain-of-custody seals and delivered with signed chain-of-custody forms and appropriate hazard warnings for laboratory personnel. The Validated Analytical Results Packages are provided in Appendix C. All samples were kept on ice during delivery to the assigned laboratories.

4.0 DEVIATIONS FROM FIELD SAMPLING PLAN

WESTON anticipated collecting stormwater samples from stormwater outfalls exiting Sparrows Point along the southeast shoreline that were flowing at the time of the sample event. However, stormwater samples were not collected because the exact location of the outfalls could not be determined in the field. The exact location of each outfall will need to be determined prior to sample collection during a storm event. WESTON does not anticipate collecting stormwater samples in support of the sediment assessment scope of work.

5.0 ANALYTICAL RESULTS

This section summarizes the analytical results for the sediment samples collected at the Site by WESTON during the second round sediment assessment conducted in July 2017. Sediment samples were submitted to WESTON-procured Tier IV laboratories for the analysis of VOCs, SVOCs, PCBs, PAHs by SIM, and ancillary parameters (pH, TOC, AVS/SEM) under DAS case number R35186. Samples were analyzed in accordance with the EPA CLP Statement of Work (SOW) Organic Superfund Method (SOM02.4) for VOCs, SVOCs, PCBs, and PAHs by SIM. The EPA CLP SOW SOM02.4 for SVOCs is a full-scan SVOC method with detection limits higher than the SIM limits. The SIM method is a separate extraction from the full-scan method and can achieve lower detection limits using gas chromatography/mass spectrometry (GC/MS) in SIM mode. The sediment samples were submitted for analysis of grain size, TAL metals, mercury, and cyanide under CLP RAS case number 47079. Samples were also analyzed in accordance with



EPA CLP SOW Inorganic Superfund Method (ISM02.4) for TAL metals, mercury, and cyanide (EPA, 2016a and EPA, 2016b).

A summary of the detected analytical results is provided in the attached analytical summary tables. Validated Analytical Results Packages are provided in Appendix C. All analytical results were validated to the Inorganic and Organic Level 2 by the EPA Office of Analytical Services and Quality Assurance (OASQA) Environmental Services Assistance Team (ESAT) contractor, in accordance with the EPA Contract Laboratory Program *National Functional Guidelines for Superfund Organic Methods Data Review*, EPA-540-R-2017-002, and the EPA Contract Laboratory Program *National Functional Guidelines for Inorganic Superfund Methods Data Review*, EPA-540-R-2017-001, (EPA, 2017a and EPA 2017b).

5.1 SEDIMENT SAMPLE RESULTS FOR THE SECOND ROUND OF SAMPLING

Sediment analytical results were primarily compared to their respective NOAA SQuiRT PECs screening benchmarks for freshwater sediment, and were additionally compared to EPA BTAG screening benchmarks for freshwater sediment (NOAA, 2008; EPA, 2006). The NOAA SQuiRTs include multiple sediment screening values to help portray a spectrum of concentrations that have been associated with various probabilities of adverse biological effects. This spectrum ranges from presumable nearly non-toxic to toxic levels. PECs, sometimes referred to as “consensus-based values,” are merely the average of numerous other benchmarks, many of which have been included in the SQuiRT cards, such as Severe Effect Levels (SELs) and Probable Effect Levels (PELs) (NOAA, 2008). The EPA Region 3 BTAG screening benchmarks provide an approach to compare chemical concentrations detected in environmental samples (e.g., surface water, sediment) to values that are protective of biota, including sensitive species. If concentrations exceed the screening values, they are further evaluated. Bioaccumulative compounds may also be further evaluated in consideration of food chain exposure. If concentrations of a compound are below the screening value, it is assumed that the compound poses no unacceptable risk to ecological receptors. Exceedances of screening values do not trigger remedial or removal actions nor are they intended to be used as cleanup values. The use of the screening values in this manner assumes

that all of the compounds present are biologically available to the biota (i.e., can be absorbed by an organism). Not all of the compounds detected in an environmental sample are typically bioavailable; thus, even if a chemical exceeds a screening level, it may not be present at levels that pose an unacceptable risk.

Given the purpose of the data collection, the results were compared to benchmarks more closely associated with probable toxic effects such as those summarized in the NOAA SQuiRT cards (NOAA, 2008). The results were also compared to BTAG screening benchmarks, which are conservative and designed to clearly identify when contaminant levels are not expected to pose an unacceptable risk to even sensitive species (i.e., if contaminant levels are below the benchmark, no unacceptable risk is expected). The results of the benchmark comparisons are listed in the following paragraphs.

PCBs were not detected in any of the collected sediment samples.

As shown in Table 2, Detected VOC Results, two VOCs, acetone and methylene chloride, were detected in sample S01, located within Jones Creek. There are no listed applicable NOAA SQuiRT PEC or BTAG screening benchmarks for these VOCs. These compounds are routinely recognized as laboratory artifacts.

As shown in Table 3, Detected PAHs Results, 17 PAHs were detected in the sediment samples. Table 3 also provides values for total PAH concentrations for each sampling location. The detected PAHs did not exceed NOAA SQuiRT PEC screening benchmarks or there are no listed NOAA SQuiRT PEC screening benchmarks for the detected PAHs. In addition, the following PAHs were detected at concentrations exceeding applicable BTAG screening benchmarks in four sediment samples:

- Acenaphthylene
- Benzo(b)fluoranthene
- Indeno(1,2,3-c,d)pyrene

Acenaphthylene, benzo(b)fluoranthene and indeno(1,2,3-c,d)pyrene were detected at concentrations greater than the BTAG screening benchmark of 5.9 micrograms per

kilogram ($\mu\text{g/kg}$), 27.2 $\mu\text{g/kg}$, and 17 $\mu\text{g/kg}$, respectively, in the subsurface sample (SS)-B01. Benzo(b)fluoranthene was also detected at concentrations greater than the BTAG screening benchmark of 27.2 $\mu\text{g/kg}$ in samples of surface sediment (SD)-N02, SD-Q01, and SD-T03. There are no listed NOAA SQuiRT PEC screening benchmarks for the three PAHs that were detected at concentrations exceeding BTAG screening values.

As shown in Table 4, Detected SVOC Results, 10 other SVOCs were detected in the sediment samples. The detected SVOCs did not exceed NOAA SQuiRT PEC screening benchmarks or there are no listed NOAA SQuiRT PEC screening benchmarks detected PAHs. In addition, three SVOCs, 4-methylphenol, benzo(b)fluoranthene, and bis(2ethylhexyl)phthalate, were detected in three samples at concentrations that exceeded BTAG screening benchmarks. The compound 4-methylphenol was detected at a concentration greater than the BTAG level of 670 $\mu\text{g/kg}$ in sample SD-P03, collected from Jones Creek. Benzo(b)fluoranthene was detected at concentrations greater than the BTAG level of 27.2 $\mu\text{g/kg}$ in sample SD-Q01, collected from Jones Creek. Bis(2-ethylhexyl) phthalate was detected at a concentration greater than the BTAG level of 180 $\mu\text{g/kg}$ in subsurface sediment sample SS-T02, collected from Jones Creek. There are no listed NOAA SQuiRT PEC screening benchmarks for the three SVOCs that were detected at concentrations exceeding BTAG screening values.

As shown in Table 5, Detected Metals Results, 24 metals were detected in sediment samples and the following metals were detected at concentrations exceeding both applicable NOAA SQuiRT PECs and BTAG screening benchmarks:

- Chromium
- Copper
- Lead
- Mercury
- Zinc

Chromium, copper, lead, and zinc were detected at concentrations exceeding BTAG and NOAA SQuiRT PEC screening benchmarks in almost every sample collected from locations within Jones Creek. The highest concentration of chromium was detected in sample SD-R03 at a concentration of 464 mg/kg, which exceeds the NOAA SQuiRT PEC of 111 mg/kg and the BTAG level of 43.4 mg/kg. The highest concentration of copper was detected in sample SD-S02 and SS-

T02 at a concentration of 224 mg/kg, which exceeds the NOAA SQuiRT PEC of 149 mg/kg and the BTAG level of 31.6 mg/kg. The highest concentration of lead was detected in sample SD-R03 at a concentration of 467 milligrams per kilogram (mg/kg), which exceeds the NOAA SQuiRT PEC of 128 mg/kg and the BTAG level of 35.8 mg/kg. The highest concentration of zinc was detected in sample SD-R03 at a concentration of 2,150 mg/kg, which exceeds the NOAA SQuiRT PEC of 459 mg/kg and the BTAG level of 121 mg/kg and.

Mercury was detected in 39 of 44 sediment samples collected within Jones Creek. Six samples contained concentrations above the NOAA SQuiRT PEC of 1.06 mg/kg. Thirty-four samples contained concentrations greater than the BTAG level of 0.18 mg/kg. The highest concentration of mercury was detected in samples SS-R02 and SD-T01, collected from Jones Creek. Mercury was detected in these samples at a concentration of 1.4 J mg/kg.

As shown in Table 5, Detected Metals Results, the following metals were detected in sediment samples and concentrations did not exceed the listed NOAA SQuiRT PEC in any of the sediment samples, or there was no NOAA SQuiRT PEC available. However concentrations of the following metals exceeded applicable BTAG screening benchmarks

- | | |
|------------|-------------|
| ▪ Antimony | ▪ Manganese |
| ▪ Arsenic | ▪ Nickel |
| ▪ Cadmium | ▪ Selenium |
| ▪ Iron | ▪ Silver |

Arsenic was detected in all sediment samples. Thirty-six samples contained concentrations greater than the BTAG level of 9.8 mg/kg. The highest concentration of arsenic was detected in subsurface sediment sample SS-B01, collected from Patapsco River at a concentration of 20.8 mg/kg, which is above the BTAG level of 9.8 mg/kg. .

Nickel was detected in all sediment samples. Thirty-nine samples contained concentrations greater than the BTAG level of 22.7 mg/kg. The highest concentration of nickel (44.6 mg/kg) was detected in sample SS-R02 at a concentration above the BTAG level of 22.7 mg/kg.

Iron was detected in all sediment samples. Forty-three samples contained concentrations greater than the BTAG level of 20,000 mg/kg. The highest concentration of iron (455,000 J mg/kg) was detected in sample SS-H01 at a concentration above the BTAG level of 20,000 mg/kg.

The majority of metals containing the highest concentrations that exceed both their and NOAA SQuiRT PEC and BTAG benchmarks were collected from samples in transects R through U located within the mid-lower portion of Jones Creek, as follows:

- The highest concentration of chromium detected was 464 mg/kg, which is greater than the NOAA SQuiRT PEC of 111 mg/kg and the BTAG level of 43.4 mg/kg.
- The highest concentration of copper detected was 224J mg/kg, which is greater than the NOAA SQuiRT PEC of 149 mg/kg and the BTAG level of 31.6 mg/kg.
- The highest concentration of lead detected was 467 mg/kg, which is greater than the NOAA SQuiRT PEC of 128 mg/kg and the BTAG level of 35.8 mg/kg.
- The highest concentration of mercury detected was 1.4 mg/kg, which is greater than the NOAA SQuiRT PEC of 1.06 mg/kg and the BTAG level of 0.18 mg/kg.
- The highest concentration of zinc detected was 2,150 mg/kg, which is greater than the NOAA SQuiRT PEC of 459 mg/kg and the BTAG level of 121 mg/kg.
- In addition, the majority of metals containing the highest concentrations that exceed their respective BTAG benchmarks for which there is no listed NOAA SQuiRT PEC screening benchmarks were collected from samples in transects R through U located within the mid-lower portion of Jones Creek, as follows: The highest concentration of manganese detected was 2890 mg/kg, which is greater than the BTAG level of 460 mg/kg.
- The highest concentration of selenium detected was 4.9 mg/kg, which is greater than the BTAG level of 2 mg/kg.
- The highest concentration of silver detected was 4.1 mg/kg, which is greater than the BTAG level of 1 mg/kg.

Data on the ancillary parameters of pH, AVS, TOC, and grain size were obtained for 10 sediment sampling locations to support evaluation of bioavailability and the potential for sorption (or migration) of contaminants (Table 6). The TOC concentrations may serve to reduce bioavailability

of organic contaminants. The presence of free sulfide in the sediments may result in heavy metals being bound as highly insoluble metal sulfides and, therefore, may be less bioavailable to ecological receptors and less likely to dissolve and migrate from sediments. Sediment pH values ranged from 7.31 to 8.48 standard units (SU). Estimated TOC concentrations ranged from 7,660 J mg/kg (fraction organic carbon (f_{OC}) of 0.008) to 28,100 J mg/kg (0.028 f_{OC}) with average and median concentrations of 20,366 mg/kg (0.020 f_{OC}) and 21,750 mg/kg (0.022 f_{OC}), respectively. AVS concentrations ranged from 139 mg/kg (4.33 micromoles per gram ($\mu\text{mol/g}$)) to 603 mg/kg (18.81 $\mu\text{mol/g}$) with average and median concentrations of 285 mg/kg (8.88 $\mu\text{mol/g}$) and 255 mg/kg (7.95 $\mu\text{mol/g}$), respectively. Total simultaneously extracted metals (ΣSEM) concentrations ranged from 1.73 to 10.75 $\mu\text{mol/g}$ with average and median concentrations of 6.16 $\mu\text{mol/g}$ and 6.11 $\mu\text{mol/g}$. The $\Sigma\text{SEM}/\text{AVS}$ ratios ranged from 0.39 to 1.24 and three locations had ratios above unity (1) that may indicate not all divalent heavy metals are bound as insoluble sulfides. However, the ratio of the difference between total simultaneously extracted metals and acid volatile sulfide to the fraction organic carbon ($(\Sigma\text{SEM} - \text{AVS})/f_{OC}$) was below 130 $\mu\text{mol/g}$ for all but one location (137 $\mu\text{mol/g}$).

Any sediment with a $\Sigma\text{SEM}/\text{AVS}$ ratios below 1 or a $(\Sigma\text{SEM} - \text{AVS})/f_{OC}$ ratio below 130 $\mu\text{mol/g}$ should pose low risk of adverse biological effects due to cadmium, copper, lead, nickel or zinc (USEPA, 2005).

With the exception of one sample primarily composed of sand (97%), the sediment samples were dominated by finer grain size fractions with a greater capacity for adsorption of contaminants (Figure 5 and Table 6). The sand, silt, and clay percent (by weight) median values were 8%, 50%, and 35%, respectively. The majority of the samples were clayey silt. The sample primarily composed of sand was from the location which also had the lowest AVS and f_{OC} and which was the only location with a $(\Sigma\text{SEM} - \text{AVS})/f_{OC}$ ratio above 130 $\mu\text{mol/g}$. In summary, the majority of the sample locations should pose low risk of adverse biological effects due to metals concentrations exceeding benchmarks because of likely reduced bioavailability.



6.0 SUMMARY

This section summarizes the results from both rounds of sediment sampling, conducted in June 2016 and July 2017. Each sediment sample was visually screened for sheening and staining. Additionally, a PID was used to detect organic vapors. There were no PID readings above background of 0.0 parts per million (ppm) and there was no observed sheen or staining in any of the samples. Additionally, no petroleum odors were observed to indicate the presence of oil and grease.

PCBs were not detected in any of the sediment samples collected from the southeast shoreline at the Site. Two VOCs, acetone and methylene chloride, were detected in one sample (S01) collected within Jones Creek. These compounds do not have applicable NOAA SQuiRT PEC or BTAG screening benchmarks and are common laboratory contaminants. Other SVOCs concentrations were less than NOAA SQuiRT PEC screening benchmarks or there are no listed NOAA SQuiRT PEC screening benchmarks. Carbon disulfide was detected at concentrations exceeding BTAG screening benchmarks in samples collected from Patapsco River and in samples collected from Transect E in Old Road Bay. Two SVOCs, 4-methylphenol, and bis(2-ethylhexyl) phthalate, were detected at concentrations exceeding BTAG screening benchmarks.

Concentrations of numerous PAHs and metals were detected in samples collected from Patapsco River, Old Road Bay, and Jones Creek. Results for individual metals and PAHs were combined and average concentrations were calculated. The average calculated concentrations for samples collected from the Patapsco River were compared to NOAA SQuiRT PEC screening benchmarks, as shown in Table 7. For compounds with no listed PEC values, BTAG values were used as screening benchmarks. Averaged concentrations of PAHs and metals did not exceed PECs. However, within the Patapsco River, six PAHs: 2-methylnaphthalene, acenaphthlene, acenaphthylene, benzo(b)fluoranthene, benzo(g,h,i)perylene, and indeno(1,2,3-c,d)pyrene, were detected at concentrations higher than the BTAG screening benchmarks. Additionally, two metals, iron and manganese, had average concentrations higher than the BTAG screening benchmarks.



The average calculated concentrations for samples collected from the Old Road Bay and Jones Creek were compared to NOAA SQuiRT PEC screening benchmarks, as shown in Table 8. For compounds with no listed PEC values, BTAG values were used as screening benchmarks. Averaged concentrations of PAHs did not exceed PECs. However, five PAHs: acenaphthlene, acenaphthylene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, and indeno(1,2,3-c,d)pyrene, were detected at concentrations higher than the BTAG screening benchmarks. Additionally, six metals: chromium, iron, lead, manganese, silver and zinc, had average concentration higher than the available BTAG or PEC screening benchmarks.

The sediment sampling results indicated that, of the contaminants identified, select metals show the strongest association with origin from the site. Concentrations of certain metals (chromium, copper, lead, and zinc) were generally highest in samples collected from transects located within Jones Creek (Figures 6 through 9). There is no clear spatial trend in the concentrations of these metals across these transects, from nearshore to offshore locations.

The sediments within Jones Creek appear to be a depositional environment with flows driven primarily by tidal currents. Therefore, the contaminated sediments deposited historically from the former BSC facility may have been transported to Jones Creek from portions of Old Road Bay and the Patapsco River. Additionally, site sediments may also undergo gradual burial by less impacted sediments from upstream or downstream.

7.0 REFERENCES

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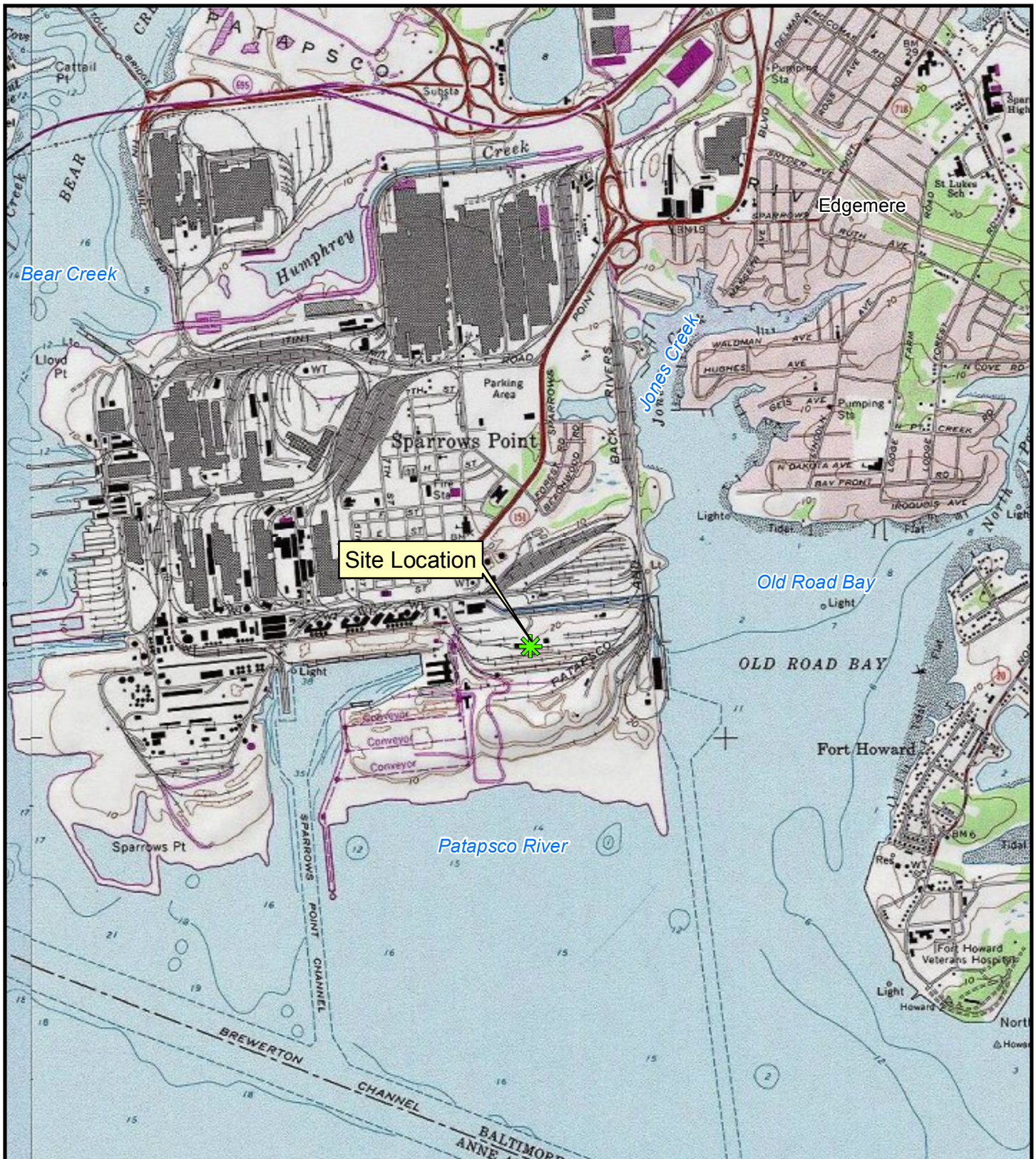
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FIGURES



USGS 7.5 Minute Quadrangle
Sparrows Point MD, 1975



Coordinate System:
WGS84 UTM Zone 18N Feet

0 2,000 4,000
Feet

Sparrows Point Southeast Area
Sediment Assessment
Baltimore, Baltimore County, Maryland

Figure 1
Site Location Map

TDD# W501-15-08-003
Contract: EP-53-15-02
Prepared: 3/20/2017





Legend

- Approximate Location of Active Stormwater Outfall
- Southeast Shoreline

Imagery: ESRI, Bing
Mapping Service



Coordinate System:
WGS84 UTM Zone 18N Feet

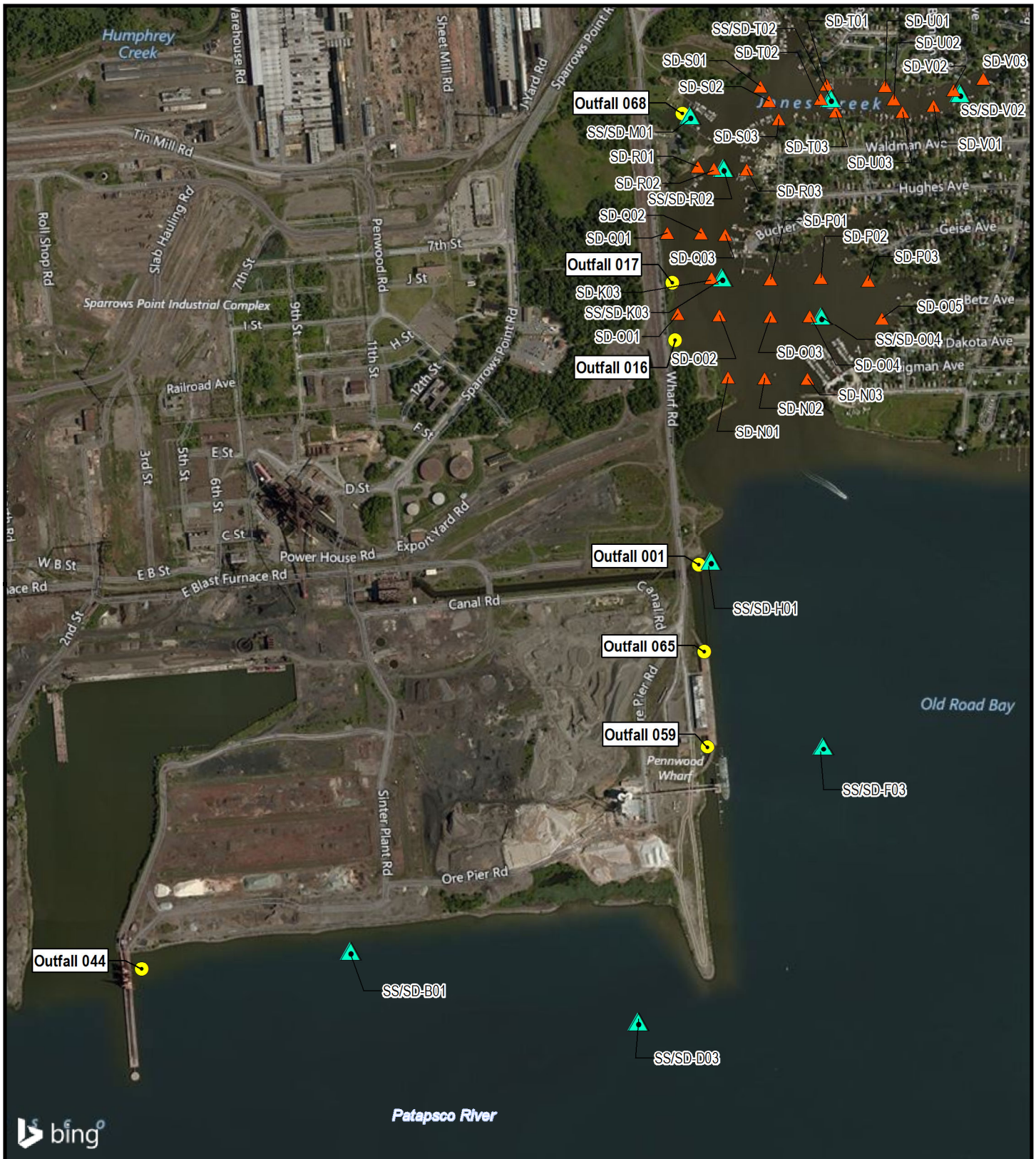
0 1,350
Feet

Sparrows Point Southeast Area
Sediment Assessment
Baltimore, Baltimore County, Maryland

Figure 2
Site Layout Map

TDD# W501-15-08-003
Contract: EP-S3-15-02
Prepared: 3/20/2017





Legend

- Approximate Location of Stormwater Outfall
- ▲ Surface Sediment Sample Location
- ▲ Subsurface Sediment Sampling Location and Surface Sediment Sample Location Analyzed for Physical Parameters

Imagery: ESRI, Bing Mapping Service



Coordinate System:
WGS84 UTM Zone 18N Feet

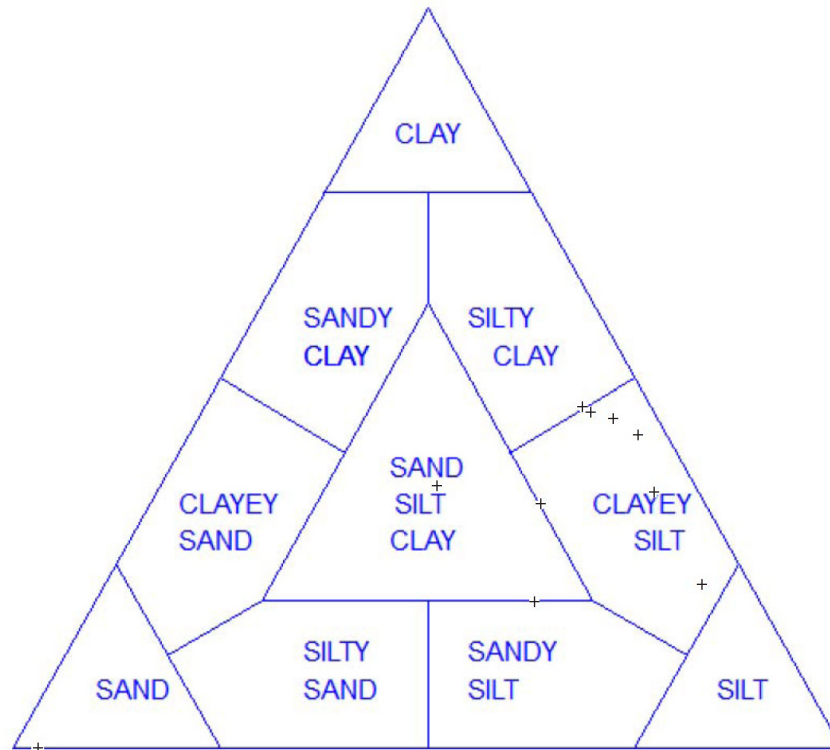
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Sparrows Point Sediment Assessment
Baltimore, Baltimore County, Maryland

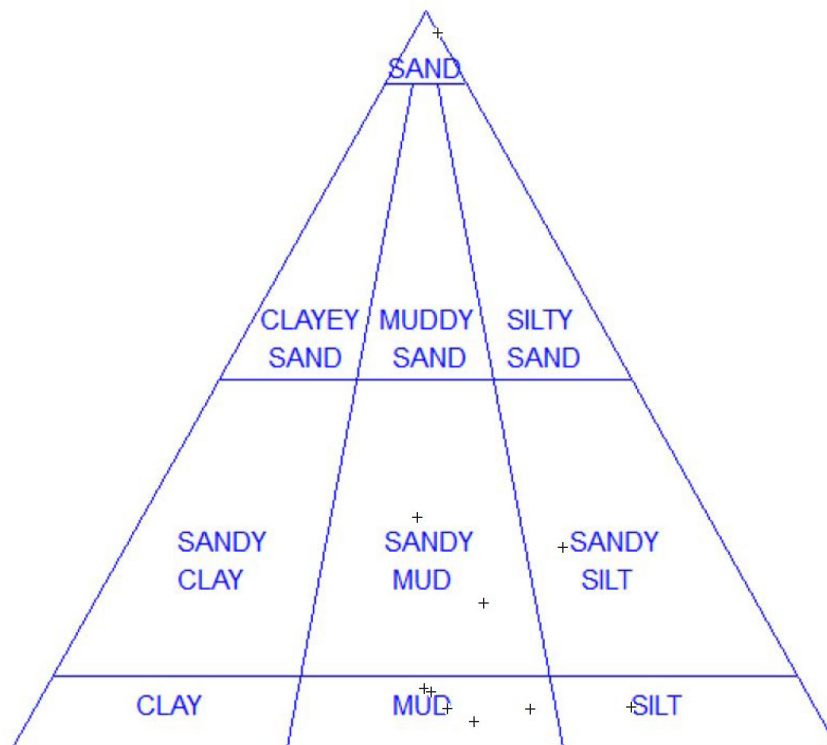
Figure 4
Round 2 Sediment
Sample Locations

TDD# W501-15-08-003
Contract: EP-S3-15-02
Prepared: 11/21/2017





Shepard Sand-Silt-Clay Plot



Folk Sand-Silt-Clay Plot

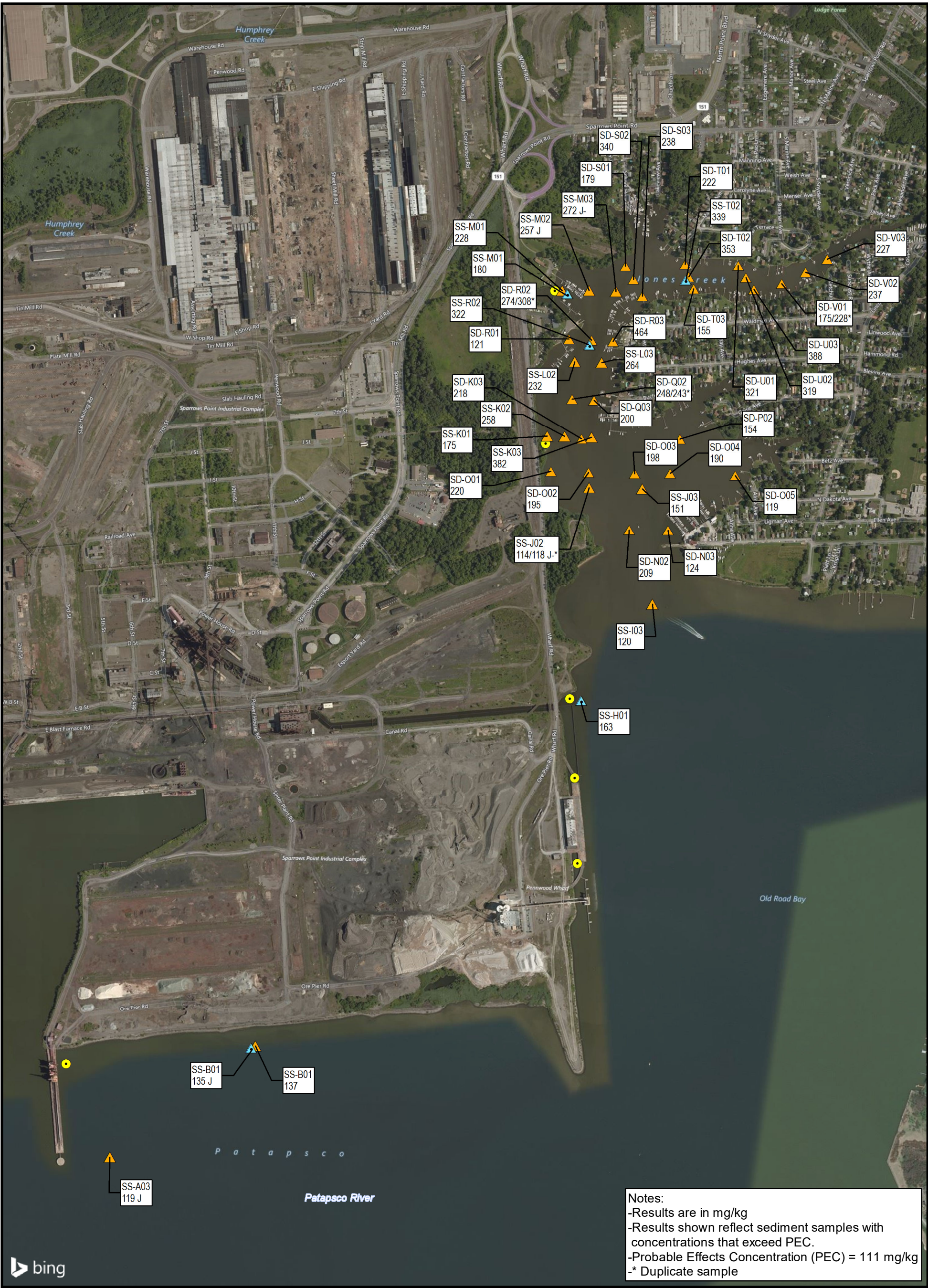
Legend

+ Sediment Sample Location

Figure 5
Sediment Classifications

Sparrows Point Southeast Area
Sediment Assessment
Baltimore, Baltimore County, Maryland





Legend <ul style="list-style-type: none">Surface Sample LocationsSub Surface Sample LocationsApproximate Location of Stormwater Outfall	<p>Imagery: ESRI, Bing Mapping Service</p> <p>Coordinate System: WGS84 UTM Zone 18N Feet</p> <p>0 1,000 2,000 Feet</p>	Sparrows Point Southeast Area Sediment Assessment Baltimore, Baltimore County, Maryland	
		Figure 6 Chromium Results	
		TDD# W501-15-08-003 Contract: EP-S3-15-02 Prepared: 2/15/2018	



Notes:
-Results are in mg/kg
-Results shown reflect sediment samples with concentrations that exceed PEC.
-Probable Effects Concentration (PEC) = 149 mg/kg

Legend ▲ Surface Sample Locations ● Approximate Location of Stormwater Outfall	Imagery: ESRI, Bing Mapping Service N Coordinate System: WGS84 UTM Zone 18N Feet 0 1,000 2,000 Feet	Sparrows Point Southeast Area Sediment Assessment Baltimore, Baltimore County, Maryland Figure 7 Copper Results TDD# W501-15-08-003 Contract: EP-S3-15-02 Prepared: 2/15/2018	
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Legend

- Surface Sample Locations
- Sub Surface Sample Locations
- Approximate Location of Stormwater Outfall

Imagery:
ESRI, Bing Mapping Service

Coordinate System:
WGS84 UTM Zone 18N Feet

0 1,000 2,000
Feet

Sparrows Point Southeast Area
Sediment Assessment
Baltimore, Baltimore County, Maryland

**Figure 8
Lead Results**

TDD# W501-15-08-003
Contract: EP-S3-15-02
Prepared: 3/29/2018

WESTON SOLUTIONS



Legend <ul style="list-style-type: none">▲ Surface Sample Locations▲ Sub Surface Sample Locations● Approximate Location of Stormwater Outfall	<p>Imagery: ESRI, Bing Mapping Service</p> <p>Coordinate System: WGS84 UTM Zone 18N Feet</p> <p>0 1,000 2,000 Feet</p>	Sparrows Point Southeast Area Sediment Assessment Baltimore, Baltimore County, Maryland	
		Figure 9 Zinc Results	
		TDD# W501-15-08-003 Contract: EP-S3-15-02 Prepared: 2/15/2018	



TABLES

Table 1 Sample Descriptions
Sparrows Point Southeast Shoreline Area
Sediment Assessment

Transect	Location	Sample Coordinates		Description	Water Depth
		Northing	Easting		
B	SD-B01	14240531.82	1222812.046	Dark silt with few organics. Odorless with a PID reading of 0.0	14 feet
	SS-B01	14240531.82	1222812.046	Subsurface sample, 24" recovery, dark silt with trace organics, clay at bottom of cone. Odorless with a PID reading of 0.0.	14 feet
D	SD-D03	14239836.01	1225647.306	Dark grey silt with few organics. Odorless with PID reading of 0.0	14 feet
	SS-D03	14239836.01	1225647.306	Subsurface sample, 30" recovery, dark silt with trace organics upper 15", clay lower 15". Odorless with a PID reading of 0.0.	14 feet
F	SD-F03	14242547.72	1227468.115	Dark grey silt with few organics. Odorless with PID reading of 0.0	13 feet
	SS-F03	14242547.72	1227468.115	Subsurface sample, 20" recovery, dark silt with trace organics upper 6", clay lower 14". Odorless with a PID reading of 0.0.	13 feet
H	SD-H01	14244375.03	1226362.624	Dark Silty sand with trace organics. Odorless with PID reading of 0.0	3.5 feet
	SS-H01	14244375.03	1226362.624	Subsurface sample, 10" recovery, dark sandy silt with trace organics upper refusal at 2 ft bgs". Odorless with a PID reading of 0.0.	3.5 feet
N	SD-N01	14246189.33	1226538.202	Dark gray silty sand composed of 60% fine silt and 40% sand. Odorless with a PID reading of 7 ppm.	4 feet
	SD-N02	14246182.83	1226895.861	Dark brown to dark gray composed of 100% fine silt. Odorless with a PID reading of 0.0	8 feet
	SD-N03	14246176.33	1227318.549	Medium brown to dark gray composed of 100% fine silt with organics and clam shells. Odorless with a PID reading of 0.0	8 feet
O	SD-O01	14246820.11	1226043.982	Dark brown to dark grey silt. Odorless with a PID reading of 0.0	3 feet
	SD-O02	14246807.11	1226453.664	Dark brown to dark grey silt. Odorless with a PID reading of 0.0	7 feet
	SD-O03	14246794.1	1226954.387	Dark brown to dark grey silt. Odorless with a PID reading of 0.0	10 feet
	SD-O04	14246794.1	1227448.606	Dark grey silt with trace organics and shells. PID 0.0.	7 feet
	SS-O04	14246794.1	1227448.606	Subsurface sample, 40" recovery, dark silt upper 20", clay lower 20". Odorless with a PID reading of 0.0.	7 feet
	SD-O05	14246774.59	1228053.375	Dark brown to dark silt. Odorless with a PID reading of 0.0	7 feet
K	SD-K03	14247177.77	1226473.173	Dark grey silt with few organics. Odorless with PID reading of 0.0	7 feet
	SS-K03	14247177.77	1226473.173	Subsurface sample, 30" recovery, dark silt upper 20", clay lower 10". Odorless with a PID reading of 0.0.	7 feet
M	SD-M01	14248770.98	1226161.034	Dark sandy silt . PID 0.0.	4 feet
	SS-M01	14248770.98	1226161.034	Subsurface sample, 36" recovery, silty clay upper 4", mid 20" silty clay, bottom 12" clay. Odorless with a PID reading of 0.0.	4 feet
P	SD-P01	14247158.27	1226954.387	Dark gray silt with some clay with lots of clam shells (mollusk shells). Odorless with a PID reading of 0.0	8 feet
	SD-P02	14247171.27	1227448.606	Dark silt with few organics. Odorless with a PID reading of 0.0	7 feet
	SD-P03	14247145.26	1227916.815	Dark silty sand with lots of clam shells. Odorless with a PID reading of 0.0	2 feet
Q	SD-Q01	14247158.27	1226954.387	Dark grey silt with few organics. Odorless with PID reading of 0.0	6 feet
	SD-Q02	14247171.27	1227448.606	Dark grey silt with few organics. Odorless with PID reading of 0.0	9 feet
	SD-Q03	14247145.26	1227916.815	Dark grey silt with few organics. Odorless with PID reading of 0.0	10 feet
R	SD-R01	14248263.76	1226239.069	Dark brown to medium gray composed of silt. Odorless with a PID reading of 0.0	3 feet
	SD-R02	14248250.75	1226486.179	Dark grey silt with few organics. Odorless with PID reading of 0.0	8 feet
	SS-R02	14248250.75	1226486.179	Subsurface sample, 30" recovery, dark silt upper 20", clay lower 10". Odorless with a PID reading of 0.0.	8 feet
	SD-R03	14248237.74	1226720.283	Medium brown to grey composed silt and some clay. Odorless with a PID reading of 0.0	10 feet
S	SD-S01	14249057.11	1226856.843	Medium brown to grey composed of silt . Odorless with a PID reading of 0.0	7 feet
	SD-S02	14248914.05	1226941.381	Brown to dark gray composed of fine silt. Odorless with a PID reading of 0.0	10 feet
	SD-S03	14248731.96	1227038.924	Brown to dark gray composed of fine silt. Odorless with a PID reading of 0.0	8 feet
T	SD-T01	14249076.62	1227507.132	Brown to dark gray composed of fine silt. Odorless with a PID reading of 0.0	4 feet
	SD-T02	14248940.06	1227546.15	Dark grey silt with few organics. Odorless with PID reading of 0.0	5 feet
	SS-T02	14248940.06	1227546.15	Subsurface sample, 36" recovery, silt upper 20", bottom 12" clay. Odorless with a PID reading of 0.0.	5 feet
	SD-T03	14248810	1227598.173	Brown to dark gray composed of fine silt. Odorless with a PID reading of 0.0	6 feet
U	SD-U01	14249063.61	1228085.89	Dark grey silt with few organics. Odorless with PID reading of 0.0	5 feet
	SD-U02	14248933.55	1228170.427	Dark grey silt with few organics. Odorless with PID reading of 0.0	7 feet
	SD-U03	14248803.5	1228254.965	Dark grey silt with few organics. Odorless with PID reading of 0.0	5 feet
V	SD-V01	14248868.53	1228560.601	Dark grey silt with few organics. Odorless with PID reading of 0.0	8 feet
	SD-V02	14248992.08	1228820.716	Dark grey silt with few organics. Odorless with PID reading of 0.0	7 feet
	SS-V02	14248992.08	1228820.716	Subsurface sample, 42" recovery, silt clay throughout core. Odorless with a PID reading of 0.0.	7 feet
	SD-V03	14249135.14	1229054.82	Dark grey silt with few organics. Odorless with PID reading of 0.0	5 feet

Notes:
PID - Photoionization Detector
SD - Surface Sediment Sample
SS - Subsurface Sediment Sample

Table 2 Detected VOCs Results
 July 2017
 Sparrows Point Southeast Area Sediment Assessment
 Sparrows Point, MD

Sample Number:		SESL-2017-SD-S01-B	
Sampling Location:		SD-S01	
Date Sampled:		7/12/2017	
VOC (µg/kg)	BTAG	PEC	
Acetone	NL	NL	60
Methylene chloride	NL	NL	12 J

Notes:

BTAG - Biological Technical Assistance Group-Freshwater Screening Benchmarks

PEC defined by National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SQiRTs)

J - Estimated value.

µg/kg - microgram per kilogram

NL - Not Listed

PEC - Probable Effect Concentration

SD - Surface Sediment Sample

VOC - Volatile Organic Compound

Table 3 Detected PAHs Results
July 2017
Sparrows Point Southeast Area Sediment Assessment
Sparrows Point, MD

Sample Number:			SESL-2017-SS-B01	SESL-2017-SS-D03	SESL-2017-SS-F03	SESL-2017-SS-H01	SESL-2017-SD-N01	SESL-2017-SD-N02
Sampling Location:			SS-B01	SS-D03	SS-F03	SS-H01	SD-N01	SD-N02
Date Sampled:			7/11/2017	7/11/2017	7/11/2017	7/11/2017	7/10/2017	7/10/2017
Sample Depth:			1.5-2 feet	1.5-2 feet	1.5-2 feet	1.5-2 feet	0-6 inches	0-6 inches
PAH by SIM (µg/kg)	BTAG	PEC						
2-METHYLNAPHTHALENE	20.2	NL	5.7 J	ND	ND	ND	ND	ND
ACENAPHTHENE	6.7	NL	ND	ND	ND	5.6	ND	3.2 J
ACENAPHTHYLENE	5.9	NL	8.8	ND	ND	ND	ND	ND
ANTHRACENE	57.2	845	9.8	2.8 J	ND	4.6	ND	2.5 J
BENZO(A)ANTHRACENE	108	1050	35	5.7 J	2.1 J	11	2.3 J	14
BENZO(A)PYRENE	150	1450	50	9.4	3.3 J	17	2.8 J	28
BENZO(B)FLUORANTHENE	27.2	NL	58	10	4.1 J	18	3.4 J	29
BENZO(G,H,I)PERYLENE	170	NL	30	5.2 J	ND	12	1.9 J	21
BENZO(K)FLUORANTHENE	240	NL	23	4.6 J	ND	7.1	1.7 J	11
CHRYSENE	166	1290	41	6.8 J	2.3 J	12	2.7 J	14
DIBENZO(A,H)ANTHRACENE	33	NL	9.2	ND	ND	3.5 J	ND	6 J
FLUORANTHENE	423	2230	54	6.6 J	3.6 J	18	3.1 J	14
FLUORENE	77.4	536	1.9 J	ND	ND	4.1 J	ND	ND
INDENO(1,2,3-C,D)PYRENE	17	NL	28	5.1 J	ND	11	1.8 J	18
NAPHTHALENE	176	561	81	ND	ND	7.3	ND	6.1 J
PHENANTHRENE	204	1170	9.1	2.6 J	3 J	16	1.5 J	6.2 J
PYRENE	195	1520	48	7.6 J	2.9 J	19	4.1 J	19
Total PAHs	1610	22800	492.5	66.4	21.3	166.2	25.3	192

Notes:

Blue highlighted results indicate results exceeding BTAG screening benchmarks

PEC defined by National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SQiRTs)

J + - Estimated value, may be biased high.

J - Estimated value.

J - - Estimated value, may be biased low.

µg/kg - microgram per kilogram

BTAG - Biological Technical Assistance Group-Freshwater Screening Benchmarks

ND - compound not detected

NL - Not Listed

PAH - polycyclic aromatic hydrocarbon

PEC - Probable Effect Concentrations

SIM - selective ion monitoring

SD - Surface Sediment

SS - Subsurface Sediment

Table 3 Detected PAHs Results
July 2017
Sparrows Point Southeast Area Sediment Assessment
Sparrows Point, MD

Sample Number:			SESL-2017-SD-N03	SESL-2017-SD-O01	SESL-2017-SD-O02	SESL-2017-SD-O03	SESL-2017-SD-O04	SESL-2017-SS-O04
Sampling Location:			SD-N03	SD-O01	SD-O02	SD-O03	SD-O04	SS-O04
Date Sampled:			7/10/2017	7/10/2017	7/10/2017	7/10/2017	7/10/2017	7/12/2017
Sample Depth:			0-6 inches	0-6 inches	0-6 inches	0-6 inches	0-6 inches	1.5-2 feet
PAH by SIM (µg/kg)	BTAG	PEC						
2-METHYLNAPHTHALENE	20.2	NL	ND	ND	ND	ND	ND	ND
ACENAPHTHENE	6.7	NL	ND	ND	ND	ND	ND	ND
ACENAPHTHYLENE	5.9	NL	ND	ND	ND	ND	ND	ND
ANTHRACENE	57.2	845	ND	ND	ND	ND	ND	ND
BENZO(A)ANTHRACENE	108	1050	3.4 J	11	4.3 J	3 J	3.8 J	1.6 J
BENZO(A)PYRENE	150	1450	5.3 J	18	6.7 J	5.8 J	6.6 J	ND
BENZO(B)FLUORANTHENE	27.2	NL	6.3	21	8.1	6.2 J	7.4 J	ND
BENZO(G,H,I)PERYLENE	170	NL	3.7 J	11	4.8 J	4.1 J	4.4 J	ND
BENZO(K)FLUORANTHENE	240	NL	2.3 J	8.2	3.4 J	ND	3.2 J	ND
CHRYSENE	166	1290	3.8 J	13	4.7 J	3.3 J	4.3 J	1.7 J
DIBENZO(A,H)ANTHRACENE	33	NL	ND	ND	ND	ND	ND	ND
FLUORANTHENE	423	2230	3.5 J	12	6.5 J	3.4 J	5.4 J	2.8 J
FLUORENE	77.4	536	ND	ND	ND	ND	ND	ND
INDENO(1,2,3-C,D)PYRENE	17	NL	3.2 J	10	4.1 J	3.4 J	3.8 J	ND
NAPHTHALENE	176	561	4.4 J	3.2 J	3.9 J	4.2 J	5.8 J	ND
PHENANTHRENE	204	1170	2.1 J	5.2 J	2.9 J	2.3 J	2.8 J	2.2 J
PYRENE	195	1520	4.2 J	15	6.1 J	3.5 J	6.6 J	ND
Total PAHs	1610	22800	42.2	127.6	55.5	39.2	54.1	8.3

Notes:

Blue highlighted results indicate results exceeding BTAG screening benchmarks

PEC defined by National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SQuiRTs)

J + - Estimated value, may be biased high.

J - Estimated value.

J - - Estimated value, may be biased low.

µg/kg - microgram per kilogram

BTAG - Biological Technical Assistance Group-Freshwater Screening Benchmarks

ND - compound not detected

NL - Not Listed

PAH - polycyclic aromatic hydrocarbon

PEC - Probable Effect Concentrations

SIM - selective ion monitoring

SD - Surface Sediment

SS - Subsurface Sediment

Table 3 Detected PAHs Results
July 2017
Sparrows Point Southeast Area Sediment Assessment
Sparrows Point, MD

Sample Number:			SESL-2017-SD-O05	SESL-2017-SD-K03	SESL-2017-SS-K03	SESL-2017-SS-K03-D	SESL-2017-SD-P01	SESL-2017-SD-P02
Sampling Location:			SD-O05	SD-K03	SS-K03	SS-K03 (duplicate)	SD-P01	SD-P02
Date Sampled:			7/10/2017	7/10/2017	7/12/2017	7/12/2017	7/10/2017	7/10/2017
Sample Depth:			0-6 inches	0-6 inches	1.5-2 feet	1.5-2 feet	0-6 inches	0-6 inches
PAH by SIM (µg/kg)	BTAG	PEC						
2-METHYLNAPHTHALENE	20.2	NL	ND	ND	ND	ND	ND	ND
ACENAPHTHENE	6.7	NL	ND	ND	ND	ND	ND	ND
ACENAPHTHYLENE	5.9	NL	ND	ND	ND	ND	ND	ND
ANTHRACENE	57.2	845	ND	ND	ND	ND	ND	ND
BENZO(A)ANTHRACENE	108	1050	3.2 J	4.1 J	ND	ND	5.7 J	4.9 J
BENZO(A)PYRENE	150	1450	5.5 J	5.7 J	ND	ND	8.7	8.4
BENZO(B)FLUORANTHENE	27.2	NL	7.1	6.3 J	ND	ND	9.6	9.8
BENZO(G,H,I)PERYLENE	170	NL	3.1 J	3.7 J	ND	ND	4.9 J	5.7 J
BENZO(K)FLUORANTHENE	240	NL	2.5 J	ND	ND	ND	3.9 J	4 J
CHRYSENE	166	1290	4.8 J	3.9 J	ND	ND	6.2 J	6.3 J
DIBENZO(A,H)ANTHRACENE	33	NL	ND	ND	ND	ND	ND	ND
FLUORANTHENE	423	2230	3.5 J	5.3 J	1.8 J	1.8 J	7.4	5 J
FLUORENE	77.4	536	ND	ND	ND	ND	ND	ND
INDENO(1,2,3-C,D)PYRENE	17	NL	ND	ND	ND	ND	4.5 J	4.8 J
NAPHTHALENE	176	561	2.8 J	5.6 J	ND	3.5 J	4.6 J	6 J
PHENANTHRENE	204	1170	2.3 J	2.4 J	2.1 J	ND	3.9 J	2.6 J
PYRENE	195	1520	4.5 J	6 J	ND	ND	7.7	5.9 J
Total PAHs	1610	22800	39.3	43	3.9	5.3	67.1	63.4

Notes:

Blue highlighted results indicate results exceeding BTAG screening benchmarks

PEC defined by National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SQuiRTs)

J + - Estimated value, may be biased high.

J - Estimated value.

J - - Estimated value, may be biased low.

µg/kg - microgram per kilogram

BTAG - Biological Technical Assistance Group-Freshwater Screening Benchmarks

ND - compound not detected

NL - Not Listed

PAH - polycyclic aromatic hydrocarbon

PEC - Probable Effect Concentrations

SIM - selective ion monitoring

SD - Surface Sediment

SS - Subsurface Sediment

Table 3 Detected PAHs Results
July 2017
Sparrows Point Southeast Area Sediment Assessment
Sparrows Point, MD

Sample Number:			SESL-2017-SD-P03	SESL-2017-SD-Q01	SESL-2017-SD-Q02	SESL-2017-SD-Q02-D	SESL-2017-SD-Q03	SESL-2017-SD-R01
Sampling Location:			SD-P03	SD-Q01	SD-Q02	SD-Q02	SD-Q03	SD-R01
Date Sampled:			7/10/2017	7/10/2017	7/10/2017	7/10/2017	7/10/2017	7/11/2017
Sample Depth:			0-6 inches	0-6 inches	0-6 inches	0-6 inches	0-6 inches	0-6 inches
PAH by SIM (µg/kg)	BTAG	PEC						
2-METHYLNAPHTHALENE	20.2	NL	ND	ND	ND	ND	ND	ND
ACENAPHTHENE	6.7	NL	ND	ND	ND	ND	ND	ND
ACENAPHTHYLENE	5.9	NL	1.5 J	ND	ND	ND	ND	ND
ANTHRACENE	57.2	845	ND	5.1 J	ND	ND	ND	ND
BENZO(A)ANTHRACENE	108	1050	4 J	91	3 J	4.4 J	3.5 J	6.2 J
BENZO(A)PYRENE	150	1450	5.2 J	110	5.2 J	6.1 J	5 J	6.7
BENZO(B)FLUORANTHENE	27.2	NL	6 J	120	5.7 J	7.2 J	6.6 J	8.3
BENZO(G,H,I)PERYLENE	170	NL	2.8 J	41	3.5 J	ND	3.8 J	3.4 J
BENZO(K)FLUORANTHENE	240	NL	2.4 J	54	ND	ND	ND	3.9 J
CHRYSENE	166	1290	3 J	85	3.2 J	4.5 J	4 J	6.3 J
DIBENZO(A,H)ANTHRACENE	33	NL	ND	17	ND	ND	ND	ND
FLUORANTHENE	423	2230	5.5 J	85	3.5 J	7.2 J	4.8 J	8.1
FLUORENE	77.4	536	ND	ND	ND	ND	ND	ND
INDENO(1,2,3-C,D)PYRENE	17	NL	2.7 J	48	3.1 J	ND	ND	3.6 J
NAPHTHALENE	176	561	3.2 J	3.6 J	6.6 J	ND	9.3 J	2.2 J
PHENANTHRENE	204	1170	1.4 J	6.5 J	2.6 J	5.3 J	3.2 J	4.1 J
PYRENE	195	1520	6.1 J	87	4.6 J	6.9 J	5.4 J	9.5
Total PAHs	1610	22800	43.8	753.2	41	41.6	45.6	62.3

Notes:

Blue highlighted results indicate results exceeding BTAG screening benchmarks

PEC defined by National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SQiRTs)

J + - Estimated value, may be biased high.

J - Estimated value.

J - - Estimated value, may be biased low.

µg/kg - microgram per kilogram

BTAG - Biological Technical Assistance Group-Freshwater Screening Benchmarks

ND - compound not detected

NL - Not Listed

PAH - polycyclic aromatic hydrocarbon

PEC - Probable Effect Concentrations

SIM - selective ion monitoring

SD - Surface Sediment

SS - Subsurface Sediment

Table 3 Detected PAHs Results
July 2017
Sparrows Point Southeast Area Sediment Assessment
Sparrows Point, MD

Sample Number:			SESL-2017-SD-R02	SESL-2017-SD-R02-D	SESL-2017-SS-R02	SESL-2017-SD-R03	SESL-2017-SS-M01	SESL-2017-SD-S01
Sampling Location:			SD-R02	SD-R02	SS-R02	SD-R03	SS-M01	SD-S01
Date Sampled:			7/11/2017	7/11/2017	7/12/2017	7/11/2017	7/12/2017	7/11/2017
Sample Depth:			0-6 inches	0-6 inches	1.5-2 feet	0-6 inches	1.5-2 feet	0-6 inches
PAH by SIM (µg/kg)	BTAG	PEC						
2-METHYLNAPHTHALENE	20.2	NL	2.4	ND	ND	ND	ND	ND
ACENAPHTHENE	6.7	NL	ND	ND	ND	ND	ND	ND
ACENAPHTHYLENE	5.9	NL	ND	ND	ND	ND	ND	2.2 J
ANTHRACENE	57.2	845	ND	ND	ND	ND	2.6 J	1.6 J
BENZO(A)ANTHRACENE	108	1050	4.1 J	2.5 J	4.1 J	2.1 J	10	12
BENZO(A)PYRENE	150	1450	6 J	3.7 J	7.1 J	3.2 J	13	17
BENZO(B)FLUORANTHENE	27.2	NL	7.3 J	ND	8.6 J	3.8 J	16	17
BENZO(G,H,I)PERYLENE	170	NL	4 J	ND	4.9 J	2.1 J	7.9	10
BENZO(K)FLUORANTHENE	240	NL	ND	ND	3.4 J	ND	6.1 J	6.4
CHRYSENE	166	1290	4.6 J	2.7 J	4.4 J	2.2 J	10	11
DIBENZO(A,H)ANTHRACENE	33	NL	ND	ND	ND	ND	ND	2.1 J
FLUORANTHENE	423	2230	5.6 J	3.8 J	4.8 J	3.6 J	18	15
FLUORENE	77.4	536	ND	ND	ND	ND	ND	ND
INDENO(1,2,3-C,D)PYRENE	17	NL	ND	ND	4.3 J	ND	7.3 J	8.1
NAPHTHALENE	176	561	9.4 J	3.7 J	ND	7.8 J	ND	2.6 J
PHENANTHRENE	204	1170	3.4 J	ND	2.9 J	2.9 J	7.3 J	2.1 J
PYRENE	195	1520	6.4 J	ND	5.8 J	4.4 J	22	23
Total PAHs	1610	22800	53.2	16.4	50.3	32.1	120.2	130.1

Notes:

Blue highlighted results indicate results exceeding BTAG screening benchmarks

PEC defined by National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SQiRTs)

J + - Estimated value, may be biased high.

J - Estimated value.

J - - Estimated value, may be biased low.

µg/kg - microgram per kilogram

BTAG - Biological Technical Assistance Group-Freshwater Screening Benchmarks

ND - compound not detected

NL - Not Listed

PAH - polycyclic aromatic hydrocarbon

PEC - Probable Effect Concentrations

SIM - selective ion monitoring

SD - Surface Sediment

SS - Subsurface Sediment

Table 3 Detected PAHs Results
July 2017
Sparrows Point Southeast Area Sediment Assessment
Sparrows Point, MD

Sample Number:			SESL-2017-SD-S02	SESL-2017-SD-S03	SESL-2017-SD-T01	SESL-2017-SD-T02	SESL-2017-SS-T02	SESL-2017-SD-T03
Sampling Location:			SD-S02	SD-S03	SD-T01	SD-T02	SS-T02	SD-T03
Date Sampled:			7/11/2017	7/11/2017	7/11/2017	7/11/2017	42928	7/11/2017
Sample Depth:			0-6 inches	0-6 inches	0-6 inches	0-6 inches	1.5-2 feet	0-6 inches
PAH by SIM (µg/kg)	BTAG	PEC						
2-METHYLNAPHTHALENE	20.2	NL	ND	ND	ND	ND	ND	ND
ACENAPHTHENE	6.7	NL	ND	ND	ND	ND	ND	ND
ACENAPHTHYLENE	5.9	NL	ND	ND	ND	3.2 J	ND	3.4 J
ANTHRACENE	57.2	845	ND	ND	ND	3.5 J	ND	7.9
BENZO(A)ANTHRACENE	108	1050	2.9 J	3.3 J	6.5 J	14	ND	36
BENZO(A)PYRENE	150	1450	4.5 J	3.7 J	8.7	12	2.9 J	27
BENZO(B)FLUORANTHENE	27.2	NL	6.1 J	5.5 J	13	17	4.5 J	39
BENZO(G,H,I)PERYLENE	170	NL	ND	ND	5.7 J	6.7 J	ND	11
BENZO(K)FLUORANTHENE	240	NL	ND	ND	4.7 J	6.8 J	ND	16
CHRYSENE	166	1290	3.2 J	3.4 J	9	13	2.6 J	50
DIBENZO(A,H)ANTHRACENE	33	NL	ND	ND	ND	ND	ND	4 J
FLUORANTHENE	423	2230	4.4 J	5.1 J	12	29	3.9 J	44
FLUORENE	77.4	536	ND	ND	ND	ND	ND	1.7 J
INDENO(1,2,3-C,D)PYRENE	17	NL	ND	ND	5.1 J	6.8 J	ND	12
NAPHTHALENE	176	561	ND	ND	ND	ND	ND	ND
PHENANTHRENE	204	1170	ND	3.3 J	3.7 J	3.9 J	ND	14
PYRENE	195	1520	4.7 J	4.7 J	15	27	3.5 J	40
Total PAHs	1610	22800	25.8	29	83.4	142.9	17.4	306

Notes:

Blue highlighted results indicate results exceeding BTAG screening benchmarks

PEC defined by National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SQuiRTs)

J + - Estimated value, may be biased high.

J - Estimated value.

J - - Estimated value, may be biased low.

µg/kg - microgram per kilogram

BTAG - Biological Technical Assistance Group-Freshwater Screening Benchmarks

ND - compound not detected

NL - Not Listed

ND - compound not detected

PAH - polycyclic aromatic hydrocarbon

PEC - Probable Effect Concentrations

SIM - selective ion monitoring

SD - Surface Sediment

SS - Subsurface Sediment

Table 3 Detected PAHs Results
July 2017
Sparrows Point Southeast Area Sediment Assessment
Sparrows Point, MD

Sample Number:			SESL-2017-SD-U01	SESL-2017-SD-U02	SESL-2017-SD-U03	SESL-2017-SD-V01	SESL-2017-SD-V01-D	SESL-2017-SD-V02
Sampling Location:			SD-U01	SD-U02	SD-U03	SD-V01	SD-V01	SD-V02
Date Sampled:			7/11/2017	7/11/2017	7/11/2017	7/11/2017	7/11/2017	7/11/2017
Sample Depth:			0-6 inches	0-6 inches	0-6 inches	0-6 inches	0-6 inches	0-6 inches
PAH by SIM (µg/kg)	BTAG	PEC						
2-METHYLNAPHTHALENE	20.2	NL	ND	ND	ND	ND	ND	ND
ACENAPHTHENE	6.7	NL	ND	ND	ND	ND	ND	ND
ACENAPHTHYLENE	5.9	NL	ND	ND	3.2 J	ND	ND	ND
ANTHRACENE	57.2	845	4 J	ND	ND	ND	ND	ND
BENZO(A)ANTHRACENE	108	1050	9.8 J	3.6 J	12	4 J	8 J	3.4 J
BENZO(A)PYRENE	150	1450	11	4.8 J	15	5.7 J	14	4.3 J
BENZO(B)FLUORANTHENE	27.2	NL	14	7.3 J	19	7.7 J	21	6.6 J
BENZO(G,H,I)PERYLENE	170	NL	8.3 J	3.3 J	9.1	ND	9.9	ND
BENZO(K)FLUORANTHENE	240	NL	7.8 J	ND	7 J	ND	8.8 J	ND
CHRYSENE	166	1290	9.6 J	4.1 J	13	4.4 J	17	4.1 J
DIBENZO(A,H)ANTHRACENE	33	NL	4.8 J	ND	ND	ND	ND	ND
FLUORANTHENE	423	2230	13	6.4 J	19	6.5 J	39	5.2 J
FLUORENE	77.4	536	ND	ND	ND	ND	ND	ND
INDENO(1,2,3-C,D)PYRENE	17	NL	7.7 J	ND	8.4 J	ND	8.9 J	ND
NAPHTHALENE	176	561	ND	ND	ND	ND	ND	ND
PHENANTHRENE	204	1170	6 J	2.8 J	5.3 J	ND	24	ND
PYRENE	195	1520	19	6.4 J	22	6.9 J	38	5.3 J
Total PAHs	1610	22800	115	38.7	133	35.2	188.6	28.9

Notes:

Blue highlighted results indicate results exceeding BTAG screening benchmarks

PEC defined by National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SQiRTs)

J + - Estimated value, may be biased high.

J - Estimated value.

J - - Estimated value, may be biased low.

µg/kg - microgram per kilogram

BTAG - Biological Technical Assistance Group-Freshwater Screening Benchmarks

ND - compound not detected

NL - Not Listed

ND - compound not detected

PAH - polycyclic aromatic hydrocarbon

PEC - Probable Effect Concentrations

SIM - selective ion monitoring

SD - Surface Sediment

SS - Subsurface Sediment

Table 3 Detected PAHs Results
 July 2017
 Sparrows Point Southeast Area Sediment Assessment
 Sparrows Point, MD

Sample Number:		SESL-2017-SD-V03	
Sampling Location:		SD-V03	
Date Sampled:		7/11/2017	
Sample Depth:		0-6 inches	
PAH by SIM (µg/kg)	BTAG	PEC	
2-METHYLNAPHTHALENE	20.2	NL	ND
ACENAPHTHENE	6.7	NL	ND
ACENAPHTHYLENE	5.9	NL	ND
ANTHRACENE	57.2	845	ND
BENZO(A)ANTHRACENE	108	1050	5.1 J
BENZO(A)PYRENE	150	1450	6.4 J
BENZO(B)FLUORANTHENE	27.2	NL	8.4 J
BENZO(G,H,I)PERYLENE	170	NL	4.5 J
BENZO(K)FLUORANTHENE	240	NL	ND
CHRYSENE	166	1290	5.4 J
DIBENZO(A,H)ANTHRACENE	33	NL	ND
FLUORANTHENE	423	2230	8.8 J
FLUORENE	77.4	536	ND
INDENO(1,2,3-C,D)PYRENE	17	NL	ND
NAPHTHALENE	176	561	ND
PHENANTHRENE	204	1170	4.4 J
PYRENE	195	1520	8.5 J
Total PAHs	1610	22800	51.5

Notes:

Blue highlighted results indicate results exceeding BTAG screening benchmarks

PEC defined by National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SQiRTs)

J + - Estimated value, may be biased high.

J - Estimated value.

J - - Estimated value, may be biased low.

µg/kg - microgram per kilogram

BTAG - Biological Technical Assistance Group-Freshwater Screening Benchmarks

ND - compound not detected

NL - Not Listed

PAH - polycyclic aromatic hydrocarbon

PEC - Probable Effect Concentrations

SIM - selective ion monitoring

SD - Surface Sediment

SS - Subsurface Sediment

Table 4 Detected SVOCs Results
July 2017
Sparrows Point Southeast Area Sediment Assessment
Sparrows Point, MD

Sample Number:			SESL-2017-SS-B01	SESL-2017-SS-D03	SESL-2017-SS-F03	SESL-2017-SS-H01
Sampling Location:			SS-B01	SS-D03	SS-F03	SS-H01
Date Sampled:			7/11/2017	7/11/2017	7/11/2017	7/11/2017
Sample Depth:			1.5-2 feet	1.5-2 feet	1.5-2 feet	1.5-2 feet
SVOC SOM02.4 (µg/kg)	BTAG	PEC				
4-Methylphenol (p-cresol)	670	NL	ND	ND	ND	ND
Benzo(a)anthracene	108	1050	ND	ND	ND	ND
Benzo(b)fluoranthene	27.2	NL	ND	ND	ND	ND
Bis (2-ethylhexyl) phthalate	180	NL	ND	ND	ND	ND
Chrysene	166	1290	ND	ND	ND	ND
Dimethyl phthalate	NL	NL	2000	ND	380	110 J
Di-n-butyl phthalate	6470	NL	ND	ND	ND	ND
Fluoranthene	423	2230	ND	ND	ND	ND
Naphthalene	176	561	85 J	ND	ND	ND
Phenol	420	NL	130 J	270 J	ND	ND

Notes:

Blue highlighted results indicate results exceeding BTAG screening benchmarks

PEC defined by National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SQiRTs)

J - Estimated value.

µg/kg - microgram per kilogram

mg/kg - milligram per kilogram

BTAG - Biological Technical Assistance Group-Freshwater Screening Benchmarks

NL - Not Listed

ND - compound not detected

PEC - Probable Effect Concentrations

SS - Surface Sediment

SVOCs - Semivolatile Organic Compounds

Table 4 Detected SVOCs Results
July 2017
Sparrows Point Southeast Area Sediment Assessment
Sparrows Point, MD

Sample Number:			SESL-2017-SD-N01	SESL-2017-SD-N02	SESL-2017-SD-N03	SESL-2017-SD-O01
Sampling Location:			SD-N01	SD-N02	SD-N03	SD-O01
Date Sampled:			7/10/2017	7/10/2017	7/10/2017	7/10/2017
Sample Depth:			0-6 inches	0-6 inches	0-6 inches	0-6 inches
SVOC SOM02.4 (µg/kg)	BTAG	PEC				
4-Methylphenol (p-cresol)	670	NL	ND	ND	ND	ND
Benzo(a)anthracene	108	1050	ND	ND	ND	ND
Benzo(b)fluoranthene	27.2	NL	ND	ND	ND	ND
Bis (2-ethylhexyl) phthalate	180	NL	ND	ND	ND	ND
Chrysene	166	1290	ND	ND	ND	ND
Dimethyl phthalate	NL	NL	470	1800	1900	1700
Di-n-butyl phthalate	6470	NL	ND	ND	ND	ND
Fluoranthene	423	2230	ND	ND	ND	ND
Naphthalene	176	561	ND	ND	ND	ND
Phenol	420	NL	ND	120 J	170 J	130 J

Notes:

Blue highlighted results indicates results exceeding BTAG screening benchmarks

PEC defined by National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SQiRTs)

J - Estimated value.

µg/kg - microgram per kilogram

mg/kg - milligram per kilogram

BTAG - Biological Technical Assistance Group-Freshwater Screening Benchmarks

NL - Not Listed

ND - compound not detected

PEC - Probable Effect Concentrations

SS - Surface Sediment

SVOCs - Semivolatile Organic Compounds

Table 4 Detected SVOCs Results
July 2017
Sparrows Point Southeast Area Sediment Assessment
Sparrows Point, MD

Sample Number:			SESL-2017-SD-O02	SESL-2017-SD-O03	SESL-2017-SD-O04	SESL-2017-SS-O04
Sampling Location:			SD-O02	SD-O03	SD-O04	SS-O04
Date Sampled:			7/10/2017	7/10/2017	7/10/2017	7/11/2017
Sample Depth:			0-6 inches	0-6 inches	0-6 inches	1.5-2 feet
SVOC SOM02.4 (µg/kg)	BTAG	PEC				
4-Methylphenol (p-cresol)	670	NL	ND	ND	ND	ND
Benzo(a)anthracene	108	1050	ND	ND	ND	ND
Benzo(b)fluoranthene	27.2	NL	ND	ND	ND	ND
Bis (2-ethylhexyl) phthalate	180	NL	ND	ND	ND	ND
Chrysene	166	1290	ND	ND	ND	ND
Dimethyl phthalate	NL	NL	2600	1600	1200	420
Di-n-butyl phthalate	6470	NL	ND	ND	ND	ND
Fluoranthene	423	2230	ND	ND	ND	ND
Naphthalene	176	561	ND	ND	ND	ND
Phenol	420	NL	240 J	190 J	200 J	ND

Notes:

Blue highlighted results indicates results exceeding BTAG screening benchmarks

PEC defined by National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SQiRTs)

J - Estimated value.

µg/kg - microgram per kilogram

mg/kg - milligram per kilogram

BTAG - Biological Technical Assistance Group-Freshwater Screening Benchmarks

NL - Not Listed

ND - compound not detected

PEC - Probable Effect Concentrations

SS - Surface Sediment

SVOCs - Semivolatile Organic Compounds

Table 4 Detected SVOCs Results
July 2017
Sparrows Point Southeast Area Sediment Assessment
Sparrows Point, MD

Sample Number:			SESL-2017-SD-O05	SESL-2017-SD-K03	SESL-2017-SS-K03	SESL-2017-SD-P01
Sampling Location:			SD-O05	SD-K03	SS-K03	SD-P01
Date Sampled:			7/10/2017	7/10/2017	7/12/2017	7/10/2017
Sample Depth:			0-6 inches	0-6 inches	1.5-2 feet	0-6 inches
SVOC SOM02.4 (µg/kg)	BTAG	PEC				
4-Methylphenol (p-cresol)	670	NL	ND	ND	ND	ND
Benzo(a)anthracene	108	1050	ND	ND	ND	ND
Benzo(b)fluoranthene	27.2	NL	ND	ND	ND	ND
Bis (2-ethylhexyl) phthalate	180	NL	ND	ND	ND	ND
Chrysene	166	1290	ND	ND	ND	ND
Dimethyl phthalate	NL	NL	680	2100	680	1300
Di-n-butyl phthalate	6470	NL	ND	ND	ND	ND
Fluoranthene	423	2230	ND	ND	ND	ND
Naphthalene	176	561	ND	ND	ND	ND
Phenol	420	NL	120 J	210 J	ND	150 J

Notes:

Blue highlighted results indicates results exceeding BTAG screening benchmarks

PEC defined by National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SQiRTs)

J - Estimated value.

µg/kg - microgram per kilogram

mg/kg - milligram per kilogram

BTAG - Biological Technical Assistance Group-Freshwater Screening Benchmarks

NL - Not Listed

ND - compound not detected

PEC - Probable Effect Concentrations

SS - Surface Sediment

SVOCs - Semivolatile Organic Compounds

Table 4 Detected SVOCs Results
July 2017
Sparrows Point Southeast Area Sediment Assessment
Sparrows Point, MD

Sample Number:			SESL-2017-SD-P02	SESL-2017-SD-P03	SESL-2017-SD-Q01	SESL-2017-SD-Q02
Sampling Location:			SD-P02	SD-P03	SD-Q01	SD-Q02
Date Sampled:			7/10/2017	7/10/2017	7/10/2017	7/10/2017
Sample Depth:			0-6 inches	0-6 inches	0-6 inches	0-6 inches
SVOC SOM02.4 (µg/kg)	BTAG	PEC				
4-Methylphenol (p-cresol)	670	NL	ND	840	ND	ND
Benzo(a)anthracene	108	1050	ND	ND	94 J	ND
Benzo(b)fluoranthene	27.2	NL	ND	ND	110 J	ND
Bis (2-ethylhexyl) phthalate	180	NL	ND	ND	ND	ND
Chrysene	166	1290	ND	ND	88 J	ND
Dimethyl phthalate	NL	NL	1400	740	530	1200
Di-n-butyl phthalate	6470	NL	ND	ND	ND	ND
Fluoranthene	423	2230	ND	ND	85 J	ND
Naphthalene	176	561	ND	ND	ND	ND
Phenol	420	NL	170 J	240 J	ND	140 J

Notes:

Blue highlighted results indicates results exceeding BTAG screening benchmarks

PEC defined by National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SQiRTs)

J - Estimated value.

µg/kg - microgram per kilogram

mg/kg - milligram per kilogram

BTAG - Biological Technical Assistance Group-Freshwater Screening Benchmarks

NL - Not Listed

ND - compound not detected

PEC - Probable Effect Concentrations

SS - Surface Sediment

SVOCs - Semivolatile Organic Compounds

Table 4 Detected SVOCs Results
July 2017
Sparrows Point Southeast Area Sediment Assessment
Sparrows Point, MD

Sample Number:			SESL-2017-SD-Q02-D	SESL-2017-SD-Q03	SESL-2017-SD-R01	SESL-2017-SD-R02
Sampling Location:			SD-Q02 (duplicate)	SD-Q03	SD-R01	SD-R02
Date Sampled:			7/10/2017	7/10/2017	7/11/2017	7/11/2017
Sample Depth:			0-6 inches	0-6 inches	0-6 inches	0-6 inches
SVOC SOM02.4 (µg/kg)	BTAG	PEC				
4-Methylphenol (p-cresol)	670	NL	ND	ND	ND	ND
Benzo(a)anthracene	108	1050	ND	ND	ND	ND
Benzo(b)fluoranthene	27.2	NL	ND	ND	ND	ND
Bis (2-ethylhexyl) phthalate	180	NL	ND	ND	ND	ND
Chrysene	166	1290	ND	ND	ND	ND
Dimethyl phthalate	NL	NL	460	2200	620	1500
Di-n-butyl phthalate	6470	NL	ND	ND	ND	ND
Fluoranthene	423	2230	ND	ND	ND	ND
Naphthalene	176	561	ND	ND	ND	ND
Phenol	420	NL	ND	210 J	82 J	230 J

Notes:

Blue highlighted results indicates results exceeding BTAG screening benchmarks

PEC defined by National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SQiRTs)

J - Estimated value.

µg/kg - microgram per kilogram

mg/kg - milligram per kilogram

BTAG - Biological Technical Assistance Group-Freshwater Screening Benchmarks

NL - Not Listed

ND - compound not detected

PEC - Probable Effect Concentrations

SS - Surface Sediment

SVOCs - Semivolatile Organic Compounds

Table 4 Detected SVOCs Results
July 2017
Sparrows Point Southeast Area Sediment Assessment
Sparrows Point, MD

Sample Number:			SESL-2017-SD-R02-D	SESL-2017-SS-R02	SESL-2017-SD-R03	SESL-2017-SD-S01
Sampling Location:			SD-R02 (duplicate)	SS-R02	SD-R03	SD-S01
Date Sampled:			7/11/2017	7/11/2017	7/11/2017	7/11/2017
Sample Depth:			0-6 inches	1.5-2 feet	0-6 inches	0-6 inches
SVOC SOM02.4 (µg/kg)	BTAG	PEC				
4-Methylphenol (p-cresol)	670	NL	ND	ND	ND	ND
Benzo(a)anthracene	108	1050	ND	ND	ND	ND
Benzo(b)fluoranthene	27.2	NL	ND	ND	ND	ND
Bis (2-ethylhexyl) phthalate	180	NL	ND	ND	ND	ND
Chrysene	166	1290	ND	ND	ND	ND
Dimethyl phthalate	NL	NL	980	520	1300	660
Di-n-butyl phthalate	6470	NL	ND	ND	ND	ND
Fluoranthene	423	2230	ND	ND	ND	ND
Naphthalene	176	561	ND	ND	ND	ND
Phenol	420	NL	ND	ND	200 J	140 J

Notes:

Blue highlighted results indicates results exceeding BTAG screening benchmarks

PEC defined by National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SQiRTs)

J - Estimated value.

µg/kg - microgram per kilogram

mg/kg - milligram per kilogram

BTAG - Biological Technical Assistance Group-Freshwater Screening Benchmarks

NL - Not Listed

ND - compound not detected

PEC - Probable Effect Concentrations

SS - Surface Sediment

SVOCs - Semivolatile Organic Compounds

Table 4 Detected SVOCs Results
July 2017
Sparrows Point Southeast Area Sediment Assessment
Sparrows Point, MD

Sample Number:			SESL-2017-SD-S02	SESL-2017-SD-S03	SESL-2017-SS-M01	SESL-2017-SD-T01
Sampling Location:			SD-S02	SD-S03	SD-M01	SD-T01
Date Sampled:			7/11/2017	7/11/2017	7/12/2017	7/11/2017
Sample Depth:			0-6 inches	0-6 inches	0-6 inches	0-6 inches
SVOC SOM02.4 (µg/kg)	BTAG	PEC				
4-Methylphenol (p-cresol)	670	NL	ND	ND	ND	ND
Benzo(a)anthracene	108	1050	ND	ND	ND	ND
Benzo(b)fluoranthene	27.2	NL	ND	ND	ND	ND
Bis (2-ethylhexyl) phthalate	180	NL	ND	ND	ND	ND
Chrysene	166	1290	ND	ND	ND	ND
Dimethyl phthalate	NL	NL	500 J	520	310 J	400 J
Di-n-butyl phthalate	6470	NL	ND	ND	ND	ND
Fluoranthene	423	2230	ND	ND	ND	ND
Naphthalene	176	561	ND	ND	ND	ND
Phenol	420	NL	ND	ND	ND	ND

Notes:

Blue highlighted results indicates results exceeding BTAG screening benchmarks

PEC defined by National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SQiRTs)

J - Estimated value.

µg/kg - microgram per kilogram

mg/kg - milligram per kilogram

BTAG - Biological Technical Assistance Group-Freshwater Screening Benchmarks

NL - Not Listed

ND - compound not detected

PEC - Probable Effect Concentrations

SS - Surface Sediment

SVOCs - Semivolatile Organic Compounds

Table 4 Detected SVOCs Results
July 2017
Sparrows Point Southeast Area Sediment Assessment
Sparrows Point, MD

Sample Number:			SESL-2017-SD-T02	SESL-2017-SS-T02	SESL-2017-SD-T03	SESL-2017-SD-U01
Sampling Location:			SD-T02	SS-T02	SD-T03	SD-U01
Date Sampled:			7/11/2017	7/12/2017	7/11/2017	7/11/2017
Sample Depth:			0-6 inches	1.5-2 feet	0-6 inches	0-6 inches
SVOC SOM02.4 (µg/kg)	BTAG	PEC				
4-Methylphenol (p-cresol)	670	NL	ND	ND	ND	ND
Benzo(a)anthracene	108	1050	ND	ND	ND	ND
Benzo(b)fluoranthene	27.2	NL	ND	ND	ND	ND
Bis (2-ethylhexyl) phthalate	180	NL	ND	250 J	ND	ND
Chrysene	166	1290	ND	ND	65 J	ND
Dimethyl phthalate	NL	NL	690	360 J	ND	530
Di-n-butyl phthalate	6470	NL	ND	170 J	ND	ND
Fluoranthene	423	2230	ND	ND	ND	ND
Naphthalene	176	561	ND	ND	ND	ND
Phenol	420	NL	ND	ND	ND	ND

Notes:

Blue highlighted results indicates results exceeding BTAG screening benchmarks

PEC defined by National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SQiRTs)

J - Estimated value.

