PHASE II
INVESTIGATION REPORT

AREA A: PARCEL A8
TRADEPOINT ATLANTIC
SPARROWS POINT, MARYLAND

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Revision 1 – November 6, 2017

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1.0 INTRODUCTION

ARM Group Inc. (ARM), on behalf of EnviroAnalytics Group (EAG), has completed a Phase II Investigation of a portion of the Tradepoint Atlantic property (formerly Sparrows Point Terminal, LLC) that has been designated as Area A: Parcel A8 (the Site). Parcel A8 is comprised of 27.1 acres of the approximately 3,100-acre former steel making facility (**Figure 1**). The Site is bounded to the west by Peninsula Expressway, to the north by Reservoir Road and a densely vegetated area (currently designated as Parcel A7), and to the east by the Industrial Water Reservoir.

The Phase II Investigation was performed in accordance with procedures outlined in the approved Phase II Investigation Work Plan – Parcel A8. This Work Plan (dated October 23, 2015) was approved by the Maryland Department of the Environment and the United States Environmental Protection Agency on October 22, 2015 in compliance with requirements pursuant to the following:

- Administrative Consent Order (ACO) between Tradepoint Atlantic (formerly Sparrows Point Terminal, LLC) and the Maryland Department of the Environment (effective September 12, 2014); and
- Settlement Agreement and Covenant Not to Sue (SA) between Tradepoint Atlantic (formerly Sparrows Point Terminal, LLC) and the United States Environmental Protection Agency (effective November 25, 2014).

Parcel A8 is part of the acreage that was removed (Carveout Area) from inclusion in the Multimedia Consent Decree between Bethlehem Steel Corporation, the United States Environmental Protection Agency (USEPA), and the Maryland Department of the Environment (MDE) (effective October 8, 1997) as documented in correspondence received from USEPA on September 12, 2014. Based on this agreement, USEPA determined that no further investigation or corrective measures will be required under the terms of the Consent Decree for the Carveout Area. However, the SA reflects that the property within the Carveout Area will remain subject to the USEPA's Resource Conservation and Recovery Act (RCRA) Corrective Action authorities.

An application to enter the Tradepoint Atlantic property into the Maryland Department of the Environment Voluntary Cleanup Program (MDE-VCP) was submitted to MDE on September 10, 2014. The property's current and anticipated future use is Tier 3 (Industrial), and plans for the property include demolition and redevelopment over the next several years.

This revised Phase II Investigation Report is being submitted in response to comments received from the MDE and USEPA regarding the Screening Level Risk Assessment (SLRA) procedure presented in Section 6.0. The original Phase II Investigation Report (Revision 0) was previously submitted to the agencies dated January 11, 2017. A transmittal letter listing the updates made to the Phase II Investigation Report (from Revision 0 to Revision 1) accompanies this document.

1.1. SITE HISTORY

From the late 1800s until 2012, the production and manufacturing of steel was conducted at Sparrows Point. 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, 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 steel making operations at Sparrows Point ceased in fall 2012.

Parcel A8 was formerly partially occupied by several buildings making up the Oxygen Plant (also referred to as the Air Products Facility). The Oxygen Plant was an air separation unit. This facility supplied oxygen and nitrogen gas to the steel mill during its operation. Pure gases were separated from air by first cooling it until it liquefied, then selectively distilling the components at their various boiling temperatures. After its closure, equipment was salvaged from the facility and the buildings were demolished. Concrete building slabs remain on grade.

1.2. OBJECTIVES

The objective of this Phase II Investigation was to fully characterize the nature and extent of contamination at the Site. This report includes a summary of the work performed, including the environmental setting, site investigation methods, analytical results and data usability assessment, and findings and recommendations. A summary table of the site investigation locations, including the boring identification numbers and the analyses performed, is provided as **Appendix A**. A human health SLRA was prepared to identify constituents and pathways of potential concern and to evaluate the significance of any observed impacts or elevated concentrations with respect to the potential future use of the Site.

2.0 ENVIRONMENTAL SETTING

2.1. LAND USE AND SURFACE FEATURES

The Tradepoint Atlantic property consists of the former Sparrows Point steel mill. According to the Phase I Environmental Site Assessment (ESA) prepared by Weaver Boos dated May 19, 2014, the property is zoned Manufacturing Heavy-Industrial Major (MH-IM). Surrounding property zoning classifications (beyond Tradepoint Atlantic) include the following: Manufacturing Light (ML); Resource Conservation (RC); Density Residential (DR); Business Roadside (BR); Business Major (BM); Business Local (BL); and Residential Office (RO). Light industrial and commercial properties are located northeast of the property and northwest of the property across Bear Creek. Residential areas of Edgemere and Fort Howard are located northeast of the property across Jones Creek and to the southeast across Old Road Bay, respectively. Residential and commercial areas of Dundalk are located northwest of the property across Bear Creek.

According to topographic maps provided by EAG, the Site is at an elevation of approximately 12 feet above mean sea level (amsl). Elevations at the Site range from 2 to 22 feet over the parcel area. Along the western edge, the parcel slopes sharply downward from the intersection of Peninsula Expressway and Reservoir Road inward towards the parcel. Additionally, there are two distinct mounds in the northern vegetated portion of the parcel which influence surface stormwater runoff direction. In the northern section of the parcel, runoff generally flows to the west towards several small drainage features. The 5500 Set of historical steel plant drawings shows one culvert to convey drainage from the northwestern corner of Parcel A8 to the west under Peninsula Expressway to the southern expressway drainage ditch, and another culvert to convey drainage to the north under Reservoir Road to the northern expressway drainage ditch. According to Figure B-2 of the Stormwater Pollution Prevention Plan (SWPPP) Revision 5 dated June 1, 2017, runoff from the northwestern corner of the parcel flows through the Peninsula Expressway drainage ditches to the permitted Outfall 069, located in the nearby Parcel A11 to the west. Runoff from the eastern portion of the parcel, including the footprint of the former Air Products Facility, appears to be collected in the adjacent Industrial Water Reservoir. The reservoir is fed by effluent from the Back River Wastewater Treatment Plant (BRWWTP) operated by Baltimore City. While the steel plant was operational, treated effluent stored in the reservoir was used as an industrial water source. The reservoir continues to receive effluent from the BRWWTP.

2.2. REGIONAL GEOLOGY

The Site is located within the Atlantic Coastal Plain Physiographic Province (Coastal Plain). The western boundary of the Coastal Plain is the “Fall Line”, which separates the Coastal Plain from the Piedmont Plateau Province. The Fall Line runs from northeast to southwest along the

western boundary of the Chesapeake Bay, passing through Elkton (MD), Havre de Grace (MD), Baltimore City (MD), and Laurel (MD). The eastern boundary of the Coastal Plain is the off-shore Continental Shelf.

The unconsolidated sediments beneath the Site belong to the Talbot Formation (Pleistocene), which is then underlain by the Cretaceous formations which comprise the Potomac Group (Patapsco Formation, Arundel Formation and the Patuxent Formation). The Potomac Group formations are comprised of unconsolidated sediments of varying thicknesses and types, which may be several hundred feet to several thousand feet thick. These unconsolidated formations may overly deeper Mesozoic and/or Precambrian bedrock. Depth to bedrock is approximately 700 feet within the Site.

2.3. SITE GEOLOGY/HYDROGEOLOGY

Groundcover at the Site is comprised of approximately 97% natural soils and 3% slag-fill based on the approximate shoreline of the Sparrows Point Peninsula in 1916, as shown on **Figure 2** (adapted from Figure 2-20 in the Description of Current Conditions (DCC) Report prepared by Rust Environmental and Infrastructure, dated January 1998).

In general, the encountered subsurface geology included slag fill materials overlying natural soils, which included fine-grained sediments (clays and silts) and coarse grained sediments (sands). Slag fill materials were encountered at depths of up to 11 feet below the ground surface (bgs), although typical thicknesses ranged from 2 to 4 feet bgs (often underlying paved cover). Perched groundwater was observed in roughly half of the soil cores at depths ranging from 3 to 10 feet bgs. As soil borings were advanced in the field, the perched water table was indicated by the observation of two wet intervals with a dry (or moist) clay zone between the water bearing units. The shallow groundwater was observed in soil borings from 12 to 19.7 feet bgs across the Site. Soil boring logs are provided in **Appendix B**.

Temporary groundwater sample collection points (commonly referred to as piezometers) were installed at seven locations across the Site to investigate shallow groundwater conditions. The locations of the groundwater sampling points are indicated on **Figure 3**. The temporary groundwater sample collection points were surveyed by a Maryland-licensed surveyor. Supporting documentation from the surveys is included as **Appendix C**.

A synoptic round of groundwater level measurements was collected on April 8, 2016 from each of the groundwater points included in the parcel-specific sampling plan. Surveyed top of casing (TOC) and ground surface elevations for all applicable locations can be found in **Table 1**, along with the depth to water (DTW) measurements from this date.

A groundwater potentiometric surface map was constructed for the shallow hydrogeologic zone based on the field measurements. The localized potentiometric map for shallow groundwater has been included on **Figure 3**. In the northern half of the Site, groundwater in the shallow zone appears to flow to the west (toward Peninsula Expressway) and south (toward the Industrial

Water Reservoir) in the vicinity of A8-013-PZ. Groundwater in the center of the Site appears to flow radially in all directions (except northeast) from a mounded area identified in the vicinity of piezometer A8-009-PZ. On the southern half of the Site within the footprint of the former Air Products Facility, shallow groundwater appears to flow generally to the east towards the Industrial Water Reservoir.

3.0 SITE INVESTIGATION

A total of 58 soil samples (from 20 boring locations) and seven groundwater samples were collected for analysis between October 26, 2015 and April 13, 2016 as part of the Parcel A8 Phase II Investigation. A supplemental groundwater sample was also collected on August 30, 2016. The Phase II Investigation utilized methods and protocols that followed the procedures included in the Quality Assurance Project Plan (QAPP) dated October 2, 2015 (updated April 5, 2016) approved by the agencies to support the investigation and remediation of the Tradepoint Atlantic property. Information regarding the project organization, field activities and sampling methods, sampling equipment, sample handling and management procedures, the selected laboratory and analytical methods, quality control and quality assurance procedures, investigation-derived waste (IDW) management methods, and reporting requirements are described in detail in the approved Parcel A8 Work Plan dated October 23, 2015, and the QAPP.

All site characterization activities were conducted under the site-specific health and safety plan (HASP) provided as Appendix D of the approved Work Plan.

3.1. SAMPLE TARGET IDENTIFICATION

Previous activities within and around the buildings and facilities located on the Tradepoint Atlantic property may have been historical sources of environmental contamination. If present, source areas were identified as targets for sampling through a careful review of historical documents. When a sampling target was identified, a boring was placed at or next to its location using GIS software (ArcMap Version 10.2.2).

Sampling targets included, as applicable, 1) Recognized Environmental Conditions (RECs) shown on the REC Location Map provided in Weaver Boos' Phase I ESA, 2) additional findings (non-RECs) from the Phase I ESA which were identified as potential environmental concerns, and 3) Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) identified from the DCC Report prepared by Rust Environmental and Infrastructure. The following RECs were identified in the Parcel A8 Work Plan: Exposed Cold Box Insulation (REC 11A, Finding 242) and Oily Surface Water Discharge (REC 11B, Finding 243). There were no SWMUs or AOCs identified at the Site based on the DCC Report.

Four sets of historical drawings were also reviewed to identify potential sampling targets for the Site. These drawings included the 5000 Set (Plant Arrangement), the 5100 Set (Plant Index), the 5500 Set (Plant Sewer Lines), and a set of drawings indicating coke oven gas distribution drip leg locations. Drip legs are points throughout the distribution system where coke oven gas condensate was removed from the gas pipelines. The condensate from the drip legs was typically discharged to drums, although it is possible some spilled out of the drums and on to the ground. There were no drip legs identified inside the boundary of Parcel A8. A summary of the

specific drawings covering the Site is presented in **Table 2**. Sampling target locations were identified if the historical drawings depicted industrial activities or a specific feature at a location that may have been a source of environmental contamination that potentially impacted the Site.

Based on the review of plant drawings, sampling targets were identified at the Site that included the following: Air Products Facility and Flammable Material Storage Area. A summary of the areas that were investigated, along with the applicable boring identification numbers and the analyses performed, has been provided as **Appendix A**. Additional sample locations were then added to fill in large spatial gaps between proposed borings to provide complete coverage of the Site. During the completion of fieldwork, it was necessary to shift some borings from the approved locations given in the Work Plan, primarily due to access restrictions. **Table 3** provides the identification numbers of the field adjusted borings, the rationale for field adjustment, the coordinates of the proposed and final locations, and the distance/direction of the field shifts.

The density of soil borings met the requirements set forth in the QAPP Worksheet 17 – Sampling Design and Rationale. Parcel A8 contained a total of 25.1 acres without engineered barriers. The current engineered barriers on the parcel include 2.0 acres of paved parking/roads. In accordance with the relevant sampling density requirements, a minimum of 17 soil borings were required to cover the area without engineered barriers, and a minimum of 2 soil borings were required to cover areas with barriers. A total of 19 borings were required to meet the density specification; 20 soil borings were completed during the Phase II Investigation.

3.2. SOIL INVESTIGATION

Continuous core soil borings were advanced at 20 locations across the Site to assess the presence or absence of soil contamination, and to assess the vertical distribution of any encountered contamination (**Figure 4**). The continuous core soil borings were advanced to depths between 12 and 20 feet bgs using the Geoprobe® MC-7 Macrocore soil sampler (surface to 10 feet bgs) and the Geoprobe® D-22 Dual-Tube Sampler (depths >10 feet bgs). All borings were completed to 20 feet bgs with the exception of A8-012-SB, which was terminated at 12 feet bgs. At each location, each soil core was visually inspected and screened with a hand-held photoionization detector (PID) prior to logging soil types. Soil boring logs have been included as **Appendix B,** and the PID calibration log has been included as **Appendix D**. Please note that unless otherwise indicated, all Unified Soil Classification System (USCS) group symbols provided on the attached boring logs are from visual observations, and not from laboratory testing.

One shallow sample was collected from the 0 to 1 foot depth interval, and a deeper sample was collected from the 4 to 5 foot depth interval from each continuous core soil boring. One additional set of samples was also collected from the 9 to 10 foot depth interval if groundwater had not been encountered; however, these samples were held by the laboratory pending the analysis of the 0 to 1 and 4 to 5 foot depth interval samples and were only analyzed for

parameters that were detected in the 5 foot depth samples at concentrations above the Project Action Limits (PALs). If the PID or other field observations indicated contamination to exist at a depth greater than 5 feet bgs but less than 9 feet bgs, and was above the water table, the sample from the deeper 4 to 5 foot interval was shifted to the alternate depth interval. It should be noted that soil samples were not collected from a depth that was below the water table. Soil sampling activities were conducted in accordance with the procedures and methods referenced in **Field Standard Operating Procedure (SOP) Numbers 008, 009, 012, and 013** provided in Appendix A of the QAPP.

Down-hole soil sampling equipment was decontaminated after soil sampling had been concluded at a location, according to the procedures and methods referenced in **Field SOP Number 016** provided in Appendix A of the QAPP.

Soil samples were submitted to Pace Analytical Services, Inc. (PACE), and analyzed for Target Compound List (TCL) volatile organic compounds (VOCs) via USEPA Method 8260B, TCL semi-volatile organic compounds (SVOCs) via USEPA Methods 8270D and 8270D SIM, Oil & Grease via USEPA Method 9071, Target Analyte List (TAL) Metals via 6010C and 7471C, hexavalent chromium via USEPA Method 7196A, and cyanide via USEPA Method 9012. Based on the standard field procedures at the time of Work Plan approval, select locations were analyzed for total petroleum hydrocarbon (TPH) diesel range organics (DRO) and gasoline range organics (GRO) via USEPA Methods 8015B and 8015D. The agencies have specified the requirements for analysis of TPH-DRO/GRO and/or Oil & Grease throughout the investigation process. During the implementation of the Parcel A8 Work Plan, Oil & Grease analysis was required at every soil location, and sampling targets with potential petroleum contamination were also required to be analyzed for TPH-DRO/GRO. Additionally, the shallow soil samples collected across the Site from the 0 to 1 foot bgs interval were analyzed for polychlorinated biphenyls (PCBs) via USEPA Method 8082, and asbestos via USEPA Method 600/R-93/116. Sample containers, preservatives, and holding times for the sample analyses are listed in the QAPP Worksheet 19 & 30 – Sample Containers, Preservation, and Holding Times.

3.3. GROUNDWATER INVESTIGATION

Seven shallow temporary groundwater sample collection points were installed to facilitate the collection of groundwater samples and to support the definition of the groundwater potentiometric surface. The soil boring locations where shallow temporary groundwater sample collection points were installed during the investigation included A8-002-SB, A8-004-SB, A8-007-SB, A8-009-SB, A8-013-SB, A8-015-SB, and A8-017-SB (**Figure 3**). The temporary groundwater sample collection point construction logs have been included as **Appendix E**.

At each location the Geoprobe® DT22 Dual Tube sampling system was advanced to a depth approximately 10 feet below where groundwater was identified in the associated soil cores, the 1.25-inch inner rod string was removed, and the temporary 1-inch PVC groundwater sample

collection point was installed through the outer casing. Following the installation of each sample collection point, the 0-hour depth to water was documented and the collection point was checked for the presence of non-aqueous phase liquid (NAPL) using an oil-water interface probe in accordance with the methods referenced in **Field SOP Number 019** provided in Appendix A of the QAPP.

After the installation of each temporary groundwater sample collection point, down-hole equipment was decontaminated according to the procedures and methods referenced in **Field SOP Number 016** provided in Appendix A of the QAPP.

Groundwater samples were collected in accordance with methods referenced in **Field SOP Number 006** provided in Appendix A of the QAPP; which employed the use of laboratory supplied sample containers and preservatives, a peristaltic pump, dedicated polyethylene tubing, and a YSI water quality meter with a flow-through cell. Groundwater samples submitted for analysis of TAL-Dissolved Metals were filtered in the field with an in-line 0.45 micron filter. The sampling and purge logs have been included in **Appendix F**. Calibration of the YSI meter was performed before the start of each day of the sampling event, and a calibration post-check was completed at the end of the day. Appropriate documentation of the YSI calibration has also been included in **Appendix F**.

Groundwater samples were submitted to PACE, and analyzed for TCL-VOCs via USEPA Method 8260B, TCL-SVOCs via USEPA Methods 8270D and 8270D SIM, Oil & Grease via USEPA Method 1664A, TAL-Dissolved Metals via 6010C and 7470A, hexavalent chromium via USEPA Method 7196A, and cyanide (total) via USEPA Method 9012A. In addition, select locations were analyzed for TPH-DRO/GRO via USEPA Methods 8015B and 8015D. The agencies have specified the requirements for analysis of TPH-DRO/GRO and/or Oil & Grease throughout the investigation process. During the implementation of the Parcel A8 Work Plan, Oil & Grease analysis was required at every groundwater sample collection point, and groundwater sampling targets with potential petroleum contamination were additionally required to be analyzed for TPH-DRO/GRO. Sample containers, preservatives, and holding times for the sample analyses are listed in the QAPP Worksheet 19 & 30 – Sample Containers, Preservation, and Holding Times.

3.4. MANAGEMENT OF INVESTIGATION-DERIVED WASTE (IDW)

In accordance with **Field SOP Number 005** provided in Appendix A of the QAPP, potentially impacted materials, or IDW, generated during this Phase II Investigation was containerized in 55-gallon (DOT-UN1A2) drums. The types of IDW that were generated during this Phase II Investigation included the following:

- soil cuttings generated from soil borings or the installation of the temporary groundwater sampling points;
- purged groundwater;
- decontamination fluids; and
- used personal protective equipment

Following the completion of field activities, a composite sample was gathered from the Parcel A8 Phase II IDW soil drums for TCLP analysis. Following this analysis, the waste soil was characterized as non-hazardous. A list of all results from the soil TCLP procedure can be found in **Table 4**, which indicates no exceedances of TCLP criteria.

IDW drums containing aqueous materials were characterized by preparing composite samples from randomly selected drums. Each composite sample included aliquots from three individual drums that were chosen from a set of 30 drums being staged on-site at the date of collection. A total of eight aqueous composite samples were collected for TCLP analysis. A list of all results from the aqueous TCLP procedure can be found in **Table 5**, which indicates no exceedances of TCLP criteria.

The parcel specific IDW drum log from the Phase II investigation is included as **Appendix G**. All IDW procedures were carried out in accordance with methods referenced in the QAPP Worksheet 21 – Field SOPs and Appendix A of the QAPP.

4.0 ANALYTICAL RESULTS

4.1. SOIL CONDITIONS

Soil analytical results were screened against Project Action Limits (PALs) established in the site-wide Quality Assurance Project Plan (QAPP) (or other direct guidance from the agencies; i.e. TPH/Oil & Grease) to determine PAL exceedances. PALs are generally based on the USEPA's Regional Screening Levels (RSLs) for the Composite Worker exposure to soil. The Composite Worker is defined by the USEPA as a long-term receptor exposed during the work day who is a full time employee that spends most of the workday conducting maintenance activities (which typically involve on-site exposures to surface soils) outdoors.

The analytical results for the detected parameters are summarized and compared to the PALs in attached **Table 6** (Organics) and **Table 7** (Inorganics). There were no detections of asbestos in the samples collected from Parcel A8, so a table is not warranted. The laboratory Certificates of Analysis (including Chains of Custody) and Data Validation Reports have been included as electronic attachments. The Data Validation Reports contain a glossary of qualifiers for the final flags assigned to individual results in the attached summary tables.

4.1.1. Soil Conditions: Organic Compounds

As provided on **Table 6**, several VOCs were identified above the laboratory's method detection limits (MDLs) in the soil samples collected from across the Site. There were no VOCs detected above their respective PALs.

Table 6 provides a summary of SVOCs detected above the laboratory's MDLs in the soil samples collected from across the Site. Five SVOCs, all polynuclear aromatic hydrocarbons (PAHs), were detected above their respective PALs. These SVOCs were benz[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, dibenz[a,h]anthracene, and indeno[1,2,3-c,d]pyrene. Exceedances were noted at over half the boring locations distributed throughout the parcel. A summary of the PAL exceedance locations and results has been provided on **Figure S-1**. The exceedances indicated for these SVOCs are based on the PALs specified in the approved QAPP, and these PAL values have not been adjusted upward based on revised toxicity data for PAHs published in the USEPA RSL Composite Worker Soil Table dated June 2017. The number of PAL exceedances would not be as great using the new toxicity data, and therefore, the PAL exceedances shown overstate the significance of the SVOC detections. RSL adjustments were made for the PAH compounds when they were evaluated in the human health risk assessment (Section 6.0).

Shallow soil samples collected across the Site from the 0 to 1 foot bgs interval were analyzed for PCBs. **Table 6** provides a summary of the PCBs detected above the laboratory's MDLs. No individual PCB mixtures (or total PCBs) were detected above the specified PALs.

Table 6 provides a summary of the Oil & Grease and TPH-DRO/GRO detections in the parcel. Each sample was analyzed for Oil & Grease and there were detections of Oil & Grease at each location across the Site. Three locations were selected for TPH-DRO/GRO analysis, based on the specific sampling target at the boring locations and the standard sampling protocol at the time of Work Plan approval. Most of the Oil & Grease detections on the Site were fairly low, with only one exceedance of the PAL (6,200 mg/kg). The highest detection of Oil & Grease (7,740 mg/kg) was identified in boring A8-005-SB-1, which was located to evaluate soil conditions in close proximity to the former Oily Surface Water Discharge (REC 11B). REC 11B was identified based on the observation of oily surface water in the vicinity of a discharge pipe during Weaver Boos' Phase I ESA site inspection (February 2014), completed after operation of the plant had ceased. On October 15, 2015, ARM personnel conducted a site walk at the former discharge location noted in the description of REC 11B. A discharge pipe was located in the area; however, no evidence of staining on the ground or oily sheen on the surface water was observed. A baffle was observed in the reservoir at this location, but not a sorbent boom. Neither DRO nor GRO were detected above the applicable PAL (6,200 mg/kg) at this or any other location, indicating that the elevated Oil & Grease concentration is not related to petroleum contamination. The Oil & Grease exceedance is indicated on **Figure S-2**. This figure also highlights one boring location (A8-017-SB) that had physical evidence of possible NAPL in the associated soil core. The specific observations of NAPL are given in Section 4.1.4.

4.1.2. Soil Conditions: Inorganic Constituents

Table 7 provides a summary of inorganic constituents detected above the laboratory's MDLs in the soil samples collected from across the Site. Two inorganic compounds (arsenic and manganese) were detected above their respective PALs. Arsenic was by far the most common inorganic exceedance, and was detected above the PAL in 84% of the soil samples analyzed for this compound. In comparison, manganese exceeded its PAL in only three samples (or 8%). A summary of the PAL exceedance locations and results has been provided on **Figure S-3.**

4.1.3. Soil Conditions: Results Summary

Table 6 and **Table 7** provide a summary of the detected organic and inorganic compounds in the soil samples submitted for laboratory analysis, and **Figures S-1** through **S-3** present a summary of the soil sample results that exceeded the PALs. **Table 8** provides a summary of results for all PAL exceedances in soil, including maximum values and detection frequencies. **Table 9** indicates which soil impacts (PAL exceedances) are associated with the specific targets listed in the Parcel A8 Work Plan. There were no detections of VOCs, PCBs, or TPH-DRO/GRO above the applicable PALs. Exceedances of the PALs in soil within Parcel A8 consisted of two inorganics (arsenic and manganese), five SVOCs (benz[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, dibenz[a,h]anthracene, and indeno[1,2,3-c,d]pyrene), and Oil & Grease. Arsenic was detected above the PAL in most soil samples, although only four samples had a

concentration greater than five times the PAL (15 mg/kg). The highest arsenic detection was 27.7 mg/kg in sample A8-017-SB-7. This detection was flagged with a "J" qualifier, indicating that it is an estimated value. Manganese was detected above the PALs in only three samples, all located in the northern portion of the Site. The maximum detections for PAH compounds benzo[a]pyrene, dibenz[a,h]anthracene, and indeno[1,2,3-c,d]pyrene were associated with a single sample (A8-006-SB-4). The maximum detections for the remaining two PAH compounds (benz[a]anthracene and benzo[b]fluoranthene) were associated with sample A8-001-SB-4. The Oil & Grease exceedance at A8-005-SB-1 was relatively minor, and the accompanying TPH analyses for this sample indicated that this exceedance was not associated with petroleum impacts. No evidence of staining on the ground or oily sheen on the surface water was noted in the vicinity of this boring, which targeted a former surface water discharge point (REC 11B).