µg/kg - microgram per kilogram

mg/kg - milligram per kilogram

BTAG - Biological Technical Assistance Group-Freshwater Screening Benchmarks

NL - Not Listed

ND - compound not detected

PEC - Probable Effect Concentrations

SS - Surface Sediment

SVOCs - Semivolatile Organic Compounds

Table 4 Detected SVOCs Results
July 2017
Sparrows Point Southeast Area Sediment Assessment
Sparrows Point, MD

Sample Number:			SESL-2017-SD-U02	SESL-2017-SD-U03	SESL-2017-SD-V01	SESL-2017-SD-V01-D
Sampling Location:			SD-U02	SD-U03	SD-V01	SD-V01 (duplicate)
Date Sampled:			7/11/2017	7/11/2017	7/11/2017	7/11/2017
Sample Depth:			0-6 inches	0-6 inches	0-6 inches	0-6 inches
SVOC SOM02.4 (µg/kg)	BTAG	PEC				
4-Methylphenol (p-cresol)	670	NL	ND	ND	ND	ND
Benzo(a)anthracene	108	1050	ND	ND	ND	ND
Benzo(b)fluoranthene	27.2	NL	ND	ND	ND	ND
Bis (2-ethylhexyl) phthalate	180	NL	ND	ND	ND	ND
Chrysene	166	1290	ND	ND	ND	ND
Dimethyl phthalate	NL	NL	410 J	320 J	410 J	560 J
Di-n-butyl phthalate	6470	NL	ND	ND	ND	ND
Fluoranthene	423	2230	ND	ND	ND	ND
Naphthalene	176	561	ND	ND	ND	ND
Phenol	420	NL	ND	ND	ND	ND

Notes:

Blue highlighted results indicates results exceeding BTAG screening benchmarks

PEC defined by National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SQiRTs)

J - Estimated value.

µg/kg - microgram per kilogram

mg/kg - milligram per kilogram

BTAG - Biological Technical Assistance Group-Freshwater Screening Benchmarks

NL - Not Listed

ND - compound not detected

PEC - Probable Effect Concentrations

SS - Surface Sediment

SVOCs - Semivolatile Organic Compounds

Table 4 Detected SVOCs Results
July 2017
Sparrows Point Southeast Area Sediment Assessment
Sparrows Point, MD

Sample Number:			SESL-2017-SD-V02	SESL-2017-SS-V02	SESL-2017-SD-V03
Sampling Location:			SD-V02	SS-V02	SD-V03
Date Sampled:			7/11/2017	7/12/2017	7/11/2017
Sample Depth:			0-6 inches	1.5-2 feet	0-6 inches
<i>SVOC SOM02.4 (µg/kg)</i>	BTAG	PEC			
4-Methylphenol (p-cresol)	670	NL	ND	ND	ND
Benzo(a)anthracene	108	1050	ND	ND	ND
Benzo(b)fluoranthene	27.2	NL	ND	ND	ND
Bis (2-ethylhexyl) phthalate	180	NL	ND	ND	ND
Chrysene	166	1290	ND	ND	ND
Dimethyl phthalate	NL	NL	480 J	910	490 J
Di-n-butyl phthalate	6470	NL	ND	ND	ND
Fluoranthene	423	2230	ND	ND	ND
Naphthalene	176	561	ND	ND	ND
Phenol	420	NL	ND	ND	ND

Notes:

Blue highlighted results indicates results exceeding BTAG screening benchmarks

PEC defined by National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SQiRTs)

J - Estimated value.

µg/kg - microgram per kilogram

mg/kg - milligram per kilogram

BTAG - Biological Technical Assistance Group-Freshwater Screening Benchmarks

NL - Not Listed

ND - compound not detected

PEC - Probable Effect Concentrations

SS - Surface Sediment

SVOCs - Semivolatile Organic Compounds

Table 5 Detected Metals Results
July 2017
Sparrows Point Southeast Area Sediment Assessment
Sparrows Point, MD

Sample Number:			SESL-2017-SS-B01	SESL-2017-SS-D03	SESL-2017-SS-F03	SESL-2017-SS-H01	SESL-2017-SD-N01	SESL-2017-SD-N02	SESL-2017-SD-N03	SESL-2017-SD-O01	SESL-2017-SD-O02	SESL-2017-SD-O03	SESL-2017-SD-O04	SESL-2017-SS-O04
Sampling Location:			SS-B01	SS-D03	SS-F03	SS-H01	SD-N01	SD-N02	SD-N03	SD-O01	SD-O02	SD-O03	SD-O04	SS-O04
Date Sampled:			7/11/2017	7/11/2017	7/11/2017	7/11/2017	7/10/2017	7/10/2017	7/10/2017	7/10/2017	7/10/2017	7/10/2017	7/10/2017	7/12/2017
Sample Depth:			1.5-2 feet	1.5-2 feet	1.5-2 feet	1.5-2 feet	0-6 inches	0-6 inches	0-6 inches	0-6 inches	0-6 inches	0-6 inches	0-6 inches	1.5-2 feet
Metals (mg/kg)	BTAG	PEC												
Aluminum	NL	NL	19800	25200 J	18300 J	6980 J	1820	12400	10400	9240	12600	13600	12200	19200 J
Antimony	2	NL	ND	ND	ND	ND	ND	ND	ND	2.5 J	ND	ND	ND	ND
Arsenic	9.8	33	20.8 J	14.9	12.9	9.8	2.4	11.9	10	9.8	10.8	12.6	12.6	9.8
Barium	NL	NL	49.2	40.7	34.6	52.2	17.1	35.2	26.1	37.1	40.6	36.2	33.9	26.1
Beryllium	NL	NL	0.46 J-	1.5	1.4	0.87	ND	0.58 J-	0.49 J-	0.48 J-	0.47 J-	0.63 J-	0.57 J-	1.1
Cadmium	0.99	4.98	2.7 J	0.72 J	0.58 J	0.68	0.24 J	2.3	1.8	1.9	2.1	2.3	1.8 J	1.4 J
Calcium	NL	NL	2820	2210 J	1610 J	9550 J	600 J	2000	1500	2240	2280	2120	1860	1440 J
Chromium	43.4	111	135 J	86	55	163	16.4	209	124	220	195	198	190	88
Cobalt	50	NL	23.4 J	21.5	18.3	18.8	3.4	20.7	14.2	16.2	17.9	19.5	19.3	11.1
Copper	31.6	149	105 J	57.8 J	38.1 J	66 J	9.8	117	95.2	93.3	132	135	133	50.2 J
Cyanide	NL	NL	1.6 J	ND	ND	0.67 J-	ND	ND	ND	ND	ND	ND	ND	ND
Iron	20000	NL	65400	48100 J	39500	455000 J	10300	70900	52400	58000	63400	70500	62300	47000 J
Lead	35.8	128	316	144	136	214	34	305	303	223	276	361	330	189
Magnesium	NL	NL	6170	6780	4690	9870	573 J	3790	2880	3380	4150	4050	3600	4420
Manganese	460	NL	1020 J	1140	776	2890	477 J	1110 J	574 J	1100 J	1070 J	1050 J	1110 J	374
Mercury	0.18	1.06	0.34 J	ND	ND	0.44 J	ND	0.6	0.38	0.42	0.65	0.66	0.6	0.59 J
Nickel	22.7	48.6	36.8 J	37.5 J	33 J	27.8 J	5.9	36.9	26.3	31.4	35.3	37.7	36.8	24.1 J
Potassium	NL	NL	2720 J	4010	2580	178	234 J	1460 J	1210 J	1070 J	1190 J	1330 J	1220 J	2230
Selenium	2	NL	3.5 J	2.3 J	1.5 J	ND	ND	ND	1.5 J	1.2 J	1.7 J	2.1 J	1.6 J	1.5 J
Silver	1	NL	1.1	0.60 J	0.42 J	0.56 J	0.14 J	2.5	2.1	1.7	2.7	3	2.9	1.1 J
Sodium	NL	NL	4180	4760	3210	864	702	2530	1850	1810	2500	2740	2580	3490
Thallium	NL	NL	0.37 J	0.17 J	0.17 J	0.37 J	0.055 J	0.32 J	0.51 J	0.34 J	0.5 J	0.45 J	0.33 J	0.33 J
Vanadium	NL	NL	71.7 J	53.2	42.3	280	13	82.6	58.4	67.3	74.4	76.6	74.8	43.5
Zinc	121	459	769 J	389	369	1400	167	1630	1230	1450	1420	1560	1480	694

Notes:

Blue highlighted results indicate results exceeding BTAG screening benchmarks

Yellow highlighted results indicate results exceeding BTAG and NOAA SQuiRT PEC screening benchmarks

PEC defined by National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SQuiRTs)

J + - Estimated value, may be biased high.

J - Estimated value.

J - - Estimated value, may be biased low.

mg/kg - milligram per kilogram

BTAG - Biological Technical Assistance Group-Freshwater Screening Benchmarks

NL - Not Listed

ND - compound not detected

PEC - Probable Effect Concentrations

SIM - selective ion monitoring

SD - Surface Sediment

SS - Subsurface Sediment

Table 5 Detected Metals Results
 July 2017
 Sparrows Point Southeast Area Sediment Assessment
 Sparrows Point, MD

Sample Number:			SESL-2017-SD-O05	SESL-2017-SD-K03	SESL-2017-SS-K03-D	SESL-2017-SS-K03	SESL-2017-SD-P01	SESL-2017-SD-P02	SESL-2017-SD-P03	SESL-2017-SD-Q01	SESL-2017-SD-Q02	SESL-2017-SD-Q02-D	SESL-2017-SD-Q03	SESL-2017-SD-R01
Sampling Location:			SD-O05	SD-K03	SS-K03 (duplicate)	SS-K03	SD-P01	SD-P02	SD-P03	SD-Q01	SD-Q02	SD-Q02 (duplicate)	SD-Q03	SD-R01
Date Sampled:			7/10/2017	7/10/2017	7/12/2017	7/12/2017	7/10/2017	7/10/2017	7/10/2017	7/10/2017	7/10/2017	7/10/2017	7/10/2017	7/11/2017
Sample Depth:			0-6 inches	0-6 inches	1.5-2 feet	1.5-2 feet	0-6 inches	0-6 inches	0-6 inches	0-6 inches	0-6 inches	0-6 inches	0-6 inches	0-6 inches
Metals (mg/kg)	BTAG	PEC												
Aluminum	NL	NL	8330	17600	21500	23700 J	10000	12600	6680	13600	16300	16500 J	17600	7940
Antimony	2	NL	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	9.8	33	6.9	11.2	9.6	8.7	7.2	9.8	4.2	10.2	11.9	12.1	11.4	5.9
Barium	NL	NL	30.6	32.3	29.6	34.2	25.2	29	28.3	33.4	41.1	39.8	28.9	22.3
Beryllium	NL	NL	0.43 J-	0.56 J-	1.5	1.3	0.38 J-	0.47 J-	0.3 J-	0.37 J-	0.62 J-	1.4	0.48 J-	0.38 J-
Cadmium	0.99	4.98	1.5 J	1.7 J	1.3	1.3 J	1.1 J	1.7 J	0.66 J	2.2	2.3 J	2.2	1.2 J	1.5 J
Calcium	NL	NL	1340	2170	1480	1140 J	1630	1830	14200	1510	2170	2010 J	2040	13000
Chromium	43.4	111	119	218	96.2	87.7	95.4	154	56.3	91.4	248	243	200	121
Cobalt	50	NL	10.8	19.5	12	11.4	11.2	15.4	7.5	10.9	19.1	18.3	17.1	10.7
Copper	31.6	149	81.4	147	56.8	52.2 J	70.1	107	47.3	87.5	172	163 J	146	88.6
Cyanide	NL	NL	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Iron	20000	NL	37900	69900	40800	39500	43100	60500	23700	38800	67600	66500 J	66700	33000
Lead	35.8	128	230	299	159	168	175	312	107	224	400	354	270	160
Magnesium	NL	NL	2460	4710	5010	5300	2780	3650	1880	3340	4630	4410	4650	ND
Manganese	460	NL	470 J	922 J	421	377	506 J	762 J	455 J	440 J	799 J	771	788 J	445 J
Mercury	0.18	1.06	0.43	0.7 J	0.44	0.48 J	0.36 J	0.59 J	0.26 J	1	0.78	0.86 J	0.88	0.43 J
Nickel	22.7	48.6	22	36.8	26.3	25.8 J	20.9	30.4	12.8	25.6	38.2	36.5 J	31.4	19.9
Potassium	NL	NL	772 J	1960 J	3200	3230	1020 J	1290 J	698 J	1430 J	1600 J	1680	1860 J	785 J
Selenium	2	NL	ND	1.4 J	1.4 J	2.0 J	1.6 J	2 J	ND	3.6 J	1.9 J	2.2 J	ND	ND
Silver	1	NL	1.5 J	2.8	1.2	1.1 J	1.3 J	2.4	0.69 J	2.1	3.5	3.3	2.8	1.3 J
Sodium	NL	NL	1740	3220	3830	4090	1710	2500	1740	2350	3580	3460	3500	1920
Thallium	NL	NL	0.46 J	0.26 J	0.38 J	0.38 J	0.27 J	0.42 J	0.15 J	0.38 J	0.72 J	0.65 J	0.2 J	0.42 J
Vanadium	NL	NL	41.2	75.9	45.6	42.2	42	58.1	32.1	60.4	75.1	74.8	65	38.8
Zinc	121	459	895	1460	593	577	734	1230	457	898	1570	1500	1230	778

Notes:

Blue highlighted results indicate results exceeding BTAG screening benchmarks

Yellow highlighted results indicate results exceeding BTAG and NOAA SQuIRT PEC screening benchmarks

PEC defined by National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SQuIRTS)

J + - Estimated value, may be biased high.

J - Estimated value.

J - - Estimated value, may be biased low.

mg/kg - milligram per kilogram

BTAG - Biological Technical Assistance Group-Freshwater Screening Benchmarks

NL - Not Listed

ND - compound not detected

PEC - Probable Effect Concentrations

SIM - selective ion monitoring

SD - Surface Sediment

SS - Subsurface Sediment

Table 5 Detected Metals Results
July 2017
Sparrows Point Southeast Area Sediment Assessment
Sparrows Point, MD

Sample Number:			SESL-2017-SD-R02	SESL-2017-SD-R02-D	SESL-2017-SS-R02	SESL-2017-SD-R03	SESL-2017-SS-M01	SESL-2017-SD-S01	SESL-2017-SD-S02	SESL-2017-SD-S03	SESL-2017-SD-T01	SESL-2017-SD-T02	SESL-2017-SS-T02	SESL-2017-SD-T03
Sampling Location:			SD-R02	SD-R02 (duplicate)	SS-R02	SD-R03	SS-M01	SD-S01	SD-S02	SD-S03	SD-T01	SD-T02	SS-T02	SD-T03
Date Sampled:			7/11/2017	7/11/2017	7/12/2017	7/11/2017	7/12/2017	7/11/2017	7/11/2017	7/11/2017	7/11/2017	7/11/2017	7/12/2017	7/11/2017
Sample Depth:			0-6 inches	0-6 inches	1.5-2 feet	0-6 inches	1.5-2 feet	0-6 inches	0-6 inches	0-6 inches	0-6 inches	0-6 inches	1.5-2 feet	0-6 inches
Metals (mg/kg)	BTAG	PEC												
Aluminum	NL	NL	17100	19400	20000 J	18500	10400 J	7890	16300 J	12000 J	15200 J	19100 J	18500 J	7750 J
Antimony	2	NL	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	9.8	33	11.5	11.7	13	13.6	8.7	7.3	13.2	9.5	9.3	11.1	11.9	7.4
Barium	NL	NL	44.5	38.5	47.3	45.7	31.8	21.6	42.1	33.7	77.2	44	41.1	39.1
Beryllium	NL	NL	1.9 J-	1.6	2	1.7 J-	1.1	0.79 J-	1.7	1.0 J	1.3	1.2	1.6	0.84
Cadmium	0.99	4.98	1.7 J	2.1	2.2 J	2.6	2.6	2.4	2.2	1.3	2.7	2.4	3	1.8
Calcium	NL	NL	2000	2040	2230 J	1960	1770 J	1090	1800 J	1400 J	3570 J	1830 J	2210 J	3410 J
Chromium	43.4	111	274	308	322	464	180	179	340	238	222	353	339	155
Cobalt	50	NL	19.9	21.3	22.1	20.3	16.5	12.9	20	15.9	16.6	18.1	18.8	13
Copper	31.6	149	191	206	222 J	198	145 J	109	224 J	181 J	215 J	213 J	224 J	118 J
Cyanide	NL	NL	ND	ND	ND	ND	ND	ND	ND	ND	1.3 R	ND	ND	ND
Iron	20000	NL	64600	67700	70900 J	62200	37300 J	31000	57100 J	40200 J	49900 J	51600 J	59000 J	25300 J
Lead	35.8	128	417	398	437	467	241	209	395	274	316	384	419	188
Magnesium	NL	NL	4700	5010	5140	4550	3690	2020	4200	3100	4820	4290	4530	2450
Manganese	460	NL	676 J	725	791	653 J	472	239 J	602	533	401	427	539	326
Mercury	0.18	1.06	0.91 J	1.1 J	1.4 J	1.2 J	0.62 J	0.5 J	0.99 J	0.76 J	1.4 J	1.2 J	1.1 J	0.43 J
Nickel	22.7	48.6	37.6	40.6	44.6 J	39.3	30 J	23	39.4 J	30.3 J	30.8	37.4 J	40 J	21.8 J
Potassium	NL	NL	1670 J	2220	2040	1920 J	955 J	753 J	1560	1180	1400	2050	1950	681 J
Selenium	2	NL	1.9 J	ND	1.8 J	2.2 J	1.4 J	1.3 J	2.2 J	ND	4.9	2.4 J	1.6 J	0.93 J
Silver	1	NL	3.3	3.6	4.1	3.5	1.8	1.7	3.7	2.6	2.2	3.2	3.7	1.5
Sodium	NL	NL	3850	3610	3770	3680	2600	1590	3870	3000	2910	3450	3270	1950
Thallium	NL	NL	0.49 J	0.48 J	0.72 J	0.95 J	1.4	0.88	0.69 J	0.36	1	1	0.99	0.79
Vanadium	NL	NL	76.4	85.2	84.5	78.2	49.1	40.2	77.5	60.8	49.6	63.9	67.5	36.5
Zinc	121	459	1570	1680	1760	2150	1140	1030	1630	1160	1290	1550	1700	827

Notes:

Blue highlighted results indicate results exceeding BTAG screening benchmarks

Yellow highlighted results indicate results exceeding BTAG and NOAA SQuiRT PEC screening benchmarks

PEC defined by National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SQuiRTs)

J + - Estimated value, may be biased high.

J - Estimated value.

J - - Estimated value, may be biased low.

mg/kg - milligram per kilogram

BTAG - Biological Technical Assistance Group-Freshwater Screening Benchmarks

NL - Not Listed

ND - compound not detected

PEC - Probable Effect Concentrations

SIM - selective ion monitoring

SD - Surface Sediment

SS - Subsurface Sediment

Table 5 Detected Metals Results
 July 2017
 Sparrows Point Southeast Area Sediment Assessment
 Sparrows Point, MD

Sample Number:			SESL-2017-SD-U01	SESL-2017-SD-U02	SESL-2017-SD-U03	SESL-2017-SD-V01	SESL-2017-SD-V01-D	SESL-2017-SD-V02	SESL-2017-SS-V02	SESL-2017-SD-V03
Sampling Location:			SD-U01	SD-U02	SD-U03	SD-V01	SD-V01 (duplicate)	SD-V02	SS-V02	SD-V03
Date Sampled:			7/11/2017	7/11/2017	7/11/2017	7/11/2017	7/11/2017	7/11/2017	7/12/2017	7/11/2017
Sample Depth:			0-6 inches	0-6 inches	0-6 inches	0-6 inches	0-6 inches	0-6 inches	1.5-2 feet	0-6 inches
Metals (mg/kg)	BTAG	PEC								
Aluminum	NL	NL	15100 J	16600 J	15600 J	15700 J	14200	16700 J	16900	14400 J
Antimony	2	NL	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	9.8	33	9.5	10.7	9.2	8.7	9.5	9.6	4.9	10.9
Barium	NL	NL	45.8	44.2	47.2	33.1	36.7	44.1	20.7	49
Beryllium	NL	NL	1.0 J	1.4	0.98 J	1.1 J	1.1 J	1.2 J	0.93 J	1.5
Cadmium	0.99	4.98	3.2	2.5	3.3	1.7	2.1	2.3	0.23 J	2.6
Calcium	NL	NL	2010 J	1820 J	1920 J	1490 J	1630	1890 J	1190	2210 J
Chromium	43.4	111	321	319	388	175	228	237	29.8	227
Cobalt	50	NL	15.4	18.5	17.1	13.7	15.4	16.1	9	17.7
Copper	31.6	149	177 J	216 J	183 J	133 J	175	191 J	18.3	195 J
Cyanide	NL	NL	ND	ND	ND	ND	ND	ND	ND	ND
Iron	20000	NL	44200 J	47200 J	43800 J	35000 J	38200	40500 J	26800	39200 J
Lead	35.8	128	330	350	384	201	263	275	23	288
Magnesium	NL	NL	3720	4010	3670	3430	3640	4120	3440	4090
Manganese	460	NL	410	396	330	293	322	332	265	380
Mercury	0.18	1.06	1.0 J	1.1 J	1.0 J	0.75 J	0.86	0.90 J	ND	0.80 J
Nickel	22.7	48.6	32.9 J	36.2 J	32.8 J	25.5 J	29	31.2 J	16.8	35.1 J
Potassium	NL	NL	1460	1600	1440	1610	1710	1560	2290	1270 J
Selenium	2	NL	1.8 J	2.1 J	2.3 J	ND	2.1 J	1.9 J	ND	1.9 J
Silver	1	NL	2.6	2.9	2.7	1.5	2	2.2	0.12 J	2
Sodium	NL	NL	3250	3440	3080	3210	3300	4070	3070	3710
Thallium	NL	NL	1.3	0.95 J	1.3	0.72 J	0.8 J	0.71 J	0.17 J	0.99 J
Vanadium	NL	NL	53.2	63.6	57.6	43.3	51.1	54.1	29.7	56
Zinc	121	459	1450	1420	1620	793	1030	1100	79.2	1150

Notes:

Blue highlighted results indicate results exceeding BTAG screening benchmarks

Yellow highlighted results indicate results exceeding BTAG and NOAA SQUIRT PEC screening benchmarks

PEC defined by National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SQUIRTs)

J + - Estimated value, may be biased high.

J - Estimated value.

J - - Estimated value, may be biased low.

mg/kg - milligram per kilogram

BTAG - Biological Technical Assistance Group-Freshwater Screening Benchmarks

NL - Not Listed

ND - compound not detected

PEC - Probable Effect Concentrations

SIM - selective ion monitoring

SD - Surface Sediment

SS - Subsurface Sediment

Table 6 - Results of Ancillary Chemical and Physical Parameters

July 2017

Sparrows Point Southeast Area Sediment Assessment

Sparrows Point, MD

Sample Number:	SESL-2017-SD-B01	SESL-2017-SD-D03	SESL-2017-SD-F03	SESL-2017-SD-H01	SESL-2017-SD-004-B	SESL-2017-SD-K03-B	SESL-2017-SD-R02-B	SESL-2017-SD-M01	SESL-2017-SD-T02-B	SESL-2017-SD-V02-B	Median	Average
Sampling Location:	SD-B01	SD-D03	SD-F03	SD-H01	SD-004	SD-K03	SD-R02	SD-M01	SD-T02	SD-V02		
Date Sampled:	7/11/2017	7/11/2017	7/11/2017	7/11/2017	7/12/2017	7/12/2017	7/12/2017	7/12/2017	7/12/2017	7/12/2017		
Sample Depth:	0-6 inches	0-6 inches	0-6 inches	0-6 inches	0-6 inches	0-6 inches	0-6 inches	0-6 inches	0-6 inches	0-6 inches		
Ancillary chemical parameters												
pH	7.86	7.42	7.59	7.74	7.42	7.31	8.27	8.03	8.48	7.54	7.67	--
TOC (mg/kg)	26900 J	21300 J	24500 J	7660 J	28100 J	24200 J	22200 J	14200 J	14500 J	20100 J	21750	20366
f _{oc}	0.027	0.021	0.025	0.008	0.028	0.024	0.022	0.014	0.015	0.020	0.022	0.020
Acid Volatile Sulfide (mg/kg)	191	284	209	143	240	270	300	139	468	603	255	285
Acid Volatile Sulfide (μmol/g)	5.96	8.86	6.52	4.46	7.48	8.42	9.36	4.33	14.60	18.81	7.95	8.88
Simultaneously Extracted Metals (μmol/g)												
Cadmium	0.007690	0.006666	0.009678	0.006216	0.016667	0.014334	0.011173	0.004259	0.020570	0.015202	0.010426	0.011246
Copper	0.185430	0.174275	0.372358	0.208570	0.308865	1.043502	0.432218	0.037912	1.254768	0.151949	0.258718	0.416985
Lead	0.399824	0.422466	0.900960	0.519328	0.998925	1.166467	0.737785	0.143387	1.513640	0.802576	0.7701805	0.7605358
Mercury	ND	ND	ND	0.000078	ND	ND	ND	ND	ND	ND	--	--
Nickel	0.170963	0.288127	0.301869	0.254893	0.146942	0.246031	0.140502	0.048638	0.277378	0.199776	0.2229035	0.2075119
Zinc	2.151336	2.649625	4.089488	4.440275	6.506160	6.549405	4.904199	1.365378	7.515010	6.024365	4.672237	4.6195241
ΣSEM	3.02	3.71	5.83	5.51	8.13	9.18	6.39	1.73	10.75	7.39	6.11	6.16
ΣSEM/AVS	0.51	0.42	0.89	1.24	1.09	1.09	0.68	0.40	0.74	0.39	0.71	0.74
(ΣSEM - AVS)/f _{oc}	--	--	--	137.08	23.13	31.40	--	--	--	--	31.40	63.87
Grain Size (% by weight)												
Sand	31.3 J	5.3	19.6	97	7.6	5.7	5.3	27.2	8.1	3.5	7.6	19.9
Silt	33.5 J	50.2	47.3	3	49	72.2	60.1	53.3	45.8	54.2	50.2	48.3
Clay	35.3 J	44.5	33.1	--	46.5	22.2	34.6	19.6	46.1	42.3	38.5	36.1
Shepard classification	SAND SILT CLAY	CLAYEY SILT	CLAYEY SILT	SAND	CLAYEY SILT	CLAYEY SILT	CLAYEY SILT	SANDY SILT	SILTY CLAY	CLAYEY SILT	--	--
Folk classification	SANDY MUD	MUD	SANDY MUD	SAND	MUD	SILT	MUD	SANDY SILT	MUD	MUD	--	--

Notes:f_{oc} = fraction organic carbon (dimensionless)

μmol/g - micromoles per gram (dry weight basis)

% - Percent

J - Estimated value.

-- - textural class not detected

mg/kg - milligrams per kilogram

AVS = Acid Volatile Sulfide

ND - Not Detected

SD - Surface Sediment

SEM = Simultaneously Extracted Metals

SESL - Southeast Area Sampling Location

TOC - Total Organic Carbon

Values of (Σ SEM - AVS)/f_{oc} < 130 μmol/g should pose low risk of adverse biological effects

Folk, R.L., 1974. Petrology of Sedimentary Rocks. Hemphill Publishing Co., Austin, TX, 182pp.

Shepard, F.P. 1954. Nomenclature based on sand-silt-clay ratios. Journal of Sedimentary Petrology 24 (3):151-158.

Table 7
Average Concentrations and Detection Frequencies of Metals and PAHs in
Sediment Samples within Patapsco River - Rounds 1 and 2,
Southern Shoreline of Sparrows Point

Metals (mg/kg)	PEC	Average Concentration	Frequency of Detections Exceeding PEC
Aluminum	NA	21,600	0/15
Antimony	2*	0.56	0/15
Arsenic	33	12.4	0/15
Barium	NA	37.6	0/15
Beryllium	NA	0.49	0/15
Cadmium	4.98	0.80	0/15
Calcium	NA	4,006	0/15
Chromium	111	89.1	3/15
Cobalt	50*	19.6	0/15
Copper	149	54.3	0/15
Cyanide	NA	0.33	0/15
Iron	20,000*	51,953	15/15
Lead	128	123	5/15
Magnesium	NA	6,681	0/15
Manganese	460*	1,068	15/15
Mercury	1.06	0.28	0/15
Nickel	48.6	36.9	1/15
Potassium	NA	3,583	0/15
Selenium	2*	1.79	2/15
Silver	1*	0.59	1/15
Sodium	NA	9,124	0/15
Thallium	NA	0.24	0/15
Vanadium	NA	55.4	0/15
Zinc	459	388	4/15
PAHs (µg/kg)			
2-Methylnaphthalene	20.2*	71.3	9/15
Acenaphthene	6.7*	17.3	9/15
Acenaphthylene	5.9*	80.2	13/15
Anthracene	845	149	0/15
Benzo(a)anthracene	1050	423	1/15
Benzo(a)pyrene	1450	525	0/15
Benzo(b)fluoranthene	27.2*	671	14/15
Benzo(g,h,i)perylene	170*	279	10/15
Benzo(k)fluoranthene	240*	236	8/15
Chrysene	1290	449	0/15
Dibenzo(a,h)anthracene	33*	9.20	0/15
Fluoranthene	2230	656	0/15
Fluorene	536	47.7	0/15
Indeno(1,2,3-c,d)pyrene	17*	303	14/15
Naphthalene	561	280	1/15
Pentachlorophenol	504*	ND	0/15
Phenanthrene	1170	164	0/15
Pyrene	1520	512	0/15

µg/kg - microgram per kilogram

mg/kg - milligram per kilogram

NA - Not Available

PAH - polycyclic aromatic hydrocarbon

Light blue highlighted cells indicate results exceeding BTAG screening benchmarks

PEC - Probable Effect Concentrations

PEC defined by National Oceanic and Atmospheric Administration (NOAA) Screening

Quick Reference Tables (SQiRTs)

* - Biological Technical Assistance Group (BTAG)-Freshwater Screening Benchmarks

were used as a default if PEC values were not available

*BTAG screening benchmarks are conservative and designed to identify when contaminant

levels are not expected to pose an unacceptable risk

Table 8
Average Concentrations and Detection Frequencies of Metals and PAHs in
Sediment Samples within Old Road Bay and Jones Creek - Rounds 1 and 2,
Eastern Shoreline of Sparrows Point

Metals (mg/kg)	PEC	Average Concentration	Frequency of Detections Exceeding PEC
Aluminum	NA	14,039	0/75
Antimony	2*	0.70	1/75
Arsenic	33	9.62	0/75
Barium	NA	33.88	0/75
Beryllium	NA	0.76	0/75
Cadmium	4.98	1.62	1/75
Calcium	NA	3,195	0/75
Chromium	111	169	46/75
Cobalt	50*	15.25	0/75
Copper	149	112	24/75
Cyanide	NA	0.39	0/75
Iron	20,000*	65,635	70/75
Lead	128	242	66/75
Magnesium	NA	4,143	0/75
Manganese	460*	819	57/75
Mercury	1.06	0.73	9/75
Nickel	48.6	29.2	0/75
Potassium	NA	1,678	0/75
Selenium	2*	1.79	18/75
Silver	1*	1.81	51/75
Sodium	NA	3,712	0/75
Thallium	NA	0.55	0/75
Vanadium	NA	61.91	0/75
Zinc	459	1,142	64/75
PAHs (µg/kg)			
2-Methylnaphthalene	20.2*	19.0	10/75
Acenaphthene	6.7*	20.2	20/75
Acenaphthylene	5.9*	15.2	25/75
Anthracene	845	43.8	0/75
Benzo(a)anthracene	1050	78.8	1/75
Benzo(a)pyrene	1450	105	1/75
Benzo(b)fluoranthene	27.2*	134	32/75
Benzo(g,h,i)perylene	170*	71.3	7/75
Benzo(k)fluoranthene	240*	60.1	2/75
Chrysene	1290	84.3	0/75
Dibenzo(a,h)anthracene	33*	35.8	1/75
Fluoranthene	2230	113	0/75
Fluorene	536	18.9	0/75
Indeno(1,2,3-c,d)pyrene	17*	75.0	29/75
Naphthalene	561	28.0	0/75
Pentachlorophenol	504*	14.0	0/75
Phenanthrene	1170	43.0	0/75
Pyrene	1520	105	0/75

µg/kg - microgram per kilogram

mg/kg - milligram per kilogram

NA - Not Available

PAH - polycyclic aromatic hydrocarbon

Blue highlighted results indicates results exceeding NOAA SQUIRT PEC

Light blue highlighted cells indicates results exceeding BTAG screening benchmarks

PEC - Probable Effect Concentrations

PEC defined by National Oceanic and Atmospheric Administration (NOAA) Screening

Quick Reference Tables (SQUIRTs)

* - Biological Technical Assistance Group (BTAG)-Freshwater Screening Benchmarks

were used as a default if PEC values were not available

*BTAG screening benchmarks are conservative and designed to identify when contaminant

levels are not expected to pose an unacceptable risk



APPENDIX A

NOAA SCREENING QUICK REFERENCE TABLE (SQUIRT)



Screening Quick Reference Tables

These tables were developed for screening purposes only: they do not represent official NOAA policy and do not constitute criteria or clean-up levels. All attempts have been made to ensure accuracy; however, NOAA is not liable for errors. Values are subject to changes as new data become available.

This set of NOAA Screening Quick Reference Tables, or SQiRTs, presents screening concentrations for inorganic and organic contaminants in various environmental media. Additional reference material, such as guidelines for sample preservation, are also included.

NOAA identifies potential impacts to coastal resources and habitats likely to be affected by hazardous wastes. To screen for substances which may threaten natural resources of concern to NOAA, environmental concentrations are compared to these screening levels. These tables are intended for preliminary screening purposes only: they do not represent official NOAA policy and do not constitute criteria or clean-up levels. NOAA does not endorse their use for any other purposes. Screening levels are reported with the number of significant figures they were originally reported with.

In this new version, column headings link to OR&R's web site where brief descriptions of the benchmark may be found. However, detailed guidance on the recommended application of various screening guidelines is provided in the original sources (listed in each SQiRT section, with web links for many). Users of the SQiRT cards are strongly encouraged to review supporting documentation to determine appropriateness for their specific use.

The SQiRT card set has been re-organized from earlier versions to accommodate expansion. Benchmarks from numerous new sources have been incorporated, and the list of analytes vastly increased. The SQiRT cards present benchmarks representing different degrees of protectiveness. Multiple benchmarks are also provided in many cases: the user is advised to review the derivation of any particular benchmark before selecting a specific value. Information is still presented in sections, with *new sections* appearing in this expanded version:

- Inorganics in Sediment (freshwater and marine)
- Inorganics in Water (groundwater and surface water)
- Organics in Water and Soil
- Toxic Equivalency Factors
- Guidelines for Sample Collection & Storage
- Analytical Methods for Inorganics
- Inorganics in Soil
- Organics in Sediment
- PCB Composition
- Composition by Carbon Range
- Analytical Methods for Organics

Footnotes within each SQiRT section which appear at the bottom of the page are only to aid in deciphering the nature of specific entries. Due to space constraints, notations which relate to the source for individual values are explained at the end of the section. Organic chemicals are now listed alphabetically, without categorization. A few synonyms are provided, but CAS numbers are also presented to aid in identifying and finding specific analytes. Except as noted, all concentrations in the SQiRT cards are in parts per billion.

For surface water samples, because releases from hazardous waste sites are often continuous and long-term, concentrations are most often compared directly with chronic benchmarks, when available. Groundwater concentrations are also screened against chronic benchmarks. However, suitable site-specific dilution factors should be applied to allow for dilution upon migration and discharge of groundwater to surface water. The SQiRT cards present U.S. Environmental Protection Agency (EPA) Maximum Contaminant Levels (MCLs), applicable to drinking water sources and secondary MCLs applicable to groundwater, supplemented by values from Canada and the United Nations World Health Organization.

Preference for surface water and groundwater benchmarks is given to U.S. EPA Ambient Water Quality Criteria (AWQC). This is generally followed by Tier II Secondary Acute Values (SAVs) or available standards and guidelines from other regulatory agencies. Tier II SAVs are derived using a similar approach to AWQC, but do not have sufficient supporting data for full criteria calculation. Lowest Observable Effect Levels (LOELs) were originally published by EPA with AWQC. Around 2000, EPA stopped publishing these values, however, LOELs are reproduced here when no other benchmark is available, because in many instances, they formed the basis for state standards.

For many trace elements, AWQC are now expressed in terms of the "dissolved" fraction, which is essentially defined operationally as a filtered fraction. Likewise, the toxicity of many trace elements is related to the water hardness, and the values presented are for a default hardness of 100 mg/L CaCO₃. Equations are provided in the SQiRT cards to calculate the exact criteria for a given hardness, or, to convert from unfiltered, total concentrations to "dissolved" fractions.



Screening Quick Reference Table for Inorganics in Sediment

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Analyte		FRESHWATER SEDIMENT									MARINE SEDIMENT						
All concentrations in parts per billion dry weight unless specified otherwise		"Background" ¹	ARCS <i>H. azteca</i> TEL ²	TEC ³	TEL ³	LEL ⁴	PEC ³	PEL ³	SEL ⁴	UET ¹	T ₂₀ ⁵	TEL ⁶	ERL ⁶	T ₅₀ ⁵	PEL ⁶	ERM ⁶	AET ⁷
Predicted Toxicity Gradient:		Increasing									Increasing						
Aluminum (%)	Al	0.26%	2.55%														1.8% N
Antimony	Sb	160								3,000 M	630			2,400			9,300 E
Arsenic	As	1,100	10,798	9,790	5,900	6,000	33,000	17,000	33,000	17,000 I	7,400	7,240	8,200	20,000	41,600	70,000	35,000 B
Barium	Ba	700										130,100#					48,000 A
Cadmium	Cd	100-300	583	990	596	600	4,980	3,530	10,000	3,000 I	380	680	1,200	1,400	4,210	9,600	3,000 N
Chromium	Cr	7,000-13,000	36,286	43,400	37,300	26,000	111,000	90,000	110,000	95,000 H	49,000	52,300	81,000	141,000	160,000	370,000	62,000 N
Cobalt	Co	10,000				50,000+											10,000 N
Copper	Cu	10,000-25,000	28,012	31,600	35,700	16,000	149,000	197,000	110,000	86,000 I	32,000	18,700	34,000	94,000	108,000	270,000	390,000 MO
Iron (%)	Fe	0.99-1.8 %	18.84%			2%			4%	4% I							22% N
Lead	Pb	4,000-17,000	37,000	35,800	35,000	31,000	128,000	91,300	250,000	127,000 H	30,000	30,240	46,700	94,000	112,000	218,000	400,000 B
Manganese	Mn	400,000	630,000			460,000			1,100,000	1,100,000 I							260,000 N
Mercury	Hg	4-51		180	174	200	1,060	486	2,000	560 M	140	130	150	480	700	710	410 M
Nickel	Ni	9,900	19,514	22,700	18,000	16,000	48,600	36,000	75,000	43,000 H	15,000	15,900	20,900	47,000	42,800	51,600	110,000 EL
Selenium	Se	290															1,000 A
Silver	Ag	<500				500 +				4,500 H	230	730	1,000	1,100	1,770	3,700	3,100 B
Strontium	Sr	49,000															
Tin	Sn	5,000										48 *					> 3,400 N
Vanadium	V	50,000															57,000 N
Zinc	Zn	7,000-38,000	98,000	121,000	123,000	120,000	459,000	315,000	820,000	520,000 M	94,000	124,000	150,000	245,000	271,000	410,000	410,000 I
Lead 210 ^{bq/g} dw						0.5 ^			< 9.7 ^								
Polonium 210 ^{bq/g} dw						0.6 ^			< 8.7 ^								
Radium 226 ^{bq/g} dw						0.1 ^			< 13 ^								
Sulfides										130,000 M							4,500 MO

- Based on SLC approach using sensitive species HC5%; ES&T 2005 39(14):5148-5156.

* - Based upon EQp approach using current AWQC CCC

^ - Based on SLC approach to derive LEL and SEL; Env'al Monitor & Ass'ment 2005 110:71-85

+ - Carried over from Open Water disposal Guidelines; treated as if LEL for management decisions.

Bioassay endpoints: M - Microtox; B - Bivalve; E - Echinoderm larvae; O - Oyster larvae;

A - Amphipod; N - Neanthes; L - Larval bioassay; plus, I - Infaunal community impacts

Sources

1 - Buchman, M. 1999. NOAA HAZMAT Report 99-1.

2 - EPA 905-R96-008

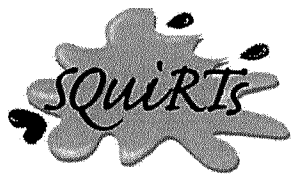
3 - Arch ET&C 2000, 39(1)20- TEL and PEL are also known as Canadian ISQGs and PELs

4 - Guidelines for the protection and management of aquatic sediment quality in Ontario Aug 1993

5 - ET&C 2002, 21(9)1993-

6 - Ecotox. 1996, 5(4):253-

7 - Chapter 173-204 WAC, 1991/95 as supplemented by WA Dept of Ecology staff with unpublished data.



Screening Quick Reference Table for Inorganics in Soil

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ANALYTE <small>All concentrations in parts per billion dry weight unless specified otherwise</small>		CAS Number	BACKGROUND ¹		DUTCH STANDARDS ²		Eco-SSL ³				
			Mean	Range	Target	Intervention	Avian	Inverts	Mammals	Plants	Microbes ⁴
Aluminum	Al	7429905	4.70%	0.5- >10%						50,000 a	600,000
Antimony	Sb	7440360	480	bd-8,800	3,000	15,000		78,000	142 v	5,000 a	
Arsenic	As	7440382	5,200	bd-97,000	900 L	55,000	43,000	60,000 a	5,700 v	18,000	100,000
Barium	Ba	7440393	440,000	10,000-0.5%	160,000	625,000		330,000	1,040 v	500,000 a	3,000,000
Beryllium	Be	7440417	630	bd-15,000	1,100	30,000 S		40,000	1,060 v	10,000 a	
Boron	B	7440428	26,000	bd-300,000						500 a	20,000
Bromine	Br	7726956	560	bd-11,000	20,000					10,000 a	
Cadmium	Cd	7440439			800	12,000	770	20,000 a	2.22 v	4,000 a	20,000
Chromium III	Cr	7440473	< 37,000	1,000-0.2%	< 380 L	< 220,000 L	26,000	<400 a	34,000	< 1,000 a	< 10,000
Chromium VI	Cr	18540299	< 37,000		< 380 L	< 220,000 L		400 a	81,000	< 1,000 a	< 10,000
Cobalt	Co	7440484	6,700	bd-70,000	2,400 L	180,000 L	120,000		140 v	13,000	1,000,000
Copper	Cu	7440508	17,000	bd-700,000	3,400 L	96,000 L	28,000	50,000 a	5,400 v	70,000	100,000
Cyanide (total complex)	CN	57125			5,000	50,000 (pH>5)			1,330 v		
Cyanide (total free)	CN				1,000	20,000					
Fluorine	F	7782414	210,000	bd-0.37%	500,000					200,000 a	30,000
Iodine	I	7553562	750	bd-9,600						4,000 a	
Iron	Fe	7439896	1.80%	0.01- >10%							200,000
Lanthanum	La	7439910	30,000	bd-200,000							50,000
Lead	Pb	7439921	16,000	bd-700,000	55,000 L	530,000	11,000	500,000 a	53.7 v	50,000 a	900,000
Lithium	Li	7439932	20,000	bd-140,000						2,000 a	10,000
Manganese	Mn	7439965	330,000	bd-0.7%			4,300,000	450,000	4,000,000	220,000	100,000
Mercury	Hg	7439976	58	bd-4,600	300	10,000		100 a v		300 a	30,000
Mercury(methyl)		22967926			37 L	4,000 L		< 100 a v	1.58 v	< 300 a	
Molybdenum	Mo	7439987	590	bd-15,000	3,000	190,000 L				2,000 a	200,000
Nickel	Ni	7440020	13,000	bd-700,000	260 L	100,000 L	210,000	200,000 a	13,600 v	30,000 a	90,000
Selenium	Se	7782492	260	bd-4,300	700 L	100,000 S	1,2000	4,100	630	520	100,000
Silver	Ag	7440224				15,000 S	4,200		4,040 v	2,000 a	50,000
Strontium	Sr	7440246	120,000	bd-0.3%							
Sulfide		18496258							3.58 v		
Sulfur	S	7704349	0.12%	bd-4.8%							
Technetium	Tc	7440268								200 a	

1: bd – below detection

2: S – serious contamination level; L – Environmental Risk Limit



Screening Quick Reference Table for Inorganics in Soil

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ANALYTE		CAS Number	BACKGROUND ¹		DUTCH STANDARDS ²		Eco-SSL ³				
All concentrations in parts per billion dry weight unless specified otherwise			Mean	Range	Target	Intervention	Avian	Inverts	Mammals	Plants	Microbes ⁴
Tellurium	Te	13494809				600,000					
Thallium	Tl	7440280	8,600	2,20-31,000	1,000	15,000 S			56.9 v	1,000 a	
Tin	Sn	7440315	890	bd-10,000	19,000 background	900,000 S			7,620 v	50,000 a	2,000,000
Titanium	Ti	7440326	0.224 %	0.007-2 %							1,000,000
Tin as Triphenyltin		668348				< 2,500					
Tungsten	W	7440337									400,000
Uranium	U	7440611	2,300	290-11,000						5,000 a	
Vanadium	V	7440622	58,000	bd-500,000	42,000	250,000 S	7,800		1,590 v	2,000 a	20,000
Zinc	Zn	7440666	48,000	bd-0.29%	16,000 L	350,000 L	46,000	6,620 v		50,000 a	100,000

Sources

1 – USGS Prof. Paper 1270, 1984. Mean is geometric mean of national data.

2 – Entry is lower of current VROM Environmental Quality standards or the updated RIVM Environmental Risk Limits. Risk limits are typically divided by 100 to derive the Target value; this computation has not been done here.

Dutch Target/Intervention: E.M.J. Verbruggen, R. Posthumus and A.P. van Wezel, 2001. Ecotoxicological Serious Risk Concentrations for soil, sediment, and (ground)water: Updated proposal for first series of compounds. Nat. Inst. Public Health and the Env., and subsequent updates as published elsewhere.

Min. Housing, Spatial Plan. And the Env., 2000. Annexes Circular on target values and intervention values for soil remediations.

3 – Entry is lower of either:

EPA Eco-SSLs, www.epa.gov/ecotox/ecoss/

a – ORNL Screening benchmark for earthworms and soil microorganisms: ORNL 1997a, [ES/ER/TM-126/R2](#)

v – EPA R5 Eco Screening levels soil - shrew or vole, www.epa.gov/reg5rcra/ca/

4 - ORNL 1997b, [ES/ER/TM-85/R3](#).

1: bd – below detection

2: S – serious contamination level; L – Environmental Risk Limit



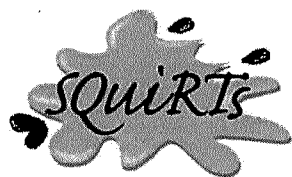
Screening Quick Reference Table for Inorganics in Water

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ELEMENT All concentrations in parts per billion unless specified otherwise		GROUND WATER ¹	SURFACE WATERS ²			
			Freshwater		Marine	
			Acute	Chronic	Acute	Chronic
Aluminum	Al	50-200 *	pH 750	pH 87		
Antimony	Sb	6	88 p	30 p	1,500 p	500 p
Arsenic III	As ⁺³	<10		190 E		2.3 NZ
Arsenic V	As ⁺⁵	< 10	66 T	3.1 T	2,319 *	
Arsenic, Total	As	10	340	150	69	36
Barium	Ba	2,000	110 T	3.9 E	1,000 BC	200 BC
Beryllium	Be	4	35 T	0.66 T	1,500 BC	100 BC
Boron	B	5,000 C	30 T	1.6 T		1,200
Cadmium	Cd	5	2.0 †	0.25 †	40	8.8
Chromium III	Cr ⁺³	< 100	570 †	74 †	10,300 *	27.4 NZ
Chromium VI	Cr ⁺⁶	< 100	16	11	1,100	50
Chromium, Total	Cr	100				
Cobalt	Co		1,500 T	3.0 E		1 NZ
Copper	Cu	1,300	13 †	9 †	4.8	3.1
Fluoride	F	4,000	200 BC (hardness < 50)		1,500 BC	
Gallium	Ga			18 NZ		use 18 NZ
Iron	Fe	300 *		1,000	300 BC	50 BC
Lanthium	La			0.04 NZ		
Lead	Pb	15	65 †	2.5 †	210	8.1
Lithium	Li		260 T	14 T		
Manganese	Mn	50 *	2,300 T	80 E		100 BC
Mercury	Hg	2	1.4	0.77	1.8	0.94
Methyl Mercury			0.099 T	0.0028 T		
Molybdenum	Mo	70 W	16,000 T	34 NZ		23 NZ
Nickel	Ni	20 W	470 †	52 †	74	8.2
Phosphorus	P					0.1
Potassium	K		373,000 BC			
Selenium	Se	50	13-186 total	5 total	290	71
Silver	Ag	100 *	1.6 (½) †	0.36 T	0.95 (½)	
Strontium	Sr		15,000 T	1,500 T		
Thallium	Tl	2	110 T	0.03 NZ	2,130 *	17 NZ
Tin as TBT			0.46	0.072	0.42	0.0074

1: * – Secondary standard

2: pH – criteria is pH dependent ; p – proposed; † – hardness dependent; * – EPA LOEL ; (½) – CMC is halved to compare to 1985 Guideline derivation



Screening Quick Reference Table for Inorganics in Water

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ELEMENT All concentrations in parts per billion unless specified otherwise		GROUND WATER ¹	SURFACE WATERS ²			
			Freshwater		Marine	
			Acute	Chronic	Acute	Chronic
Tin as Di-N-Butyl			0.08 BC			
Tin as Triethyl			0.4 BC			
Tin as Triphenyl			0.022 BC		34 BC	
Titanium	Ti		2,000 BC			
Uranium	U	30	46 T	0.5 NZ	500 BC	100 BC
Vanadium	V		280 T	19 E		50 BC
Zinc (Zn)	Zn	5,000 *	120 †	120 †	90	81
Zirconium	Zr		310 T	17 T		
Hydrogen Sulfide			2		2	
Cyanide, free	CN	200	22	5.2	1	1

Freshwater criterion for certain elements (†) are expressed as a function of hardness (mg/L) in the water column. The values shown assume 100 mg/L. Values for a different hardness may be calculated using the following equations to arrive at a CMC or CCC for filtered samples. Hardness may range up to 400 mg/L as calcium carbonate. For hardness above this range, use 400 mg/L as the maximum value allowed. For salinity between 1 and 10 ppt, use the more stringent of either fresh or marine values.

Sources

1 – Primary entry is the US EPA MCL value, followed by the WHO drinking water guidelines.

Maximum Contaminant Levels (MCLs): <http://www.epa.gov/safewater/index.html>

W – World Health Organization's (WHO) Drinking water guidelines: http://www.who.int/water_sanitation_health/dwg/en/

C – Canadian water Quality Guidelines: <http://www.ec.gc.ca/CEQG-RCQE/English/Ceqg/Water/default.cfm>

2 – Primary entry is the US Ambient Water Quality Criteria, followed by the lowest of Tier II SAVs or available standards and guidelines.

EPA Ambient water Quality Criteria (AWQC): <http://www.epa.gov/waterscience/criteria/aqlife.html>

T – Tier II Secondary Acute Value: <http://www.esd.ornl.gov/programs/ecorisk/tools.html>

BC – British Columbia Water Quality Guidelines (either working or recommended): <http://www.env.gov.bc.ca/wat/wq/>

NZ – Australian & New Zealand ECLs and Trigger values: ANZECC Oct 2000, Volume 1, The Guidelines. www.mfe.govt.nz/publications/

E – EcoUpdate: www.epa.gov/oswer/riskassessment/ecoup/

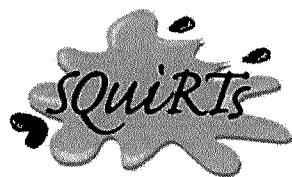
Lowest Observable Effect Levels (LOELs) previously published by EPA are also included since these essentially were the basis for many state standards.

EPA LOELs: EPA Water quality Criteria Summary, Office of Science & Technology, Health & Ecological Criteria Div., Ecological Risk Assessment Branch, 1991.

Full listings appeared in various Fed. Register notices and in EPA's Quality Criteria for Water, 1992.

1: * – Secondary standard

2: pH – criteria is pH dependent ; p – proposed; † – hardness dependent; * – EPA LOEL ; (½) – CMC is halved to compare to 1985 Guideline derivation



Screening Quick Reference Table for Inorganics in Water

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ELEMENT	HARDNESS CALCULATIONS – UNFILTERED FRESHWATER CRITERIA		UNFILTERED TO FILTERED CALCULATIONS		
	CMC	CCC	Fresh water CMC	Freshwater CCC	Marine CMC / CCC
Arsenic (As)			1	1	1
Cadmium (Cd)	$CMC = e^{1.0166 [\ln(\text{hardness})] - 3.924}$	$CCC = e^{0.7409 [\ln(\text{hardness})] - 4.719}$	$CF = 1.136672 - 0.041838 [\ln(\text{hardness})]$	$CF = 1.101672 - 0.041838 [\ln(\text{hardness})]$	$CF = 0.994$
Chromium III (Cr+3)	$CMC = e^{0.819 [\ln(\text{hardness})] + 3.7256}$	$CCC = e^{0.819 [\ln(\text{hardness})] + 0.6848}$	$CF = 0.316$	$CF = 0.860$	—
Chromium VI (Cr +6)			$CF = 0.982$	$CF = 0.962$	$CF = 0.993$
Copper (Cu)	$CMC = e^{0.9422 [\ln(\text{hardness})] - 1.7}$	$CCC = e^{0.8545 [\ln(\text{hardness})] - 1.702}$	$CF = 0.960$	$CF = 0.960$	$CF = 0.83$
Lead (Pb)	$CMC = e^{1.273 [\ln(\text{hardness})] - 1.46}$	$CCC = e^{1.273 [\ln(\text{hardness})] - 4.705}$	$CF = 1.46203 - 0.145712 [\ln(\text{hardness})]$	SAME AS CMC	$CF = 0.951$
Mercury (Hg)			$CF = 0.85$	$CF = 0.85$	$CF = 0.85$
Nickel (Ni)	$CMC = e^{0.846 [\ln(\text{hardness})] + 2.255}$	$CCC = e^{0.846 [\ln(\text{hardness})] + 0.0584}$	$CF = 0.998$	$CF = 0.997$	$CF = 0.990$
Selenium (Se)			—	—	$CF = 0.998$
Silver (Ag)	$CMC = e^{1.72 [\ln(\text{hardness})] - 6.52}$	CCC — No criteria	$CF = 0.85$	—	$CF = 0.85 / —$
Zinc (Zn)	$CMC = e^{0.8473 [\ln(\text{hardness})] + 0.884}$	$CCC = e^{0.8473 [\ln(\text{hardness})] + 0.884}$	$CF = 0.978$	$CF = 0.986$	$CF = 0.946$

Freshwater criterion for certain elements are expressed as a function of hardness (mg/L) in the water column. The values shown assume 100 mg/L. Values for a different hardness may be calculated using the above equations to arrive at a CMC or CCC for *filtered* samples. Hardness may range up to 400 mg/L as calcium carbonate. For hardness above this range, use 400 mg/L as the maximum value allowed.

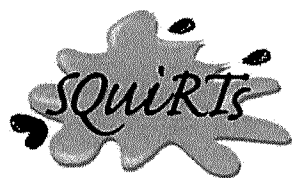
Criteria for most metals are expressed as standards for samples filtered through 0.45 m filter (*i.e.*, "dissolved"). To convert unfiltered concentrations to filtered, multiply the unfiltered concentration value by the appropriate Conversion Factor (CF) above. For cadmium and lead, the conversion factor itself is hardness-dependent.

CMC: Criteria Maximum Concentration is the highest level for a 1-hour average exposure not to be exceeded more than once every three years, and is synonymous with "acute."

CCC: for a 4-day average exposure not to be exceeded more than once every three years, and is synonymous with "chronic."

Sources

EPA Ambient water Quality Criteria (AWQC): <http://www.epa.gov/waterscience/criteria/aqlife.html>



Screening Quick Reference Tables for Organics – Sediment

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ANALYTE <small>All concentrations in parts per billion dry weight unless specified otherwise</small>	CAS Number	FRESHWATER SEDIMENT								DUTCH Sediment ⁵		MARINE SEDIMENT							Eco Tox EqP ⁸ @1%TOC
		ARCS <i>Hyalella</i> TEL ¹	TEL ²	TEC ²	LEL ³	PEL ²	PEC ²	SEL ³	UET ⁴ @1%TOC	Target	Intervention	T ₂₀ ⁶	TEL ⁷	ERL ⁷	T ₅₀ ⁶	PEL ⁷	ERM ⁷	AET ⁸	
2,3,7,8-TCDD dioxin TEQs	1746016		0.00085 c			0.0215 c			0.0088†H		1 S		0.00085 c			0.0215 c		0.0036 N	
Acenaphthene	83329		6.71 c			88.9 c			290 M			19	6.71	16	116	88.9	500	130 E	
Acenaphthylene	208968		5.87 c			128 c			160 M			14	5.87	44	140	128	640	71 E	
Acrylonitrile	107131									0.07	100 S								
Aldrin	309002				2			80	40 I	0.06	1,700 LB							9.5 AE	
Aldrin + Dieldrin + Endrin	na									5	140 L								
Anthracene	120127	10	46.9 c	57.2	220	245 c	845	3,700	260 M	39 LB	1,600 LB	34	46.9	85.3	290	245	1,100	280 E	
Atrazine	1912249									0.2	710 LB								
BCH compounds (sum)	na									10	6,400 L								
Benz[a]anthracene	56553	15.72	31.7	108	320	385	1,050	14,800	500 I	25 L	2,500 L	61	74.8	261	466	693	1,600	960 E	
Benzene	71432									10	1,000								57
Benzo(ghi)perylene	191242				170			3,200	300 M	570 LB	33,000 LB	67			497			670 M	
Benzo[a]pyrene	50328	32.4	31.9	150	370	782	1,450	14,400	700 I	52 L	7,000 L	69	88.8	430	520	763	1,600	1,100 E	
Benzo[b]fluoranthene	205992											130			1,107			1,800 E I	
Benzo[k]fluoranthene	207089	27.2			240			13,400	13,400B	380 LB	38,000 LB	70			537			1,800 E I	
Benzolc acid	65850																	65 O	
Benzyl alcohol	100516																	52 B	
BHC, alpha (α-HCH)	319846				6			100		3	< 2,000								
BHC, beta (β-HCH)	319857				5			210		9	< 2,000								
BHC, delta (δ-HCH)	319868									< 10	< 2,000								
BHC, gamma- (γ-HCH; Lindane)	58899		0.94	2.37	3	1.38	4.99	10	9 I	0.05	1,200 L		0.32			0.99		> 4.8 N	3.7
Biiphenyl	92524											17			73			1,100	
Bis(2-ethylhexyl)phthalate (DEHP)	117817								750 †M	< 100	10,000 LB		182			2647		1,300 I	
Bromoform (Tribromomethane)	75252										75,000							650	
Butanol	35296721										30,000 S								
Butyl acetate, 1- or 2-	na										200,000 S								
Butyl benzyl phthalate	85687									< 100	48,000 LB							63 M	1,100
Carbaryl	63252									0.03	450 LB								
Carbofuran	1563662									0.02	17 LB								
Carbon tetrachloride (Tetrachloromethane; Tetra)	56235									170 LB	1,000								1,200

4: Entry is lowest, reliable value among AET tests, on 1% TOC basis: I - Infaunal community impact; M - Microtox bioassay; H - *Hyalella azteca* bioassay; † - value on dry weight basis.

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		ARCS <i>Hyalella</i> TEL ¹	TEL ²	TEC ²	LEL ³	PEL ²	PEC ²	SEL ³	UET ⁴ @1%TOC	Target	Intervention	T ₂₀ ⁶	TEL ⁷	ERL ⁷	T ₅₀ ⁶	PEL ⁷	ERM ⁷	AET ⁸	
Catechol (o-Dihydroxybenzene)	120809									3.2 LB	2,600 LB								
Chlordane	57749		4.5	3.24	7	8.9	17.6	60	30 I	0.03	4,000		2.26	0.5		4.79	6	2.8 A	
Chlordane (alpha)	5103719									< 0.03	< 4,000								
Chlordane (gamma)	5103742									< 0.03	< 4,000								
Chloro, 4- 2-methyl phenol	1570645										< 15,000 S								
Chloro, 4- 2-methylphenoxy acetic acid (MCPA)	94746									0.05	4,000								
Chloro, 4- 3-methyl phenol	59507										< 15,000 S								
Chloro, 4- methyl phenols	na										15,000 S								
Chloroaniline	27134265									5	50,000								
Chlorobenzenes (sum)	na									30	30,000								820
Chloroform (trichloromethane)	67663									20	10,000								
Chloronaphthalene, 1-	90131									57 LB	< 10,000								
Chloronaphthalene, 2-	91587									250 LB	< 10,000								
Chlorophenol, 2-	95578									55 LB	7,800 LB							0.333	
Chlorophenol, 3-	108430									35 L	14,000 L								
Chlorophenol, 4-	106489									20 LB	1,400 LB								
Chlorophenols (sum)	na									10	10,000								
Chrysene	218019	26.83	57.1	166	340	862	1,290	4,600	800 I	8,100 LB	35,000 LB	82	108	384	650	846	2,800	950 E	
Cresol [m-] (3-Methyl phenol)	108394									1,600 L	16,000 L								
Cresol [o-] (2-Methyl phenol)	95487									500 L	50,000 L							8 B	
Cresol [p-] (4-Methyl phenol)	106445									5.1 LB	2,600 LB							100 B	
Cresols, sum	1319773									50	5,000								
Cyclohexanone	108941									100	45,000								
DDD, 4,4- (p,p-DDD, TDE)	72548		3.54	4.88	8	8.51	28	60	< 60 I	3.9 LB	34,000 LB		1.22	2		7.81	20	< 16 I	
DDE, 4,4- (p,p-DDE)	72559		1.42	3.16	5	6.75	31.3	190	< 50 I	5.8 LB	1,300 LB		2.07	2.2		374	27	< 9 I	
DDT, 4,4- (p,p-DDT)	50293		1.19 c	4.16	8	4.77 c	62.9	710	50 I	9.8 LB	1,000 L		1.19	1		4.77	7	< 12 E	
DDT+DDE+DDD (sum)	na		7	5.28	7	4,450	572	120	50 I	10	4,000		3.89	1.58		51.7	46.1	11 B	
Diazinon	333415																		1.9
Dibenz[ah]anthracene	53703	10	6.22 c	33	60	135 c		1,300	100 M			19	6.22	63.4	113	135	260	230 OM	
Dibenzofuran	132649								5,100 H									110 E	2,000

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		ARCS <i>Hyalella</i> TEL ¹	TEL ²	TEC ²	LEL ³	PEL ²	PEC ²	SEL ³	UET ⁴ @1%TOC	Target	Intervention	T ₂₀ ⁶	TEL ⁷	ERL ⁷	T ₅₀ ⁶	PEL ⁷	ERM ⁷	AET ⁸		
Dichloroaniline, 2,4-	554007									< 5	< 50,000 S									
Dichloroaniline, 3,4-	95761									< 5	< 50,000 S									
Dichloroaniline, 3,4-	95761									< 5	< 50,000 S									
Dichlorobenzene, 1,2-	95501									< 30	17,000 LB							13 N	340	
Dichlorobenzene, 1,3-	541731									< 30	24,000 LB								1700	
Dichlorobenzene, 1,4-	106467									< 30	18,000 LB							110 IM	350	
Dichlorobenzenes	25321226									< 30	19,000 LB									
Dichloroethane, 1,1-	75343									20	15,000									
Dichloroethane, 1,2-	107062									20	4,000									
Dichloroethene, 1,1- (vinylidene chloride)	75354									100	300									
Dichloroethene, 1,2- (cis or trans)	540590									200	1,000									
Dichlorophenol, 2,4-	120832									< 10	8,400 LB							0.2083		
Dichlorophenol, 2,6-	87650									< 10	57,000 LB									
Dichlorophenol, 3,4-	95772									< 10	57,000 LB									
Dichlorophenol, 3,5-	591355									< 10	5,400 LB									
Dichlorophenols (sum)	na									< 10	22,000 LB									
Dichloropropane, 1,2- (propylene dichloride)	78875									< 2	< 2,000									
Dieldrin ‡	60571	2.85	1.9	2	6.67	61.8	910	300 I		0.5	1,900 LB	0.83	0.72	0.02	2.9	4.3	8	1.9 E		
Diethyl phthalate	84662									530 L	53,000 L							6 BL	630	
Diethylene-glycol	111466										270,000 S									
Dihydroxybenzenes, sum	na									62 LB	8,000 LB									
Di-iso-butyl phthalate	84695									92 LB	17,000 LB									
Dimethyl phthalate	131113									1,000 LB	84,000 LB							6 B		
Dimethylnaphthalene, 2,6-	581420											25			133					
Dimethylphenol, 2,4-	105679																	18 N		
Di-n-butyl phthalate	84742							110 H		7,000 LB	36,000 LB							58 BL	11,000	
Di-n-octyl phthalate	117840									< 100	< 60,000							61 BL		
Dodecylbenzene	25155300										1,000,000 S									
Endosulfan (a or b)	115297									0.01	4,000								2.9 α 14 β	

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		ARCS <i>Hyaella</i> TEL ¹	TEL ²	TEC ²	LEL ³	PEL ²	PEC ²	SEL ³	UET ⁴ @1%TOC	Target	Intervention	T ₂₀ ⁶	TEL ⁷	ERL ⁷	T ₅₀ ⁶	PEL ⁷	ERM ⁷	AET ³		
Endosulfan II	33213659																			
Endrin	72208		2.67	2.22	3	62.4	207	1,300	500 I	0.04	95 L									
Ethyl acetate	141786										75,000 S									
Ethyl acetate	141786										75,000 S									
Ethyl benzene	100414									30	50,000							4 EL	3,600	
Ethylene glycol	107211										100,000 S									
Fluoranthene	206440	31.46	111	423	750	2,355	2,230	10,200	1,500 M	1,000 LB	260,000	119	113	600	1,034	1,494	5,100	1,300 E		
Fluorene	86737	10	21.2 c	77.4	190	144 c	536	1,600	300 M			19	21.2	19	114	144	540	120 E	540	
Formaldehyde	50000										100 S									
Guthion (Azinphos-methyl)	865000									0.005	2,000 S									
Heptachlor	76448								10 I	0.7	4,000							0.3 B		
Heptachlorepoide	1024573		0.6	2.47	5	2.74	16	50	30 I	0.0002	4,000	0.6 c				2.74 c				
Hexachlorobenzene	118741				20			240	100 I	1.4 LB	2,000 LB							6 B		
Hexachlorobutadiene (HCBD)	87683																	1.3 E		
Hexachlorocyclohexane (BHC)	608731				3			120	100 I											
Hexachloroethane	67721																	73 BL	1,000	
Hydroquinone (p-dihydroxybenzene)	123319									50	43,000 LB									
Indeno[1,2,3-cd]pyrene	193395	17.32			200			3,200	330 M	31 LB	1,900 LB	68			488			600 M		
Linar alkylbenzene sulfonates (LAS)	na												<12,800 €			>62,000 €				
Malathion	121755																			0.67
Maneb	12427382									2	22,000 L									
Methanol	67561										30,000 S									
Methoxychlor	72435																			19
Methyl ethyl ketone (MEK; 2-Butanone)	78933										35,000 S									
Methyl naphthalene, 2-	91576											21	20.2	70	128	201	670	64 E		
Methylene chloride (Dichloromethane, DCM)	75092									18 LB	3,900 L									
Methylnaphthalene, 1-	90120											21			94					
Methylphenanthrene, 1-	832699											18			112					
Methyl-tert-butyl ether (MTBE)	1634044										100,000 S									
Mirex	2385855				7			1,300	800 I											

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Monochloroaniline (3 isomers)	na									5	50,000								
Monochlorobenzenes	108907									< 30	15,000 LB								820
Monochloronaphthalenes	na									120 LB	10,000								
Monochlorophenols (sum)	na									< 10	5,400 L								
Naphthalene	91203	14.65	34.6 c	176		391 c	561		600 I	120 LB	17,000 LB	30	34.6	160	217	391	2,100	230 E	480
Nitrobenzene	98953																	21 N	
Nitrosodiphenylamine, N-	86306																	28 I	
Nonylphenol	25154523		1,400 c										1,000 c						
PAHs, Low MW	na	76.42							5,300 M	< 1,000	< 40,000		312	552		1,442	3,160	1,200 E	
PAHs, High MW	na	193							6,500 M	< 1,000	< 40,000		655	1,700		6,676	9,600	7,900 E	
PAHs, Total	na	264.1		1,610	4,000		22,800*	100,000*	12,000 M	1,000	40,000		1,684	4,022		16,770	44,792		
PCB 105	32598144									1.5 LB	< 1,000								
PCB 126	57465288									0.0025 LB	920 LB								
PCB 77	32598131									0.42 LB	< 1,00								
PCB-Aroclor 1254	na		60 c		60	340 c		340					63.3 c			709 c			
PCBs (sum)	1336363	31.62	34.1	59.8	70	277	676	5,300	26 M	0.3 LB	1,000	35	21.6	22.7	368	189	180	130 M	
Pentachloroaniline	527208										10,000 S								
Pentachlorobenzene	608935									15 LB	16,000 LB								
Pentachlorophenol [PCP: at pH 7.8‡]	87865									< 10	8,000 LB							17 B	690
Perylene	198550											74			453				
Phenanthrene	85018	18.73	41.9	204	560	515	1,170	9,500	800 I	3,300 LB	31,00 LB	68	86.7	240	455	544	1500	660 E	
Phenol	108952								48 † H	50	14,000 LB							130 E	
Phthalates (sum)	na									100	60,000								
Propanol, 2- (Isopropanol)	67630										220,000 S								
Pyrene	129000	44.27	53	195	490	875	1,520	8,500	1,000 I			125	153	665	932	1,398	2,600	2,400 E	
Pyridine	110861									100	500								
Resorcinol (m-dihydroxybenzene)	108463									34 LB	4,600 LB								
Styrene (Vinyl benzene)	100425									200 LB	86,000 LB								
Tetrachloroaniline, 2,3,5,6-	3481207										< 30,000 S								
Tetrachlorobenzene, 1,2,3,4-	634662									160 L	16,000 L								
Tetrachlorobenzene, 1,2,3,5-	634902									6.5 L	650 L								

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Tetrachlorobenzene, 1,2,4,5-	95943									10 L	1,000 L									
Tetrachlorobenzenes	na									22 L	2,200 L									
Tetrachloroethylene (Tetrachloroethene; PCE; PER)	127184									2	4,000							57 I	530	
Tetrachlorophenol, 2,3,4,5-	4901513									< 10	< 10,000									
Tetrachlorophenol, 2,3,4,6-	58902									< 10	< 10,000									
Tetrachlorophenols (sum)	25167833									< 10	< 10,000									
Tetrahydrofuran	109999									100	2,000									
Tetrahydrothiophene	110010									100	8,800 LB									
Toluene	108883									10	47,000 L								670	
Toxaphene	8001352		0.1 c										0.1 c						28	
Tributyltin oxide	56359									< 10	< 2,500									
Trichloroaniline (multiple isomers)	na										10,000 S									
Trichloroaniline, 2,4,5-	636306										< 10,000 S									
Trichlorobenzene, 1,2,3-	87616									< 11 L	5,000 L									
Trichlorobenzene, 1,2,4-	120821									11 LB	5,100 LB							> 4.8 E	9,200	
Trichlorobenzenes	12002481									38 L	11,000 L									
Trichloroethane, 1,1,1-	71556									70	15,000								170	
Trichloroethane, 1,1,2-	79005									400	10,000									
Trichloroethene (TCE)	na									7.8 L	2,500 L							41 N	1,600	
Trichlorophenol, 2,3,5-	na									< 10	4,500 L									
Trichlorophenol, 2,4,5-	95954									< 10	22,000 LB							3 I		
Trichlorophenol, 2,4,6-	88062									< 10	110,000 LB							6 I		
Triclorophenols, (sum)	na									< 10	22,000 L									
Vinyl chloride	75014									10	100									
Xylene	1330207									130 LB	17,000 LB							4 BL		
Xylene, m-	108383									110 LB	18,000 LB								25	
Xylene, o-	95476									89 LB	9,300LB									

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Sources

- 1 – Assessment & Remediation of Contaminated Sediments (ARCS) Program, Sept 1996. EPA 905-R96-008.
- 2 – MacDonald et al, 2000. Arch ET&C 39(1):20-
C – Canadian Sediment Quality Guidelines for the Protection of Aquatic Life, Summary Tables Update 2002, www.ccme.ca/publications/cegg_rcqe.html
- 3 – Persuad 1993. Guidelines for the Protection and Management of Aquatic Sediment Quality in Ontario. Thompson et al., 2005. Enval Monitor & Assessment 110:71-
- 4 – Buchman 1999. NOAA HAZMAT Report 99-1.
- 5 – Entry is lower of current VROM Environmental Quality standards or the updated RIVM Environmental Risk Limits. Risk limits are typically divided by 100 to derive the Target value; this computation has not been done here.
Dutch Target/Intervention: E.M.J. Verbruggen, R. Posthumus and A.P. van Wezel, 2001. Ecotoxicological Serious Risk Concentrations for soil, sediment, and (ground)water: updated proposal for first series of compounds. Nat. Inst. Public Health and the Env., and subsequent updates as published elsewhere.
Min. Housing, Spatial Plan. And the Env., 2000. Annexes Circular on target values and intervention values for soil remediations.
- 6 – Field et al., 2002. ET&C 21:1993-
- 7 – MacDonald et al., 1996. Ecotox. 5(4):253-
C – Canadian Sediment Quality Guidelines for the Protection of Aquatic Life, Summary Tables Update 2002, www.ccme.ca/publications/cegg_rcqe.html
€ - DelValls et al., 1999. Ecotox. & Env Rest 2(1):34-
- 8 – Wash Dept Ecol Publ 95-308, 1995 and 97-323a, 1997
Gries & Waldrow Puget Sound Dredged Disposal Analysis Rept 1996. <http://www.ecy.wa.gov/biblio/wac173204.html>
plus unpublished information.
- 9 – EcoUpdate EcoTox Thresholds, <http://www.epa.gov/oswer/riskassessment/>

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Screening Quick Reference Tables for Organic in Water and Soil

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ANALYTE <small>All concentrations in parts per billion unless specified otherwise</small>	CAS Number	GROUND WATER			SURFACE WATERS				SOIL			
		Dutch		MCL ²	Fresh		Marine		Invertebrates ⁴	Mammals ⁵	Plants ⁶	Other ⁷
		Target	Intervention		Acute ³	Chronic ³	Acute ³	Chronic ³				
2,3,7,8-TCDD (dioxin TEQs)	1746016		0.001 ^W /L S	0.00003	<0.01 *	<0.00001 *				0.000199		
2,4,5-Trichlorophenoxyacetic acid (2,4,5-T)	93765			9 W		36 NZ				596		
2,4-Dichlorophenoxyacetic acid (2,4-D)	94757			70		4.0 CA				27.2		
Acenaphthene	83329				1,700 *	5.8 CA	970 *	40 Eco		682,000	20,000	
Acenaphthylene	208968					4,840 V	300 *C			682,000		
Acetone	67641				28,000 T	1,500 T				2,500		
Acetonitrile	75058					160 NZ				1,370		
Acetophenone	98862									300,000		
Acetylaminofluorene, 2-	53963									596		
Acridine	260946					4.4 CA						
Acrolein	107028				68 *	0.01 NZ	55 *	0.1 NZ		5,270		
Acrylonitrile	107131	0.08	5 S		7,550 *	2,600 *				23.9		1,000,000 M 0.007 D
Alcohol ethoxylated surfactants (AE)	na					140 NZ						
Alcohol ethoxylated sulfate (AES)	na					650 NZ						
Aldicarb	116063			9 C		1 CA		0.15 CA				
Aldrin	309002	0.009 ^W /L	< 0.1		1.5 (½)	0.017 V	0.65 (½)				3.32 v	0.06 D
Aldrin+Dieldrin+Endrin	na		0.1	<0.03 W								5 D
Allyl chloride	107051									13.4		
Aminobiphenyl, 4-	92671									3.05		
Aminomethylphosphonic acid (AMPA)	1066519	0.797 L										
Amitrole	61825					22 NZ						
Aniline	62533					2.2 CA				56.8		
Anthracene	120127	0.0007	5		13 T	0.73 T 0.012 CA	300 *C			1.48E6		
Aramite	140578									16,600		
Atrazine	1912249	29 ^W /L	76 L	3		1.8 CA		10 BC				0.2 D
Benz[a]anthracene	56553	0.0001	0.5		0.49 T	0.027 T	300 *C			5,210		
Benzene	71432	0.2	30	5	2,300 T	46 Eco	5,100 *	110 CA		255		10 D
Benzidine	92875				70 T	3.9 T						
Benzo(ghi)perylene	191242	0.0003	0.05			7.64 V	300 *C			119,000		
Benzo[a]pyrene	50328	0.0005	0.05	0.2	0.24 T	0.014 T Eco	300 *C			1,520		

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		Dutch ¹		MCL ²	Fresh		Marine		Invertebrates ⁴	Mammals ⁵	Plants ⁶	Other ⁷
		Target	Intervention		Acute ³	Chronic ³	Acute ³	Chronic ³				
Benzo[b]fluoranthene	205992					9.07 V	300 °C			59,800		
Benzo[k]fluoranthene	207089	0.0004	0.05				300 °C			148,000		
Benzoic acid	65850				740 T	42 T						
Benzyl alcohol	100516				150 T	8.6 T				65,800		
BHC, alpha (α-HCH)	319846	33 ^{ng} /L	<1		39 T	2.2 T				99.4		3 D
BHC, beta (β-HCH)	319857	8 ^{ng} /L	<1		39 T	2.2 T					3.98 v	9 D
BHC, delta δ-HCH)	319868	< 0.05	<1		39 T	2.2 T				9,940		< 10 D
BHC, gamma- (γ-HCH; Lindane)	58899	9 ^{ng} /L	<1	0.2	0.95	0.08	0.08 (½)				5 v	0.05 D
BHC (sum)	na	0.05	1		< 0.95	< 0.08	< 0.08					10 D
Biphenyl	92524					14 T Eco					60,000	
Bis(2-chloroethoxy) methane	111911				11,000 °C		12,000 °C	6,400 °C		302		
Bis(2-chloroethyl) ether	111444					1,900 V				23,700		
Bis(2-ethylhexyl)phthalate (DEHP)	117817	1.9 ^{ng} /L L	< 5	6	400 p	32 Eco 16 CA 0.3 V	400 p	360 p		925		< 100 D
Bis-2-chloro-1-methylethylether	108601									19,900		
Bromocil	314409					5 CA						
Bromodichloromethane (Dichlorobromomethane)	75274			60 W	11,000 °C		12,000 °C	6,400 °C		540		
Bromoform (Tribromomethane)	75252		630		2,300 T	320 T Eco				15,900		
Bromoxynil	1689845			5 C		5 CA						
Butanol	35296721		5,600 S									
Butyl acetate, 1- or 2-	na		6,300 S									
Butyl benzyl phthalate	85687	2.9 ^{ng} /L L	< 5		940 °C	19 T Eco	2,944 °C	3.4 °C		239		< 100 D
Captan	133062					1.3 CA						
Carbaryl	63252	2 ^{ng} /L	41 L	90 C		0.2 CA		0.32 CA				
Carbofuran	1563662	9 ^{ng} /L	6.5 L	40		1.8 CA		0.06 NZ				
Carbon disulfide	75150				17 T	0.92 T				94.1		
Carbon tetrachloride (Tetrachloromethane; Tetra)	56235	0.01	10	5	180 T	9.8 T	50,000 *	5,000 x 0.1		2,980		1,000,000 M 400 D
Catechol (o-Dihydroxybenzene)	120809	0.2	630 L									50 D

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		Target	Intervention		Acute ³	Chronic ³	Acute ³	Chronic ³				
Chlordane	57749	0.02 ^W /L	0.2	2	1.2 (½)	0.00215 (½)	0.045 (½)	0.002 (½)			224 v	0.03 D
Chlordane (alpha)	5103719	< 0.02 ^W /L	< 0.2								< 224 v	< 0.03 D
Chlordane (gamma)	5103742	< 0.02 ^W /L	< 0.2								< 224 v	< 0.03 D
Chlorfenvinphos	470906					0.1 EU		0.1 EU				
Chloroacetamide	79072								2,000			5 D
Chloroaniline	27134265		30									< 5 D
Chloroaniline, 3-	108429		< 30						30,000		20,000	< 5 D
Chloroaniline, 4-	106478		< 30		250 *C	50 *C	160 *C	129 *C		1,100		< 30 D
Chlorobenzenes (sum)	na	< 7	< 180	100		130 Eco <47 V			< 40,000	< 13,100		30 D
Chlorobenzilate	510156									5,050		20 D
Chloroform (trichloromethane)	67663	6	400	200 W	490 T	1.8 CA				1,190		
Chloro, 4- 2-methyl phenol	1570645		< 350 S									
Chloro, 4- 3-methyl phenol	59507		< 350 S							7,950		
Chloro, 4- methyl phenols	na		350 S							< 7,950		
Chloro, 4- 2-methylphenoxy acetic acid (MCPA)	94746	0.02	50	2 W		2.6 CA		4.2 CA				0.05 D
Chloronaphthalene, 1-	90131	3.7 ^W /L L	< 6									
Chloronaphthalene, 2-	91587	0.016 L	< 6		1,600 * C	0.396 V	7.5 * C			12.2		
Chlorophenol, 2-	95578	< 0.3	< 100		4,380 *	490 NZ 24 V				243		< 10 D
Chlorophenol, 3-	108430	< 0.3	< 100						10,000		7,000	< 10 D
Chlorophenol, 4-	106489	< 0.3	< 100			220 NZ						< 10 D
Chlorophenols (sum)	na	0.3	100			< 24 V			< 10,000	< 243	< 7,000	< 10 D
Chloroprene	126998									2.9		
Chlorothalonil	1897456			200 BC		0.18 CA		0.36 CA				
Chlorpyrifos	2921882			30 W	0.083	0.041	0.011	0.0056				
Chrysene	218019	0.003	0.2				300 *C			4,730		
Cresol [m-] (3-Methyl phenol)	108394	< 0.2	< 200							3,490		< 50 D
Cresol [o-] (2-Methyl phenol)	95487	< 0.2	< 200		230 T	13 T				40,400		< 50 D
Cresol [p-] (4-Methyl phenol)	106445	< 0.2	< 200							163,000		< 50 D
Cresols, sum	1319773	0.2	200		< 230 T	< 13 T				< 3,490		50 D
Cyclohexanone	108941	0.5	15,000									100 D