4.1.4. Summary of NAPL Observations in Soil Cores

During the completion of the Phase II soil borings in Parcel A8, soil cores were screened for evidence of possible NAPL contamination. During the field screening completed by ARM representatives, one location had physical evidence of possible product. Soil boring A8-017-SB (highlighted on **Figure S-2**) had visible NAPL which was noted on the boring log. The analytical samples from this location were not analyzed for TPH-DRO/GRO based on the sampling plan at the time of Work Plan approval which did not require these analyses. However, samples from this soil boring were analyzed for Oil & Grease, which can be used as a conservative proxy for TPH.

Sample location A8-017-SB had the appearance of NAPL in the core from 10 to 13 feet bgs. Elevated PID readings above 100 ppm were also noted in the soil core between 2 and 10 feet bgs. The shallow (0 to 1 foot) and intermediate (6 to 7 foot) soil samples collected from A8-017-SB had Oil & Grease detections of 4,150 mg/kg and 144 mg/kg, respectively, which do not exceed the PAL of 6,200 mg/kg. Oil & Grease data was not analyzed below the 6 to 7 foot bgs sample based on the existing sampling and analysis protocol. However, a piezometer was installed at this location in accordance with the parcel-specific sampling plan, and free product was later identified and delineated in the vicinity of A8-017-SB. The observed impacts in groundwater are discussed in greater detail below.

4.2. GROUNDWATER CONDITIONS

The analytical results for the detected parameters in groundwater are summarized and compared to the site-specific PALs in attached **Table 10** (Organics) and **Table 11** (Inorganics). The laboratory Certificates of Analysis (including Chains of Custody) and Data Validation Reports have been included as electronic attachments. The Data Validation Reports contain a glossary of qualifiers for the final flags assigned to individual results in the attached summary tables.

4.2.1. Groundwater Conditions: Organic Compounds

As provided on **Table 10**, several VOCs were identified above the laboratory's MDLs in groundwater samples collected from across the Site. Five VOCs (1,1-dichloroethane, 1,1-dichloroethene, benzene, chloroform, and trichloroethene) were detected above their respective PALs, but three of the VOCs (1,1-dichloroethene, benzene, and trichloroethene) had only one PAL exceedance each. A summary of the PAL exceedance locations and results has been provided as **Figure GW-1**. The PAL exceedances for VOCs were limited to four locations within the footprint of the former Air Products Facility. The two chlorinated VOCs with only single exceedances (1,1-dichloroethene and trichloroethene) were co-located at the same sampling location (A8-007-PZ). The single benzene exceedance was located in a separate groundwater sample collection point (A8-017-PZ), which also contained measureable NAPL (discussed below).

Table 10 provides a summary of SVOCs reported in groundwater above the laboratory's MDLs. Eight SVOCs (1,1-biphenyl, 1,4-dioxane, 2-methylnaphthalene, benz[a]anthracene, benzo[b]fluoranthene, indeno[1,2,3-c,d]pyrene, naphthalene, and pentachlorophenol) were detected above their respective PALs. Three of these analytes were detected above their PALs in more than one aqueous sample (1,4-dioxane, naphthalene, and pentachlorophenol). 1,4-dioxane was detected in two groundwater samples (A8-007-PZ and A8-009-PZ) with the highest detection of 44.7 µg/L at A8-007-PZ. Pentachlorophenol was detected in two groundwater samples (A8-009-PZ and A8-015-PZ), with the highest detection of 4.5 µg/L in A8-015-PZ. Naphthalene had the greatest number of exceedances in groundwater on the parcel, with three total (A8-009-PZ, A8-015-PZ, and A8-017-PZ). The maximum observed concentrations of naphthalene, 1,1-biphenyl, and 2-methylnaphthalene, respectively, were 168 µg/L, 12.7 µg/L, and 352 µg/L (all associated with the NAPL impacted A8-017-PZ). The remaining three SVOC compounds (benz[a]anthracene, benzo[b]fluoranthene, and indeno[1,2,3-cd]pyrene) were co-located at a single groundwater sample location (A8-002-PZ), but the exceedances were relatively low (all less than 6 times the PALs). A summary of the PAL exceedance locations has been provided as **Figure GW-2**. Similar to the analysis of soil data, the exceedances indicated for these PAHs are based on the PALs specified in the approved QAPP, which have not been adjusted based on recent updates to the USEPA RSL Resident Tapwater Table dated June 2017. Therefore, the number of PAL exceedances would not be as great using the new toxicity data, and the PAL exceedances shown overstate the significance of the PAH detections.

Table 10 provides a summary of the Oil & Grease and TPH-DRO/GRO detections in groundwater. DRO was detected above its PAL in the two groundwater samples for which it was analyzed (A8-004-PZ and A8-017-PZ). The only detection of Oil & Grease in groundwater was 23,700 µg/L (exceeding the applicable PAL of 47 µg/L) at A8-017-PZ which was impacted by measureable NAPL (discussed below). The product present at this groundwater location influences and invalidates the TPH/Oil & Grease detections (as well as other parameters) at A8-

017-PZ. The observed NAPL has been delineated around A8-017-PZ and is limited to the immediate vicinity of the piezometer. A summary of the TPH/Oil & Grease PAL exceedance locations is provided on **Figure GW-3**.

4.2.2. Groundwater Conditions: Inorganic Constituents

Table 11 provides a summary of inorganic constituents detected above the MDLs in the groundwater samples collected from across the Site. A total of five inorganic compounds (arsenic, cobalt, manganese, vanadium, and hexavalent chromium) were detected above their respective PALs. Hexavalent chromium was initially identified as a significant Site contaminant, with "J" flagged detections of 70 µg/L (A8-009-PZ) and 6 µg/L (A8-002-PZ), versus the established PAL of 0.035 µg/L. However, these hexavalent chromium results are suspect because the dissolved chromium results in the same samples were below the detection limit of 5 µg/L (A8-009-PZ) or not substantially above the level of the associated laboratory blanks (A8-002-PZ). On August 30, 2016, a supplemental hexavalent chromium sample was collected from A8-009-SB using low-flow sampling techniques, and the sample was field filtered to reduce turbidity. On this occasion, dissolved hexavalent chromium was not detected in the sample above the reporting limit of 1 µg/L. This non-detect sample result has been reported in lieu of the suspect result. Vanadium exceeded the PAL in only one sample (A8-004-PZ) and arsenic was only detected slightly above the PAL in two of the samples from this parcel (A8-002-PZ and A8-009-PZ). Cobalt and manganese each had three PAL exceedances (A8-002-PZ, A8-007-PZ, and A8-013-PZ). A summary of the PAL exceedance locations and results has been provided as **Figure GW-4**.

4.2.3. Groundwater Conditions: Results Summary

Groundwater data were screened to determine whether individual sample results may exceed the USEPA Vapor Intrusion (VI) Screening Levels (Target Cancer Risk (TCR) of 1E-5 and Target Hazard Quotient (THQ) of 1) as determined by the Vapor Intrusion Screening Level (VISL) Calculator version 3.5.1 (https://www.epa.gov/vaporintrusion/vapor-intrusion-screening-levels-visls). The PALs specified in the QAPP are based upon drinking water use, which is not a potential exposure pathway for groundwater at the Site. The results of the sample screening against the VI criteria are summarized in **Table 12**.

Four parameters exceeded the individual VI TCR or THQ screening levels. Three parameters (1,1-dichloroethane, 1,1-dichloroethene, and trichloroethene) exceeded the individual VI screening levels at a single location (A8-007-PZ). The fourth parameter that exceeded the individual VI screening was benzene at sample location A8-017-PZ. Sample location A8-017-PZ was observed to have measureable NAPL in the piezometer casing prior to sampling. Following the initial screening, a cumulative risk assessment was also performed for each individual sample location, with the results separated by cancer versus non-cancer risk. All compounds with detections were included in the computation of the cumulative cancer risk, and

all compounds with detections exceeding 10% of the THQ level were included in the evaluation of non-cancer hazard. Sample locations A8-007-PZ and A8-017-PZ were the only locations where the cumulative VI cancer risks were greater than 1E-5 (with computed values of 2E-5 at each location). There were no locations where the calculated cumulative VI non-cancer hazard exceeded 1 for an individual target organ (rounded to one significant digit). The results of the cumulative VI comparisons are provided in **Table 13**, with the exceedances highlighted. The piezometer locations which exceeded the VI cumulative criteria due to elevated VOCs are shown in **Figure GW-5**.

The presence and absence of groundwater impacts within the Site boundaries have been adequately described. Groundwater is not used on the Tradepoint Atlantic property (and is not proposed to be utilized). VI risks were evaluated and identified two locations which may be impacted by elevated VOC concentrations.

4.2.4. Summary of NAPL Observations in Piezometers

Temporary monitoring point A8-017-PZ was installed on October 27, 2015. During the installation of this monitoring point, petroleum odors/PID detections were noted while screening the associated soil core between 0 and 5 feet bgs; visible NAPL was observed between 10 and 13 feet bgs. NAPL was not observed within any other soil cores during the Phase II Investigation.

The thickness of the light non-aqueous phase liquid (LNAPL) in A8-017-PZ (screened from 10 to 25 feet bgs), was measured with an oil-water interface probe immediately after installation and determined to be approximately 0.41 feet thick. Additional shallow temporary piezometers (screened from 10 to 25 feet bgs) were installed approximately 25 feet to the north, south, east and west of A8-017-PZ to delineate the extent of the LNAPL. One additional piezometer (A8-017A-PZ, screened from 3 to 8 feet bgs) was also installed within a perched water bearing unit directly adjacent to A8-017-PZ. The location of each piezometer installed for LNAPL delineation is provided on **Figure 5**. The original groundwater piezometer (A8-017-PZ) was the only piezometer with measureable LNAPL detected after 0 hours, 48 hours, and 30 days. Boring logs documenting soil core observations were completed for all delineation piezometers installed in the vicinity of A8-017-PZ. The delineation soil boring observation logs, and a typical piezometer construction detail log, are given in **Appendix H**.

The delineation of the observed LNAPL has been completed, with no detections of LNAPL observed in any of the screening piezometers installed 25 feet away from the initial location. A trace LNAPL detection in A8-017A-PZ on September 22, 2016 was determined to be anomalous and not indicative of significant contamination. LNAPL thickness has been periodically monitored, and accumulated product has been collected and removed from the impacted monitoring point. The exact dates of removal activities, as well as product thickness measurements and recovery volumes, have been included in **Appendix I**. Continued monitoring and periodic removal of LNAPL from the impacted piezometer location is recommended.

5.0 DATA USABILITY ASSESSMENT

The approved site-wide QAPP specified a process for evaluating data usability in the context of meeting project goals. Specifically, the goal of the Phase II Investigation is to determine if potentially hazardous substances or petroleum products (VOCs, SVOCs, PCBs, TAL-Metals, cyanide, Oil & Grease, or TPH-DRO/GRO) are present in Site media (soil and groundwater) at concentrations that could pose an unacceptable risk to Site receptors. Individual results are compared to the Project Action Limits established in the QAPP (i.e., the most current USEPA RSLs) or based on other direct guidance from the agencies, to identify the presence of exceedances in each environmental medium.

Quality control (QC) samples were collected during field studies to evaluate field/laboratory variability. A summary of QA/QC samples associated with this investigation has been included as **Appendix J**. The following QC samples were submitted for analysis to support the data validation:

- Trip Blank – at a rate of one per day
  - Soil – VOCs only
  - Water – VOCs only
- Blind Field Duplicate – at a rate of one per twenty samples
  - Soil – VOCs, SVOCs, Metals, TPH-DRO, TPH-GRO, Oil & Grease, PCBs, Hexavalent Chromium, and Cyanide
  - Water – VOCs, SVOCs, Metals, TPH-DRO, TPH-GRO, Oil & Grease, Hexavalent Chromium, and Cyanide
- Matrix Spike/Matrix Spike Duplicate – at a rate of one per twenty samples
  - Soil – VOCs, SVOCs, Metals, TPH-DRO, TPH-GRO, Oil & Grease, PCBs, and Hexavalent Chromium
  - Water – VOCs, SVOCs, Metals, TPH-DRO, TPH-GRO, Oil & Grease, and Hexavalent Chromium
- Field Blank and Equipment Blank – at a rate of one per twenty samples
  - Soil – VOCs, SVOCs, Metals, TPH-DRO, TPH-GRO, Oil & Grease, Hexavalent Chromium, and Cyanide
  - Water – VOCs, SVOCs, Metals, TPH-DRO, TPH-GRO, Oil & Grease, Hexavalent Chromium, and Cyanide

The QC samples were collected and analyzed in accordance with the QAPP Worksheet 12 – Measurement Performance Criteria, QAPP Worksheet 20 – Field Quality Control, and QAPP Worksheet 28 – Analytical Quality Control and Corrective Action.

5.1. DATA VERIFICATION

A verification review was performed on documentation generated during sample collection and analysis. The verification included a review of field log books, field data sheets, and Chain of

Custody (COC) forms to ensure that all planned samples were collected, and to ensure consistency with the field methods and decontamination procedures specified in the QAPP Worksheet 21 – Field SOPs and Appendix A of the QAPP. In addition, calibration logs were reviewed to ensure that field equipment was calibrated and/or checked once per day. The logs have been provided in **Appendix D** (PID calibration log) and **Appendix F** (YSI calibration log).

The laboratory deliverables were reviewed to ensure that all records specified in the QAPP as well as necessary signatures and dates are present. Sample receipt records were reviewed to ensure that the sample condition upon receipt was noted, and any missing/broken sample containers (if any) were noted and reported according to plan. The data packages were compared to the COCs to verify that results were provided for all collected samples. The data package case narratives were reviewed to ensure that all exceptions (if any) are described.

5.2. DATA VALIDATION

USEPA Stage 2B data validation was completed for the environmental sample analyses performed by PACE and supporting Level IV Data Package information by Environmental Data Quality Inc. (EDQI).

Sample analyses have undergone an analytical quality assurance review to ensure adherence to the required protocols. The Stage 2B review was performed as outlined in "Guide for Labeling Externally Validated Laboratory Analytical Data for Superfund Use", EPA-540-R-08-005. Results have been validated or qualified according to general guidance provided in "USEPA National Functional Guidelines for Inorganic Superfund Data Review (ISM02.1)", USEPA October 2013. Region III references this guidance for validation requirements. This document specifies procedures for validating data generated for Contract Laboratory Program (CLP) analyses. The approved QAPP dated October 2, 2015 (updated April 5, 2016) and the quality control requirements specified in the methods and associated acceptance criteria were also used to evaluate the non-CLP data.

Data Validation has been completed for the Parcel A8 data. The Data Validation Reports (DVRs) provided by EDQI have been included as electronic attachments.

5.3. DATA USABILITY

The data were evaluated with respect to the quality control elements of precision, bias, representativeness, comparability, completeness and sensitivity relative to data quality indicators and performance measurement criteria outlined in QAPP Worksheet 12 – Measurement Performance Criteria. The following discussion details deviation from the performance measurement criteria, and the impact on data quality and usability.

The measurement performance criteria of precision and bias were evaluated in the data validation process as described in the DVRs provided as electronic attachments. Where appropriate, potential limitations in the results have been indicated through final data flags. These flags indicate whether particular data points were quantitative estimates, biased high/low, associated with blank contamination, etc. Individual data flags are provided with the results in the detection summary tables. A qualifier code glossary is included with each DVR provided by EDQI. Particular results may have been marked with the "R" flag if the result was deemed to be unreliable and was not included in any further data evaluation. A summary of the results that were rejected during data validation has been provided on **Table 14** (soil) and **Table 15** (groundwater). A discussion of data completeness (the proportion of valid data) is included below.

Representativeness is a measure of how accurately and precisely the data describe the Site conditions. Representativeness of the samples submitted for analysis was ensured by adherence to standard sampling techniques and protocols, as well as appropriate sample preservation prior to analysis. Sampling was conducted in accordance with the QAPP Worksheet 21 – Field SOPs and Appendix A of the QAPP. Specific Field SOPs applicable to the assessment of representativeness include **Field SOP Numbers 006, 007, 008, 009, 010, 011, 017, and 024**. Review of the field notes and laboratory sample receipt records indicated that collection of soil and groundwater at the Site was representative, with no significant deviations from the SOPs.

Comparability describes the degree of confidence in comparing two sets of data. Comparability is maintained across multiple datasets by the use of consistent sampling and analytical methods across multiple project phases. Comparability of sample results was ensured through the use of approved standard sampling and analysis methods outlined in the QAPP. QA/QC protocols help to maintain the comparability of datasets, and in this case were assessed via blind duplicates, blank samples, and spiked samples, where applicable. No deviations from the QAPP were noted in the dataset.

Sensitivity is a determination of whether the analytical methods and quantitation limits will satisfy the requirements of the project. The laboratory reports were reviewed to verify that reporting limits met the quantitation limits for specific analytes provided in QAPP Worksheet #15 – Project Action Limits and Laboratory-Specific Detection/Quantitation Limits. In general the laboratory reporting limits met the detection and quantitation limits specified in the QAPP.

Completeness is expressed as a ratio of the number of valid data points to the total number of analytical data results. Non-usable ("R" flagged) data results were determined through the data validation process. The approved QAPP specifies that the completeness of data is assessed by professional judgement, but should be greater than or equal to 90%. Data completeness for each compound is provided in **Appendix K**. As a result of dilutions due to matrix interferences, some of the initial soil samples had limited value for characterization of SVOCs. As a corrective

measure, and to improve the accuracy and precision of the dataset, an additional round of soil samples were collected and analyzed for SVOCs at each of the affected boring locations and the results of the second round of samples was used in lieu of the original results for SVOCs. This resampling event is further described in detail in the SVOC Soil Resample Analysis Clarification Letter: Parcels A3, A4, A8, B5, and B8 which was submitted to the agencies dated June 1, 2017.

Several SVOC compounds had overall completeness ratios below 90%, including benzaldehyde, 2,3,4,6-tetrachlorophenol, 2,4-dinitrophenol, pentachlorophenol, 2,4,5-trichlorophenol, 2,4,6-trichlorophenol, 2,4-dichlorophenol, 2-chlorophenol, and 2-methylphenol. Since most of these compounds had completeness scores very close to the 90% goal (≥86%), these are not considered to be significant data gaps. Only benzaldehyde had a completeness value below 86%. However, adequate data for groundwater was available to determine that benzaldehyde is not a significant concern at the Site. Excluding the SVOCs, the completeness goal was met for all remaining compounds except 1,4-dioxane and methyl acetate.

In the groundwater samples, only methyl acetate, 3,3'-dichlorobenzidine, and acetone were below the goal of 90% completeness. The lack of soil/groundwater data for methyl acetate is not considered to be a significant data gap as this compound was not detected in either media and is not expected to be a site-related contaminant. Adequate data for soil was available to determine that 3,3'-dichlorobenzidine and acetone do not appear to be significant contaminants at the Site.

Overall, the soil and groundwater data can be used as intended. The lack of 1,4-dioxane data in soil is not considered to be significant data gap since the two locations that showed PAL exceedances for 1,4-dioxane in groundwater (A8-007-PZ and A8-009-PZ) also exhibited detections of chlorinated VOCs. Therefore, any potentially significant concentrations of 1,4-dioxane in the soil would be expected to be accompanied by a significant presence of chlorinated VOCs in the soil, which has not been the case on this parcel.

6.0 HUMAN HEALTH SCREENING LEVEL RISK ASSESSMENT (SLRA)

6.1. ANALYSIS PROCESS

A human health Screening Level Risk Assessment (SLRA) has been conducted for soils to further evaluate the Site conditions in support of the design of necessary response measures. The SLRA included the following evaluation process:

Identification of Exposure Units (EUs): Parcel A8 (27.1 ac) consisted of one single EU including the entire Site.

Identification of Constituents of Potential Concern (COPCs): Compounds that are present at concentrations at or above the USEPA Regional Screening Levels (RSLs) set at a target cancer risk of 1E-6 or target non-cancer Hazard Quotient (HQ) of 0.1 were identified as COPCs to be included in the SLRA. Although the PALs (discussed in preceding sections) remain unchanged, the COPC screening levels for relevant PAHs were modified for the SLRA based on the updated USEPA RSL Composite Worker Soil Table dated June 2017. A COPC screening analysis is provided in **Table 16** to identify compounds above the relevant screening levels in Parcel A8.

Exposure Point Concentrations (EPCs): The COPC soil datasets for the site-wide EU were divided into surface (0 to 1 foot) and subsurface (>1 foot) depths for estimation of potential EPCs. An evaluation of pooled surface and subsurface soil data was also performed. Thus, for Parcel A8 there are three soil datasets. A statistical analysis was performed for each COPC dataset using the ProUCL software (version 5.0) developed by the USEPA to determine representative reasonable maximum exposure (RME) values for the EPC for each constituent. The RME value is typically the 95% Upper Confidence Limit (UCL) of the mean. For lead, the arithmetic mean for each depth was calculated for comparison to the Adult Lead Model-based values, and any individual results exceeding 10,000 would be delineated for possible excavation and removal (if applicable). For PCBs, all results equaling or exceeding 50 mg/kg would be delineated for excavation and removal (if applicable).

Risk Ratios: The surface soil EPCs, subsurface soil EPCs, and pooled soil EPCs were compared to the USEPA RSLs for the Composite Industrial Worker and to site-specific Soil Screening Levels (SSLs) for the Construction Worker based on equations derived in the USEPA Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites (OSWER 9355.4-24, December 2002). For the Construction Worker scenario, a baseline scenario was evaluated using the default exposure frequency of 250 work days (1 year construction period) for future potential risk. The risk ratios were calculated with a cancer risk of 1E-6 and a non-cancer Hazard Quotient (HQ) of 1. The risk ratios for the

carcinogens were summed to develop a screening level estimate of the baseline cumulative cancer risk. The risk ratios for the non-carcinogens were segregated and summed by target organ to develop a screening level estimate of the baseline cumulative non-cancer hazard.

There is no potential for human exposure to groundwater for a Composite Worker since groundwater is not used on the Tradepoint Atlantic property (and is not proposed to be utilized). In the event that future construction/excavation leads to a potential Construction Worker exposure to groundwater, health and safety plans and procedures shall be followed to limit exposure risk.

Assessment of Lead: For lead, the arithmetic mean concentrations for surface soils, subsurface soils, and pooled soils for the site-wide EU were compared to the applicable RSL (800 mg/kg) as an initial screening. If the mean concentrations for the EU were below the applicable RSL, the EU was identified as requiring no further action for lead. If a mean concentration exceeded the RSL, the mean values were compared to calculated Adult Lead Model values (ALM Version dated 6/21/2009 updated with the 5/17/2017 OLEM Directive) with inputs of 1.8 for the geometric standard deviation and a blood baseline lead level of 0.6 ug/dL. The ALM calculation generates a soil lead concentration of 2,518 mg/kg, which is the most conservative (i.e., lowest) concentration which would yield a probability of 5% of a blood lead concentration of 10 ug/dL. If the arithmetic mean concentrations for the EU were below 2,518 mg/kg, the EU was identified as requiring no further action for lead. The lead averages and screening levels are presented for surface, subsurface, and pooled soils in **Table 17**. For lead, any results equaling or exceeding 10,000 mg/kg would be identified to be delineated for possible excavation and removal (if applicable).

Assessment of TPH-DRO/GRO and Oil & Grease: EPCs were not calculated for TPH-DRO/GRO or Oil & Grease. Instead, the individual results were compared to the PAL set to a HQ of 1 (6,200 mg/kg). Only one sample exceeded the specified limit for Oil & Grease (A8-005-SB-1) with a detection of 7,740 mg/kg. In addition, one boring (A8-017-SB) had physical evidence of NAPL in the soil core which represents an additional exceedance of the TPH/Oil & Grease PAL. A piezometer installed at this location had measureable LNAPL accumulate in the casing. An evaluation of the potential for product mobility based on these detections and response actions is presented following the SLRA in Section 7.3.

Risk Characterization Approach: For the site-wide EU, if the baseline risk ratio for each non-carcinogenic COPC or cumulative target organ does not exceed 1 (with the exception of lead), and the sum of the risk ratios for the carcinogenic COPCs does not exceed a cumulative cancer risk of 1E-5, then a no further action determination will be recommended. The primary EPC comparisons to determine the need for possible remedial action will be the Construction Worker scenario comparisons to the surface and subsurface soil EPCs, as well as the Composite Worker comparison to the surface soil EPCs. However, no further action will only be approvable if subsurface soil EPCs are compared to the Composite Worker RSLs in addition to the Construction Worker SSLs, and the cancer and non-cancer risk estimates are equal to or less than 1E-5 and 1, respectively. Pooled soil data has also been evaluated and included for discussion.

If the baseline estimate of cumulative cancer risk exceeds 1E-5, but is less than or equal to 1E-4, then capping of the EU will be considered to be an acceptable remedy for the Composite Worker. For the Construction Worker, cumulative cancer risks exceeding 1E-5, but less than or equal to 1E-4, will be mitigated via site-specific health and safety requirements. The efficacy of capping for elevated non-cancer hazard will be evaluated in terms of the magnitude of the exceedance and other factors such as bioavailability of the COPC. Similarly, for lead, if the ALM results indicate that the mean concentrations would present a 5% to 10% probability of a blood concentration of 10 ug/dL for the EU, then capping of the EU would be an acceptable presumptive remedy. The mean soil lead concentrations corresponding to ALM probabilities of 5% and 10% are 2,518 mg/kg, and 3,216 mg/kg, respectively. If capping of the identified area is not proposed, additional more detailed quantitative evaluation of risk will be required for the EU. This supplemental risk evaluation may include a selective removal (excavation) remedy to reduce site-wide cancer and/or non-cancer risks to acceptable levels.

The USEPA's acceptable risk range is between 1E-6 and 1E-4. If the sum of the risk ratios for carcinogens exceeds a cumulative cancer risk of 1E-4, further analysis of site conditions will be required including the consideration of toxicity reduction in any proposal for a remedy. The magnitude of non-carcinogen hazard exceedances and bioavailability of the COPC will also dictate further analysis of site conditions including consideration of toxicity reduction in any proposal for a remedy. In addition, if the ALM indicates that the mean concentrations would present a >10% probability of a blood concentration of 10 ug/dL for the EU, further analysis of site conditions including toxicity reduction will be completed such that the probability would be reduced to less than 10% after toxicity reduction, but before capping.

6.2. PARCEL A8 SLRA RESULTS AND RISK CHARACTERIZATION

Soil data were divided into three datasets (surface, subsurface, and pooled) for the Parcel A8 EU to evaluate potential current and future exposure scenarios. The current Composite Worker will be exposed only to surface soils. However, if construction activities were to result in the placement of subsurface material over existing surface soils, a future Composite Worker could be exposed to a mixture of surface and subsurface soils. The Construction Worker may be exposed only to surface soils, but subsurface soils would be encountered for development activities that involve soil disturbances such as excavations or other intrusive earth-moving activities. The pooled data may be applicable for development work that involves disturbances through the surface soil, since workers would likely not be exposed solely to the subsurface soil.