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		Dutch ¹		MCL ²	Fresh		Marine		Invertebrates ⁴	Mammals ⁵	Plants ⁶	Other ⁷
		Target	Intervention		Acute ³	Chronic ³	Acute ³	Chronic ³				
DDD, 4,4- (p,p-DDD, TDE)	72548	<0.004 ^{ng} /L	< 0.01	< 1 W	0.19 T	0.011 T	3.6 *	0.36 x 0.1		758		< 10 D
DDE, 4,4- (p,p-DDE)	72559	<0.004 ^{ng} /L	< 0.01	< 1 W	1,050 *	105 x 0.1	14 *	1.4 x 0.1		596		< 10 D
DDT, 4,4- (p,p-DDT)	50293	<0.004 ^{ng} /L	< 0.01	< 1 W	0.55 (½)	0.0005 (½)	0.065 (½)	0.0005 (½)		3.5		< 10 D
DDT+DDE+DDD (sum)	na	0.004 ^{ng} /L	0.01	1 W	<0.55 (½)	<0.0005 (½)	<0.065 (½)	<0.0005 (½)		21 EPA		93 A 10 D
Decane	124185				880 T	49 T						
Deltamethrin	52918635					0.0004 CA						
Demeton	8065483					0.1		0.1				
Diallate	2303164									452		
Diazinon	333415			20 C	0.17	0.17	0.82	0.82				
Dibenz[ah]anthracene	53703						300 *C			18,400		
Dibenzofuran	132649				66 T	3.7 T						
Dibromo, 1,2- 3-chloropropane (DBCP)	96128			0.2						35.2		
Dibromochloromethane (Chlorodibromomethane)	124481			100 W	11,000 *C		12,000 *C	6,400 *C		2,050		
Dibromoethane, 1,2-	106934			0.4 W						1,230		
Dicamba	1918009			120 C		10 CA						
Dichloro, 1,4- 2-butene (cis)	1476115											1,000,000 M
Dichloro, 1,4- 2-butene (trans)	110576											1,000,000 M
Dichloroaniline, 2,4-	554007		< 100 S			7 NZ			100,000			< 5 D
Dichloroaniline, 3,4-	95761		< 100 S			3 NZ		150 NZ	20,000			< 5 D
Dichlorobenzene, 1,2-	95501	< 3	< 50	600	260 T	0.7 CA	< 1,970 *S	42 CA		2,960		< 30 D
Dichlorobenzene, 1,3-	541731	< 3	< 50		630 T	71 T Eco 38 V	< 1,970 *S			37,700		< 30 D
Dichlorobenzene, 1,4-	106467	< 3	< 50	75	180 T	15 T Eco 60 NZ 9.4 V	< 1,970 *S	129 *C	20,000	546		< 30 D
Dichlorobenzenes	25321226	3	50	< 75	< 180 T	< 0.7 CA	1,970 *S		< 20,000	< 548		< 30 D
Dichlorobenzidine, 3,3-	91941					4.5 V				646		
Dichlorodifluoromethane	75718									39,500		
Dichloroethane, 1,1-	75343	7	900		830 T	47 T Eco				20,100		20 D
Dichloroethane, 1,2-	107062	7	400	5	8,800 T	100 CA	113,000 *	11,300 x 0.1		21,200		20 D

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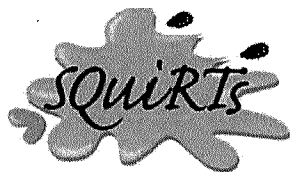
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		Dutch ¹		MCL ²	Fresh		Marine		Invertebrates ⁴	Mammals ⁵	Plants ⁶	Other ⁷
		Target	Intervention		Acute ³	Chronic ³	Acute ³	Chronic ³				
Dichloroethene, 1,1- (vinylidene chloride)	75354	0.01	10	7	450 T	25 T	224,000 *S			8,280		100 D
Dichloroethene, 1,2- (cis or trans)	540590	0.01	20	70 cis	1,100 T	590 T	224,000 *S					200 D
Dichloroethene, 1,2- (trans)	156605			100	11,600 *S	1,160 x 0.1	224,000 *S			784		
Dichlorophenol, 2,4-	120832	< 0.2	< 30	900 C	2,020 *	160 NZ 11 V				87,500		< 10 D
Dichlorophenol, 2,6-	87650	< 0.2	< 30			< 0.2 CA				1,170		< 10 D
Dichlorophenol, 3,4-	95772	< 0.2	< 30			< 0.2 CA			20,000		20,000	< 10 D
Dichlorophenol, 3,5-	591355	< 0.2	< 30			< 0.2 CA						< 10 D
Dichlorophenols (sum)	na	0.2	30	< 900 C	< 2,020 *	0.2 CA			< 20,000	< 1,170	< 20,000	< 10 D
Dichloropropane, 1,2- (propylene dichloride)	78875	< 0.08	< 80	5	23,000 *S	5,700 *S	10,300 *S	3,040 *S	700,000	32,700		< 2 D
Dichloropropene, 1,3-	542756			20 W	0.99 T	0.055 T	790 *S					
Dichloropropene, 1,3- (cis)	10061015			< 20 W	< 0.99 T	< 0.055 T				398		
Dichloropropene, 1,3- (trans)	10061026			< 20 W	< 0.99 T	< 0.055 T				398		
Diclofop-methyl	51338273			9 C		6.1 CA						
Dicofol	115322					0.5 NZ		0.1 NZ				
Didecyl dimethyl ammonium chloride (DDAC)	7173515					1.5 CA						
Dieldrin ‡	60571	0.1 mg/L	< 0.1		0.24	0.056	0.355 (½)	0.00095 (½)		2.38		22 A
Diethyl phthalate	84662	< 0.5	< 5		1,800 T	210 T 110 V	2,944 *C	3.4 *C		24,800	100,000	< 100 D
Diethylene-glycol	111466		13,000 S									
Dihydroxybenzenes, sum	na	0.24 L										
Di-iso-butyl phthalate	84695	< 0.5	< 5									< 100 D
Dimethoate	60515			6 W		6.2 CA 0.15 NZ				218		
Dimethyl aminoazobenzene [p-]	60117									40		
Dimethyl benz(a)anthracene, 7,12-	57976									16,300		
Dimethyl benzidine, 3,3-	119937									104		
Dimethyl naphthalene, 2,6-	581420											
Dimethyl phenethylamine [alpha,alpha]	122098									300		
Dimethyl phenol, 2,4-	105679				2,120 *	100 V					10 v	
Dimethyl phthalate	131113	< 0.5	< 5		940 *C	3 *C	2,944 *C	3.4 *C	200,000	734,000		< 100 D

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		Target	Intervention		Acute ³	Chronic ³	Acute ³	Chronic ³				
Di-n-butyl phthalate	84742	< 0.5	< 5		190 T	19 CA 9.7 V	2,944 *C	3.4 *C		150	200,000	< 100 D
Dinitrobenzene, 1,3-	99650									655		
Dinitrophenol, 2,4-	51285				230 *C	45 NZ 19 V	4,850 *C			60.9		
Dinitrotoluene, 2,4-	121142				330 *	65 NZ 44 V	590 *S	370 *S		1,280		
Dinitrotoluene, 2,6-	606202									32.8		
Di-n-octyl phthalate	117840	< 0.5	< 5		940 *C	3 *C	2,944 *C	3.4 *C		709,000		< 100 D
Dinoseb	88857			7		0.05 CA				21.8		
Dioxane, 1,4-	123911									2,050		
Dioxins (sum of PCDDs)	na		0.001 ^{na} /L S							0.000199		
Diphenylhydrazine 1,2-	122667				270 *	27 x 0.1						
Diphenylamine	122394									1,010		
Diquat	85007			20		1.4 NZ						
Disulfoton	298044									19.9		
Diuron	330541			150 C		0.1EU		0.1EU				
Dodecylbenzene	25155300		0.02 S									
Endosulfan (α or β: I or II)	115297	0.2 ^{na} /L	5		0.11 (½)	0.028 (½)	0.017 (½)	0.00435 (½)		119		0.01 D
Endosulfan sulfate	1031078					2.22 V				35.8		
Endrin	72208	0.04 ^{na} /L	< 0.1	2	0.086	0.036	0.0185 (½)	0.00115 (½)		10.1		0.04 D
Endrin aldehyde	7421934					0.15 V				10.5		
Esfenvalerate	66230044					0.001 NZ						
Ethanol	64175					1,400 NZ						
Ethyl acetate	141786		15,000 S									
Ethyl benzene	100414	4	150	700	130 T	7.3 T 14 V	430 *	25 CA		5,160		30 D
Ethyl methacrylate	97632									30,000		
Ethylene glycol	107211		5,500 S			192,000 CA						
Famphur	52857									49.7		
Fenitrothion	122145					0.2 NZ						
Fluoranthene	206440	0.003	1		3,980 *	0.04 CA	40 *	11 Eco		122,000		
Fluorene	86737				70 T	3.9 T Eco	300 *C		30,000	122,000		

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		Target	Intervention		Acute ³	Chronic ³	Acute ³	Chronic ³				
Formaldehyde	50000		50 S	900 W								
Furan	110009										600,000	
Glyphosate	1071836			280 C		65 CA						
Guthion (azinphos-methyl)	865000	0.1 ^m /L	2 S	20 C		0.01 0.02 NZ		0.01				0.005 D
Heptachlor	76448	0.005 ^m /L	0.3	0.4	0.26 (½)	0.0019 (½)	0.0265 (½)	0.0018 (½)		5.98		0.7 D
Heptachlor epoxide	1024573	0.005 ^m /L	3	0.2	0.26 (½)	0.0019 (½)	0.0265 (½)	0.0018 (½)		152		0.0002 D
Hexachlorobenzene	118741	2.1E-7 L	0.5	1	6 p	3.68 p 0.0003 V	160 *C	129 *C		199		1,000,000 M
Hexachlorobutadiene (HCBd)	87683			0.6 W	90 *	1.3 CA 0.053 V	32 *	3.2 x 0.1		39.8		
Hexachlorocyclohexane (BHC)	608731				100 *	10 x 0.1	0.34 *	0.034 x 0.1				
Hexachlorocyclopentadiene	77474			50	7 *	5.2 *	7 *	0.7 x 0.1		755	10,000	
Hexachloroethane	67721				210 T	12 T Eco 8 V	940 *	94 x 0.1		596		
Hexachlorophene	70304									199		
Hexane	110543				10 T	0.58 T						
Hexanone, 2- (methyl butyl ketone)	591786				1,800 T	99 T				12,600		
Hydroquinone (p-dihydroxybenzene)	123319	0.2	800									50 D
Indeno[1,2,3-cd]pyrene	193395	0.0004	0.05			4.31 V	300 *C			109,000		
Iodo, 3- 2-propynyl butyl carbamate (IPBC)	55406536					1.9 CA						
Isodrin	465736										3.32 v	
Isophorone	78591				117,000 *	1,170 x 0.1 920 V	12,900 *	1,290 x 0.1		139,000		
Isoproturon	34123596			9 W		0.1 EU		0.1 EU				
Isosafrole	120581									9,940		
Kepone	143500									32.7		
Linear alkylbenzene sulfonates (LAS)	na					280 NZ						
Linuron	335502					7.0 CA						
Malathion	121755			190 C		0.1		0.1				
Maneb	12427382	0.05 ^m /L	0.1									2 D
Methacrylonitrile	126987									57		
Methanol	67561		24,000 S									

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		Target	Intervention		Acute ³	Chronic ³	Acute ³	Chronic ³				
Methanol	67561		24,000 S									
Methapyrilene	91805									2,780		
Methomyl	16752775					3.5 NZ						
Methoxychlor	72435			40		0.03		0.03		19.9		
Methyl bromide	74839					16 V				235		
Methyl chloride	74873									10,400		
Methyl cholanthrene, 3-	56495									77.9		
Methyl, 2- 4,6-dinitrophenol	534521									144		
Methyl ethyl ketone (MEK; 2-Butanone)	78933		6,000 S		240,000 T	14,000 T				89,600		
Methyl iodide	74884									1,230		
Methyl methacrylate	80626									984,000		
Methyl methanesulfanate	66273									315		
Methyl naphthalene, 1-	90120				37 T	2.1 T						
Methyl naphthalene, 2-	91576					330 V	300 °C			3,240		
Methyl parathion	298000									0.292		
Methyl, 4- 2-pentanone	108101				2,200 T	170 T				443,000		
Methyl-tert-butyl ether (MTBE)	1634044		9,200 S			10,000 CA		5,000 CA				
Methylene bromide (Dibromomethane)	74953				11,000 °C		12,000 °C	6,400 °C		65,000		
Methylene chloride (Dichloromethane, DCM)	75092	0.01	1,000	5	26,000 T	2,200 T 98.1 CA	12,000 °C	6,400 °C		4,050		400 D
Metolachlor	51218452			10 W		7.8 CA						
Metribuzin	21087649			80 C		1 CA						
Mineral oil (Operationally defined)	8012951	50	600									50,000 D
Mirex	2385855					0.001		0.001				
Molinate	2212671			6 W		3.4 NZ						
Monochloroaniline (3 isomers)	na		30									5 D
Monochlorobenzenes	108907	7	180	100	1,100 T	1.3 CA	160 °C	25 CA	40,000	13,100		< 30 D
Monochloronaphthalenes		7.7 µg/L L	6									120 L
Monochlorophenols (sum)	na	0.3	100			7 CA						< 10 D
Naphthalene	91203	0.01	70		190 T	1.1 CA	2,350 *	1.4 CA		99.4		
Naphthoquinone, 1,4-	130154									1,670		

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7: M – microbes; A – avian



Screening Quick Reference Tables for Organic in Water and Soil

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ANALYTE <small>All concentrations in parts per billion unless specified otherwise</small>	CAS Number	GROUND WATER			SURFACE WATERS				SOIL			
		Dutch		MCL ²	Fresh		Marine		Invertebrates ⁴	Mammals ⁵	Plants ⁶	Other ⁷
		Target	Intervention		Acute ³	Chronic ³	Acute ³	Chronic ³				
Naphthylamine, 1-	134327									9,340		
Naphthylamine, 2-	91598									3,030		
Nitroaniline [m-]	99092									3,160		
Nitroaniline [p-]	100016									21,900		
Nitroaniline, 2-	88744									74,100		
Nitrobenzene	98953				27,000 *	550 NZ 220 V	6,680 *	668 x 0.1	40,000	1,310		1,000,000 M
Nitro-o-toluidine, 5-	99558									8,730		
Nitrophenol, 2-	88755									1,600		
Nitrophenol, 4-	100027				1,200 T	300 T 60 V	4,850 *C		7,000	5,120		
Nitroquinoline, 4- 1-oxide	56575									122		
Nitrosodiethylamine, N-	55185					768 V				69.3		
Nitrosodimethylamine, N-	62759									0.0321		
Nitroso-di-n-butylamine, N-	924163									267		
Nitroso-di-n-propylamine, N-	621647									544		
Nitrosodiphenylamine, N-	86306				3,800 T	210 T	3,300,000 *C		20,000	545		
Nitrosomethylethylamine, N-	10595956									1.66		
Nitrosomorpholine, N-	59892									70.6		
Nitrosopiperidine, N-	100754									6.65		
Nitrosopyrrolidine, N-	930552									12.6		
Nonylphenol	25154523				28	6.6	7	1.7				
O,O-diethyl O-2-pyrazinylphosphorothioate	297972									799,000		
Octanone, 2-	111137				150 T	8.3 T						
PAHs, High MW	na						300 *C		29,000 EPA	100,000 EPA		< 1,000 D
PAHs, Low MW	na						300 *C		18,000 EPA	1,100 EPA		< 1,000 D
PAHs, Total	na						300 *C					1,000 D
Paraquat	4685147					0.5 NZ						
Parathion	56382			50 C	0.065	0.013			0.34 V			
PCBs (sum)	1336363	0.01	0.01	0.5	0.6 T 0.03 NZ	0.014	0.033 T	0.03		0.332	40,000	< 20 D
Pentachloroaniline	527208		1 S						100,000			

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Screening Quick Reference Tables for Organic in Water and Soil

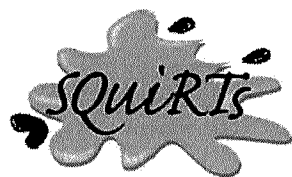
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		Dutch		MCL ²	Fresh		Marine		Invertebrates ⁴	Mammals ⁵	Plants ⁶	Other ⁷
		Target	Intervention		Acute ³	Chronic ³	Acute ³	Chronic ³				
Pentachlorobenzene	608935	0.003	1		8.4 T	0.47 T 0.019 V	160 °C	129 °C	20,000	497		< 30 D
Pentachloroethane	76017				7,240 *	1,100 *	390 *	281 *		10,700		
Pentachloronitrobenzene	82688									7,090		
Pentachlorophenol [PCP: at pH 7.8]	87865	0.04	3	1.0	19 ph	15 Ph	13	7.9	6,000	119	3,000	2,100 A
Pentanol, 1-	71410				2,000 T	110 T						
Permethrin	52645531					0.004 CA		0.001 CA				
Phenacetin	62442									11,700		
Phenanthrene	85018	0.003	5		30 p	6.3 p Eco 3.6 V	7.7 p	4.6 p		45,700		
Phenol	108952	0.2	2,000		10,200 *	320 NZ 180 V	5,800 *	400 NZ	30,000	120,000	70,000	1,000,000 M 500 D
Phenylenediamine [p-]	106503									6,160		
Phorate	298022			2 C						0.496		
Phthalates (sum)	na	0.5	5									100 D
Picloram	1918021			500		29 CA						
Picoline, 2-	109068									9,900		
Polychlorinated dibenzofurans	51207319									0.0386		
Pronamide	23950585										13.6 v	
Propanol, 2- (Isopropanol)	67630		31,000 S		130 T	7.5 T						
Propionitrile	107120									49.8		
Propylene glycol	57556					500,000 CA						
Pyrene	129000					0.025 CA	300 °C			78,500		
Pyridine	110861	0.5	30							1,030		100 D
Quinoline	91225					3.4 CA						
Resorcinol (m-dihydroxybenzene)	108463	0.2	600									50 D
Safrole	94597									404		
Silvex (2,4,5-TP)	93721			50							109 v	
Simazine	122349			4		10 CA 3.2 NZ		1 EU				
Styrene (Vinyl benzene)	100425	6	300	100		72 CA 32 V				4,690	300,000	300 D

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		Dutch ¹		MCL ²	Fresh		Marine		Invertebrates ⁴	Mammals ⁵	Plants ⁶	Other ⁷
		Target	Intervention		Acute ³	Chronic ³	Acute ³	Chronic ³				
Tebuthiuron	34014181			490 BC		1.6 CA 2.2 NZ						
Temephos	3383968					0.05 NZ		0.05 NZ				
Tetrachloroaniline, 2,3,5,6-	3481207		< 10 S						20,000		20,000	
Tetrachlorobenzene, 1,2,3,4-	634662	< 0.01	< 2.5		250 *C	1.8 CA	160 *C	129 *C	10,000			< 30 D
Tetrachlorobenzene, 1,2,3,5-	634902	< 0.01	< 2.5		250 *C		160 *C	129 *C				< 30 D
Tetrachlorobenzene, 1,2,4,5-	95943	< 0.01	< 2.5		250 *C	50 *C 3 V	160 *C	129 *C		2,020		< 30 D
Tetrachlorobenzenes	na	0.01	2.5		250 *C	< 3 V	160 *C	129 *C	< 10,000	< 2,020		< 30 D
Tetrachloroethane, 1,1,1,2-	630206									225,000		
Tetrachloroethane, 1,1,2,2-	79345				2,100 T	111 CA	9,020 *	902 x 0.1		127		
Tetrachloroethylene (Tetrachloroethene; PCE; PER)	127184	0.01	40	5	830 T	98 T 45 V	10,200 *	450 *		9,920		2 D
Tetrachlorophenol, 2,3,4,5-	4901513	< 0.01	< 10			< 1 CA			20,000			< 10 D
Tetrachlorophenol, 2,3,4,6-	58902	< 0.01	< 10	100 C		20 NZ	440 *	44 x 0.1		199		< 10 D
Tetrachlorophenols (sum)	25167833	0.01	10			1 CA			< 20,000	< 199		< 10 D
Tetraethylthiopyrophosphate	3689245									596		
Tetrahydrofuran	109999	0.5	300									100 D
Tetrahydrothiophene	110010	0.5	5,000									100 D
Thiobencarb	28249776					2.8 NZ						
Thiram	137268					0.2 NZ		0.01 NZ				
Toluene	108883	7	1,000	1,000	120 T	9.8 T 2 CA	6,300 *	215 CA		5,450	200,000	10 D
Toluidine [o-]	95534									2,970		
Toxaphene	8001352			3	0.73	0.0002	0.21	0.0002		119		
Triallate	2303175					0.24 CA						
Tributyltin oxide	56359	<0.05E-16 mg/L	< 0.7		0.46	0.072	0.42	0.0074				< 1 D
Trichloroaniline (multiple isomers)	na		10 S									
Trichloroaniline, 2,4,5-	636306		< 10 S						20,000		20,000	
Trichlorobenzene, 1,2,3-	87616	< 0.10	< 10			8.0 CA			20,000			< 30 D
Trichlorobenzene, 1,2,4-	120821	< 0.10	< 10	70	700 T	24 CA	160 *C	5.4 CA	20,000	11,100		< 30 D
Trichlorobenzenes	12002481	0.01	10	< 70	< 700 T	< 8 CA	160 *C	< 5.4 CA	< 20,000	< 11,100		< 30 D

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		Dutch		MCL ²	Fresh		Marine		Invertebrates ⁴	Mammals ⁵	Plants ⁶	Other ⁷
		Target	Intervention		Acute ³	Chronic ³	Acute ³	Chronic ³				
Trichloroethane, 1,1,1-	71556	0.01	300	200	200 T	11 T	31,200 *	3,120 x 0.1		29,800		70 D
Trichloroethane, 1,1,2-	79005	0.01	130	5	5,200 T	1,200 T 500 V		1,900 NZ		28,600		400 D
Trichloroethene (TCE)		24	500	5		21 CA	2,000 *	200 x 0.1		12,400		100 D
Trichloroethene, 1,1,1-	71556	< 24	< 500	< 5	< 440 T	< 21 CA						< 100 D
Trichloroethene, 1,1,2-	79016	< 24	< 500	< 5	< 440 T	< 21 CA						< 100 D
Trichlorofluoromethane	75694				11,000 *C		12,000 *C	6,400 *C		16,400		
Trichlorophenol, 2,3,5-		< 0.03	< 10			< 18 CA						< 10 D
Trichlorophenol, 2,4,5-	95954	< 0.03	< 10		100 p	63 p	240 p	11 p	9,000	14,100	4,000	< 10 D
Trichlorophenol, 2,4,6-	88062	< 0.03	< 10	5 C		20 NZ 4.9 V			10,000	9,940		< 10 D
Trichlorophenols, (sum)	na	0.03	10			18 CA			< 9,000	< 9,940	< 4,000	< 10 D
Trichloropropane, 1,2,3-	96184									3,360		
Triethylphosphorothioate [O,O,O-]	126681									818		
Trifluralin	1582098			20 W		0.2 CA		0.1EU				
Trinitrobenzene, 1,3,5-	99354									376		
Trinitrotoluene, 2,4,6-	118967					140 NZ						
Vinyl acetate	108054				280 T	16 T				12,700		
Vinyl chloride	75014	0.01	5	2		930 V				646		10 D
Xylene, m-	108383	< 0.2	< 70		32 T	1.8 T Eco						< 100
Xylene, o-	95476	< 0.2	< 70			350 NZ						< 100
Xylene, p-		< 0.2	< 70									< 100
Xylenes	1330207	0.2	70	10,000	230 T	13 T					10,000 v	100 D

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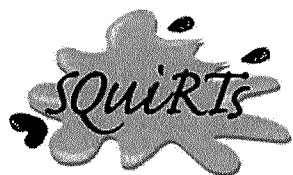


Screening Quick Reference Tables for Organic in Water and Soil

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Sources

- 1 – Entry is lower of current VROM Environmental Quality standards or the updated RIVM Environmental Risk Limits. Risk limits are typically divided by 100 to derive the Target value; this computation has been done here.
Dutch Target/Intervention: E.M.J. Verbruggen, R. Posthumus and A.P. van Wezel, 2001. Ecotoxicological Serious Risk Concentrations for soil, sediment, and (ground)water: updated proposal for first series of compounds. Nat. Inst. Public Health and the Env., and subsequent updates as published elsewhere.
Min. Housing, Spatial Plan. And the Env., 2000. Annexes Circular on target values and intervention values for soil remediations.
- 2 – Primary entry is the US EPA MCL value, followed by the lower of appropriate WHO, Canadian, or British Columbia guidelines.
Maximum Contaminant Levels (MCLs): <http://www.epa.gov/safewater/index.html>
W – World Health Organization's (WHO) Drinking water guidelines: http://www.who.int/water_sanitation_health/dwg/en/
C – Canadian Environmental Quality Guidelines for Community Water, Summary Table Update 2002: <http://www.ccme.ca>
BC – British Columbia Water Quality Guidelines (either working or recommended): <http://www.env.gov.bc.ca/wat/wq/>
- 3 – Primary entry is the US Ambient Water Quality Criteria, followed by the lowest of Tier II SAVs or available standards or guidelines.
Lowest Observable Effect Levels (LOELs) previously published by EPA are also included since these essentially were the basis for many state standards.
EPA Ambient water Quality Criteria (AWQC): <http://www.epa.gov/waterscience/criteria/aqlife.html>
T – Tier II Secondary Acute Value: <http://www.esd.ornl.gov/programs/ecorisk/tools.html>
Eco – EPA EcoUpdate, Ecotox Thresholds, EPA 540/F-95/038
CA – Canadian water Quality Guidelines: <http://www.ec.gc.ca/CEQG-RCQE/English/Ceqq/Water/default.cfm>
BC – British Columbia Water Quality Guidelines (either working or recommended): <http://www.env.gov.bc.ca/wat/wq/>
EU – European Union (EU) Environmental Quality Standards: COM(2006) 397 and 398 final.
V – US EPA Region V Ecological Screening Levels: <http://www.epa.gov/reg5rcra/ca/edql.htm>
- 4 – Toxicological Benchmarks for Effects on Earthworms: <http://www.esd.ornl.gov/programs/ecorisk/tools.html>
EPA – Eco-SSL for Invertebrates: <http://www.epa.gov/ecotox/ecossl/>
Region V Ecological Screening Level for Invertebrates: <http://www.epa.gov/reg5rcra/ca/>
- 5 – Entry is lower of either:
Region V Ecological Screening Level for shrew or vole: <http://www.epa.gov/reg5rcra/ca/>
EPA – Eco-SSL for Mammals: <http://www.epa.gov/ecotox/ecossl/>
- 6 – Toxicological Benchmarks for Effects on Terrestrial Plants: <http://www.esd.ornl.gov/programs/ecorisk/tools.html>
V – EPA Region V Ecological Screening Level for Plants: <http://www.epa.gov/reg5rcra/ca/>
- 7 – Entry is lower of either:
M – Toxicological Benchmarks for Effects on Microbes: <http://www.esd.ornl.gov/programs/ecorisk/tools.html>
A – Eco-SSL for Avian Receptors: <http://www.epa.gov/ecotox/ecossl/>
D – Entry is lower of current VROM Environmental Quality standards or the updated RIVM Environmental Risk Limits. See #1 above for sources.



Screening Quick Reference Table for PCB Composition

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Degree of Chlorination	A1221 Wt %	A1232 Wt %	A1016 Wt %	A1242 Wt %	A1248 Wt %	A1254 Wt %	A1260 Wt %	A1262 Wt %
Biphenyl	11.7 ^a	6.2 ^a						
Σ1 Cl	65.5	31.3	Tr (#1, 3)	Tr (#1, 3)				
Σ2 Cl	30.0	26.1	15.2	11.5	Tr (#7, 8)			
Σ3 Cl	3.5	21.7	58.2	51.0	21.8	2.1		
Σ4 Cl	Tr	15.0	26.5	29.0	60.2	14.3	Tr (#52, 70, 74)	Tr (#52, 70, 74)
Σ5 Cl	Tr (#95)	5.8	Tr (#91, 95, 102)	8.5	17.1	53.2	8.2	3.5
Σ6 Cl				Tr (#136, 138)	0.8	26.6	47.2	31.6
Σ7 Cl					Tr	3.8	37.6	45.8
Σ8 Cl						Tr (#202)	6.3	17.7
Σ9 Cl							0.7	1.3
Total	99.1%	99.94%	99.95%	100%	99.93%	99.95%	100.01%	99.98%
Prominent congeners ^b	1 3 8 4 15 6	1 8 3 4 15 28	18 28 8 31 33 16	18 28 31 8 33 16	66 70 64 28 52 60	118 110 101 95 138 153	180 138 149 187 174 170	180 153187 149 174 203
Unique congener	#11 Tr					#137	#189 Tr	
Peak Range ^c	1-48	1-74	2-50	2-82	8-106	8-107	31.1-117	31.1-117
Ratio #118:203 ^d	Neither	No #203	Neither	No #203	73	370 - 1230	0.3 – 0.5	0.1
Ratio #31:118 ^e	No #118	4.3	No #118	8.5 - 9.2	2.1	0.01 – 0.04	0.1	No #31
Wt % of #153 ^f				0.1 - 0.14	Tr - 0.52	4.7-6.1	11.0 – 12.2	
Additional Information		~ 1:1 mix of 1221-1242	Distillation of 1242					

Notes

Commercial PCBs were manufactured by chlorination of biphenyl to produce complex mixtures (Aroclors in the USA and Great Britain, Clophens in Germany, or Kanechlors in Japan), each containing 60 to 90 different molecular species (*congeners*) and a specified weight percent of chlorine (for example, 54% in Aroclor 1254). There are 209 distinct congener structures possible, of which about 140 to 150 have been detected at significant levels in commercial PCBs.

Congener distributions in environmental samples roughly resemble those of the parent commercial mixtures, but are often modified due to evaporation, water extraction, microbial oxidation or dechlorination, photochemical dechlorination or differential biological uptake and metabolism. Compositional modification from original Aroclor patterns increases in biotic samples with trophic level. Still, it is often useful or necessary to attempt distinguishing the parent mixture released. The following information is presented to provide assistance with initial, preliminary evaluation of Aroclor. *Aroclor assignment should be conducted only by qualified chemists.*

Total PCBs can be characterized by two primary methods – the sum of congeners, or, the sum of estimates of individual Aroclor concentrations. In lower trophic level samples, these two methods provide approximately equal estimates of total PCBs. At higher trophic levels, analyses of samples tend to overestimate total PCBs by as much as 2-fold using the sum of Aroclor method, due to an overestimation of Aroclor 1254.

Tr - Individual congeners are at trace levels - 0.05 to 0.5% each - and are not included in totals.

- Refers to IUPAC congener number. IUPAC #s 107, 108, 109, 199, 200, 201 correspond to BZ#s 108, 109, 107, 201, 199, and 200, respectively.

a - Biphenyl figures are not reflected in congener weight percentages.

b - The six most prominent peaks listed by IUPAC congener number.

c - In the 118 peak numbering system, peak 1 is biphenyl.

d - This ratio is often used as an indicator for Aroclor 1260.

e - This ratio is often used as an indicator for Aroclor 1248.

f - Congener 153 is persistent in biota and abundantly present in higher chlorinated Aroclors and so provides a degree of modification estimate for biotic samples (increasing modification with decreasing PD values):

$$PD_{153} = \left[\frac{\#153_{theory} - \#153_{sample}}{\#153_{sample}} \right] * 100$$



Screening Quick Reference Table for Toxic Equivalency Factors

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Compound	2005 Mammals / human TEF	1998 Fish TEF	1998 Avian TEF
CHLORINATED DIBENZO-P-DIOXINS			
2,3,7,8-TCDD	1	1	1
1,2,3,7,8-PeCDD	1	1	1
1,2,3,4,7,8-HxCDD	0.1	0.5	0.05
1,2,3,6,7,8-HxCDD	0.1	0.01	0.01
1,2,3,7,8,9-HxCDD	0.1	0.01	0.1
1,2,3,4,6,7,8-HpCDD	0.01	0.001	<0.001
OCDD	0.0003	<0.0001	<0.0001
CHLORINATED DIBENZOFURANS			
2,3,7,8-TCDF	0.1	0.05	1
1,2,3,7,8-PeCDF	0.03	0.05	0.1
2,3,4,7,8-PeCDF	0.3	0.5	1
1,2,3,4,7,8-HxCDF	0.1	0.1	0.1
1,2,3,6,7,8-HxCDF	0.1	0.1	0.1
1,2,3,7,8,9-HxCDF	0.1	0.1	0.1
2,3,4,6,7,8-HxCDF	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDF	0.01	0.01	0.01
1,2,3,4,7,8,9-HpCDF	0.01	0.01	0.01
OCDF	0.0003	<0.0001	0.0001
NON-ORTHO-SUBSTITUTED PCBs			
3,3#,4,4#-tetraCB (PCB 77)	0.0001	0.0001	0.05
3,4,4#,5-tetraCB (PCB 81)	0.0003	0.0005	0.1
3,3#,4,4#,5-pentaCB (PCB 126)	0.1	0.005	0.1
3,3#,4,4#,5,5#-hexaCB (PCB 169)	0.03	0.00005	0.001
MONO-ORTHO-SUBSTITUTED PCBs			
2,3,3#,4,4#-pentaCB (PCB 105)	0.00003	<0.000005	0.0001
2,3,4,4#,5-pentaCB (PCB 114)	0.00003	<0.000005	0.0001
2,3#,4,4#,5-pentaCB (PCB 118)	0.00003	<0.000005	0.00001
2#,3,4,4#,5-pentaCB (PCB 123)	0.00003	<0.000005	0.00001
2,3,3#,4,4#,5-hexaCB (PCB 156)	0.00003	<0.000005	0.0001
2,3,3#,4,4#,5#-hexaCB (PCB 157)	0.00003	<0.000005	0.0001
2,3#,4,4#,5,5#-hexaCB (PCB 167)	0.00003	<0.000005	0.00001
2,3,3#,4,4#,5,5#-heptaCB (PCB 189)	0.00003	<0.000005	0.00001

It has been well established that 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD), and other chlorinated dioxins, furans, and even PCBs with a similar planar chemical structures are capable of inducing similar toxicity, such as carcinogenicity. Since these compounds generally are observed in mixtures, it is desirable to be able to express the cumulative, overall toxicity of the mixture. However, since each of these congeners does not exhibit the same degree, or potency, of toxicity, some manipulations of raw concentrations are required to express total toxicity.

A number of systems have been developed to express the total, overall toxicity from mixtures of these chemicals. Most commonly, the potency of each congener is weighted relative to a standard, generally the most potent congener. For dioxins and furans, 2,3,7,8-TCDD is the common standard which is given a reference value of one. The weighting, or potency factor, is called a Toxic Equivalency Factor (TEF). When cumulative results are reported, the absolute concentration of each congener is multiplied by its corresponding TEF to derive a TCDD-equivalency. These values are then summed together to give a total Toxic Equivalency Quotient, or TEQ.

The TEQ scheme refers **only** to adverse effects (e.g., cancer) following interactions with certain cellular enzyme systems (the Ah receptors). Other toxic effects of dioxins and dioxin-like compounds are not quantified by this method. Because they involve potency to specific enzyme systems, TEF values vary for different animal species.

There are two main schemes:

The two most common systems for determining TEQs are:

- 1) **I-TEF and I-TEQ:** The older International Toxic Equivalent (I-TEQ) scheme by the North Atlantic Treaty Organization (NATO) initially set up in 1989 and later extended and updated.
- 2) **WHO-TEF and WHO-TEQ** (also referred to as TEF or TEQ): More recently, the World Health Organization (WHO) suggested modified Toxic Equivalency Factor (TEF) values for human risk assessment.

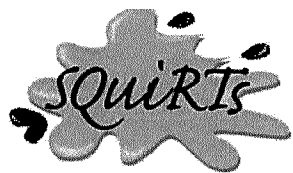
ITEQs are most common in North America, while Asia and Europe tend to use WHO-TEQs. On average, the result of TEQ-calculations is about 10% higher when I-TEFs are used compared to when WHO-TEFs are used.

Potency in fish reflects mainly rainbow trout: potency for birds is mainly derived from chickens.

Sources

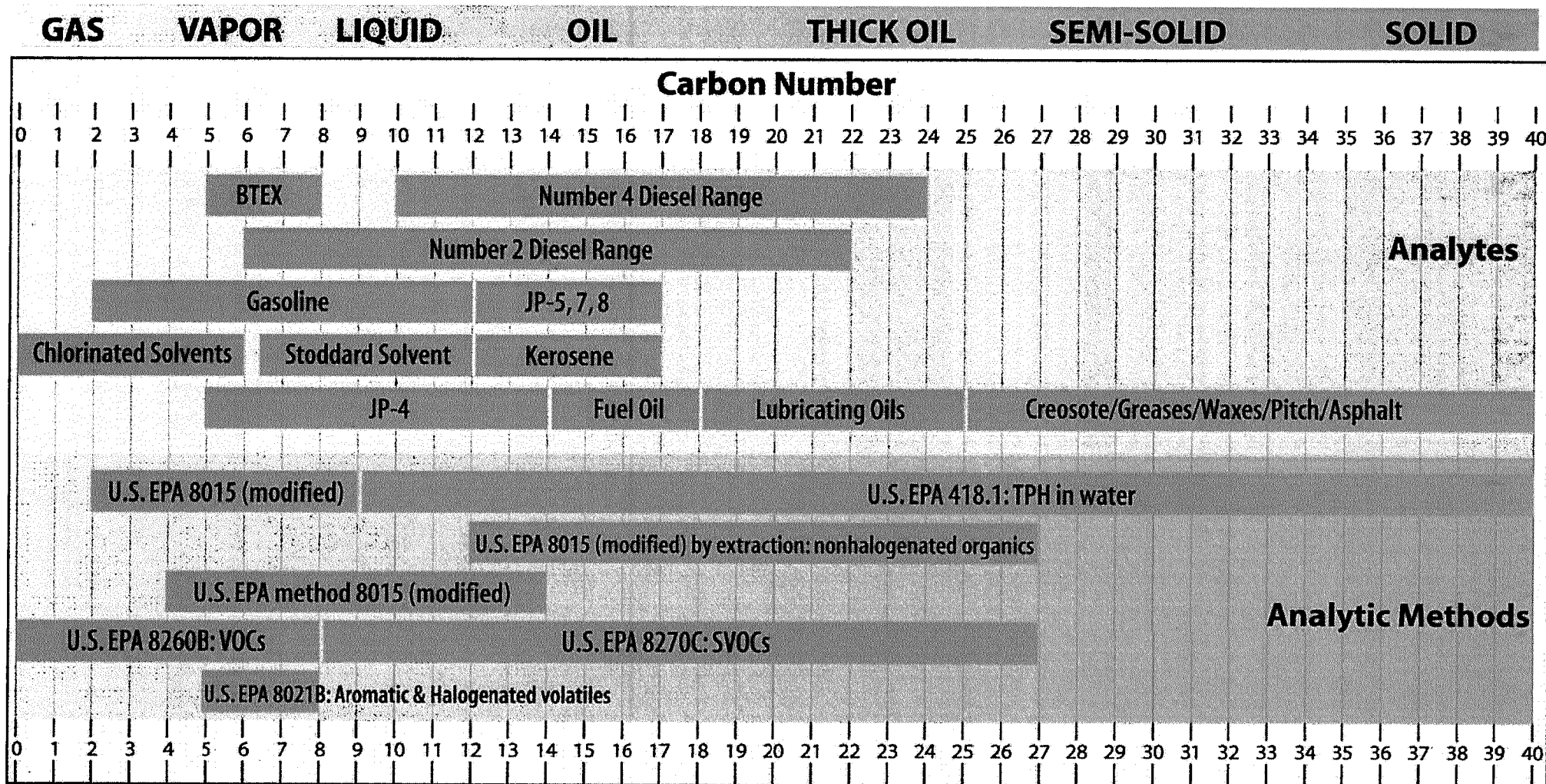
Van den Berg, M., and others. 1998. "Toxic Equivalency Factors (TEFs) for PCBs, PCDDs, and PCDFs for Humans and Wildlife." *Environmental Health Perspectives*. Volume 106. Pages 775 - 792.

Van den Berg, M., and others. 2006. "The 2005 World Health Organization Re-evaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds." *Toxicological Sciences* 93(2):223-241.



Screening Quick Reference Tables for Composition by Carbon Range

These tables were developed for screening purposes only: they do not represent official NOAA policy and do not constitute criteria or clean-up levels. All attempts have been made to ensure accuracy; however, NOAA is not liable for errors. Values are subject to changes as new data become available.



Carbon ranges are approximate: actual carbon ranges for a specific product are dependent upon the distillation process of the exact source.

Analytic Methods generally refer to EPA SW-846 methods (www.epa.gov/SW-846/index.htm)



Screening Quick Reference Tables for Sample Collection and Storage

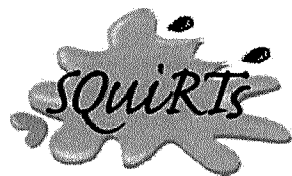
These tables were developed for screening purposes only: they do not represent official NOAA policy and do not constitute criteria or clean-up levels. All attempts have been made to ensure accuracy; however, NOAA is not liable for errors. Values are subject to changes as new data become available.

MATERIAL	CONTAINER	PRESERVATION	MAXIMUM HOLDING TIME	SAMPLE SIZE
INORGANICS				
Chromium ⁺⁶ (Cr ⁺⁶)	P,G	Cool, 4°C	24 hours	400 mL/200 g
Mercury (Hg)	P,G	HNO ₃ , to pH <2	28 days	400 mL/200 g
Metals, except Cr ⁺⁶ and Hg	P,G	HNO ₃ , to pH <2	6 months	600 mL/200 g
Cyanide by method no. 9010	P,G	Cool 4°C, pH >12 See method 9010	14 days	1,000 mL
Alpha, Beta, and Radium Radiation	P,G	HNO ₃ to pH <2	6 months	1,000 mL
ORGANICS				
Benzidines	G, TLC	Cool, 4°C	7 days until extraction, 40 days after extraction	1,000 mL
Chlorinated Hydrocarbons	G, TLC	Cool, 4°C ³	7 days until extraction, 40 days after extraction	1,000 mL
Dioxins and Furans	G, TLC	Cool, 4°C ³	30 days until extraction, 45 days after extraction	1,000 mL
Haloethers	G, TLC	Cool, 4°C ³	7 days until extraction, 40 days after extraction	1,000 mL
Nitrites	G, TLC	Cool, 4°C ³	14 days	
Nitrosamines	G, TLC	Cool, 4°C ³	7 days until extraction, 40 days after extraction	1,000 mL
Nitroaromatics and Cyclic Ketones	G, TLC	Cool, 4°C ³	7 days until extraction, 40 days after extraction	1,000 mL
OIL And GREASE	G	Cool, 4°C ²	28 days	1,000 mL
TOTAL Organic Carbon, By Method No. 9060	P,G	Cool, 4°C ² store in the dark	28 days	100 mL
TOTAL Organic Halides By Method No. 9020/9021	G, TLC	Cool, 4°C ²	28 days	500 mL
PCBs	G, TLC	Cool, 4°C	7 days until extraction, 40 days after extraction	1,000 mL/250 mL
Pesticides	G, TLC	Cool 4°C,	7 days until extraction, 40 days after extraction	1,000 mL/250 mL
Phenols	G, TLC	Cool, 4°C ³	7 days until extraction, 40 days after extraction	1,000 mL
Phthalate Esters	G, TLC	Cool, 4°C	7 days until extraction, 40 days after extraction	1,000 mL
Polynuclear Aromatic Hydrocarbons	G, TLC	Cool, 4°C ³ store in the dark	7 days until extraction, 40 days after extraction	1,000 mL/250 mL
Purgeable Aromatic Hydrocarbons	VOA	Cool, 4°C ^{2,3}	14 days	40 mL
Purgeable Halocarbons	VOA	Cool, 4°C ³	14 days	40 mL

Sources

EPA SW846

- 1 P - Polyethylene; G - Amber glass containers; TLC - Teflon-lined cap; VOA - Volatile organic analyte vial of amber glass with teflon-lined septum.
- 2 Adjust to pH <2 with H₂SO₄, HCl, or solid NaHSO₄
- 3 Free chlorine must be removed before addition of HCl by exact addition of Na₂S₂O₃



Screening Quick Reference Table

Options for Selection of Analytical Methods: Inorganics

These tables were developed for screening purposes only: they do not represent official NOAA policy and do not constitute criteria or clean-up levels. All attempts have been made to ensure accuracy; however, NOAA is not liable for errors. Values are subject to changes as new data become available.

TRACE ELEMENT	OTHER ¹	FLAME AA	FURNANCE AA	ICP	EXTRACTION METHODS	
					WATER	SOIL/SEDIMENT
Aluminum (Al)	6800	7020		6010B 6020A	3005A 3010A 3015A	3050B 3051A
Antimony (Sb)	6200(55) 6800	7040	7041 7062 ³	6010B 6020A	3005A 3015A	3050B 3051A
Arsenic (As)	6200(60) 7063 7061A ³		7060 7062 ³	6010B 6020A	3005A 3010A 3015A 7063	3050B 3051A
Barium (Ba)	6200(60) 6800	7080A	7081 ³	6010B 6020A	3005A 3010A 3015A	3050B 3051A
Beryllium (Be)		7090	7091	6010B 6020A	3005A 3010A 3015A 3020A	3050B 3051A
Cadmium (Cd)	6200 6800	7130	7131A	6010B 6020A	3005A 3010A 3015A 3020A	3050B 3051A
Calcium (Ca)	6200 6800	7140		6010B 6020A	3005A 3010A 3015A	3050B 3051A
Chromium (CR), total	6200(200) 6800	7190	7191	6010B 6020A	3005A 3010A 3015A 3020A	3050B 3051A
Chromium+6 (Cr+6)	7195 — 7199 ³				7195 - 7199	3060A
Cobalt (Co)	6200(330)	7200	7201	6010B 6020A	3005A 3010A 3015A 3020A	3050B 3051A
Copper (Cu)	6200(85) 6800	7210	7211 ³	6010B 6020A	3005A 3010A 3015A	3050B 3051A
Iron (Fe)	6200 6 800	7380	7381 ³	6010B 6020A	3005A 3010A 3015A	3050B 3051A
Lead (Pb)	6200(45) 6800	7420	7421	6010B 6020A	3005A 3010A 3015A 3020A	3051A
Magnesium (Mg)	6800	7450		6010B 6020A	3005A 3010A 3015A	3050B 3051A
Manganese (Mn)	6200(240)	7460	7461	6010B 6020A	3005A 3010A 3015A	3050B 3051A
Mercury (Hg)	4500(0.5) 6200 6800 7470A 7471B 7472 7473 7474 ³			6020A	7470A 7472 3015A	3051A 7471B 7473 7474
Molybdenum (Mo)	6200(25) 6800	7480	7481	6010B	3005A 3010A 3015A 3020A	3050B 3051A
Nickel (Ni)	6200(100) 6800	7520	7521	6010B 6020A	3005A 3010A 3015A	3050B 3051A
Potassium (K)	6200 6800	7610		6010B 6020A	3005A 3010A 3015A	3050B 3051A
Selenium (Se)	6200 6800 7741A 7742 ³		7740	6010B 6020A	3005A 3010A 3015A	3050B 3051A
Silver (Ag)	6200 6800	7760A	7761 ³	6010B 6020A	3005A 3015A	3051A 7760 7761
Sodium (Na)		7770		6010B 6020A	3005A 3010A 3015A	3050B 3051A
Strontium (Sr)	6200(30) 6800	7780		6010B	3015A	3050B 3051A
Thallium (Tl)	6200 6800	7840	7841	6010B 6020A	3005A 3010A 3015A 3020A	3050B 3051A
Tin (Sn)	6200(85)	7870				
Vanadium (V)	6200 6800	7910	7911	6010B 6020A	3005A 3010A 3015A 3020A	3050B 3051A
Zinc (Zn)	6200(80) 6800	7950	7951 ³	6010B 6020A	3005A 3010A 3015A	3050B 3051A
Cyanide (HCN)	9010B — 9014 ³					

Sources

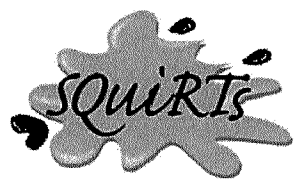
All method numbers refer to EPA SW-846, Volume III with changes as proposed for Volume IV.

ICP's advantage is that it allows simultaneous or rapid sequential determination of many elements, but suffers from interferences. AA determinations are normally completed as single element analyses. ICP and Flame AA have comparable detection limits (within a factor of 4), but ICP-MS (6020A) can drastically improve the detection limits (e.g., an order of magnitude lower). Furnace AA generally exhibits lower detection limits than ICP or Flame-AA, and offers more control over unwanted matrix components. X-RAY and immunoassays allow field determinations.

¹ Method 6200 is Portable X-Ray; 6800 is Elemental/Isotope Mass Spec.; 4500 is Immunoassay; 7063 is ASV; where available, soil detection limits in ppm are in parentheses.

² Except as noted, most individual procedures are proposed to be integrated into Method 7000B or 7010.

³ Includes various methods. Follow the extraction procedure detailed in the individual determinative method.



Screening Quick Reference Table

Options for Selection of Analytical Methods: Organics

These tables were developed for screening purposes only: they do not represent official NOAA policy and do not constitute criteria or clean-up levels. All attempts have been made to ensure accuracy; however, NOAA is not liable for errors. Values are subject to changes as new data become available.

COMPOUNDS	FIELD METHODS	GC/MS METHOD	SPECIFIC DETECTION METHOD	HPLC METHOD	EXTRACTION METHODS		CLEANUP METHOD
					WATER	SOIL/SEDIMENT	
Aromatic and Halogenated Volatiles		8260B	8021B		5021 5030B 5032	5021 5032 5035	
Carbamates				8318 8321B	8318 8321B	8318 8321B	8318
Chlorinated Dioxins and Furans			8280B 8290A		8280B 8290A	8280B 8290A 3545A	8280B 8290A
Chlorinated Hydrocarbons		8270D	8121		3510C 3520C 3535A	3540C 3550B	3620B 3640A
Chlorinated Phenoxyacids	4015 (0.1 ppm)	8270D 2	8151A	8321B	8151A 8321B 3535A	8321B 8151A 3545A 3580A	8151A 3620B
Haloethers		8270D	8111		3510C 3520C	3540C 3545 3550B	3620B 3640A
Nitriles and Amides		8260B	8031 8032A 8033	8315 8316	5030B — 5032 8031 8032A 8316	5031 5032 5035	8032A
Nitroaromatics and Ketones		8270D	8091	8330A	3510C 3520C 3535A	3540C 3545 3550B	3620B 3640A
Nitroaromatics (Explosives)	4050 (0.5 ppm) 4051 8515 (1 ppm)			8330A - 8332	8330A — 8332	8330A — 8332	8330A — 8332 3620B
Nitrosamines		8270D	8070A		3510C 3520C 8070A	3540C 3545 3550B 8070A	3610B 3620B 3640A 8070A
Non-Halogenated Volatiles		8260B	8015B		5030B — 5032	5021 5031 5032 5035	
Organochlorines	4040 — 4042 (0.2 to 20 ppm)	8270D 2	8081B 8275A		3510C 3520C 3535A	3540C 3545A 3550B 3562	3620B 3630C 3640A 3660
Organophosphates		8270D 2	8141B	8321B	3510C 3520C 3535A	3540C 3545A 3550B	3620B
PAHs	4035 (1 ppm)	8270D	8100 8275A	8310	3510C 3520C	3540C 3545 3550B 3561	3610B 3630 3640A 3650B
PCBs	4020 (5 ppm) 9078 (2 ppm)	8270D 2	8082A 8275A		3510C 3520C 3535A	3540C 3545A 3550B 3665A 3562	3620B 3630C 3640A 3660 3665A
Phenolics	4010A (0.5 ppm)	8270D	8041		3510C 3520C	3540C 3545 3550B	3630 3640A 3650B 8041
Phthalates		8270D	8061A		3510C 3520C 3535A	3540C 3545 3550B	3610B 3620B 3640A
Semi-Volatile Organics		8270D			3510C 3520C 3535A	3540C 3545A 3550B	3640A 3650B 3660
Total Organic Halides (TOX)			9020B 9022		9020B 9022		
Total Petroleum Hydrocarbons	4030 (5 ppm) 9074		8015B				
Volatile Organics		8260B	8015B 8021B		5030B — 5032	5021 5031 5032 5035	

Sources

All method numbers refer to EPA SW-846, Update III, with changes as proposed in Update IV.

Options shown are generally for chemical classes; more detailed information may be available for specific compounds

GC/MS methods allow for scanning a broad range of volatile and semi-volatile compounds, but suffer from interference and higher detection limits.

Specific determination methods and HPLC methods allow for more precise determinations of specific compounds of interest.

1 Series 4000 are immunoassays and are for specific compounds within these classes (i.e., 2,4-D, TNT, RDX, and PCP). Soil detection limits are in parentheses.

2 This is not a method of choice, but rather a confirmatory method.



Screening Quick Reference Tables

These tables were developed for screening purposes only; they do not represent official NOAA policy and do not constitute criteria or clean-up levels. All attempts have been made to ensure accuracy; however, NOAA is not liable for errors. Values are subject to changes as new data become available.

Because trace elements are naturally occurring compounds, concentrations reflective of non-anthropogenically impacted, or “background,” are provided in addition to toxicological benchmarks. For screening, trace element levels may be compared to the geometric mean (and range) observed in natural soils in the U.S. Further comparisons to regional values is encouraged.

Promulgated criteria or standards for sediments or soils are generally not available in the U.S. For screening purposes, contaminant levels in solids (sediment or soil) may be compared to benchmarks representative of different characterizations of ecological risk. They should **not** be applied without a reasonable understanding of their development, their performance, and their limitations.

The NOAA SQUIRTs include multiple sediment screening values to help portray a spectrum of concentrations which have been associated with various probabilities of adverse biological effects. This spectrum ranges from presumably nearly non-toxic to toxic levels. For instance, if all analytes screen below lower-threshold values (for example, TELs), this suggests, with a high degree of confidence, that a sample with these levels of contaminants has a low probability of being toxic, as tested through standard bioassays. Conversely, exceeding lower thresholds does **not** necessarily predict toxicity. Comparison to higher toxicity thresholds (for example, PELs) identifies compounds which are more probably present at elevated, toxic levels.

Sources of benchmarks for sediment were chosen primarily on the basis of representing a fairly unique approach for their derivation. A major exception is the “Consensus TEC/PEC” values: these values are simply averages of other existing benchmarks (mostly those appearing in the SQUIRT cards). The consensus TEC/PECs are provided here merely as a service.

For soil- and sediment-associated contaminants, dry weight concentrations are screened directly against published benchmarks. Some benchmarks are available only on a Total Organic Carbon (TOC) normalized basis, and are footnoted as such. Separate values are provided for either freshwater and estuarine or marine sediments.

For freshwater sediments, the Upper Effects Threshold (UET) was derived by NOAA as the lowest AET from a compilation of endpoint analogous to the

marine AET endpoints. The UETs for organic contaminants are generally listed for a sediment containing 1% TOC.

This version of the SQUIRT cards adds a section on the composition of PCBs. A characterization of Aroclors by their degree of chlorination and congener patterns may aid in *preliminary* exploration of source type. Definitive Aroclor assignment should only be conducted by a qualified chemist.

To express cumulative toxicity from mixtures of dioxins and furans, Toxic Equivalency Factors are included in this version of the SQUIRT cards. Absolute concentrations can be multiplied by the TEF potency factors and the products then summed to derive total toxicity.

Every effort has been made to ensure accuracy in these SQUIRT cards. However, NOAA is not liable for errors in original sources or revision of values. These screening values are subject to change as new data become available. The SQUIRT cards may be freely reproduced and distributed, if they are distributed in their entirety, without modification, and properly credited to NOAA.

The SQUIRT cards should be cited as:

“Buchman, M. F., 2008. NOAA Screening Quick Reference Tables, NOAA OR&R Report 08-1, Seattle WA, Office of Response and Restoration Division, National Oceanic and Atmospheric Administration, 34 pages.”



APPENDIX B

PHOTOGRAPHIC DOCUMENTATION LOG

PHOTOGRAPHIC DOCUMENTATION LOG
Sparrows Point, MD • Sediment Sampling

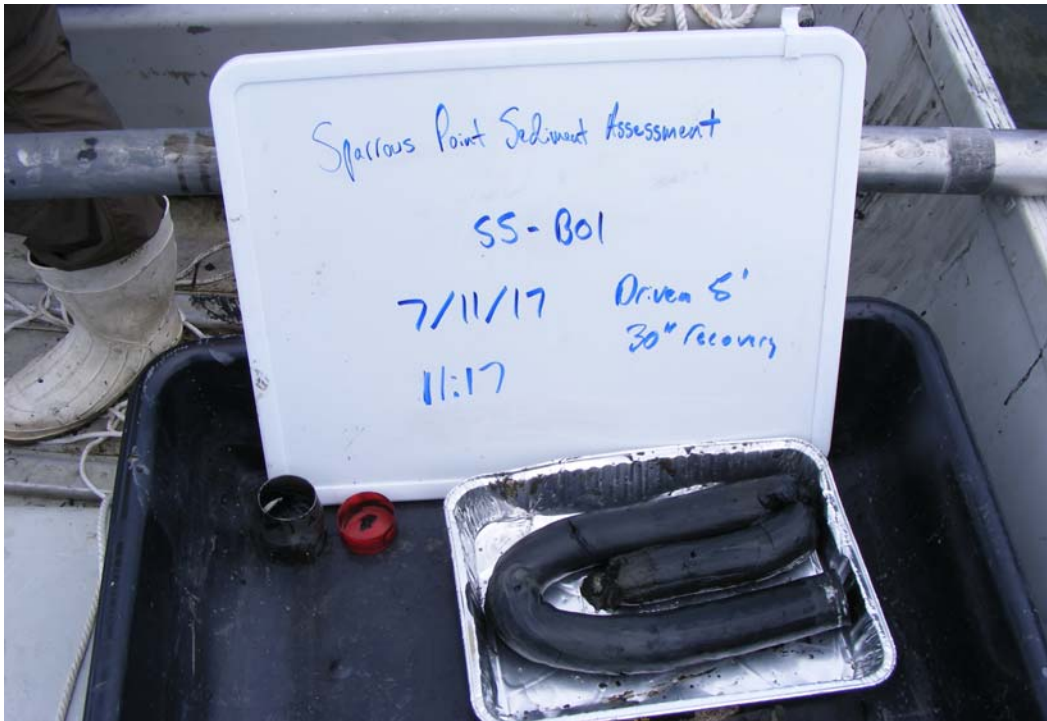


PHOTO: Sediment sample from location SS-B01
DATE: 11 July 2017

PHOTOGRAPHER: Weston START



PHOTO: Sediment sample from location SD-D03
DATE: 11 July 2017

PHOTOGRAPHER: Weston START

PHOTOGRAPHIC DOCUMENTATION LOG
Sparrows Point, MD • Sediment Sampling

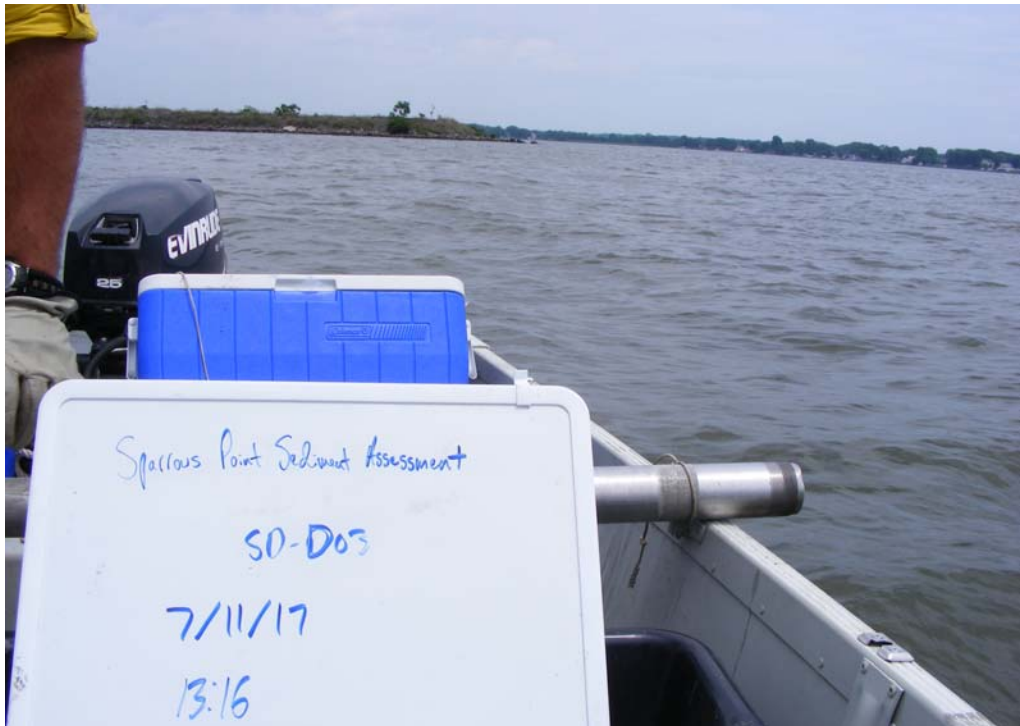


PHOTO: Surrounding area of location SD-D03
DATE: 11 July 2017

PHOTOGRAPHER: Weston START



PHOTO: Sediment sample from location SS-D03
DATE: 11 July 2017

PHOTOGRAPHER: Weston START

PHOTOGRAPHIC DOCUMENTATION LOG
Sparrows Point, MD • Sediment Sampling



PHOTO: Surrounding area of from location SS-D03
DATE: 11 July 2017

PHOTOGRAPHER: Weston START



PHOTO: Sediment sample from location SD-F03
DATE: 11 July 2017

PHOTOGRAPHER: Weston START

PHOTOGRAPHIC DOCUMENTATION LOG
Sparrows Point, MD • Sediment Sampling



PHOTO: Sediment sample from location SS-F03

DATE: 11 July 2017

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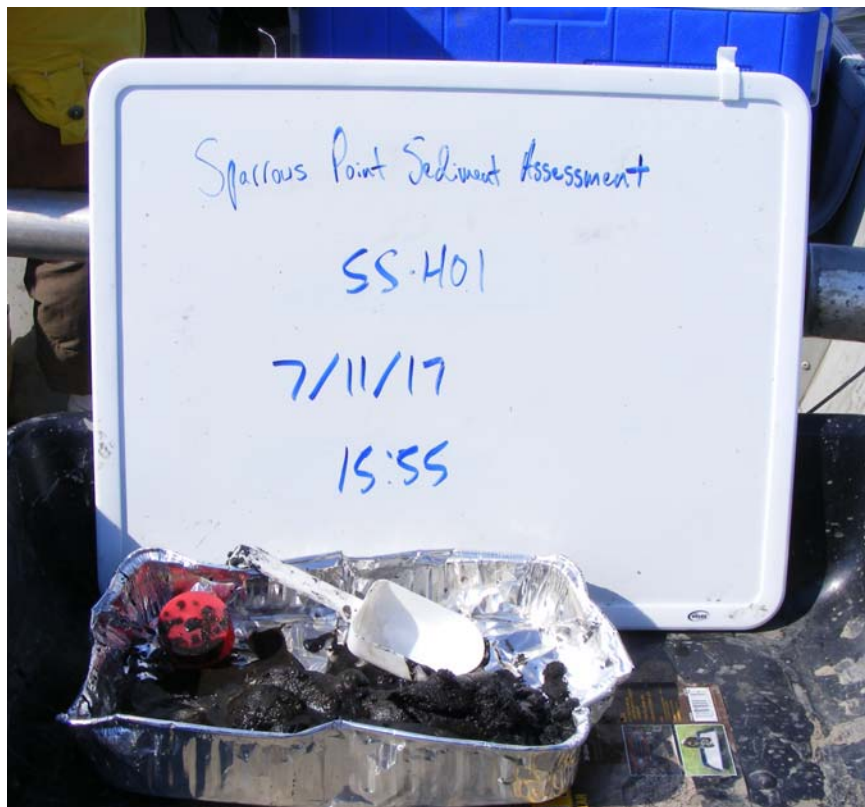


PHOTO: Sediment sample from location SS-H01

DATE: 11 July 2017

PHOTOGRAPHER: Weston START

PHOTOGRAPHIC DOCUMENTATION LOG
Sparrows Point, MD • Sediment Sampling



PHOTO: Surrounding area of location SS-H01
DATE: 11 July 2017

PHOTOGRAPHER: Weston START



PHOTO: Surrounding area of location SS-H01
DATE: 11 July 2017

PHOTOGRAPHER: Weston START

PHOTOGRAPHIC DOCUMENTATION LOG
Sparrows Point, MD • Sediment Sampling



PHOTO: Sediment sample from location SS-K03
DATE: 12 July 2017

PHOTOGRAPHER: Weston START



PHOTO: Surrounding area of location SS-K03
DATE: 11 July 2017

PHOTOGRAPHER: Weston START

PHOTOGRAPHIC DOCUMENTATION LOG
Sparrows Point, MD • Sediment Sampling



PHOTO: Sediment sample from location SD-K03
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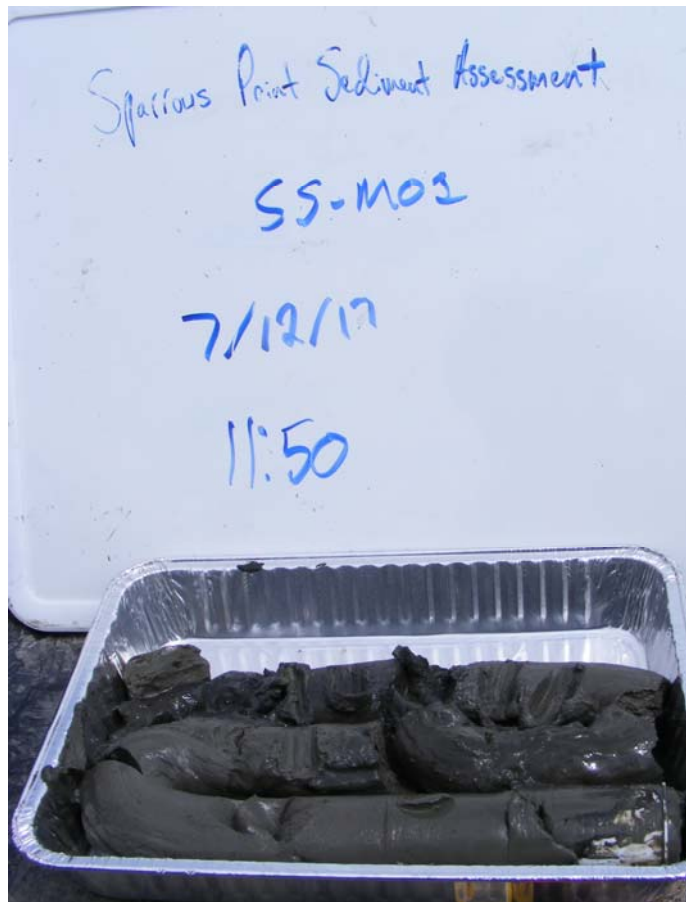


PHOTO: Sediment sample from location SS-M01
DATE: 12 July 2017

PHOTOGRAPHER: Weston START

PHOTOGRAPHIC DOCUMENTATION LOG
Sparrows Point, MD • Sediment Sampling



PHOTO: Sediment sample from location SD-M01
DATE: 12 July 2017

PHOTOGRAPHER: Weston START



PHOTO: Surrounding area of location SS-M01
DATE: 12 July 2017

PHOTOGRAPHER: Weston START

PHOTOGRAPHIC DOCUMENTATION LOG
Sparrows Point, MD • Sediment Sampling

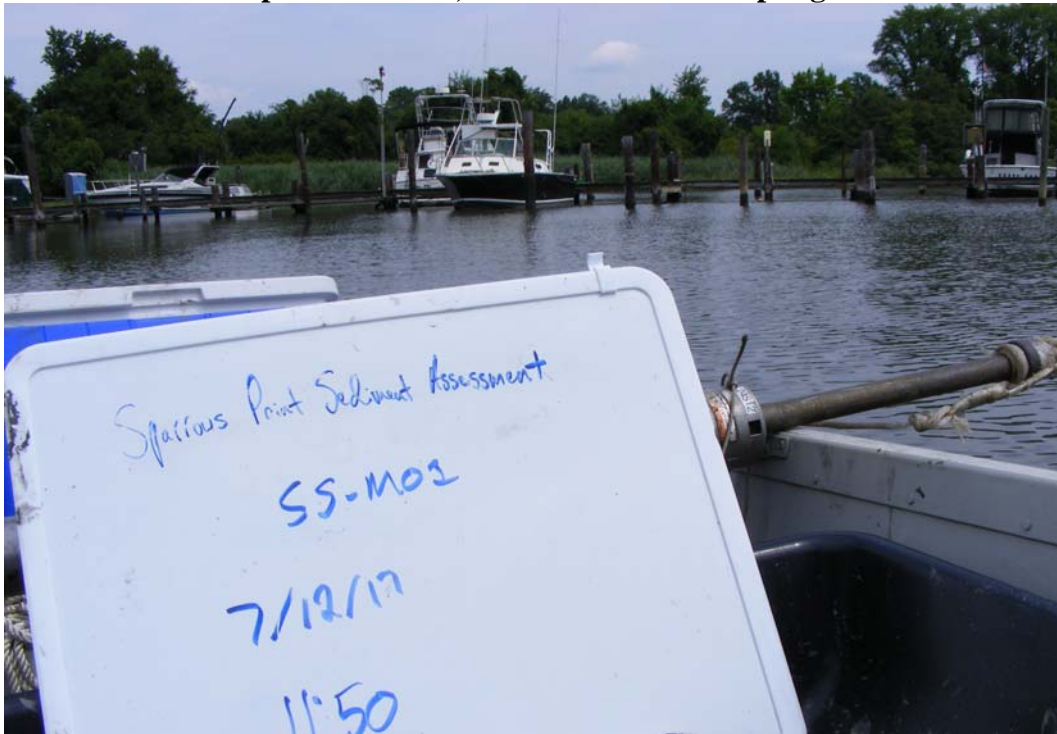


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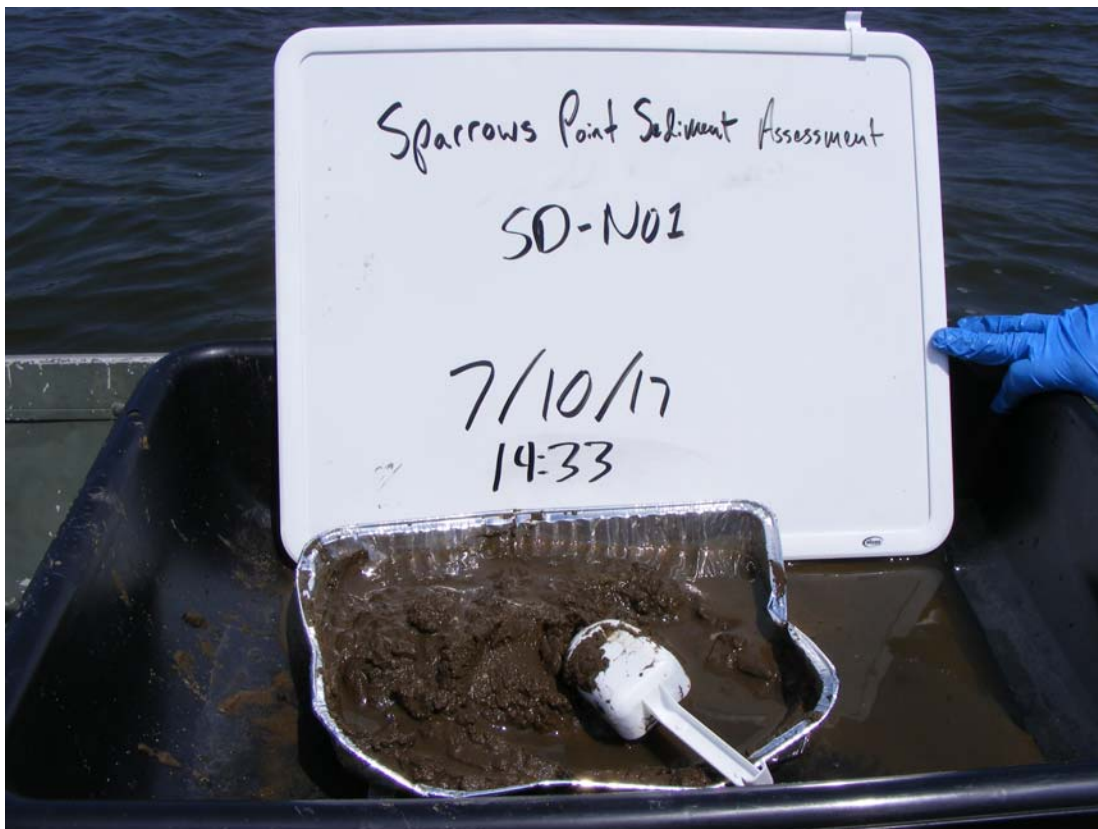


PHOTO: Sediment sample from location SD-N01
DATE: 10 July 2017

PHOTOGRAPHER: Weston START

PHOTOGRAPHIC DOCUMENTATION LOG
Sparrows Point, MD • Sediment Sampling



PHOTO: Sediment sample from location SD- N02
DATE: 10 July 2017

PHOTOGRAPHER: Weston START

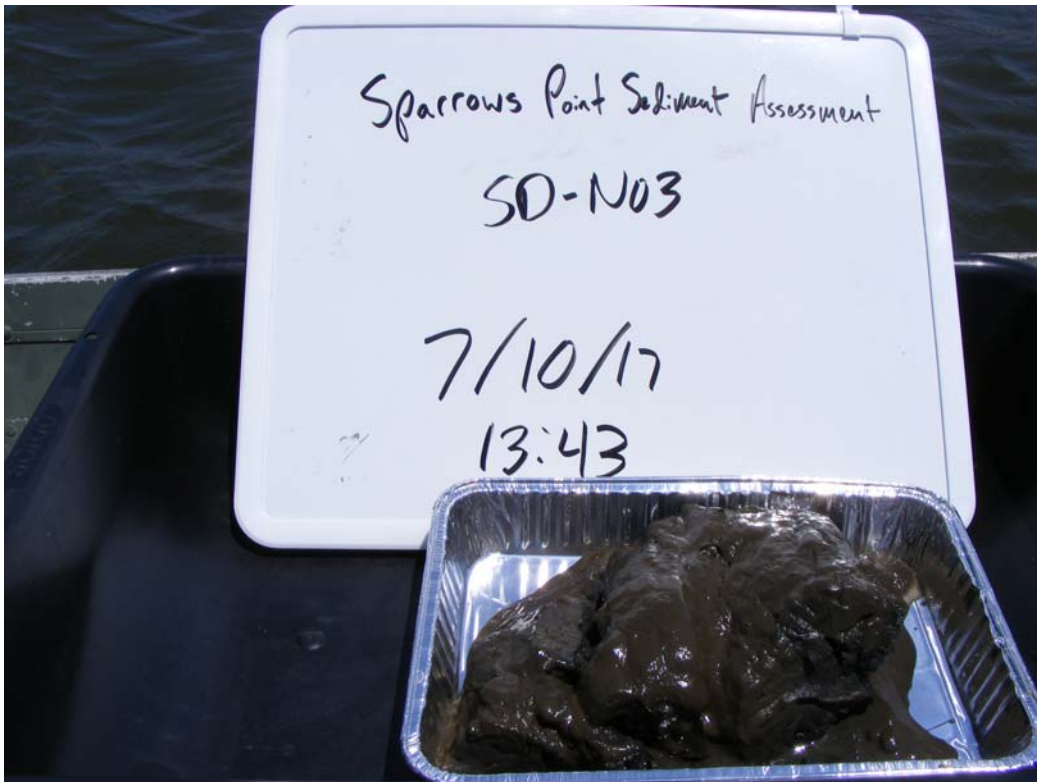


PHOTO: Sediment sample from location SD-N03
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PHOTOGRAPHIC DOCUMENTATION LOG
Sparrows Point, MD • Sediment Sampling