If the detection frequency of an analyte is less than 5% in a dataset with a minimum of 20 samples, the COPC can be eliminated from the risk assessment assuming the detections are not extremely high (based on agency discretion). A single detection that is extremely high could require delineation rather than elimination. No analyte designated as a COPC in Parcel A8 had a detection frequency less than 5%; thus, no COPCs were removed due to low detection frequencies.

EPCs were calculated for each soil dataset (i.e., surface, subsurface, and pooled surface/subsurface) in the site-wide EU. ProUCL output tables (with computed UCLs) derived from the data for each COPC in soils are provided as electronic attachments, with computations presented and EPCs calculated for COPCs within each of the three datasets. The ProUCL input tables are also included as electronic attachments. The results were evaluated to identify any samples that may require additional assessment or special management based on the risk characterization approach. The calculated site-wide EPCs for the surface and subsurface exposure scenarios are provided in **Table 18**. The supplemental EPCs generated from the pooled surface and subsurface soils are also included in the EPC table. These EPCs were used for both the Composite Worker and Construction Worker risk assessments.

As indicated above, the EPCs for lead are the average (i.e., arithmetic mean) values for each dataset. A lead evaluation spreadsheet, providing the computations used to determine lead averages for each dataset in the site-wide EU, is also included as an electronic attachment. The average lead concentrations are presented for each dataset in **Table 17**, which indicates that neither surface, subsurface, nor pooled soils exceeded an average lead value of 800 mg/kg. The screening criterion for lead was set at an EU arithmetic mean of 800 mg/kg based on the RSL, with a secondary limit of 2,518 mg/kg based on the May 2017 updated ALM developed by the USEPA (corresponding to a 5% probability of a blood lead level of 10 ug/dL). There were no locations where detections of lead exceeded 10,000 mg/kg, the designated threshold at which delineation would be required.

None of the detections of PCBs exceeded the mandatory excavation criterion of 50 mg/kg.

Composite Worker Assessment:

Risk ratios for the estimates of potential EPCs for the Composite Worker scenario are shown in **Table 19** (surface), **Table 20** (subsurface), and **Table 21** (pooled surface and subsurface soils). The results are summarized as follows:

Worker Scenario	Medium	Hazard Index (>1)	Total Cancer Risk
Composite Worker	Surface Soil	none	4E-6
	Subsurface Soil	none	9E-6
	Surface & Subsurface Soil	none	7E-6

The current Composite Worker will be exposed only to surface soils. The risk ratios indicated that the cumulative cancer risk for a potential Composite Worker exposure to surface soils was equal to 4E-6, below the acceptable limit for no further action (1E-5). When the non-cancer risks were segregated and summed by target organ for cumulative Hazard Index (HI), no target organ exceeded a cumulative HI of 1 in surface soils.

Future construction activities were assumed to result in the placement of subsurface material over existing surface soils exposing a future Composite Worker to a mixture of surface and subsurface soils. This exposure scenario is dependent on any future development proposed for the parcel. The risk ratios indicated that the cumulative cancer risks for the Composite Worker scenario were equal to 9E-6 and 7E-6 for subsurface soils and pooled soils, respectively. When the non-cancer risks were segregated and summed by target organ for cumulative hazard, no target organs exceeded a cumulative HI of 1 in subsurface or pooled soils.

The calculated total cancer risk and cumulative non-cancer hazards for a Composite Worker exposed to surface, subsurface, and pooled soils did not exceed the regulatory standards identified in the SLRA Risk Characterization Approach. Based on this assessment, the potential current and future risks to a Composite Worker are acceptable with no further action. The Site is suitable for occupancy and use by a Composite Worker without special land-use considerations or corrective remedies to be implemented in a Response and Development Work Plan.

Construction Worker Assessment:

Risk ratios for the estimates of potential EPCs for the Construction Worker scenario (250-day baseline exposure frequency) are shown in **Table 22** (surface), **Table 23** (subsurface), and **Table 24** (pooled surface and subsurface soils). The variables entered for calculation of site-specific SSLs (EU area, input assumptions, and exposure frequency) are indicated as notes on the tables. The spreadsheet used for computation of the site-specific 250-day Construction Worker SSLs is included as **Appendix L**. The results are summarized as follows:

Worker Scenario	Medium	Hazard Index (>1)	Total Cancer Risk
Construction Worker (250 work day schedule)	Surface Soil	Nervous System = 4 Dermal System = 2	6E-7
	Subsurface Soil	Nervous System = 2	1E-6
	Surface & Subsurface Soil	Nervous System = 3	1E-6

The Construction Worker may be exposed to only surface soils or a combination of surface and subsurface soils (i.e. pooled) during future excavation or other earth moving activities. The screening level estimates of Construction Worker cancer risk for exposure to surface soils, subsurface soils, and pooled soils in the parcel-wide EU were all less than the regulatory risk level of 1E-5. Using the baseline 250-day exposure to evaluate surface soil hazards, elevated non-cancer hazards above the HI of 1 were calculated for the nervous system (HI=4) due to elevated manganese (HQ=4), and the dermal system (HI=2) due to the additive effect of vanadium (HQ=1), thallium (HQ=0.2), and arsenic (HQ=0.07). For the subsurface soils evaluated by the baseline 250-day exposure scenario, an elevated non-cancer hazard was again noted for the nervous system (HI=2) due to elevated manganese (HQ=2). For the baseline Construction Worker exposure to pooled soils, an elevated non-cancer hazard was noted for the nervous system (HI=3) due to elevated manganese (HQ=3).

Institutional controls should be implemented to ensure proper oversight and management of any future construction activity that includes disturbances of the existing soil. These controls will be protective of future Construction Workers by limiting potential exposures to surface and subsurface soil which may be impacted above the acceptable risk criteria. The potential non-cancer risks may be re-evaluated based on any future proposed schedule of construction, which may be less than the 250 work day exposure presented herein.

7.0 FINDINGS AND RECOMMENDATIONS

The objective of this Phase II Investigation was to fully characterize the nature and extent of contamination at the Site. During the Phase II Investigation, a total of seven groundwater samples and 58 soil samples (all locations/depths) were collected and analyzed to define the nature and extent of contamination in Parcel A8. The sampling and analysis plan for the parcel was developed to target specific features which represented a potential release of hazardous substances and/or petroleum products to the environment. Groundwater samples were analyzed for TCL-VOCs, TCL-SVOCs, Oil & Grease, TAL-Dissolved Metals, hexavalent chromium, and cyanide. Soil samples were analyzed for TCL-VOCs, TCL-SVOCs, Oil & Grease, TAL-Metals, hexavalent chromium, and cyanide. Select soil and groundwater samples were also analyzed for TPH-DRO/GRO. Shallow soil samples (0 to 1 foot bgs) were analyzed for PCBs and asbestos.

7.1. SOIL

The concentrations of constituents in the soil have been characterized by the Phase II Investigation to provide estimates of exposure point concentrations to support risk assessment.

Lead and PCB concentrations are well below the levels that would warrant evaluation of a removal remedy. The average lead concentrations in the surface, subsurface, and pooled (surface and subsurface) soils are below the 800 mg/kg RSL, indicating that no further action is needed with respect to lead. In addition, there were no locations where detections of lead exceeded 10,000 mg/kg, the designated threshold at which delineation would be required. There were no PCB concentrations identified in Parcel A8 above the PALs, indicating that no further action is needed. There were no soil PAL exceedances for VOCs, indicating that VOCs are not significant contaminants in soil at the Site. Asbestos was not detected in any of the surface soil samples collected from across the Site.

SVOCs (benz[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, dibenz[a,h]anthracene, and indeno[1,2,3-c,d]pyrene) and inorganics (arsenic and manganese) in soil were responsible for most PAL exceedances at the Site. The maximum detections for benzo[a]pyrene, dibenz[a,h]anthracene, and indeno[1,2,3-c,d]pyrene were associated with a single sample (A8-006-SB-4). The maximum detections for the remaining two PAHs (benz[a]anthracene and benzo[b]fluoranthene) were associated with sample A8-001-SB-4. Manganese exceeded its PAL in three locations, all associated with general parcel coverage. Arsenic exceeded its PAL in the largest proportion of the samples analyzed site-wide; however, all results were relatively low, with a maximum detection of 27.7 mg/kg at A8-017-SB-7 (general coverage). While TPH-DRO/GRO were not analyzed at every location in the parcel, adequate Oil & Grease data was available to indicate that TPH contamination does not appear to be significant at the Site. Elevated TPH/Oil & Grease results above the PAL of 6,200 mg/kg which may represent locations that could potentially be impacted by NAPL are discussed in Section 7.3.

7.2. GROUNDWATER

The concentrations of constituents in the groundwater have also been characterized by the Phase II Investigation to provide estimates of exposure point concentrations to support risk assessment.

Analysis of the groundwater samples identified concentrations of five inorganic compounds that exceeded their PALs (arsenic, cobalt, manganese, vanadium, and hexavalent chromium). The majority of inorganic exceedances were located in the central portion of the Site. Total hexavalent chromium initially appeared to be the most significant Site contaminant, with a maximum detection of 70 µg/L (A8-009-PZ) versus the established PAL of 0.035 µg/L. However, the dissolved chromium result in this sample was below the detection limit of 5 µg/L, and the dissolved hexavalent chromium result (resampled on August 30, 2016) was below the detection limit of 1 µg/L. The elevated hexavalent chromium results are believed to be a result of matrix interferences, rather than actual on-site conditions.

Five VOC compounds exceeded their respective PALs (1,1-dichloroethane, 1,1-dichloroethene, benzene, chloroform, and trichloroethene). Piezometer location A8-007-PZ had multiple PAL exceedances (four chlorinated VOCs), while the other groundwater exceedance locations appeared to be isolated with only one PAL exceedance each. The only benzene exceedance was at location A8-017-PZ, where LNAPL was identified and delineated. All VOC exceedances were identified in the central and southern areas of the parcel, in the vicinity of the former Air Products Facility.

Eight SVOCs (1,1-biphenyl, 1,4-dioxane, 2-methylnaphthalene, benz[a]anthracene, benzo[b]fluoranthene, indeno[1,2,3-c,d]pyrene, naphthalene, and pentachlorophenol) were detected at concentrations above the PALs. Only three of these SVOCs were detected above their PALs in more than one aqueous sample (1,4-dioxane, naphthalene, and pentachlorophenol). The elevated SVOC detections in A8-017-PZ are most likely linked to the presence of LNAPL. The maximum observed concentrations for naphthalene, 1,1-biphenyl, and 2-methylnaphthalene were all associated with the LNAPL impacted A8-017-PZ.

The two groundwater samples selected for TPH-DRO/GRO analysis both exceeded the PAL for DRO, with a maximum detection of 13,800 µg/L. This maximum detection was identified at groundwater location A8-017-PZ, where LNAPL was identified and delineated. Aside from an Oil & Grease exceedance in A8-017-PZ (23,700 µg/L), there were no other detections of Oil & Grease in groundwater. The product present in the casing of A8-017-PZ is most likely responsible for the elevated TPH/Oil & Grease detections at this location. Based on the lack of elevated Oil & Grease elsewhere on the Site, DRO and GRO are not suspected to be significant contaminants in groundwater in Parcel A8 outside of the area where LNAPL has been delineated.

7.3. NON-AQUEOUS PHASE LIQUID

One temporary groundwater sample collection point (A8-017-PZ) was observed to contain measureable LNAPL during groundwater gauging. NAPL was observed in the soil core associated with A8-017-PZ during field screening, but no other soil borings in Parcel A8 had visible indications of NAPL. No other groundwater sample collection points contained any measureable NAPL. Delineation of the LNAPL contamination in the vicinity of A8-017-PZ has been completed, and EAG has periodically performed monitoring and product recovery from the casing of the impacted piezometer. Continued LNAPL monitoring and periodic removal is recommended at piezometer A8-017-PZ.

While TPH-DRO/GRO were not analyzed at every location in the parcel, adequate Oil & Grease data was available to indicate that TPH contamination does not appear to be widespread at the Site. DRO and GRO were not detected above the PAL (6,200 mg/kg) in any of the soil borings selected for these analyses.

One of the borings located to evaluate soil conditions in close proximity to the former Oily Surface Water Discharge (REC 11B) exceeded the Oil & Grease PAL (A8-005-SB-1 at 7,740 mg/kg), and represents a location which could potentially be impacted by NAPL that could possibly migrate along utility corridors. A site visit on October 15, 2015 located a discharge pipe in the vicinity of this REC, but no evidence of staining or oily sheen was observed. A baffle was observed in the reservoir at this location, but not a sorbent boom. The deeper 5 foot bgs sample at boring location A8-005-SB had a negligible Oil & Grease detection of 937 mg/kg. Because of the lack of physical evidence of NAPL at the Oil & Grease impacted boring A8-005-SB (a lack of sheen or product in the soil core and absence of surface staining on the ground or oily sheen in the surface water), along with negligible analytical detections in the underlying 5 foot bgs sample, it appears unlikely that NAPL is present in sufficient quantity to migrate and no additional action is recommended at this time. However, the proximity of the Oil & Grease impacted boring (A8-005-SB) and LNAPL delineation piezometers (around A8-017-PZ) to proposed utilities should be evaluated in any future development planning for Parcel A8. Appropriate protocols should be documented in a Response and Development Work Plan (as necessary) to prevent the mobilization of any product if future utilities are proposed in the vicinity of these impacts.

7.4. HUMAN HEALTH SCREENING LEVEL RISK ASSESSMENT

Groundwater is not used on the Tradepoint Atlantic property (and is not proposed to be utilized), therefore there is no potential for direct human exposure for a Composite Worker. In the event that future construction/excavation leads to a potential Construction Worker exposure to groundwater, health and safety plans should be implemented to limit exposure risk. The groundwater data were screened to determine whether any cumulative (or individual) sample results exceeded the USEPA VI TCR (carcinogen) or THQ (non-carcinogen) Screening Levels.

Four parameters (1,1-dichloroethane, 1,1-dichloroethene, trichloroethene, and benzene) exceeded the individual VI screening levels set at a TCR of 1E-5 or THQ of 1. Benzene was detected above the individual VI level at sample location A8-017-PZ. The LNAPL in A8-017-PZ is presumed to be the source of the elevated VOC (and SVOC) detections at this location. As the delineation of product associated with A8-017-PZ has already been completed, this sample location does not warrant additional assessment. The three remaining parameters (1,1-dichloroethane, 1,1-dichloroethene, and trichloroethene) exceeded their individual VI screening levels at one location (A8-007-PZ). When the analytical results were summed by sample location to determine cumulative risks, piezometers A8-007-PZ and A8-017-PZ were the only locations where the cumulative VI cancer risks were greater than 1E-5. The non-cancer cumulative VI hazards did not exceed 1 for any individual target organ (rounded to one significant digit). Further assessment or mitigation is recommended to address the potential VI risk identified at piezometer A8-007-PZ if development is proposed in this area. The selection of appropriate response measures, based on the specific development plan for the parcel, should be addressed in a project-specific Response and Development Work Plan.

The current Composite Worker will be exposed to surface soils. The risk ratios indicated that the cumulative cancer risk for the Composite Worker scenario was equal to 4E-6 for surface soils. A non-cancer cumulative HI of 1 was not exceeded for any organ system evaluated for Composite Worker exposure to surface soils. Since the cumulative HI did not exceed 1 for any target organ and the estimate of cumulative cancer risk was less than 1E-5, no additional action is required to address potential risks to a current Composite Worker.

The cumulative carcinogenic risk for the potential Composite Worker exposure to subsurface soils was equal to 9E-6 (below the target benchmark). A cumulative HI of 1 was not exceeded for any organ system evaluated for a potential future Composite Worker exposure to subsurface soils when the non-cancer risks were segregated and summed by target organ. Based on this assessment, the potential current and future risks to a Composite Worker are acceptable with no further action. The Site is suitable for occupancy and use by a Composite Worker without special land-use considerations or corrective measures.

The Construction Worker risk assessment for a potential baseline exposure (250 work days) indicated that the cumulative cancer risks were equal to 6E-7 (surface soils) and 1E-6 (subsurface soils) in the parcel. Based on these values, the cancer risks to the future Construction Worker are in the acceptable range for no further action. Elevated non-cancer hazards above the HI of 1 were calculated for surface soils associated with the nervous system (HI=4) due to elevated manganese, and the dermal system (HI=2) due to the cumulative effect of vanadium, thallium, and arsenic. An elevated non-cancer hazard was also noted in subsurface soils for the nervous system (HI=2) due to elevated manganese. The total HI values associated with the nervous system and the dermal system for the future Construction Worker may indicate the need for protective controls (dust mask, etc.) if a long term construction project is proposed

for the property in the future. The risks may be re-evaluated based on the proposed schedule of construction, which may be less than the baseline 250 work day exposure presented herein. Unacceptable risks due to elevated metals can be addressed by the implementation of health and safety protocols.

7.5. RECOMMENDATIONS

Sufficient remedial investigation data has been collected to evaluate the nature and extent of possible constituents of concern in Parcel A8. The presence and absence of soil and groundwater impacts within Parcel A8 have been adequately described and further investigation is not warranted. Based on the evaluation of risk, the Site is suitable for use by industrial workers; remedial action is not required to support occupancy and use of the parcel in its current condition. Recommendations for the parcel are as follows:

- Future use of the parcel should include the following deed restrictions:
    - Deed restriction for industrial Site use only; no portion of the Site should be used for agricultural, recreational, or residential purposes.
    - Deed restriction on groundwater use; no subsurface water or groundwater should be extracted from aquifers for any purpose.
- Institutional controls should be implemented for the protection of Construction Workers to ensure proper oversight and management of any future construction activity that includes disturbances of the existing soil. These institutional controls will necessarily need to include a written notice to the MDE of any future soil disturbance activities, and may require health and safety requirements for any excavations of substantial time periods, and proper management and characterization of any material disturbed at the Site.
- If an enclosed structure is proposed for construction in the vicinity of A8-007-PZ, further assessment or mitigation of the potential for human exposures via the vapor intrusion to indoor air pathway should be addressed in a Response and Development Work Plan.
- The soil boring location with an elevated detection of Oil & Grease (A8-005-SB) and the LNAPL delineation area (A8-017-PZ) should be considered for proximity to proposed utilities in any future development planning. If future utilities are proposed in the vicinity of these borings/piezometers, appropriate protocols for the mitigation of potential product (NAPL) mobility should be addressed in a Response and Development Work Plan. Continued LNAPL monitoring and periodic removal is recommended at location A8-017-PZ, until there is no measureable free product remaining in groundwater.

8.0 REFERENCES

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USEPA (2002). *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites.* OSWER 9355.4-24. December, 2002.

USEPA (2016). Vapor Intrusion Screening Level (VISL) Calculator version 3.5.1. (https://www.epa.gov/vaporintrusion/vapor-intrusion-screening-levels-visls).

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FIGURES

Tradepoint Atlantic
Area A and Area B Parcels

July 25, 2017

Figure 1

ARM Group Inc.
Earth Resource Engineers and Consultants

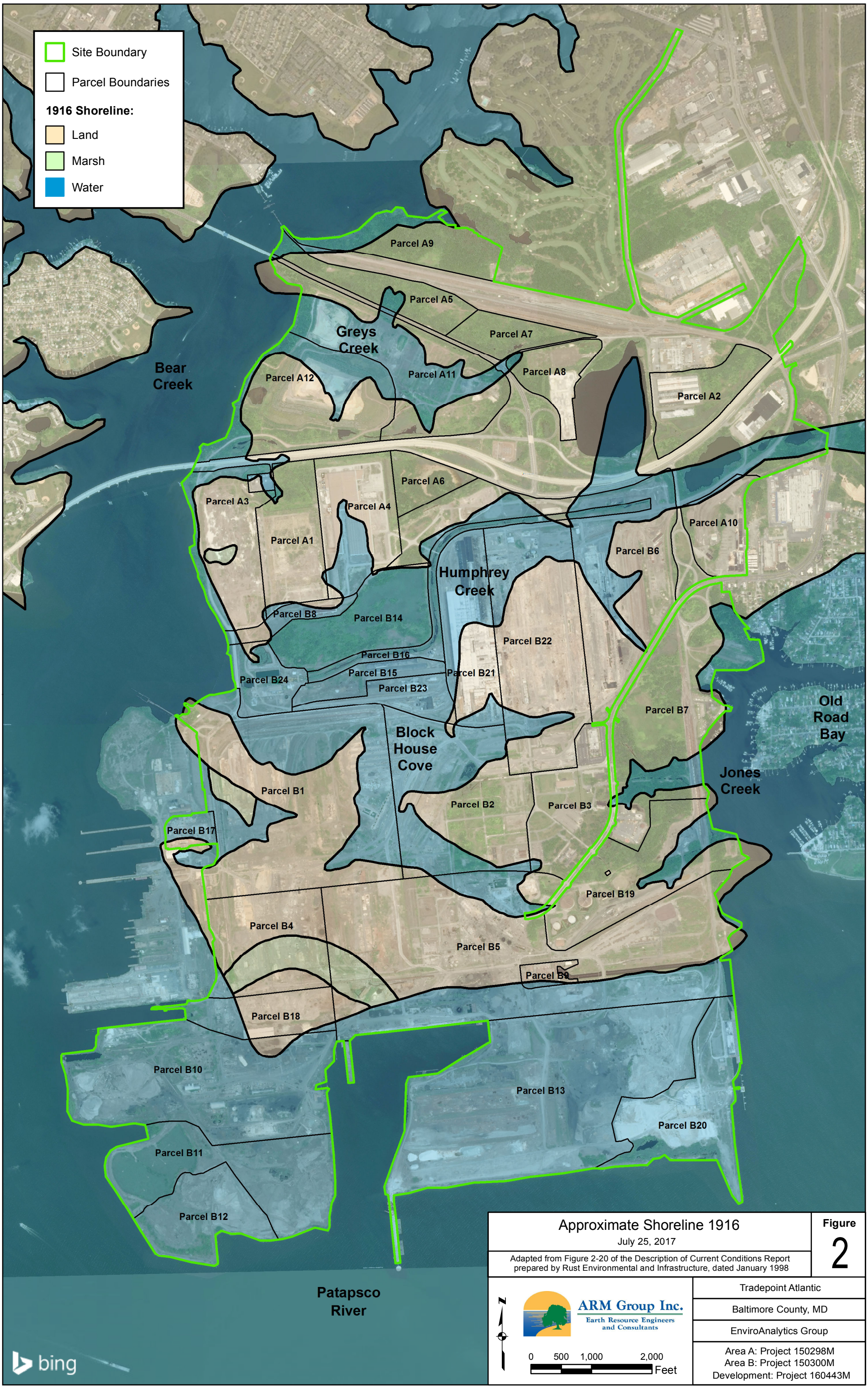
0 500 1,000 2,000 Feet

Tradepoint Atlantic

Baltimore County, MD

EnviroAnalytics Group

Area A: Project 150298M
Area B: Project 150300M
Development: Project 160443M



Approximate Shoreline 1916

July 25, 2017

Adapted from Figure 2-20 of the Description of Current Conditions Report prepared by Rust Environmental and Infrastructure, dated January 1998