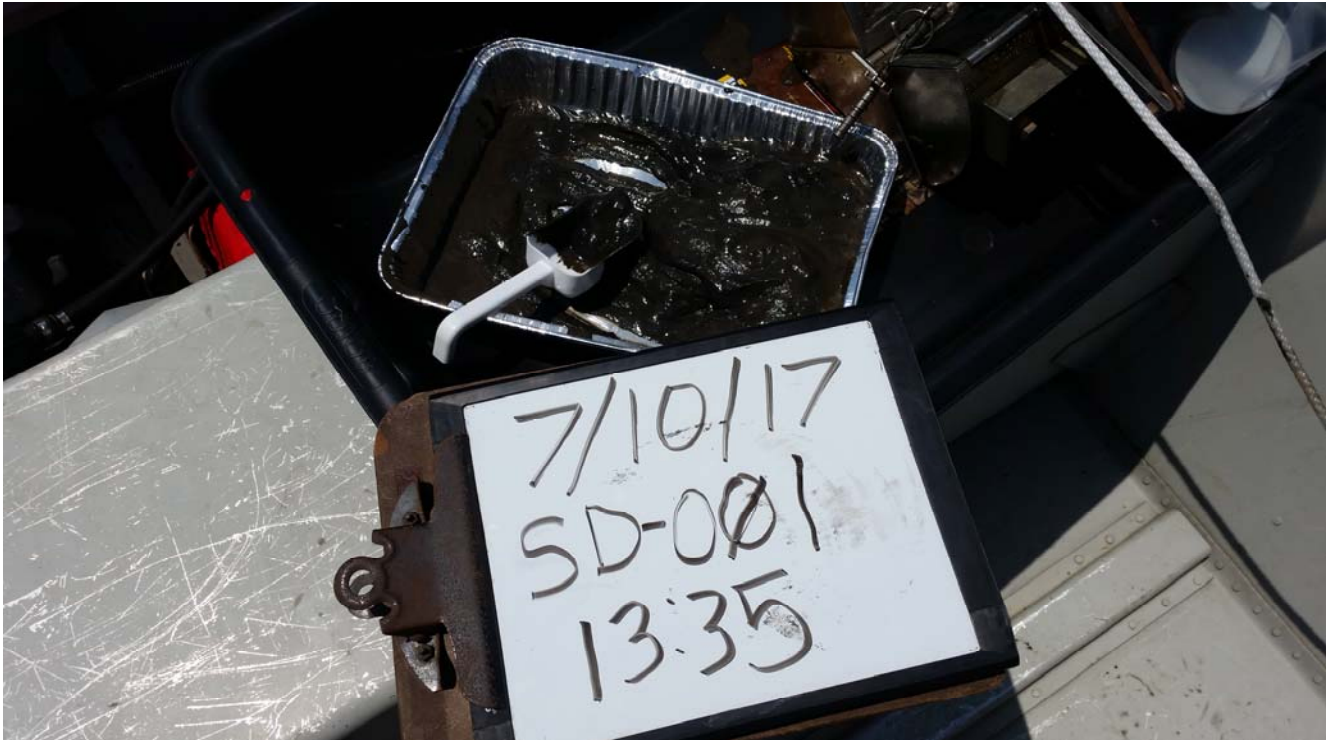


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DATE: 10 July 2017

PHOTOGRAPHER: Weston START

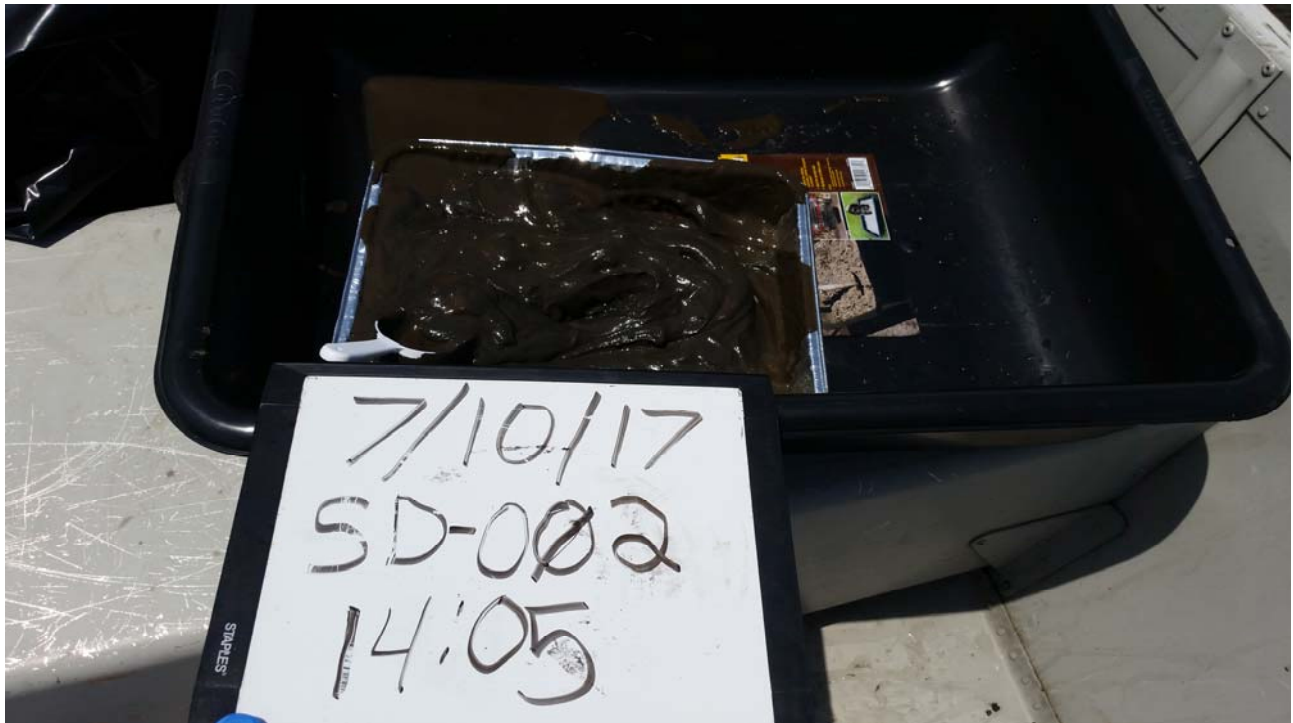


PHOTO: Sediment sample from location SD-002
DATE: 10 July 2017

PHOTOGRAPHER: Weston START

PHOTOGRAPHIC DOCUMENTATION LOG
Sparrows Point, MD • Sediment Sampling



PHOTO: Sediment sample from location SD-003
DATE: 10 July 2017

PHOTOGRAPHER: Weston START



PHOTO: Sediment sample from location SD-003
DATE: 12 July 2017

PHOTOGRAPHER: Weston START

PHOTOGRAPHIC DOCUMENTATION LOG
Sparrows Point, MD • Sediment Sampling

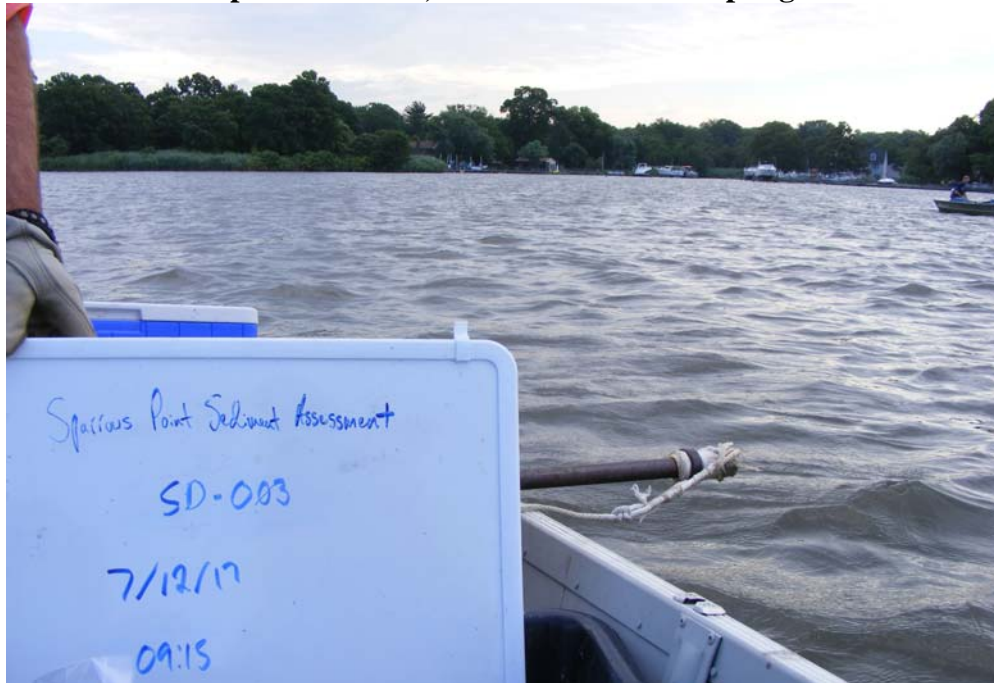


PHOTO: Surrounding area of location SD-003
DATE: 12 July 2017

PHOTOGRAPHER: Weston START

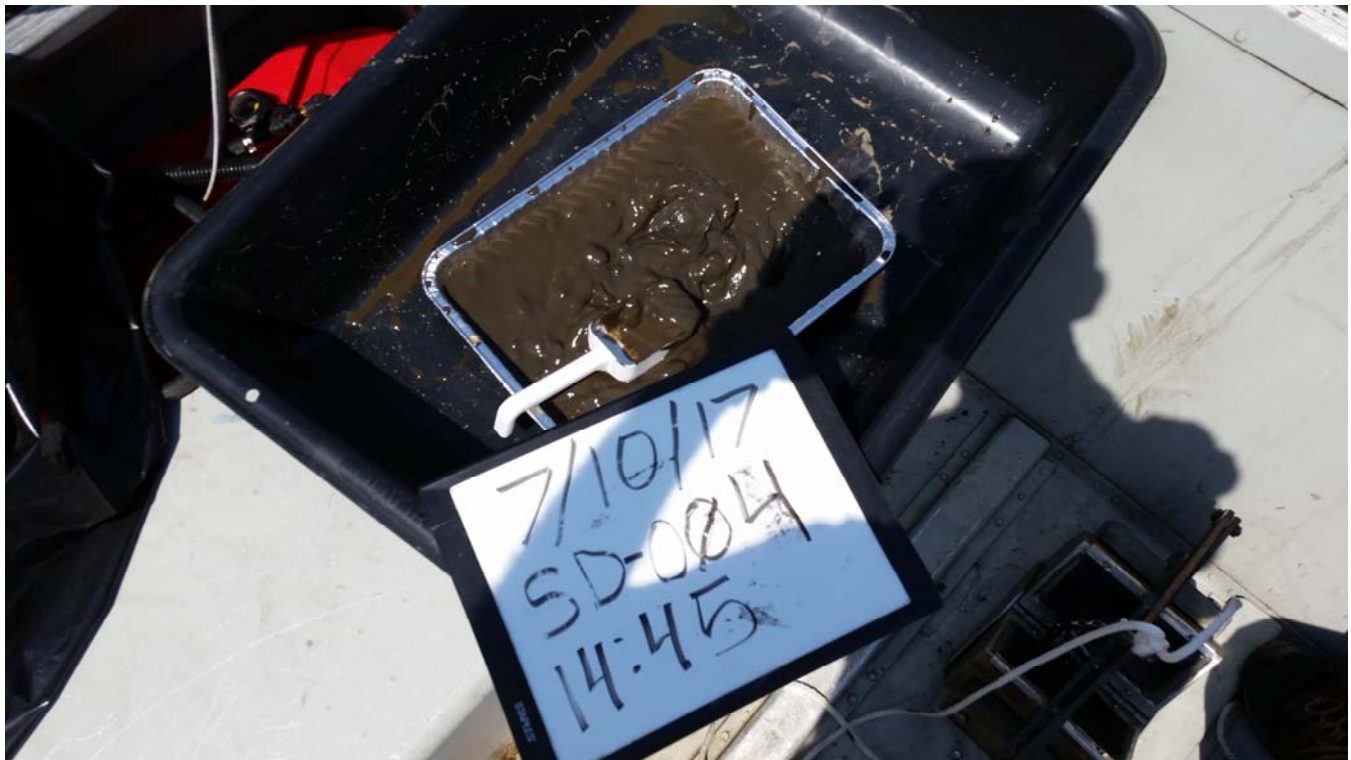


PHOTO: Sediment sample from location SD-004
DATE: 10 July 2017

PHOTOGRAPHER: Weston START

PHOTOGRAPHIC DOCUMENTATION LOG
Sparrows Point, MD • Sediment Sampling

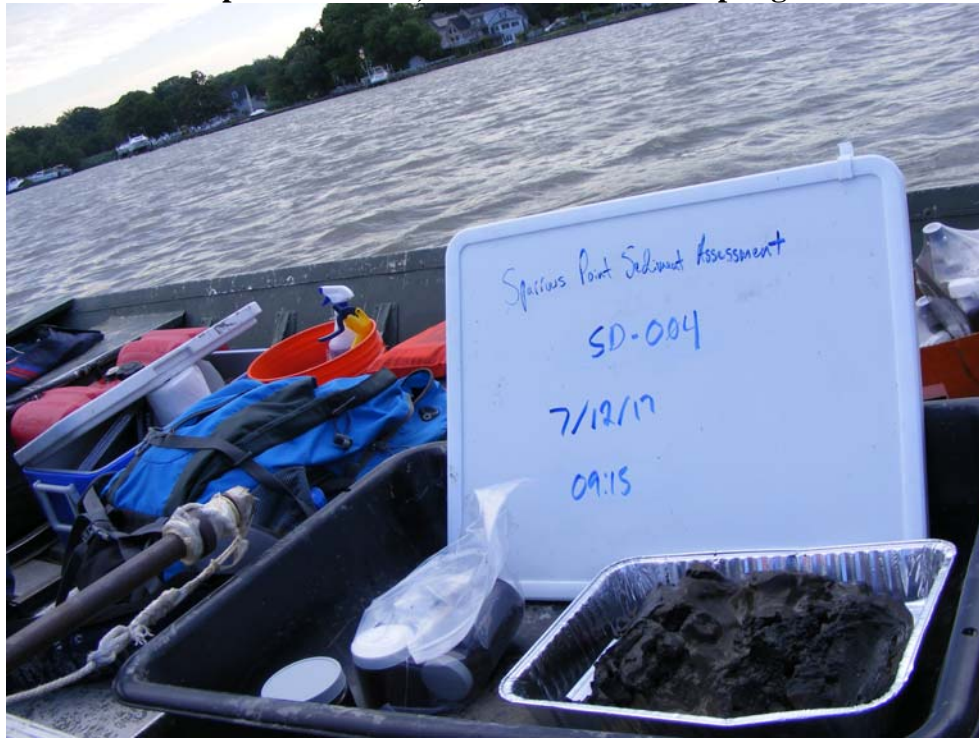


PHOTO: Sediment sample from location SD-004
DATE: 12 July 2017

PHOTOGRAPHER: Weston START

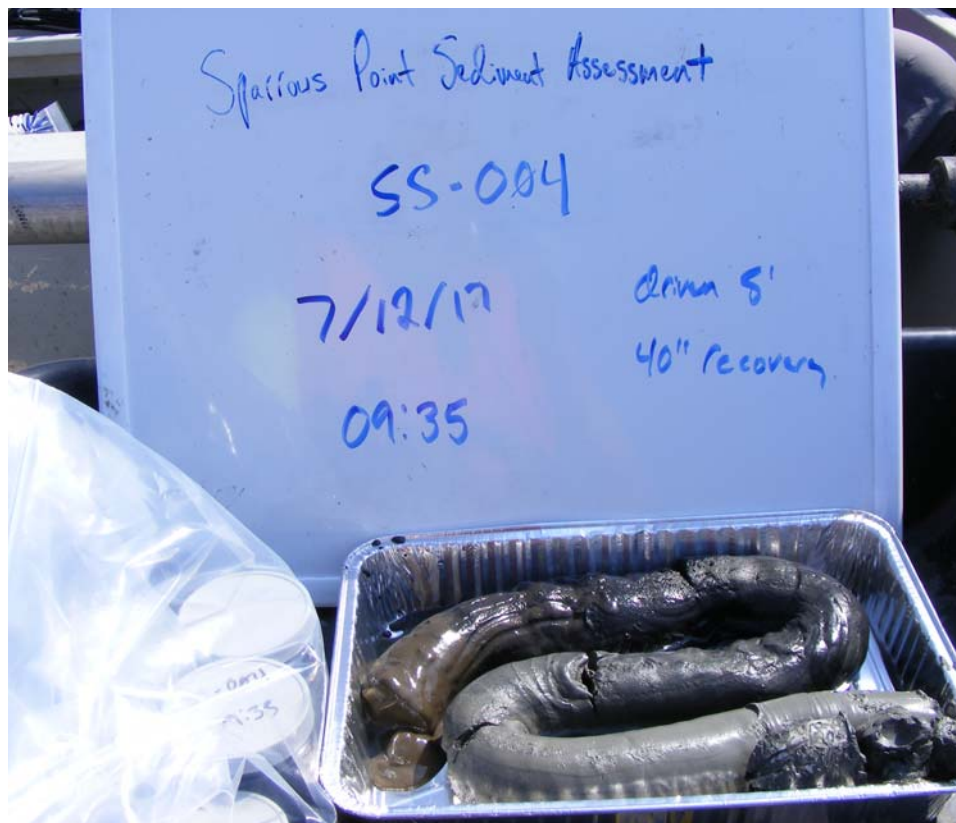


PHOTO: Sediment sample from location SS-004
DATE: 12 July 2017

PHOTOGRAPHER: Weston START

PHOTOGRAPHIC DOCUMENTATION LOG
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PHOTO: Sediment sample from location SD-005
DATE: 10 July 2017

PHOTOGRAPHER: Weston START

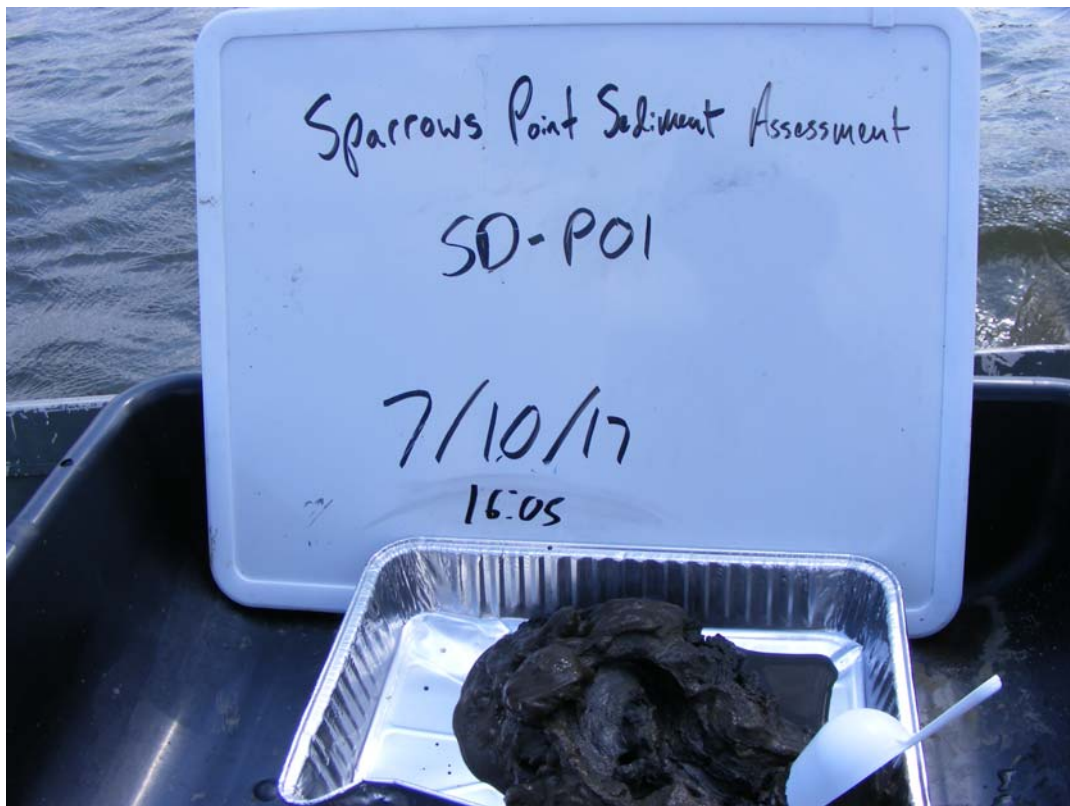


PHOTO: Sediment sample from location SD-P01
DATE: 10 July 2017

PHOTOGRAPHER: Weston START

PHOTOGRAPHIC DOCUMENTATION LOG
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PHOTO: Sediment sample from location SD-P02
DATE: 10 July 2017

PHOTOGRAPHER: Weston START

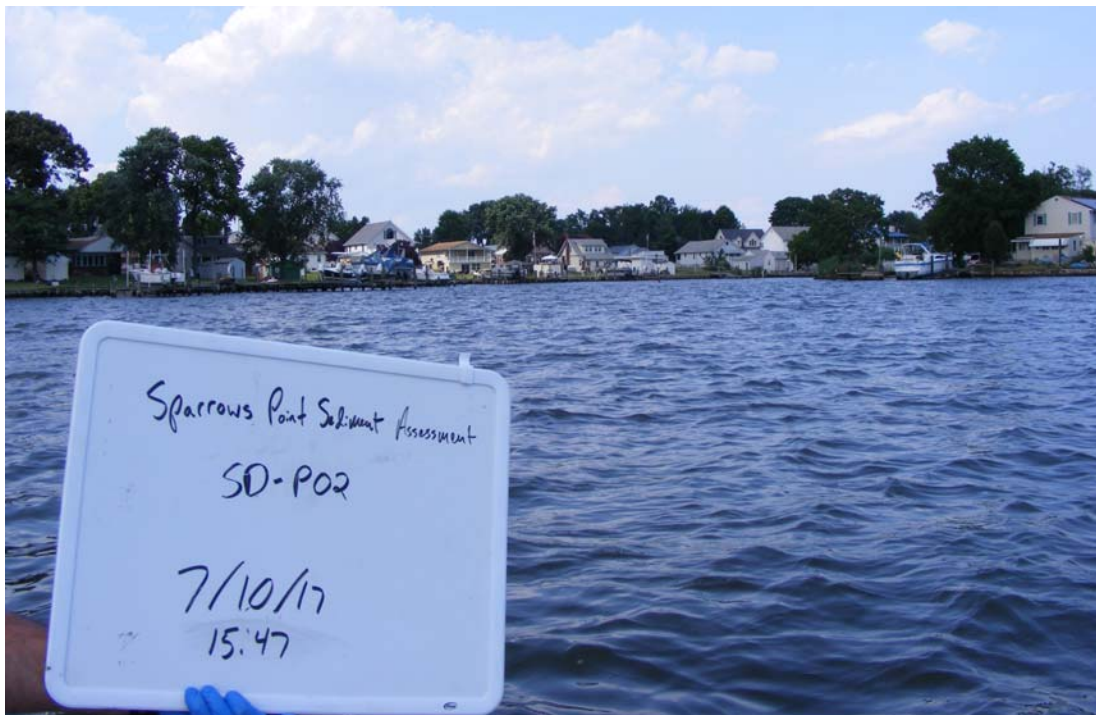


PHOTO: Surrounding area of location SD-P02
DATE: 10 July 2017

PHOTOGRAPHER: Weston START

PHOTOGRAPHIC DOCUMENTATION LOG
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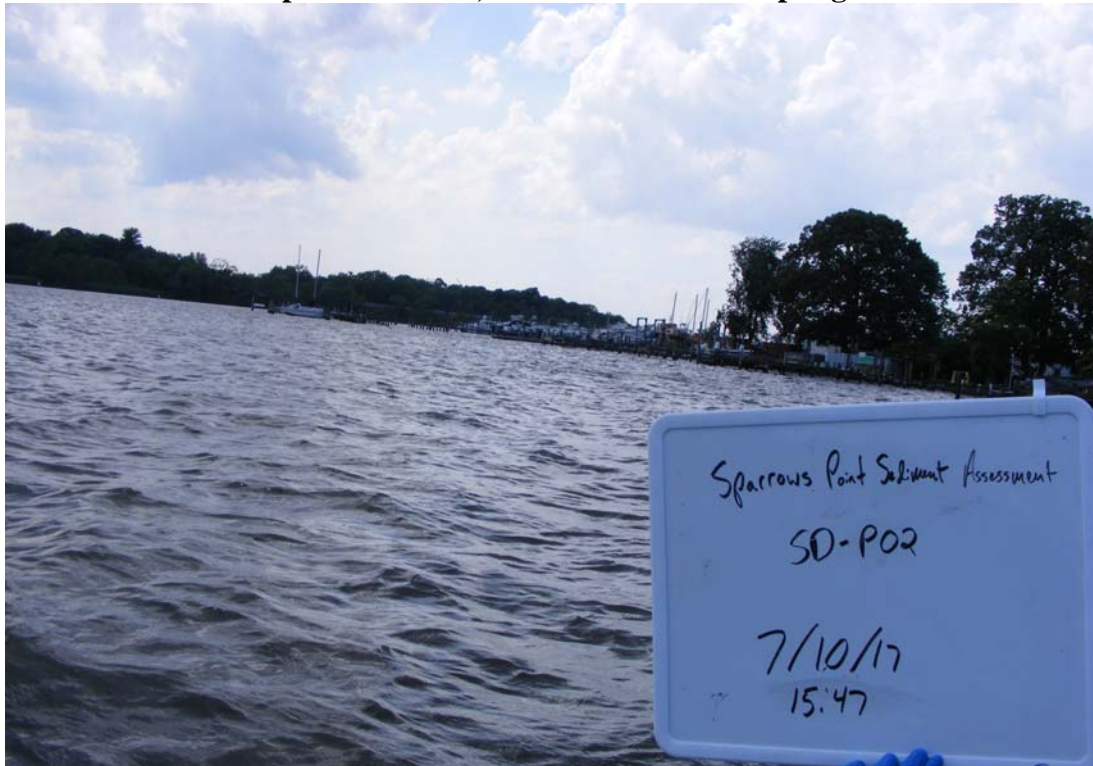


PHOTO: Surrounding area of location SD-P02
DATE: 10 July 2017

PHOTOGRAPHER: Weston START



PHOTO: Sediment sample from location SD-P03
DATE: 10 July 2017

PHOTOGRAPHER: Weston START

PHOTOGRAPHIC DOCUMENTATION LOG
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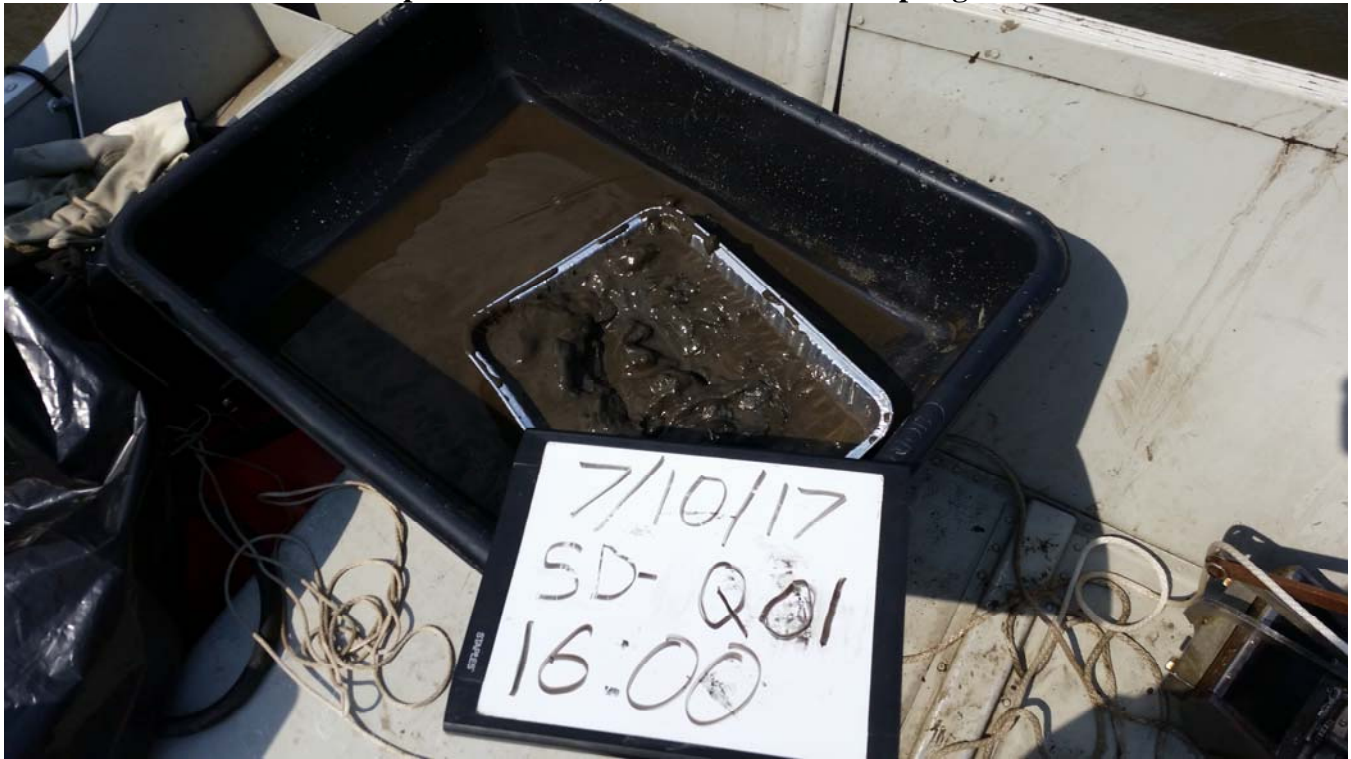


PHOTO: Sediment sample from location SD-Q01
DATE: 10 July 2017

PHOTOGRAPHER: Weston START

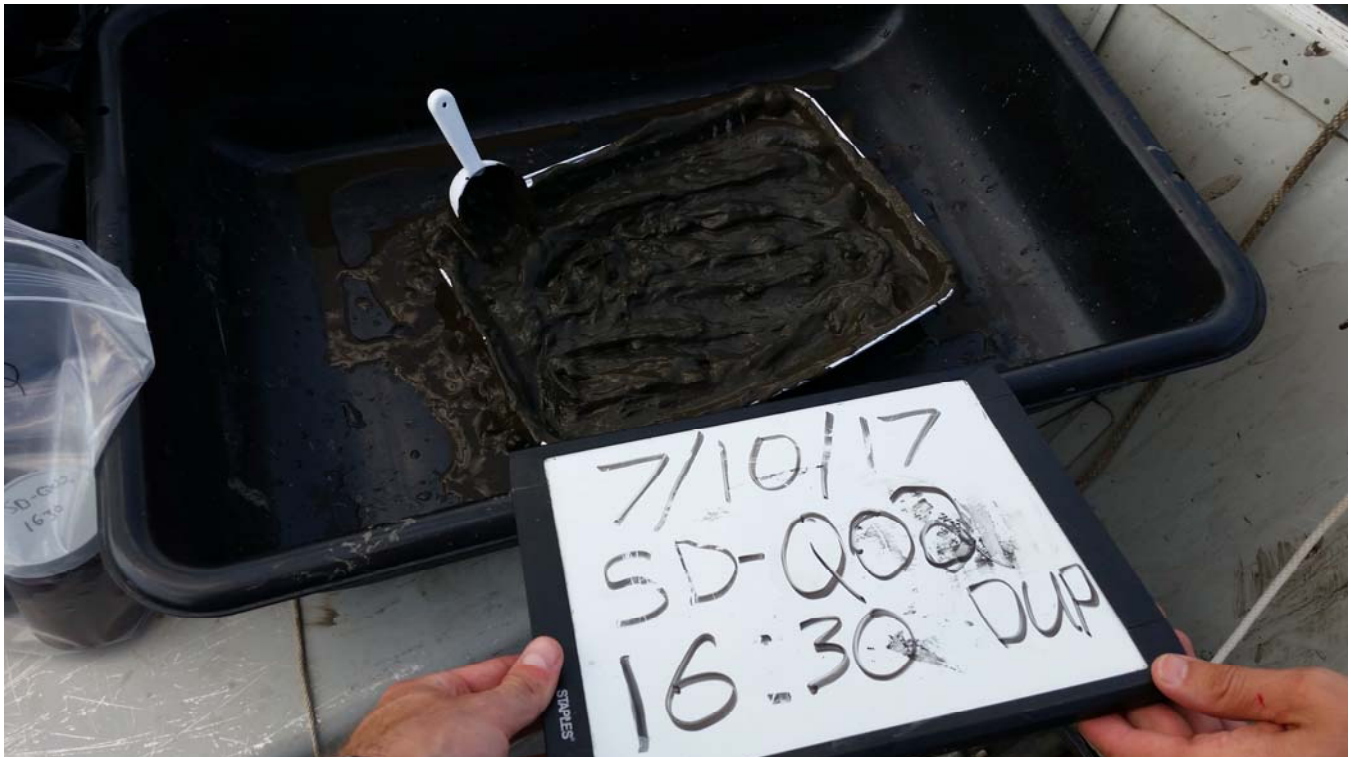


PHOTO: Sediment sample from location SD-Q02
DATE: 10 July 2017

PHOTOGRAPHER: Weston START

PHOTOGRAPHIC DOCUMENTATION LOG
Sparrows Point, MD • Sediment Sampling



PHOTO: Surrounding area of location SD-Q02
DATE: 10 July 2017

PHOTOGRAPHER: Weston START



PHOTO: Surrounding area of location SD-Q02
DATE: 10 July 2017

PHOTOGRAPHER: Weston START

PHOTOGRAPHIC DOCUMENTATION LOG
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PHOTO: Sediment sample from location SD-Q03
DATE: 10 July 2017

PHOTOGRAPHER: Weston START



PHOTO: Sediment sample from location SD-R01
DATE: 11 July 2017

PHOTOGRAPHER: Weston START

PHOTOGRAPHIC DOCUMENTATION LOG
Sparrows Point, MD • Sediment Sampling



PHOTO: Sediment sample from location SD-R02
DATE: 11 July 2017

PHOTOGRAPHER: Weston START

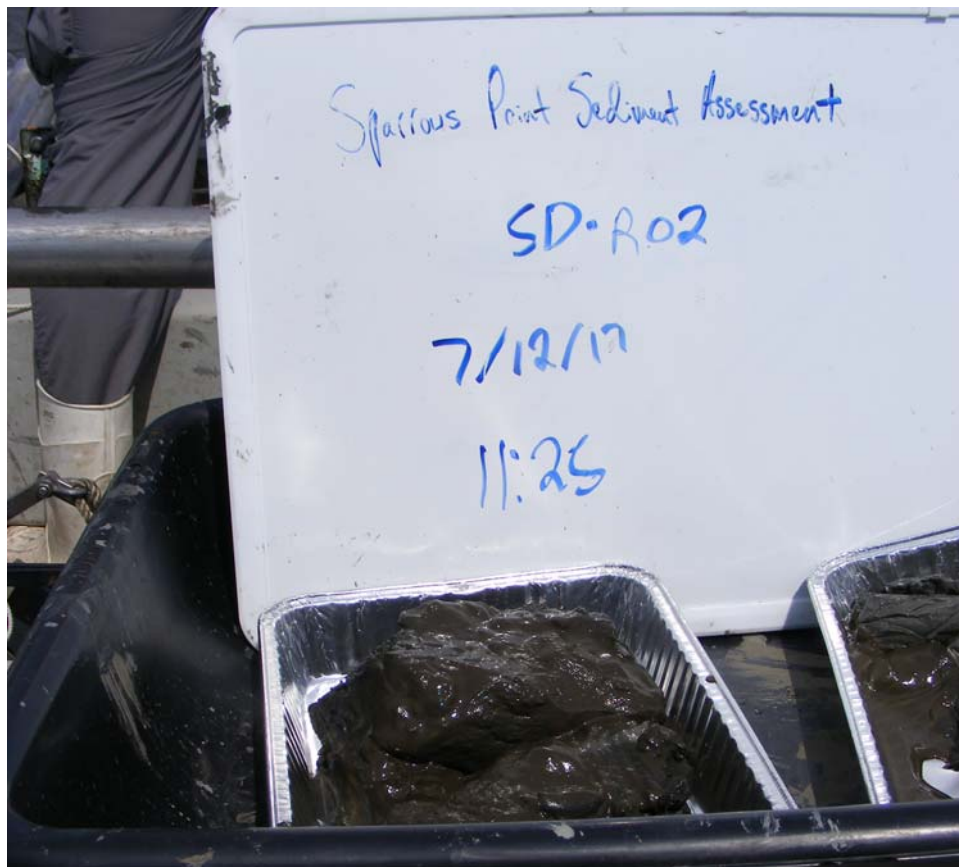


PHOTO: Sediment sample from location SD-R02
DATE: 12 July 2017

PHOTOGRAPHER: Weston START

PHOTOGRAPHIC DOCUMENTATION LOG
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PHOTO: Surrounding area of location SD- R02
DATE: 11 July 2017

PHOTOGRAPHER: Weston START



PHOTO: Surrounding area of location SD- R02
DATE: 11 July 2017

PHOTOGRAPHER: Weston START

PHOTOGRAPHIC DOCUMENTATION LOG
Sparrows Point, MD • Sediment Sampling



PHOTO: Sediment sample from location SS-R02
DATE: 12 July 2017

PHOTOGRAPHER: Weston START



PHOTO: Sediment sample from location SD-R03
DATE: 11 July 2017

PHOTOGRAPHER: Weston START

PHOTOGRAPHIC DOCUMENTATION LOG
Sparrows Point, MD • Sediment Sampling



PHOTO: Sediment sample from location SD-S01
DATE: 11 July 2017

PHOTOGRAPHER: Weston START

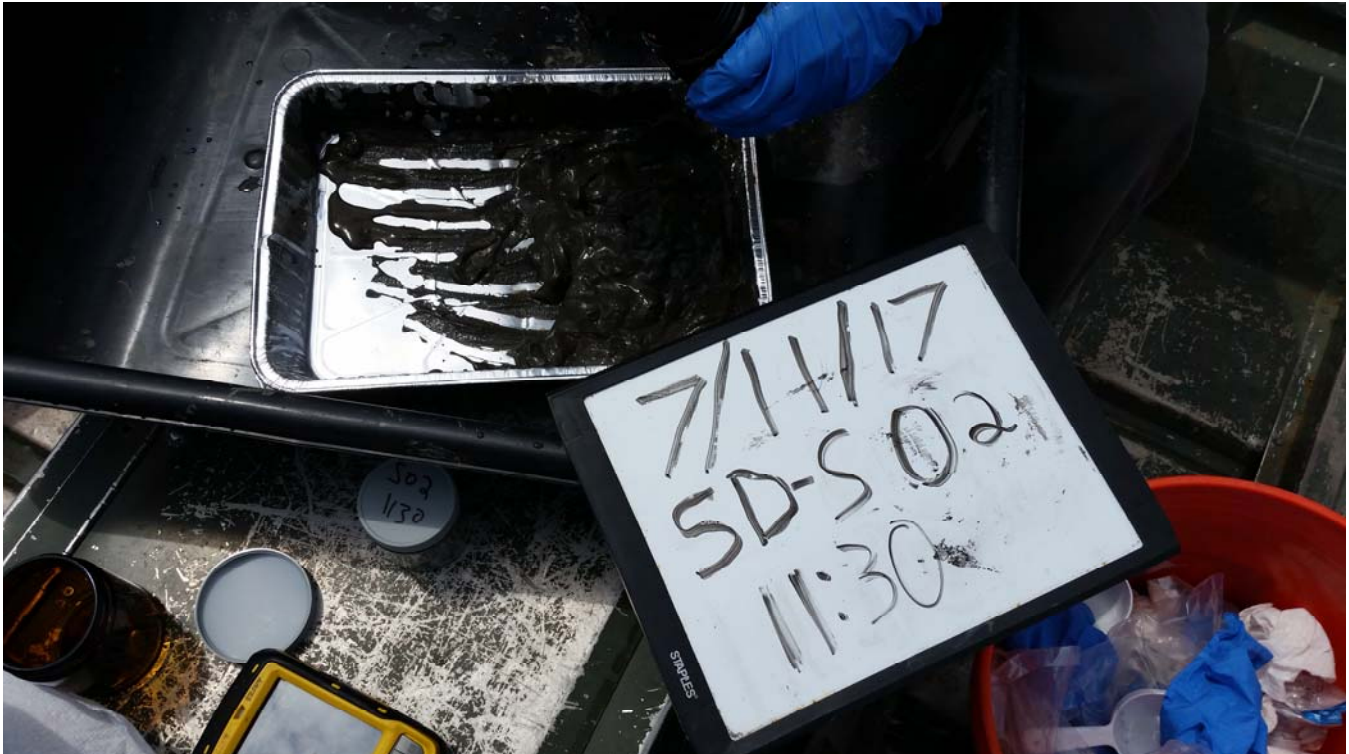


PHOTO: Sediment sample from location SD-S02
DATE: 11 July 2017

PHOTOGRAPHER: Weston START

PHOTOGRAPHIC DOCUMENTATION LOG
Sparrows Point, MD • Sediment Sampling



PHOTO: Surrounding area of location SD- S02
DATE: 11 July 2017

PHOTOGRAPHER: Weston START



PHOTO: Surrounding area of location SD- S02
DATE: 11 July 2017

PHOTOGRAPHER: Weston START

PHOTOGRAPHIC DOCUMENTATION LOG
Sparrows Point, MD • Sediment Sampling



PHOTO: Sediment sample from location SD-S03
DATE: 11 July 2017

PHOTOGRAPHER: Weston START



PHOTO: Sediment sample from location SD-T01
DATE: 11 July 2017

PHOTOGRAPHER: Weston START

PHOTOGRAPHIC DOCUMENTATION LOG
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PHOTO: Sediment sample from location SD-T02
DATE: 11 July 2017

PHOTOGRAPHER: Weston START



PHOTO: Sediment sample from location SD-T02
DATE: 12 July 2017

PHOTOGRAPHER: Weston START

PHOTOGRAPHIC DOCUMENTATION LOG
Sparrows Point, MD • Sediment Sampling



PHOTO: Surrounding area of location SD- T02
DATE: 11 July 2017

PHOTOGRAPHER: Weston START



PHOTO: Surrounding area of location SD- T02
DATE: 11 July 2017

PHOTOGRAPHER: Weston START

PHOTOGRAPHIC DOCUMENTATION LOG
Sparrows Point, MD • Sediment Sampling



PHOTO: Sediment sample from location SD-T03
DATE: 11 July 2017

PHOTOGRAPHER: Weston START



PHOTO: Sediment sample from location SD-U01
DATE: 11 July 2017

PHOTOGRAPHER: Weston START

PHOTOGRAPHIC DOCUMENTATION LOG
Sparrows Point, MD • Sediment Sampling



PHOTO: Sediment sample from location SD-U02
DATE: 11 July 2017

PHOTOGRAPHER: Weston START



PHOTO: Surrounding area of location SD- U02
DATE: 11 July 2017

PHOTOGRAPHER: Weston START

PHOTOGRAPHIC DOCUMENTATION LOG
Sparrows Point, MD • Sediment Sampling



PHOTO: Surrounding area of location SD- U02
DATE: 11 July 2017

PHOTOGRAPHER: Weston START



PHOTO: Sediment sample from location SD-U03
DATE: 11 July 2017

PHOTOGRAPHER: Weston START

PHOTOGRAPHIC DOCUMENTATION LOG
Sparrows Point, MD • Sediment Sampling



PHOTO: Sediment sample from location SD-V01
DATE: 11 July 2017

PHOTOGRAPHER: Weston START



PHOTO: Sediment sample from location SD-V02
DATE: 11 July 2017

PHOTOGRAPHER: Weston START

PHOTOGRAPHIC DOCUMENTATION LOG
Sparrows Point, MD • Sediment Sampling



PHOTO: Sediment sample from location SS-V02
DATE: 12 July 2017

PHOTOGRAPHER: Weston START



PHOTO: Surrounding area of location SD- V02
DATE: 11 July 2017

PHOTOGRAPHER: Weston START

PHOTOGRAPHIC DOCUMENTATION LOG
Sparrows Point, MD • Sediment Sampling



PHOTO: Surrounding area of location SD- V02
DATE: 11 July 2017

PHOTOGRAPHER: Weston START



PHOTO: Sediment sample from location SD-V03
DATE: 11 July 2017

PHOTOGRAPHER: Weston START

PHOTOGRAPHIC DOCUMENTATION LOG
Sparrows Point, MD • Sediment Sampling

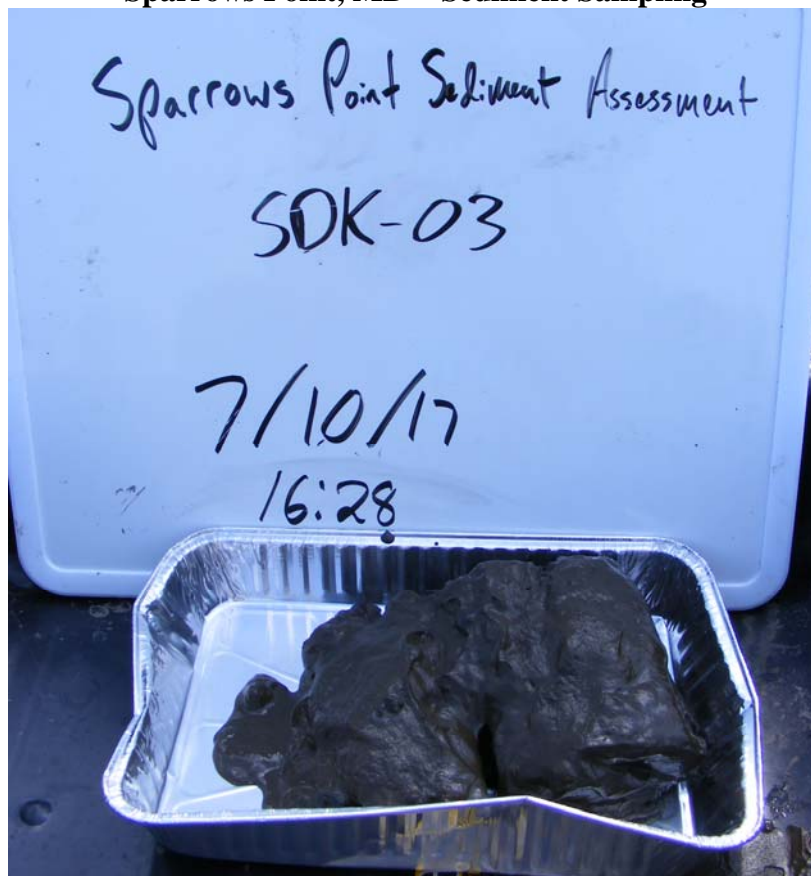


PHOTO: Sediment sample from location SDK-03
DATE: 10 July 2017

PHOTOGRAPHER: Weston START



PHOTO: Surrounding area of location SDK-03
DATE: 10 July 2017

PHOTOGRAPHER: Weston START

PHOTOGRAPHIC DOCUMENTATION LOG
Sparrows Point, MD • Sediment Sampling

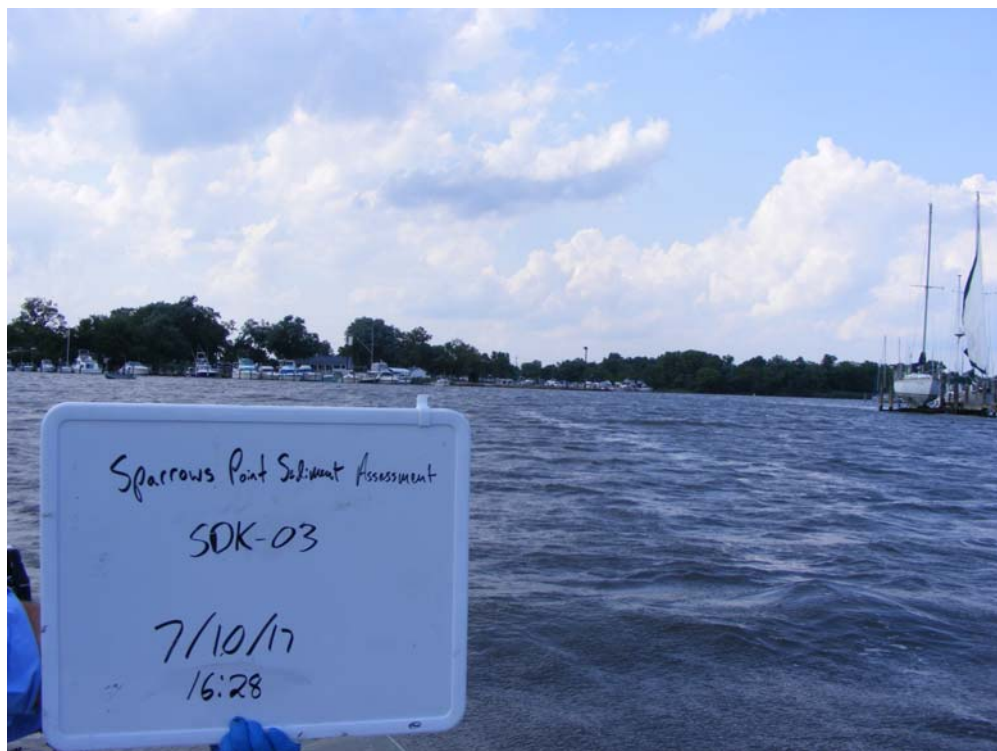


PHOTO: Surrounding area of location SDK-03

DATE: 10 July 2017

PHOTOGRAPHER: Weston START



APPENDIX C


VALIDATED ANALYTICAL RESULTS PACKAGES



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
Environmental Sciences Center
701 Mapes Road
Fort Meade, Maryland 20755-5350

DATE: 9/14/2017

SUBJECT: Region III Data QA Review

FROM: Brandon McDonald 
Region III ESAT RPO (3EA22)

TO: GREG HAM
Hazardous Site Cleanup Division (HSCD)

Attached is the data validation report for the SPARROWS POINT- SEDIMENT ASSESSMENT SOUTHEAST AREA site for DAS# R35186; SDG# C0B23 completed by the Region III Environmental Services Assistance Team (ESAT) contractor, ICF International, under the direction of Region III EAID.

If you have any questions regarding this review, please call Brandon McDonald at (410) 305-2607 or you can call Eric Graybill at (410)-305-2665.

cc: Charles Rapone(WESTON SOLUTIONS)
Laura Mathew (WESTON SOLUTIONS)

TO: #0002 TDF: #0817058

OFFICE OF ANALYTICAL SERVICES AND QUALITY ASSURANCE



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ICF
ESAT Region 3
US Environmental Protection Agency Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Phone 410-305-3012

Date: September 12, 2017

To: Brandon McDonald
ESAT Region 3 Project Officer

From: Leah Watson
Validator

Kurt Roby
Reviewer

Subject: Organic Data Validation (S3VM)
Sparrows Point
R35186 C0B23

Overview

This data package consisted of three (3) water samples and ten (10) surface sediment samples analyzed for Aroclors, volatile, semivolatile, semivolatile Polycyclic Aromatic Hydrocarbon (PAH) and pentachlorophenol target analytes.

Analyses were performed by Chemtech Consulting Group (CHM) according to Contract Laboratory Program (CLP) Statement of Work (SOW) SOM02.4 and using the selective ion monitoring (SIM) technique for PAHs.

Data were validated according to the National Functional Guidelines for Organic Superfund Methods Data Review and applicable USEPA Region 3 modifications. The validation report has been assigned the Superfund Data Validation Label S3VM (Stage_3_Validation_Manual).

Samples were submitted to the laboratory directly by the contractor and not through the EPA Technical Services Branch (TSB). Environmental Services Assistance Team (ESAT) has been tasked to evaluate laboratory reported data for the purpose of usability, based on the hardcopy data package received by ESAT dated August 4, 2017.

Summary

No significant data quality outliers or technical deficiencies were identified that would require rejection of sample results. Less significant data quality outliers resulting in estimation of sample results were identified including, but are not limited to, internal standard and deuterated monitoring compound (DMC) percent recovery as detailed below.

Minor problems

Area counts for the following internal standard were outside the lower control limit for the samples listed below. Sample C0B80 was reanalyzed yielding similar results. The initial analyzed results were reported for sample C0B80. Sample C0B86 was also reanalyzed. The reanalyzed results for sample C0B86 were reported. Analytes associated with these internal standards were not detected. Quantitation limits are estimated and have been qualified "UJ".

Fraction	Internal Standard	Samples
Volatile	1,4-Difluorobenzene-d ₄	C0B80
	Chlorobenzene-d ₅	C0B80
	1,4-Dichlorobenzene-d ₄	C0B80, C0B86RE

DMC 1, 2-dichloroethane-d₄ was outside lower control limit in volatile sample C0B80. This sample was reanalyzed with multiple DMCs outside the control limits. The initial analysis was reported by the reviewer. Quantitation limits are estimated and have been qualified "UJ".

Notes

Samples with detected concentrations for target analytes less than Contract Required Quantitation Limits (CRQLs) are estimated and have been qualified "J".

Method blanks for Aroclors, semivolatile and semivolatile SIM fractions were free from contamination.

Target analyte methylene chloride was detected in volatile method blank VBLK09. The associated samples were non-detect for this analyte. No data were qualified based on these findings.

Volatile trip blank (C0B68) and rinsate blank (C0B70) reported detected concentrations of the acetone greater than the CRQL and methyl acetate less than the CRQL. The associated samples were non-detect for methyl acetate. Acetone was detected in sample C0B86RE greater than the CRQL but less than 2x the blank results. The sample result for acetone was reported and qualify as non-detect (U).

Accuracy and precision criteria were met by the laboratory in the initial and continuing calibration verification standard analyses for Aroclors, semivolatile and semivolatile SIM fractions.

Percent recoveries for Aroclors in the LCS analyses were within control limits on both columns. No data were qualified based on LCS precision.

Target analyte bromoform failed to meet the precision criteria [Percent Relative Standard Deviation (%RSD)] in the volatile initial calibration dated 7/7/2017. No positive results were reported for this compound. No data were qualified based on this outlier.

DMC trans-1, 3-Dichloropropene-d₄ failed to meet the precision criteria (%RSD) in the volatile initial calibration dated 7/7/2017. The Relative Response Factor (RRF) were less than 0.200 in the volatile initial calibrations dated 7/7/17 and 7/13/17. The RRFs for this DMC also failed in all the volatile initial calibration verification standards (ICV) and continuing calibration standards (CCV) with the exception of CCV standard VU018104. D. No data are qualified based on DMC %RSD and RRF precision.

Percent recovery for semivolatile DMC 4-chloroaniline-d₄ was outside the lower control limit for sample COB70. This DMC is only advisory, and no data was qualified based on this outlier.

Aroclors Matrix Spike/Matrix Spike Duplicate (MS/MSD) analyses were not performed. No data were qualified based on this finding.

Glossary of Organic Data Qualifier Codes

Validation Qualifiers	In order of descending precedence. Only one of these qualifiers may apply to any result.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
Additional Qualifiers	Additional qualifiers may be combined with other qualifiers.
N	The analyte has been "tentatively identified" or "presumptively" as present.
B	The result is presumed a blank contaminant. This qualifier is used for drinking water samples only.
C	The target Pesticide or Aroclor analyte identification has been confirmed by Gas Chromatography/Mass Spectrometry (GC/MS). This qualifier may be added to other qualifiers.
X	The target Pesticide or Aroclor analyte identification was not confirmed when GC/MS analysis was performed. This qualifier may be added to other qualifiers.

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

C0B23

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : VOA
Matrix : Soil
Sample wt/vol : 4.92 (g/mL): g
% Solids : 49.1
GC Column : RXI-624 ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N)
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N) Y
Purge Volume : 10 (mL)
Cleanup Types :
Concentration Units (μg/L, mg/L, μg/kg): μg/kg

Contract : EPW14030
MA No. : SDG No.: C0B23
Level : LOW
Lab Sample ID : I4183-01
Lab File ID : VT017242.D
Date Received : 07/13/2017
Date Extracted :
Date Analyzed : 07/17/2017
Extract Volume : (μL)
Extraction Type : PT
Injection Volume : (μL)
pH : Dilution Factor : 1.0
Cleanup Factor :

CAS NO.	ANALYTE	CONCENTRATION	Q
75-71-8	Dichlorodifluoromethane	10	U
74-87-3	Chloromethane	10	U
75-01-4	Vinyl chloride	10	U
74-83-9	Bromomethane	10	U
75-00-3	Chloroethane	10	U
75-69-4	Trichlorofluoromethane	10	U
75-35-4	1,1-Dichloroethene	10	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	10	U
67-64-1	Acetone	21	U
75-15-0	Carbon disulfide	10	U
79-20-9	Methyl Acetate	10	U
75-09-2	Methylene chloride	10	U
156-60-5	trans-1,2-Dichloroethene	10	U
1634-04-4	Methyl tert-butyl Ether	10	U
75-34-3	1,1-Dichloroethane	10	U
156-59-2	cis-1,2-Dichloroethene	10	U
78-93-3	2-Butanone	21	U
74-97-5	Bromochloromethane	10	U
67-66-3	Chloroform	10	U
71-55-6	1,1,1-Trichloroethane	10	U
110-82-7	Cyclohexane	10	U
56-23-5	Carbon tetrachloride	10	U
71-43-2	Benzene	10	U
107-06-2	1,2-Dichloroethane	10	U
79-01-6	Trichloroethene	10	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

C0B23

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : VOA
Matrix : Soil
Sample wt/vol : 4.92 (g/mL): g
% Solids : 49.1
GC Column : RXI-624 ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N)
Soil Aliquot (VOA) : (µL)
Heated Purge : (Y / N) Y
Purge Volume : 10 (mL)
Cleanup Types :
Concentration Units (µg/L, mg/L, µg/kg): µg/kg

Contract : EPW14030
MA No. : SDG No.: C0B23
Level : LOW
Lab Sample ID : I4183-01
Lab File ID : VT017242.D
Date Received : 07/13/2017
Date Extracted :
Date Analyzed : 07/17/2017
Extract Volume : (µL)
Extraction Type : PT
Injection Volume : (µL)
pH : Dilution Factor : 1.0
Cleanup Factor :

CAS NO.	ANALYTE	CONCENTRATION	Q
108-87-2	Methylcyclohexane	10	U
78-87-5	1,2-Dichloropropane	10	U
75-27-4	Bromodichloromethane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
108-10-1	4-Methyl-2-pentanone	21	U
108-88-3	Toluene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
79-00-5	1,1,2-Trichloroethane	10	U
127-18-4	Tetrachloroethene	10	U
591-78-6	2-Hexanone	21	U
124-48-1	Dibromochloromethane	10	U
106-93-4	1,2-Dibromoethane	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
95-47-6	o-xylene	10	U
179601-23-1	m,p-Xylene	10	U
100-42-5	Styrene	10	U
75-25-2	Bromoform	10	U
98-82-8	Isopropylbenzene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
96-12-8	1,2-Dibromo-3-chloropropane	10	U
120-82-1	1,2,4-trichlorobenzene	10	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

C0B23

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : VOA
Matrix : Soil
Sample wt/vol : 4.92 (g/mL): g
% Solids : 49.1
GC Column : RXI-624 ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N)
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N) Y
Purge Volume : 10 (mL)
Cleanup Types :
Concentration Units (μg/L, mg/L, μg/kg): μg/kg

Contract : EPW14030
MA No. : SDG No.: C0B23
Level : LOW
Lab Sample ID : I4183-01
Lab File ID : VT017242.D
Date Received : 07/13/2017
Date Extracted :
Date Analyzed : 07/17/2017
Extract Volume : (μL)
Extraction Type : PT
Injection Volume : (μL)
pH : Dilution Factor : 1.0
Cleanup Factor :

CAS NO.	ANALYTE	CONCENTRATION	Q
87-61-6	1,2,3-Trichlorobenzene	10	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB68

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : VOA
Matrix : Water
Sample wt/vol : 5.0 (g/mL): mL
% Solids : _____
GC Column : DB-624UI ID : 0.18 (mm)
GC Column : _____ ID : _____ (mm)
Extract Concentrated : (Y / N) _____
Soil Aliquot (VOA) : _____ (μL)
Heated Purge : (Y / N) N
Purge Volume : 5 (mL)
Cleanup Types : _____
Concentration Units (μg/L, mg/L, μg/kg): μg/L

Contract : EPW14030
MA No. : _____ SDG No.: COB23
Level : _____
Lab Sample ID : I4183-03
Lab File ID : VU018106.D
Date Received : 07/13/2017
Date Extracted : _____
Date Analyzed : 07/17/2017
Extract Volume : _____ (μL)
Extraction Type : PT
Injection Volume : _____ (μL)
pH : 1.0 Dilution Factor : 1.0
Cleanup Factor : _____

CAS NO.	ANALYTE	CONCENTRATION	Q
75-71-8	Dichlorodifluoromethane	5.0	U
74-87-3	Chloromethane	5.0	U
75-01-4	Vinyl chloride	5.0	U
74-83-9	Bromomethane	5.0	U
75-00-3	Chloroethane	5.0	U
75-69-4	Trichlorofluoromethane	5.0	U
75-35-4	1,1-Dichloroethene	5.0	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U
67-64-1	Acetone	29	
75-15-0	Carbon disulfide	5.0	U
79-20-9	Methyl Acetate	3.4	J
75-09-2	Methylene chloride	5.0	U
156-60-5	trans-1,2-Dichloroethene	5.0	U
1634-04-4	Methyl tert-butyl Ether	5.0	U
75-34-3	1,1-Dichloroethane	5.0	U
156-59-2	cis-1,2-Dichloroethene	5.0	U
78-93-3	2-Butanone	10	U
74-97-5	Bromochloromethane	5.0	U
67-66-3	Chloroform	5.0	U
71-55-6	1,1,1-Trichloroethane	5.0	U
110-82-7	Cyclohexane	5.0	U
56-23-5	Carbon tetrachloride	5.0	U
71-43-2	Benzene	5.0	U
107-06-2	1,2-Dichloroethane	5.0	U
79-01-6	Trichloroethene	5.0	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB68

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : VOA
Matrix : Water
Sample wt/vol : 5.0 (g/mL): mL
% Solids : _____
GC Column : DB-624UI ID : 0.18 (mm)
GC Column : _____ ID : _____ (mm)
Extract Concentrated : (Y / N) _____
Soil Aliquot (VOA) : _____ (μL)
Heated Purge : (Y / N) N
Purge Volume : 5 (mL)
Cleanup Types : _____
Concentration Units (μg/L, mg/L, μg/kg) : μg/L

Contract : EPW14030
MA No. : _____ SDG No.: COB23
Level : _____
Lab Sample ID : I4183-03
Lab File ID : VU018106.D
Date Received : 07/13/2017
Date Extracted : _____
Date Analyzed : 07/17/2017
Extract Volume : _____ (μL)
Extraction Type : PT
Injection Volume : _____ (μL)
pH : 1.0 Dilution Factor : 1.0
Cleanup Factor : _____

CAS NO.	ANALYTE	CONCENTRATION	Q
108-87-2	Methylcyclohexane	5.0	U
78-87-5	1,2-Dichloropropane	5.0	U
75-27-4	Bromodichloromethane	5.0	U
10061-01-5	cis-1,3-Dichloropropene	5.0	U
108-10-1	4-Methyl-2-pentanone	10	U
108-88-3	Toluene	5.0	U
10061-02-6	trans-1,3-Dichloropropene	5.0	U
79-00-5	1,1,2-Trichloroethane	5.0	U
127-18-4	Tetrachloroethene	5.0	U
591-78-6	2-Hexanone	10	U
124-48-1	Dibromochloromethane	5.0	U
106-93-4	1,2-Dibromoethane	5.0	U
108-90-7	Chlorobenzene	5.0	U
100-41-4	Ethylbenzene	5.0	U
95-47-6	o-xylene	5.0	U
179601-23-1	m,p-Xylene	5.0	U
100-42-5	Styrene	5.0	U
75-25-2	Bromoform	5.0	U
98-82-8	Isopropylbenzene	5.0	U
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U
541-73-1	1,3-Dichlorobenzene	5.0	U
106-46-7	1,4-Dichlorobenzene	5.0	U
95-50-1	1,2-Dichlorobenzene	5.0	U
96-12-8	1,2-Dibromo-3-chloropropane	5.0	U
120-82-1	1,2,4-trichlorobenzene	5.0	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB68

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : VOA
Matrix : Water
Sample wt/vol : 5.0 (g/mL): mL
% Solids : _____
GC Column : DB-624UI ID : 0.18 (mm)
GC Column : _____ ID : _____ (mm)
Extract Concentrated : (Y / N) _____
Soil Aliquot (VOA) : _____ (μL)
Heated Purge : (Y / N) N
Purge Volume : 5 (mL)
Cleanup Types : _____
Concentration Units (μg/L, mg/L, μg/kg): μg/L

Contract : EPW14030
MA No. : _____ SDG No.: COB23
Level : _____
Lab Sample ID : I4183-03
Lab File ID : VU018106.D
Date Received : 07/13/2017
Date Extracted : _____
Date Analyzed : 07/17/2017
Extract Volume : _____ (μL)
Extraction Type : PT
Injection Volume : _____ (μL)
pH : 1.0 Dilution Factor : 1.0
Cleanup Factor : _____

CAS NO.	ANALYTE	CONCENTRATION	Q
87-61-6	1,2,3-Trichlorobenzene	5.0	U

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EPA SAMPLE NO.

C0B70

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : VOA
Matrix : Water
Sample wt/vol : 5.0 (g/mL): mL
% Solids : _____
GC Column : DB-624UI ID : 0.18 (mm)
GC Column : _____ ID : _____ (mm)
Extract Concentrated : (Y / N) _____
Soil Aliquot (VOA) : _____ (μL)
Heated Purge : (Y / N) N
Purge Volume : 5 (mL)
Cleanup Types : _____
Concentration Units (μg/L, mg/L, μg/kg): μg/L

Contract : EPW14030
MA No. : _____ SDG No.: C0B23
Level : _____
Lab Sample ID : I4183-04
Lab File ID : VU018107.D
Date Received : 07/13/2017
Date Extracted : _____
Date Analyzed : 07/17/2017
Extract Volume : _____ (μL)
Extraction Type : PT
Injection Volume : _____ (μL)
pH : 1.0 Dilution Factor : 1.0
Cleanup Factor : _____

CAS NO.	ANALYTE	CONCENTRATION	Q
75-71-8	Dichlorodifluoromethane	5.0	U
74-87-3	Chloromethane	5.0	U
75-01-4	Vinyl chloride	5.0	U
74-83-9	Bromomethane	5.0	U
75-00-3	Chloroethane	5.0	U
75-69-4	Trichlorofluoromethane	5.0	U
75-35-4	1,1-Dichloroethene	5.0	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U
67-64-1	Acetone	27	
75-15-0	Carbon disulfide	5.0	U
79-20-9	Methyl Acetate	3.2	J
75-09-2	Methylene chloride	5.0	U
156-60-5	trans-1,2-Dichloroethene	5.0	U
1634-04-4	Methyl tert-butyl Ether	5.0	U
75-34-3	1,1-Dichloroethane	5.0	U
156-59-2	cis-1,2-Dichloroethene	5.0	U
78-93-3	2-Butanone	10	U
74-97-5	Bromochloromethane	5.0	U
67-66-3	Chloroform	5.0	U
71-55-6	1,1,1-Trichloroethane	5.0	U
110-82-7	Cyclohexane	5.0	U
56-23-5	Carbon tetrachloride	5.0	U
71-43-2	Benzene	5.0	U
107-06-2	1,2-Dichloroethane	5.0	U
79-01-6	Trichloroethene	5.0	U

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TARGET ANALYTE LIST

EPA SAMPLE NO.

C0B70

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : VOA
Matrix : Water
Sample wt/vol : 5.0 (g/mL): mL
% Solids : _____
GC Column : DB-624UI ID : 0.18 (mm)
GC Column : _____ ID : _____ (mm)
Extract Concentrated : (Y / N) _____
Soil Aliquot (VOA) : _____ (µL)
Heated Purge : (Y / N) N
Purge Volume : 5 (mL)
Cleanup Types : _____
Concentration Units (µg/L, mg/L, µg/kg) : µg/L

Contract : EPW14030
MA No. : _____ SDG No.: C0B23
Level : _____
Lab Sample ID : I4183-04
Lab File ID : VU018107.D
Date Received : 07/13/2017
Date Extracted : _____
Date Analyzed : 07/17/2017
Extract Volume : _____ (µL)
Extraction Type : PT
Injection Volume : _____ (µL)
pH : 1.0 Dilution Factor : 1.0
Cleanup Factor : _____

CAS NO.	ANALYTE	CONCENTRATION	Q
108-87-2	Methylcyclohexane	5.0	U
78-87-5	1,2-Dichloropropane	5.0	U
75-27-4	Bromodichloromethane	5.0	U
10061-01-5	cis-1,3-Dichloropropene	5.0	U
108-10-1	4-Methyl-2-pentanone	10	U
108-88-3	Toluene	5.0	U
10061-02-6	trans-1,3-Dichloropropene	5.0	U
79-00-5	1,1,2-Trichloroethane	5.0	U
127-18-4	Tetrachloroethene	5.0	U
591-78-6	2-Hexanone	10	U
124-48-1	Dibromochloromethane	5.0	U
106-93-4	1,2-Dibromoethane	5.0	U
108-90-7	Chlorobenzene	5.0	U
100-41-4	Ethylbenzene	5.0	U
95-47-6	o-xylene	5.0	U
179601-23-1	m,p-Xylene	5.0	U
100-42-5	Styrene	5.0	U
75-25-2	Bromoform	5.0	U
98-82-8	Isopropylbenzene	5.0	U
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U
541-73-1	1,3-Dichlorobenzene	5.0	U
106-46-7	1,4-Dichlorobenzene	5.0	U
95-50-1	1,2-Dichlorobenzene	5.0	U
96-12-8	1,2-Dibromo-3-chloropropane	5.0	U
120-82-1	1,2,4-trichlorobenzene	5.0	U

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TARGET ANALYTE LIST

EPA SAMPLE NO.

COB70

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : VOA
Matrix : Water
Sample wt/vol : 5.0 (g/mL): mL
% Solids :
GC Column : DB-624UI ID : 0.18 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N)
Soil Aliquot (VOA) : (µL)
Heated Purge : (Y / N) N
Purge Volume : 5 (mL)
Cleanup Types :
Concentration Units (µg/L, mg/L, µg/kg): µg/L

Contract : EPW14030
MA No. : SDG No.: COB23
Level :
Lab Sample ID : I4183-04
Lab File ID : VU018107.D
Date Received : 07/13/2017
Date Extracted :
Date Analyzed : 07/17/2017
Extract Volume : (µL)
Extraction Type : PT
Injection Volume : (µL)
pH : 1.0 Dilution Factor : 1.0
Cleanup Factor :

CAS NO.	ANALYTE	CONCENTRATION	Q
87-61-6	1,2,3-Trichlorobenzene	5.0	U

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EPA SAMPLE NO.

COB78

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : VOA
Matrix : Soil
Sample wt/vol : 3.88 (g/mL): g
% Solids : 39.1
GC Column : RXI-624 ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N)
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N) Y
Purge Volume : 10 (mL)
Cleanup Types :
Concentration Units (μg/L, mg/L, μg/kg): μg/kg

Contract : EPW14030
MA No. : SDG No.: COB23
Level : LOW
Lab Sample ID : I4183-05
Lab File ID : VT017243.D
Date Received : 07/13/2017
Date Extracted :
Date Analyzed : 07/17/2017
Extract Volume : (μL)
Extraction Type : PT
Injection Volume : (μL)
pH : Dilution Factor : 1.0
Cleanup Factor :

CAS NO.	ANALYTE	CONCENTRATION	Q
75-71-8	Dichlorodifluoromethane	16	U
74-87-3	Chloromethane	16	U
75-01-4	Vinyl chloride	16	U
74-83-9	Bromomethane	16	U
75-00-3	Chloroethane	16	U
75-69-4	Trichlorofluoromethane	16	U
75-35-4	1,1-Dichloroethene	16	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	16	U
67-64-1	Acetone	33	U
75-15-0	Carbon disulfide	16	U
79-20-9	Methyl Acetate	16	U
75-09-2	Methylene chloride	16	U
156-60-5	trans-1,2-Dichloroethene	16	U
1634-04-4	Methyl tert-butyl Ether	16	U
75-34-3	1,1-Dichloroethane	16	U
156-59-2	cis-1,2-Dichloroethene	16	U
78-93-3	2-Butanone	33	U
74-97-5	Bromochloromethane	16	U
67-66-3	Chloroform	16	U
71-55-6	1,1,1-Trichloroethane	16	U
110-82-7	Cyclohexane	16	U
56-23-5	Carbon tetrachloride	16	U
71-43-2	Benzene	16	U
107-06-2	1,2-Dichloroethane	16	U
79-01-6	Trichloroethene	16	U

FORM 1A-OR
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TARGET ANALYTE LIST

EPA SAMPLE NO.

COB78

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : VOA
Matrix : Soil
Sample wt/vol : 3.88 (g/mL): g
% Solids : 39.1
GC Column : RXI-624 ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N)
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N) Y
Purge Volume : 10 (mL)
Cleanup Types :
Concentration Units (μg/L, mg/L, μg/kg): μg/kg

Contract : EPW14030
MA No. : SDG No.: COB23
Level : LOW
Lab Sample ID : I4183-05
Lab File ID : VT017243.D
Date Received : 07/13/2017
Date Extracted :
Date Analyzed : 07/17/2017
Extract Volume : (μL)
Extraction Type : PT
Injection Volume : (μL)
pH : Dilution Factor : 1.0
Cleanup Factor :

CAS NO.	ANALYTE	CONCENTRATION	Q
108-87-2	Methylcyclohexane	16	U
78-87-5	1,2-Dichloropropane	16	U
75-27-4	Bromodichloromethane	16	U
10061-01-5	cis-1,3-Dichloropropene	16	U
108-10-1	4-Methyl-2-pentanone	33	U
108-88-3	Toluene	16	U
10061-02-6	trans-1,3-Dichloropropene	16	U
79-00-5	1,1,2-Trichloroethane	16	U
127-18-4	Tetrachloroethene	16	U
591-78-6	2-Hexanone	33	U
124-48-1	Dibromochloromethane	16	U
106-93-4	1,2-Dibromoethane	16	U
108-90-7	Chlorobenzene	16	U
100-41-4	Ethylbenzene	16	U
95-47-6	o-xylene	16	U
179601-23-1	m,p-Xylene	16	U
100-42-5	Styrene	16	U
75-25-2	Bromoform	16	U
98-82-8	Isopropylbenzene	16	U
79-34-5	1,1,2,2-Tetrachloroethane	16	U
541-73-1	1,3-Dichlorobenzene	16	U
106-46-7	1,4-Dichlorobenzene	16	U
95-50-1	1,2-Dichlorobenzene	16	U
96-12-8	1,2-Dibromo-3-chloropropane	16	U
120-82-1	1,2,4-trichlorobenzene	16	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

C0B78

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : VOA
Matrix : Soil
Sample wt/vol : 3.88 (g/mL): g
% Solids : 39.1
GC Column : RXI-624 ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N)
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N) Y
Purge Volume : 10 (mL)
Cleanup Types :
Concentration Units (μg/L, mg/L, μg/kg): μg/kg

Contract : EPW14030
MA No. : SDG No.: C0B23
Level : LOW
Lab Sample ID : I4183-05
Lab File ID : VT017243.D
Date Received : 07/13/2017
Date Extracted :
Date Analyzed : 07/17/2017
Extract Volume : (μL)
Extraction Type : PT
Injection Volume : (μL)
pH : Dilution Factor : 1.0
Cleanup Factor :

CAS NO.	ANALYTE	CONCENTRATION	Q
87-61-6	1,2,3-Trichlorobenzene	16	U

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ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB79

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : VOA
Matrix : Soil
Sample wt/vol : 4.68 (g/mL): g
% Solids : 40.1
GC Column : RXI-624 ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N)
Soil Aliquot (VOA) : (µL)
Heated Purge : (Y / N) Y
Purge Volume : 10 (mL)
Cleanup Types :
Concentration Units (µg/L, mg/L, µg/kg): µg/kg

Contract : EPW14030
MA No. : SDG No.: COB23
Level : LOW
Lab Sample ID : I4183-06
Lab File ID : VT017244.D
Date Received : 07/13/2017
Date Extracted :
Date Analyzed : 07/17/2017
Extract Volume : (µL)
Extraction Type : PT
Injection Volume : (µL)
pH : Dilution Factor : 1.0
Cleanup Factor :

CAS NO.	ANALYTE	CONCENTRATION	Q
75-71-8	Dichlorodifluoromethane	13	U
74-87-3	Chloromethane	13	U
75-01-4	Vinyl chloride	13	U
74-83-9	Bromomethane	13	U
75-00-3	Chloroethane	13	U
75-69-4	Trichlorofluoromethane	13	U
75-35-4	1,1-Dichloroethene	13	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	13	U
67-64-1	Acetone	27	U
75-15-0	Carbon disulfide	13	U
79-20-9	Methyl Acetate	13	U
75-09-2	Methylene chloride	13	U
156-60-5	trans-1,2-Dichloroethene	13	U
1634-04-4	Methyl tert-butyl Ether	13	U
75-34-3	1,1-Dichloroethane	13	U
156-59-2	cis-1,2-Dichloroethene	13	U
78-93-3	2-Butanone	27	U
74-97-5	Bromochloromethane	13	U
67-66-3	Chloroform	13	U
71-55-6	1,1,1-Trichloroethane	13	U
110-82-7	Cyclohexane	13	U
56-23-5	Carbon tetrachloride	13	U
71-43-2	Benzene	13	U
107-06-2	1,2-Dichloroethane	13	U
79-01-6	Trichloroethene	13	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB79

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : VOA
Matrix : Soil
Sample wt/vol : 4.68 (g/mL): g
% Solids : 40.1
GC Column : RXI-624 ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N)
Soil Aliquot (VOA) : (µL)
Heated Purge : (Y / N) Y
Purge Volume : 10 (mL)
Cleanup Types :
Concentration Units (µg/L, mg/L, µg/kg): µg/kg

Contract : EPW14030
MA No. : SDG No.: COB23
Level : LOW
Lab Sample ID : I4183-06
Lab File ID : VT017244.D
Date Received : 07/13/2017
Date Extracted :
Date Analyzed : 07/17/2017
Extract Volume : (µL)
Extraction Type : PT
Injection Volume : (µL)
pH : Dilution Factor : 1.0
Cleanup Factor :

CAS NO.	ANALYTE	CONCENTRATION	Q
108-87-2	Methylcyclohexane	13	U
78-87-5	1,2-Dichloropropane	13	U
75-27-4	Bromodichloromethane	13	U
10061-01-5	cis-1,3-Dichloropropene	13	U
108-10-1	4-Methyl-2-pentanone	27	U
108-88-3	Toluene	13	U
10061-02-6	trans-1,3-Dichloropropene	13	U
79-00-5	1,1,2-Trichloroethane	13	U
127-18-4	Tetrachloroethene	13	U
591-78-6	2-Hexanone	27	U
124-48-1	Dibromochloromethane	13	U
106-93-4	1,2-Dibromoethane	13	U
108-90-7	Chlorobenzene	13	U
100-41-4	Ethylbenzene	13	U
95-47-6	o-xylene	13	U
179601-23-1	m,p-Xylene	13	U
100-42-5	Styrene	13	U
75-25-2	Bromoform	13	U
98-82-8	Isopropylbenzene	13	U
79-34-5	1,1,2,2-Tetrachloroethane	13	U
541-73-1	1,3-Dichlorobenzene	13	U
106-46-7	1,4-Dichlorobenzene	13	U
95-50-1	1,2-Dichlorobenzene	13	U
96-12-8	1,2-Dibromo-3-chloropropane	13	U
120-82-1	1,2,4-trichlorobenzene	13	U

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EPA SAMPLE NO.

COB79

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : VOA
Matrix : Soil
Sample wt/vol : 4.68 (g/mL): g
% Solids : 40.1
GC Column : RXI-624 ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N)
Soil Aliquot (VOA) : (µL)
Heated Purge : (Y / N) Y
Purge Volume : 10 (mL)
Cleanup Types :
Concentration Units (µg/L, mg/L, µg/kg): µg/kg

Contract : EPW14030
MA No. : SDG No.: COB23
Level : LOW
Lab Sample ID : I4183-06
Lab File ID : VT017244.D
Date Received : 07/13/2017
Date Extracted :
Date Analyzed : 07/17/2017
Extract Volume : (µL)
Extraction Type : PT
Injection Volume : (µL)
pH : Dilution Factor : 1.0
Cleanup Factor :

CAS NO.	ANALYTE	CONCENTRATION	Q
87-61-6	1,2,3-Trichlorobenzene	13	U

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EPA SAMPLE NO.

COB80

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : VOA
Matrix : Soil
Sample wt/vol : 6.07 (g/mL): g
% Solids : 41.7
GC Column : RXI-624 ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N)
Soil Aliquot (VOA) : (µL)
Heated Purge : (Y / N) Y
Purge Volume : 10 (mL)
Cleanup Types :
Concentration Units (µg/L, mg/L, µg/kg): µg/kg

Contract : EPW14030
MA No. : SDG No.: COB23
Level : LOW
Lab Sample ID : I4183-07
Lab File ID : VT017231.D
Date Received : 07/13/2017
Date Extracted :
Date Analyzed : 07/14/2017
Extract Volume : (µL)
Extraction Type : PT
Injection Volume : (µL)
pH : Dilution Factor : 1.0
Cleanup Factor :

DV9/11/17

CAS NO.	ANALYTE	CONCENTRATION	Q
75-71-8	Dichlorodifluoromethane	9.9	U 05
74-87-3	Chloromethane	9.9	U
75-01-4	Vinyl chloride	9.9	U
74-83-9	Bromomethane	9.9	U
75-00-3	Chloroethane	9.9	U
75-69-4	Trichlorofluoromethane	9.9	U
75-35-4	1,1-Dichloroethene	9.9	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	9.9	U
67-64-1	Acetone	20	U
75-15-0	Carbon disulfide	9.9	U
79-20-9	Methyl Acetate	9.9	U
75-09-2	Methylene chloride	9.9	U
156-60-5	trans-1,2-Dichloroethene	9.9	U
1634-04-4	Methyl tert-butyl Ether	9.9	U
75-34-3	1,1-Dichloroethane	9.9	U
156-59-2	cis-1,2-Dichloroethene	9.9	U
78-93-3	2-Butanone	20	U
74-97-5	Bromochloromethane	9.9	U
67-66-3	Chloroform	9.9	U
71-55-6	1,1,1-Trichloroethane	9.9	U
110-82-7	Cyclohexane	9.9	U
56-23-5	Carbon tetrachloride	9.9	U
71-43-2	Benzene	9.9	U
107-06-2	1,2-Dichloroethane	9.9	U
79-01-6	Trichloroethene	9.9	U

FORM 1A-OR
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TARGET ANALYTE LIST

EPA SAMPLE NO.

COB80

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : VOA
Matrix : Soil
Sample wt/vol : 6.07 (g/mL): g
% Solids : 41.7
GC Column : RXI-624 ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N)
Soil Aliquot (VOA) : (µL)
Heated Purge : (Y / N) Y
Purge Volume : 10 (mL)
Cleanup Types :
Concentration Units (µg/L, mg/L, µg/kg): µg/kg

Contract : EPW14030
MA No. : SDG No.: COB23
Level : LOW
Lab Sample ID : I4183-07
Lab File ID : VT017231.D
Date Received : 07/13/2017
Date Extracted :
Date Analyzed : 07/14/2017
Extract Volume : (µL)
Extraction Type : PT
Injection Volume : (µL)
pH : Dilution Factor : 1.0
Cleanup Factor :

07/14/17

CAS NO.	ANALYTE	CONCENTRATION	Q
108-87-2	Methylcyclohexane	9.9	U
78-87-5	1,2-Dichloropropane	9.9	U
75-27-4	Bromodichloromethane	9.9	U
10061-01-5	cis-1,3-Dichloropropene	9.9	U
108-10-1	4-Methyl-2-pentanone	20	U
108-88-3	Toluene	9.9	U
10061-02-6	trans-1,3-Dichloropropene	9.9	U
79-00-5	1,1,2-Trichloroethane	9.9	U
127-18-4	Tetrachloroethene	9.9	U
591-78-6	2-Hexanone	20	U
124-48-1	Dibromochloromethane	9.9	U
106-93-4	1,2-Dibromoethane	9.9	U
108-90-7	Chlorobenzene	9.9	U
100-41-4	Ethylbenzene	9.9	U
95-47-6	o-xylene	9.9	U
179601-23-1	m,p-Xylene	9.9	U
100-42-5	Styrene	9.9	U
75-25-2	Bromoform	9.9	U
98-82-8	Isopropylbenzene	9.9	U
79-34-5	1,1,2,2-Tetrachloroethane	9.9	U
541-73-1	1,3-Dichlorobenzene	9.9	U
106-46-7	1,4-Dichlorobenzene	9.9	U
95-50-1	1,2-Dichlorobenzene	9.9	U
96-12-8	1,2-Dibromo-3-chloropropane	9.9	U
120-82-1	1,2,4-trichlorobenzene	9.9	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB80

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : VOA
Matrix : Soil
Sample wt/vol : 6.07 (g/mL): g
% Solids : 41.7
GC Column : RXI-624 ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N)
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N) Y
Purge Volume : 10 (mL)
Cleanup Types :
Concentration Units (μg/L, mg/L, μg/kg): μg/kg

Contract : EPW14030
MA No. : SDG No.: COB23
Level : LOW
Lab Sample ID : I4183-07
Lab File ID : VT017231.D
Date Received : 07/13/2017
Date Extracted :
Date Analyzed : 07/14/2017
Extract Volume : (μL)
Extraction Type : PT
Injection Volume : (μL)
pH : Dilution Factor : 1.0
Cleanup Factor :

CAS NO.	ANALYTE	CONCENTRATION	Q
87-61-6	1,2,3-Trichlorobenzene	9.9	<u>9/11/17</u> <u>DV</u>

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TARGET ANALYTE LIST

EPA SAMPLE NO.

C0B82

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : VOA
Matrix : Soil
Sample wt/vol : 5.13 (g/mL): g
% Solids : 37.4
GC Column : RXI-624 ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N)
Soil Aliquot (VOA) : (µL)
Heated Purge : (Y / N) Y
Purge Volume : 10 (mL)
Cleanup Types :
Concentration Units (µg/L, mg/L, µg/kg): µg/kg

Contract : EPW14030
MA No. : SDG No.: C0B23
Level : LOW
Lab Sample ID : I4183-08
Lab File ID : VT017232.D
Date Received : 07/13/2017
Date Extracted :
Date Analyzed : 07/14/2017
Extract Volume : (µL)
Extraction Type : PT
Injection Volume : (µL)
pH : Dilution Factor : 1.0
Cleanup Factor :

CAS NO.	ANALYTE	CONCENTRATION	Q
75-71-8	Dichlorodifluoromethane	13	U
74-87-3	Chloromethane	13	U
75-01-4	Vinyl chloride	13	U
74-83-9	Bromomethane	13	U
75-00-3	Chloroethane	13	U
75-69-4	Trichlorofluoromethane	13	U
75-35-4	1,1-Dichloroethene	13	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	13	U
67-64-1	Acetone	26	U
75-15-0	Carbon disulfide	13	U
79-20-9	Methyl Acetate	13	U
75-09-2	Methylene chloride	13	U
156-60-5	trans-1,2-Dichloroethene	13	U
1634-04-4	Methyl tert-butyl Ether	13	U
75-34-3	1,1-Dichloroethane	13	U
156-59-2	cis-1,2-Dichloroethene	13	U
78-93-3	2-Butanone	26	U
74-97-5	Bromochloromethane	13	U
67-66-3	Chloroform	13	U
71-55-6	1,1,1-Trichloroethane	13	U
110-82-7	Cyclohexane	13	U
56-23-5	Carbon tetrachloride	13	U
71-43-2	Benzene	13	U
107-06-2	1,2-Dichloroethane	13	U
79-01-6	Trichloroethene	13	U

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ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB82

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : VOA
Matrix : Soil
Sample wt/vol : 5.13 (g/mL): g
% Solids : 37.4
GC Column : RXI-624 ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N)
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N) Y
Purge Volume : 10 (mL)
Cleanup Types :
Concentration Units (μg/L, mg/L, μg/kg): μg/kg

Contract : EPW14030
MA No. : SDG No.: COB23
Level : LOW
Lab Sample ID : I4183-08
Lab File ID : VT017232.D
Date Received : 07/13/2017
Date Extracted :
Date Analyzed : 07/14/2017
Extract Volume : (μL)
Extraction Type : PT
Injection Volume : (μL)
pH : Dilution Factor : 1.0
Cleanup Factor :

CAS NO.	ANALYTE	CONCENTRATION	Q
108-87-2	Methylcyclohexane	13	U
78-87-5	1,2-Dichloropropane	13	U
75-27-4	Bromodichloromethane	13	U
10061-01-5	cis-1,3-Dichloropropene	13	U
108-10-1	4-Methyl-2-pentanone	26	U
108-88-3	Toluene	13	U
10061-02-6	trans-1,3-Dichloropropene	13	U
79-00-5	1,1,2-Trichloroethane	13	U
127-18-4	Tetrachloroethene	13	U
591-78-6	2-Hexanone	26	U
124-48-1	Dibromochloromethane	13	U
106-93-4	1,2-Dibromoethane	13	U
108-90-7	Chlorobenzene	13	U
100-41-4	Ethylbenzene	13	U
95-47-6	o-xylene	13	U
179601-23-1	m,p-Xylene	13	U
100-42-5	Styrene	13	U
75-25-2	Bromoform	13	U
98-82-8	Isopropylbenzene	13	U
79-34-5	1,1,2,2-Tetrachloroethane	13	U
541-73-1	1,3-Dichlorobenzene	13	U
106-46-7	1,4-Dichlorobenzene	13	U
95-50-1	1,2-Dichlorobenzene	13	U
96-12-8	1,2-Dibromo-3-chloropropane	13	U
120-82-1	1,2,4-trichlorobenzene	13	U

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TARGET ANALYTE LIST

EPA SAMPLE NO.

COB82

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : VOA
Matrix : Soil
Sample wt/vol : 5.13 (g/mL): g
% Solids : 37.4
GC Column : RXI-624 ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N)
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N) Y
Purge Volume : 10 (mL)
Cleanup Types :
Concentration Units (μg/L, mg/L, μg/kg): μg/kg

Contract : EPW14030
MA No. : SDG No.: COB23
Level : LOW
Lab Sample ID : I4183-08
Lab File ID : VT017232.D
Date Received : 07/13/2017
Date Extracted :
Date Analyzed : 07/14/2017
Extract Volume : (μL)
Extraction Type : PT
Injection Volume : (μL)
pH : Dilution Factor : 1.0
Cleanup Factor :

CAS NO.	ANALYTE	CONCENTRATION	Q
87-61-6	1,2,3-Trichlorobenzene	13	U

FORM 1A-OR
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TARGET ANALYTE LIST

EPA SAMPLE NO.

COB83

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : VOA
Matrix : Soil
Sample wt/vol : 4.35 (g/mL): g
% Solids : 32.3
GC Column : RXI-624 ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N)
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N) Y
Purge Volume : 10 (mL)
Cleanup Types :
Concentration Units (μg/L, mg/L, μg/kg): μg/kg

Contract : EPW14030
MA No. : SDG No.: COB23
Level : LOW
Lab Sample ID : I4183-09
Lab File ID : VT017233.D
Date Received : 07/13/2017
Date Extracted :
Date Analyzed : 07/14/2017
Extract Volume : (μL)
Extraction Type : PT
Injection Volume : (μL)
pH : Dilution Factor : 1.0
Cleanup Factor :

CAS NO.	ANALYTE	CONCENTRATION	Q
75-71-8	Dichlorodifluoromethane	18	U
74-87-3	Chloromethane	18	U
75-01-4	Vinyl chloride	18	U
74-83-9	Bromomethane	18	U
75-00-3	Chloroethane	18	U
75-69-4	Trichlorofluoromethane	18	U
75-35-4	1,1-Dichloroethene	18	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	18	U
67-64-1	Acetone	36	U
75-15-0	Carbon disulfide	18	U
79-20-9	Methyl Acetate	18	U
75-09-2	Methylene chloride	18	U
156-60-5	trans-1,2-Dichloroethene	18	U
1634-04-4	Methyl tert-butyl Ether	18	U
75-34-3	1,1-Dichloroethane	18	U
156-59-2	cis-1,2-Dichloroethene	18	U
78-93-3	2-Butanone	36	U
74-97-5	Bromochloromethane	18	U
67-66-3	Chloroform	18	U
71-55-6	1,1,1-Trichloroethane	18	U
110-82-7	Cyclohexane	18	U
56-23-5	Carbon tetrachloride	18	U
71-43-2	Benzene	18	U
107-06-2	1,2-Dichloroethane	18	U
79-01-6	Trichloroethene	18	U

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TARGET ANALYTE LIST

EPA SAMPLE NO.

COB83

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : VOA
Matrix : Soil
Sample wt/vol : 4.35 (g/mL): g
% Solids : 32.3
GC Column : RXI-624 ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N)
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N) Y
Purge Volume : 10 (mL)
Cleanup Types :
Concentration Units (μg/L, mg/L, μg/kg): μg/kg

Contract : EPW14030
MA No. : SDG No.: COB23
Level : LOW
Lab Sample ID : I4183-09
Lab File ID : VT017233.D
Date Received : 07/13/2017
Date Extracted :
Date Analyzed : 07/14/2017
Extract Volume : (μL)
Extraction Type : PT
Injection Volume : (μL)
pH : Dilution Factor : 1.0
Cleanup Factor :

CAS NO.	ANALYTE	CONCENTRATION	Q
108-87-2	Methylcyclohexane	18	U
78-87-5	1,2-Dichloropropane	18	U
75-27-4	Bromodichloromethane	18	U
10061-01-5	cis-1,3-Dichloropropene	18	U
108-10-1	4-Methyl-2-pentanone	36	U
108-88-3	Toluene	18	U
10061-02-6	trans-1,3-Dichloropropene	18	U
79-00-5	1,1,2-Trichloroethane	18	U
127-18-4	Tetrachloroethene	18	U
591-78-6	2-Hexanone	36	U
124-48-1	Dibromochloromethane	18	U
106-93-4	1,2-Dibromoethane	18	U
108-90-7	Chlorobenzene	18	U
100-41-4	Ethylbenzene	18	U
95-47-6	o-xylene	18	U
179601-23-1	m,p-Xylene	18	U
100-42-5	Styrene	18	U
75-25-2	Bromoform	18	U
98-82-8	Isopropylbenzene	18	U
79-34-5	1,1,2,2-Tetrachloroethane	18	U
541-73-1	1,3-Dichlorobenzene	18	U
106-46-7	1,4-Dichlorobenzene	18	U
95-50-1	1,2-Dichlorobenzene	18	U
96-12-8	1,2-Dibromo-3-chloropropane	18	U
120-82-1	1,2,4-trichlorobenzene	18	U

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TARGET ANALYTE LIST

EPA SAMPLE NO.

C0B83

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : VOA
Matrix : Soil
Sample wt/vol : 4.35 (g/mL): g
% Solids : 32.3
GC Column : RXI-624 ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N)
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N) Y
Purge Volume : 10 (mL)
Cleanup Types :
Concentration Units (μg/L, mg/L, μg/kg): μg/kg

Contract : EPW14030
MA No. : SDG No.: C0B23
Level : LOW
Lab Sample ID : I4183-09
Lab File ID : VT017233.D
Date Received : 07/13/2017
Date Extracted :
Date Analyzed : 07/14/2017
Extract Volume : (μL)
Extraction Type : PT
Injection Volume : (μL)
pH : Dilution Factor : 1.0
Cleanup Factor :

CAS NO.	ANALYTE	CONCENTRATION	Q
87-61-6	1,2,3-Trichlorobenzene	18	U

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TARGET ANALYTE LIST

EPA SAMPLE NO.

COB85

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : VOA
Matrix : Soil
Sample wt/vol : 5.21 (g/mL): g
% Solids : 48.3
GC Column : RXI-624 ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N)
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N) Y
Purge Volume : 10 (mL)
Cleanup Types :
Concentration Units (μg/L, mg/L, μg/kg): μg/kg

Contract : EPW14030
MA No. : SDG No.: COB23
Level : LOW
Lab Sample ID : I4183-10
Lab File ID : VT017234.D
Date Received : 07/13/2017
Date Extracted :
Date Analyzed : 07/14/2017
Extract Volume : (μL)
Extraction Type : PT
Injection Volume : (μL)
pH : Dilution Factor : 1.0
Cleanup Factor :

CAS NO.	ANALYTE	CONCENTRATION	Q
75-71-8	Dichlorodifluoromethane	9.9	U
74-87-3	Chloromethane	9.9	U
75-01-4	Vinyl chloride	9.9	U
74-83-9	Bromomethane	9.9	U
75-00-3	Chloroethane	9.9	U
75-69-4	Trichlorofluoromethane	9.9	U
75-35-4	1,1-Dichloroethene	9.9	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	9.9	U
67-64-1	Acetone	20	U
75-15-0	Carbon disulfide	9.9	U
79-20-9	Methyl Acetate	9.9	U
75-09-2	Methylene chloride	9.9	U
156-60-5	trans-1,2-Dichloroethene	9.9	U
1634-04-4	Methyl tert-butyl Ether	9.9	U
75-34-3	1,1-Dichloroethane	9.9	U
156-59-2	cis-1,2-Dichloroethene	9.9	U
78-93-3	2-Butanone	20	U
74-97-5	Bromochloromethane	9.9	U
67-66-3	Chloroform	9.9	U
71-55-6	1,1,1-Trichloroethane	9.9	U
110-82-7	Cyclohexane	9.9	U
56-23-5	Carbon tetrachloride	9.9	U
71-43-2	Benzene	9.9	U
107-06-2	1,2-Dichloroethane	9.9	U
79-01-6	Trichloroethene	9.9	U

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TARGET ANALYTE LIST

EPA SAMPLE NO.

COB85

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : VOA
Matrix : Soil
Sample wt/vol : 5.21 (g/mL): g
% Solids : 48.3
GC Column : RXI-624 ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N)
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N) Y
Purge Volume : 10 (mL)
Cleanup Types :
Concentration Units (μg/L, mg/L, μg/kg): μg/kg

Contract : EPW14030
MA No. : SDG No.: COB23
Level : LOW
Lab Sample ID : I4183-10
Lab File ID : VT017234.D
Date Received : 07/13/2017
Date Extracted :
Date Analyzed : 07/14/2017
Extract Volume : (μL)
Extraction Type : PT
Injection Volume : (μL)
pH : Dilution Factor : 1.0
Cleanup Factor :

CAS NO.	ANALYTE	CONCENTRATION	Q
108-87-2	Methylcyclohexane	9.9	U
78-87-5	1,2-Dichloropropane	9.9	U
75-27-4	Bromodichloromethane	9.9	U
10061-01-5	cis-1,3-Dichloropropene	9.9	U
108-10-1	4-Methyl-2-pentanone	20	U
108-88-3	Toluene	9.9	U
10061-02-6	trans-1,3-Dichloropropene	9.9	U
79-00-5	1,1,2-Trichloroethane	9.9	U
127-18-4	Tetrachloroethene	9.9	U
591-78-6	2-Hexanone	20	U
124-48-1	Dibromochloromethane	9.9	U
106-93-4	1,2-Dibromoethane	9.9	U
108-90-7	Chlorobenzene	9.9	U
100-41-4	Ethylbenzene	9.9	U
95-47-6	o-xylene	9.9	U
179601-23-1	m,p-Xylene	9.9	U
100-42-5	Styrene	9.9	U
75-25-2	Bromoform	9.9	U
98-82-8	Isopropylbenzene	9.9	U
79-34-5	1,1,2,2-Tetrachloroethane	9.9	U
541-73-1	1,3-Dichlorobenzene	9.9	U
106-46-7	1,4-Dichlorobenzene	9.9	U
95-50-1	1,2-Dichlorobenzene	9.9	U
96-12-8	1,2-Dibromo-3-chloropropane	9.9	U
120-82-1	1,2,4-trichlorobenzene	9.9	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB85

Lab Name : Chemtech Consulting Group Contract : EPW14030
Lab Code: CHM Case No.: R35186 MA No. : _____ SDG No.: COB23
Analytical Method : VOA Level : LOW
Matrix : Soil Lab Sample ID : I4183-10
Sample wt/vol : 5.21 (g/mL): g Lab File ID : VT017234.D
% Solids : 48.3 Date Received : 07/13/2017
GC Column : RXI-624 ID : 0.25 (mm) Date Extracted : _____
GC Column : _____ ID : _____ (mm) Date Analyzed : 07/14/2017
Extract Concentrated : (Y / N) _____ Extract Volume : _____ (μL)
Soil Aliquot (VOA) : _____ (μL) Extraction Type : PT
Heated Purge : (Y / N) Y Injection Volume : _____ (μL)
Purge Volume : 10 (mL) pH : _____ Dilution Factor : 1.0
Cleanup Types : _____ Cleanup Factor : _____
Concentration Units (μg/L, mg/L, μg/kg) : μg/kg

CAS NO.	ANALYTE	CONCENTRATION	Q
87-61-6	1,2,3-Trichlorobenzene	9.9	U

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EPA SAMPLE NO.

COB86RE

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : VOA
Matrix : Soil
Sample wt/vol : 4.84 (g/mL): g
% Solids : 39.4
GC Column : RXI-624 ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N)
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N) Y
Purge Volume : 10 (mL)
Cleanup Types :
Concentration Units (μg/L, mg/L, μg/kg): μg/kg

Contract : EPW14030
MA No. : SDG No.: COB23
Level : LOW
Lab Sample ID : I4183-11RE
Lab File ID : VT017246.D
Date Received : 07/13/2017
Date Extracted :
Date Analyzed : 07/17/2017
Extract Volume : (μL)
Extraction Type : PT
Injection Volume : (μL)
pH : Dilution Factor : 1.0
Cleanup Factor :

CAS NO.	ANALYTE	CONCENTRATION	Q
75-71-8	Dichlorodifluoromethane	13	U
74-87-3	Chloromethane	13	U
75-01-4	Vinyl chloride	13	U
74-83-9	Bromomethane	13	U
75-00-3	Chloroethane	13	U
75-69-4	Trichlorofluoromethane	13	U
75-35-4	1,1-Dichloroethene	13	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	13	U
67-64-1	Acetone	52	U
75-15-0	Carbon disulfide	13	U
79-20-9	Methyl Acetate	13	U
75-09-2	Methylene chloride	12	J
156-60-5	trans-1,2-Dichloroethene	13	U
1634-04-4	Methyl tert-butyl Ether	13	U
75-34-3	1,1-Dichloroethane	13	U
156-59-2	cis-1,2-Dichloroethene	13	U
78-93-3	2-Butanone	26	U
74-97-5	Bromochloromethane	13	U
67-66-3	Chloroform	13	U
71-55-6	1,1,1-Trichloroethane	13	U
110-82-7	Cyclohexane	13	U
56-23-5	Carbon tetrachloride	13	U
71-43-2	Benzene	13	U
107-06-2	1,2-Dichloroethane	13	U
79-01-6	Trichloroethene	13	U

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TARGET ANALYTE LIST

EPA SAMPLE NO.

COB86RE

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : VOA
Matrix : Soil
Sample wt/vol : 4.84 (g/mL): g
% Solids : 39.4
GC Column : RXI-624 ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N)
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N) Y
Purge Volume : 10 (mL)
Cleanup Types :
Concentration Units (μg/L, mg/L, μg/kg): μg/kg

Contract : EPW14030
MA No. : SDG No.: COB23
Level : LOW
Lab Sample ID : I4183-11RE
Lab File ID : VT017246.D
Date Received : 07/13/2017
Date Extracted :
Date Analyzed : 07/17/2017
Extract Volume : (μL)
Extraction Type : PT
Injection Volume : (μL)
pH : Dilution Factor : 1.0
Cleanup Factor :

CAS NO.	ANALYTE	CONCENTRATION	Q
108-87-2	Methylcyclohexane	13	U
78-87-5	1,2-Dichloropropane	13	U
75-27-4	Bromodichloromethane	13	U
10061-01-5	cis-1,3-Dichloropropene	13	U
108-10-1	4-Methyl-2-pentanone	26	U
108-88-3	Toluene	13	U
10061-02-6	trans-1,3-Dichloropropene	13	U
79-00-5	1,1,2-Trichloroethane	13	U
127-18-4	Tetrachloroethene	13	U
591-78-6	2-Hexanone	26	U
124-48-1	Dibromochloromethane	13	U
106-93-4	1,2-Dibromoethane	13	U
108-90-7	Chlorobenzene	13	U
100-41-4	Ethylbenzene	13	U
95-47-6	o-xylene	13	U
179601-23-1	m,p-Xylene	13	U
100-42-5	Styrene	13	U
75-25-2	Bromoform	13	U
98-82-8	Isopropylbenzene	13	U
79-34-5	1,1,2,2-Tetrachloroethane	13	U
541-73-1	1,3-Dichlorobenzene	13	U
106-46-7	1,4-Dichlorobenzene	13	U
95-50-1	1,2-Dichlorobenzene	13	U
96-12-8	1,2-Dibromo-3-chloropropane	13	U
120-82-1	1,2,4-trichlorobenzene	13	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB86RE

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : VOA
Matrix : Soil
Sample wt/vol : 4.84 (g/mL): g
% Solids : 39.4
GC Column : RXI-624 ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N)
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N) Y
Purge Volume : 10 (mL)
Cleanup Types :
Concentration Units (μg/L, mg/L, μg/kg): μg/kg

Contract : EPW14030
MA No. : SDG No.: COB23
Level : LOW
Lab Sample ID : I4183-11RE
Lab File ID : VT017246.D
Date Received : 07/13/2017
Date Extracted :
Date Analyzed : 07/17/2017
Extract Volume : (μL)
Extraction Type : PT
Injection Volume : (μL)
pH : Dilution Factor : 1.0
Cleanup Factor :

CAS NO.	ANALYTE	CONCENTRATION	Q
87-61-6	1,2,3-Trichlorobenzene	13	<u> </u>

9/11/17
DV

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB87

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : VOA
Matrix : Soil
Sample wt/vol : 4.79 (g/mL): g
% Solids : 40.4
GC Column : RXI-624 ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N)
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N) Y
Purge Volume : 10 (mL)
Cleanup Types :
Concentration Units (μg/L, mg/L, μg/kg): μg/kg

Contract : EPW14030
MA No. : 0094780 SDG No.: COB23
Level : LOW
Lab Sample ID : I4183-12
Lab File ID : VT017236.D
Date Received : 07/13/2017
Date Extracted :
Date Analyzed : 07/14/2017
Extract Volume : (μL)
Extraction Type : PT
Injection Volume : (μL)
pH : Dilution Factor : 1.0
Cleanup Factor :

CAS NO.	ANALYTE	CONCENTRATION	Q
75-71-8	Dichlorodifluoromethane	13	U
74-87-3	Chloromethane	13	U
75-01-4	Vinyl chloride	13	U
74-83-9	Bromomethane	13	U
75-00-3	Chloroethane	13	U
75-69-4	Trichlorofluoromethane	13	U
75-35-4	1,1-Dichloroethene	13	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	13	U
67-64-1	Acetone	26	U
75-15-0	Carbon disulfide	13	U
79-20-9	Methyl Acetate	13	U
75-09-2	Methylene chloride	13	U
156-60-5	trans-1,2-Dichloroethene	13	U
1634-04-4	Methyl tert-butyl Ether	13	U
75-34-3	1,1-Dichloroethane	13	U
156-59-2	cis-1,2-Dichloroethene	13	U
78-93-3	2-Butanone	26	U
74-97-5	Bromochloromethane	13	U
67-66-3	Chloroform	13	U
71-55-6	1,1,1-Trichloroethane	13	U
110-82-7	Cyclohexane	13	U
56-23-5	Carbon tetrachloride	13	U
71-43-2	Benzene	13	U
107-06-2	1,2-Dichloroethane	13	U
79-01-6	Trichloroethene	13	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB87

Lab Name : Chemtech Consulting Group Contract : EPW14030
Lab Code: CHM Case No.: R35186 MA No. : SDG No.: COB23
Analytical Method : VOA Level: LOW
Matrix : Soil Lab Sample ID : I4183-12
Sample wt/vol : 4.79 (g/mL): g Lab File ID : VT017236.D
% Solids : 40.4 Date Received : 07/13/2017
GC Column : RXI-624 ID : 0.25 (mm) Date Extracted :
GC Column : ID : (mm) Date Analyzed : 07/14/2017
Extract Concentrated : (Y / N) Extract Volume : (µL)
Soil Aliquot (VOA) : (µL) Extraction Type : PT
Heated Purge : (Y / N) Y Injection Volume : (µL)
Purge Volume : 10 (mL) pH : Dilution Factor : 1.0
Cleanup Types : Cleanup Factor :
Concentration Units (µg/L, mg/L, µg/kg): µg/kg

CAS NO.	ANALYTE	CONCENTRATION	Q
108-87-2	Methylcyclohexane	13	U
78-87-5	1,2-Dichloropropane	13	U
75-27-4	Bromodichloromethane	13	U
10061-01-5	cis-1,3-Dichloropropene	13	U
108-10-1	4-Methyl-2-pentanone	26	U
108-88-3	Toluene	13	U
10061-02-6	trans-1,3-Dichloropropene	13	U
79-00-5	1,1,2-Trichloroethane	13	U
127-18-4	Tetrachloroethene	13	U
591-78-6	2-Hexanone	26	U
124-48-1	Dibromochloromethane	13	U
106-93-4	1,2-Dibromoethane	13	U
108-90-7	Chlorobenzene	13	U
100-41-4	Ethylbenzene	13	U
95-47-6	o-xylene	13	U
179601-23-1	m,p-Xylene	13	U
100-42-5	Styrene	13	U
75-25-2	Bromoform	13	U
98-82-8	Isopropylbenzene	13	U
79-34-5	1,1,2,2-Tetrachloroethane	13	U
541-73-1	1,3-Dichlorobenzene	13	U
106-46-7	1,4-Dichlorobenzene	13	U
95-50-1	1,2-Dichlorobenzene	13	U
96-12-8	1,2-Dibromo-3-chloropropane	13	U
120-82-1	1,2,4-trichlorobenzene	13	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB87

Lab Name : <u>Chemtech Consulting Group</u>	Contract : <u>EPW14030</u>
Lab Code: <u>CHM</u> Case No.: <u>R35186</u>	MA No. : _____ SDG No.: <u>COB23</u>
Analytical Method : <u>VOA</u>	Level : <u>LOW</u>
Matrix : <u>Soil</u>	Lab Sample ID : <u>I4183-12</u>
Sample wt/vol : <u>4.79</u> (g/mL): <u>g</u>	Lab File ID : <u>VT017236.D</u>
% Solids : <u>40.4</u>	Date Received : <u>07/13/2017</u>
GC Column : <u>RXI-624</u> ID : <u>0.25</u> (mm)	Date Extracted : _____
GC Column : _____ ID : _____ (mm)	Date Analyzed : <u>07/14/2017</u>
Extract Concentrated : (Y / N) _____	Extract Volume : _____ (μL)
Soil Aliquot (VOA) : _____ (μL)	Extraction Type : <u>PT</u>
Heated Purge : (Y / N) <u>Y</u>	Injection Volume : _____ (μL)
Purge Volume : <u>10</u> (mL)	pH : _____ Dilution Factor : <u>1.0</u>
Cleanup Types : _____	Cleanup Factor : _____
Concentration Units (μg/L, mg/L, μg/kg): <u>μg/kg</u>	

CAS NO.	ANALYTE	CONCENTRATION	Q
87-61-6	1,2,3-Trichlorobenzene	13	U

FORM 1B-OR
ORGANIC ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

C0B87

Lab Name : Chemtech Consulting Group Contract : EPW14030
Lab Code: CHM Case No.: R35186 MA No. : SDG No.: C0B23
Analytical Method : VOA Level : LOW
Matrix : Soil Lab Sample ID : I4183-12
Sample wt/vol : 4.79 (g/mL): g Lab File ID : VT017236.D
% Solids : 40.4 Date Received : 07/13/2017
GC Column : RXI-624 ID : 0.25 (mm) Date Extracted :
Extract Concentrated : (Y / N) Date Analyzed : 07/14/2017
Soil Aliquot (VOA) : (μL) Extract Volume : (μL)
Heated Purge : (Y / N) Y Extraction Type : PT
Purge Volume : 10 (mL) Injection Volume : (μL)
Cleanup Types : pH : Dilution Factor : 1.0
Concentration Units (μg/L,mg/L,μg/kg): μg/kg Cleanup Factor :

CAS NO.	ANALYTE	RT	EST. CONC.	Q
1 E966796	Total Alkanes	N/A	0.0	

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB88

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : VOA
Matrix : Soil
Sample wt/vol : 5.06 (g/mL): g
% Solids : 57.4
GC Column : RXI-624 ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N)
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N) Y
Purge Volume : 10 (mL)
Cleanup Types :
Concentration Units (μg/L, mg/L, μg/kg): μg/kg

Contract : EPW14030
MA No. : SDG No.: COB23
Level : LOW
Lab Sample ID : I4183-13
Lab File ID : VT017247.D
Date Received : 07/13/2017
Date Extracted :
Date Analyzed : 07/17/2017
Extract Volume : (μL)
Extraction Type : PT
Injection Volume : (μL)
pH : Dilution Factor : 1.0
Cleanup Factor :

CAS NO.	ANALYTE	CONCENTRATION	Q
75-71-8	Dichlorodifluoromethane	8.6	U
74-87-3	Chloromethane	8.6	U
75-01-4	Vinyl chloride	8.6	U
74-83-9	Bromomethane	8.6	U
75-00-3	Chloroethane	8.6	U
75-69-4	Trichlorofluoromethane	8.6	U
75-35-4	1,1-Dichloroethene	8.6	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	8.6	U
67-64-1	Acetone	17	U
75-15-0	Carbon disulfide	8.6	U
79-20-9	Methyl Acetate	8.6	U
75-09-2	Methylene chloride	8.6	U
156-60-5	trans-1,2-Dichloroethene	8.6	U
1634-04-4	Methyl tert-butyl Ether	8.6	U
75-34-3	1,1-Dichloroethane	8.6	U
156-59-2	cis-1,2-Dichloroethene	8.6	U
78-93-3	2-Butanone	17	U
74-97-5	Bromochloromethane	8.6	U
67-66-3	Chloroform	8.6	U
71-55-6	1,1,1-Trichloroethane	8.6	U
110-82-7	Cyclohexane	8.6	U
56-23-5	Carbon tetrachloride	8.6	U
71-43-2	Benzene	8.6	U
107-06-2	1,2-Dichloroethane	8.6	U
79-01-6	Trichloroethene	8.6	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB88

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : VOA
Matrix : Soil
Sample wt/vol : 5.06 (g/mL): g
% Solids : 57.4
GC Column : RXI-624 ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N)
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N) Y
Purge Volume : 10 (mL)
Cleanup Types :
Concentration Units (μg/L, mg/L, μg/kg): μg/kg

Contract : EPW14030
MA No. : SDG No.: COB23
Level : LOW
Lab Sample ID : I4183-13
Lab File ID : VT017247.D
Date Received : 07/13/2017
Date Extracted :
Date Analyzed : 07/17/2017
Extract Volume : (μL)
Extraction Type : PT
Injection Volume : (μL)
pH : Dilution Factor : 1.0
Cleanup Factor :

CAS NO.	ANALYTE	CONCENTRATION	Q
108-87-2	Methylcyclohexane	8.6	U
78-87-5	1,2-Dichloropropane	8.6	U
75-27-4	Bromodichloromethane	8.6	U
10061-01-5	cis-1,3-Dichloropropene	8.6	U
108-10-1	4-Methyl-2-pentanone	17	U
108-88-3	Toluene	8.6	U
10061-02-6	trans-1,3-Dichloropropene	8.6	U
79-00-5	1,1,2-Trichloroethane	8.6	U
127-18-4	Tetrachloroethene	8.6	U
591-78-6	2-Hexanone	17	U
124-48-1	Dibromochloromethane	8.6	U
106-93-4	1,2-Dibromoethane	8.6	U
108-90-7	Chlorobenzene	8.6	U
100-41-4	Ethylbenzene	8.6	U
95-47-6	o-xylene	8.6	U
179601-23-1	m,p-Xylene	8.6	U
100-42-5	Styrene	8.6	U
75-25-2	Bromoform	8.6	U
98-82-8	Isopropylbenzene	8.6	U
79-34-5	1,1,2,2-Tetrachloroethane	8.6	U
541-73-1	1,3-Dichlorobenzene	8.6	U
106-46-7	1,4-Dichlorobenzene	8.6	U
95-50-1	1,2-Dichlorobenzene	8.6	U
96-12-8	1,2-Dibromo-3-chloropropane	8.6	U
120-82-1	1,2,4-trichlorobenzene	8.6	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB88

Lab Name : Chemtech Consulting Group Contract : EPW14030
Lab Code: CHM Case No.: R35186 MA No. : _____ SDG No.: COB23
Analytical Method : VOA Level : LOW
Matrix : Soil Lab Sample ID : I4183-13
Sample wt/vol : 5.06 (g/mL): g Lab File ID : VT017247.D
% Solids : 57.4 Date Received : 07/13/2017
GC Column : RXI-624 ID : 0.25 (mm) Date Extracted : _____
GC Column : _____ ID : _____ (mm) Date Analyzed : 07/17/2017
Extract Concentrated : (Y / N) _____ Extract Volume : _____ (μL)
Soil Aliquot (VOA) : _____ (μL) Extraction Type : PT
Heated Purge : (Y / N) Y Injection Volume : _____ (μL)
Purge Volume : 10 (mL) pH : _____ Dilution Factor : 1.0
Cleanup Types : _____ Cleanup Factor : _____
Concentration Units (μg/L, mg/L, μg/kg): μg/kg

CAS NO.	ANALYTE	CONCENTRATION	Q
87-61-6	1,2,3-Trichlorobenzene	8.6	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB45

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA
Matrix : Water
Sample wt/vol : 991 (g/mL) : mL
% Solids : _____
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : _____ ID : _____ (mm)
Extract Concentrated : (Y / N) N
Soil Aliquot (VOA) : _____ (µL)
Heated Purge : (Y / N) _____
Purge Volume : _____ (mL)
Cleanup Types : _____
Concentration Units (µg/L, mg/L, µg/kg) : µg/L

Contract : EPW14030
MA No. : _____ SDG No.: COB23
Level : _____
Lab Sample ID : I4183-02
Lab File ID : BG027953.D
Date Received : 07/13/2017
Date Extracted : 07/14/2017
Date Analyzed : 07/17/2017
Extract Volume : 1000 (µL)
Extraction Type : CONH
Injection Volume : 1.0 (µL)
pH : 6 Dilution Factor : 1.0
Cleanup Factor : 1.0

CAS NO.	ANALYTE	CONCENTRATION	Q
123-91-1	1,4-Dioxane	2.0	U
100-52-7	Benzaldehyde	1.2	J
108-95-2	Phenol	10	U
111-44-4	Bis(2-Chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	5.0	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-n-propylamine	5.0	U
67-72-1	Hexachloroethane	5.0	U
98-95-3	Nitrobenzene	5.0	U
78-59-1	Isophorone	5.0	U
88-75-5	2-Nitrophenol	5.0	U
105-67-9	2,4-Dimethylphenol	5.0	U
111-91-1	Bis(2-Chloroethoxy)methane	5.0	U
120-83-2	2,4-Dichlorophenol	5.0	U
91-20-3	Naphthalene	5.0	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	5.0	U
105-60-2	Caprolactam	10	U
59-50-7	4-Chloro-3-methylphenol	6.4	
91-57-6	2-Methylnaphthalene	5.0	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	5.0	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

C0B45

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA
Matrix : Water
Sample wt/vol : 991 (g/mL): mL
% Solids : _____
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : _____ ID : _____ (mm)
Extract Concentrated : (Y / N) N
Soil Aliquot (VOA) : _____ (µL)
Heated Purge : (Y / N) _____
Purge Volume : _____ (mL)
Cleanup Types : _____
Concentration Units (µg/L, mg/L, µg/kg) : µg/L

Contract : EPW14030
MA No. : _____ SDG No.: C0B23
Level : _____
Lab Sample ID : I4183-02
Lab File ID : BG027953.D
Date Received : 07/13/2017
Date Extracted : 07/14/2017
Date Analyzed : 07/17/2017
Extract Volume : 1000 (µL)
Extraction Type : CONH
Injection Volume : 1.0 (µL)
pH : 6 Dilution Factor : 1.0
Cleanup Factor : 1.0

CAS NO.	ANALYTE	CONCENTRATION	Q
95-95-4	2,4,5-Trichlorophenol	5.0	U
92-52-4	1,1-Biphenyl	5.0	U
91-58-7	2-Chloronaphthalene	5.0	U
88-74-4	2-Nitroaniline	5.0	U
131-11-3	Dimethylphthalate	5.0	U
606-20-2	2,6-Dinitrotoluene	5.0	U
208-96-8	Acenaphthylene	5.0	U
99-09-2	3-Nitroaniline	10	U
83-32-9	Acenaphthene	5.0	U
51-28-5	2,4-Dinitrophenol	10	U
100-02-7	4-Nitrophenol	10	U
132-64-9	Dibenzofuran	5.0	U
121-14-2	2,4-Dinitrotoluene	5.0	U
84-66-2	Diethylphthalate	5.0	U
86-73-7	Fluorene	5.0	U
7005-72-3	4-Chlorophenyl-phenylether	5.0	U
100-01-6	4-Nitroaniline	10	U
534-52-1	4,6-Dinitro-2-methylphenol	10	U
86-30-6	N-Nitrosodiphenylamine	5.0	U
95-94-3	1,2,4,5-Tetrachlorobenzene	5.0	U
101-55-3	4-Bromophenyl-phenylether	5.0	U
118-74-1	Hexachlorobenzene	5.0	U
1912-24-9	Atrazine	10	U
87-86-5	Pentachlorophenol	10	U
85-01-8	Phenanthrene	5.0	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

C0B45

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA
Matrix : Water
Sample wt/vol : 991 (g/mL): mL
% Solids : _____
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : _____ ID : _____ (mm)
Extract Concentrated : (Y / N) N
Soil Aliquot (VOA) : _____ (µL)
Heated Purge : (Y / N) _____
Purge Volume : _____ (mL)
Cleanup Types : _____
Concentration Units (µg/L, mg/L, µg/kg) : µg/L

Contract : EPW14030
MA No. : _____ SDG No.: C0B23
Level : _____
Lab Sample ID : I4183-02
Lab File ID : BG027953.D
Date Received : 07/13/2017
Date Extracted : 07/14/2017
Date Analyzed : 07/17/2017
Extract Volume : 1000 (µL)
Extraction Type : CONH
Injection Volume : 1.0 (µL)
pH : 6 Dilution Factor : 1.0
Cleanup Factor : 1.0

CAS NO.	ANALYTE	CONCENTRATION	Q
120-12-7	Anthracene	5.0	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	5.0	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	5.0	U
85-68-7	Butylbenzylphthalate	5.0	U
91-94-1	3,3-Dichlorobenzidine	10	U
56-55-3	Benzo(a)anthracene	5.0	U
218-01-9	Chrysene	5.0	U
117-81-7	Bis(2-ethylhexyl)phthalate	5.0	U
117-84-0	Di-n-octyl phthalate	10	U
205-99-2	Benzo(b)fluoranthene	5.0	U
207-08-9	Benzo(k)fluoranthene	5.0	U
50-32-8	Benzo(a)pyrene	5.0	U
193-39-5	Indeno(1,2,3-cd)pyrene	5.0	U
53-70-3	Dibenzo(a,h)anthracene	5.0	U
191-24-2	Benzo(g,h,i)perylene	5.0	U
58-90-2	2,3,4,6-Tetrachlorophenol	5.0	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

C0B70

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA
Matrix : Water
Sample wt/vol : 986 (g/mL): mL
% Solids : _____
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : _____ ID : _____ (mm)
Extract Concentrated : (Y / N) N
Soil Aliquot (VOA) : _____ (µL)
Heated Purge : (Y / N) _____
Purge Volume : _____ (mL)
Cleanup Types : _____
Concentration Units (µg/L, mg/L, µg/kg) : µg/L

Contract : EPW14030
MA No. : _____ SDG No.: C0B23
Level : _____
Lab Sample ID : I4183-04
Lab File ID : BG027954.D
Date Received : 07/13/2017
Date Extracted : 07/14/2017
Date Analyzed : 07/17/2017
Extract Volume : 1000 (µL)
Extraction Type : CONH
Injection Volume : 1.0 (µL)
pH : 6 Dilution Factor : 1.0
Cleanup Factor : 1.0

CAS NO.	ANALYTE	CONCENTRATION	Q
123-91-1	1,4-Dioxane	2.0	U
100-52-7	Benzaldehyde	1.2	J
108-95-2	Phenol	10	U
111-44-4	Bis(2-Chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	5.1	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-n-propylamine	5.1	U
67-72-1	Hexachloroethane	5.1	U
98-95-3	Nitrobenzene	5.1	U
78-59-1	Isophorone	5.1	U
88-75-5	2-Nitrophenol	5.1	U
105-67-9	2,4-Dimethylphenol	5.1	U
111-91-1	Bis(2-Chloroethoxy)methane	5.1	U
120-83-2	2,4-Dichlorophenol	5.1	U
91-20-3	Naphthalene	5.1	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	5.1	U
105-60-2	Caprolactam	10	U
59-50-7	4-Chloro-3-methylphenol	6.1	
91-57-6	2-Methylnaphthalene	5.1	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	5.1	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

C0B70

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA
Matrix : Water
Sample wt/vol : 986 (g/mL): mL
% Solids : _____
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : _____ ID : _____ (mm)
Extract Concentrated : (Y / N) N
Soil Aliquot (VOA) : _____ (µL)
Heated Purge : (Y / N) _____
Purge Volume : _____ (mL)
Cleanup Types : _____
Concentration Units (µg/L, mg/L, µg/kg) : µg/L

Contract : EPW14030
MA No. : _____ SDG No.: C0B23
Level : _____
Lab Sample ID : I4183-04
Lab File ID : BG027954.D
Date Received : 07/13/2017
Date Extracted : 07/14/2017
Date Analyzed : 07/17/2017
Extract Volume : 1000 (µL)
Extraction Type : CONH
Injection Volume : 1.0 (µL)
pH : 6 Dilution Factor : 1.0
Cleanup Factor : 1.0

CAS NO.	ANALYTE	CONCENTRATION	Q
95-95-4	2,4,5-Trichlorophenol	5.1	U
92-52-4	1,1-Biphenyl	5.1	U
91-58-7	2-Chloronaphthalene	5.1	U
88-74-4	2-Nitroaniline	5.1	U
131-11-3	Dimethylphthalate	5.1	U
606-20-2	2,6-Dinitrotoluene	5.1	U
208-96-8	Acenaphthylene	5.1	U
99-09-2	3-Nitroaniline	10	U
83-32-9	Acenaphthene	5.1	U
51-28-5	2,4-Dinitrophenol	10	U
100-02-7	4-Nitrophenol	10	U
132-64-9	Dibenzofuran	5.1	U
121-14-2	2,4-Dinitrotoluene	5.1	U
84-66-2	Diethylphthalate	5.1	U
86-73-7	Fluorene	5.1	U
7005-72-3	4-Chlorophenyl-phenylether	5.1	U
100-01-6	4-Nitroaniline	10	U
534-52-1	4,6-Dinitro-2-methylphenol	10	U
86-30-6	N-Nitrosodiphenylamine	5.1	U
95-94-3	1,2,4,5-Tetrachlorobenzene	5.1	U
101-55-3	4-Bromophenyl-phenylether	5.1	U
118-74-1	Hexachlorobenzene	5.1	U
1912-24-9	Atrazine	10	U
87-86-5	Pentachlorophenol	10	U
85-01-8	Phenanthrene	5.1	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

C0B70

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA
Matrix : Water
Sample wt/vol : 986 (g/mL): mL
% Solids : _____
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : _____ ID : _____ (mm)
Extract Concentrated : (Y / N) N
Soil Aliquot (VOA) : _____ (μL)
Heated Purge : (Y / N) _____
Purge Volume : _____ (mL)
Cleanup Types : _____
Concentration Units (μg/L, mg/L, μg/kg) : μg/L

Contract : EPW14030
MA No. : _____ SDG No.: C0B23
Level : _____
Lab Sample ID : I4183-04
Lab File ID : BG027954.D
Date Received : 07/13/2017
Date Extracted : 07/14/2017
Date Analyzed : 07/17/2017
Extract Volume : 1000 (μL)
Extraction Type : CONH
Injection Volume : 1.0 (μL)
pH : 6 Dilution Factor : 1.0
Cleanup Factor : 1.0

CAS NO.	ANALYTE	CONCENTRATION	Q
120-12-7	Anthracene	5.1	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	5.1	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	5.1	U
85-68-7	Butylbenzylphthalate	5.1	U
91-94-1	3,3-Dichlorobenzidine	10	U
56-55-3	Benzo(a)anthracene	5.1	U
218-01-9	Chrysene	5.1	U
117-81-7	Bis(2-ethylhexyl)phthalate	5.1	U
117-84-0	Di-n-octyl phthalate	10	U
205-99-2	Benzo(b)fluoranthene	5.1	U
207-08-9	Benzo(k)fluoranthene	5.1	U
50-32-8	Benzo(a)pyrene	5.1	U
193-39-5	Indeno(1,2,3-cd)pyrene	5.1	U
53-70-3	Dibenzo(a,h)anthracene	5.1	U
191-24-2	Benzo(g,h,i)perylene	5.1	U
58-90-2	2,3,4,6-Tetrachlorophenol	5.1	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

C0B45

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA SIM
Matrix : Water
Sample wt/vol : 991 (g/mL): mL
% Solids : _____
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : _____ ID : _____ (mm)
Extract Concentrated : (Y / N) N
Soil Aliquot (VOA) : _____ (μL)
Heated Purge : (Y / N) _____
Purge Volume : _____ (mL)
Cleanup Types : _____
Concentration Units (μg/L, mg/L, μg/kg) : μg/L

Contract : EPW14030
MA No. : _____ SDG No.: C0B23
Level : _____
Lab Sample ID : I4183-02
Lab File ID : BE093541.D
Date Received : 07/13/2017
Date Extracted : 07/14/2017
Date Analyzed : 07/24/2017
Extract Volume : 1000 (μL)
Extraction Type : CONH
Injection Volume : 1.0 (μL)
pH : 6 Dilution Factor : 1.0
Cleanup Factor : 1.0

CAS NO.	ANALYTE	CONCENTRATION	Q
91-20-3	Naphthalene	0.23	
91-57-6	2-Methylnaphthalene	0.090	J
208-96-8	Acenaphthylene	0.10	U
83-32-9	Acenaphthene	0.10	U
86-73-7	Fluorene	0.10	U
87-86-5	Pentachlorophenol	0.20	U
85-01-8	Phenanthrene	0.10	U
120-12-7	Anthracene	0.10	U
206-44-0	Fluoranthene	0.10	U
129-00-0	Pyrene	0.10	U
56-55-3	Benzo(a)anthracene	0.10	U
218-01-9	Chrysene	0.10	U
205-99-2	Benzo(b)fluoranthene	0.10	U
207-08-9	Benzo(k)fluoranthene	0.10	U
50-32-8	Benzo(a)pyrene	0.10	U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	U
53-70-3	Dibenzo(a,h)anthracene	0.10	U
191-24-2	Benzo(g,h,i)perylene	0.10	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

C0B70

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA SIM
Matrix : Water
Sample wt/vol : 986 (g/mL): mL
% Solids : _____
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : _____ ID : _____ (mm)
Extract Concentrated : (Y / N) N
Soil Aliquot (VOA) : _____ (µL)
Heated Purge : (Y / N) _____
Purge Volume : _____ (mL)
Cleanup Types : _____
Concentration Units (µg/L, mg/L, µg/kg) : µg/L

Contract : EPW14030
MA No. : _____ SDG No.: C0B23
Level : _____
Lab Sample ID : I4183-04
Lab File ID : BE093542.D
Date Received : 07/13/2017
Date Extracted : 07/14/2017
Date Analyzed : 07/24/2017
Extract Volume : 1000 (µL)
Extraction Type : CONH
Injection Volume : 1.0 (µL)
pH : 6 Dilution Factor : 1.0
Cleanup Factor : 1.0

CAS NO.	ANALYTE	CONCENTRATION	Q
91-20-3	Naphthalene	0.27	
91-57-6	2-Methylnaphthalene	0.11	
208-96-8	Acenaphthylene	0.10	U
83-32-9	Acenaphthene	0.10	U
86-73-7	Fluorene	0.10	U
87-86-5	Pentachlorophenol	0.20	U
85-01-8	Phenanthrene	0.10	U
120-12-7	Anthracene	0.10	U
206-44-0	Fluoranthene	0.10	U
129-00-0	Pyrene	0.10	U
56-55-3	Benzo(a)anthracene	0.10	U
218-01-9	Chrysene	0.10	U
205-99-2	Benzo(b)fluoranthene	0.10	U
207-08-9	Benzo(k)fluoranthene	0.10	U
50-32-8	Benzo(a)pyrene	0.10	U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	U
53-70-3	Dibenzo(a,h)anthracene	0.10	U
191-24-2	Benzo(g,h,i)perylene	0.10	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

C0B45

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : ARO
Matrix : Water
Sample wt/vol : 982 (g/mL): mL
% Solids : _____
GC Column : ZB-MR1 ID : 0.32 (mm)
GC Column : ZB-MR2 ID : 0.32 (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : _____ (µL)
Heated Purge : (Y/N) _____
Purge Volume : _____ (mL)
Cleanup Types : Acid
Concentration Units (µg/L, mg/L, µg/kg): µg/L

Contract : EPW14030
MA No. : _____ SDG No.: C0B23
Level : _____
Lab Sample ID : I4183-02
Lab File ID : PR019943.D
Date Received : 07/13/2017
Date Extracted : 07/14/2017
Date Analyzed : 07/31/2017
Extract Volume : 10000 (µL)
Extraction Type : SEPF
Injection Volume : 1.0 (µL)
pH : 6 Dilution Factor : 1.0
Cleanup Factor : 1.0

CAS NO.	ANALYTE	CONCENTRATION	Q
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	1.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U
37324-23-5	Aroclor-1262	1.0	U
11100-14-4	Aroclor-1268	1.0	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

C0B70

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : ARO
Matrix : Water
Sample wt/vol : 978 (g/mL): mL
% Solids : _____
GC Column : ZB-MR1 ID : 0.32 (mm)
GC Column : ZB-MR2 ID : 0.32 (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : _____ (μL)
Heated Purge : (Y/N) _____
Purge Volume : _____ (mL)
Cleanup Types : Acid
Concentration Units (μg/L, mg/L, μg/kg): μg/L

Contract : EPW14030
MA No. : _____ SDG No.: C0B23
Level : _____
Lab Sample ID : I4183-04
Lab File ID : PR019942.D
Date Received : 07/13/2017
Date Extracted : 07/14/2017
Date Analyzed : 07/31/2017
Extract Volume : 10000 (μL)
Extraction Type : SEPF
Injection Volume : 1.0 (μL)
pH : 6 Dilution Factor : 1.0
Cleanup Factor : 1.0


CAS NO.	ANALYTE	CONCENTRATION	Q
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	1.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U
37324-23-5	Aroclor-1262	1.0	U
11100-14-4	Aroclor-1268	1.0	U



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
Environmental Sciences Center
701 Mapes Road
Fort Meade, Maryland 20755-5350

DATE: 9/12/2017

SUBJECT: Region III Data QA Review

FROM: Brandon McDonald 
Region III ESAT RPO (3EA22)

TO: GREG HAM
Hazardous Site Cleanup Division (HSCD)

Attached is the data validation report for the SPARROWS POINT- SEDIMENT ASSESSMENT SOUTHEAST AREA site for DAS# R35186; SDG# C0B74 completed by the Region III Environmental Services Assistance Team (ESAT) contractor, ICF International, under the direction of Region III EAID.

If you have any questions regarding this review, please call Brandon McDonald at (410) 305-2607 or you can call Eric Graybill at (410)-305-2665.

cc: Charles Rapone(WESTON SOLUTIONS)
Laura Mathew (WESTON SOLUTIONS)

TO: #0002 TDF: #0817057

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ICF
ESAT Region 3
US Environmental Protection Agency Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Phone 410-305-3012

Date: September 8, 2017

To: Brandon McDonald
ESAT Region 3 Project Officer

From: Leah Watson
Validator

Kurt Roby
Reviewer

Subject: Organic Data Validation (S3VM)
Sparrows Point
R35186 C0B74

Overview

This data package consisted of four (4) surface sediment samples including three (3) field duplicate pairs analyzed for semivolatile, semivolatile Polycyclic Aromatic Hydrocarbon (PAH) and pentachlorophenol target analytes.

Analyses were performed by Chemtech Consulting Group (CHM) according to Contract Laboratory Program (CLP) Statement of Work (SOW) SOM02.4 and using the selective ion monitoring (SIM) technique for PAHs.

Data were validated according to the National Functional Guidelines for Organic Superfund Methods Data Review and applicable USEPA Region 3 modifications. The validation report has been assigned the Superfund Data Validation Label S3VM (Stage_3_Validation_Manual).

Samples were submitted to the laboratory directly by the contractor and not through the EPA Technical Services Branch (TSB). Environmental Services Assistance Team (ESAT) has been tasked to evaluate laboratory reported data for the purpose of usability, based on the hardcopy data package received by ESAT dated August 4, 2017.

Summary

No data quality outliers or technical deficiencies were identified.

Sample C0B74 of this sample delivery group (SDG) is a field duplicate pair to sample C0B21, which was analyzed in SDG C0B00. Samples C0B75 and C0B76 of this SDG are field duplicates to samples C0B33 and C0B40 in SDG C0B25. Comparison of field duplicate pairs are discussed in "Notes".

Notes

Samples with detected concentrations for target analytes less than Contract Required Quantitation Limits (CRQLs) are estimated and have been qualified "J".

The method blanks for both fractions were free of contamination.

For both fractions the accuracy and precision criteria were met by the laboratory in the initial and continuing calibration verification standard analyses.

Results reported for field duplicate pairs COB21/COB74, COB33/COB75 and COB40/COB76 were comparable in the semivolatile fraction with the exception of dimethylphthalate present in all three (3) pairs. In the semivolatile SIM fraction COB21/COB74 and COB40/COB76 were comparable. Field duplicate pair COB33/COB75 were not comparable in the semivolatile SIM fraction. No data were qualified based on field duplicate precision.

The regional chain of custody (COC) records for case R35186 only list the semivolatile SIM fraction for samples in the SDG. The regional COC records for case 47079 list the semivolatile fraction for these samples. No action was taken by the reviewer due to this finding.

Glossary of Organic Data Qualifier Codes

Validation Qualifiers	In order of descending precedence. Only one of these qualifiers may apply to any result.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
Additional Qualifiers	Additional qualifiers may be combined with other qualifiers.
N	The analyte has been "tentatively identified" or "presumptively" as present.
B	The result is presumed a blank contaminant. This qualifier is used for drinking water samples only.
C	The target Pesticide or Aroclor analyte identification has been confirmed by Gas Chromatography/Mass Spectrometry (GC/MS). This qualifier may be added to other qualifiers.
X	The target Pesticide or Aroclor analyte identification was not confirmed when GC/MS analysis was performed. This qualifier may be added to other qualifiers.

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB74

Lab Name : Chemtech Consulting Group Contract : EPW14030
Lab Code: CHM Case No.: R35186 MA No. : SDG No.: COB74
Analytical Method : SVOA Level : LOW
Matrix : Soil Lab Sample ID : I4214-01
Sample wt/vol : 30.1 (g/mL): g Lab File ID : BG027985.D
% Solids : 32.3 Date Received : 07/14/2017
GC Column : ZB-GR ID : 0.25 (mm) Date Extracted : 07/17/2017
GC Column : ID : (mm) Date Analyzed : 07/20/2017
Extract Concentrated : (Y / N) Y Extract Volume : 500 (μL)
Soil Aliquot (VOA) : (μL) Extraction Type : SOXH
Heated Purge : (Y / N) Injection Volume : 1.0 (μL)
Purge Volume : (mL) pH : Dilution Factor : 1.0
Cleanup Types : GPC Cleanup Factor : 2.0
Concentration Units (μg/L, mg/L, μg/kg) : μg/kg

CAS NO.	ANALYTE	CONCENTRATION	Q
123-91-1	1,4-Dioxane	210	U
100-52-7	Benzaldehyde	1000	U
108-95-2	Phenol	1000	U
111-44-4	Bis (2-Chloroethyl) ether	1000	U
95-57-8	2-Chlorophenol	520	U
95-48-7	2-Methylphenol	1000	U
108-60-1	2,2-oxybis (1-Chloropropane)	1000	U
98-86-2	Acetophenone	1000	U
106-44-5	4-Methylphenol	1000	U
621-64-7	N-Nitroso-di-n-propylamine	520	U
67-72-1	Hexachloroethane	520	U
98-95-3	Nitrobenzene	520	U
78-59-1	Isophorone	520	U
88-75-5	2-Nitrophenol	520	U
105-67-9	2,4-Dimethylphenol	520	U
111-91-1	Bis (2-Chloroethoxy) methane	520	U
120-83-2	2,4-Dichlorophenol	520	U
91-20-3	Naphthalene	520	U
106-47-8	4-Chloroaniline	1000	U
87-68-3	Hexachlorobutadiene	520	U
105-60-2	Caprolactam	1000	U
59-50-7	4-Chloro-3-methylphenol	520	U
91-57-6	2-Methylnaphthalene	520	U
77-47-4	Hexachlorocyclopentadiene	1000	U
88-06-2	2,4,6-Trichlorophenol	520	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB74

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA
Matrix : Soil
Sample wt/vol : 30.1 (g/mL): g
% Solids : 32.3
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N)
Purge Volume : (mL)
Cleanup Types : GPC
Concentration Units (μg/L, mg/L, μg/kg): μg/kg

Contract : EPW14030
MA No. : SDG No.: COB74
Level : LOW
Lab Sample ID : I4214-01
Lab File ID : BG027985.D
Date Received : 07/14/2017
Date Extracted : 07/17/2017
Date Analyzed : 07/20/2017
Extract Volume : 500 (μL)
Extraction Type : SOXH
Injection Volume : 1.0 (μL)
pH : Dilution Factor : 1.0
Cleanup Factor : 2.0

CAS NO.	ANALYTE	CONCENTRATION	Q
95-95-4	2,4,5-Trichlorophenol	520	U
92-52-4	1,1-Biphenyl	520	U
91-58-7	2-Chloronaphthalene	520	U
88-74-4	2-Nitroaniline	520	U
131-11-3	Dimethylphthalate	980	
606-20-2	2,6-Dinitrotoluene	520	U
208-96-8	Acenaphthylene	520	U
99-09-2	3-Nitroaniline	1000	U
83-32-9	Acenaphthene	520	U
51-28-5	2,4-Dinitrophenol	1000	U
100-02-7	4-Nitrophenol	1000	U
132-64-9	Dibenzofuran	520	U
121-14-2	2,4-Dinitrotoluene	520	U
84-66-2	Diethylphthalate	520	U
86-73-7	Fluorene	520	U
7005-72-3	4-Chlorophenyl-phenylether	520	U
100-01-6	4-Nitroaniline	1000	U
534-52-1	4,6-Dinitro-2-methylphenol	1000	U
86-30-6	N-Nitrosodiphenylamine	520	U
95-94-3	1,2,4,5-Tetrachlorobenzene	520	U
101-55-3	4-Bromophenyl-phenylether	520	U
118-74-1	Hexachlorobenzene	520	U
1912-24-9	Atrazine	1000	U
87-86-5	Pentachlorophenol	1000	U
85-01-8	Phenanthrene	520	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

C0B74

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA
Matrix : Soil
Sample wt/vol : 30.1 (g/mL): g
% Solids : 32.3
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N)
Purge Volume : (mL)
Cleanup Types : GPC
Concentration Units (μg/L, mg/L, μg/kg): μg/kg

Contract : EPW14030
MA No. : SDG No.: C0B74
Level : LOW
Lab Sample ID : I4214-01
Lab File ID : BG027985.D
Date Received : 07/14/2017
Date Extracted : 07/17/2017
Date Analyzed : 07/20/2017
Extract Volume : 500 (μL)
Extraction Type : SOXH
Injection Volume : 1.0 (μL)
pH : Dilution Factor : 1.0
Cleanup Factor : 2.0

CAS NO.	ANALYTE	CONCENTRATION	Q
120-12-7	Anthracene	520	U
86-74-8	Carbazole	1000	U
84-74-2	Di-n-butylphthalate	520	U
206-44-0	Fluoranthene	1000	U
129-00-0	Pyrene	520	U
85-68-7	Butylbenzylphthalate	520	U
91-94-1	3,3-Dichlorobenzidine	1000	U
56-55-3	Benzo(a)anthracene	520	U
218-01-9	Chrysene	520	U
117-81-7	Bis(2-ethylhexyl)phthalate	520	U
117-84-0	Di-n-octyl phthalate	1000	U
205-99-2	Benzo(b)fluoranthene	520	U
207-08-9	Benzo(k)fluoranthene	520	U
50-32-8	Benzo(a)pyrene	520	U
193-39-5	Indeno(1,2,3-cd)pyrene	520	U
53-70-3	Dibenzo(a,h)anthracene	520	U
191-24-2	Benzo(g,h,i)perylene	520	U
58-90-2	2,3,4,6-Tetrachlorophenol	520	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

C0B75

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA
Matrix : Soil
Sample wt/vol : 30.1 (g/mL): g
% Solids : 35.4
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N)
Purge Volume : (mL)
Cleanup Types : GPC
Concentration Units (μg/L, mg/L, μg/kg): μg/kg

Contract : EPW14030
MA No. : SDG No.: C0B74
Level : LOW
Lab Sample ID : I4214-02
Lab File ID : BG027986.D
Date Received : 07/14/2017
Date Extracted : 07/17/2017
Date Analyzed : 07/20/2017
Extract Volume : 500 (μL)
Extraction Type : SOXH
Injection Volume : 1.0 (μL)
pH : Dilution Factor : 1.0
Cleanup Factor : 2.0

CAS NO.	ANALYTE	CONCENTRATION	Q
123-91-1	1,4-Dioxane	190	U
100-52-7	Benzaldehyde	930	U
108-95-2	Phenol	930	U
111-44-4	Bis(2-Chloroethyl)ether	930	U
95-57-8	2-Chlorophenol	480	U
95-48-7	2-Methylphenol	930	U
108-60-1	2,2-oxybis(1-Chloropropane)	930	U
98-86-2	Acetophenone	930	U
106-44-5	4-Methylphenol	930	U
621-64-7	N-Nitroso-di-n-propylamine	480	U
67-72-1	Hexachloroethane	480	U
98-95-3	Nitrobenzene	480	U
78-59-1	Isophorone	480	U
88-75-5	2-Nitrophenol	480	U
105-67-9	2,4-Dimethylphenol	480	U
111-91-1	Bis(2-Chloroethoxy)methane	480	U
120-83-2	2,4-Dichlorophenol	480	U
91-20-3	Naphthalene	480	U
106-47-8	4-Chloroaniline	930	U
87-68-3	Hexachlorobutadiene	480	U
105-60-2	Caprolactam	930	U
59-50-7	4-Chloro-3-methylphenol	480	U
91-57-6	2-Methylnaphthalene	480	U
77-47-4	Hexachlorocyclopentadiene	930	U
88-06-2	2,4,6-Trichlorophenol	480	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB75

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA
Matrix : Soil
Sample wt/vol : 30.1 (g/mL): g
% Solids : 35.4
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N)
Purge Volume : (mL)
Cleanup Types : GPC
Concentration Units (μg/L, mg/L, μg/kg): μg/kg

Contract : EPW14030
MA No. : SDG No.: COB74
Level : LOW
Lab Sample ID : I4214-02
Lab File ID : BG027986.D
Date Received : 07/14/2017
Date Extracted : 07/17/2017
Date Analyzed : 07/20/2017
Extract Volume : 500 (μL)
Extraction Type : SOXH
Injection Volume : 1.0 (μL)
pH : Dilution Factor : 1.0
Cleanup Factor : 2.0

CAS NO.	ANALYTE	CONCENTRATION	Q
95-95-4	2,4,5-Trichlorophenol	480	U
92-52-4	1,1-Biphenyl	480	U
91-58-7	2-Chloronaphthalene	480	U
88-74-4	2-Nitroaniline	480	U
131-11-3	Dimethylphthalate	560	
606-20-2	2,6-Dinitrotoluene	480	U
208-96-8	Acenaphthylene	480	U
99-09-2	3-Nitroaniline	930	U
83-32-9	Acenaphthene	480	U
51-28-5	2,4-Dinitrophenol	930	U
100-02-7	4-Nitrophenol	930	U
132-64-9	Dibenzofuran	480	U
121-14-2	2,4-Dinitrotoluene	480	U
84-66-2	Diethylphthalate	480	U
86-73-7	Fluorene	480	U
7005-72-3	4-Chlorophenyl-phenylether	480	U
100-01-6	4-Nitroaniline	930	U
534-52-1	4,6-Dinitro-2-methylphenol	930	U
86-30-6	N-Nitrosodiphenylamine	480	U
95-94-3	1,2,4,5-Tetrachlorobenzene	480	U
101-55-3	4-Bromophenyl-phenylether	480	U
118-74-1	Hexachlorobenzene	480	U
1912-24-9	Atrazine	930	U
87-86-5	Pentachlorophenol	930	U
85-01-8	Phenanthrene	480	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB75

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA
Matrix : Soil
Sample wt/vol : 30.1 (g/mL): g
% Solids : 35.4
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N)
Purge Volume : (mL)
Cleanup Types : GPC
Concentration Units (μg/L, mg/L, μg/kg): μg/kg

Contract : EPW14030
MA No. : SDG No.: COB74
Level : LOW
Lab Sample ID : I4214-02
Lab File ID : BG027986.D
Date Received : 07/14/2017
Date Extracted : 07/17/2017
Date Analyzed : 07/20/2017
Extract Volume : 500 (μL)
Extraction Type : SOXH
Injection Volume : 1.0 (μL)
pH : Dilution Factor : 1.0
Cleanup Factor : 2.0

CAS NO.	ANALYTE	CONCENTRATION	Q
120-12-7	Anthracene	480	U
86-74-8	Carbazole	930	U
84-74-2	Di-n-butylphthalate	480	U
206-44-0	Fluoranthene	930	U
129-00-0	Pyrene	480	U
85-68-7	Butylbenzylphthalate	480	U
91-94-1	3,3-Dichlorobenzidine	930	U
56-55-3	Benzo(a)anthracene	480	U
218-01-9	Chrysene	480	U
117-81-7	Bis(2-ethylhexyl)phthalate	480	U
117-84-0	Di-n-octyl phthalate	930	U
205-99-2	Benzo(b)fluoranthene	480	U
207-08-9	Benzo(k)fluoranthene	480	U
50-32-8	Benzo(a)pyrene	480	U
193-39-5	Indeno(1,2,3-cd)pyrene	480	U
53-70-3	Dibenzo(a,h)anthracene	480	U
191-24-2	Benzo(g,h,i)perylene	480	U
58-90-2	2,3,4,6-Tetrachlorophenol	480	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB76

Lab Name : Chemtech Consulting Group Contract : EPW14030
Lab Code: CHM Case No.: R35186 MA No. : _____ SDG No.: COB74
Analytical Method : SVOA Level : LOW
Matrix : Soil Lab Sample ID : I4214-03
Sample wt/vol : 30.1 (g/mL): g Lab File ID : BG027987.D
% Solids : 42.8 Date Received : 07/14/2017
GC Column : ZB-GR ID : 0.25 (mm) Date Extracted : 07/17/2017
GC Column : _____ ID : _____ (mm) Date Analyzed : 07/20/2017
Extract Concentrated : (Y / N) Y Extract Volume : 500 (µL)
Soil Aliquot (VOA) : _____ (µL) Extraction Type : SOXH
Heated Purge : (Y / N) _____ Injection Volume : 1.0 (µL)
Purge Volume : _____ (mL) pH : _____ Dilution Factor : 1.0
Cleanup Types : GPC Cleanup Factor : 2.0
Concentration Units (µg/L, mg/L, µg/kg): µg/kg

CAS NO.	ANALYTE	CONCENTRATION	Q
123-91-1	1,4-Dioxane	160	U
100-52-7	Benzaldehyde	770	U
108-95-2	Phenol	770	U
111-44-4	Bis(2-Chloroethyl)ether	770	U
95-57-8	2-Chlorophenol	400	U
95-48-7	2-Methylphenol	770	U
108-60-1	2,2-oxybis(1-Chloropropane)	770	U
98-86-2	Acetophenone	770	U
106-44-5	4-Methylphenol	770	U
621-64-7	N-Nitroso-di-n-propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	Bis(2-Chloroethoxy)methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	770	U
87-68-3	Hexachlorobutadiene	400	U
105-60-2	Caprolactam	770	U
59-50-7	4-Chloro-3-methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U
77-47-4	Hexachlorocyclopentadiene	770	U
88-06-2	2,4,6-Trichlorophenol	400	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

C0B76

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA
Matrix : Soil
Sample wt/vol : 30.1 (g/mL): g
% Solids : 42.8
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N)
Purge Volume : (mL)
Cleanup Types : GPC
Concentration Units (μg/L, mg/L, μg/kg): μg/kg

Contract : EPW14030
MA No. : SDG No.: C0B74
Level : LOW
Lab Sample ID : I4214-03
Lab File ID : BG027987.D
Date Received : 07/14/2017
Date Extracted : 07/17/2017
Date Analyzed : 07/20/2017
Extract Volume : 500 (μL)
Extraction Type : SOXH
Injection Volume : 1.0 (μL)
pH : Dilution Factor : 1.0
Cleanup Factor : 2.0

CAS NO.	ANALYTE	CONCENTRATION	Q
95-95-4	2,4,5-Trichlorophenol	400	U
92-52-4	1,1-Biphenyl	400	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	400	U
131-11-3	Dimethylphthalate	680	
606-20-2	2,6-Dinitrotoluene	400	U
208-96-8	Acenaphthylene	400	U
99-09-2	3-Nitroaniline	770	U
83-32-9	Acenaphthene	400	U
51-28-5	2,4-Dinitrophenol	770	U
100-02-7	4-Nitrophenol	770	U
132-64-9	Dibenzofuran	400	U
121-14-2	2,4-Dinitrotoluene	400	U
84-66-2	Diethylphthalate	400	U
86-73-7	Fluorene	400	U
7005-72-3	4-Chlorophenyl-phenylether	400	U
100-01-6	4-Nitroaniline	770	U
534-52-1	4,6-Dinitro-2-methylphenol	770	U
86-30-6	N-Nitrosodiphenylamine	400	U
95-94-3	1,2,4,5-Tetrachlorobenzene	400	U
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U
1912-24-9	Atrazine	770	U
87-86-5	Pentachlorophenol	770	U
85-01-8	Phenanthrene	400	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

C0B76

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA
Matrix : Soil
Sample wt/vol : 30.1 (g/mL): g
% Solids : 42.8
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N)
Purge Volume : (mL)
Cleanup Types : GPC
Concentration Units (μg/L, mg/L, μg/kg): μg/kg

Contract : EPW14030
MA No. : SDG No.: C0B74
Level : LOW
Lab Sample ID : I4214-03
Lab File ID : BG027987.D
Date Received : 07/14/2017
Date Extracted : 07/17/2017
Date Analyzed : 07/20/2017
Extract Volume : 500 (μL)
Extraction Type : SOXH
Injection Volume : 1.0 (μL)
pH : Dilution Factor : 1.0
Cleanup Factor : 2.0

CAS NO.	ANALYTE	CONCENTRATION	Q
120-12-7	Anthracene	400	U
86-74-8	Carbazole	770	U
84-74-2	Di-n-butylphthalate	400	U
206-44-0	Fluoranthene	770	U
129-00-0	Pyrene	400	U
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3-Dichlorobenzidine	770	U
56-55-3	Benzo(a)anthracene	400	U
218-01-9	Chrysene	400	U
117-81-7	Bis(2-ethylhexyl)phthalate	400	U
117-84-0	Di-n-octyl phthalate	770	U
205-99-2	Benzo(b)fluoranthene	400	U
207-08-9	Benzo(k)fluoranthene	400	U
50-32-8	Benzo(a)pyrene	400	U
193-39-5	Indeno(1,2,3-cd)pyrene	400	U
53-70-3	Dibenzo(a,h)anthracene	400	U
191-24-2	Benzo(g,h,i)perylene	400	U
58-90-2	2,3,4,6-Tetrachlorophenol	400	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB89

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA
Matrix : Soil
Sample wt/vol : 30.1 (g/mL): g
% Solids : 41
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N)
Purge Volume : (mL)
Cleanup Types : GPC
Concentration Units (μg/L, mg/L, μg/kg): μg/kg

Contract : EPW14030
MA No. : SDG No.: COB74
Level : LOW
Lab Sample ID : I4214-04
Lab File ID : BG027988.D
Date Received : 07/14/2017
Date Extracted : 07/17/2017
Date Analyzed : 07/20/2017
Extract Volume : 500 (μL)
Extraction Type : SOXH
Injection Volume : 1.0 (μL)
pH : Dilution Factor : 1.0
Cleanup Factor : 2.0

CAS NO.	ANALYTE	CONCENTRATION	Q
123-91-1	1,4-Dioxane	160	U
100-52-7	Benzaldehyde	800	U
108-95-2	Phenol	800	U
111-44-4	Bis(2-Chloroethyl)ether	800	U
95-57-8	2-Chlorophenol	410	U
95-48-7	2-Methylphenol	800	U
108-60-1	2,2-oxybis(1-Chloropropane)	800	U
98-86-2	Acetophenone	800	U
106-44-5	4-Methylphenol	800	U
621-64-7	N-Nitroso-di-n-propylamine	410	U
67-72-1	Hexachloroethane	410	U
98-95-3	Nitrobenzene	410	U
78-59-1	Isophorone	410	U
88-75-5	2-Nitrophenol	410	U
105-67-9	2,4-Dimethylphenol	410	U
111-91-1	Bis(2-Chloroethoxy)methane	410	U
120-83-2	2,4-Dichlorophenol	410	U
91-20-3	Naphthalene	410	U
106-47-8	4-Chloroaniline	800	U
87-68-3	Hexachlorobutadiene	410	U
105-60-2	Caprolactam	800	U
59-50-7	4-Chloro-3-methylphenol	410	U
91-57-6	2-Methylnaphthalene	410	U
77-47-4	Hexachlorocyclopentadiene	800	U
88-06-2	2,4,6-Trichlorophenol	410	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB89

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA
Matrix : Soil
Sample wt/vol : 30.1 (g/mL): g
% Solids : 41
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N)
Purge Volume : (mL)
Cleanup Types : GPC
Concentration Units (μg/L, mg/L, μg/kg): μg/kg

Contract : EPW14030
MA No. : SDG No.: COB74
Level : LOW
Lab Sample ID : I4214-04
Lab File ID : BG027988.D
Date Received : 07/14/2017
Date Extracted : 07/17/2017
Date Analyzed : 07/20/2017
Extract Volume : 500 (μL)
Extraction Type : SOXH
Injection Volume : 1.0 (μL)
pH : Dilution Factor : 1.0
Cleanup Factor : 2.0

CAS NO.	ANALYTE	CONCENTRATION	Q
95-95-4	2,4,5-Trichlorophenol	410	U
92-52-4	1,1-Biphenyl	410	U
91-58-7	2-Chloronaphthalene	410	U
88-74-4	2-Nitroaniline	410	U
131-11-3	Dimethylphthalate	910	
606-20-2	2,6-Dinitrotoluene	410	U
208-96-8	Acenaphthylene	410	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	410	U
51-28-5	2,4-Dinitrophenol	800	U
100-02-7	4-Nitrophenol	800	U
132-64-9	Dibenzofuran	410	U
121-14-2	2,4-Dinitrotoluene	410	U
84-66-2	Diethylphthalate	410	U
86-73-7	Fluorene	410	U
7005-72-3	4-Chlorophenyl-phenylether	410	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine	410	U
95-94-3	1,2,4,5-Tetrachlorobenzene	410	U
101-55-3	4-Bromophenyl-phenylether	410	U
118-74-1	Hexachlorobenzene	410	U
1912-24-9	Atrazine	800	U
87-86-5	Pentachlorophenol	800	U
85-01-8	Phenanthrene	410	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB89

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA
Matrix : Soil
Sample wt/vol : 30.1 (g/mL): g
% Solids : 41
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : (µL)
Heated Purge : (Y / N)
Purge Volume : (mL)
Cleanup Types : GPC
Concentration Units (µg/L, mg/L, µg/kg): µg/kg

Contract : EPW14030
MA No. : SDG No.: COB74
Level : LOW
Lab Sample ID : I4214-04
Lab File ID : BG027988.D
Date Received : 07/14/2017
Date Extracted : 07/17/2017
Date Analyzed : 07/20/2017
Extract Volume : 500 (µL)
Extraction Type : SOXH
Injection Volume : 1.0 (µL)
pH : Dilution Factor : 1.0
Cleanup Factor : 2.0

CAS NO.	ANALYTE	CONCENTRATION	Q
120-12-7	Anthracene	410	U
86-74-8	Carbazole	800	U
84-74-2	Di-n-butylphthalate	410	U
206-44-0	Fluoranthene	800	U
129-00-0	Pyrene	410	U
85-68-7	Butylbenzylphthalate	410	U
91-94-1	3,3-Dichlorobenzidine	800	U
56-55-3	Benzo(a)anthracene	410	U
218-01-9	Chrysene	410	U
117-81-7	Bis(2-ethylhexyl)phthalate	410	U
117-84-0	Di-n-octyl phthalate	800	U
205-99-2	Benzo(b)fluoranthene	410	U
207-08-9	Benzo(k)fluoranthene	410	U
50-32-8	Benzo(a)pyrene	410	U
193-39-5	Indeno(1,2,3-cd)pyrene	410	U
53-70-3	Dibenzo(a,h)anthracene	410	U
191-24-2	Benzo(g,h,i)perylene	410	U
58-90-2	2,3,4,6-Tetrachlorophenol	410	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB74

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA SIM
Matrix : Soil
Sample wt/vol : 30.1 (g/mL): g
% Solids : 32.3
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : (µL)
Heated Purge : (Y / N)
Purge Volume : (mL)
Cleanup Types : GPC
Concentration Units (µg/L, mg/L, µg/kg): µg/kg

Contract : EPW14030
MA No. : SDG No.: COB74
Level : LOW
Lab Sample ID : I4214-01
Lab File ID : BE093543.D
Date Received : 07/14/2017
Date Extracted : 07/17/2017
Date Analyzed : 07/24/2017
Extract Volume : 500 (µL)
Extraction Type : SOXH
Injection Volume : 1.0 (µL)
pH : Dilution Factor : 1.0
Cleanup Factor : 2.0

CAS NO.	ANALYTE	CONCENTRATION	Q
91-20-3	Naphthalene	3.7	J
91-57-6	2-Methylnaphthalene	10	U
208-96-8	Acenaphthylene	10	U
83-32-9	Acenaphthene	10	U
86-73-7	Fluorene	10	U
87-86-5	Pentachlorophenol	21	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
206-44-0	Fluoranthene	3.8	J
129-00-0	Pyrene	10	U
56-55-3	Benzo(a)anthracene	2.5	J
218-01-9	Chrysene	2.7	J
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	3.7	J
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB75

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA SIM
Matrix : Soil
Sample wt/vol : 30.1 (g/mL): g
% Solids : 35.4
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N)
Purge Volume : (mL)
Cleanup Types : GPC
Concentration Units (μg/L, mg/L, μg/kg) : μg/kg

Contract : EPW14030
MA No. : SDG No.: COB74
Level : LOW
Lab Sample ID : I4214-02
Lab File ID : BE093544.D
Date Received : 07/14/2017
Date Extracted : 07/17/2017
Date Analyzed : 07/24/2017
Extract Volume : 500 (μL)
Extraction Type : SOXH
Injection Volume : 1.0 (μL)
pH : Dilution Factor : 1.0
Cleanup Factor : 2.0

CAS NO.	ANALYTE	CONCENTRATION	Q
91-20-3	Naphthalene	9.3	U
91-57-6	2-Methylnaphthalene	9.3	U
208-96-8	Acenaphthylene	9.3	U
83-32-9	Acenaphthene	9.3	U
86-73-7	Fluorene	9.3	U
87-86-5	Pentachlorophenol	19	U
85-01-8	Phenanthrene	24	
120-12-7	Anthracene	9.3	U
206-44-0	Fluoranthene	39	
129-00-0	Pyrene	38	
56-55-3	Benzo(a)anthracene	8.0	J
218-01-9	Chrysene	17	
205-99-2	Benzo(b)fluoranthene	21	
207-08-9	Benzo(k)fluoranthene	8.8	J
50-32-8	Benzo(a)pyrene	14	
193-39-5	Indeno(1,2,3-cd)pyrene	8.9	J
53-70-3	Dibenzo(a,h)anthracene	9.3	U
191-24-2	Benzo(g,h,i)perylene	9.9	

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB76

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA SIM
Matrix : Soil
Sample wt/vol : 30.1 (g/mL): g
% Solids : 42.8
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N)
Purge Volume : (mL)
Cleanup Types : GPC
Concentration Units (μg/L, mg/L, μg/kg): μg/kg

Contract : EPW14030
MA No. : SDG No.: COB74
Level : LOW
Lab Sample ID : I4214-03
Lab File ID : BE093545.D
Date Received : 07/14/2017
Date Extracted : 07/17/2017
Date Analyzed : 07/24/2017
Extract Volume : 500 (μL)
Extraction Type : SOXH
Injection Volume : 1.0 (μL)
pH : Dilution Factor : 1.0
Cleanup Factor : 2.0

CAS NO.	ANALYTE	CONCENTRATION	Q
91-20-3	Naphthalene	3.5	J
91-57-6	2-Methylnaphthalene	7.7	U
208-96-8	Acenaphthylene	7.7	U
83-32-9	Acenaphthene	7.7	U
86-73-7	Fluorene	7.7	U
87-86-5	Pentachlorophenol	16	U
85-01-8	Phenanthrene	7.7	U
120-12-7	Anthracene	7.7	U
206-44-0	Fluoranthene	1.8	J
129-00-0	Pyrene	7.7	U
56-55-3	Benzo(a)anthracene	7.7	U
218-01-9	Chrysene	7.7	U
205-99-2	Benzo(b)fluoranthene	7.7	U
207-08-9	Benzo(k)fluoranthene	7.7	U
50-32-8	Benzo(a)pyrene	7.7	U
193-39-5	Indeno(1,2,3-cd)pyrene	7.7	U
53-70-3	Dibenzo(a,h)anthracene	7.7	U
191-24-2	Benzo(g,h,i)perylene	7.7	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB89

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA SIM
Matrix : Soil
Sample wt/vol : 30.1 (g/mL): g
% Solids : 41
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N)
Purge Volume : (mL)
Cleanup Types : GPC
Concentration Units (μg/L, mg/L, μg/kg): μg/kg

Contract : EPW14030
MA No. : SDG No.: COB74
Level : LOW
Lab Sample ID : I4214-04
Lab File ID : BE093546.D
Date Received : 07/14/2017
Date Extracted : 07/17/2017
Date Analyzed : 07/24/2017
Extract Volume : 500 (μL)
Extraction Type : SOXH
Injection Volume : 1.0 (μL)
pH : Dilution Factor : 1.0
Cleanup Factor : 2.0

CAS NO.	ANALYTE	CONCENTRATION	Q
91-20-3	Naphthalene	8.0	U
91-57-6	2-Methylnaphthalene	8.0	U
208-96-8	Acenaphthylene	8.0	U
83-32-9	Acenaphthene	8.0	U
86-73-7	Fluorene	8.0	U
87-86-5	Pentachlorophenol	16	U
85-01-8	Phenanthrene	8.0	U
120-12-7	Anthracene	8.0	U
206-44-0	Fluoranthene	8.0	U
129-00-0	Pyrene	8.0	U
56-55-3	Benzo(a)anthracene	8.0	U
218-01-9	Chrysene	8.0	U
205-99-2	Benzo(b)fluoranthene	8.0	U
207-08-9	Benzo(k)fluoranthene	8.0	U
50-32-8	Benzo(a)pyrene	8.0	U
193-39-5	Indeno(1,2,3-cd)pyrene	8.0	U
53-70-3	Dibenzo(a,h)anthracene	8.0	U
191-24-2	Benzo(g,h,i)perylene	8.0	U




UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III

Environmental Sciences Center
701 Mapes Road
Fort Meade, Maryland 20755-5350

DATE: 9/12/2017

SUBJECT: Region III Data QA Review

FROM: Brandon McDonald 
Region III ESAT RPO (3EA22)

TO: GREG HAM
Hazardous Site Cleanup Division (HSCD)

Attached is the data validation report for the SPARROWS POINT- SEDIMENT ASSESSMENT SOUTHEAST AREA site for DAS# R35186; SDG# C0B00 completed by the Region III Environmental Services Assistance Team (ESAT) contractor, ICF International, under the direction of Region III EAID.

If you have any questions regarding this review, please call Brandon McDonald at (410) 305-2607 or you can call Eric Graybill at (410)-305-2665.

cc: Charles Rapone(WESTON SOLUTIONS)
Laura Mathew (WESTON SOLUTIONS)

TO: #0002 TDF: #0817055

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ICF
ESAT Region 3
US Environmental Protection Agency Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Phone 410-305-3012

Date: September 7, 2017

To: Brandon McDonald
ESAT Region 3 Project Officer

From: Leah Watson
Validator

Kurt Roby
Reviewer

Subject: Organic Data Validation (S3VM)
Sparrows Point
R35186 C0B00

Overview

This data package consisted of twenty (20) surface sediment samples including two (2) field duplicate pairs analyzed for semivolatile, semivolatile Polycyclic Aromatic Hydrocarbon (PAH) and pentachlorophenol target analytes.

Analyses were performed by Chemtech Consulting Group (CHM) according to Contract Laboratory Program (CLP) Statement of Work (SOW) SOM02.4 and using the selective ion monitoring (SIM) technique for PAHs.

Data were validated according to the National Functional Guidelines for Organic Superfund Methods Data Review and applicable USEPA Region 3 modifications. The validation report has been assigned the Superfund Data Validation Label S3VM (Stage_3_Validation_Manual).

Samples were submitted to the laboratory directly by the contractor and not through the EPA Technical Services Branch (TSB). Environmental Services Assistance Team (ESAT) has been tasked to evaluate laboratory reported data for the purpose of usability, based on the hardcopy data package received by ESAT dated August 4, 2017.

Summary

No significant data quality outliers or technical deficiencies were identified that would require rejection of sample results. Less significant data quality outliers resulting in estimation of sample results were identified including, but not limited to deuterated monitoring compound (DMC) recoveries as detailed below.

Sample C0B21 of this sample delivery group (SDG) is a field duplicate pair to sample C0B74, which was analyzed in SDG C0B74. Sample C0B18 in this SDG is a field duplicate pair to sample C0B72 analyzed in SDG C0B25. Comparison of field duplicate pairs are discussed in "Notes".

Minor Problem

Percent recovery for the following DMC was outside lower control limit for the samples listed below. The analyte associated with this DMC was non-detect in the associated samples. Quantitation limits are estimated and have been qualified "UJ".

Fraction	DMC	Affected Samples
Semivolatile	1,4-Dioxane-d8	COB05, COB17, COB20

Notes

Samples with detected concentrations for target analytes less than Contract Required Quantitation Limits (CRQLs) are estimated and have been qualified "J".

The method blanks for both fractions were free of contamination.