Figure 2

ARM Group Inc.
Earth Resource Engineers and Consultants

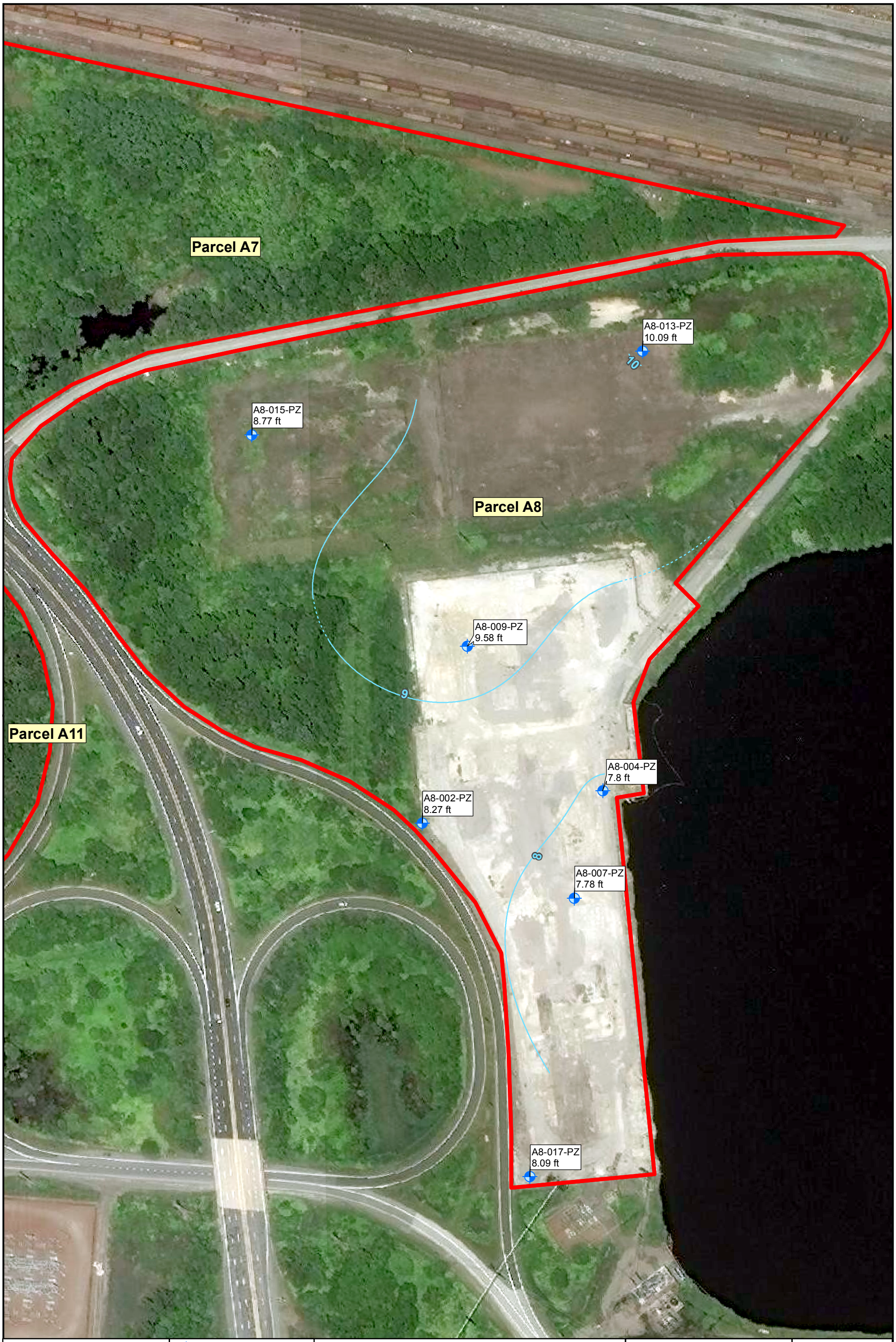
0 500 1,000 2,000 Feet

Tradepoint Atlantic

Baltimore County, MD

EnviroAnalytics Group

Area A: Project 150298M
Area B: Project 150300M
Development: Project 160443M



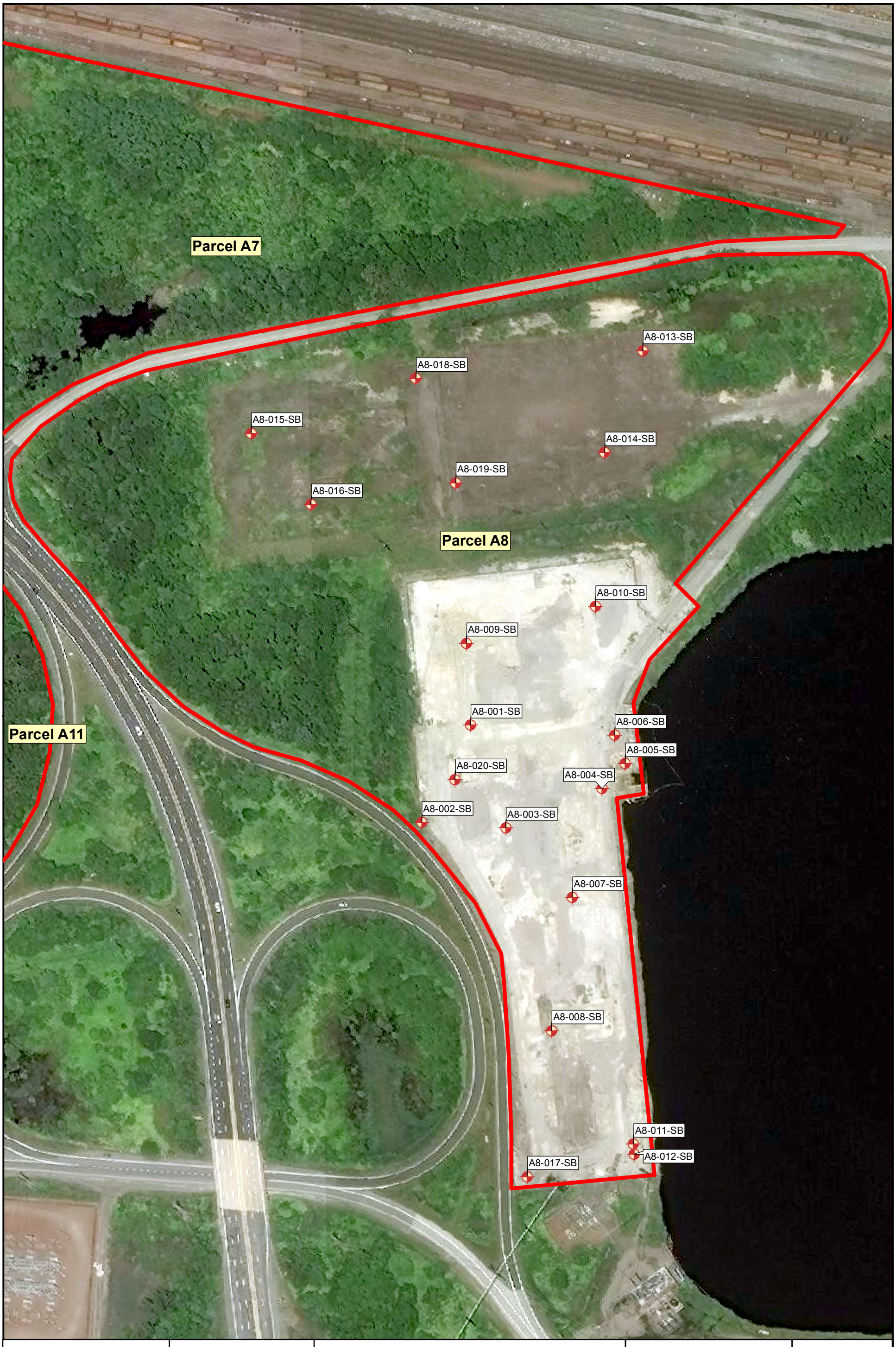
Parcel A8
Groundwater Contour Map
Field Measurement on April 8, 2016

May 4, 2016

EnviroAnalytics Group
ARM Project 150298M-3

Tradepoint Atlantic
Baltimore County, MD

Figure
3



Parcel A8 Soil Borings
Final Field Sample Locations

May 3, 2016

EnviroAnalytics Group
ARM Project 150298M-3

Tradepoint Atlantic
Baltimore County, MD

Figure

4

Parcel A7

Parcel A8

Parcel A11

A8-013-SB-1
A8-013-SB-5

A8-018-SB-1
Benzo[a]pyrene: 0.39 J
A8-018-SB-5

A8-015-SB-1
Benzo[a]pyrene: 0.82 J
A8-015-SB-7

A8-014-SB-1
Benzo[a]pyrene: 0.8 J
A8-014-SB-5

A8-016-SB-1
Benzo[a]pyrene: 1.3 J
A8-016-SB-5

A8-019-SB-1
A8-019-SB-5

A8-001-SB-1
Benz[a]anthracene: 3.1
Benzo[a]pyrene: 6.1 J
Benzo[b]fluoranthene: 8.2
Dibenz[a,h]anthracene: 1.2
A8-001-SB-4
Benz[a]anthracene: 24.6
Benzo[a]pyrene: 16.4 J
Benzo[b]fluoranthene: 29.5
A8-001-SB-10

A8-010-SB-1
A8-010-SB-5

A8-009-SB-1
A8-009-SB-5

A8-006-SB-1
Benzo[a]pyrene: 0.34 J
A8-006-SB-4
Benz[a]anthracene: 10.0
Benzo[a]pyrene: 16.6 J
Benzo[b]fluoranthene: 18.3
Dibenz[a,h]anthracene: 3.9
Indeno[1,2,3-c,d]pyrene: 13.6
A8-006-SB-10

A8-020-SB-1
Benz[a]anthracene: 3.6
Benzo[a]pyrene: 3.1 J
Benzo[b]fluoranthene: 6.4
Dibenz[a,h]anthracene: 0.77
A8-020-SB-5

A8-004-SB-1
Benzo[a]pyrene: 1.2 J
A8-004-SB-5
Benzo[a]pyrene: 1.3 J
A8-004-SB-10

A8-005-SB-1
Benzo[a]pyrene: 0.63 J
A8-005-SB-5
Benz[a]anthracene: 2.9
Benzo[a]pyrene: 6.8 J
Benzo[b]fluoranthene: 7.6
Dibenz[a,h]anthracene: 0.93
Indeno[1,2,3-c,d]pyrene: 5.7
A8-005-SB-10

A8-003-SB-1
Benzo[a]pyrene: 0.6
A8-003-SB-5

A8-002-SB-1
A8-002-SB-5

A8-007-SB-1
A8-007-SB-5

A8-008-SB-1
Benzo[a]pyrene: 0.43
A8-008-SB-5

A8-011-SB-1
A8-011-SB-5

A8-017-SB-1
A8-017-SB-7

A8-012-SB-1
A8-012-SB-5

ARM Group Inc.
Earth Resource Engineers and Consultants

0 50 100 200 Feet

Soil Boring

Parcel Boundary

Parcel A8 Soil Borings
Phase II SVOC Exceedances (mg/kg)

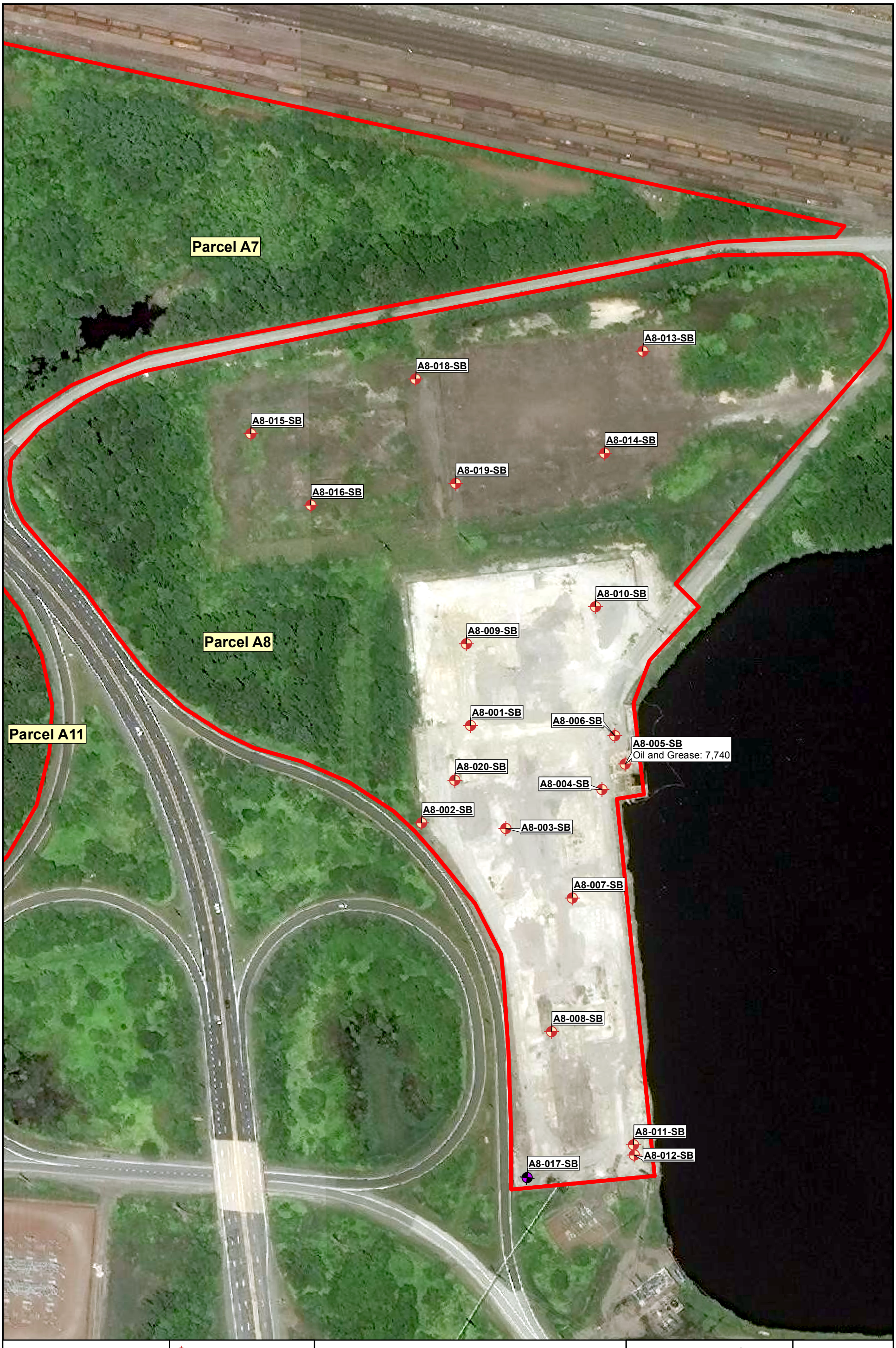
September 14, 2017

EnviroAnalytics Group
ARM Project 150298M-3

Tradepoint Atlantic
Baltimore County, MD

Figure

SB-1



Parcel A8 Soil Borings
Phase II O&G Exceedances (mg/kg)