For both fractions the accuracy and precision criteria were met by the laboratory in the initial and continuing calibration verification standard analyses.

Percent recovery for the following DMC was outside upper control limit for the sample listed below. The analyte associated with this DMC was non-detect in the associated sample. No data were qualified based on these outliers.

Fraction	DMC	Affected Sample
Semivolatile	4-Chloroaniline-d4	COB16

Results reported for field duplicate pairs COB18/COB72 and COB21/COB74 were comparable in the semivolatile fraction with the exception of dimethylphthalate. In the semivolatile SIM fraction COB18/COB72 and COB21/COB74 were comparable.

The regional chain of custody (COC) records for case R35186 only list the semivolatile SIM fraction for samples in this sample delivery group (SDG). The regional COC records for case 47079 list the semivolatile fraction for these samples. No action was taken by the reviewer due to this finding.

Glossary of Organic Data Qualifier Codes

Validation Qualifiers	In order of descending precedence. Only one of these qualifiers may apply to any result.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
Additional Qualifiers	Additional qualifiers may be combined with other qualifiers.
N	The analyte has been “tentatively identified” or “presumptively” as present.
B	The result is presumed a blank contaminant. This qualifier is used for drinking water samples only.
C	The target Pesticide or Aroclor analyte identification has been confirmed by Gas Chromatography/Mass Spectrometry (GC/MS). This qualifier may be added to other qualifiers.
X	The target Pesticide or Aroclor analyte identification was not confirmed when GC/MS analysis was performed. This qualifier may be added to other qualifiers.

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB00

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA SIM
Matrix : Soil
Sample wt/vol : 30.1 (g/mL): g
% Solids : 48.4
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N)
Purge Volume : (mL)
Cleanup Types : GPC
Concentration Units (μg/L, mg/L, μg/kg): μg/kg

Contract : EPW14030
MA No. : SDG No.: COB00
Level : LOW
Lab Sample ID : I4209-01
Lab File ID : BE093580.D
Date Received : 07/14/2017
Date Extracted : 07/18/2017
Date Analyzed : 07/25/2017
Extract Volume : 500 (μL)
Extraction Type : SOXH
Injection Volume : 1.0 (μL)
pH : Dilution Factor : 1.0
Cleanup Factor : 2.0

CAS NO.	ANALYTE	CONCENTRATION	Q
91-20-3	Naphthalene	81	
91-57-6	2-Methylnaphthalene	5.7	J
208-96-8	Acenaphthylene	8.8	
83-32-9	Acenaphthene	6.8	U
86-73-7	Fluorene	1.9	J
87-86-5	Pentachlorophenol	14	U
85-01-8	Phenanthrene	9.1	
120-12-7	Anthracene	9.8	
206-44-0	Fluoranthene	54	
129-00-0	Pyrene	48	
56-55-3	Benzo(a)anthracene	35	
218-01-9	Chrysene	41	
205-99-2	Benzo(b)fluoranthene	58	
207-08-9	Benzo(k)fluoranthene	23	
50-32-8	Benzo(a)pyrene	50	
193-39-5	Indeno(1,2,3-cd)pyrene	28	
53-70-3	Dibenzo(a,h)anthracene	9.2	
191-24-2	Benzo(g,h,i)perylene	30	

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB05

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA SIM
Matrix : Soil
Sample wt/vol : 30.0 (g/mL): g
% Solids : 77.3
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : (µL)
Heated Purge : (Y / N)
Purge Volume : (mL)
Cleanup Types : GPC
Concentration Units (µg/L, mg/L, µg/kg): µg/kg

Contract : EPW14030
MA No. : SDG No.: COB00
Level : LOW
Lab Sample ID : I4209-02
Lab File ID : BE093552.D
Date Received : 07/14/2017
Date Extracted : 07/18/2017
Date Analyzed : 07/24/2017
Extract Volume : 500 (µL)
Extraction Type : SOXH
Injection Volume : 1.0 (µL)
pH : Dilution Factor : 1.0
Cleanup Factor : 2.0

CAS NO.	ANALYTE	CONCENTRATION	Q
91-20-3	Naphthalene	4.3	U
91-57-6	2-Methylnaphthalene	4.3	U
208-96-8	Acenaphthylene	4.3	U
83-32-9	Acenaphthene	4.3	U
86-73-7	Fluorene	4.3	U
87-86-5	Pentachlorophenol	8.7	U
85-01-8	Phenanthrene	1.5	J
120-12-7	Anthracene	4.3	U
206-44-0	Fluoranthene	3.1	J
129-00-0	Pyrene	4.1	J
56-55-3	Benzo(a)anthracene	2.3	J
218-01-9	Chrysene	2.7	J
205-99-2	Benzo(b)fluoranthene	3.4	J
207-08-9	Benzo(k)fluoranthene	1.7	J
50-32-8	Benzo(a)pyrene	2.8	J
193-39-5	Indeno(1,2,3-cd)pyrene	1.8	J
53-70-3	Dibenzo(a,h)anthracene	4.3	U
191-24-2	Benzo(g,h,i)perylene	1.9	J

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB06

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA SIM
Matrix : Soil
Sample wt/vol : 30.1 (g/mL): g
% Solids : 47.2
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N)
Purge Volume : (mL)
Cleanup Types : GPC
Concentration Units (μg/L, mg/L, μg/kg): μg/kg

Contract : EPW14030
MA No. : SDG No.: COB00
Level : LOW
Lab Sample ID : I4209-03
Lab File ID : BE093581.D
Date Received : 07/14/2017
Date Extracted : 07/18/2017
Date Analyzed : 07/25/2017
Extract Volume : 500 (μL)
Extraction Type : SOXH
Injection Volume : 1.0 (μL)
pH : Dilution Factor : 1.0
Cleanup Factor : 2.0

CAS NO.	ANALYTE	CONCENTRATION	Q
91-20-3	Naphthalene	6.1	J
91-57-6	2-Methylnaphthalene	7.0	U
208-96-8	Acenaphthylene	7.0	U
83-32-9	Acenaphthene	3.2	J
86-73-7	Fluorene	7.0	U
87-86-5	Pentachlorophenol	14	U
85-01-8	Phenanthrene	6.2	J
120-12-7	Anthracene	2.5	J
206-44-0	Fluoranthene	14	
129-00-0	Pyrene	19	
56-55-3	Benzo(a)anthracene	14	
218-01-9	Chrysene	14	
205-99-2	Benzo(b)fluoranthene	29	
207-08-9	Benzo(k)fluoranthene	11	
50-32-8	Benzo(a)pyrene	28	
193-39-5	Indeno(1,2,3-cd)pyrene	18	
53-70-3	Dibenzo(a,h)anthracene	6.0	J
191-24-2	Benzo(g,h,i)perylene	21	

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB07

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA SIM
Matrix : Soil
Sample wt/vol : 30.0 (g/mL): g
% Solids : 54.7
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N)
Purge Volume : (mL)
Cleanup Types : GPC
Concentration Units (μg/L, mg/L, μg/kg) : μg/kg

Contract : EPW14030
MA No. : SDG No.: COB00
Level : LOW
Lab Sample ID : I4209-04
Lab File ID : BE093591.D
Date Received : 07/14/2017
Date Extracted : 07/18/2017
Date Analyzed : 07/25/2017
Extract Volume : 500 (μL)
Extraction Type : SOXH
Injection Volume : 1.0 (μL)
pH : Dilution Factor : 1.0
Cleanup Factor : 2.0

CAS NO.	ANALYTE	CONCENTRATION	Q
91-20-3	Naphthalene	4.4	J
91-57-6	2-Methylnaphthalene	6.0	U
208-96-8	Acenaphthylene	6.0	U
83-32-9	Acenaphthene	6.0	U
86-73-7	Fluorene	6.0	U
87-86-5	Pentachlorophenol	12	U
85-01-8	Phenanthrene	2.1	J
120-12-7	Anthracene	6.0	U
206-44-0	Fluoranthene	3.5	J
129-00-0	Pyrene	4.2	J
56-55-3	Benzo(a)anthracene	3.4	J
218-01-9	Chrysene	3.8	J
205-99-2	Benzo(b)fluoranthene	6.3	
207-08-9	Benzo(k)fluoranthene	2.3	J
50-32-8	Benzo(a)pyrene	5.3	J
193-39-5	Indeno(1,2,3-cd)pyrene	3.2	J
53-70-3	Dibenzo(a,h)anthracene	6.0	U
191-24-2	Benzo(g,h,i)perylene	3.7	J

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB08

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA SIM
Matrix : Soil
Sample wt/vol : 30.1 (g/mL): g
% Solids : 46.4
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N)
Purge Volume : (mL)
Cleanup Types : GPC
Concentration Units (μg/L, mg/L, μg/kg): μg/kg

Contract : EPW14030
MA No. : SDG No.: COB00
Level : LOW
Lab Sample ID : I4209-05
Lab File ID : BE093566.D
Date Received : 07/14/2017
Date Extracted : 07/18/2017
Date Analyzed : 07/25/2017
Extract Volume : 500 (μL)
Extraction Type : SOXH
Injection Volume : 1.0 (μL)
pH : Dilution Factor : 1.0
Cleanup Factor : 2.0

CAS NO.	ANALYTE	CONCENTRATION	Q
91-20-3	Naphthalene	3.2	J
91-57-6	2-Methylnaphthalene	7.1	U
208-96-8	Acenaphthylene	7.1	U
83-32-9	Acenaphthene	7.1	U
86-73-7	Fluorene	7.1	U
87-86-5	Pentachlorophenol	14	U
85-01-8	Phenanthrene	5.2	J
120-12-7	Anthracene	7.1	U
206-44-0	Fluoranthene	12	
129-00-0	Pyrene	15	
56-55-3	Benzo(a)anthracene	11	
218-01-9	Chrysene	13	
205-99-2	Benzo(b)fluoranthene	21	
207-08-9	Benzo(k)fluoranthene	8.2	
50-32-8	Benzo(a)pyrene	18	
193-39-5	Indeno(1,2,3-cd)pyrene	10	
53-70-3	Dibenzo(a,h)anthracene	7.1	U
191-24-2	Benzo(g,h,i)perylene	11	

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

C0B09

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA SIM
Matrix : Soil
Sample wt/vol : 30.0 (g/mL): g
% Solids : 41.3
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N)
Purge Volume : (mL)
Cleanup Types : GPC
Concentration Units (μg/L, mg/L, μg/kg) : μg/kg

Contract : EPW14030
MA No. : SDG No.: C0B00
Level : LOW
Lab Sample ID : I4209-06
Lab File ID : BE093567.D
Date Received : 07/14/2017
Date Extracted : 07/18/2017
Date Analyzed : 07/25/2017
Extract Volume : 500 (μL)
Extraction Type : SOXH
Injection Volume : 1.0 (μL)
pH : Dilution Factor : 1.0
Cleanup Factor : 2.0

CAS NO.	ANALYTE	CONCENTRATION	Q
91-20-3	Naphthalene	3.9	J
91-57-6	2-Methylnaphthalene	8.0	U
208-96-8	Acenaphthylene	8.0	U
83-32-9	Acenaphthene	8.0	U
86-73-7	Fluorene	8.0	U
87-86-5	Pentachlorophenol	16	U
85-01-8	Phenanthrene	2.9	J
120-12-7	Anthracene	8.0	U
206-44-0	Fluoranthene	6.5	J
129-00-0	Pyrene	6.1	J
56-55-3	Benzo(a)anthracene	4.3	J
218-01-9	Chrysene	4.7	J
205-99-2	Benzo(b)fluoranthene	8.1	
207-08-9	Benzo(k)fluoranthene	3.4	J
50-32-8	Benzo(a)pyrene	6.7	J
193-39-5	Indeno(1,2,3-cd)pyrene	4.1	J
53-70-3	Dibenzo(a,h)anthracene	8.0	U
191-24-2	Benzo(g,h,i)perylene	4.8	J

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB10

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA SIM
Matrix : Soil
Sample wt/vol : 30.1 (g/mL): g
% Solids : 42.4
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N)
Purge Volume : (mL)
Cleanup Types : GPC
Concentration Units (μg/L, mg/L, μg/kg) : μg/kg

Contract : EPW14030
MA No. : SDG No.: COB00
Level : LOW
Lab Sample ID : I4209-07
Lab File ID : BE093568.D
Date Received : 07/14/2017
Date Extracted : 07/18/2017
Date Analyzed : 07/25/2017
Extract Volume : 500 (μL)
Extraction Type : SOXH
Injection Volume : 1.0 (μL)
pH : Dilution Factor : 1.0
Cleanup Factor : 2.0

CAS NO.	ANALYTE	CONCENTRATION	Q
91-20-3	Naphthalene	4.2	J
91-57-6	2-Methylnaphthalene	7.8	U
208-96-8	Acenaphthylene	7.8	U
83-32-9	Acenaphthene	7.8	U
86-73-7	Fluorene	7.8	U
87-86-5	Pentachlorophenol	16	U
85-01-8	Phenanthrene	2.3	J
120-12-7	Anthracene	7.8	U
206-44-0	Fluoranthene	3.4	J
129-00-0	Pyrene	3.5	J
56-55-3	Benzo(a)anthracene	3.0	J
218-01-9	Chrysene	3.3	J
205-99-2	Benzo(b)fluoranthene	6.2	J
207-08-9	Benzo(k)fluoranthene	7.8	U
50-32-8	Benzo(a)pyrene	5.8	J
193-39-5	Indeno(1,2,3-cd)pyrene	3.4	J
53-70-3	Dibenzo(a,h)anthracene	7.8	U
191-24-2	Benzo(g,h,i)perylene	4.1	J

FORM 1A-OR
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EPA SAMPLE NO.

COB11

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA SIM
Matrix : Soil
Sample wt/vol : 30.1 (g/mL): g
% Solids : 37
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N)
Purge Volume : (mL)
Cleanup Types : GPC
Concentration Units (μg/L, mg/L, μg/kg) : μg/kg

Contract : EPW14030
MA No. : SDG No.: C0B00
Level : LOW
Lab Sample ID : I4209-08
Lab File ID : BE093569.D
Date Received : 07/14/2017
Date Extracted : 07/18/2017
Date Analyzed : 07/25/2017
Extract Volume : 500 (μL)
Extraction Type : SOXH
Injection Volume : 1.0 (μL)
pH : Dilution Factor : 1.0
Cleanup Factor : 2.0

CAS NO.	ANALYTE	CONCENTRATION	Q
91-20-3	Naphthalene	5.8	J
91-57-6	2-Methylnaphthalene	8.9	U
208-96-8	Acenaphthylene	8.9	U
83-32-9	Acenaphthene	8.9	U
86-73-7	Fluorene	8.9	U
87-86-5	Pentachlorophenol	18	U
85-01-8	Phenanthrene	2.8	J
120-12-7	Anthracene	8.9	U
206-44-0	Fluoranthene	5.4	J
129-00-0	Pyrene	6.6	J
56-55-3	Benzo(a)anthracene	3.8	J
218-01-9	Chrysene	4.3	J
205-99-2	Benzo(b)fluoranthene	7.4	J
207-08-9	Benzo(k)fluoranthene	3.2	J
50-32-8	Benzo(a)pyrene	6.6	J
193-39-5	Indeno(1,2,3-cd)pyrene	3.8	J
53-70-3	Dibenzo(a,h)anthracene	8.9	U
191-24-2	Benzo(g,h,i)perylene	4.4	J

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EPA SAMPLE NO.

COB12

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA SIM
Matrix : Soil
Sample wt/vol : 30.0 (g/mL): g
% Solids : 55.7
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N)
Purge Volume : (mL)
Cleanup Types : GPC
Concentration Units (μg/L, mg/L, μg/kg) : μg/kg

Contract : EPW14030
MA No. : SDG No.: COB00
Level : LOW
Lab Sample ID : I4209-09
Lab File ID : BE093558.D
Date Received : 07/14/2017
Date Extracted : 07/18/2017
Date Analyzed : 07/25/2017
Extract Volume : 500 (μL)
Extraction Type : SOXH
Injection Volume : 1.0 (μL)
pH : Dilution Factor : 1.0
Cleanup Factor : 2.0

CAS NO.	ANALYTE	CONCENTRATION	Q
91-20-3	Naphthalene	2.8	J
91-57-6	2-Methylnaphthalene	5.9	U
208-96-8	Acenaphthylene	5.9	U
83-32-9	Acenaphthene	5.9	U
86-73-7	Fluorene	5.9	U
87-86-5	Pentachlorophenol	12	U
85-01-8	Phenanthrene	2.3	J
120-12-7	Anthracene	5.9	U
206-44-0	Fluoranthene	3.5	J
129-00-0	Pyrene	4.5	J
56-55-3	Benzo(a)anthracene	3.2	J
218-01-9	Chrysene	4.8	J
205-99-2	Benzo(b)fluoranthene	7.1	
207-08-9	Benzo(k)fluoranthene	2.5	J
50-32-8	Benzo(a)pyrene	5.5	J
193-39-5	Indeno(1,2,3-cd)pyrene	5.9	U
53-70-3	Dibenzo(a,h)anthracene	5.9	U
191-24-2	Benzo(g,h,i)perylene	3.1	J

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TARGET ANALYTE LIST

EPA SAMPLE NO.

COB13

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA SIM
Matrix : Soil
Sample wt/vol : 30.1 (g/mL): g
% Solids : 50.7
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N)
Purge Volume : (mL)
Cleanup Types : GPC
Concentration Units (μg/L, mg/L, μg/kg) : μg/kg

Contract : EPW14030
MA No. : SDG No.: COB00
Level : LOW
Lab Sample ID : I4209-10
Lab File ID : BE093570.D
Date Received : 07/14/2017
Date Extracted : 07/18/2017
Date Analyzed : 07/25/2017
Extract Volume : 500 (μL)
Extraction Type : SOXH
Injection Volume : 1.0 (μL)
pH : Dilution Factor : 1.0
Cleanup Factor : 2.0

CAS NO.	ANALYTE	CONCENTRATION	Q
91-20-3	Naphthalene	4.6	J
91-57-6	2-Methylnaphthalene	6.5	U
208-96-8	Acenaphthylene	6.5	U
83-32-9	Acenaphthene	6.5	U
86-73-7	Fluorene	6.5	U
87-86-5	Pentachlorophenol	13	U
85-01-8	Phenanthrene	3.9	J
120-12-7	Anthracene	6.5	U
206-44-0	Fluoranthene	7.4	
129-00-0	Pyrene	7.7	
56-55-3	Benzo(a)anthracene	5.7	J
218-01-9	Chrysene	6.2	J
205-99-2	Benzo(b)fluoranthene	9.6	
207-08-9	Benzo(k)fluoranthene	3.9	J
50-32-8	Benzo(a)pyrene	8.7	
193-39-5	Indeno(1,2,3-cd)pyrene	4.5	J
53-70-3	Dibenzo(a,h)anthracene	6.5	U
191-24-2	Benzo(g,h,i)perylene	4.9	J

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EPA SAMPLE NO.

COB14

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA SIM
Matrix : Soil
Sample wt/vol : 30.1 (g/mL): g
% Solids : 42.5
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : (µL)
Heated Purge : (Y / N)
Purge Volume : (mL)
Cleanup Types : GPC
Concentration Units (µg/L, mg/L, µg/kg) : µg/kg

Contract : EPW14030
MA No. : SDG No.: COB00
Level : LOW
Lab Sample ID : I4209-11
Lab File ID : BE093571.D
Date Received : 07/14/2017
Date Extracted : 07/18/2017
Date Analyzed : 07/25/2017
Extract Volume : 500 (µL)
Extraction Type : SOXH
Injection Volume : 1.0 (µL)
pH : Dilution Factor : 1.0
Cleanup Factor : 2.0

CAS NO.	ANALYTE	CONCENTRATION	Q
91-20-3	Naphthalene	6.0	J
91-57-6	2-Methylnaphthalene	7.7	U
208-96-8	Acenaphthylene	7.7	U
83-32-9	Acenaphthene	7.7	U
86-73-7	Fluorene	7.7	U
87-86-5	Pentachlorophenol	16	U
85-01-8	Phenanthrene	2.6	J
120-12-7	Anthracene	7.7	U
206-44-0	Fluoranthene	5.0	J
129-00-0	Pyrene	5.9	J
56-55-3	Benzo(a)anthracene	4.9	J
218-01-9	Chrysene	6.3	J
205-99-2	Benzo(b)fluoranthene	9.8	
207-08-9	Benzo(k)fluoranthene	4.0	J
50-32-8	Benzo(a)pyrene	8.4	
193-39-5	Indeno(1,2,3-cd)pyrene	4.8	J
53-70-3	Dibenzo(a,h)anthracene	7.7	U
191-24-2	Benzo(g,h,i)perylene	5.7	J

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EPA SAMPLE NO.

COB15

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA SIM
Matrix : Soil
Sample wt/vol : 30.1 (g/mL): g
% Solids : 53.6
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : (µL)
Heated Purge : (Y / N)
Purge Volume : (mL)
Cleanup Types : GPC
Concentration Units (µg/L, mg/L, µg/kg) : µg/kg

Contract : EPW14030
MA No. : SDG No.: COB00
Level : LOW
Lab Sample ID : I4209-12
Lab File ID : BE093590.D
Date Received : 07/14/2017
Date Extracted : 07/18/2017
Date Analyzed : 07/25/2017
Extract Volume : 500 (µL)
Extraction Type : SOXH
Injection Volume : 1.0 (µL)
pH : Dilution Factor : 1.0
Cleanup Factor : 2.0

CAS NO.	ANALYTE	CONCENTRATION	Q
91-20-3	Naphthalene	3.2	J
91-57-6	2-Methylnaphthalene	6.1	U
208-96-8	Acenaphthylene	1.5	J
83-32-9	Acenaphthene	6.1	U
86-73-7	Fluorene	6.1	U
87-86-5	Pentachlorophenol	12	U
85-01-8	Phenanthrene	1.4	J
120-12-7	Anthracene	6.1	U
206-44-0	Fluoranthene	5.5	J
129-00-0	Pyrene	6.1	
56-55-3	Benzo(a)anthracene	4.0	J
218-01-9	Chrysene	3.0	J
205-99-2	Benzo(b)fluoranthene	6.0	J
207-08-9	Benzo(k)fluoranthene	2.4	J
50-32-8	Benzo(a)pyrene	5.2	J
193-39-5	Indeno(1,2,3-cd)pyrene	2.7	J
53-70-3	Dibenzo(a,h)anthracene	6.1	U
191-24-2	Benzo(g,h,i)perylene	2.8	J

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EPA SAMPLE NO.

COB16

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA SIM
Matrix : Soil
Sample wt/vol : 30.1 (g/mL): g
% Solids : 35.6
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N)
Purge Volume : (mL)
Cleanup Types : GPC
Concentration Units (μg/L, mg/L, μg/kg) : μg/kg

Contract : EPW14030
MA No. : SDG No.: COB00
Level : LOW
Lab Sample ID : I4209-13
Lab File ID : BE093573.D
Date Received : 07/14/2017
Date Extracted : 07/18/2017
Date Analyzed : 07/25/2017
Extract Volume : 500 (μL)
Extraction Type : SOXH
Injection Volume : 1.0 (μL)
pH : Dilution Factor : 1.0
Cleanup Factor : 2.0

CAS NO.	ANALYTE	CONCENTRATION	Q
91-20-3	Naphthalene	5.6	J
91-57-6	2-Methylnaphthalene	9.2	U
208-96-8	Acenaphthylene	9.2	U
83-32-9	Acenaphthene	9.2	U
86-73-7	Fluorene	9.2	U
87-86-5	Pentachlorophenol	19	U
85-01-8	Phenanthrene	2.4	J
120-12-7	Anthracene	9.2	U
206-44-0	Fluoranthene	5.3	J
129-00-0	Pyrene	6.0	J
56-55-3	Benzo(a)anthracene	4.1	J
218-01-9	Chrysene	3.9	J
205-99-2	Benzo(b)fluoranthene	6.3	J
207-08-9	Benzo(k)fluoranthene	9.2	U
50-32-8	Benzo(a)pyrene	5.7	J
193-39-5	Indeno(1,2,3-cd)pyrene	9.2	U
53-70-3	Dibenzo(a,h)anthracene	9.2	U
191-24-2	Benzo(g,h,i)perylene	3.7	J

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EPA SAMPLE NO.

COB17

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA SIM
Matrix : Soil
Sample wt/vol : 30.1 (g/mL): g
% Solids : 40.6
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N)
Purge Volume : (mL)
Cleanup Types : GPC
Concentration Units (μg/L, mg/L, μg/kg): μg/kg

Contract : EPW14030
MA No. : SDG No.: COB00
Level : LOW
Lab Sample ID : I4209-14
Lab File ID : BE093577.D
Date Received : 07/14/2017
Date Extracted : 07/18/2017
Date Analyzed : 07/25/2017
Extract Volume : 500 (μL)
Extraction Type : SOXH
Injection Volume : 1.0 (μL)
pH : Dilution Factor : 1.0
Cleanup Factor : 2.0

CAS NO.	ANALYTE	CONCENTRATION	Q
91-20-3	Naphthalene	3.6	J
91-57-6	2-Methylnaphthalene	8.1	U
208-96-8	Acenaphthylene	8.1	U
83-32-9	Acenaphthene	8.1	U
86-73-7	Fluorene	8.1	U
87-86-5	Pentachlorophenol	16	U
85-01-8	Phenanthrene	6.5	J
120-12-7	Anthracene	5.1	J
206-44-0	Fluoranthene	85	
129-00-0	Pyrene	87	
56-55-3	Benzo(a)anthracene	91	
218-01-9	Chrysene	85	
205-99-2	Benzo(b)fluoranthene	120	
207-08-9	Benzo(k)fluoranthene	54	
50-32-8	Benzo(a)pyrene	110	
193-39-5	Indeno(1,2,3-cd)pyrene	48	
53-70-3	Dibenzo(a,h)anthracene	17	
191-24-2	Benzo(g,h,i)perylene	41	

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EPA SAMPLE NO.

COB18

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA SIM
Matrix : Soil
Sample wt/vol : 30.1 (g/mL): g
% Solids : 33.8
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N)
Purge Volume : (mL)
Cleanup Types : GPC
Concentration Units (μg/L, mg/L, μg/kg): μg/kg

Contract : EPW14030
MA No. : SDG No.: COB00
Level : LOW
Lab Sample ID : I4209-15
Lab File ID : BE093578.D
Date Received : 07/14/2017
Date Extracted : 07/18/2017
Date Analyzed : 07/25/2017
Extract Volume : 500 (μL)
Extraction Type : SOXH
Injection Volume : 1.0 (μL)
pH : Dilution Factor : 1.0
Cleanup Factor : 2.0

CAS NO.	ANALYTE	CONCENTRATION	Q
91-20-3	Naphthalene	6.6	J
91-57-6	2-Methylnaphthalene	9.7	U
208-96-8	Acenaphthylene	9.7	U
83-32-9	Acenaphthene	9.7	U
86-73-7	Fluorene	9.7	U
87-86-5	Pentachlorophenol	20	U
85-01-8	Phenanthrene	2.6	J
120-12-7	Anthracene	9.7	U
206-44-0	Fluoranthene	3.5	J
129-00-0	Pyrene	4.6	J
56-55-3	Benzo(a)anthracene	3.0	J
218-01-9	Chrysene	3.2	J
205-99-2	Benzo(b)fluoranthene	5.7	J
207-08-9	Benzo(k)fluoranthene	9.7	U
50-32-8	Benzo(a)pyrene	5.2	J
193-39-5	Indeno(1,2,3-cd)pyrene	3.1	J
53-70-3	Dibenzo(a,h)anthracene	9.7	U
191-24-2	Benzo(g,h,i)perylene	3.5	J

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EPA SAMPLE NO.

COB19

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA SIM
Matrix : Soil
Sample wt/vol : 30.1 (g/mL): g
% Solids : 31.4
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : (µL)
Heated Purge : (Y / N)
Purge Volume : (mL)
Cleanup Types : GPC
Concentration Units (µg/L, mg/L, µg/kg): µg/kg

Contract : EPW14030
MA No. : SDG No.: COB00
Level : LOW
Lab Sample ID : I4209-16
Lab File ID : BE093579.D
Date Received : 07/14/2017
Date Extracted : 07/18/2017
Date Analyzed : 07/25/2017
Extract Volume : 500 (µL)
Extraction Type : SOXH
Injection Volume : 1.0 (µL)
pH : Dilution Factor : 1.0
Cleanup Factor : 2.0

CAS NO.	ANALYTE	CONCENTRATION	Q
91-20-3	Naphthalene	9.3	J
91-57-6	2-Methylnaphthalene	10	U
208-96-8	Acenaphthylene	10	U
83-32-9	Acenaphthene	10	U
86-73-7	Fluorene	10	U
87-86-5	Pentachlorophenol	21	U
85-01-8	Phenanthrene	3.2	J
120-12-7	Anthracene	10	U
206-44-0	Fluoranthene	4.8	J
129-00-0	Pyrene	5.4	J
56-55-3	Benzo(a)anthracene	3.5	J
218-01-9	Chrysene	4.0	J
205-99-2	Benzo(b)fluoranthene	6.6	J
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	5.0	J
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	3.8	J

FORM 1A-OR
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TARGET ANALYTE LIST

EPA SAMPLE NO.

COB20

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA SIM
Matrix : Soil
Sample wt/vol : 30.0 (g/mL): g
% Solids : 50.8
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N)
Purge Volume : (mL)
Cleanup Types : GPC
Concentration Units (μg/L, mg/L, μg/kg) : μg/kg

Contract : EPW14030
MA No. : SDG No.: COB00
Level : LOW
Lab Sample ID : I4209-17
Lab File ID : BE093588.D
Date Received : 07/14/2017
Date Extracted : 07/18/2017
Date Analyzed : 07/25/2017
Extract Volume : 500 (μL)
Extraction Type : SOXH
Injection Volume : 1.0 (μL)
pH : Dilution Factor : 1.0
Cleanup Factor : 2.0

CAS NO.	ANALYTE	CONCENTRATION	Q
91-20-3	Naphthalene	2.2	J
91-57-6	2-Methylnaphthalene	6.5	U
208-96-8	Acenaphthylene	6.5	U
83-32-9	Acenaphthene	6.5	U
86-73-7	Fluorene	6.5	U
87-86-5	Pentachlorophenol	13	U
85-01-8	Phenanthrene	4.1	J
120-12-7	Anthracene	6.5	U
206-44-0	Fluoranthene	8.1	
129-00-0	Pyrene	9.5	
56-55-3	Benzo(a)anthracene	6.2	J
218-01-9	Chrysene	6.3	J
205-99-2	Benzo(b)fluoranthene	8.3	
207-08-9	Benzo(k)fluoranthene	3.9	J
50-32-8	Benzo(a)pyrene	6.7	
193-39-5	Indeno(1,2,3-cd)pyrene	3.6	J
53-70-3	Dibenzo(a,h)anthracene	6.5	U
191-24-2	Benzo(g,h,i)perylene	3.4	J

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EPA SAMPLE NO.

COB21

Lab Name : Chemtech Consulting Group Contract : EPW14030
Lab Code: CHM Case No.: R35186 MA No. : _____ SDG No.: COB00
Analytical Method : SVOA SIM Level : LOW
Matrix : Soil Lab Sample ID : I4209-18
Sample wt/vol : 30.2 (g/mL): g Lab File ID : BE093589.D
% Solids : 34 Date Received : 07/14/2017
GC Column : ZB-GR ID : 0.25 (mm) Date Extracted : 07/18/2017
GC Column : _____ ID : _____ (mm) Date Analyzed : 07/25/2017
Extract Concentrated : (Y / N) Y Extract Volume : 500 (µL)
Soil Aliquot (VOA) : _____ (µL) Extraction Type : SOXH
Heated Purge : (Y / N) _____ Injection Volume : 1.0 (µL)
Purge Volume : _____ (mL) pH : _____ Dilution Factor : 1.0
Cleanup Types : GPC Cleanup Factor : 2.0
Concentration Units (µg/L, mg/L, µg/kg) : µg/kg

CAS NO.	ANALYTE	CONCENTRATION	Q
91-20-3	Naphthalene	9.4	J
91-57-6	2-Methylnaphthalene	2.4	J
208-96-8	Acenaphthylene	9.6	U
83-32-9	Acenaphthene	9.6	U
86-73-7	Fluorene	9.6	U
87-86-5	Pentachlorophenol	20	U
85-01-8	Phenanthrene	3.4	J
120-12-7	Anthracene	9.6	U
206-44-0	Fluoranthene	5.6	J
129-00-0	Pyrene	6.4	J
56-55-3	Benzo(a)anthracene	4.1	J
218-01-9	Chrysene	4.6	J
205-99-2	Benzo(b)fluoranthene	7.3	J
207-08-9	Benzo(k)fluoranthene	9.6	U
50-32-8	Benzo(a)pyrene	6.0	J
193-39-5	Indeno(1,2,3-cd)pyrene	9.6	U
53-70-3	Dibenzo(a,h)anthracene	9.6	U
191-24-2	Benzo(g,h,i)perylene	4.0	J

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB22

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA SIM
Matrix : Soil
Sample wt/vol : 30.1 (g/mL): g
% Solids : 36.4
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : (μL)
Heated Purge : (Y / N)
Purge Volume : (mL)
Cleanup Types : GPC
Concentration Units (μg/L, mg/L, μg/kg) : μg/kg

Contract : EPW14030
MA No. : SDG No.: COB00
Level : LOW
Lab Sample ID : I4209-19
Lab File ID : BE093586.D
Date Received : 07/14/2017
Date Extracted : 07/18/2017
Date Analyzed : 07/25/2017
Extract Volume : 500 (μL)
Extraction Type : SOXH
Injection Volume : 1.0 (μL)
pH : Dilution Factor : 1.0
Cleanup Factor : 2.0

CAS NO.	ANALYTE	CONCENTRATION	Q
91-20-3	Naphthalene	7.8	J
91-57-6	2-Methylnaphthalene	9.0	U
208-96-8	Acenaphthylene	9.0	U
83-32-9	Acenaphthene	9.0	U
86-73-7	Fluorene	9.0	U
87-86-5	Pentachlorophenol	18	U
85-01-8	Phenanthrene	2.9	J
120-12-7	Anthracene	9.0	U
206-44-0	Fluoranthene	3.6	J
129-00-0	Pyrene	4.4	J
56-55-3	Benzo(a)anthracene	2.1	J
218-01-9	Chrysene	2.2	J
205-99-2	Benzo(b)fluoranthene	3.8	J
207-08-9	Benzo(k)fluoranthene	9.0	U
50-32-8	Benzo(a)pyrene	3.2	J
193-39-5	Indeno(1,2,3-cd)pyrene	9.0	U
53-70-3	Dibenzo(a,h)anthracene	9.0	U
191-24-2	Benzo(g,h,i)perylene	2.1	J

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB24

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : SVOA SIM
Matrix : Soil
Sample wt/vol : 30.0 (g/mL): g
% Solids : 52
GC Column : ZB-GR ID : 0.25 (mm)
GC Column : ID : (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : (µL)
Heated Purge : (Y / N)
Purge Volume : (mL)
Cleanup Types : GPC
Concentration Units (µg/L, mg/L, µg/kg) : µg/kg

Contract : EPW14030
MA No. : SDG No.: COB00
Level : LOW
Lab Sample ID : I4209-20
Lab File ID : BE093587.D
Date Received : 07/14/2017
Date Extracted : 07/18/2017
Date Analyzed : 07/25/2017
Extract Volume : 500 (µL)
Extraction Type : SOXH
Injection Volume : 1.0 (µL)
pH : Dilution Factor : 1.0
Cleanup Factor : 2.0

CAS NO.	ANALYTE	CONCENTRATION	Q
91-20-3	Naphthalene	2.6	J
91-57-6	2-Methylnaphthalene	6.3	U
208-96-8	Acenaphthylene	2.2	J
83-32-9	Acenaphthene	6.3	U
86-73-7	Fluorene	6.3	U
87-86-5	Pentachlorophenol	13	U
85-01-8	Phenanthrene	2.1	J
120-12-7	Anthracene	1.6	J
206-44-0	Fluoranthene	15	
129-00-0	Pyrene	23	
56-55-3	Benzo(a)anthracene	12	
218-01-9	Chrysene	11	
205-99-2	Benzo(b)fluoranthene	17	
207-08-9	Benzo(k)fluoranthene	6.4	
50-32-8	Benzo(a)pyrene	17	
193-39-5	Indeno(1,2,3-cd)pyrene	8.1	
53-70-3	Dibenzo(a,h)anthracene	2.1	J
191-24-2	Benzo(g,h,i)perylene	10	



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION III


Environmental Sciences Center

701 Mapes Road

Fort Meade, Maryland 20755-5350

DATE: 8/31/2017

SUBJECT: Region III Data QA Review

FROM: Brandon McDonald 
Region III ESAT RPO (3EA22)

TO: GREG HAM
Hazardous Site Cleanup Division (HSCD)

Attached is the data validation report for the SPARROWS POINT- SEDIMENT ASSESSMENT SOUTHEAST AREA site for DAS# R35186; SDG# I4206 completed by the Region III Environmental Services Assistance Team (ESAT) contractor, ICF International, under the direction of Region III EAID.

If you have any questions regarding this review, please call Brandon McDonald at (410) 305-2607 or you can call Eric Graybill at (410)-305-2665.

cc: Charles Rapone(WESTON SOLUTIONS)
Laura Mathew (WESTON SOLUTIONS)

TO: #0002 TDF: #0817038

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ESAT Region 3
US Environmental Protection Agency Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Phone 410-305-3012

Date: August 22, 2017

To: Brandon McDonald
ESAT Region 3 Project Officer

From: Leah Watson
Validator

Dean Gouveia
Reviewer

Subject: Organic Data Validation (S3VM)
Sparrows Point
R35186 I4206

Overview

This data package consisted of six (6) surface sediment samples analyzed for Aroclors.

Analyses were performed by Chemtech Consulting Group (CHM) according to Contract Laboratory Program (CLP) Statement of Work (SOW) SOM02.4.

Data were validated according to the National Functional Guidelines for Organic Superfund Methods Data Review and applicable USEPA Region 3 modifications. The validation report has been assigned the Superfund Data Validation Label S3VM (Stage_3_Validation_Manual).

Samples were submitted to the laboratory directly by the contractor and not through the EPA Technical Services Branch (TSB). Environmental Services Assistance Team (ESAT) has been tasked to evaluate laboratory reported data for the purpose of usability, based on the hardcopy data package received by ESAT dated July 31, 2017.

Summary

No significant data quality outliers or technical deficiencies were identified that would require rejection of sample results. Data were qualified as estimated due to dual column precision and results less than the Contract Required Quantitation Limits (CRQLs).

Notes

Detected concentrations for Aroclors less than the CRQLs in the Laboratory Control Sample (LCS) analysis are estimated and have been qualified "J".

Aroclors with percent difference (%D) greater than twenty-five percent (>25%) between the two (2) analytical columns were qualified "J". The lower of the two (2) column results is reported.

Percent recoveries for Aroclors in the LCS analyses were within control limits on both columns. No data were qualified based on LCS precision.

Accuracy and precision criteria were met by the laboratory in the initial and continuing calibration verification standard analyses associated with the samples in this sample delivery group (SDG).

Percent recoveries and Relative Percent Differences (RPDs) for Aroclors in Matrix Spike/Matrix Spike Duplicate (MS/MSD) analyses of sample COB27 were within control limits on both columns. No data were qualified based on MS/MSD precision or accuracy.

Glossary of Organic Data Qualifier Codes

Validation Qualifiers	In order of descending precedence. Only one of these qualifiers may apply to any result.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
Additional Qualifiers	Additional qualifiers may be combined with other qualifiers.
N	The analyte has been "tentatively identified" or "presumptively" as present.
B	The result is presumed a blank contaminant. This qualifier is used for drinking water samples only.
C	The target Pesticide or Aroclor analyte identification has been confirmed by Gas Chromatography/Mass Spectrometry (GC/MS). This qualifier may be added to other qualifiers.
X	The target Pesticide or Aroclor analyte identification was not confirmed when GC/MS analysis was performed. This qualifier may be added to other qualifiers.

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB05

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : ARO
Matrix : Soil
Sample wt/vol : 30.1 (g/mL): g
% Solids : 77.3
GC Column : ZB-MR1 ID : 0.32 (mm)
GC Column : ZB-MR2 ID : 0.32 (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : _____ (μL)
Heated Purge : (Y/N) _____
Purge Volume : _____ (mL)
Cleanup Types : Acid
Concentration Units (μg/L, mg/L, μg/kg): μg/kg

Contract : EPW14030
MA No. : _____ SDG No.: COB05
Level : _____
Lab Sample ID : I4206-01
Lab File ID : PR019730.D
Date Received : 07/14/2017
Date Extracted : 07/18/2017
Date Analyzed : 07/21/2017
Extract Volume : 10000 (μL)
Extraction Type : SOXH
Injection Volume : 1.0 (μL)
pH : _____ Dilution Factor : 1.0
Cleanup Factor : 1.0

CAS NO.	ANALYTE	CONCENTRATION	Q
12674-11-2	Aroclor-1016	43	U
11104-28-2	Aroclor-1221	43	U
11141-16-5	Aroclor-1232	43	U
53469-21-9	Aroclor-1242	43	U
12672-29-6	Aroclor-1248	43	U
11097-69-1	Aroclor-1254	43	U
11096-82-5	Aroclor-1260	43	U
37324-23-5	Aroclor-1262	43	U
11100-14-4	Aroclor-1268	43	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB08

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : ARO
Matrix : Soil
Sample wt/vol : 30.0 (g/mL): g
% Solids : 46.4
GC Column : ZB-MR1 ID : 0.32 (mm)
GC Column : ZB-MR2 ID : 0.32 (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : _____ (μL)
Heated Purge : (Y/N) _____
Purge Volume : _____ (mL)
Cleanup Types : Acid
Concentration Units (μg/L, mg/L, μg/kg): μg/kg

Contract : EPW14030
MA No. : _____ SDG No.: COB05
Level : _____
Lab Sample ID : I4206-02
Lab File ID : PR019731.D
Date Received : 07/14/2017
Date Extracted : 07/18/2017
Date Analyzed : 07/21/2017
Extract Volume : 10000 (μL)
Extraction Type : SOXH
Injection Volume : 1.0 (μL)
pH : _____ Dilution Factor : 1.0
Cleanup Factor : 1.0

CAS NO.	ANALYTE	CONCENTRATION	Q
12674-11-2	Aroclor-1016	71	U
11104-28-2	Aroclor-1221	71	U
11141-16-5	Aroclor-1232	71	U
53469-21-9	Aroclor-1242	71	U
12672-29-6	Aroclor-1248	71	U
11097-69-1	Aroclor-1254	71	U
11096-82-5	Aroclor-1260	71	U
37324-23-5	Aroclor-1262	71	U
11100-14-4	Aroclor-1268	71	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB22

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : ARO
Matrix : Soil
Sample wt/vol : 30.2 (g/mL): g
% Solids : 33.8
GC Column : ZB-MR1 ID : 0.32 (mm)
GC Column : ZB-MR2 ID : 0.32 (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : _____ (μL)
Heated Purge : (Y/N) _____
Purge Volume : _____ (mL)
Cleanup Types : Acid
Concentration Units (μg/L, mg/L, μg/kg): μg/kg

Contract : EPW14030
MA No. : _____ SDG No.: COB05
Level : _____
Lab Sample ID : I4206-03
Lab File ID : PR019732.D
Date Received : 07/14/2017
Date Extracted : 07/18/2017
Date Analyzed : 07/21/2017
Extract Volume : 10000 (μL)
Extraction Type : SOXH
Injection Volume : 1.0 (μL)
pH : _____ Dilution Factor : 1.0
Cleanup Factor : 1.0

CAS NO.	ANALYTE	CONCENTRATION	Q
12674-11-2	Aroclor-1016	97	U
11104-28-2	Aroclor-1221	97	U
11141-16-5	Aroclor-1232	97	U
53469-21-9	Aroclor-1242	97	U
12672-29-6	Aroclor-1248	97	U
11097-69-1	Aroclor-1254	97	U
11096-82-5	Aroclor-1260	97	U
37324-23-5	Aroclor-1262	97	U
11100-14-4	Aroclor-1268	97	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB27

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : ARO
Matrix : Soil
Sample wt/vol : 30.0 (g/mL): g
% Solids : 38
GC Column : ZB-MR1 ID : 0.32 (mm)
GC Column : ZB-MR2 ID : 0.32 (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : _____ (µL)
Heated Purge : (Y/N) _____
Purge Volume : _____ (mL)
Cleanup Types : Acid
Concentration Units (µg/L, mg/L, µg/kg): µg/kg

Contract : EPW14030
MA No. : _____ SDG No.: COB05
Level : _____
Lab Sample ID : I4206-04
Lab File ID : PR019733.D
Date Received : 07/14/2017
Date Extracted : 07/18/2017
Date Analyzed : 07/21/2017
Extract Volume : 10000 (µL)
Extraction Type : SOXH
Injection Volume : 1.0 (µL)
pH : _____ Dilution Factor : 1.0
Cleanup Factor : 1.0

CAS NO.	ANALYTE	CONCENTRATION	Q
12674-11-2	Aroclor-1016	87	U
11104-28-2	Aroclor-1221	87	U
11141-16-5	Aroclor-1232	87	U
53469-21-9	Aroclor-1242	87	U
12672-29-6	Aroclor-1248	87	U
11097-69-1	Aroclor-1254	87	U
11096-82-5	Aroclor-1260	87	U
37324-23-5	Aroclor-1262	87	U
11100-14-4	Aroclor-1268	87	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

COB30

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : ARO
Matrix : Soil
Sample wt/vol : 30.1 (g/mL): g
% Solids : 33.1
GC Column : ZB-MR1 ID : 0.32 (mm)
GC Column : ZB-MR2 ID : 0.32 (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : _____ (µL)
Heated Purge : (Y/N) _____
Purge Volume : _____ (mL)
Cleanup Types : Acid
Concentration Units (µg/L, mg/L, µg/kg): µg/kg

Contract : EPW14030
MA No. : _____ SDG No.: COB05
Level : _____
Lab Sample ID : I4206-07
Lab File ID : PR019736.D
Date Received : 07/14/2017
Date Extracted : 07/18/2017
Date Analyzed : 07/21/2017
Extract Volume : 10000 (µL)
Extraction Type : SOXH
Injection Volume : 1.0 (µL)
pH : _____ Dilution Factor : 1.0
Cleanup Factor : 1.0

CAS NO.	ANALYTE	CONCENTRATION	Q
12674-11-2	Aroclor-1016	99	U
11104-28-2	Aroclor-1221	99	U
11141-16-5	Aroclor-1232	99	U
53469-21-9	Aroclor-1242	99	U
12672-29-6	Aroclor-1248	99	U
11097-69-1	Aroclor-1254	99	U
11096-82-5	Aroclor-1260	99	U
37324-23-5	Aroclor-1262	99	U
11100-14-4	Aroclor-1268	99	U

FORM 1A-OR
ORGANIC ANALYSIS DATA SHEET
TARGET ANALYTE LIST

EPA SAMPLE NO.

C0B34

Lab Name : Chemtech Consulting Group
Lab Code: CHM Case No.: R35186
Analytical Method : ARO
Matrix : Soil
Sample wt/vol : 30.1 (g/mL): g
% Solids : 30.3
GC Column : ZB-MR1 ID : 0.32 (mm)
GC Column : ZB-MR2 ID : 0.32 (mm)
Extract Concentrated : (Y / N) Y
Soil Aliquot (VOA) : _____ (µL)
Heated Purge : (Y/N) _____
Purge Volume : _____ (mL)
Cleanup Types : Acid
Concentration Units (µg/L, mg/L, µg/kg): µg/kg

Contract : EPW14030
MA No. : _____ SDG No.: C0B05
Level : _____
Lab Sample ID : I4206-08
Lab File ID : PR019737.D
Date Received : 07/14/2017
Date Extracted : 07/18/2017
Date Analyzed : 07/21/2017
Extract Volume : 10000 (µL)
Extraction Type : SOXH
Injection Volume : 1.0 (µL)
pH : _____ Dilution Factor : 1.0
Cleanup Factor : 1.0

CAS NO.	ANALYTE	CONCENTRATION	Q
12674-11-2	Aroclor-1016	110	U
11104-28-2	Aroclor-1221	110	U
11141-16-5	Aroclor-1232	110	U
53469-21-9	Aroclor-1242	110	U
12672-29-6	Aroclor-1248	110	U
11097-69-1	Aroclor-1254	110	U
11096-82-5	Aroclor-1260	110	U
37324-23-5	Aroclor-1262	110	U
11100-14-4	Aroclor-1268	110	U




UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III

Environmental Sciences Center
701 Mapes Road
Fort Meade, Maryland 20755-5350

DATE: 8/31/2017

SUBJECT: Region III Data QA Review

FROM: Brandon McDonald 
Region III ESAT RPO (3EA22)

TO: GREG HAM
Hazardous Site Cleanup Division (HSCD)

Attached is the data validation report for the SPARROWS POINT- SEDIMENT ASSESSMENT SOUTHEAST AREA site for RAS# 47079; SDG# MC0B05 completed by the Region III Environmental Services Assistance Team (ESAT) contractor, ICF International, under the direction of Region III EAID.

If you have any questions regarding this review, please call Brandon McDonald at (410) 305-2607 or you can call Eric Graybill at (410)-305-2665.

cc: Charles Rapone(WESTON SOLUTIONS)
Laura Mathew (WESTON SOLUTIONS)

TO: #0002 TDF: #0817051

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ESAT Region 3
US Environmental Protection Agency Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Phone 410-305-3012

Date: August 17, 2017

To: Brandon McDonald
ESAT Region 3 Project Officer

From: Lisa D. Penix
Validator

Dean Gouveia
Reviewer

Subject: Inorganic Data Validation (S4VEM)
Sparrows Point
47079 MCOB05

Overview

This data package consisted of twenty (20) sediment samples, including two (2) field duplicate samples, analyzed for aluminum (Al), calcium (Ca), iron (Fe), magnesium (Mg), potassium (K) and sodium (Na) by ICP – AES, for metals by ICP-MS, mercury (Hg) by cold vapor atomic absorption technique and cyanide (CN-) by spectrophotometry.

Analyses were performed by Shealy Environmental Services (EQI) according to Contract Laboratory Program (CLP) Statement of Work (SOW) ISM02.4 through the Routine Analytical Services (RAS) program.

Data were validated according to the National Functional Guidelines for Inorganic Superfund Methods Data Review and applicable USEPA Region 3 modifications. Electronic validation was performed by the Electronic Data eXchange & Evaluation System (EXES). The validation report has been assigned the Superfund Data Validation Level Stage_4_Validation_Electronic_Manual (S4VEM).

This validation is based on the hardcopy data package received at Region 3 on August 4, 2017.

Sample MCOB18 of this SDG is a field duplicate to sample MCOB72, which was analyzed in SDG MCOB25. Sample MCOB21 of this SDG is a field duplicate to sample MCOB74, which was analyzed in SDG MCOB74. Comparison of these field duplicate pairs is discussed in “Notes”.

Rinsate blanks MCOB45 and MCOB70 were used in evaluating blank contamination for the associated samples in this case based on sampling date. These blanks were analyzed in SDG MCOB45. No positive results were reported in these blanks.

Summary

No significant data quality outliers or technical deficiencies were identified that would require rejection of sample results. Less significant data quality outliers and deficiencies resulting in estimation of sample results were identified including, but not limited to, internal standards, matrix spike, and blank contamination as detailed below.

Minor Problems

The sample cooler containing samples MCOB00, MCOB13, MCOB14, MCOB15, MCOB16, MCOB20, MCOB21, MCOB22 and MCOB24 had an interior temperature of 7.3°C when received by the laboratory, which exceeded the criteria of $\leq 6^{\circ}\text{C}$. Detected concentrations for Hg and CN- are estimated and have been qualified "J". Quantitation limits for CN- are estimated and have been qualified "UJ".

Laboratory instrumentation reported a negative value for CN- greater than the absolute value of the Method Detection Limit (MDL) in blank analyses. Detected concentrations reported for CN- which are less than the Contract Required Quantitation Limit (CRQL) were raised to the CRQL and qualified "UJ". Quantitation limits for CN- are estimated and have been qualified "UJ".

Percent differences (%Ds) in the ICP serial dilution analysis were outside the control limit ($>10\%$) for manganese (Mn) and K. Detected concentrations for these analytes are estimated and have been qualified "J".

The matrix spike percent recovery was low ($<75\%$) for antimony (Sb). The post-digestion spike recovery was within control limits. Detected concentrations and quantitation limits for Sb are estimated and have been qualified "J" and "UJ", respectively.

Matrix spike and post-digestion spike percent recoveries were low ($<75\%$) for beryllium (Be). Detected concentrations for Be may be estimated low and are qualified "J-". Quantitation limits for Be are estimated and have been qualified "UJ".

The percent relative intensity (%RI) for internal standard yttrium was outside the upper control limit ($>125\%$) in the initial analyses of samples MCOB00, MCOB06, MCOB07, MCOB08, MCOB09, MCOB10, MCOB11, MCOB12, MCOB13, MCOB14, MCOB16, MCOB17, MCOB18, MCOB19, MCOB20, MCOB21, MCOB22, and MCOB24. These samples were reanalyzed at a two-fold (2X) dilution with %RI within control limits for all samples except sample MCOB00, which was still outside the upper control limit. Associated analytes arsenic (As), cadmium (Cd), chromium (Cr), cobalt (Co), copper (Cu), Mn, nickel (Ni), silver (Ag), vanadium (V), and zinc (Zn) were reported from the initial analysis for sample MCOB00, are estimated, and have been qualified "J". All associated analytes previously listed were reported from the diluted analyses for all other affected samples without qualification.

Notes

Sb and Hg have been detected in laboratory blanks associated with the samples in this SDG. Reported concentrations for these analytes less than the Contract Required Quantitation Limit (CRQL) have been reported at the CRQL and qualified "U".

Analytes detected below CRQLs not attributed to blank contamination are estimated and have been qualified "J".

Results reported for field duplicate pair MCOB18/MCOB72 were within twenty-five (25) Relative Percent Difference (RPD), + CRQL for all analytes. No data were qualified based on field duplicate precision.

Results reported for field duplicate pair MCOB21/MCOB74 were within twenty-five (25) RPD, + CRQL for all analytes except K. No data were qualified based on field duplicate precision.

Glossary of Inorganic Data Qualifier Codes

Validation Qualifiers	In order of descending precedence. Only one of these qualifiers may apply to any result.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit
B	The result is presumed a blank contaminant. This qualifier is used for drinking water samples only.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.

Sample Summary Report

Case: 47079	Contract: EPW14035	SDG: MC0B05	Lab Code: EQI
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Sample Number: LCS001	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture:		% Solids: 100	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Spike	39.8		mg/kg	39.8		1	YES	S4VEM
Calcium	Spike	988		mg/kg	988		1	YES	S4VEM
Iron	Spike	21.1		mg/kg	21.1		1	YES	S4VEM
Magnesium	Spike	947		mg/kg	947		1	YES	S4VEM
Potassium	Spike	1000		mg/kg	1000		1	YES	S4VEM
Sodium	Spike	1010		mg/kg	1010		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: LCS001

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location:

pH:

Sample Date:

Sample Time:

% Moisture:

% Solids: 100

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Spike	2.0		mg/kg	2.0		1	YES	S4VEM
Arsenic	Spike	1.0		mg/kg	1.0		1	YES	S4VEM
Barium	Spike	9.5		mg/kg	9.5		1	YES	S4VEM
Beryllium	Spike	0.91		mg/kg	0.91		1	YES	S4VEM
Cadmium	Spike	1.0		mg/kg	1.0		1	YES	S4VEM
Chromium	Spike	2.1		mg/kg	2.1		1	YES	S4VEM
Cobalt	Spike	1.0		mg/kg	1.0		1	YES	S4VEM
Copper	Spike	2.2		mg/kg	2.2		1	YES	S4VEM
Lead	Spike	0.98		mg/kg	0.98		1	YES	S4VEM
Manganese	Spike	1.0		mg/kg	1.0		1	YES	S4VEM
Nickel	Spike	1.1		mg/kg	1.1		1	YES	S4VEM
Selenium	Spike	5.1		mg/kg	5.1		1	YES	S4VEM
Silver	Spike	1.1		mg/kg	1.1		1	YES	S4VEM
Thallium	Spike	0.98		mg/kg	0.98		1	YES	S4VEM
Vanadium	Spike	5.1		mg/kg	5.1		1	YES	S4VEM
Zinc	Spike	2.1		mg/kg	2.1		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B00	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SS-B01	pH:	Sample Date: 07/11/2017	Sample Time: 11:17:00
% Moisture:		% Solids: 44.2	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	1.6	J	mg/kg	1.6		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B00	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SS-B01	pH:	Sample Date: 07/11/2017	Sample Time: 11:17:00
% Moisture:	% Solids: 44.2		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.34	J	mg/kg	0.34		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B00	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SS-B01	pH:	Sample Date: 07/11/2017	Sample Time: 11:17:00
% Moisture:		% Solids: 44.2	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	19800		mg/kg	19800		1	YES	S4VEM
Calcium	Target	2820		mg/kg	2820		1	YES	S4VEM
Iron	Target	65400		mg/kg	65400		1	YES	S4VEM
Magnesium	Target	6170		mg/kg	6170		1	YES	S4VEM
Potassium	Target	2720	J	mg/kg	2720		1	YES	S4VEM
Sodium	Target	4180		mg/kg	4180		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B00

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location: SS-B01

pH:

Sample Date: 07/11/2017

Sample Time: 11:17:00

% Moisture:

% Solids: 44.2

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.5	UJ	mg/kg	0.67	J	1	YES	S4VEM
Arsenic	Target	20.8	J	mg/kg	20.8		1	YES	S4VEM
Barium	Target	49.2		mg/kg	49.2		1	YES	S4VEM
Beryllium	Target	0.46	J-	mg/kg	0.46	J	1	YES	S4VEM
Cadmium	Target	2.7	J	mg/kg	2.7		1	YES	S4VEM
Chromium	Target	135	J	mg/kg	135		1	YES	S4VEM
Cobalt	Target	23.4	J	mg/kg	23.4		1	YES	S4VEM
Copper	Target	105	J	mg/kg	105		1	YES	S4VEM
Lead	Target	316		mg/kg	316		1	YES	S4VEM
Manganese	Target	1020	J	mg/kg	1020		1	YES	S4VEM
Nickel	Target	36.8	J	mg/kg	36.8		1	YES	S4VEM
Selenium	Target	3.5	J	mg/kg	3.5	J	1	YES	S4VEM
Silver	Target	1.1		mg/kg	1.1		1	YES	S4VEM
Thallium	Target	0.37	J	mg/kg	0.37	J	1	YES	S4VEM
Vanadium	Target	71.7	J	mg/kg	71.7		1	YES	S4VEM
Zinc	Target	769	J	mg/kg	769		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B05	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SD-N01	pH:	Sample Date: 07/10/2017	Sample Time: 14:33:00
% Moisture:		% Solids: 71.9	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	0.46	UJ	mg/kg	0.087	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B05	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SD-N01	pH:	Sample Date: 07/10/2017	Sample Time: 14:33:00
% Moisture:		% Solids: 71.9	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.15	U	mg/kg	0.048	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B05	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SD-N01	pH:	Sample Date: 07/10/2017	Sample Time: 14:33:00
% Moisture:		% Solids: 71.9	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	1820		mg/kg	1820		1	YES	S4VEM
Calcium	Target	600	J	mg/kg	600	J	1	YES	S4VEM
Iron	Target	10300		mg/kg	10300		1	YES	S4VEM
Magnesium	Target	573	J	mg/kg	573	J	1	YES	S4VEM
Potassium	Target	234	J	mg/kg	234	J	1	YES	S4VEM
Sodium	Target	702		mg/kg	702		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B05

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location: SD-N01

pH:

Sample Date: 07/10/2017

Sample Time: 14:33:00

% Moisture:

% Solids: 71.9

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.3	UJ	mg/kg	0.94	J	1	YES	S4VEM
Arsenic	Target	2.4		mg/kg	2.4		1	YES	S4VEM
Barium	Target	17.1		mg/kg	17.1		1	YES	S4VEM
Beryllium	Target	0.65	UJ	mg/kg	0.65	U	1	YES	S4VEM
Cadmium	Target	0.24	J	mg/kg	0.24	J	1	YES	S4VEM
Chromium	Target	16.4		mg/kg	16.4		1	YES	S4VEM
Cobalt	Target	3.4		mg/kg	3.4		1	YES	S4VEM
Copper	Target	9.8		mg/kg	9.8		1	YES	S4VEM
Lead	Target	34.0		mg/kg	34.0		1	YES	S4VEM
Manganese	Target	477	J	mg/kg	477		1	YES	S4VEM
Nickel	Target	5.9		mg/kg	5.9		1	YES	S4VEM
Selenium	Target	3.3	U	mg/kg	3.3	U	1	YES	S4VEM
Silver	Target	0.14	J	mg/kg	0.14	J	1	YES	S4VEM
Thallium	Target	0.055	J	mg/kg	0.055	J	1	YES	S4VEM
Vanadium	Target	13.0		mg/kg	13.0		1	YES	S4VEM
Zinc	Target	167		mg/kg	167		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B06	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SD-N02	pH:	Sample Date: 07/10/2017	Sample Time: 14:04:00
% Moisture:	% Solids: 43.4		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	1.2	UJ	mg/kg	0.50	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B06	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SD-N02	pH:	Sample Date: 07/10/2017	Sample Time: 14:04:00
% Moisture:		% Solids: 43.4	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.60		mg/kg	0.60		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B06

Method: Metals by ICP-AES

Matrix: Soil

MA Number:

Sample Location: SD-N02

pH:

Sample Date: 07/10/2017

Sample Time: 14:04:00

% Moisture:

% Solids: 43.4

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	12400		mg/kg	12400		1	YES	S4VEM
Calcium	Target	2000		mg/kg	2000		1	YES	S4VEM
Iron	Target	70900		mg/kg	70900		1	YES	S4VEM
Magnesium	Target	3790		mg/kg	3790		1	YES	S4VEM
Potassium	Target	1460	J	mg/kg	1460		1	YES	S4VEM
Sodium	Target	2530		mg/kg	2530		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B06

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location: SD-N02

pH:

Sample Date: 07/10/2017

Sample Time: 14:04:00

% Moisture:

% Solids: 43.4

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.9	UJ	mg/kg	0.58	J	1	YES	S4VEM
Arsenic	Target	11.9		mg/kg	11.9		2	YES	S4VEM
Barium	Target	35.2		mg/kg	35.2		1	YES	S4VEM
Beryllium	Target	0.58	J-	mg/kg	0.58	J	1	YES	S4VEM
Cadmium	Target	2.3		mg/kg	2.3		2	YES	S4VEM
Chromium	Target	209		mg/kg	209		2	YES	S4VEM
Cobalt	Target	20.7		mg/kg	20.7		2	YES	S4VEM
Copper	Target	117		mg/kg	117		2	YES	S4VEM
Lead	Target	305		mg/kg	305		1	YES	S4VEM
Manganese	Target	1110	J	mg/kg	1110		2	YES	S4VEM
Nickel	Target	36.9		mg/kg	36.9		2	YES	S4VEM
Selenium	Target	4.8	U	mg/kg	4.8	U	1	YES	S4VEM
Silver	Target	2.5		mg/kg	2.5		2	YES	S4VEM
Thallium	Target	0.32	J	mg/kg	0.32	J	1	YES	S4VEM
Vanadium	Target	82.6		mg/kg	82.6		2	YES	S4VEM
Zinc	Target	1630		mg/kg	1630		2	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B07	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SD-N03	pH:	Sample Date: 07/10/2017	Sample Time: 13:45:00
% Moisture:		% Solids: 51.7	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	0.87	UJ	mg/kg	0.46	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B07	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SD-N03	pH:	Sample Date: 07/10/2017	Sample Time: 13:45:00
% Moisture:		% Solids: 51.7	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.38		mg/kg	0.38		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B07	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SD-N03	pH:	Sample Date: 07/10/2017	Sample Time: 13:45:00
% Moisture:		% Solids: 51.7	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	10400		mg/kg	10400		1	YES	S4VEM
Calcium	Target	1500		mg/kg	1500		1	YES	S4VEM
Iron	Target	52400		mg/kg	52400		1	YES	S4VEM
Magnesium	Target	2880		mg/kg	2880		1	YES	S4VEM
Potassium	Target	1210	J	mg/kg	1210		1	YES	S4VEM
Sodium	Target	1850		mg/kg	1850		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B07

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location: SD-N03

pH:

Sample Date: 07/10/2017

Sample Time: 13:45:00

% Moisture:

% Solids: 51.7

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.8	UJ	mg/kg	0.59	J	1	YES	S4VEM
Arsenic	Target	10.0		mg/kg	10.0		2	YES	S4VEM
Barium	Target	26.1		mg/kg	26.1		1	YES	S4VEM
Beryllium	Target	0.49	J-	mg/kg	0.49	J	1	YES	S4VEM
Cadmium	Target	1.8		mg/kg	1.8		2	YES	S4VEM
Chromium	Target	124		mg/kg	124		2	YES	S4VEM
Cobalt	Target	14.2		mg/kg	14.2		2	YES	S4VEM
Copper	Target	95.2		mg/kg	95.2		2	YES	S4VEM
Lead	Target	303		mg/kg	303		1	YES	S4VEM
Manganese	Target	574	J	mg/kg	574		2	YES	S4VEM
Nickel	Target	26.3		mg/kg	26.3		2	YES	S4VEM
Selenium	Target	1.5	J	mg/kg	1.5	J	1	YES	S4VEM
Silver	Target	2.1		mg/kg	2.1		2	YES	S4VEM
Thallium	Target	0.51	J	mg/kg	0.51	J	1	YES	S4VEM
Vanadium	Target	58.4		mg/kg	58.4		2	YES	S4VEM
Zinc	Target	1230		mg/kg	1230		2	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B08	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SD-O01	pH:	Sample Date: 07/10/2017	Sample Time: 13:35:00
% Moisture:		% Solids: 53.8	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	0.69	UJ	mg/kg	0.29	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B08	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SD-O01	pH:	Sample Date: 07/10/2017	Sample Time: 13:35:00
% Moisture:		% Solids: 53.8	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.42		mg/kg	0.42		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B08	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SD-O01	pH:	Sample Date: 07/10/2017	Sample Time: 13:35:00
% Moisture:		% Solids: 53.8	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	9240		mg/kg	9240		1	YES	S4VEM
Calcium	Target	2240		mg/kg	2240		1	YES	S4VEM
Iron	Target	58000		mg/kg	58000		1	YES	S4VEM
Magnesium	Target	3380		mg/kg	3380		1	YES	S4VEM
Potassium	Target	1070	J	mg/kg	1070		1	YES	S4VEM
Sodium	Target	1810		mg/kg	1810		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B08

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location: SD-O01

pH:

Sample Date: 07/10/2017

Sample Time: 13:35:00

% Moisture:

% Solids: 53.8

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	2.5	J	mg/kg	2.5		1	YES	S4VEM
Arsenic	Target	9.8		mg/kg	9.8		2	YES	S4VEM
Barium	Target	37.1		mg/kg	37.1		1	YES	S4VEM
Beryllium	Target	0.48	J-	mg/kg	0.48	J	1	YES	S4VEM
Cadmium	Target	1.9		mg/kg	1.9		2	YES	S4VEM
Chromium	Target	220		mg/kg	220		2	YES	S4VEM
Cobalt	Target	16.2		mg/kg	16.2		2	YES	S4VEM
Copper	Target	93.3		mg/kg	93.3		2	YES	S4VEM
Lead	Target	223		mg/kg	223		1	YES	S4VEM
Manganese	Target	1100	J	mg/kg	1100		2	YES	S4VEM
Nickel	Target	31.4		mg/kg	31.4		2	YES	S4VEM
Selenium	Target	1.2	J	mg/kg	1.2	J	1	YES	S4VEM
Silver	Target	1.7		mg/kg	1.7		2	YES	S4VEM
Thallium	Target	0.34	J	mg/kg	0.34	J	1	YES	S4VEM
Vanadium	Target	67.3		mg/kg	67.3		2	YES	S4VEM
Zinc	Target	1450		mg/kg	1450		2	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B09	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SD-O02	pH:	Sample Date: 07/10/2017	Sample Time: 14:05:00
% Moisture:		% Solids: 40.9	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	0.96	UJ	mg/kg	0.33	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B09	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SD-O02	pH:	Sample Date: 07/10/2017	Sample Time: 14:05:00
% Moisture:		% Solids: 40.9	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.65		mg/kg	0.65		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B09	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SD-O02	pH:	Sample Date: 07/10/2017	Sample Time: 14:05:00
% Moisture:		% Solids: 40.9	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	12600		mg/kg	12600		1	YES	S4VEM
Calcium	Target	2280		mg/kg	2280		1	YES	S4VEM
Iron	Target	63400		mg/kg	63400		1	YES	S4VEM
Magnesium	Target	4150		mg/kg	4150		1	YES	S4VEM
Potassium	Target	1190	J	mg/kg	1190		1	YES	S4VEM
Sodium	Target	2500		mg/kg	2500		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B09

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location: SD-O02

pH:

Sample Date: 07/10/2017

Sample Time: 14:05:00

% Moisture:

% Solids: 40.9

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.8	UJ	mg/kg	0.79	J	1	YES	S4VEM
Arsenic	Target	10.8		mg/kg	10.8		2	YES	S4VEM
Barium	Target	40.6		mg/kg	40.6		1	YES	S4VEM
Beryllium	Target	0.47	J-	mg/kg	0.47	J	1	YES	S4VEM
Cadmium	Target	2.1		mg/kg	2.1		2	YES	S4VEM
Chromium	Target	195		mg/kg	195		2	YES	S4VEM
Cobalt	Target	17.9		mg/kg	17.9		2	YES	S4VEM
Copper	Target	132		mg/kg	132		2	YES	S4VEM
Lead	Target	276		mg/kg	276		1	YES	S4VEM
Manganese	Target	1070	J	mg/kg	1070		2	YES	S4VEM
Nickel	Target	35.3		mg/kg	35.3		2	YES	S4VEM
Selenium	Target	1.7	J	mg/kg	1.7	J	1	YES	S4VEM
Silver	Target	2.7		mg/kg	2.7		2	YES	S4VEM
Thallium	Target	0.50	J	mg/kg	0.50	J	1	YES	S4VEM
Vanadium	Target	74.4		mg/kg	74.4		2	YES	S4VEM
Zinc	Target	1420		mg/kg	1420		2	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B10	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SD-O03	pH:	Sample Date: 07/10/2017	Sample Time: 14:20:00
% Moisture:		% Solids: 40.7	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	1.0	UJ	mg/kg	0.62	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B10	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SD-O03	pH:	Sample Date: 07/10/2017	Sample Time: 14:20:00
% Moisture:		% Solids: 40.7	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.66		mg/kg	0.66		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B10	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SD-O03	pH:	Sample Date: 07/10/2017	Sample Time: 14:20:00
% Moisture:		% Solids: 40.7	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	13600		mg/kg	13600		1	YES	S4VEM
Calcium	Target	2120		mg/kg	2120		1	YES	S4VEM
Iron	Target	70500		mg/kg	70500		1	YES	S4VEM
Magnesium	Target	4050		mg/kg	4050		1	YES	S4VEM
Potassium	Target	1330	J	mg/kg	1330		1	YES	S4VEM
Sodium	Target	2740		mg/kg	2740		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B10	Method: Metals by ICP-MS	Matrix: Soil	MA Number:
Sample Location: SD-O03	pH:	Sample Date: 07/10/2017	Sample Time: 14:20:00
% Moisture:		% Solids: 40.7	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	2.3	UJ	mg/kg	0.98	J	1	YES	S4VEM
Arsenic	Target	12.6		mg/kg	12.6		2	YES	S4VEM
Barium	Target	36.2		mg/kg	36.2		1	YES	S4VEM
Beryllium	Target	0.63	J-	mg/kg	0.63	J	1	YES	S4VEM
Cadmium	Target	2.3		mg/kg	2.3		2	YES	S4VEM
Chromium	Target	198		mg/kg	198		2	YES	S4VEM
Cobalt	Target	19.5		mg/kg	19.5		2	YES	S4VEM
Copper	Target	135		mg/kg	135		2	YES	S4VEM
Lead	Target	361		mg/kg	361		1	YES	S4VEM
Manganese	Target	1050	J	mg/kg	1050		2	YES	S4VEM
Nickel	Target	37.7		mg/kg	37.7		2	YES	S4VEM
Selenium	Target	2.1	J	mg/kg	2.1	J	1	YES	S4VEM
Silver	Target	3.0		mg/kg	3.0		2	YES	S4VEM
Thallium	Target	0.45	J	mg/kg	0.45	J	1	YES	S4VEM
Vanadium	Target	76.6		mg/kg	76.6		2	YES	S4VEM
Zinc	Target	1560		mg/kg	1560		2	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B11	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SD-O04	pH:	Sample Date: 07/10/2017	Sample Time: 14:45:00
% Moisture:		% Solids: 39.2	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	1.0	UJ	mg/kg	0.62	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B11	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SD-O04	pH:	Sample Date: 07/10/2017	Sample Time: 14:45:00
% Moisture:		% Solids: 39.2	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.60		mg/kg	0.60		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B11	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SD-O04	pH:	Sample Date: 07/10/2017	Sample Time: 14:45:00
% Moisture:		% Solids: 39.2	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	12200		mg/kg	12200		1	YES	S4VEM
Calcium	Target	1860		mg/kg	1860		1	YES	S4VEM
Iron	Target	62300		mg/kg	62300		1	YES	S4VEM
Magnesium	Target	3600		mg/kg	3600		1	YES	S4VEM
Potassium	Target	1220	J	mg/kg	1220		1	YES	S4VEM
Sodium	Target	2580		mg/kg	2580		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B11

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location: SD-O04

pH:

Sample Date: 07/10/2017

Sample Time: 14:45:00

% Moisture:

% Solids: 39.2

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	2.1	UJ	mg/kg	0.65	J	1	YES	S4VEM
Arsenic	Target	12.6		mg/kg	12.6		2	YES	S4VEM
Barium	Target	33.9		mg/kg	33.9		1	YES	S4VEM
Beryllium	Target	0.57	J-	mg/kg	0.57	J	1	YES	S4VEM
Cadmium	Target	1.8	J	mg/kg	1.8	J	2	YES	S4VEM
Chromium	Target	190		mg/kg	190		2	YES	S4VEM
Cobalt	Target	19.3		mg/kg	19.3		2	YES	S4VEM
Copper	Target	133		mg/kg	133		2	YES	S4VEM
Lead	Target	330		mg/kg	330		1	YES	S4VEM
Manganese	Target	1110	J	mg/kg	1110		2	YES	S4VEM
Nickel	Target	36.8		mg/kg	36.8		2	YES	S4VEM
Selenium	Target	1.6	J	mg/kg	1.6	J	1	YES	S4VEM
Silver	Target	2.9		mg/kg	2.9		2	YES	S4VEM
Thallium	Target	0.33	J	mg/kg	0.33	J	1	YES	S4VEM
Vanadium	Target	74.8		mg/kg	74.8		2	YES	S4VEM
Zinc	Target	1480		mg/kg	1480		2	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B12	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SD-O05	pH:	Sample Date: 07/10/2017	Sample Time: 15:05:00
% Moisture:		% Solids: 51.9	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	0.86	UJ	mg/kg	0.27	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B12	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SD-O05	pH:	Sample Date: 07/10/2017	Sample Time: 15:05:00
% Moisture:		% Solids: 51.9	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.43		mg/kg	0.43		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B12	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SD-O05	pH:	Sample Date: 07/10/2017	Sample Time: 15:05:00
% Moisture:		% Solids: 51.9	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	8330		mg/kg	8330		1	YES	S4VEM
Calcium	Target	1340		mg/kg	1340		1	YES	S4VEM
Iron	Target	37900		mg/kg	37900		1	YES	S4VEM
Magnesium	Target	2460		mg/kg	2460		1	YES	S4VEM
Potassium	Target	772	J	mg/kg	772	J	1	YES	S4VEM
Sodium	Target	1740		mg/kg	1740		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B12

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location: SD-O05

pH:

Sample Date: 07/10/2017

Sample Time: 15:05:00

% Moisture:

% Solids: 51.9

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.8	UJ	mg/kg	0.55	J	1	YES	S4VEM
Arsenic	Target	6.9		mg/kg	6.9		2	YES	S4VEM
Barium	Target	30.6		mg/kg	30.6		1	YES	S4VEM
Beryllium	Target	0.43	J-	mg/kg	0.43	J	1	YES	S4VEM
Cadmium	Target	1.5	J	mg/kg	1.5	J	2	YES	S4VEM
Chromium	Target	119		mg/kg	119		2	YES	S4VEM
Cobalt	Target	10.8		mg/kg	10.8		2	YES	S4VEM
Copper	Target	81.4		mg/kg	81.4		2	YES	S4VEM
Lead	Target	230		mg/kg	230		1	YES	S4VEM
Manganese	Target	470	J	mg/kg	470		2	YES	S4VEM
Nickel	Target	22.0		mg/kg	22.0		2	YES	S4VEM
Selenium	Target	4.6	U	mg/kg	4.6	U	1	YES	S4VEM
Silver	Target	1.5	J	mg/kg	1.5	J	2	YES	S4VEM
Thallium	Target	0.46	J	mg/kg	0.46	J	1	YES	S4VEM
Vanadium	Target	41.2		mg/kg	41.2		2	YES	S4VEM
Zinc	Target	895		mg/kg	895		2	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B13	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SD-P01	pH:	Sample Date: 07/10/2017	Sample Time: 16:05:00
% Moisture:		% Solids: 54.2	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	0.69	UJ	mg/kg	0.20	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B13	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SD-P01	pH:	Sample Date: 07/10/2017	Sample Time: 16:05:00
% Moisture:		% Solids: 54.2	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.36	J	mg/kg	0.36		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B13	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SD-P01	pH:	Sample Date: 07/10/2017	Sample Time: 16:05:00
% Moisture:		% Solids: 54.2	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	10000		mg/kg	10000		1	YES	S4VEM
Calcium	Target	1630		mg/kg	1630		1	YES	S4VEM
Iron	Target	43100		mg/kg	43100		1	YES	S4VEM
Magnesium	Target	2780		mg/kg	2780		1	YES	S4VEM
Potassium	Target	1020	J	mg/kg	1020		1	YES	S4VEM
Sodium	Target	1710		mg/kg	1710		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B13

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location: SD-P01

pH:

Sample Date: 07/10/2017

Sample Time: 16:05:00

% Moisture:

% Solids: 54.2

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.6	UJ	mg/kg	0.45	J	1	YES	S4VEM
Arsenic	Target	7.2		mg/kg	7.2		2	YES	S4VEM
Barium	Target	25.2		mg/kg	25.2		1	YES	S4VEM
Beryllium	Target	0.38	J-	mg/kg	0.38	J	1	YES	S4VEM
Cadmium	Target	1.1	J	mg/kg	1.1	J	2	YES	S4VEM
Chromium	Target	95.4		mg/kg	95.4		2	YES	S4VEM
Cobalt	Target	11.2		mg/kg	11.2		2	YES	S4VEM
Copper	Target	70.1		mg/kg	70.1		2	YES	S4VEM
Lead	Target	175		mg/kg	175		1	YES	S4VEM
Manganese	Target	506	J	mg/kg	506		2	YES	S4VEM
Nickel	Target	20.9		mg/kg	20.9		2	YES	S4VEM
Selenium	Target	1.6	J	mg/kg	1.6	J	1	YES	S4VEM
Silver	Target	1.3	J	mg/kg	1.3	J	2	YES	S4VEM
Thallium	Target	0.27	J	mg/kg	0.27	J	1	YES	S4VEM
Vanadium	Target	42.0		mg/kg	42.0		2	YES	S4VEM
Zinc	Target	734		mg/kg	734		2	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B14	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SD-P02	pH:	Sample Date: 07/10/2017	Sample Time: 15:47:00
% Moisture:		% Solids: 44.0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	1.0	UJ	mg/kg	0.53	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B14	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SD-P02	pH:	Sample Date: 07/10/2017	Sample Time: 15:47:00
% Moisture:	% Solids: 44.0		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.59	J	mg/kg	0.59		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B14	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SD-P02	pH:	Sample Date: 07/10/2017	Sample Time: 15:47:00
% Moisture:		% Solids: 44.0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	12600		mg/kg	12600		1	YES	S4VEM
Calcium	Target	1830		mg/kg	1830		1	YES	S4VEM
Iron	Target	60500		mg/kg	60500		1	YES	S4VEM
Magnesium	Target	3650		mg/kg	3650		1	YES	S4VEM
Potassium	Target	1290	J	mg/kg	1290		1	YES	S4VEM
Sodium	Target	2500		mg/kg	2500		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B14

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location: SD-P02

pH:

Sample Date: 07/10/2017

Sample Time: 15:47:00

% Moisture:

% Solids: 44.0

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.7	UJ	mg/kg	0.97	J	1	YES	S4VEM
Arsenic	Target	9.8		mg/kg	9.8		2	YES	S4VEM
Barium	Target	29.0		mg/kg	29.0		1	YES	S4VEM
Beryllium	Target	0.47	J-	mg/kg	0.47	J	1	YES	S4VEM
Cadmium	Target	1.7	J	mg/kg	1.7	J	2	YES	S4VEM
Chromium	Target	154		mg/kg	154		2	YES	S4VEM
Cobalt	Target	15.4		mg/kg	15.4		2	YES	S4VEM
Copper	Target	107		mg/kg	107		2	YES	S4VEM
Lead	Target	312		mg/kg	312		1	YES	S4VEM
Manganese	Target	762	J	mg/kg	762		2	YES	S4VEM
Nickel	Target	30.4		mg/kg	30.4		2	YES	S4VEM
Selenium	Target	2.0	J	mg/kg	2.0	J	1	YES	S4VEM
Silver	Target	2.4		mg/kg	2.4		2	YES	S4VEM
Thallium	Target	0.42	J	mg/kg	0.42	J	1	YES	S4VEM
Vanadium	Target	58.1		mg/kg	58.1		2	YES	S4VEM
Zinc	Target	1230		mg/kg	1230		2	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B15	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SD-P03	pH:	Sample Date: 07/10/2017	Sample Time: 15:24:00
% Moisture:		% Solids: 56.1	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	0.65	UJ	mg/kg	0.65	U	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B15	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SD-P03	pH:	Sample Date: 07/10/2017	Sample Time: 15:24:00
% Moisture:	% Solids: 56.1		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.26	J	mg/kg	0.26		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B15	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SD-P03	pH:	Sample Date: 07/10/2017	Sample Time: 15:24:00
% Moisture:		% Solids: 56.1	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	6680		mg/kg	6680		1	YES	S4VEM
Calcium	Target	14200		mg/kg	14200		1	YES	S4VEM
Iron	Target	23700		mg/kg	23700		1	YES	S4VEM
Magnesium	Target	1880		mg/kg	1880		1	YES	S4VEM
Potassium	Target	698	J	mg/kg	698	J	1	YES	S4VEM
Sodium	Target	1740		mg/kg	1740		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B15

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location: SD-P03

pH:

Sample Date: 07/10/2017

Sample Time: 15:24:00

% Moisture:

% Solids: 56.1

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.5	UJ	mg/kg	0.34	J	1	YES	S4VEM
Arsenic	Target	4.2		mg/kg	4.2		1	YES	S4VEM
Barium	Target	28.3		mg/kg	28.3		1	YES	S4VEM
Beryllium	Target	0.30	J-	mg/kg	0.30	J	1	YES	S4VEM
Cadmium	Target	0.66	J	mg/kg	0.66	J	1	YES	S4VEM
Chromium	Target	56.3		mg/kg	56.3		1	YES	S4VEM
Cobalt	Target	7.5		mg/kg	7.5		1	YES	S4VEM
Copper	Target	47.3		mg/kg	47.3		1	YES	S4VEM
Lead	Target	107		mg/kg	107		1	YES	S4VEM
Manganese	Target	455	J	mg/kg	455		1	YES	S4VEM
Nickel	Target	12.8		mg/kg	12.8		1	YES	S4VEM
Selenium	Target	3.8	U	mg/kg	3.8	U	1	YES	S4VEM
Silver	Target	0.69	J	mg/kg	0.69	J	1	YES	S4VEM
Thallium	Target	0.15	J	mg/kg	0.15	J	1	YES	S4VEM
Vanadium	Target	32.1		mg/kg	32.1		1	YES	S4VEM
Zinc	Target	457		mg/kg	457		1	YES	S4VEM

Sample Summary Report

Case: 47079	Contract: EPW14035	SDG: MC0B05	Lab Code: EQI
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Sample Number: MC0B16	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SD-K03	pH:	Sample Date: 07/10/2017	Sample Time: 16:28:00
% Moisture:		% Solids: 37.8	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	1.3	UJ	mg/kg	0.24	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B16	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SD-K03	pH:	Sample Date: 07/10/2017	Sample Time: 16:28:00
% Moisture:		% Solids: 37.8	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.70	J	mg/kg	0.70		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B16	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SD-K03	pH:	Sample Date: 07/10/2017	Sample Time: 16:28:00
% Moisture:		% Solids: 37.8	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	17600		mg/kg	17600		1	YES	S4VEM
Calcium	Target	2170		mg/kg	2170		1	YES	S4VEM
Iron	Target	69900		mg/kg	69900		1	YES	S4VEM
Magnesium	Target	4710		mg/kg	4710		1	YES	S4VEM
Potassium	Target	1960	J	mg/kg	1960		1	YES	S4VEM
Sodium	Target	3220		mg/kg	3220		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B16

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location: SD-K03

pH:

Sample Date: 07/10/2017

Sample Time: 16:28:00

% Moisture:

% Solids: 37.8

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.9	UJ	mg/kg	0.60	J	1	YES	S4VEM
Arsenic	Target	11.2		mg/kg	11.2		2	YES	S4VEM
Barium	Target	32.3		mg/kg	32.3		1	YES	S4VEM
Beryllium	Target	0.56	J-	mg/kg	0.56	J	1	YES	S4VEM
Cadmium	Target	1.7	J	mg/kg	1.7	J	2	YES	S4VEM
Chromium	Target	218		mg/kg	218		2	YES	S4VEM
Cobalt	Target	19.5		mg/kg	19.5		2	YES	S4VEM
Copper	Target	147		mg/kg	147		2	YES	S4VEM
Lead	Target	299		mg/kg	299		1	YES	S4VEM
Manganese	Target	922	J	mg/kg	922		2	YES	S4VEM
Nickel	Target	36.8		mg/kg	36.8		2	YES	S4VEM
Selenium	Target	1.4	J	mg/kg	1.4	J	1	YES	S4VEM
Silver	Target	2.8		mg/kg	2.8		2	YES	S4VEM
Thallium	Target	0.26	J	mg/kg	0.26	J	1	YES	S4VEM
Vanadium	Target	75.9		mg/kg	75.9		2	YES	S4VEM
Zinc	Target	1460		mg/kg	1460		2	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B17	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SD-Q01	pH:	Sample Date: 07/10/2017	Sample Time: 16:00:00
% Moisture:		% Solids: 48.7	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	1.0	UJ	mg/kg	0.26	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B17	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SD-Q01	pH:	Sample Date: 07/10/2017	Sample Time: 16:00:00
% Moisture:		% Solids: 48.7	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	1.0		mg/kg	1.0		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B17	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SD-Q01	pH:	Sample Date: 07/10/2017	Sample Time: 16:00:00
% Moisture:		% Solids: 48.7	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	13600		mg/kg	13600		1	YES	S4VEM
Calcium	Target	1510		mg/kg	1510		1	YES	S4VEM
Iron	Target	38800		mg/kg	38800		1	YES	S4VEM
Magnesium	Target	3340		mg/kg	3340		1	YES	S4VEM
Potassium	Target	1430	J	mg/kg	1430		1	YES	S4VEM
Sodium	Target	2350		mg/kg	2350		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B17

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location: SD-Q01

pH:

Sample Date: 07/10/2017

Sample Time: 16:00:00

% Moisture:

% Solids: 48.7

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.8	UJ	mg/kg	0.58	J	1	YES	S4VEM
Arsenic	Target	10.2		mg/kg	10.2		2	YES	S4VEM
Barium	Target	33.4		mg/kg	33.4		1	YES	S4VEM
Beryllium	Target	0.37	J-	mg/kg	0.37	J	1	YES	S4VEM
Cadmium	Target	2.2		mg/kg	2.2		2	YES	S4VEM
Chromium	Target	91.4		mg/kg	91.4		2	YES	S4VEM
Cobalt	Target	10.9		mg/kg	10.9		2	YES	S4VEM
Copper	Target	87.5		mg/kg	87.5		2	YES	S4VEM
Lead	Target	224		mg/kg	224		1	YES	S4VEM
Manganese	Target	440	J	mg/kg	440		2	YES	S4VEM
Nickel	Target	25.6		mg/kg	25.6		2	YES	S4VEM
Selenium	Target	3.6	J	mg/kg	3.6	J	1	YES	S4VEM
Silver	Target	2.1		mg/kg	2.1		2	YES	S4VEM
Thallium	Target	0.38	J	mg/kg	0.38	J	1	YES	S4VEM
Vanadium	Target	60.4		mg/kg	60.4		2	YES	S4VEM
Zinc	Target	898		mg/kg	898		2	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B18	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SD-Q02	pH:	Sample Date: 07/10/2017	Sample Time: 16:30:00
% Moisture:		% Solids: 34.1	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	1.0	UJ	mg/kg	0.42	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B18	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SD-Q02	pH:	Sample Date: 07/10/2017	Sample Time: 16:30:00
% Moisture:		% Solids: 34.1	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.78		mg/kg	0.78		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B18	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SD-Q02	pH:	Sample Date: 07/10/2017	Sample Time: 16:30:00
% Moisture:		% Solids: 34.1	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	16300		mg/kg	16300		1	YES	S4VEM
Calcium	Target	2170		mg/kg	2170		1	YES	S4VEM
Iron	Target	67600		mg/kg	67600		1	YES	S4VEM
Magnesium	Target	4630		mg/kg	4630		1	YES	S4VEM
Potassium	Target	1600	J	mg/kg	1600		1	YES	S4VEM
Sodium	Target	3580		mg/kg	3580		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B18

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location: SD-Q02

pH:

Sample Date: 07/10/2017

Sample Time: 16:30:00

% Moisture:

% Solids: 34.1

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	2.3	UJ	mg/kg	1.0	J	1	YES	S4VEM
Arsenic	Target	11.9		mg/kg	11.9		2	YES	S4VEM
Barium	Target	41.1		mg/kg	41.1		1	YES	S4VEM
Beryllium	Target	0.62	J-	mg/kg	0.62	J	1	YES	S4VEM
Cadmium	Target	2.3	J	mg/kg	2.3	J	2	YES	S4VEM
Chromium	Target	248		mg/kg	248		2	YES	S4VEM
Cobalt	Target	19.1		mg/kg	19.1		2	YES	S4VEM
Copper	Target	172		mg/kg	172		2	YES	S4VEM
Lead	Target	400		mg/kg	400		1	YES	S4VEM
Manganese	Target	799	J	mg/kg	799		2	YES	S4VEM
Nickel	Target	38.2		mg/kg	38.2		2	YES	S4VEM
Selenium	Target	1.9	J	mg/kg	1.9	J	1	YES	S4VEM
Silver	Target	3.5		mg/kg	3.5		2	YES	S4VEM
Thallium	Target	0.72	J	mg/kg	0.72	J	1	YES	S4VEM
Vanadium	Target	75.1		mg/kg	75.1		2	YES	S4VEM
Zinc	Target	1570		mg/kg	1570		2	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B19	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SD-Q03	pH:	Sample Date: 07/10/2017	Sample Time: 16:50:00
% Moisture:		% Solids: 32.8	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	1.4	UJ	mg/kg	0.22	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B19	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SD-Q03	pH:	Sample Date: 07/10/2017	Sample Time: 16:50:00
% Moisture:		% Solids: 32.8	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.88		mg/kg	0.88		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B19	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SD-Q03	pH:	Sample Date: 07/10/2017	Sample Time: 16:50:00
% Moisture:		% Solids: 32.8	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	17600		mg/kg	17600		1	YES	S4VEM
Calcium	Target	2040		mg/kg	2040		1	YES	S4VEM
Iron	Target	66700		mg/kg	66700		1	YES	S4VEM
Magnesium	Target	4650		mg/kg	4650		1	YES	S4VEM
Potassium	Target	1860	J	mg/kg	1860		1	YES	S4VEM
Sodium	Target	3500		mg/kg	3500		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B19

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location: SD-Q03

pH:

Sample Date: 07/10/2017

Sample Time: 16:50:00

% Moisture:

% Solids: 32.8

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	2.2	UJ	mg/kg	0.69	J	1	YES	S4VEM
Arsenic	Target	11.4		mg/kg	11.4		2	YES	S4VEM
Barium	Target	28.9		mg/kg	28.9		1	YES	S4VEM
Beryllium	Target	0.48	J-	mg/kg	0.48	J	1	YES	S4VEM
Cadmium	Target	1.2	J	mg/kg	1.2	J	2	YES	S4VEM
Chromium	Target	200		mg/kg	200		2	YES	S4VEM
Cobalt	Target	17.1		mg/kg	17.1		2	YES	S4VEM
Copper	Target	146		mg/kg	146		2	YES	S4VEM
Lead	Target	270		mg/kg	270		1	YES	S4VEM
Manganese	Target	788	J	mg/kg	788		2	YES	S4VEM
Nickel	Target	31.4		mg/kg	31.4		2	YES	S4VEM
Selenium	Target	5.4	U	mg/kg	5.4	U	1	YES	S4VEM
Silver	Target	2.8		mg/kg	2.8		2	YES	S4VEM
Thallium	Target	0.20	J	mg/kg	0.20	J	1	YES	S4VEM
Vanadium	Target	65.0		mg/kg	65.0		2	YES	S4VEM
Zinc	Target	1230		mg/kg	1230		2	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B19A	Method: Metals by ICP-MS	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date: 07/10/2017	Sample Time: 16:50:00
% Moisture:		% Solids: 32.8	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Spike	5.0		mg/kg	5.0		1	YES	S4VEM
Beryllium	Spike	1.5		mg/kg	1.5		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B19D	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date: 07/10/2017	Sample Time: 16:50:00
% Moisture:		% Solids: 32.8	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	1.4	UJ	mg/kg	0.29	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B19D	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date: 07/10/2017	Sample Time: 16:50:00
% Moisture:		% Solids: 32.8	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.79		mg/kg	0.79		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B19D	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date: 07/10/2017	Sample Time: 16:50:00
% Moisture:		% Solids: 32.8	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	17700		mg/kg	17700		1	YES	S4VEM
Calcium	Target	2020		mg/kg	2020		1	YES	S4VEM
Iron	Target	64900		mg/kg	64900		1	YES	S4VEM
Magnesium	Target	4570		mg/kg	4570		1	YES	S4VEM
Potassium	Target	1880		mg/kg	1880		1	YES	S4VEM
Sodium	Target	3540		mg/kg	3540		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B19D

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location:

pH:

Sample Date: 07/10/2017

Sample Time: 16:50:00

% Moisture:

% Solids: 32.8

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	0.64	J	mg/kg	0.64	J	1	YES	S4VEM
Arsenic	Target	11.7		mg/kg	11.7	D	2	YES	S4VEM
Barium	Target	38.6		mg/kg	38.6		1	YES	S4VEM
Beryllium	Target	0.60	J	mg/kg	0.60	J	1	YES	S4VEM
Cadmium	Target	1.2	J	mg/kg	1.2	JD	2	YES	S4VEM
Chromium	Target	227		mg/kg	227	D	2	YES	S4VEM
Cobalt	Target	19.1		mg/kg	19.1	D	2	YES	S4VEM
Copper	Target	162		mg/kg	162	D	2	YES	S4VEM
Lead	Target	324		mg/kg	324		1	YES	S4VEM
Manganese	Target	886	J	mg/kg	886	D	2	YES	S4VEM
Nickel	Target	35.5		mg/kg	35.5	D	2	YES	S4VEM
Selenium	Target	2.1	J	mg/kg	2.1	J	1	YES	S4VEM
Silver	Target	3.0		mg/kg	3.0	D	2	YES	S4VEM
Thallium	Target	0.23	J	mg/kg	0.23	J	1	YES	S4VEM
Vanadium	Target	74.4		mg/kg	74.4	D	2	YES	S4VEM
Zinc	Target	1360		mg/kg	1360	D	2	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B19L	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture:		% Solids: 32.8	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	18800		mg/kg	18800		5	YES	S4VEM
Calcium	Target	2190	J	mg/kg	2190	J	5	YES	S4VEM
Iron	Target	72700		mg/kg	72700		5	YES	S4VEM
Magnesium	Target	4960	J	mg/kg	4960	J	5	YES	S4VEM
Potassium	Target	612	J	mg/kg	612	J*	5	YES	S4VEM
Sodium	Target	3590	J	mg/kg	3590	J	5	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B19L

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location:

pH:

Sample Date:

Sample Time:

% Moisture:

% Solids: 32.8

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	10.8	U	mg/kg	10.8	U	5	YES	S4VEM
Arsenic	Target	9.4		mg/kg	9.4	J	10	YES	S4VEM
Barium	Target	29.1	J	mg/kg	29.1	J	5	YES	S4VEM
Beryllium	Target	5.4	U	mg/kg	5.4	U	5	YES	S4VEM
Cadmium	Target	0.95	J	mg/kg	0.95	J	10	YES	S4VEM
Chromium	Target	184		mg/kg	184		10	YES	S4VEM
Cobalt	Target	15.8		mg/kg	15.8		10	YES	S4VEM
Copper	Target	138		mg/kg	138		10	YES	S4VEM
Lead	Target	265		mg/kg	265		5	YES	S4VEM
Manganese	Target	697		mg/kg	697	*	10	YES	S4VEM
Nickel	Target	29.9		mg/kg	29.9		10	YES	S4VEM
Selenium	Target	27.0	U	mg/kg	27.0	U	5	YES	S4VEM
Silver	Target	2.7	J	mg/kg	2.7	J	10	YES	S4VEM
Thallium	Target	5.4	U	mg/kg	5.4	U	5	YES	S4VEM
Vanadium	Target	59.3		mg/kg	59.3		10	YES	S4VEM
Zinc	Target	1170		mg/kg	1170		10	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B19S	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date: 07/10/2017	Sample Time: 16:50:00
% Moisture:		% Solids: 32.8	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Spike	3.2	J	mg/kg	3.2		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B19S	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date: 07/10/2017	Sample Time: 16:50:00
% Moisture:		% Solids: 32.8	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Spike	2.4		mg/kg	2.4		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B19S

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location:

pH:

Sample Date: 07/10/2017

Sample Time: 16:50:00

% Moisture:

% Solids: 32.8

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Spike	12.2		mg/kg	12.2		1	YES	S4VEM
Arsenic	Spike	19.2		mg/kg	19.2		2	YES	S4VEM
Barium	Spike	466		mg/kg	466		1	YES	S4VEM
Beryllium	Spike	5.4		mg/kg	5.4		1	YES	S4VEM
Cadmium	Spike	12.1		mg/kg	12.1		2	YES	S4VEM
Chromium	Spike	263		mg/kg	263		2	YES	S4VEM
Cobalt	Spike	124		mg/kg	124		2	YES	S4VEM
Copper	Spike	210		mg/kg	210		2	YES	S4VEM
Lead	Spike	356		mg/kg	356		1	YES	S4VEM
Manganese	Spike	938	J	mg/kg	938		2	YES	S4VEM
Nickel	Spike	141		mg/kg	141		2	YES	S4VEM
Selenium	Spike	22.7		mg/kg	22.7		1	YES	S4VEM
Silver	Spike	14.0		mg/kg	14.0		2	YES	S4VEM
Thallium	Spike	10.9		mg/kg	10.9		1	YES	S4VEM
Vanadium	Spike	173		mg/kg	173		2	YES	S4VEM
Zinc	Spike	1440		mg/kg	1440		2	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B20	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SD-R01	pH:	Sample Date: 07/11/2017	Sample Time: 09:45:00
% Moisture:		% Solids: 50.8	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	0.83	UJ	mg/kg	0.17	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B20	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SD-R01	pH:	Sample Date: 07/11/2017	Sample Time: 09:45:00
% Moisture:		% Solids: 50.8	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.43	J	mg/kg	0.43		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B20	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SD-R01	pH:	Sample Date: 07/11/2017	Sample Time: 09:45:00
% Moisture:		% Solids: 50.8	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	7940		mg/kg	7940		1	YES	S4VEM
Calcium	Target	13000		mg/kg	13000		1	YES	S4VEM
Iron	Target	33000		mg/kg	33000		1	YES	S4VEM
Magnesium	Target	2580		mg/kg	2580		1	YES	S4VEM
Potassium	Target	785	J	mg/kg	785		1	YES	S4VEM
Sodium	Target	1920		mg/kg	1920		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B20

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location: SD-R01

pH:

Sample Date: 07/11/2017

Sample Time: 09:45:00

% Moisture:

% Solids: 50.8

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.8	UJ	mg/kg	0.54	J	1	YES	S4VEM
Arsenic	Target	5.9		mg/kg	5.9		2	YES	S4VEM
Barium	Target	22.3		mg/kg	22.3		1	YES	S4VEM
Beryllium	Target	0.38	J-	mg/kg	0.38	J	1	YES	S4VEM
Cadmium	Target	1.5	J	mg/kg	1.5	J	2	YES	S4VEM
Chromium	Target	121		mg/kg	121		2	YES	S4VEM
Cobalt	Target	10.7		mg/kg	10.7		2	YES	S4VEM
Copper	Target	88.6		mg/kg	88.6		2	YES	S4VEM
Lead	Target	160		mg/kg	160		1	YES	S4VEM
Manganese	Target	445	J	mg/kg	445		2	YES	S4VEM
Nickel	Target	19.9		mg/kg	19.9		2	YES	S4VEM
Selenium	Target	4.4	U	mg/kg	4.4	U	1	YES	S4VEM
Silver	Target	1.3	J	mg/kg	1.3	J	2	YES	S4VEM
Thallium	Target	0.42	J	mg/kg	0.42	J	1	YES	S4VEM
Vanadium	Target	38.8		mg/kg	38.8		2	YES	S4VEM
Zinc	Target	778		mg/kg	778		2	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B21	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SD-R02	pH:	Sample Date: 07/11/2017	Sample Time: 10:00:00
% Moisture:		% Solids: 31.6	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	1.3	UJ	mg/kg	0.35	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B21	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SD-R02	pH:	Sample Date: 07/11/2017	Sample Time: 10:00:00
% Moisture:		% Solids: 31.6	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.91	J	mg/kg	0.91		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B21	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SD-R02	pH:	Sample Date: 07/11/2017	Sample Time: 10:00:00
% Moisture:		% Solids: 31.6	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	17100		mg/kg	17100		1	YES	S4VEM
Calcium	Target	2000		mg/kg	2000		1	YES	S4VEM
Iron	Target	64600		mg/kg	64600		1	YES	S4VEM
Magnesium	Target	4700		mg/kg	4700		1	YES	S4VEM
Potassium	Target	1670	J	mg/kg	1670		1	YES	S4VEM
Sodium	Target	3850		mg/kg	3850		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B21

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location: SD-R02

pH:

Sample Date: 07/11/2017

Sample Time: 10:00:00

% Moisture:

% Solids: 31.6

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	2.9	UJ	mg/kg	0.69	J	1	YES	S4VEM
Arsenic	Target	11.5		mg/kg	11.5		2	YES	S4VEM
Barium	Target	44.5		mg/kg	44.5		1	YES	S4VEM
Beryllium	Target	1.9	J-	mg/kg	1.9		1	YES	S4VEM
Cadmium	Target	1.7	J	mg/kg	1.7	J	2	YES	S4VEM
Chromium	Target	274		mg/kg	274		2	YES	S4VEM
Cobalt	Target	19.9		mg/kg	19.9		2	YES	S4VEM
Copper	Target	191		mg/kg	191		2	YES	S4VEM
Lead	Target	417		mg/kg	417		1	YES	S4VEM
Manganese	Target	676	J	mg/kg	676		2	YES	S4VEM
Nickel	Target	37.6		mg/kg	37.6		2	YES	S4VEM
Selenium	Target	1.9	J	mg/kg	1.9	J	1	YES	S4VEM
Silver	Target	3.3		mg/kg	3.3		2	YES	S4VEM
Thallium	Target	0.49	J	mg/kg	0.49	J	1	YES	S4VEM
Vanadium	Target	76.4		mg/kg	76.4		2	YES	S4VEM
Zinc	Target	1570		mg/kg	1570		2	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B22	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SD-R03	pH:	Sample Date: 07/11/2017	Sample Time: 10:30:00
% Moisture:		% Solids: 32.9	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	1.3	UJ	mg/kg	0.98	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B22	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SD-R03	pH:	Sample Date: 07/11/2017	Sample Time: 10:30:00
% Moisture:		% Solids: 32.9	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	1.2	J	mg/kg	1.2		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B22	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SD-R03	pH:	Sample Date: 07/11/2017	Sample Time: 10:30:00
% Moisture:		% Solids: 32.9	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	18500		mg/kg	18500		1	YES	S4VEM
Calcium	Target	1960		mg/kg	1960		1	YES	S4VEM
Iron	Target	62200		mg/kg	62200		1	YES	S4VEM
Magnesium	Target	4550		mg/kg	4550		1	YES	S4VEM
Potassium	Target	1920	J	mg/kg	1920		1	YES	S4VEM
Sodium	Target	3680		mg/kg	3680		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B22

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location: SD-R03

pH:

Sample Date: 07/11/2017

Sample Time: 10:30:00

% Moisture:

% Solids: 32.9

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	2.5	UJ	mg/kg	0.98	J	1	YES	S4VEM
Arsenic	Target	13.6		mg/kg	13.6		2	YES	S4VEM
Barium	Target	45.7		mg/kg	45.7		1	YES	S4VEM
Beryllium	Target	1.7	J-	mg/kg	1.7		1	YES	S4VEM
Cadmium	Target	2.6		mg/kg	2.6		2	YES	S4VEM
Chromium	Target	464		mg/kg	464		2	YES	S4VEM
Cobalt	Target	20.3		mg/kg	20.3		2	YES	S4VEM
Copper	Target	198		mg/kg	198		2	YES	S4VEM
Lead	Target	467		mg/kg	467		1	YES	S4VEM
Manganese	Target	653	J	mg/kg	653		2	YES	S4VEM
Nickel	Target	39.3		mg/kg	39.3		2	YES	S4VEM
Selenium	Target	2.2	J	mg/kg	2.2	J	1	YES	S4VEM
Silver	Target	3.5		mg/kg	3.5		2	YES	S4VEM
Thallium	Target	0.95	J	mg/kg	0.95	J	1	YES	S4VEM
Vanadium	Target	78.2		mg/kg	78.2		2	YES	S4VEM
Zinc	Target	2150		mg/kg	2150		2	YES	S4VEM

Sample Summary Report

Case: 47079	Contract: EPW14035	SDG: MC0B05	Lab Code: EQI
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Sample Number: MC0B24	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SD-S01	pH:	Sample Date: 07/11/2017	Sample Time: 11:10:00
% Moisture:		% Solids: 53.0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	0.85	UJ	mg/kg	0.24	J	1	YES	S4VEM

Sample Summary Report

Case: 47079	Contract: EPW14035	SDG: MC0B05	Lab Code: EQI
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Sample Number: MC0B24	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SD-S01	pH:	Sample Date: 07/11/2017	Sample Time: 11:10:00
% Moisture:		% Solids: 53.0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.50	J	mg/kg	0.50		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B24	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SD-S01	pH:	Sample Date: 07/11/2017	Sample Time: 11:10:00
% Moisture:		% Solids: 53.0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	7890		mg/kg	7890		1	YES	S4VEM
Calcium	Target	1090		mg/kg	1090		1	YES	S4VEM
Iron	Target	31000		mg/kg	31000		1	YES	S4VEM
Magnesium	Target	2020		mg/kg	2020		1	YES	S4VEM
Potassium	Target	753	J	mg/kg	753	J	1	YES	S4VEM
Sodium	Target	1590		mg/kg	1590		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: MC0B24

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location: SD-S01

pH:

Sample Date: 07/11/2017

Sample Time: 11:10:00

% Moisture:

% Solids: 53.0

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.3	UJ	mg/kg	0.50	J	1	YES	S4VEM
Arsenic	Target	7.3		mg/kg	7.3		2	YES	S4VEM
Barium	Target	21.6		mg/kg	21.6		1	YES	S4VEM
Beryllium	Target	0.79	J-	mg/kg	0.79		1	YES	S4VEM
Cadmium	Target	2.4		mg/kg	2.4		2	YES	S4VEM
Chromium	Target	179		mg/kg	179		2	YES	S4VEM
Cobalt	Target	12.9		mg/kg	12.9		2	YES	S4VEM
Copper	Target	109		mg/kg	109		2	YES	S4VEM
Lead	Target	209		mg/kg	209		1	YES	S4VEM
Manganese	Target	239	J	mg/kg	239		2	YES	S4VEM
Nickel	Target	23.0		mg/kg	23.0		2	YES	S4VEM
Selenium	Target	1.3	J	mg/kg	1.3	J	1	YES	S4VEM
Silver	Target	1.7		mg/kg	1.7		2	YES	S4VEM
Thallium	Target	0.88		mg/kg	0.88		1	YES	S4VEM
Vanadium	Target	40.2		mg/kg	40.2		2	YES	S4VEM
Zinc	Target	1030		mg/kg	1030		2	YES	S4VEM

Sample Summary Report

Case: 47079	Contract: EPW14035	SDG: MC0B05	Lab Code: EQI
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Sample Number: PBS001	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture:		% Solids: 100	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	-0.019	J	mg/kg	-0.019	J	1	YES	S4VEM

Sample Summary Report

Case: 47079	Contract: EPW14035	SDG: MC0B05	Lab Code: EQI
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Sample Number: PBS001	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture:		% Solids: 100	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	20.0	U	mg/kg	20.0	U	1	YES	S4VEM
Calcium	Target	500	U	mg/kg	500	U	1	YES	S4VEM
Iron	Target	10.0	U	mg/kg	10.0	U	1	YES	S4VEM
Magnesium	Target	500	U	mg/kg	500	U	1	YES	S4VEM
Potassium	Target	500	U	mg/kg	500	U	1	YES	S4VEM
Sodium	Target	500	U	mg/kg	500	U	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI

Sample Number: PBS001

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location:

pH:

Sample Date:

Sample Time:

% Moisture:

% Solids: 100

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	0.14	J	mg/kg	0.14	J	1	YES	S4VEM
Arsenic	Target	0.50	U	mg/kg	0.50	U	1	YES	S4VEM
Barium	Target	5.0	U	mg/kg	5.0	U	1	YES	S4VEM
Beryllium	Target	0.50	U	mg/kg	0.50	U	1	YES	S4VEM
Cadmium	Target	0.50	U	mg/kg	0.50	U	1	YES	S4VEM
Chromium	Target	0.18	J	mg/kg	0.18	J	1	YES	S4VEM
Cobalt	Target	0.50	U	mg/kg	0.50	U	1	YES	S4VEM
Copper	Target	1.0	U	mg/kg	1.0	U	1	YES	S4VEM
Lead	Target	0.50	U	mg/kg	0.50	U	1	YES	S4VEM
Manganese	Target	0.50	U	mg/kg	0.50	U	1	YES	S4VEM
Nickel	Target	0.50	U	mg/kg	0.50	U	1	YES	S4VEM
Selenium	Target	2.5	U	mg/kg	2.5	U	1	YES	S4VEM
Silver	Target	0.50	U	mg/kg	0.50	U	1	YES	S4VEM
Thallium	Target	0.50	U	mg/kg	0.50	U	1	YES	S4VEM
Vanadium	Target	0.28	J	mg/kg	0.28	J	1	YES	S4VEM
Zinc	Target	1.0	U	mg/kg	1.0	U	1	YES	S4VEM

Sample Summary Report

Case: 47079	Contract: EPW14035	SDG: MC0B05	Lab Code: EQI
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Sample Number: PBS003	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture:		% Solids: 100	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.011	J	mg/kg	0.011	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B05

Lab Code: EQI




UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION III

Environmental Sciences Center
701 Mapes Road
Fort Meade, Maryland 20755-5350

DATE: 9/12/2017

SUBJECT: Region III Data QA Review

FROM: Brandon McDonald 
Region III ESAT RPO (3EA22)

TO: GREG HAM
Hazardous Site Cleanup Division (HSCD)

Attached is the data validation report for the SPARROWS POINT- SEDIMENT ASSESSMENT SOUTHEAST AREA site for RAS# 47079; SDG# MC0B25 completed by the Region III Environmental Services Assistance Team (ESAT) contractor, ICF International, under the direction of Region III EAID.

If you have any questions regarding this review, please call Brandon McDonald at (410) 305-2607 or you can call Eric Graybill at (410)-305-2665.

cc: Charles Rapone(WESTON SOLUTIONS)
Laura Mathew (WESTON SOLUTIONS)

TO: #0002 TDF: #0817059

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ICF
ESAT Region 3
US Environmental Protection Agency Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Phone 410-305-3012

Date: August 21, 2017

To: Brandon McDonald
ESAT Region 3 Project Officer

From: Lisa D. Penix
Validator

Kurt Roby
Reviewer

Subject: Inorganic Data Validation (S4VEM)
Sparrows Point
47079 MCOB25

Overview

This data package consisted of twenty (20) sediment samples, including a field duplicate sample, analyzed for aluminum (Al), calcium (Ca), iron (Fe), magnesium (Mg), potassium (K) and sodium (Na) by ICP – AES, for metals by ICP-MS, mercury (Hg) by cold vapor atomic absorption technique and cyanide (CN-) by spectrophotometry.

Analyses were performed by Shealy Environmental Services (EQI) according to Contract Laboratory Program (CLP) Statement of Work (SOW) ISM02.4 through the Routine Analytical Services (RAS) program.

Data were validated according to the National Functional Guidelines for Inorganic Superfund Methods Data Review and applicable USEPA Region 3 modifications. Electronic validation was performed by the Electronic Data eXchange & Evaluation System (EXES). The validation report has been assigned the Superfund Data Validation Level Stage_4_Validation_Electronic_Manual (S4VEM).

This validation is based on the hardcopy data package received at Region 3 on August 7, 2017.

Sample MCOB72 of this SDG is a field duplicate to sample MCOB18, which was analyzed in SDG MCOB05. Comparison of this field duplicate pair is discussed in "Notes".

Rinsate blanks MCOB45 and MCOB70 were used in evaluating blank contamination for the associated samples in this case based on sampling date. These blanks were analyzed in SDG MCOB45. No positive results were reported in these blanks.

Summary

A technical holding time outlier was identified that required rejection of sample results. Less significant data quality outliers resulting in estimation of sample results were identified including, but not limited to, sample integrity, laboratory quality control issues and blank contamination as detailed below.

Major Problem

The technical holding time of fourteen (14) days from the time of sample collection to sample analysis for CN- has been exceeded by one day for sample MCOB27. The result reported for CN- in this sample is rejected and has been qualified "R".

Minor Problems

The sample cooler containing samples MCOB25, MCOB26, MCOB36, MCOB37, MCOB38, and MCOB43 had an interior temperature of 7.3°C when received by the laboratory, which exceeded the criteria of ≤6°C. Detected concentrations and quantitation limits for CN- and Hg are estimated and have been qualified "J" and "UJ", respectively.

Laboratory instrumentation reported negative values for CN- greater than the absolute value of the Method Detection Limit (MDL) in blank analyses. Detected concentrations reported for CN- which are less than the CRQL were raised to the CRQL and qualified "UJ".

Percent differences (%Ds) in the ICP serial dilution analysis were outside the control limit (>10%) for nickel (Ni). Detected concentrations for this analyte are estimated and have been qualified "J".

The matrix spike percent recovery was low (<75%) for antimony (Sb). The post-digestion spike recovery was within control limits. Quantitation limits for Sb are estimated and have been qualified "UJ".

Matrix spike and post-digestion spike recoveries were low (<75%) for CN-. The positive result reported for CN- in sample MCOB38 may be estimated low and has been qualified "J-". Quantitation limits are estimated and have been qualified "UJ".

The Relative Percent Difference (RPD) in laboratory duplicate analyses was outside control limits [twenty (20) RPD, ±Contract Required Quantitation Limit (CRQL)] for Al, copper (Cu), Fe and Hg. Detected concentrations for these analytes are estimated and have been qualified "J". Quantitation limits for Hg are estimated and have been qualified "UJ".

The RPD in the laboratory duplicate analysis was greater than 100% for Ca. Detected concentrations for this analyte are estimated and have been qualified "J".

Notes

Sb and Hg have been detected in laboratory blanks associated with the samples in this SDG. Reported concentrations for these analytes less than the CRQL have been reported at the CRQL and qualified "U".

Analytes detected below CRQLs not attributed to blank contamination are estimated and have been qualified "J".

The percent relative intensity (%RI) for internal standard yttrium was outside the upper control limit (>125%) in the initial analyses of samples MCOB28, MCOB31, MCOB36, MCOB37, MCOB39, MCOB40, MCOB41, and MCOB43, as well as laboratory duplicate and post-digestion spike of sample MCOB27. These samples were reanalyzed at a two-fold (2X) dilution with %RI within control limits for all samples.

The %RI for internal standard yttrium was inside the upper control limit for sample MCOB27, however, this sample was reanalyzed at a 2X dilution. As sample MCOB27 was used for quality control analyses, it was also reanalyzed at 2X dilutions. Associated analytes arsenic (As), cadmium (Cd), chromium (Cr), cobalt (Co), Cu, manganese (Mn), Ni, silver (Ag), vanadium (V), and zinc (Zn) were reported from the diluted analyses without qualification.

Concentrations for the following target analytes exceeded the calibration range in the initial analysis sample MCOB38. This sample was reanalyzed at dilution in order to quantitate these analytes within the calibration range. Results were reported from the dilutions. There is no indication that these exceedance issues impacted subsequent sample analyses.

Analyte	Dilution
Fe	20X
Mn	5X
Zn	2X

Results reported for field duplicate pair MCOB18/MCOB72 were within twenty-five (25) Relative Percent Difference (RPD), + CRQL for all analytes. No data were qualified based on field duplicate precision.

Glossary of Inorganic Data Qualifier Codes

Validation Qualifiers	In order of descending precedence. Only one of these qualifiers may apply to any result.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit
B	The result is presumed a blank contaminant. This qualifier is used for drinking water samples only.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.

Sample Summary Report

Case: 47079	Contract: EPW14035	SDG: MC0B25	Lab Code: EQI
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Sample Number: LCS001	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture:		% Solids: 100	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Spike	42.5		mg/kg	42.5		1	YES	S4VEM
Calcium	Spike	964		mg/kg	964		1	YES	S4VEM
Iron	Spike	21.2		mg/kg	21.2		1	YES	S4VEM
Magnesium	Spike	907		mg/kg	907		1	YES	S4VEM
Potassium	Spike	833		mg/kg	833		1	YES	S4VEM
Sodium	Spike	954		mg/kg	954		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: LCS001

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location:

pH:

Sample Date:

Sample Time:

% Moisture:

% Solids: 100

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Spike	1.9		mg/kg	1.9		1	YES	S4VEM
Arsenic	Spike	0.97		mg/kg	0.97		1	YES	S4VEM
Barium	Spike	9.6		mg/kg	9.6		1	YES	S4VEM
Beryllium	Spike	1.1		mg/kg	1.1		1	YES	S4VEM
Cadmium	Spike	1.0		mg/kg	1.0		1	YES	S4VEM
Chromium	Spike	2.3		mg/kg	2.3		1	YES	S4VEM
Cobalt	Spike	1.0		mg/kg	1.0		1	YES	S4VEM
Copper	Spike	2.3		mg/kg	2.3		1	YES	S4VEM
Lead	Spike	0.97		mg/kg	0.97		1	YES	S4VEM
Manganese	Spike	1.0		mg/kg	1.0		1	YES	S4VEM
Nickel	Spike	1.1		mg/kg	1.1		1	YES	S4VEM
Selenium	Spike	5.3		mg/kg	5.3		1	YES	S4VEM
Silver	Spike	1.1		mg/kg	1.1		1	YES	S4VEM
Thallium	Spike	0.94		mg/kg	0.94		1	YES	S4VEM
Vanadium	Spike	5.1		mg/kg	5.1		1	YES	S4VEM
Zinc	Spike	2.2		mg/kg	2.2		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B25	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SD-S02	pH:	Sample Date: 07/11/2017	Sample Time: 11:30:00
% Moisture:		% Solids: 30.9	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	1.2	UJ	mg/kg	0.52	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B25	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SD-S02	pH:	Sample Date: 07/11/2017	Sample Time: 11:30:00
% Moisture:		% Solids: 30.9	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.99	J	mg/kg	0.99		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B25	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SD-S02	pH:	Sample Date: 07/11/2017	Sample Time: 11:30:00
% Moisture:		% Solids: 30.9	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	16300	J	mg/kg	16300		1	YES	S4VEM
Calcium	Target	1800	J	mg/kg	1800		1	YES	S4VEM
Iron	Target	57100	J	mg/kg	57100		1	YES	S4VEM
Magnesium	Target	4200		mg/kg	4200		1	YES	S4VEM
Potassium	Target	1560		mg/kg	1560		1	YES	S4VEM
Sodium	Target	3870		mg/kg	3870		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B25

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location: SD-S02

pH:

Sample Date: 07/11/2017

Sample Time: 11:30:00

% Moisture:

% Solids: 30.9

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	2.9	UJ	mg/kg	0.68	J	1	YES	S4VEM
Arsenic	Target	12.3		mg/kg	12.3		1	YES	S4VEM
Barium	Target	42.1		mg/kg	42.1		1	YES	S4VEM
Beryllium	Target	1.7		mg/kg	1.7		1	YES	S4VEM
Cadmium	Target	2.2		mg/kg	2.2		1	YES	S4VEM
Chromium	Target	340		mg/kg	340		1	YES	S4VEM
Cobalt	Target	20.0		mg/kg	20.0		1	YES	S4VEM
Copper	Target	224	J	mg/kg	224		1	YES	S4VEM
Lead	Target	395		mg/kg	395		1	YES	S4VEM
Manganese	Target	602		mg/kg	602		1	YES	S4VEM
Nickel	Target	39.4	J	mg/kg	39.4		1	YES	S4VEM
Selenium	Target	2.2	J	mg/kg	2.2	J	1	YES	S4VEM
Silver	Target	3.7		mg/kg	3.7		1	YES	S4VEM
Thallium	Target	0.69	J	mg/kg	0.69	J	1	YES	S4VEM
Vanadium	Target	77.5		mg/kg	77.5		1	YES	S4VEM
Zinc	Target	1630		mg/kg	1630		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B26	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SD-S03	pH:	Sample Date: 07/11/2017	Sample Time: 11:45:00
% Moisture:		% Solids: 36.4	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	1.1	UJ	mg/kg	0.36	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B26	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SD-S03	pH:	Sample Date: 07/11/2017	Sample Time: 11:45:00
% Moisture:		% Solids: 36.4	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.76	J	mg/kg	0.76		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B26	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SD-S03	pH:	Sample Date: 07/11/2017	Sample Time: 11:45:00
% Moisture:		% Solids: 36.4	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	12000	J	mg/kg	12000		1	YES	S4VEM
Calcium	Target	1400	J	mg/kg	1400		1	YES	S4VEM
Iron	Target	40200	J	mg/kg	40200		1	YES	S4VEM
Magnesium	Target	3100		mg/kg	3100		1	YES	S4VEM
Potassium	Target	1180		mg/kg	1180		1	YES	S4VEM
Sodium	Target	3000		mg/kg	3000		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B26	Method: Metals by ICP-MS	Matrix: Soil	MA Number:
Sample Location: SD-S03	pH:	Sample Date: 07/11/2017	Sample Time: 11:45:00
% Moisture:		% Solids: 36.4	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	2.6	UJ	mg/kg	0.53	J	1	YES	S4VEM
Arsenic	Target	9.5		mg/kg	9.5		1	YES	S4VEM
Barium	Target	33.7		mg/kg	33.7		1	YES	S4VEM
Beryllium	Target	1.0	J	mg/kg	1.0	J	1	YES	S4VEM
Cadmium	Target	1.3		mg/kg	1.3		1	YES	S4VEM
Chromium	Target	238		mg/kg	238		1	YES	S4VEM
Cobalt	Target	15.9		mg/kg	15.9		1	YES	S4VEM
Copper	Target	181	J	mg/kg	181		1	YES	S4VEM
Lead	Target	274		mg/kg	274		1	YES	S4VEM
Manganese	Target	533		mg/kg	533		1	YES	S4VEM
Nickel	Target	30.3	J	mg/kg	30.3		1	YES	S4VEM
Selenium	Target	6.5	U	mg/kg	6.5	U	1	YES	S4VEM
Silver	Target	2.6		mg/kg	2.6		1	YES	S4VEM
Thallium	Target	0.36	J	mg/kg	0.36	J	1	YES	S4VEM
Vanadium	Target	60.8		mg/kg	60.8		1	YES	S4VEM
Zinc	Target	1160		mg/kg	1160		1	YES	S4VEM

Sample Summary Report

Case: 47079	Contract: EPW14035	SDG: MC0B25	Lab Code: EQI
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Sample Number: MC0B27	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SD-T01	pH:	Sample Date: 07/11/2017	Sample Time: 13:15:00
% Moisture:		% Solids: 37.7	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	1.3	R	mg/kg	0.13	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B27	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SD-T01	pH:	Sample Date: 07/11/2017	Sample Time: 13:15:00
% Moisture:		% Solids: 37.7	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	1.4	J	mg/kg	1.4		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B27

Method: Metals by ICP-AES

Matrix: Soil

MA Number:

Sample Location: SD-T01

pH:

Sample Date: 07/11/2017

Sample Time: 13:15:00

% Moisture:

% Solids: 37.7

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	15200	J	mg/kg	15200		1	YES	S4VEM
Calcium	Target	3570	J	mg/kg	3570		1	YES	S4VEM
Iron	Target	49900	J	mg/kg	49900		1	YES	S4VEM
Magnesium	Target	4820		mg/kg	4820		1	YES	S4VEM
Potassium	Target	1440		mg/kg	1440		1	YES	S4VEM
Sodium	Target	2910		mg/kg	2910		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B27

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location: SD-T01

pH:

Sample Date: 07/11/2017

Sample Time: 13:15:00

% Moisture:

% Solids: 37.7

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	2.0	UJ	mg/kg	0.51	J	1	YES	S4VEM
Arsenic	Target	9.3		mg/kg	9.3		2	YES	S4VEM
Barium	Target	77.2		mg/kg	77.2		1	YES	S4VEM
Beryllium	Target	1.3		mg/kg	1.3		1	YES	S4VEM
Cadmium	Target	2.7		mg/kg	2.7		2	YES	S4VEM
Chromium	Target	222		mg/kg	222		2	YES	S4VEM
Cobalt	Target	16.6		mg/kg	16.6		2	YES	S4VEM
Copper	Target	215	J	mg/kg	215		2	YES	S4VEM
Lead	Target	316		mg/kg	316		1	YES	S4VEM
Manganese	Target	401		mg/kg	401		2	YES	S4VEM
Nickel	Target	30.8	J	mg/kg	30.8		2	YES	S4VEM
Selenium	Target	4.9	U	mg/kg	4.9	U	1	YES	S4VEM
Silver	Target	2.2		mg/kg	2.2		2	YES	S4VEM
Thallium	Target	1.0		mg/kg	1.0		1	YES	S4VEM
Vanadium	Target	49.6		mg/kg	49.6		2	YES	S4VEM
Zinc	Target	1290		mg/kg	1290		2	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B27A	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date: 07/11/2017	Sample Time: 13:15:00
% Moisture:		% Solids: 37.7	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Spike	0.55	J-	mg/kg	0.55		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B27A	Method: Metals by ICP-MS	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date: 07/11/2017	Sample Time: 13:15:00
% Moisture:		% Solids: 37.7	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Spike	4.2		mg/kg	4.2		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B27D	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date: 07/11/2017	Sample Time: 13:15:00
% Moisture:		% Solids: 37.7	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	1.2	R	mg/kg	0.13	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B27D	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date: 07/11/2017	Sample Time: 13:15:00
% Moisture:		% Solids: 37.7	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	1.7	J	mg/kg	1.7	*	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B27D	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date: 07/11/2017	Sample Time: 13:15:00
% Moisture:		% Solids: 37.7	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	12200		mg/kg	12200	*	1	YES	S4VEM
Calcium	Target	78500	J	mg/kg	78500	D*	2	YES	S4VEM
Iron	Target	39700		mg/kg	39700	*	1	YES	S4VEM
Magnesium	Target	4290		mg/kg	4290		1	YES	S4VEM
Potassium	Target	1240		mg/kg	1240		1	YES	S4VEM
Sodium	Target	3380		mg/kg	3380		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B27D

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location:

pH:

Sample Date: 07/11/2017

Sample Time: 13:15:00

% Moisture:

% Solids: 37.7

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.1	J	mg/kg	1.1	J	1	YES	S4VEM
Arsenic	Target	10.0		mg/kg	10.0	D	2	YES	S4VEM
Barium	Target	65.7		mg/kg	65.7		1	YES	S4VEM
Beryllium	Target	1.3		mg/kg	1.3		1	YES	S4VEM
Cadmium	Target	2.6		mg/kg	2.6	D	2	YES	S4VEM
Chromium	Target	243		mg/kg	243	D	2	YES	S4VEM
Cobalt	Target	17.6		mg/kg	17.6	D	2	YES	S4VEM
Copper	Target	282	J	mg/kg	282	D*	2	YES	S4VEM
Lead	Target	361		mg/kg	361		1	YES	S4VEM
Manganese	Target	432		mg/kg	432	D	2	YES	S4VEM
Nickel	Target	32.5	J	mg/kg	32.5	D	2	YES	S4VEM
Selenium	Target	1.8	J	mg/kg	1.8	J	1	YES	S4VEM
Silver	Target	2.4		mg/kg	2.4	D	2	YES	S4VEM
Thallium	Target	1.1		mg/kg	1.1		1	YES	S4VEM
Vanadium	Target	51.5		mg/kg	51.5	D	2	YES	S4VEM
Zinc	Target	1320		mg/kg	1320	D	2	YES	S4VEM

Sample Summary Report

Case: 47079	Contract: EPW14035	SDG: MC0B25	Lab Code: EQI
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Sample Number: MC0B27L	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture:		% Solids: 37.7	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	15800		mg/kg	15800		5	YES	S4VEM
Calcium	Target	3710	J	mg/kg	3710	J	5	YES	S4VEM
Iron	Target	53500		mg/kg	53500		5	YES	S4VEM
Magnesium	Target	4930	J	mg/kg	4930	J	5	YES	S4VEM
Potassium	Target	6200	U	mg/kg	6200	U	5	YES	S4VEM
Sodium	Target	2830	J	mg/kg	2830	J	5	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B27L

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location:

pH:

Sample Date:

Sample Time:

% Moisture:

% Solids: 37.7

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	13.3	U	mg/kg	13.3	U	5	YES	S4VEM
Arsenic	Target	8.1		mg/kg	8.1	J	10	YES	S4VEM
Barium	Target	84.8		mg/kg	84.8		5	YES	S4VEM
Beryllium	Target	6.6	U	mg/kg	6.6	U	5	YES	S4VEM
Cadmium	Target	2.3	J	mg/kg	2.3	J	10	YES	S4VEM
Chromium	Target	201		mg/kg	201		10	YES	S4VEM
Cobalt	Target	14.9		mg/kg	14.9		10	YES	S4VEM
Copper	Target	198		mg/kg	198		10	YES	S4VEM
Lead	Target	341		mg/kg	341		5	YES	S4VEM
Manganese	Target	361		mg/kg	361		10	YES	S4VEM
Nickel	Target	27.2		mg/kg	27.2	*	10	YES	S4VEM
Selenium	Target	33.2	U	mg/kg	33.2	U	5	YES	S4VEM
Silver	Target	2.2	J	mg/kg	2.2	J	10	YES	S4VEM
Thallium	Target	1.1	J	mg/kg	1.1	J	5	YES	S4VEM
Vanadium	Target	44.5	J	mg/kg	44.5	J	10	YES	S4VEM
Zinc	Target	1200		mg/kg	1200		10	YES	S4VEM

Sample Summary Report

Case: 47079	Contract: EPW14035	SDG: MC0B25	Lab Code: EQI
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Sample Number: MC0B27S	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date: 07/11/2017	Sample Time: 13:15:00
% Moisture:		% Solids: 37.7	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Spike	2.4	J-	mg/kg	2.4		1	YES	S4VEM

Sample Summary Report

Case: 47079	Contract: EPW14035	SDG: MC0B25	Lab Code: EQI
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Sample Number: MC0B27S	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date: 07/11/2017	Sample Time: 13:15:00
% Moisture:		% Solids: 37.7	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Spike	2.9		mg/kg	2.9		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B27S

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location:

pH:

Sample Date: 07/11/2017

Sample Time: 13:15:00

% Moisture:

% Solids: 37.7

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Spike	15.6		mg/kg	15.6		1	YES	S4VEM
Arsenic	Spike	17.2		mg/kg	17.2		2	YES	S4VEM
Barium	Spike	565		mg/kg	565		1	YES	S4VEM
Beryllium	Spike	14.4		mg/kg	14.4		1	YES	S4VEM
Cadmium	Spike	13.6		mg/kg	13.6		2	YES	S4VEM
Chromium	Spike	265		mg/kg	265		2	YES	S4VEM
Cobalt	Spike	130		mg/kg	130		2	YES	S4VEM
Copper	Spike	282		mg/kg	282		2	YES	S4VEM
Lead	Spike	324		mg/kg	324		1	YES	S4VEM
Manganese	Spike	532		mg/kg	532		2	YES	S4VEM
Nickel	Spike	148		mg/kg	148		2	YES	S4VEM
Selenium	Spike	23.8		mg/kg	23.8		1	YES	S4VEM
Silver	Spike	13.9		mg/kg	13.9		2	YES	S4VEM
Thallium	Spike	13.2		mg/kg	13.2		1	YES	S4VEM
Vanadium	Spike	156		mg/kg	156		2	YES	S4VEM
Zinc	Spike	1370		mg/kg	1370		2	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B28	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SD-T02	pH:	Sample Date: 07/11/2017	Sample Time: 13:45:00
% Moisture:		% Solids: 34.3	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	0.82	UJ	mg/kg	0.49	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B28	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SD-T02	pH:	Sample Date: 07/11/2017	Sample Time: 13:45:00
% Moisture:		% Solids: 34.3	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	1.2	J	mg/kg	1.2		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B28	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SD-T02	pH:	Sample Date: 07/11/2017	Sample Time: 13:45:00
% Moisture:		% Solids: 34.3	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	19100	J	mg/kg	19100		1	YES	S4VEM
Calcium	Target	1830	J	mg/kg	1830		1	YES	S4VEM
Iron	Target	51600	J	mg/kg	51600		1	YES	S4VEM
Magnesium	Target	4290		mg/kg	4290		1	YES	S4VEM
Potassium	Target	2050		mg/kg	2050		1	YES	S4VEM
Sodium	Target	3450		mg/kg	3450		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B28

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location: SD-T02

pH:

Sample Date: 07/11/2017

Sample Time: 13:45:00

% Moisture:

% Solids: 34.3

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	2.0	UJ	mg/kg	0.99	J	1	YES	S4VEM
Arsenic	Target	11.1		mg/kg	11.1		2	YES	S4VEM
Barium	Target	44.0		mg/kg	44.0		1	YES	S4VEM
Beryllium	Target	1.2		mg/kg	1.2		1	YES	S4VEM
Cadmium	Target	2.4		mg/kg	2.4		2	YES	S4VEM
Chromium	Target	353		mg/kg	353		2	YES	S4VEM
Cobalt	Target	18.1		mg/kg	18.1		2	YES	S4VEM
Copper	Target	213	J	mg/kg	213		2	YES	S4VEM
Lead	Target	384		mg/kg	384		1	YES	S4VEM
Manganese	Target	427		mg/kg	427		2	YES	S4VEM
Nickel	Target	37.4	J	mg/kg	37.4		2	YES	S4VEM
Selenium	Target	2.4	J	mg/kg	2.4	J	1	YES	S4VEM
Silver	Target	3.2		mg/kg	3.2		2	YES	S4VEM
Thallium	Target	1.0		mg/kg	1.0		1	YES	S4VEM
Vanadium	Target	63.9		mg/kg	63.9		2	YES	S4VEM
Zinc	Target	1550		mg/kg	1550		2	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B29	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SD-T03	pH:	Sample Date: 07/11/2017	Sample Time: 13:55:00
% Moisture:		% Solids: 48.3	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	0.72	UJ	mg/kg	0.18	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B29	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SD-T03	pH:	Sample Date: 07/11/2017	Sample Time: 13:55:00
% Moisture:		% Solids: 48.3	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.43	J	mg/kg	0.43		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B29	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SD-T03	pH:	Sample Date: 07/11/2017	Sample Time: 13:55:00
% Moisture:		% Solids: 48.3	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	7750	J	mg/kg	7750		1	YES	S4VEM
Calcium	Target	3410	J	mg/kg	3410		1	YES	S4VEM
Iron	Target	25300	J	mg/kg	25300		1	YES	S4VEM
Magnesium	Target	2150		mg/kg	2150		1	YES	S4VEM
Potassium	Target	681	J	mg/kg	681	J	1	YES	S4VEM
Sodium	Target	1950		mg/kg	1950		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B29

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location: SD-T03

pH:

Sample Date: 07/11/2017

Sample Time: 13:55:00

% Moisture:

% Solids: 48.3

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.4	UJ	mg/kg	0.47	J	1	YES	S4VEM
Arsenic	Target	7.4		mg/kg	7.4		1	YES	S4VEM
Barium	Target	39.1		mg/kg	39.1		1	YES	S4VEM
Beryllium	Target	0.84		mg/kg	0.84		1	YES	S4VEM
Cadmium	Target	1.8		mg/kg	1.8		1	YES	S4VEM
Chromium	Target	155		mg/kg	155		1	YES	S4VEM
Cobalt	Target	13.0		mg/kg	13.0		1	YES	S4VEM
Copper	Target	118	J	mg/kg	118		1	YES	S4VEM
Lead	Target	188		mg/kg	188		1	YES	S4VEM
Manganese	Target	326		mg/kg	326		1	YES	S4VEM
Nickel	Target	21.8	J	mg/kg	21.8		1	YES	S4VEM
Selenium	Target	0.93	J	mg/kg	0.93	J	1	YES	S4VEM
Silver	Target	1.5		mg/kg	1.5		1	YES	S4VEM
Thallium	Target	0.79		mg/kg	0.79		1	YES	S4VEM
Vanadium	Target	36.5		mg/kg	36.5		1	YES	S4VEM
Zinc	Target	827		mg/kg	827		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B30	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SD-U01	pH:	Sample Date: 07/11/2017	Sample Time: 14:05:00
% Moisture:		% Solids: 35.4	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	0.91	UJ	mg/kg	0.22	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B30	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SD-U01	pH:	Sample Date: 07/11/2017	Sample Time: 14:05:00
% Moisture:		% Solids: 35.4	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	1.0	J	mg/kg	1.0		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B30

Method: Metals by ICP-AES

Matrix: Soil

MA Number:

Sample Location: SD-U01

pH:

Sample Date: 07/11/2017

Sample Time: 14:05:00

% Moisture:

% Solids: 35.4

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	15100	J	mg/kg	15100		1	YES	S4VEM
Calcium	Target	2010	J	mg/kg	2010		1	YES	S4VEM
Iron	Target	44200	J	mg/kg	44200		1	YES	S4VEM
Magnesium	Target	3720		mg/kg	3720		1	YES	S4VEM
Potassium	Target	1460		mg/kg	1460		1	YES	S4VEM
Sodium	Target	3250		mg/kg	3250		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B30	Method: Metals by ICP-MS	Matrix: Soil	MA Number:
Sample Location: SD-U01	pH:	Sample Date: 07/11/2017	Sample Time: 14:05:00
% Moisture:		% Solids: 35.4	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	2.3	UJ	mg/kg	0.63	J	1	YES	S4VEM
Arsenic	Target	9.5		mg/kg	9.5		1	YES	S4VEM
Barium	Target	45.8		mg/kg	45.8		1	YES	S4VEM
Beryllium	Target	1.0	J	mg/kg	1.0	J	1	YES	S4VEM
Cadmium	Target	3.2		mg/kg	3.2		1	YES	S4VEM
Chromium	Target	321		mg/kg	321		1	YES	S4VEM
Cobalt	Target	15.4		mg/kg	15.4		1	YES	S4VEM
Copper	Target	177	J	mg/kg	177		1	YES	S4VEM
Lead	Target	330		mg/kg	330		1	YES	S4VEM
Manganese	Target	410		mg/kg	410		1	YES	S4VEM
Nickel	Target	32.9	J	mg/kg	32.9		1	YES	S4VEM
Selenium	Target	1.8	J	mg/kg	1.8	J	1	YES	S4VEM
Silver	Target	2.6		mg/kg	2.6		1	YES	S4VEM
Thallium	Target	1.3		mg/kg	1.3		1	YES	S4VEM
Vanadium	Target	53.2		mg/kg	53.2		1	YES	S4VEM
Zinc	Target	1450		mg/kg	1450		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B31	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SD-U02	pH:	Sample Date: 07/11/2017	Sample Time: 14:20:00
% Moisture:		% Solids: 34.5	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	1.3	UJ	mg/kg	0.27	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B31	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SD-U02	pH:	Sample Date: 07/11/2017	Sample Time: 14:20:00
% Moisture:		% Solids: 34.5	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	1.1	J	mg/kg	1.1		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B31	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SD-U02	pH:	Sample Date: 07/11/2017	Sample Time: 14:20:00
% Moisture:		% Solids: 34.5	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	16600	J	mg/kg	16600		1	YES	S4VEM
Calcium	Target	1820	J	mg/kg	1820		1	YES	S4VEM
Iron	Target	47200	J	mg/kg	47200		1	YES	S4VEM
Magnesium	Target	4010		mg/kg	4010		1	YES	S4VEM
Potassium	Target	1600		mg/kg	1600		1	YES	S4VEM
Sodium	Target	3440		mg/kg	3440		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B31 Method: Metals by ICP-MS Matrix: Soil MA Number:
Sample Location: SD-U02 pH: Sample Date: 07/11/2017 Sample Time: 14:20:00
% Moisture: % Solids: 34.5

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	2.0	UJ	mg/kg	0.48	J	1	YES	S4VEM
Arsenic	Target	10.7		mg/kg	10.7		2	YES	S4VEM
Barium	Target	44.2		mg/kg	44.2		1	YES	S4VEM
Beryllium	Target	1.4		mg/kg	1.4		1	YES	S4VEM
Cadmium	Target	2.5		mg/kg	2.5		2	YES	S4VEM
Chromium	Target	319		mg/kg	319		2	YES	S4VEM
Cobalt	Target	18.5		mg/kg	18.5		2	YES	S4VEM
Copper	Target	216	J	mg/kg	216		2	YES	S4VEM
Lead	Target	350		mg/kg	350		1	YES	S4VEM
Manganese	Target	396		mg/kg	396		2	YES	S4VEM
Nickel	Target	36.2	J	mg/kg	36.2		2	YES	S4VEM
Selenium	Target	2.1	J	mg/kg	2.1	J	1	YES	S4VEM
Silver	Target	2.9		mg/kg	2.9		2	YES	S4VEM
Thallium	Target	0.95	J	mg/kg	0.95	J	1	YES	S4VEM
Vanadium	Target	63.6		mg/kg	63.6		2	YES	S4VEM
Zinc	Target	1420		mg/kg	1420		2	YES	S4VEM

Sample Summary Report

Case: 47079	Contract: EPW14035	SDG: MC0B25	Lab Code: EQI
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Sample Number: MC0B32	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SD-U03	pH:	Sample Date: 07/11/2017	Sample Time: 14:45:00
% Moisture:		% Solids: 36.5	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	1.3	UJ	mg/kg	0.61	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B32	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SD-U03	pH:	Sample Date: 07/11/2017	Sample Time: 14:45:00
% Moisture:		% Solids: 36.5	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	1.0	J	mg/kg	1.0		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B32	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SD-U03	pH:	Sample Date: 07/11/2017	Sample Time: 14:45:00
% Moisture:		% Solids: 36.5	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	15600	J	mg/kg	15600		1	YES	S4VEM
Calcium	Target	1920	J	mg/kg	1920		1	YES	S4VEM
Iron	Target	43800	J	mg/kg	43800		1	YES	S4VEM
Magnesium	Target	3670		mg/kg	3670		1	YES	S4VEM
Potassium	Target	1440		mg/kg	1440		1	YES	S4VEM
Sodium	Target	3080		mg/kg	3080		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B32

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location: SD-U03

pH:

Sample Date: 07/11/2017

Sample Time: 14:45:00

% Moisture:

% Solids: 36.5

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	2.2	UJ	mg/kg	0.58	J	1	YES	S4VEM
Arsenic	Target	9.2		mg/kg	9.2		1	YES	S4VEM
Barium	Target	47.2		mg/kg	47.2		1	YES	S4VEM
Beryllium	Target	0.98	J	mg/kg	0.98	J	1	YES	S4VEM
Cadmium	Target	3.3		mg/kg	3.3		1	YES	S4VEM
Chromium	Target	388		mg/kg	388		1	YES	S4VEM
Cobalt	Target	17.1		mg/kg	17.1		1	YES	S4VEM
Copper	Target	183	J	mg/kg	183		1	YES	S4VEM
Lead	Target	384		mg/kg	384		1	YES	S4VEM
Manganese	Target	330		mg/kg	330		1	YES	S4VEM
Nickel	Target	32.8	J	mg/kg	32.8		1	YES	S4VEM
Selenium	Target	2.3	J	mg/kg	2.3	J	1	YES	S4VEM
Silver	Target	2.7		mg/kg	2.7		1	YES	S4VEM
Thallium	Target	1.3		mg/kg	1.3		1	YES	S4VEM
Vanadium	Target	57.6		mg/kg	57.6		1	YES	S4VEM
Zinc	Target	1620		mg/kg	1620		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B33	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SD-V01	pH:	Sample Date: 07/11/2017	Sample Time: 15:00:00
% Moisture:		% Solids: 35.0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	0.97	UJ	mg/kg	0.16	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B33	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SD-V01	pH:	Sample Date: 07/11/2017	Sample Time: 15:00:00
% Moisture:		% Solids: 35.0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.75	J	mg/kg	0.75		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B33	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SD-V01	pH:	Sample Date: 07/11/2017	Sample Time: 15:00:00
% Moisture:		% Solids: 35.0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	15700	J	mg/kg	15700		1	YES	S4VEM
Calcium	Target	1490	J	mg/kg	1490		1	YES	S4VEM
Iron	Target	35000	J	mg/kg	35000		1	YES	S4VEM
Magnesium	Target	3430		mg/kg	3430		1	YES	S4VEM
Potassium	Target	1610		mg/kg	1610		1	YES	S4VEM
Sodium	Target	3210		mg/kg	3210		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B33

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location: SD-V01

pH:

Sample Date: 07/11/2017

Sample Time: 15:00:00

% Moisture:

% Solids: 35.0

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	2.7	UJ	mg/kg	0.44	J	1	YES	S4VEM
Arsenic	Target	8.7		mg/kg	8.7		1	YES	S4VEM
Barium	Target	33.1		mg/kg	33.1		1	YES	S4VEM
Beryllium	Target	1.1	J	mg/kg	1.1	J	1	YES	S4VEM
Cadmium	Target	1.7		mg/kg	1.7		1	YES	S4VEM
Chromium	Target	175		mg/kg	175		1	YES	S4VEM
Cobalt	Target	13.7		mg/kg	13.7		1	YES	S4VEM
Copper	Target	133	J	mg/kg	133		1	YES	S4VEM
Lead	Target	201		mg/kg	201		1	YES	S4VEM
Manganese	Target	293		mg/kg	293		1	YES	S4VEM
Nickel	Target	25.5	J	mg/kg	25.5		1	YES	S4VEM
Selenium	Target	6.7	U	mg/kg	6.7	U	1	YES	S4VEM
Silver	Target	1.5		mg/kg	1.5		1	YES	S4VEM
Thallium	Target	0.72	J	mg/kg	0.72	J	1	YES	S4VEM
Vanadium	Target	43.3		mg/kg	43.3		1	YES	S4VEM
Zinc	Target	793		mg/kg	793		1	YES	S4VEM

Sample Summary Report

Case: 47079	Contract: EPW14035	SDG: MC0B25	Lab Code: EQI
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Sample Number: MC0B34	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SD-V02	pH:	Sample Date: 07/11/2017	Sample Time: 15:20:00
% Moisture:		% Solids: 30.2	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	0.075	UJ	mg/kg	0.075	J	1	YES	S4VEM

Sample Summary Report

Case: 47079	Contract: EPW14035	SDG: MC0B25	Lab Code: EQI
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Sample Number: MC0B34	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SD-V02	pH:	Sample Date: 07/11/2017	Sample Time: 15:20:00
% Moisture:		% Solids: 30.2	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.90	J	mg/kg	0.90		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B34	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SD-V02	pH:	Sample Date: 07/11/2017	Sample Time: 15:20:00
% Moisture:		% Solids: 30.2	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	16700	J	mg/kg	16700		1	YES	S4VEM
Calcium	Target	1890	J	mg/kg	1890		1	YES	S4VEM
Iron	Target	40500	J	mg/kg	40500		1	YES	S4VEM
Magnesium	Target	4120		mg/kg	4120		1	YES	S4VEM
Potassium	Target	1560		mg/kg	1560		1	YES	S4VEM
Sodium	Target	4070		mg/kg	4070		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B34

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location: SD-V02

pH:

Sample Date: 07/11/2017

Sample Time: 15:20:00

% Moisture:

% Solids: 30.2

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	2.7	UJ	mg/kg	0.41	J	1	YES	S4VEM
Arsenic	Target	9.6		mg/kg	9.6		1	YES	S4VEM
Barium	Target	44.1		mg/kg	44.1		1	YES	S4VEM
Beryllium	Target	1.2	J	mg/kg	1.2	J	1	YES	S4VEM
Cadmium	Target	2.3		mg/kg	2.3		1	YES	S4VEM
Chromium	Target	237		mg/kg	237		1	YES	S4VEM
Cobalt	Target	16.1		mg/kg	16.1		1	YES	S4VEM
Copper	Target	191	J	mg/kg	191		1	YES	S4VEM
Lead	Target	275		mg/kg	275		1	YES	S4VEM
Manganese	Target	332		mg/kg	332		1	YES	S4VEM
Nickel	Target	31.2	J	mg/kg	31.2		1	YES	S4VEM
Selenium	Target	1.9	J	mg/kg	1.9	J	1	YES	S4VEM
Silver	Target	2.2		mg/kg	2.2		1	YES	S4VEM
Thallium	Target	0.71	J	mg/kg	0.71	J	1	YES	S4VEM
Vanadium	Target	54.1		mg/kg	54.1		1	YES	S4VEM
Zinc	Target	1100		mg/kg	1100		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B35	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SD-V03	pH:	Sample Date: 07/11/2017	Sample Time: 15:40:00
% Moisture:		% Solids: 31.8	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	1.2	UJ	mg/kg	1.2	U	1	YES	S4VEM

Sample Summary Report

Case: 47079	Contract: EPW14035	SDG: MC0B25	Lab Code: EQI
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Sample Number: MC0B35	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SD-V03	pH:	Sample Date: 07/11/2017	Sample Time: 15:40:00
% Moisture:	% Solids: 31.8		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.80	J	mg/kg	0.80		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B35	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SD-V03	pH:	Sample Date: 07/11/2017	Sample Time: 15:40:00
% Moisture:		% Solids: 31.8	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	14400	J	mg/kg	14400		1	YES	S4VEM
Calcium	Target	2210	J	mg/kg	2210		1	YES	S4VEM
Iron	Target	39200	J	mg/kg	39200		1	YES	S4VEM
Magnesium	Target	4090		mg/kg	4090		1	YES	S4VEM
Potassium	Target	1270	J	mg/kg	1270	J	1	YES	S4VEM
Sodium	Target	3710		mg/kg	3710		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B35

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location: SD-V03

pH:

Sample Date: 07/11/2017

Sample Time: 15:40:00

% Moisture:

% Solids: 31.8

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	2.6	UJ	mg/kg	0.65	J	1	YES	S4VEM
Arsenic	Target	10.9		mg/kg	10.9		1	YES	S4VEM
Barium	Target	49.0		mg/kg	49.0		1	YES	S4VEM
Beryllium	Target	1.5		mg/kg	1.5		1	YES	S4VEM
Cadmium	Target	2.6		mg/kg	2.6		1	YES	S4VEM
Chromium	Target	227		mg/kg	227		1	YES	S4VEM
Cobalt	Target	17.7		mg/kg	17.7		1	YES	S4VEM
Copper	Target	195	J	mg/kg	195		1	YES	S4VEM
Lead	Target	288		mg/kg	288		1	YES	S4VEM
Manganese	Target	380		mg/kg	380		1	YES	S4VEM
Nickel	Target	35.1	J	mg/kg	35.1		1	YES	S4VEM
Selenium	Target	1.9	J	mg/kg	1.9	J	1	YES	S4VEM
Silver	Target	2.0		mg/kg	2.0		1	YES	S4VEM
Thallium	Target	0.99	J	mg/kg	0.99	J	1	YES	S4VEM
Vanadium	Target	56.0		mg/kg	56.0		1	YES	S4VEM
Zinc	Target	1150		mg/kg	1150		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B36	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SS-D03	pH:	Sample Date: 07/11/2017	Sample Time: 13:50:00
% Moisture:		% Solids: 38.5	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	0.87	UJ	mg/kg	0.61	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B36	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SS-D03	pH:	Sample Date: 07/11/2017	Sample Time: 13:50:00
% Moisture:		% Solids: 38.5	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.31	UJ	mg/kg	0.25	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B36	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SS-D03	pH:	Sample Date: 07/11/2017	Sample Time: 13:50:00
% Moisture:		% Solids: 38.5	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	25200	J	mg/kg	25200		1	YES	S4VEM
Calcium	Target	2210	J	mg/kg	2210		1	YES	S4VEM
Iron	Target	48100	J	mg/kg	48100		1	YES	S4VEM
Magnesium	Target	6780		mg/kg	6780		1	YES	S4VEM
Potassium	Target	4010		mg/kg	4010		1	YES	S4VEM
Sodium	Target	4760		mg/kg	4760		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B36	Method: Metals by ICP-MS	Matrix: Soil	MA Number:
Sample Location: SS-D03	pH:	Sample Date: 07/11/2017	Sample Time: 13:50:00
% Moisture:		% Solids: 38.5	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.7	UJ	mg/kg	0.54	J	1	YES	S4VEM
Arsenic	Target	14.9		mg/kg	14.9		2	YES	S4VEM
Barium	Target	40.7		mg/kg	40.7		1	YES	S4VEM
Beryllium	Target	1.5		mg/kg	1.5		1	YES	S4VEM
Cadmium	Target	0.72	J	mg/kg	0.72	J	2	YES	S4VEM
Chromium	Target	86.0		mg/kg	86.0		2	YES	S4VEM
Cobalt	Target	21.5		mg/kg	21.5		2	YES	S4VEM
Copper	Target	57.8	J	mg/kg	57.8		2	YES	S4VEM
Lead	Target	144		mg/kg	144		1	YES	S4VEM
Manganese	Target	1140		mg/kg	1140		2	YES	S4VEM
Nickel	Target	37.5	J	mg/kg	37.5		2	YES	S4VEM
Selenium	Target	2.3	J	mg/kg	2.3	J	1	YES	S4VEM
Silver	Target	0.60	J	mg/kg	0.60	J	2	YES	S4VEM
Thallium	Target	0.17	J	mg/kg	0.17	J	1	YES	S4VEM
Vanadium	Target	53.2		mg/kg	53.2		2	YES	S4VEM
Zinc	Target	389		mg/kg	389		2	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B37	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SS-F03	pH:	Sample Date: 07/11/2017	Sample Time: 15:02:00
% Moisture:		% Solids: 49.0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	0.69	UJ	mg/kg	0.13	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B37	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SS-F03	pH:	Sample Date: 07/11/2017	Sample Time: 15:02:00
% Moisture:		% Solids: 49.0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.21	UJ	mg/kg	0.14	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B37	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SS-F03	pH:	Sample Date: 07/11/2017	Sample Time: 15:02:00
% Moisture:		% Solids: 49.0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	18300	J	mg/kg	18300		1	YES	S4VEM
Calcium	Target	1610	J	mg/kg	1610		1	YES	S4VEM
Iron	Target	39500	J	mg/kg	39500		1	YES	S4VEM
Magnesium	Target	4690		mg/kg	4690		1	YES	S4VEM
Potassium	Target	2580		mg/kg	2580		1	YES	S4VEM
Sodium	Target	3210		mg/kg	3210		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B37

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location: SS-F03

pH:

Sample Date: 07/11/2017

Sample Time: 15:02:00

% Moisture:

% Solids: 49.0

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.5	UJ	mg/kg	0.40	J	1	YES	S4VEM
Arsenic	Target	12.9		mg/kg	12.9		2	YES	S4VEM
Barium	Target	34.6		mg/kg	34.6		1	YES	S4VEM
Beryllium	Target	1.4		mg/kg	1.4		1	YES	S4VEM
Cadmium	Target	0.58	J	mg/kg	0.58	J	2	YES	S4VEM
Chromium	Target	55.0		mg/kg	55.0		2	YES	S4VEM
Cobalt	Target	18.3		mg/kg	18.3		2	YES	S4VEM
Copper	Target	38.1	J	mg/kg	38.1		2	YES	S4VEM
Lead	Target	136		mg/kg	136		1	YES	S4VEM
Manganese	Target	776		mg/kg	776		2	YES	S4VEM
Nickel	Target	33.0	J	mg/kg	33.0		2	YES	S4VEM
Selenium	Target	1.5	J	mg/kg	1.5	J	1	YES	S4VEM
Silver	Target	0.42	J	mg/kg	0.42	J	2	YES	S4VEM
Thallium	Target	0.17	J	mg/kg	0.17	J	1	YES	S4VEM
Vanadium	Target	42.3		mg/kg	42.3		2	YES	S4VEM
Zinc	Target	369		mg/kg	369		2	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B38	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SS-H01	pH:	Sample Date: 07/11/2017	Sample Time: 15:55:00
% Moisture:		% Solids: 78.6	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	0.67	J-	mg/kg	0.67		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B38	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SS-H01	pH:	Sample Date: 07/11/2017	Sample Time: 15:55:00
% Moisture:		% Solids: 78.6	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.44	J	mg/kg	0.44		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B38	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SS-H01	pH:	Sample Date: 07/11/2017	Sample Time: 15:55:00
% Moisture:		% Solids: 78.6	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	6980	J	mg/kg	6980		1	YES	S4VEM
Calcium	Target	9550	J	mg/kg	9550		1	YES	S4VEM
Iron	Target	485000	J	mg/kg	485000		20	YES	S4VEM
Magnesium	Target	9870		mg/kg	9870		1	YES	S4VEM
Potassium	Target	178	J	mg/kg	178	J	1	YES	S4VEM
Sodium	Target	864		mg/kg	864		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B38

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location: SS-H01

pH:

Sample Date: 07/11/2017

Sample Time: 15:55:00

% Moisture:

% Solids: 78.6

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.2	UJ	mg/kg	0.59	J	1	YES	S4VEM
Arsenic	Target	9.8		mg/kg	9.8		1	YES	S4VEM
Barium	Target	52.2		mg/kg	52.2		1	YES	S4VEM
Beryllium	Target	0.87		mg/kg	0.87		1	YES	S4VEM
Cadmium	Target	0.68		mg/kg	0.68		1	YES	S4VEM
Chromium	Target	163		mg/kg	163		1	YES	S4VEM
Cobalt	Target	18.8		mg/kg	18.8		1	YES	S4VEM
Copper	Target	66.0	J	mg/kg	66.0		1	YES	S4VEM
Lead	Target	214		mg/kg	214		1	YES	S4VEM
Manganese	Target	2890		mg/kg	2890		5	YES	S4VEM
Nickel	Target	27.8	J	mg/kg	27.8		1	YES	S4VEM
Selenium	Target	3.0	U	mg/kg	3.0	U	1	YES	S4VEM
Silver	Target	0.56	J	mg/kg	0.56	J	1	YES	S4VEM
Thallium	Target	0.37	J	mg/kg	0.37	J	1	YES	S4VEM
Vanadium	Target	280		mg/kg	280		1	YES	S4VEM
Zinc	Target	1400		mg/kg	1400		2	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B39	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SS-O04	pH:	Sample Date: 07/12/2017	Sample Time: 09:35:00
% Moisture:		% Solids: 43.2	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	0.95	UJ	mg/kg	0.81	J	1	YES	S4VEM

Sample Summary Report

Case: 47079	Contract: EPW14035	SDG: MC0B25	Lab Code: EQI
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Sample Number: MC0B39	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SS-O04	pH:	Sample Date: 07/12/2017	Sample Time: 09:35:00
% Moisture:	% Solids: 43.2		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.59	J	mg/kg	0.59		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B39	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SS-O04	pH:	Sample Date: 07/12/2017	Sample Time: 09:35:00
% Moisture:		% Solids: 43.2	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	19200	J	mg/kg	19200		1	YES	S4VEM
Calcium	Target	1440	J	mg/kg	1440		1	YES	S4VEM
Iron	Target	47000	J	mg/kg	47000		1	YES	S4VEM
Magnesium	Target	4420		mg/kg	4420		1	YES	S4VEM
Potassium	Target	2230		mg/kg	2230		1	YES	S4VEM
Sodium	Target	3490		mg/kg	3490		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B39

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location: SS-O04

pH:

Sample Date: 07/12/2017

Sample Time: 09:35:00

% Moisture:

% Solids: 43.2

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.7	UJ	mg/kg	0.41	J	1	YES	S4VEM
Arsenic	Target	9.8		mg/kg	9.8		2	YES	S4VEM
Barium	Target	26.1		mg/kg	26.1		1	YES	S4VEM
Beryllium	Target	1.1		mg/kg	1.1		1	YES	S4VEM
Cadmium	Target	1.4	J	mg/kg	1.4	J	2	YES	S4VEM
Chromium	Target	88.0		mg/kg	88.0		2	YES	S4VEM
Cobalt	Target	11.1		mg/kg	11.1		2	YES	S4VEM
Copper	Target	50.2	J	mg/kg	50.2		2	YES	S4VEM
Lead	Target	189		mg/kg	189		1	YES	S4VEM
Manganese	Target	374		mg/kg	374		2	YES	S4VEM
Nickel	Target	24.1	J	mg/kg	24.1		2	YES	S4VEM
Selenium	Target	1.5	J	mg/kg	1.5	J	1	YES	S4VEM
Silver	Target	1.1	J	mg/kg	1.1	J	2	YES	S4VEM
Thallium	Target	0.33	J	mg/kg	0.33	J	1	YES	S4VEM
Vanadium	Target	43.5		mg/kg	43.5		2	YES	S4VEM
Zinc	Target	694		mg/kg	694		2	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B40	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SS-K03	pH:	Sample Date: 07/12/2017	Sample Time: 10:20:00
% Moisture:		% Solids: 42.3	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	1.0	UJ	mg/kg	0.53	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B40	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SS-K03	pH:	Sample Date: 07/12/2017	Sample Time: 10:20:00
% Moisture:		% Solids: 42.3	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.48	J	mg/kg	0.48		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B40	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SS-K03	pH:	Sample Date: 07/12/2017	Sample Time: 10:20:00
% Moisture:		% Solids: 42.3	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	23700	J	mg/kg	23700		1	YES	S4VEM
Calcium	Target	1440	J	mg/kg	1440		1	YES	S4VEM
Iron	Target	39500	J	mg/kg	39500		1	YES	S4VEM
Magnesium	Target	5300		mg/kg	5300		1	YES	S4VEM
Potassium	Target	3230		mg/kg	3230		1	YES	S4VEM
Sodium	Target	4090		mg/kg	4090		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B40

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location: SS-K03

pH:

Sample Date: 07/12/2017

Sample Time: 10:20:00

% Moisture:

% Solids: 42.3

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.7	UJ	mg/kg	0.37	J	1	YES	S4VEM
Arsenic	Target	8.7		mg/kg	8.7		2	YES	S4VEM
Barium	Target	34.2		mg/kg	34.2		1	YES	S4VEM
Beryllium	Target	1.3		mg/kg	1.3		1	YES	S4VEM
Cadmium	Target	1.3	J	mg/kg	1.3	J	2	YES	S4VEM
Chromium	Target	87.7		mg/kg	87.7		2	YES	S4VEM
Cobalt	Target	11.4		mg/kg	11.4		2	YES	S4VEM
Copper	Target	52.2	J	mg/kg	52.2		2	YES	S4VEM
Lead	Target	168		mg/kg	168		1	YES	S4VEM
Manganese	Target	377		mg/kg	377		2	YES	S4VEM
Nickel	Target	25.8	J	mg/kg	25.8		2	YES	S4VEM
Selenium	Target	2.0	J	mg/kg	2.0	J	1	YES	S4VEM
Silver	Target	1.1	J	mg/kg	1.1	J	2	YES	S4VEM
Thallium	Target	0.38	J	mg/kg	0.38	J	1	YES	S4VEM
Vanadium	Target	42.2		mg/kg	42.2		2	YES	S4VEM
Zinc	Target	577		mg/kg	577		2	YES	S4VEM

Sample Summary Report

Case: 47079	Contract: EPW14035	SDG: MC0B25	Lab Code: EQI
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Sample Number: MC0B41	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SD-R02	pH:	Sample Date: 07/12/2017	Sample Time: 11:16:00
% Moisture:		% Solids: 32.0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	0.88	UJ	mg/kg	0.55	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B41	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SD-R02	pH:	Sample Date: 07/12/2017	Sample Time: 11:16:00
% Moisture:		% Solids: 32.0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	1.4	J	mg/kg	1.4		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B41	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SD-R02	pH:	Sample Date: 07/12/2017	Sample Time: 11:16:00
% Moisture:		% Solids: 32.0	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	20000	J	mg/kg	20000		1	YES	S4VEM
Calcium	Target	2230	J	mg/kg	2230		1	YES	S4VEM
Iron	Target	70900	J	mg/kg	70900		1	YES	S4VEM
Magnesium	Target	5140		mg/kg	5140		1	YES	S4VEM
Potassium	Target	2040		mg/kg	2040		1	YES	S4VEM
Sodium	Target	3770		mg/kg	3770		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B41

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location: SD-R02

pH:

Sample Date: 07/12/2017

Sample Time: 11:16:00

% Moisture:

% Solids: 32.0

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	2.3	UJ	mg/kg	0.89	J	1	YES	S4VEM
Arsenic	Target	13.0		mg/kg	13.0		2	YES	S4VEM
Barium	Target	47.3		mg/kg	47.3		1	YES	S4VEM
Beryllium	Target	2.0		mg/kg	2.0		1	YES	S4VEM
Cadmium	Target	2.2	J	mg/kg	2.2	J	2	YES	S4VEM
Chromium	Target	322		mg/kg	322		2	YES	S4VEM
Cobalt	Target	22.1		mg/kg	22.1		2	YES	S4VEM
Copper	Target	222	J	mg/kg	222		2	YES	S4VEM
Lead	Target	437		mg/kg	437		1	YES	S4VEM
Manganese	Target	791		mg/kg	791		2	YES	S4VEM
Nickel	Target	44.6	J	mg/kg	44.6		2	YES	S4VEM
Selenium	Target	1.8	J	mg/kg	1.8	J	1	YES	S4VEM
Silver	Target	4.1		mg/kg	4.1		2	YES	S4VEM
Thallium	Target	0.72	J	mg/kg	0.72	J	1	YES	S4VEM
Vanadium	Target	84.5		mg/kg	84.5		2	YES	S4VEM
Zinc	Target	1760		mg/kg	1760		2	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B42	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SD-M01	pH:	Sample Date: 07/12/2017	Sample Time: 11:50:00
% Moisture:		% Solids: 41.7	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	0.84	UJ	mg/kg	0.24	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B42	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SD-M01	pH:	Sample Date: 07/12/2017	Sample Time: 11:50:00
% Moisture:		% Solids: 41.7	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.62	J	mg/kg	0.62		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B42	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SD-M01	pH:	Sample Date: 07/12/2017	Sample Time: 11:50:00
% Moisture:		% Solids: 41.7	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	10400	J	mg/kg	10400		1	YES	S4VEM
Calcium	Target	1770	J	mg/kg	1770		1	YES	S4VEM
Iron	Target	37300	J	mg/kg	37300		1	YES	S4VEM
Magnesium	Target	3690		mg/kg	3690		1	YES	S4VEM
Potassium	Target	955	J	mg/kg	955	J	1	YES	S4VEM
Sodium	Target	2600		mg/kg	2600		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B42

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location: SD-M01

pH:

Sample Date: 07/12/2017

Sample Time: 11:50:00

% Moisture:

% Solids: 41.7

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	2.0	UJ	mg/kg	0.45	J	1	YES	S4VEM
Arsenic	Target	8.7		mg/kg	8.7		1	YES	S4VEM
Barium	Target	31.8		mg/kg	31.8		1	YES	S4VEM
Beryllium	Target	1.1		mg/kg	1.1		1	YES	S4VEM
Cadmium	Target	2.6		mg/kg	2.6		1	YES	S4VEM
Chromium	Target	180		mg/kg	180		1	YES	S4VEM
Cobalt	Target	16.5		mg/kg	16.5		1	YES	S4VEM
Copper	Target	145	J	mg/kg	145		1	YES	S4VEM
Lead	Target	214		mg/kg	214		1	YES	S4VEM
Manganese	Target	472		mg/kg	472		1	YES	S4VEM
Nickel	Target	30.0	J	mg/kg	30.0		1	YES	S4VEM
Selenium	Target	1.4	J	mg/kg	1.4	J	1	YES	S4VEM
Silver	Target	1.8		mg/kg	1.8		1	YES	S4VEM
Thallium	Target	1.4		mg/kg	1.4		1	YES	S4VEM
Vanadium	Target	49.1		mg/kg	49.1		1	YES	S4VEM
Zinc	Target	1140		mg/kg	1140		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B43	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SD-T02	pH:	Sample Date: 07/12/2017	Sample Time: 13:30:00
% Moisture:		% Solids: 36.3	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	0.84	UJ	mg/kg	0.56	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B43	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SD-T02	pH:	Sample Date: 07/12/2017	Sample Time: 13:30:00
% Moisture:		% Solids: 36.3	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	1.1	J	mg/kg	1.1		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B43	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SD-T02	pH:	Sample Date: 07/12/2017	Sample Time: 13:30:00
% Moisture:		% Solids: 36.3	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	18500	J	mg/kg	18500		1	YES	S4VEM
Calcium	Target	2210	J	mg/kg	2210		1	YES	S4VEM
Iron	Target	59000	J	mg/kg	59000		1	YES	S4VEM
Magnesium	Target	4530		mg/kg	4530		1	YES	S4VEM
Potassium	Target	1950		mg/kg	1950		1	YES	S4VEM
Sodium	Target	3270		mg/kg	3270		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B43

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location: SD-T02

pH:

Sample Date: 07/12/2017

Sample Time: 13:30:00

% Moisture:

% Solids: 36.3

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.9	UJ	mg/kg	0.93	J	1	YES	S4VEM
Arsenic	Target	11.9		mg/kg	11.9		2	YES	S4VEM
Barium	Target	41.1		mg/kg	41.1		1	YES	S4VEM
Beryllium	Target	1.6		mg/kg	1.6		1	YES	S4VEM
Cadmium	Target	3.0		mg/kg	3.0		2	YES	S4VEM
Chromium	Target	339		mg/kg	339		2	YES	S4VEM
Cobalt	Target	18.8		mg/kg	18.8		2	YES	S4VEM
Copper	Target	224	J	mg/kg	224		2	YES	S4VEM
Lead	Target	419		mg/kg	419		1	YES	S4VEM
Manganese	Target	539		mg/kg	539		2	YES	S4VEM
Nickel	Target	40.0	J	mg/kg	40.0		2	YES	S4VEM
Selenium	Target	1.6	J	mg/kg	1.6	J	1	YES	S4VEM
Silver	Target	3.7		mg/kg	3.7		2	YES	S4VEM
Thallium	Target	0.99		mg/kg	0.99		1	YES	S4VEM
Vanadium	Target	67.5		mg/kg	67.5		2	YES	S4VEM
Zinc	Target	1700		mg/kg	1700		2	YES	S4VEM

Sample Summary Report

Case: 47079	Contract: EPW14035	SDG: MC0B25	Lab Code: EQI
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Sample Number: MC0B72	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SD-Q02	pH:	Sample Date: 07/10/2017	Sample Time: 16:33:00
% Moisture:	% Solids: 34.9		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	0.79	UJ	mg/kg	0.55	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B72	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SD-Q02	pH:	Sample Date: 07/10/2017	Sample Time: 16:33:00
% Moisture:		% Solids: 34.9	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.86	J	mg/kg	0.86		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B72	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SD-Q02	pH:	Sample Date: 07/10/2017	Sample Time: 16:33:00
% Moisture:		% Solids: 34.9	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	16500	J	mg/kg	16500		1	YES	S4VEM
Calcium	Target	2010	J	mg/kg	2010		1	YES	S4VEM
Iron	Target	66500	J	mg/kg	66500		1	YES	S4VEM
Magnesium	Target	4410		mg/kg	4410		1	YES	S4VEM
Potassium	Target	1680		mg/kg	1680		1	YES	S4VEM
Sodium	Target	3460		mg/kg	3460		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: MC0B72

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location: SD-Q02

pH:

Sample Date: 07/10/2017

Sample Time: 16:33:00

% Moisture:

% Solids: 34.9

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	2.6	UJ	mg/kg	0.74	J	1	YES	S4VEM
Arsenic	Target	12.1		mg/kg	12.1		1	YES	S4VEM
Barium	Target	39.8		mg/kg	39.8		1	YES	S4VEM
Beryllium	Target	1.4		mg/kg	1.4		1	YES	S4VEM
Cadmium	Target	2.2		mg/kg	2.2		1	YES	S4VEM
Chromium	Target	243		mg/kg	243		1	YES	S4VEM
Cobalt	Target	18.3		mg/kg	18.3		1	YES	S4VEM
Copper	Target	163	J	mg/kg	163		1	YES	S4VEM
Lead	Target	354		mg/kg	354		1	YES	S4VEM
Manganese	Target	771		mg/kg	771		1	YES	S4VEM
Nickel	Target	36.5	J	mg/kg	36.5		1	YES	S4VEM
Selenium	Target	2.2	J	mg/kg	2.2	J	1	YES	S4VEM
Silver	Target	3.3		mg/kg	3.3		1	YES	S4VEM
Thallium	Target	0.65	J	mg/kg	0.65	J	1	YES	S4VEM
Vanadium	Target	74.8		mg/kg	74.8		1	YES	S4VEM
Zinc	Target	1500		mg/kg	1500		1	YES	S4VEM

Sample Summary Report

Case: 47079	Contract: EPW14035	SDG: MC0B25	Lab Code: EQI
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Sample Number: PBS001	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture:		% Solids: 100	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.12	U	mg/kg	0.12	U	1	YES	S4VEM

Sample Summary Report

Case: 47079	Contract: EPW14035	SDG: MC0B25	Lab Code: EQI
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Sample Number: PBS001	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture:		% Solids: 100	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	15.8	J	mg/kg	15.8	J	1	YES	S4VEM
Calcium	Target	33.7	J	mg/kg	33.7	J	1	YES	S4VEM
Iron	Target	10.0	U	mg/kg	10.0	U	1	YES	S4VEM
Magnesium	Target	500	U	mg/kg	500	U	1	YES	S4VEM
Potassium	Target	-160	J	mg/kg	-160	J	1	YES	S4VEM
Sodium	Target	-18	J	mg/kg	-18	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25

Lab Code: EQI

Sample Number: PBS001

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location:

pH:

Sample Date:

Sample Time:

% Moisture:

% Solids: 100

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.0	U	mg/kg	1.0	U	1	YES	S4VEM
Arsenic	Target	0.50	U	mg/kg	0.50	U	1	YES	S4VEM
Barium	Target	5.0	U	mg/kg	5.0	U	1	YES	S4VEM
Beryllium	Target	0.50	U	mg/kg	0.50	U	1	YES	S4VEM
Cadmium	Target	0.50	U	mg/kg	0.50	U	1	YES	S4VEM
Chromium	Target	0.20	J	mg/kg	0.20	J	1	YES	S4VEM
Cobalt	Target	0.50	U	mg/kg	0.50	U	1	YES	S4VEM
Copper	Target	1.0	U	mg/kg	1.0	U	1	YES	S4VEM
Lead	Target	0.50	U	mg/kg	0.50	U	1	YES	S4VEM
Manganese	Target	0.067	J	mg/kg	0.067	J	1	YES	S4VEM
Nickel	Target	0.50	U	mg/kg	0.50	U	1	YES	S4VEM
Selenium	Target	2.5	U	mg/kg	2.5	U	1	YES	S4VEM
Silver	Target	0.50	U	mg/kg	0.50	U	1	YES	S4VEM
Thallium	Target	0.50	U	mg/kg	0.50	U	1	YES	S4VEM
Vanadium	Target	0.19	J	mg/kg	0.19	J	1	YES	S4VEM
Zinc	Target	1.0	U	mg/kg	1.0	U	1	YES	S4VEM

Sample Summary Report

Case: 47079	Contract: EPW14035	SDG: MC0B25	Lab Code: EQI
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Sample Number: PBS002	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture:		% Solids: 100	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	-0.013	J	mg/kg	-0.013	J	1	YES	S4VEM

Sample Summary Report

Case: 47079	Contract: EPW14035	SDG: MC0B25	Lab Code: EQI
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Sample Number: PBS005	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture:		% Solids: 100	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	-0.0094	J	mg/kg	-0.0094	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B25


Lab Code: EQI



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
Environmental Sciences Center
701 Mapes Road
Fort Meade, Maryland 20755-5350

DATE: 9/12/2017

SUBJECT: Region III Data QA Review

FROM: Brandon McDonald 
Region III ESAT RPO (3EA22)

TO: GREG HAM
Hazardous Site Cleanup Division (HSCD)

Attached is the data validation report for the SPARROWS POINT- SEDIMENT ASSESSMENT SOUTHEAST AREA site for RAS# 47079; SDG# MC0B74 completed by the Region III Environmental Services Assistance Team (ESAT) contractor, ICF International, under the direction of Region III EAID.

If you have any questions regarding this review, please call Brandon McDonald at (410) 305-2607 or you can call Eric Graybill at (410)-305-2665.

cc: Charles Rapone(WESTON SOLUTIONS)
Laura Mathew (WESTON SOLUTIONS)

TO: #0002 TDF: #0817052

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ICF
ESAT Region 3
US Environmental Protection Agency Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Phone 410-305-3012

Date: August 22, 2017

To: Brandon McDonald
ESAT Region 3 Project Officer

From: Lisa D. Penix
Validator

Kurt Roby
Reviewer

Subject: Inorganic Data Validation (S4VEM)
Sparrows Point
47079 MCOB74

Overview

This data package consisted of four (4) sediment samples, including three (3) field duplicate samples, analyzed for aluminum (Al), calcium (Ca), iron (Fe), magnesium (Mg), potassium (K) and sodium (Na) by ICP – AES, for metals by ICP-MS, mercury (Hg) by cold vapor atomic absorption technique and cyanide (CN-) by spectrophotometry.

Analyses were performed by Shealy Environmental Services (EQI) according to Contract Laboratory Program (CLP) Statement of Work (SOW) ISM02.4 through the Routine Analytical Services (RAS) program.

Data were validated according to the National Functional Guidelines for Inorganic Superfund Methods Data Review and applicable USEPA Region 3 modifications. Electronic validation was performed by the Electronic Data eXchange & Evaluation System (EXES). The validation report has been assigned the Superfund Data Validation Level Stage_4_Validation_Electronic_Manual (S4VEM).

The following validation narrative is an evaluation of laboratory reported data for the purpose of usability, based on the electronic data package provided to sample management office through EXES dated August 4, 2017.

Sample MCOB74 of this SDG is a field duplicate to sample MCOB21, which was analyzed in SDG MCOB05. Samples MCOB75 and MCOB76 of this SDG are field duplicates to samples MCOB33 and MCOB40, respectively, which were analyzed in SDG MCOB25. Comparison of these field duplicate pairs is discussed in “Notes”.

Rinsate blanks MCOB45 and MCOB70 were used in evaluating blank contamination for the associated samples in this case based on sampling date. These blanks were analyzed in SDG MCOB45. No positive results were reported in these blanks.

Summary

No significant data quality outliers or technical deficiencies were identified that would require rejection of sample results. Less significant data quality outliers resulting in estimation of sample results were identified including, but not limited to, sample integrity, matrix spike, and blank contamination as detailed below.

Minor Problems

The sample cooler containing sample MC0B74 had an interior temperature of 7.3°C when received by the laboratory, which exceeded the criteria of $\leq 6^{\circ}\text{C}$. Detected concentrations for CN- and Hg in this sample are estimated and have been qualified "J".

Laboratory instrumentation reported negative values for CN- greater than the absolute value of the Method Detection Limit (MDL) in blank analyses. Detected concentrations reported for CN- which are less than the CRQL were raised to the CRQL and qualified "UJ". Quantitation limits for CN- are estimated and have been qualified "UJ".

The matrix spike percent recovery was low ($<75\%$) for antimony (Sb). The post-digestion spike recovery was within control limits. Quantitation limits for Sb are estimated and have been qualified "UJ".

Notes

Sb and Hg have been detected in laboratory blanks associated with the samples in this SDG. Reported concentrations for these analytes less than the CRQL have been reported at the CRQL and qualified "U".

Analytes detected below CRQLs not attributed to blank contamination are estimated and have been qualified "J".

Results reported for field duplicate pair MC0B21/MC0B74 were within twenty-five (25) Relative Percent Difference (RPD), \pm CRQL for all analytes except potassium (K). No data were qualified based on field duplicate precision.

Results reported for field duplicate pairs MC0B33/MC0B75 and MC0B40/MC0B76 were within twenty-five (25) RPD, \pm CRQL for all analytes. No data were qualified based on field duplicate precision.

Glossary of Inorganic Data Qualifier Codes

Validation Qualifiers	In order of descending precedence. Only one of these qualifiers may apply to any result.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit
B	The result is presumed a blank contaminant. This qualifier is used for drinking water samples only.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.

Sample Summary Report

Case: 47079	Contract: EPW14035	SDG: MC0B74	Lab Code: EQI
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Sample Number: LCS001	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture:		% Solids: 100	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Spike	39.2		mg/kg	39.2		1	YES	S4VEM
Calcium	Spike	976		mg/kg	976		1	YES	S4VEM
Iron	Spike	19.4		mg/kg	19.4		1	YES	S4VEM
Magnesium	Spike	941		mg/kg	941		1	YES	S4VEM
Potassium	Spike	971		mg/kg	971		1	YES	S4VEM
Sodium	Spike	986		mg/kg	986		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B74

Lab Code: EQI

Sample Number: LCS001

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location:

pH:

Sample Date:

Sample Time:

% Moisture:

% Solids: 100

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Spike	2.2		mg/kg	2.2		1	YES	S4VEM
Arsenic	Spike	1.1		mg/kg	1.1		1	YES	S4VEM
Barium	Spike	11.3		mg/kg	11.3		1	YES	S4VEM
Beryllium	Spike	1.2		mg/kg	1.2		1	YES	S4VEM
Cadmium	Spike	1.2		mg/kg	1.2		1	YES	S4VEM
Chromium	Spike	2.6		mg/kg	2.6		1	YES	S4VEM
Cobalt	Spike	1.2		mg/kg	1.2		1	YES	S4VEM
Copper	Spike	2.4		mg/kg	2.4		1	YES	S4VEM
Lead	Spike	1.1		mg/kg	1.1		1	YES	S4VEM
Manganese	Spike	1.2		mg/kg	1.2		1	YES	S4VEM
Nickel	Spike	1.2		mg/kg	1.2		1	YES	S4VEM
Selenium	Spike	5.8		mg/kg	5.8		1	YES	S4VEM
Silver	Spike	1.3		mg/kg	1.3		1	YES	S4VEM
Thallium	Spike	1.1		mg/kg	1.1		1	YES	S4VEM
Vanadium	Spike	5.9		mg/kg	5.9		1	YES	S4VEM
Zinc	Spike	2.5		mg/kg	2.5		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B74

Lab Code: EQI

Sample Number: MC0B74	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SD-R02	pH:	Sample Date: 07/11/2017	Sample Time: 10:05:00
% Moisture:		% Solids: 31.7	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	1.6	UJ	mg/kg	0.32	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B74

Lab Code: EQI

Sample Number: MC0B74	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SD-R02	pH:	Sample Date: 07/11/2017	Sample Time: 10:05:00
% Moisture:		% Solids: 31.7	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	1.1	J	mg/kg	1.1		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B74

Lab Code: EQI

Sample Number: MC0B74	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SD-R02	pH:	Sample Date: 07/11/2017	Sample Time: 10:05:00
% Moisture:		% Solids: 31.7	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	19400		mg/kg	19400		1	YES	S4VEM
Calcium	Target	2040		mg/kg	2040		1	YES	S4VEM
Iron	Target	67700		mg/kg	67700		1	YES	S4VEM
Magnesium	Target	5010		mg/kg	5010		1	YES	S4VEM
Potassium	Target	2220		mg/kg	2220		1	YES	S4VEM
Sodium	Target	3610		mg/kg	3610		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B74

Lab Code: EQI

Sample Number: MC0B74

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location: SD-R02

pH:

Sample Date: 07/11/2017

Sample Time: 10:05:00

% Moisture:

% Solids: 31.7

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	2.5	UJ	mg/kg	0.98	J	1	YES	S4VEM
Arsenic	Target	11.7		mg/kg	11.7		1	YES	S4VEM
Barium	Target	38.5		mg/kg	38.5		1	YES	S4VEM
Beryllium	Target	1.6		mg/kg	1.6		1	YES	S4VEM
Cadmium	Target	2.1		mg/kg	2.1		1	YES	S4VEM
Chromium	Target	308		mg/kg	308		1	YES	S4VEM
Cobalt	Target	21.3		mg/kg	21.3		1	YES	S4VEM
Copper	Target	206		mg/kg	206		1	YES	S4VEM
Lead	Target	398		mg/kg	398		1	YES	S4VEM
Manganese	Target	725		mg/kg	725		1	YES	S4VEM
Nickel	Target	40.6		mg/kg	40.6		1	YES	S4VEM
Selenium	Target	6.2	U	mg/kg	6.2	U	1	YES	S4VEM
Silver	Target	3.6		mg/kg	3.6		1	YES	S4VEM
Thallium	Target	0.48	J	mg/kg	0.48	J	1	YES	S4VEM
Vanadium	Target	85.2		mg/kg	85.2		1	YES	S4VEM
Zinc	Target	1680		mg/kg	1680		1	YES	S4VEM

Sample Summary Report

Case: 47079	Contract: EPW14035	SDG: MC0B74	Lab Code: EQI
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Sample Number: MC0B74A	Method: Metals by ICP-MS	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date: 07/11/2017	Sample Time: 10:05:00
% Moisture:		% Solids: 31.7	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Spike	5.7		mg/kg	5.7		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B74

Lab Code: EQI

Sample Number: MC0B74D	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date: 07/11/2017	Sample Time: 10:05:00
% Moisture:		% Solids: 31.7	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	1.6	UJ	mg/kg	0.38	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B74

Lab Code: EQI

Sample Number: MC0B74D	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date: 07/11/2017	Sample Time: 10:05:00
% Moisture:		% Solids: 31.7	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	1.1	J	mg/kg	1.1		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B74

Lab Code: EQI

Sample Number: MC0B74D	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date: 07/11/2017	Sample Time: 10:05:00
% Moisture:		% Solids: 31.7	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	17500		mg/kg	17500		1	YES	S4VEM
Calcium	Target	1960		mg/kg	1960		1	YES	S4VEM
Iron	Target	66300		mg/kg	66300		1	YES	S4VEM
Magnesium	Target	4770		mg/kg	4770		1	YES	S4VEM
Potassium	Target	1940		mg/kg	1940		1	YES	S4VEM
Sodium	Target	3630		mg/kg	3630		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B74

Lab Code: EQI

Sample Number: MC0B74D

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location:

pH:

Sample Date: 07/11/2017

Sample Time: 10:05:00

% Moisture:

% Solids: 31.7

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.1	J	mg/kg	1.1	J	1	YES	S4VEM
Arsenic	Target	13.3		mg/kg	13.3		1	YES	S4VEM
Barium	Target	42.5		mg/kg	42.5		1	YES	S4VEM
Beryllium	Target	1.8		mg/kg	1.8		1	YES	S4VEM
Cadmium	Target	2.3		mg/kg	2.3		1	YES	S4VEM
Chromium	Target	332		mg/kg	332		1	YES	S4VEM
Cobalt	Target	23.4		mg/kg	23.4		1	YES	S4VEM
Copper	Target	225		mg/kg	225		1	YES	S4VEM
Lead	Target	426		mg/kg	426		1	YES	S4VEM
Manganese	Target	796		mg/kg	796		1	YES	S4VEM
Nickel	Target	44.4		mg/kg	44.4		1	YES	S4VEM
Selenium	Target	2.0	J	mg/kg	2.0	J	1	YES	S4VEM
Silver	Target	4.1		mg/kg	4.1		1	YES	S4VEM
Thallium	Target	0.54	J	mg/kg	0.54	J	1	YES	S4VEM
Vanadium	Target	93.0		mg/kg	93.0		1	YES	S4VEM
Zinc	Target	1830		mg/kg	1830		1	YES	S4VEM

Sample Summary Report

Case: 47079	Contract: EPW14035	SDG: MC0B74	Lab Code: EQI
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Sample Number: MC0B74L	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture:		% Solids: 31.7	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	20100		mg/kg	20100		5	YES	S4VEM
Calcium	Target	2140	J	mg/kg	2140	J	5	YES	S4VEM
Iron	Target	72100		mg/kg	72100		5	YES	S4VEM
Magnesium	Target	5240	J	mg/kg	5240	J	5	YES	S4VEM
Potassium	Target	2270	J	mg/kg	2270	J	5	YES	S4VEM
Sodium	Target	3750	J	mg/kg	3750	J	5	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B74

Lab Code: EQI

Sample Number: MC0B74L

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location:

pH:

Sample Date:

Sample Time:

% Moisture:

% Solids: 31.7

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	12.4	U	mg/kg	12.4	U	5	YES	S4VEM
Arsenic	Target	12.4		mg/kg	12.4		5	YES	S4VEM
Barium	Target	35.4	J	mg/kg	35.4	J	5	YES	S4VEM
Beryllium	Target	6.2	U	mg/kg	6.2	U	5	YES	S4VEM
Cadmium	Target	1.8	J	mg/kg	1.8	J	5	YES	S4VEM
Chromium	Target	291		mg/kg	291		5	YES	S4VEM
Cobalt	Target	21.0		mg/kg	21.0		5	YES	S4VEM
Copper	Target	209		mg/kg	209		5	YES	S4VEM
Lead	Target	369		mg/kg	369		5	YES	S4VEM
Manganese	Target	686		mg/kg	686		5	YES	S4VEM
Nickel	Target	41.3		mg/kg	41.3		5	YES	S4VEM
Selenium	Target	30.9	U	mg/kg	30.9	U	5	YES	S4VEM
Silver	Target	3.8	J	mg/kg	3.8	J	5	YES	S4VEM
Thallium	Target	0.46	J	mg/kg	0.46	J	5	YES	S4VEM
Vanadium	Target	77.5		mg/kg	77.5		5	YES	S4VEM
Zinc	Target	1710		mg/kg	1710		5	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B74

Lab Code: EQI

Sample Number: MC0B74S	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date: 07/11/2017	Sample Time: 10:05:00
% Moisture:		% Solids: 31.7	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Spike	3.5	J	mg/kg	3.5		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B74

Lab Code: EQI

Sample Number: MC0B74S	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date: 07/11/2017	Sample Time: 10:05:00
% Moisture:		% Solids: 31.7	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Spike	2.8	J	mg/kg	2.8		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B74

Lab Code: EQI

Sample Number: MC0B74S

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location:

pH:

Sample Date: 07/11/2017

Sample Time: 10:05:00

% Moisture:

% Solids: 31.7

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Spike	20.2		mg/kg	20.2		1	YES	S4VEM
Arsenic	Spike	21.6		mg/kg	21.6		1	YES	S4VEM
Barium	Spike	618		mg/kg	618		1	YES	S4VEM
Beryllium	Spike	17.6		mg/kg	17.6		1	YES	S4VEM
Cadmium	Spike	17.3		mg/kg	17.3		1	YES	S4VEM
Chromium	Spike	362		mg/kg	362		1	YES	S4VEM
Cobalt	Spike	170		mg/kg	170		1	YES	S4VEM
Copper	Spike	277		mg/kg	277		1	YES	S4VEM
Lead	Spike	393		mg/kg	393		1	YES	S4VEM
Manganese	Spike	871		mg/kg	871		1	YES	S4VEM
Nickel	Spike	190		mg/kg	190		1	YES	S4VEM
Selenium	Spike	29.0		mg/kg	29.0		1	YES	S4VEM
Silver	Spike	18.9		mg/kg	18.9		1	YES	S4VEM
Thallium	Spike	14.5		mg/kg	14.5		1	YES	S4VEM
Vanadium	Spike	230		mg/kg	230		1	YES	S4VEM
Zinc	Spike	1820		mg/kg	1820		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B74

Lab Code: EQI

Sample Number: MC0B75	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SD-V01	pH:	Sample Date: 07/11/2017	Sample Time: 15:00:00
% Moisture:		% Solids: 33.8	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	1.4	UJ	mg/kg	0.21	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B74

Lab Code: EQI

Sample Number: MC0B75	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SD-V01	pH:	Sample Date: 07/11/2017	Sample Time: 15:00:00
% Moisture:		% Solids: 33.8	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.86		mg/kg	0.86		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B74

Lab Code: EQI

Sample Number: MC0B75	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SD-V01	pH:	Sample Date: 07/11/2017	Sample Time: 15:00:00
% Moisture:		% Solids: 33.8	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	14200		mg/kg	14200		1	YES	S4VEM
Calcium	Target	1630		mg/kg	1630		1	YES	S4VEM
Iron	Target	38200		mg/kg	38200		1	YES	S4VEM
Magnesium	Target	3640		mg/kg	3640		1	YES	S4VEM
Potassium	Target	1710		mg/kg	1710		1	YES	S4VEM
Sodium	Target	3300		mg/kg	3300		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B74

Lab Code: EQI

Sample Number: MC0B75

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location: SD-V01

pH:

Sample Date: 07/11/2017

Sample Time: 15:00:00

% Moisture:

% Solids: 33.8

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	2.8	UJ	mg/kg	0.80	J	1	YES	S4VEM
Arsenic	Target	9.5		mg/kg	9.5		1	YES	S4VEM
Barium	Target	36.7		mg/kg	36.7		1	YES	S4VEM
Beryllium	Target	1.1	J	mg/kg	1.1	J	1	YES	S4VEM
Cadmium	Target	2.1		mg/kg	2.1		1	YES	S4VEM
Chromium	Target	228		mg/kg	228		1	YES	S4VEM
Cobalt	Target	15.4		mg/kg	15.4		1	YES	S4VEM
Copper	Target	175		mg/kg	175		1	YES	S4VEM
Lead	Target	263		mg/kg	263		1	YES	S4VEM
Manganese	Target	322		mg/kg	322		1	YES	S4VEM
Nickel	Target	29.0		mg/kg	29.0		1	YES	S4VEM
Selenium	Target	2.1	J	mg/kg	2.1	J	1	YES	S4VEM
Silver	Target	2.0		mg/kg	2.0		1	YES	S4VEM
Thallium	Target	0.80	J	mg/kg	0.80	J	1	YES	S4VEM
Vanadium	Target	51.1		mg/kg	51.1		1	YES	S4VEM
Zinc	Target	1030		mg/kg	1030		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B74

Lab Code: EQI

Sample Number: MC0B76	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SS-K03	pH:	Sample Date: 07/12/2017	Sample Time: 10:20:00
% Moisture:		% Solids: 42.3	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	1.2	UJ	mg/kg	0.54	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B74

Lab Code: EQI

Sample Number: MC0B76	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SS-K03	pH:	Sample Date: 07/12/2017	Sample Time: 10:20:00
% Moisture:		% Solids: 42.3	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.44		mg/kg	0.44		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B74

Lab Code: EQI

Sample Number: MC0B76	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SS-K03	pH:	Sample Date: 07/12/2017	Sample Time: 10:20:00
% Moisture:		% Solids: 42.3	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	21500		mg/kg	21500		1	YES	S4VEM
Calcium	Target	1480		mg/kg	1480		1	YES	S4VEM
Iron	Target	40800		mg/kg	40800		1	YES	S4VEM
Magnesium	Target	5010		mg/kg	5010		1	YES	S4VEM
Potassium	Target	3200		mg/kg	3200		1	YES	S4VEM
Sodium	Target	3830		mg/kg	3830		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B74

Lab Code: EQI

Sample Number: MC0B76

Method: Metals by ICP-MS

Matrix: Soil

MA Number:

Sample Location: SS-K03

pH:

Sample Date: 07/12/2017

Sample Time: 10:20:00

% Moisture:

% Solids: 42.3

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	2.2	UJ	mg/kg	0.47	J	1	YES	S4VEM
Arsenic	Target	9.6		mg/kg	9.6		1	YES	S4VEM
Barium	Target	29.6		mg/kg	29.6		1	YES	S4VEM
Beryllium	Target	1.5		mg/kg	1.5		1	YES	S4VEM
Cadmium	Target	1.3		mg/kg	1.3		1	YES	S4VEM
Chromium	Target	96.2		mg/kg	96.2		1	YES	S4VEM
Cobalt	Target	12.0		mg/kg	12.0		1	YES	S4VEM
Copper	Target	56.8		mg/kg	56.8		1	YES	S4VEM
Lead	Target	159		mg/kg	159		1	YES	S4VEM
Manganese	Target	421		mg/kg	421		1	YES	S4VEM
Nickel	Target	26.3		mg/kg	26.3		1	YES	S4VEM
Selenium	Target	1.4	J	mg/kg	1.4	J	1	YES	S4VEM
Silver	Target	1.2		mg/kg	1.2		1	YES	S4VEM
Thallium	Target	0.38	J	mg/kg	0.38	J	1	YES	S4VEM
Vanadium	Target	45.6		mg/kg	45.6		1	YES	S4VEM
Zinc	Target	593		mg/kg	593		1	YES	S4VEM

Sample Summary Report

Case: 47079	Contract: EPW14035	SDG: MC0B74	Lab Code: EQI
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Sample Number: MC0B89	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location: SS-V02	pH:	Sample Date: 07/12/2017	Sample Time: 14:02:00
% Moisture:	% Solids: 41.1		

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	1.1	UJ	mg/kg	1.1	U	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B74

Lab Code: EQI

Sample Number: MC0B89	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location: SS-V02	pH:	Sample Date: 07/12/2017	Sample Time: 14:02:00
% Moisture:		% Solids: 41.1	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.28	U	mg/kg	0.070	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B74

Lab Code: EQI

Sample Number: MC0B89	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location: SS-V02	pH:	Sample Date: 07/12/2017	Sample Time: 14:02:00
% Moisture:		% Solids: 41.1	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	16900		mg/kg	16900		1	YES	S4VEM
Calcium	Target	1190		mg/kg	1190		1	YES	S4VEM
Iron	Target	26800		mg/kg	26800		1	YES	S4VEM
Magnesium	Target	3440		mg/kg	3440		1	YES	S4VEM
Potassium	Target	2290		mg/kg	2290		1	YES	S4VEM
Sodium	Target	3070		mg/kg	3070		1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B74

Lab Code: EQI

Sample Number: MC0B89	Method: Metals by ICP-MS	Matrix: Soil	MA Number:
Sample Location: SS-V02	pH:	Sample Date: 07/12/2017	Sample Time: 14:02:00
% Moisture:		% Solids: 41.1	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.9	UJ	mg/kg	1.9	U	1	YES	S4VEM
Arsenic	Target	4.9		mg/kg	4.9		1	YES	S4VEM
Barium	Target	20.7		mg/kg	20.7		1	YES	S4VEM
Beryllium	Target	0.93	J	mg/kg	0.93	J	1	YES	S4VEM
Cadmium	Target	0.23	J	mg/kg	0.23	J	1	YES	S4VEM
Chromium	Target	29.8		mg/kg	29.8		1	YES	S4VEM
Cobalt	Target	9.0		mg/kg	9.0		1	YES	S4VEM
Copper	Target	18.3		mg/kg	18.3		1	YES	S4VEM
Lead	Target	23.0		mg/kg	23.0		1	YES	S4VEM
Manganese	Target	265		mg/kg	265		1	YES	S4VEM
Nickel	Target	16.8		mg/kg	16.8		1	YES	S4VEM
Selenium	Target	4.8	U	mg/kg	4.8	U	1	YES	S4VEM
Silver	Target	0.12	J	mg/kg	0.12	J	1	YES	S4VEM
Thallium	Target	0.17	J	mg/kg	0.17	J	1	YES	S4VEM
Vanadium	Target	29.7		mg/kg	29.7		1	YES	S4VEM
Zinc	Target	79.2		mg/kg	79.2		1	YES	S4VEM

Sample Summary Report

Case: 47079	Contract: EPW14035	SDG: MC0B74	Lab Code: EQI
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Sample Number: PBS001	Method: Metals by ICP-AES	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture:		% Solids: 100	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Aluminum	Target	20.0	U	mg/kg	20.0	U	1	YES	S4VEM
Calcium	Target	500	U	mg/kg	500	U	1	YES	S4VEM
Iron	Target	10.0	U	mg/kg	10.0	U	1	YES	S4VEM
Magnesium	Target	500	U	mg/kg	500	U	1	YES	S4VEM
Potassium	Target	500	U	mg/kg	500	U	1	YES	S4VEM
Sodium	Target	500	U	mg/kg	500	U	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B74

Lab Code: EQI

Sample Number: PBS001	Method: Metals by ICP-MS	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture:		% Solids: 100	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Antimony	Target	1.0	U	mg/kg	1.0	U	1	YES	S4VEM
Arsenic	Target	0.50	U	mg/kg	0.50	U	1	YES	S4VEM
Barium	Target	5.0	U	mg/kg	5.0	U	1	YES	S4VEM
Beryllium	Target	0.50	U	mg/kg	0.50	U	1	YES	S4VEM
Cadmium	Target	0.50	U	mg/kg	0.50	U	1	YES	S4VEM
Chromium	Target	0.22	J	mg/kg	0.22	J	1	YES	S4VEM
Cobalt	Target	0.50	U	mg/kg	0.50	U	1	YES	S4VEM
Copper	Target	1.0	U	mg/kg	1.0	U	1	YES	S4VEM
Lead	Target	0.50	U	mg/kg	0.50	U	1	YES	S4VEM
Manganese	Target	0.50	U	mg/kg	0.50	U	1	YES	S4VEM
Nickel	Target	0.50	U	mg/kg	0.50	U	1	YES	S4VEM
Selenium	Target	2.5	U	mg/kg	2.5	U	1	YES	S4VEM
Silver	Target	0.50	U	mg/kg	0.50	U	1	YES	S4VEM
Thallium	Target	0.50	U	mg/kg	0.50	U	1	YES	S4VEM
Vanadium	Target	0.23	J	mg/kg	0.23	J	1	YES	S4VEM
Zinc	Target	1.0	U	mg/kg	1.0	U	1	YES	S4VEM

Sample Summary Report

Case: 47079	Contract: EPW14035	SDG: MC0B74	Lab Code: EQI
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Sample Number: PBS002	Method: Mercury by Cold Vapor	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture:		% Solids: 100	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Mercury	Target	0.0084	J	mg/kg	0.0084	J	1	YES	S4VEM

Sample Summary Report

Case: 47079	Contract: EPW14035	SDG: MC0B74	Lab Code: EQI
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Sample Number: PBS003	Method: Cyanide	Matrix: Soil	MA Number:
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture:		% Solids: 100	

Analyte Name	Analyte Type	Validation Result	Validation Flag	Units	Lab Result	Lab Flag	Dilution Factor	Reportable	Validation Level
Cyanide	Target	-0.020	J	mg/kg	-0.020	J	1	YES	S4VEM

Sample Summary Report

Case: 47079

Contract: EPW14035

SDG: MC0B74

Lab Code: EQI




UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III

Environmental Sciences Center
701 Mapes Road
Fort Meade, Maryland 20755-5350

DATE: 8/24/2017

SUBJECT: Region III Data QA Review

FROM: Brandon McDonald 
Region III ESAT RPO (3EA22)

TO: GREG HAM
Hazardous Site Cleanup Division (HSCD)

Attached is the data validation report for the SPARROWS POINT- SEDIMENT ASSESSMENT SOUTHEAST AREA site for DAS# R35186; SDG# I4184 completed by the Region III Environmental Services Assistance Team (ESAT) contractor, ICF International, under the direction of Region III EAID.

If you have any questions regarding this review, please call Brandon McDonald at (410) 305-2607 or you can call Eric Graybill at (410)-305-2665.

cc: Charles Rapone(WESTON SOLUTIONS)
Laura Mathew (WESTON SOLUTIONS)

TO: #0002 TDF: #0817039

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ICF
ESAT Region 3
US Environmental Protection Agency Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Phone 410-305-3012

Date: August 15, 2017

To: Brandon McDonald
ESAT Region 3 Project Officer

From: Lisa D. Penix
Validator

Kurt Roby
Reviewer

Subject: Inorganic Data Validation (S3VM)
Sparrows Point-Sediment Assessment Southeast Area
R35186 I4184

Overview

This data package consisted of ten (10) surface sediment samples analyzed for pH, TOC, and acid volatile sulfide / simultaneously extracted metals consisting of cadmium (Cd), copper (Cu), lead (Pb), mercury (Hg), nickel (Ni), and zinc (Zn).

Analyses were performed by Chemtech Consulting Group (CHM) according to EPA Method 9045C, Lloyd Kahn method, and Allen & Fu method followed by EPA methods 6010C (ICP-AES) and 7471B (cold vapor atomic absorption technique). The samples were submitted to the laboratory directly by the contractor and not through the EPA Technical Services Branch (TSB). Environmental Services Assistance Team (ESAT) has been tasked to evaluate laboratory reported data for the purpose of usability.

Data were validated according to the National Functional Guidelines for Inorganic Superfund Methods Data Review and applicable USEPA Region 3 modifications. The validation report has been assigned the Superfund Data Validation Level Stage_3_Validation_Manual (S3VM).

This validation is based on the hardcopy data package received at Region 3 on July 31, 2017.

Summary

No significant data quality outliers or technical deficiencies were identified that would require rejection of sample results. Less significant data quality outliers resulting in estimation of sample results were identified including, but not limited to, laboratory quality control issues and blank contamination as detailed below.

Minor Problems

All reported TOC results exceeded the calibration range of the instrumentation. Reported results are estimated and have been qualified "J".

Percent differences (%Ds) in the ICP serial dilution analysis were outside the control limit (>10%) for Cu, Pb, and Zn. Detected concentrations for these analytes are estimated and have been qualified "J".

Notes

Analytes detected below Contract Required Quantitation Limits (CRQLs) are estimated and have been qualified "J".

Contaminants found in the analysis of the associated blanks in this data set did not qualify field sample data.

Accuracy and precision criteria were met by the laboratory in the initial and continuing calibration verification standard analyses associated with the samples in this SDG.

Percent recoveries and Relative Percent Differences (RPDs) in Laboratory Control Samples, Laboratory Duplicate and Matrix Spike/Matrix Spike Duplicate (MS/MSD) analyses were within control limits. TOC matrix spike analysis was performed on a sample not present in this SDG. No data were qualified based on this finding.

Glossary of Inorganic Data Qualifier Codes

Validation Qualifiers	In order of descending precedence. Only one of these qualifiers may apply to any result.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit
B	The result is presumed a blank contaminant. This qualifier is used for drinking water samples only.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.

Report of Analysis

Client:	Weston Solutions	Date Collected:	07/11/17 10:26
Project:	R35186	Date Received:	07/13/17
Client Sample ID:	MC0B01	SDG No.:	I4184
Lab Sample ID:	I4184-01	Matrix:	SOIL
		% Solid:	48.2

Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units(Dry Weight)	Prep Date	Date Ana.	Ana Met.
Acid Volatile Sulfide	191		1	10.3	10.3	20.6	mg/Kg	07/14/17 12:00	07/14/17 14:37	Allen & Flu
pH	7.86	H	1	0	0	0	pH		07/13/17 16:37	9045C
TOC	26900	OR J	1	11.8	125	250	mg/Kg		07/20/17 14:44	Lloyd Kahn

D.V.
8/15/17

Comments:

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

D = Dilution

Q = indicates LCS control criteria did not meet requirements

H = Sample Analysis Out Of Hold Time

J = Estimated Value

B = Analyte Found in Associated Method Blank

* = indicates the duplicate analysis is not within control limits.

E = Indicates the reported value is estimated because of the presence of interference.

OR = Over Range

N = Spiked sample recovery not within control limits

Report of Analysis

Client:	Weston Solutions	Date Collected:	07/11/17
Project:	R35186	Date Received:	07/13/17
Client Sample ID:	MC0B01	SDG No.:	I4184
Lab Sample ID:	I4184-01	Matrix:	WATER
Level (low/med):	low	% Solid:	48.2

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-43-9	Cadmium	16.8	J	1	0.5	0.75	3	ug/L	07/17/17 10:07	07/18/17 13:47	SW6010
7440-50-8	Copper	229	J	1	2	2.5	10	ug/L	07/17/17 10:07	07/18/17 13:47	SW6010
7439-92-1	Lead	1610	J	1	1.5	1.5	6	ug/L	07/17/17 10:07	07/18/17 13:47	SW6010
7439-97-6	Mercury	0.1	U	1	0.1	0.1	0.2	ug/L	07/17/17 10:21	07/17/17 17:19	SW7470A
7440-02-0	Nickel	195	J	1	4.2	5.0	20	ug/L	07/17/17 10:07	07/18/17 13:47	SW6010
7440-66-6	Zinc	4510	J	1	5	5.0	20	ug/L	07/17/17 10:07	07/18/17 13:47	SW6010

D.V.
8/15/17

Color Before:	Colorless	Clarity Before:	Texture:	Clear
Color After:	Colorless	Clarity After:	Artifacts:	Clear
Comments:	Metals Group1			

U = Not Detected

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Report of Analysis

Client:	Weston Solutions	Date Collected:	07/11/17 13:16
Project:	R35186	Date Received:	07/13/17
Client Sample ID:	MC0B02	SDG No.:	I4184
Lab Sample ID:	I4184-02	Matrix:	SOIL
		% Solid:	37.4

Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units(Dry Weight)	Prep Date	Date Ana.	Ana Met.
Acid Volatile Sulfide	284		1	13.3	13.25	26.5	mg/Kg	07/14/17 12:00	07/14/17 14:50	Allen & Flu
pH	7.42	H	1	0	0	0	pH		07/13/17 16:40	9045C
TOC	21300	OR J	1	11.8	125	250	mg/Kg		07/20/17 15:03	Lloyd Kahn

D.V.
8/15/17

Comments:

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J = Estimated Value
B = Analyte Found in Associated Method Blank
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E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N = Spiked sample recovery not within control limits

Report of Analysis

Client:	Weston Solutions	Date Collected:	07/11/17
Project:	R35186	Date Received:	07/13/17
Client Sample ID:	MC0B02	SDG No.:	I4184
Lab Sample ID:	I4184-02	Matrix:	WATER
Level (low/med):	low	% Solid:	37.4

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-43-9	Cadmium	11.3	J	1	0.5	0.75	3	ug/L	07/17/17 10:07	07/19/17 16:00	SW6010
7440-50-8	Copper	167	J	1	2	2.5	10	ug/L	07/17/17 10:07	07/19/17 16:00	SW6010
7439-92-1	Lead	1320	J	1	1.5	1.5	6	ug/L	07/17/17 10:07	07/19/17 16:00	SW6010
7439-97-6	Mercury	0.1	U	1	0.1	0.1	0.2	ug/L	07/17/17 10:21	07/17/17 17:27	SW7470A
7440-02-0	Nickel	255	J	1	4.2	5.0	20	ug/L	07/17/17 10:07	07/19/17 16:00	SW6010
7440-66-6	Zinc	4310	J	1	5	5.0	20	ug/L	07/17/17 10:07	07/19/17 16:00	SW6010

D.V.
8/15/17

Color Before:	Colorless	Clarity Before:	Texture:	Clear
Color After:	Colorless	Clarity After:	Artifacts:	Clear
Comments:	Metals Group1			

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

D = Dilution

Q = indicates LCS control criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

* = indicates the duplicate analysis is not within control limits.

E = Indicates the reported value is estimated because of the presence of interference.

OR = Over Range

N = Spiked sample recovery not within control limits

Report of Analysis

Client:	Weston Solutions	Date Collected:	07/11/17 14:20
Project:	R35186	Date Received:	07/13/17
Client Sample ID:	MC0B03	SDG No.:	I4184
Lab Sample ID:	I4184-03	Matrix:	SOIL
		% Solid:	41.8

Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units(Dry Weight)	Prep Date	Date Ana.	Ana Met.
Acid Volatile Sulfide	209		1	11.9	11.9	23.8	mg/Kg	07/14/17 12:00	07/14/17 14:53	Allen & Flu
pH	7.59	H	1	0	0	0	pH		07/13/17 16:41	9045C
TOC	24500	OR	1	11.8	125	250	mg/Kg		07/20/17 15:18	Lloyd Kahn

D. V.
8/15/17

Comments:

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

D = Dilution

Q = indicates LCS control criteria did not meet requirements

H = Sample Analysis Out Of Hold Time

J = Estimated Value

B = Analyte Found in Associated Method Blank

* = indicates the duplicate analysis is not within control limits.

E = Indicates the reported value is estimated because of the presence of interference.

OR = Over Range

N = Spiked sample recovery not within control limits

Report of Analysis

Client:	Weston Solutions	Date Collected:	07/11/17
Project:	R35186	Date Received:	07/13/17
Client Sample ID:	MC0B03	SDG No.:	I4184
Lab Sample ID:	I4184-03	Matrix:	WATER
Level (low/med):	low	% Solid:	41.8

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-43-9	Cadmium	18.3	J	1	0.5	0.75	3	ug/L	07/17/17 10:07	07/19/17 16:04	SW6010
7440-50-8	Copper	398	J	1	2	2.5	10	ug/L	07/17/17 10:07	07/19/17 16:04	SW6010
7439-92-1	Lead	3140	J	1	1.5	1.5	6	ug/L	07/17/17 10:07	07/19/17 16:04	SW6010
7439-97-6	Mercury	0.1	U	1	0.1	0.1	0.2	ug/L	07/17/17 10:21	07/17/17 17:34	SW7470A
7440-02-0	Nickel	298	J	1	4.2	5.0	20	ug/L	07/17/17 10:07	07/19/17 16:04	SW6010
7440-66-6	Zinc	7420	J	1	5	5.0	20	ug/L	07/17/17 10:07	07/19/17 16:04	SW6010

D.V.
8/15/17

Color Before:	Colorless	Clarity Before:	Texture:	Clear
Color After:	Colorless	Clarity After:	Artifacts:	Clear
Comments:	Metals Group1			

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

D = Dilution

Q = indicates LCS control criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

* = indicates the duplicate analysis is not within control limits.

E = Indicates the reported value is estimated because of the presence of interference.

OR = Over Range

N = Spiked sample recovery not within control limits

Report of Analysis

Client:	Weston Solutions	Date Collected:	07/11/17 15:34
Project:	R35186	Date Received:	07/13/17
Client Sample ID:	MC0B04	SDG No.:	14184
Lab Sample ID:	I4184-04	Matrix:	SOIL
		% Solid:	75.6

Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units(Dry Weight)	Prep Date	Date Ana.	Ana Met.
Acid Volatile Sulfide	143		1	6.56	6.55	13.1	mg/Kg	07/14/17 12:00	07/14/17 14:56	Allen & Flu
pH	7.74	H	1	0	0	0	pH		07/13/17 16:42	9045C
TOC	7660	OK	1	11.8	125	250	mg/Kg		07/20/17 16:05	Lloyd Kahn

D.V.
8/15/17

Comments:

U = Not Detected
 LOQ = Limit of Quantitation
 MDL = Method Detection Limit
 LOD = Limit of Detection
 D = Dilution
 Q = indicates LCS control criteria did not meet requirements
 H = Sample Analysis Out Of Hold Time

J = Estimated Value
 B = Analyte Found in Associated Method Blank
 * = indicates the duplicate analysis is not within control limits.
 E = Indicates the reported value is estimated because of the presence of interference.
 OR = Over Range
 N = Spiked sample recovery not within control limits

Report of Analysis

Client:	Weston Solutions	Date Collected:	07/11/17
Project:	R35186	Date Received:	07/13/17
Client Sample ID:	MC0B04	SDG No.:	I4184
Lab Sample ID:	I4184-04	Matrix:	WATER
Level (low/med):	low	% Solid:	75.6

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-43-9	Cadmium	21.3		1	0.5	0.75	3	ug/L	07/17/17 10:07	07/19/17 16:09	SW6010
7440-50-8	Copper	404	J	1	2	2.5	10	ug/L	07/17/17 10:07	07/19/17 16:09	SW6010
7439-92-1	Lead	3280	J	1	1.5	1.5	6	ug/L	07/17/17 10:07	07/19/17 16:09	SW6010
7439-97-6	Mercury	0.478		1	0.1	0.1	0.2	ug/L	07/17/17 10:21	07/17/17 17:36	SW7470A
7440-02-0	Nickel	456		1	4.2	5.0	20	ug/L	07/17/17 10:07	07/19/17 16:09	SW6010
7440-66-6	Zinc	14600	J	1	5	5.0	20	ug/L	07/17/17 10:07	07/19/17 16:09	SW6010

D.V.
8/15/17

Color Before:	Colorless	Clarity Before:	Texture:	Clear
Color After:	Colorless	Clarity After:	Artifacts:	Clear
Comments:	Metals Group1			

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

D = Dilution

Q = indicates LCS control criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

* = indicates the duplicate analysis is not within control limits.

E = Indicates the reported value is estimated because of the presence of interference.

OR = Over Range

N = Spiked sample recovery not within control limits

Report of Analysis

Client:	Weston Solutions	Date Collected:	07/12/17 12:00
Project:	R35186	Date Received:	07/13/17
Client Sample ID:	MC0B23	SDG No.:	I4184
Lab Sample ID:	I4184-05	Matrix:	SOIL
		% Solid:	49.1

Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units(Dry Weight)	Prep Date	Date Ana.	Ana Met.
Acid Volatile Sulfide	139		1	10.1	10.1	20.2	mg/Kg	07/14/17 12:00	07/14/17 14:58	Allen & Flu
pH	8.03	H	1	0	0	0	pH		07/13/17 16:43	9045C
TOC	14200	ORJ	1	11.8	125	250	mg/Kg		07/20/17 16:21	Lloyd Kahn

D.V.

8/15/17

Comments:

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

D = Dilution

Q = indicates LCS control criteria did not meet requirements

H = Sample Analysis Out Of Hold Time

J = Estimated Value

B = Analyte Found in Associated Method Blank

* = indicates the duplicate analysis is not within control limits.

E = Indicates the reported value is estimated because of the presence of interference.

OR = Over Range

N = Spiked sample recovery not within control limits

Report of Analysis

Client:	Weston Solutions	Date Collected:	07/12/17
Project:	R35186	Date Received:	07/13/17
Client Sample ID:	MC0B23	SDG No.:	I4184
Lab Sample ID:	I4184-05	Matrix:	WATER
Level (low/med):	low	% Solid:	49.1

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-43-9	Cadmium	9.46		1	0.5	0.75	3	ug/L	07/17/17 10:07	07/19/17 16:13	SW6010
7440-50-8	Copper	47.6	J	1	2	2.5	10	ug/L	07/17/17 10:07	07/19/17 16:13	SW6010
7439-92-1	Lead	587	J	1	1.5	1.5	6	ug/L	07/17/17 10:07	07/19/17 16:13	SW6010
7439-97-6	Mercury	0.1	U	1	0.1	0.1	0.2	ug/L	07/17/17 10:21	07/17/17 17:38	SW7470A
7440-02-0	Nickel	56.4		1	4.2	5.0	20	ug/L	07/17/17 10:07	07/19/17 16:13	SW6010
7440-66-6	Zinc	2910	J	1	5	5.0	20	ug/L	07/17/17 10:07	07/19/17 16:13	SW6010

D.V.
8/15/17

Color Before:	Colorless	Clarity Before:	Texture:	Clear
Color After:	Colorless	Clarity After:	Artifacts:	Clear
Comments:	Metals Group1			

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N = Spiked sample recovery not within control limits

Report of Analysis

Client:	Weston Solutions	Date Collected:	07/12/17 11:25
Project:	R35186	Date Received:	07/13/17
Client Sample ID:	MC0B78	SDG No.:	I4184
Lab Sample ID:	I4184-06	Matrix:	SOIL
		% Solid:	39.1

Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units(Dry Weight)	Prep Date	Date Ana.	Ana Met.
Acid Volatile Sulfide	300		1	12.7	12.7	25.4	mg/Kg	07/14/17 12:00	07/14/17 15:02	Allen & Flu
pH	8.27	H	1	0	0	0	pH		07/13/17 16:45	9045C
TOC	22200	ORJ	1	11.8	125	250	mg/Kg		07/20/17 16:37	Lloyd Kahn

D.V.
8/15/17

Comments:

U = Not Detected
 LOQ = Limit of Quantitation
 MDL = Method Detection Limit
 LOD = Limit of Detection
 D = Dilution
 Q = indicates LCS control criteria did not meet requirements
 H = Sample Analysis Out Of Hold Time

J = Estimated Value
 B = Analyte Found in Associated Method Blank
 * = indicates the duplicate analysis is not within control limits.
 E = Indicates the reported value is estimated because of the presence of interference.
 OR = Over Range
 N = Spiked sample recovery not within control limits

Report of Analysis

Client:	Weston Solutions	Date Collected:	07/12/17
Project:	R35186	Date Received:	07/13/17
Client Sample ID:	MC0B78	SDG No.:	I4184
Lab Sample ID:	I4184-06	Matrix:	WATER
Level (low/med):	low	% Solid:	39.1

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-43-9	Cadmium	19.8	J	1	0.5	0.75	3	ug/L	07/17/17 10:07	07/19/17 16:17	SW6010
7440-50-8	Copper	433	J	1	2	2.5	10	ug/L	07/17/17 10:07	07/19/17 16:17	SW6010
7439-92-1	Lead	2410	J	1	1.5	1.5	6	ug/L	07/17/17 10:07	07/19/17 16:17	SW6010
7439-97-6	Mercury	0.1	U	1	0.1	0.1	0.2	ug/L	07/17/17 10:21	07/17/17 17:40	SW7470A
7440-02-0	Nickel	130	J	1	4.2	5.0	20	ug/L	07/17/17 10:07	07/19/17 16:17	SW6010
7440-66-6	Zinc	8340	J	1	5	5.0	20	ug/L	07/17/17 10:07	07/19/17 16:17	SW6010

D.V.
8/15/17

Color Before:	Colorless	Clarity Before:	Texture:	Clear
Color After:	Colorless	Clarity After:	Artifacts:	Clear
Comments:	Metals Group1			

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N = Spiked sample recovery not within control limits

Report of Analysis

Client:	Weston Solutions	Date Collected:	07/12/17 10:45
Project:	R35186	Date Received:	07/13/17
Client Sample ID:	MC0B79	SDG No.:	14184
Lab Sample ID:	14184-07	Matrix:	SOIL
		% Solid:	40.1

Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units(Dry Weight)	Prep Date	Date Ana.	Ana Met.
Acid Volatile Sulfide	270		1	12.4	12.4	24.8	mg/Kg	07/14/17 12:00	07/14/17 15:05	Allen & Flu
pH	7.31	H	1	0	0	0	pH		07/13/17 16:46	9045C
TOC	24200	OR	1	11.8	125	250	mg/Kg		07/20/17 17:00	Lloyd Kahn

D.V.

8/15/17

Comments:

U = Not Detected
 LOQ = Limit of Quantitation
 MDL = Method Detection Limit
 LOD = Limit of Detection
 D = Dilution
 Q = indicates LCS control criteria did not meet requirements
 H = Sample Analysis Out Of Hold Time

J = Estimated Value
 B = Analyte Found in Associated Method Blank
 * = indicates the duplicate analysis is not within control limits.
 E = Indicates the reported value is estimated because of the presence of interference.
 OR = Over Range
 N = Spiked sample recovery not within control limits

Report of Analysis

Client:	Weston Solutions	Date Collected:	07/12/17
Project:	R35186	Date Received:	07/13/17
Client Sample ID:	MC0B79	SDG No.:	I4184
Lab Sample ID:	I4184-07	Matrix:	WATER
Level (low/med):	low	% Solid:	40.1

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-43-9	Cadmium	26		1	0.5	0.75	3	ug/L	07/17/17 10:07	07/19/17 16:21	SW6010
7440-50-8	Copper	1070	J	1	2	2.5	10	ug/L	07/17/17 10:07	07/19/17 16:21	SW6010
7439-92-1	Lead	3900	J	1	1.5	1.5	6	ug/L	07/17/17 10:07	07/19/17 16:21	SW6010
7439-97-6	Mercury	0.1	U	1	0.1	0.1	0.2	ug/L	07/17/17 10:21	07/17/17 17:42	SW7470A
7440-02-0	Nickel	233		1	4.2	5.0	20	ug/L	07/17/17 10:07	07/19/17 16:21	SW6010
7440-66-6	Zinc	11400	J	1	5	5.0	20	ug/L	07/17/17 10:07	07/19/17 16:21	SW6010

D.V.
8/15/17

Color Before:	Colorless	Clarity Before:	Texture:	Clear
Color After:	Colorless	Clarity After:	Artifacts:	Clear
Comments:	Metals Group1			

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

D = Dilution

Q = indicates LCS control criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

* = indicates the duplicate analysis is not within control limits.

E = Indicates the reported value is estimated because of the presence of interference.

OR = Over Range

N = Spiked sample recovery not within control limits

Report of Analysis

Client:	Weston Solutions	Date Collected:	07/12/17 09:15
Project:	R35186	Date Received:	07/13/17
Client Sample ID:	MC0B80	SDG No.:	I4184
Lab Sample ID:	I4184-08	Matrix:	SOIL
		% Solid:	41.7

Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units(Dry Weight)	Prep Date	Date Ana.	Ana Met.
Acid Volatile Sulfide	240		1	11.9	11.9	23.8	mg/Kg	07/14/17 12:00	07/14/17 15:08	Allen & Flu
pH	7.42	H	1	0	0	0	pH		07/13/17 16:49	9045C
TOC	28100	OR	1	11.8	125	250	mg/Kg		07/20/17 17:17	Lloyd Kahn

D.V.
8/15/17

Comments:

U = Not Detected
 LOQ = Limit of Quantitation
 MDL = Method Detection Limit
 LOD = Limit of Detection
 D = Dilution
 Q = indicates LCS control criteria did not meet requirements
 H = Sample Analysis Out Of Hold Time

J = Estimated Value
 B = Analyte Found in Associated Method Blank
 * = indicates the duplicate analysis is not within control limits.
 E = Indicates the reported value is estimated because of the presence of interference.
 OR = Over Range
 N = Spiked sample recovery not within control limits

Report of Analysis

Client:	Weston Solutions	Date Collected:	07/12/17
Project:	R35186	Date Received:	07/13/17
Client Sample ID:	MC0B80	SDG No.:	I4184
Lab Sample ID:	I4184-08	Matrix:	WATER
Level (low/med):	low	% Solid:	41.7

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-43-9	Cadmium	31.5	J	1	0.5	0.75	3	ug/L	07/17/17 10:07	07/19/17 16:25	SW6010
7440-50-8	Copper	330	J	1	2	2.5	10	ug/L	07/17/17 10:07	07/19/17 16:25	SW6010
7439-92-1	Lead	3480	J	1	1.5	1.5	6	ug/L	07/17/17 10:07	07/19/17 16:25	SW6010
7439-97-6	Mercury	0.1	U	1	0.1	0.1	0.2	ug/L	07/17/17 10:21	07/17/17 17:44	SW7470A
7440-02-0	Nickel	145	J	1	4.2	5.0	20	ug/L	07/17/17 10:07	07/19/17 16:25	SW6010
7440-66-6	Zinc	11800	J	1	5	5.0	20	ug/L	07/17/17 10:07	07/19/17 16:25	SW6010

D.V.
8/15/17

Color Before:	Colorless	Clarity Before:	Texture:	Clear
Color After:	Colorless	Clarity After:	Artifacts:	Clear
Comments:	Metals Group1			

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

D = Dilution

Q = indicates LCS control criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

* = indicates the duplicate analysis is not within control limits.

E = Indicates the reported value is estimated because of the presence of interference.

OR = Over Range

N = Spiked sample recovery not within control limits

Report of Analysis

Client:	Weston Solutions	Date Collected:	07/12/17 13:21
Project:	R35186	Date Received:	07/13/17
Client Sample ID:	MC0B82	SDG No.:	I4184
Lab Sample ID:	I4184-09	Matrix:	SOIL
		% Solid:	37.4

Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units(Dry Weight)	Prep Date	Date Ana.	Ana Met.
Acid Volatile Sulfide	468		1	13.3	13.3	26.6	mg/Kg	07/14/17 12:00	07/14/17 15:12	Allen & Flu
pH	8.48	H	1	0	0	0	pH		07/13/17 16:50	9045C
TOC	14500	ORS	1	11.8	125	250	mg/Kg		07/20/17 17:34	Lloyd Kahn

D.V.
8/15/17

Comments:

U = Not Detected
 LOQ = Limit of Quantitation
 MDL = Method Detection Limit
 LOD = Limit of Detection
 D = Dilution
 Q = indicates LCS control criteria did not meet requirements
 H = Sample Analysis Out Of Hold Time

J = Estimated Value
 B = Analyte Found in Associated Method Blank
 * = indicates the duplicate analysis is not within control limits.
 E_i = Indicates the reported value is estimated because of the presence of interference.
 OR = Over Range
 N = Spiked sample recovery not within control limits

Report of Analysis

Client:	Weston Solutions	Date Collected:	07/12/17
Project:	R35186	Date Received:	07/13/17
Client Sample ID:	MC0B82	SDG No.:	I4184
Lab Sample ID:	I4184-09	Matrix:	WATER
Level (low/med):	low	% Solid:	37.4

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-43-9	Cadmium	34.8	J	1	0.5	0.75	3	ug/L	07/17/17 10:07	07/19/17 16:47	SW6010
7440-50-8	Copper	1200	J	1	2	2.5	10	ug/L	07/17/17 10:07	07/19/17 16:47	SW6010
7439-92-1	Lead	4720	J	1	1.5	1.5	6	ug/L	07/17/17 10:07	07/19/17 16:47	SW6010
7439-97-6	Mercury	0.1	U	1	0.1	0.1	0.2	ug/L	07/17/17 10:21	07/17/17 17:47	SW7470A
7440-02-0	Nickel	245	J	1	4.2	5.0	20	ug/L	07/17/17 10:07	07/19/17 16:47	SW6010
7440-66-6	Zinc	12200	J	1	5	5.0	20	ug/L	07/17/17 10:07	07/19/17 16:47	SW6010

D. V.
8/15/17

Color Before:	Colorless	Clarity Before:	Texture:	Clear
Color After:	Colorless	Clarity After:	Artifacts:	Clear
Comments:	Metals Group1			

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

D = Dilution

Q = indicates LCS control criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

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E = Indicates the reported value is estimated because of the presence of interference.

OR = Over Range

N = Spiked sample recovery not within control limits

Report of Analysis

Client:	Weston Solutions	Date Collected:	07/12/17 14:00
Project:	R35186	Date Received:	07/13/17
Client Sample ID:	MC0B83	SDG No.:	14184
Lab Sample ID:	I4184-10	Matrix:	SOIL
		% Solid:	32.3

Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units(Dry Weight)	Prep Date	Date Ana.	Ana Met.
Acid Volatile Sulfide	603		1	15.3	15.35	30.7	mg/Kg	07/14/17 12:00	07/14/17 15:15	Allen & Flu
pH	7.54	H	1	0	0	0	pH		07/13/17 16:52	9045C
TOC	20100	OR J	1	11.8	125	250	mg/Kg		07/20/17 17:51	Lloyd Kahn

D.V.
8/15/17

Comments:

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements
H = Sample Analysis Out Of Hold Time

J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N = Spiked sample recovery not within control limits

Report of Analysis

Client:	Weston Solutions	Date Collected:	07/12/17
Project:	R35186	Date Received:	07/13/17
Client Sample ID:	MC0B83	SDG No.:	14184
Lab Sample ID:	14184-10	Matrix:	WATER
Level (low/med):	low	% Solid:	32.3

Cas	Parameter	Conc.	Qua.	DF	MDL	LOD	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
7440-43-9	Cadmium	22.3		1	0.5	0.75	3	ug/L	07/17/17 10:07	07/19/17 16:51	SW6010
7440-50-8	Copper	126	J	1	2	2.5	10	ug/L	07/17/17 10:07	07/19/17 16:51	SW6010
7439-92-1	Lead	2170	J	1	1.5	1.5	6	ug/L	07/17/17 10:07	07/19/17 16:51	SW6010
7439-97-6	Mercury	0.1	U	1	0.1	0.1	0.2	ug/L	07/17/17 10:21	07/17/17 17:49	SW7470A
7440-02-0	Nickel	153		1	4.2	5.0	20	ug/L	07/17/17 10:07	07/19/17 16:51	SW6010
7440-66-6	Zinc	8480	J	1	5	5.0	20	ug/L	07/17/17 10:07	07/19/17 16:51	SW6010

D. V.
8/15/17

Color Before:	Colorless	Clarity Before:	Texture:	Clear
Color After:	Colorless	Clarity After:	Artifacts:	Clear
Comments:	Metals Group1			

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

D = Dilution

Q = indicates LCS control criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

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E = Indicates the reported value is estimated because of the presence of interference.

OR = Over Range

N = Spiked sample recovery not within control limits



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Region 3 Environmental Science Center
Office of Analytical Services and Quality Assurance
701 Mapes Road
Fort Meade, Maryland 20755-5350



Final Analytical Report

Site Name.....	SPARROWS POINT- SEDIMENT ASSESSMENT SE
Sample Collection Date(s).....	07/11/17 10:26- 07/12/17 14:00
Contact.....	Greg Ham
Report Date.....	08/16/17 17:11
Project #.....	DAS R35187
Work Order.....	1707006

Analyses included in this report:

Grainsize by Plumb

Approved for Release

Karen Costa

OASQA Representative



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Region 3 Environmental Science Center
Office of Analytical Services and Quality Assurance
701 Mapes Road
Fort Meade, Maryland 20755-5350



Site Name: SPARROWS POINT- SEDIMENT ASSESSMENT SE

Project #: DAS R35187

Report Narrative

Grainsize by Plumb 1981:

Analysis was performed on-demand.

Summary of Method:

All material coarser than 4phi was removed by wet sieving using a 64-micrometer stainless steel sieve. The silt and clay fraction that passed through the sieve was placed in a volumetric cylinder, brought up to volume, shaken, then multiple 20 mL portions of suspension removed, evaporated, and weighed to determine the residue remaining.

For samples analyzed in duplicate, results are qualified as estimated (J) when the relative percent difference (RPD) for the duplicate of any samples' fraction is greater than 20%.

The RPD between sample 1707006-01 and its duplicate (BG72410-DUP1) exceeds the limit (20% RPD) for % Sand, %Silt and %Clay.

The RPD between sample 1707006-06 and its duplicate (BG72506-DUP1) exceeds the limit (20% RPD) for % Sand, %Silt and %Clay.

1707006 Final Repo DAS R35187 08 16 17 1711



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Region 3 Environmental Science Center
Office of Analytical Services and Quality Assurance
701 Mapes Road
Fort Meade, Maryland 20755-5350



Site Name: SPARROWS POINT- SEDIMENT ASSESSMENT SE

Project #: DAS R35187

ANALYTICAL REPORT FOR SAMPLES

Station ID	Laboratory ID	Matrix	Date Sampled	Date Received
SESL-2017-SD-B01	1707006-01	Sediment	07/11/17 10:26	07/13/17 11:45
SESL-2017-SD-D03	1707006-02	Sediment	07/11/17 13:16	07/13/17 11:45
SESL-2017-SD-F03	1707006-03	Sediment	07/11/17 14:20	07/13/17 11:45
SESL-2017-SD-H01	1707006-04	Sediment	07/11/17 15:34	07/13/17 11:45
SESL-2017-SD-M01	1707006-05	Sediment	07/12/17 12:00	07/13/17 11:45
SESL-2017-SD-R02-B	1707006-06	Sediment	07/12/17 11:25	07/13/17 11:45
SESL-2017-SD-K03-B	1707006-07	Sediment	07/12/17 10:45	07/13/17 11:45
SESL-2017-SD-004-B	1707006-08	Sediment	07/12/17 09:15	07/13/17 11:45
SESL-2017-SD-T02-B	1707006-09	Sediment	07/12/17 13:21	07/13/17 11:45
SESL-2017-SD-V02-B	1707006-10	Sediment	07/12/17 14:00	07/13/17 11:45

USEPA CLP COC (LAB COPY)

DateShipped: 7/12/2017

CarrierName: FedEx

AirbillNo: 779611328214

CHAIN OF CUSTODY RECORD

DAS #: R35187

Cooler #:

No: 3-071217-111545-0020

Lab: EPA Region 3 Laboratory

Lab Contact: Kevin Poff

Lab Phone: 410-305-2938

Sample Identifier	CLP Sample No.	Matrix/Sampler	Coll. Method	Analysis/Turnaround (Days)	Tag/Preservative/Bottles	Location	Collection Date/Time	For Lab Use Only
SESL-2017-SD-B01	MC0B01	Surface Sediment/ START	Grab	Grain Size(21 Day)	1686 (4 C) (1)	SD-B01	07/11/2017 10:26	1707006 -01
SESL-2017-SD-D03	MC0B02	Surface Sediment/ START	Grab	Grain Size(21 Day)	1697 (4 C) (1)	SD-D03	07/11/2017 13:16	-02
SESL-2017-SD-F03	MC0B03	Surface Sediment/ START	Grab	Grain Size(21 Day)	1708 (4 C) (1)	SD-F03	07/11/2017 14:20	-03
SESL-2017-SD-H01	MC0B04	Surface Sediment/ START	Grab	Grain Size(21 Day)	1719 (4 C) (1)	SD-H01	07/11/2017 15:34	-04
SESL-2017-SD-M01	MC0B23	Surface Sediment/ START	Grab	Grain Size(21 Day)	1928 (4 C), 2477 (4 C) (2)	SD-M01	07/12/2017 12:00	-05
SESL-2017-SD-R02-B	MC0B78	Surface Sediment/ START	Grab	Grain Size(21 Day)	2414 (4 C), 2478 (4 C) (2)	SD-R02	07/12/2017 11:25	-06
SESL-2017-SD-K03-B	MC0B79	Surface Sediment/ START	Grab	Grain Size(21 Day)	2382 (4 C), 2476 (4 C) (2)	SD-K03	07/12/2017 10:45	-07

Special Instructions: Samples collected by Charles Rapone (START)	Shipment for Case Complete? Y
	Samples Transferred From Chain of Custody #
Analysis Key: Grain Size=Grain Size	

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	<i>Charles Rapone</i>	7/12/17 13:00	<i>Christie Phibaur ESAT</i>	7/13/17 11:45	5°C CP 7/13/17

USEPA CLP COC (LAB COPY)

DateShipped: 7/12/2017

CarrierName: FedEx

AirbillNo: 779611328214

CHAIN OF CUSTODY RECORD

DAS #: R35187

Cooler #:

No: 3-071217-111545-0020

Lab: EPA Region 3 Laboratory

Lab Contact: Kevin Poff

Lab Phone: 410-305-2938

Sample Identifier	CLP Sample No.	Matrix/Sampler	Coll. Method	Analysis/Turnaround (Days)	Tag/Preservative/Bottles	Location	Collection Date/Time	For Lab Use Only
SESL-2017-SD-004-B	MC0B80	Surface Sediment/ START	Grab	Grain Size(21 Day)	2371 (4 C), 2475 (4 C) (2)	SD-004	07/12/2017 09:15	1707006 -08
SESL-2017-SD-T02-B	MC0B82	Surface Sediment/ START	Grab	Grain Size(21 Day)	2434 (4 C), 2479 (4 C) (2)	SD-T02	07/12/2017 13:21	-09
SESL-2017-SD-V02-B	MC0B83	Surface Sediment/ START	Grab	Grain Size(21 Day)	2442 (4 C), 2480 (4 C) (2)	SD-V02	07/12/2017 14:00	-10

Special Instructions: Samples collected by Charles Rapone (START)	Shipment for Case Complete? Y
	Samples Transferred From Chain of Custody #
Analysis Key: Grain Size=Grain Size	

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	<i>Charles Rapone Western</i>	7/12/17 1:00	<i>Christie Pheasant ES&T</i>	7/13/17 11:45	5°C CP 7/13/17



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Region 3 Environmental Science Center
Office of Analytical Services and Quality Assurance
701 Mapes Road
Fort Meade, Maryland 20755-5350

**Site Name: SPARROWS POINT- SEDIMENT ASSESSMENT SE****Project #: DAS R35187****Grainsize**

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
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Lab ID: 1707006-01
Station ID: SESL-2017-SD-B01
Sample Matrix: Sediment
Collected: 07/11/2017

Sand	31.3	J		% by Weight	1	07/25/17	07/25/17 09:07	Plumb 1981
Silt	33.5	J		% by Weight	1	07/25/17	07/25/17 09:07	Plumb 1981
Clay	35.3	J		% by Weight	1	07/25/17	07/25/17 09:07	Plumb 1981

Grainsize

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
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Lab ID: 1707006-02
Station ID: SESL-2017-SD-D03
Sample Matrix: Sediment
Collected: 07/11/2017

Sand	5.3			% by Weight	1	07/25/17	07/25/17 09:07	Plumb 1981
Silt	50.2			% by Weight	1	07/25/17	07/25/17 09:07	Plumb 1981
Clay	44.5			% by Weight	1	07/25/17	07/25/17 09:07	Plumb 1981

Grainsize

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
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Lab ID: 1707006-03
Station ID: SESL-2017-SD-F03
Sample Matrix: Sediment
Collected: 07/11/2017

Sand	19.6			% by Weight	1	07/25/17	07/25/17 09:07	Plumb 1981
Silt	47.3			% by Weight	1	07/25/17	07/25/17 09:07	Plumb 1981
Clay	33.1			% by Weight	1	07/25/17	07/25/17 09:07	Plumb 1981



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**Site Name: SPARROWS POINT- SEDIMENT ASSESSMENT SE****Project #: DAS R35187****Grainsize**

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
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Lab ID: 1707006-04
Station ID: SESL-2017-SD-H01
Sample Matrix: Sediment
Collected: 07/11/2017

Sand	97.0			% by Weight	1	07/25/17	07/25/17 09:07	Plumb 1981
Silt	3.0			% by Weight	1	07/25/17	07/25/17 09:07	Plumb 1981
Clay	0.0			% by Weight	1	07/25/17	07/25/17 09:07	Plumb 1981

Grainsize

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
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Lab ID: 1707006-05
Station ID: SESL-2017-SD-M01
Sample Matrix: Sediment
Collected: 07/12/2017

Sand	27.2			% by Weight	1	07/25/17	07/25/17 09:07	Plumb 1981
Silt	53.3			% by Weight	1	07/25/17	07/25/17 09:07	Plumb 1981
Clay	19.6			% by Weight	1	07/25/17	07/25/17 09:07	Plumb 1981

Grainsize

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
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Lab ID: 1707006-06
Station ID: SESL-2017-SD-R02-B
Sample Matrix: Sediment
Collected: 07/12/2017

Sand	5.3	J		% by Weight	1	07/26/17	08/03/17 13:39	Plumb 1981
Silt	60.1	J		% by Weight	1	07/26/17	08/03/17 13:39	Plumb 1981
Clay	34.6	J		% by Weight	1	07/26/17	08/03/17 13:39	Plumb 1981



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Site Name: SPARROWS POINT- SEDIMENT ASSESSMENT SE

Project #: DAS R35187

Grainsize

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
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Lab ID: 1707006-07
Station ID: SESL-2017-SD-K03-B
Sample Matrix: Sediment
Collected: 07/12/2017

Sand	5.7			% by Weight	1	07/26/17	08/03/17 13:39	Plumb 1981
Silt	72.2			% by Weight	1	07/26/17	08/03/17 13:39	Plumb 1981
Clay	22.2			% by Weight	1	07/26/17	08/03/17 13:39	Plumb 1981

Grainsize

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
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Lab ID: 1707006-08
Station ID: SESL-2017-SD-004-B
Sample Matrix: Sediment
Collected: 07/12/2017

Sand	7.6			% by Weight	1	07/26/17	08/03/17 13:39	Plumb 1981
Silt	49.0			% by Weight	1	07/26/17	08/03/17 13:39	Plumb 1981
Clay	43.5			% by Weight	1	07/26/17	08/03/17 13:39	Plumb 1981

Grainsize

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
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Lab ID: 1707006-09
Station ID: SESL-2017-SD-T02-B
Sample Matrix: Sediment
Collected: 07/12/2017

Sand	8.1			% by Weight	1	07/26/17	08/03/17 13:39	Plumb 1981
Silt	45.8			% by Weight	1	07/26/17	08/03/17 13:39	Plumb 1981
Clay	46.1			% by Weight	1	07/26/17	08/03/17 13:39	Plumb 1981



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Site Name: SPARROWS POINT- SEDIMENT ASSESSMENT SE

Project #: DAS R35187

Grainsize

Analyte	Result	Flags/ Qualifiers	Quantitation Limit	Units	Dilution	Prepared	Analyzed	Method/SOP#
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Lab ID: 1707006-10

Station ID: SESL-2017-SD-V02-B

Sample Matrix: Sediment

Collected: 07/12/2017

Sand	3.5		% by Weight	1	07/26/17	08/03/17 13:39	Plumb 1981
Silt	54.2		% by Weight	1	07/26/17	08/03/17 13:39	Plumb 1981
Clay	42.3		% by Weight	1	07/26/17	08/03/17 13:39	Plumb 1981



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Project #: DAS R35187

QC Data Grainsize

Analyte	Result	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BG72410 - Grain Size

Duplicate (BG72410-DUP1)		Source: 1707006-01		Prepared: 07/25/17 09:07		Analyzed: 08/03/17 13:39				
Sand	24.0		% by Weight		31.3			26	20	A
Silt	50.5		"		33.5			40	20	A
Clay	25.5		"		35.3			32	20	A

Batch BG72506 - Grain Size

Duplicate (BG72506-DUP1)		Source: 1707006-06		Prepared: 07/26/17 07:51		Analyzed: 08/03/17 13:39				
Sand	6.6		% by Weight		5.3			22	20	A
Silt	41.8		"		60.1			36	20	A
Clay	51.6		"		34.6			39	20	A



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Project #: DAS R35187

Notes and Definitions

J The identification of the analyte is acceptable; the reported value is an estimate.

A Quality control value is outside acceptance limits.

%REC Percent Recovery

RPD Relative Percent Difference

U Analyte included in the analysis, but not detected at or above the quantitation limit.

NR Not Reported

QUANTITATION LIMIT: The lowest concentration of an analyte that can be reliably measured within specified limits of precision and accuracy for a specific laboratory analytical method and that takes into account analytical adjustments made during sample preparation and analysis.

SOLID SAMPLE RESULTS - REPORTING PROTOCOL: Percent Solids (percent dry wt at 105 degrees C) determinations are routinely performed for most organic and inorganic analyses. Consequently, these samples are analyzed wet and converted to a dry weight result for reporting purposes. If metals and mercury analyses are requested, they are routinely prepared for analyses by an initial drying at 60 degrees C, homogenized prior to digestion, and are analyzed and reported on a dry weight basis. Oil-type samples are analyzed and reported on a wet weight basis for all analyses because of the nature of the sample matrix. Any exceptions to this protocol will be noted in the narrative.

ON-DEMAND: The term 'on-demand' analysis, if noted in the report narrative, refers to Section 13.1.4 in the Region III OASQA Laboratory Quality Manual, which provides procedures for non-routine analyses or analytes.