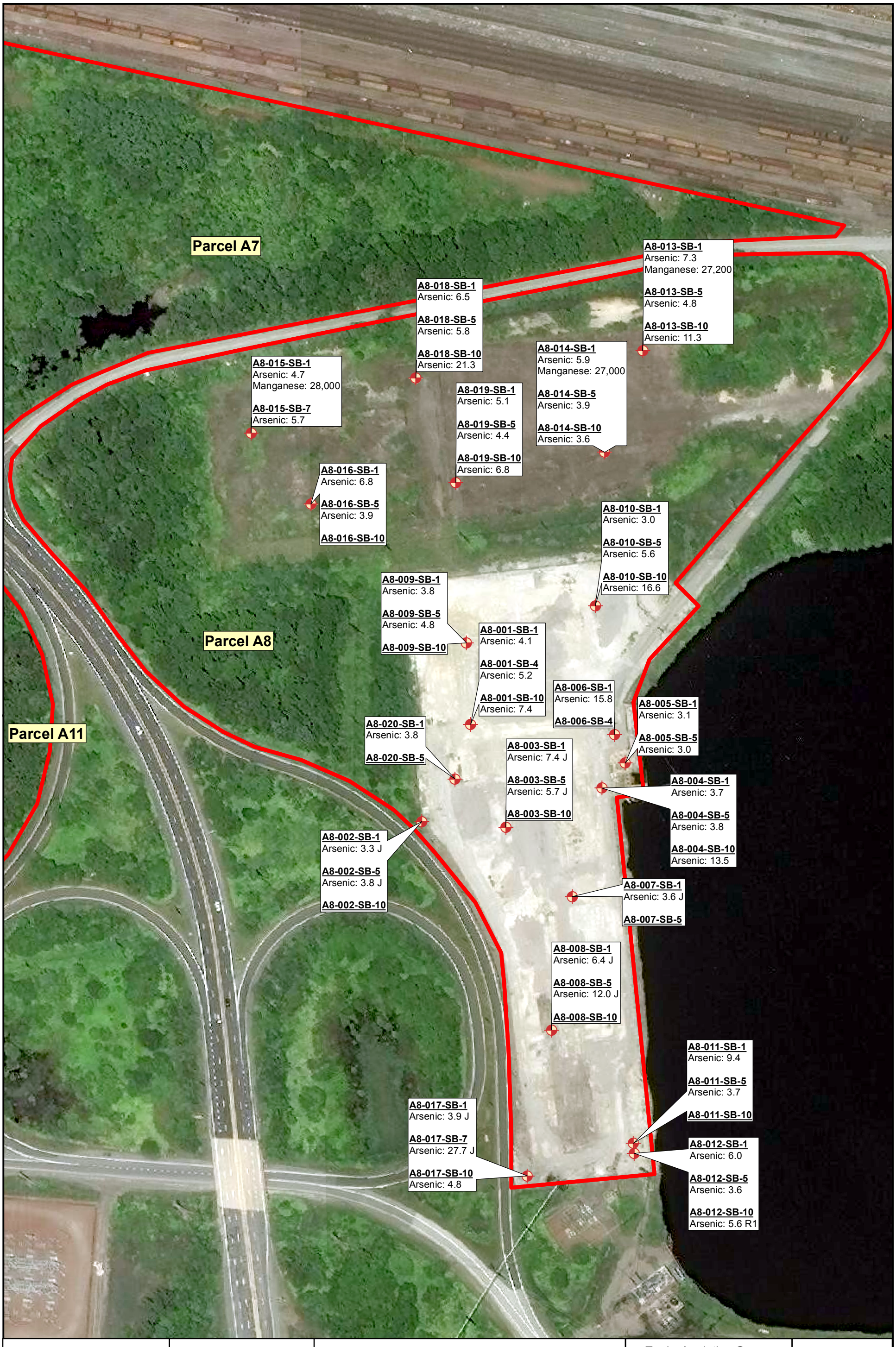
September 14, 2017

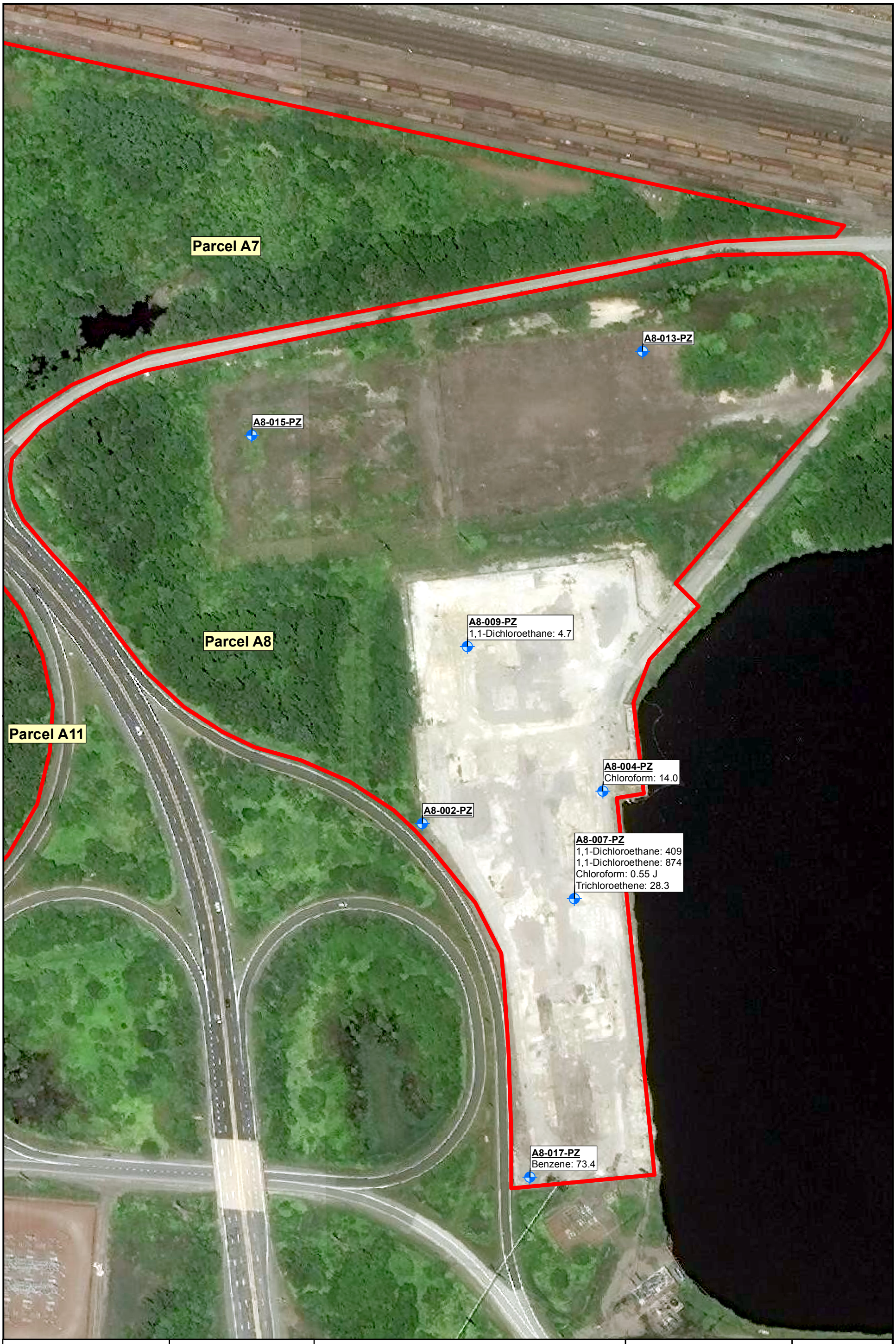
EnviroAnalytics Group
ARM Project 150298M-3

Tradepoint Atlantic
Baltimore County, MD

Figure

SB-2


Parcel A7
Parcel A8
Parcel A11
A8-013-SB-1
Arsenic: 7.3
Manganese: 27,200
A8-013-SB-5
Arsenic: 4.8
A8-013-SB-10
Arsenic: 11.3
A8-018-SB-1
Arsenic: 6.5
A8-018-SB-5
Arsenic: 5.8
A8-018-SB-10
Arsenic: 21.3
A8-014-SB-1
Arsenic: 5.9
Manganese: 27,000
A8-014-SB-5
Arsenic: 3.9
A8-014-SB-10
Arsenic: 3.6
A8-015-SB-1
Arsenic: 4.7
Manganese: 28,000
A8-015-SB-7
Arsenic: 5.7
A8-019-SB-1
Arsenic: 5.1
A8-019-SB-5
Arsenic: 4.4
A8-019-SB-10
Arsenic: 6.8
A8-016-SB-1
Arsenic: 6.8
A8-016-SB-5
Arsenic: 3.9
A8-016-SB-10
A8-010-SB-1
Arsenic: 3.0
A8-010-SB-5
Arsenic: 5.6
A8-010-SB-10
Arsenic: 16.6
A8-009-SB-1
Arsenic: 3.8
A8-009-SB-5
Arsenic: 4.8
A8-009-SB-10
A8-001-SB-1
Arsenic: 4.1
A8-001-SB-4
Arsenic: 5.2
A8-001-SB-10
Arsenic: 7.4
A8-006-SB-1
Arsenic: 15.8
A8-006-SB-4
A8-005-SB-1
Arsenic: 3.1
A8-005-SB-5
Arsenic: 3.0
A8-020-SB-1
Arsenic: 3.8
A8-020-SB-5
A8-003-SB-1
Arsenic: 7.4 J
A8-003-SB-5
Arsenic: 5.7 J
A8-003-SB-10
A8-004-SB-1
Arsenic: 3.7
A8-004-SB-5
Arsenic: 3.8
A8-004-SB-10
Arsenic: 13.5
A8-002-SB-1
Arsenic: 3.3 J
A8-002-SB-5
Arsenic: 3.8 J
A8-002-SB-10
A8-007-SB-1
Arsenic: 3.6 J
A8-007-SB-5
A8-008-SB-1
Arsenic: 6.4 J
A8-008-SB-5
Arsenic: 12.0 J
A8-008-SB-10
A8-011-SB-1
Arsenic: 9.4
A8-011-SB-5
Arsenic: 3.7
A8-011-SB-10
A8-017-SB-1
Arsenic: 3.9 J
A8-017-SB-7
Arsenic: 27.7 J
A8-017-SB-10
Arsenic: 4.8
A8-012-SB-1
Arsenic: 6.0
A8-012-SB-5
Arsenic: 3.6
A8-012-SB-10
Arsenic: 5.6 R1
N
0 50 100 200
Feet
ARM Group Inc.
Earth Resource Engineers and Consultants
Soil Boring
Parcel Boundary
Parcel A8 Soil Borings
Phase II Inorganic Exceedances (mg/kg)
September 14, 2017
EnviroAnalytics Group
ARM Project 150298M-3
Tradepoint Atlantic
Baltimore County, MD
Figure
SB-3



ARM Group Inc.
Earth Resource Engineers and Consultants

0 50 100 200 Feet

Piezometer (Shallow)

Parcel Boundary

Parcel A8 Groundwater Samples
Phase II VOC Exceedances (ug/L)

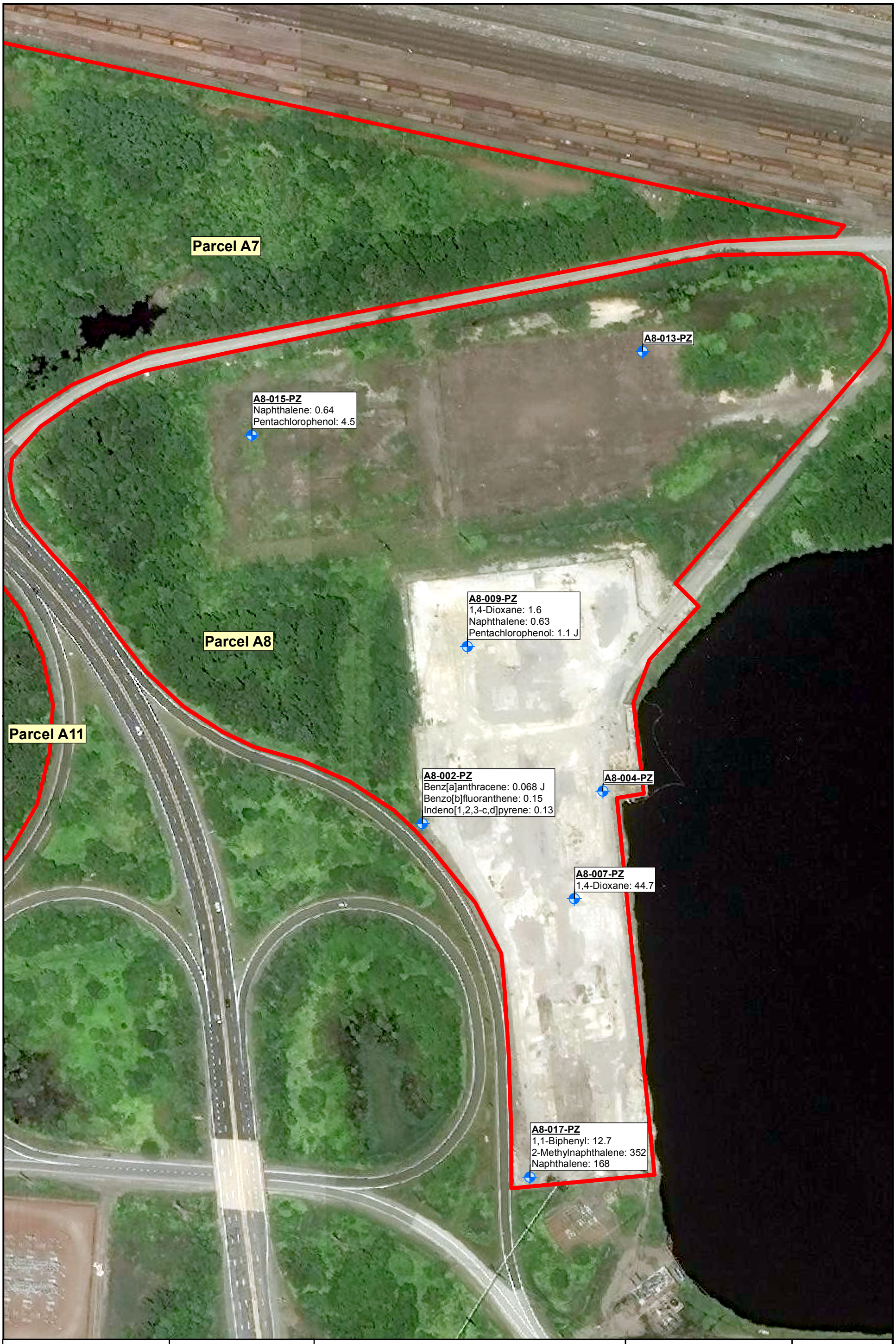
July 27, 2016

EnviroAnalytics Group
ARM Project 150298M-3

Tradepoint Atlantic
Baltimore County, MD

Figure

GW-1



ARM Group Inc.
Earth Resource Engineers and Consultants

0 50 100 200 Feet

Piezometer (Shallow)

Parcel Boundary

Parcel A8 Groundwater Samples
Phase II SVOC Exceedances (ug/L)

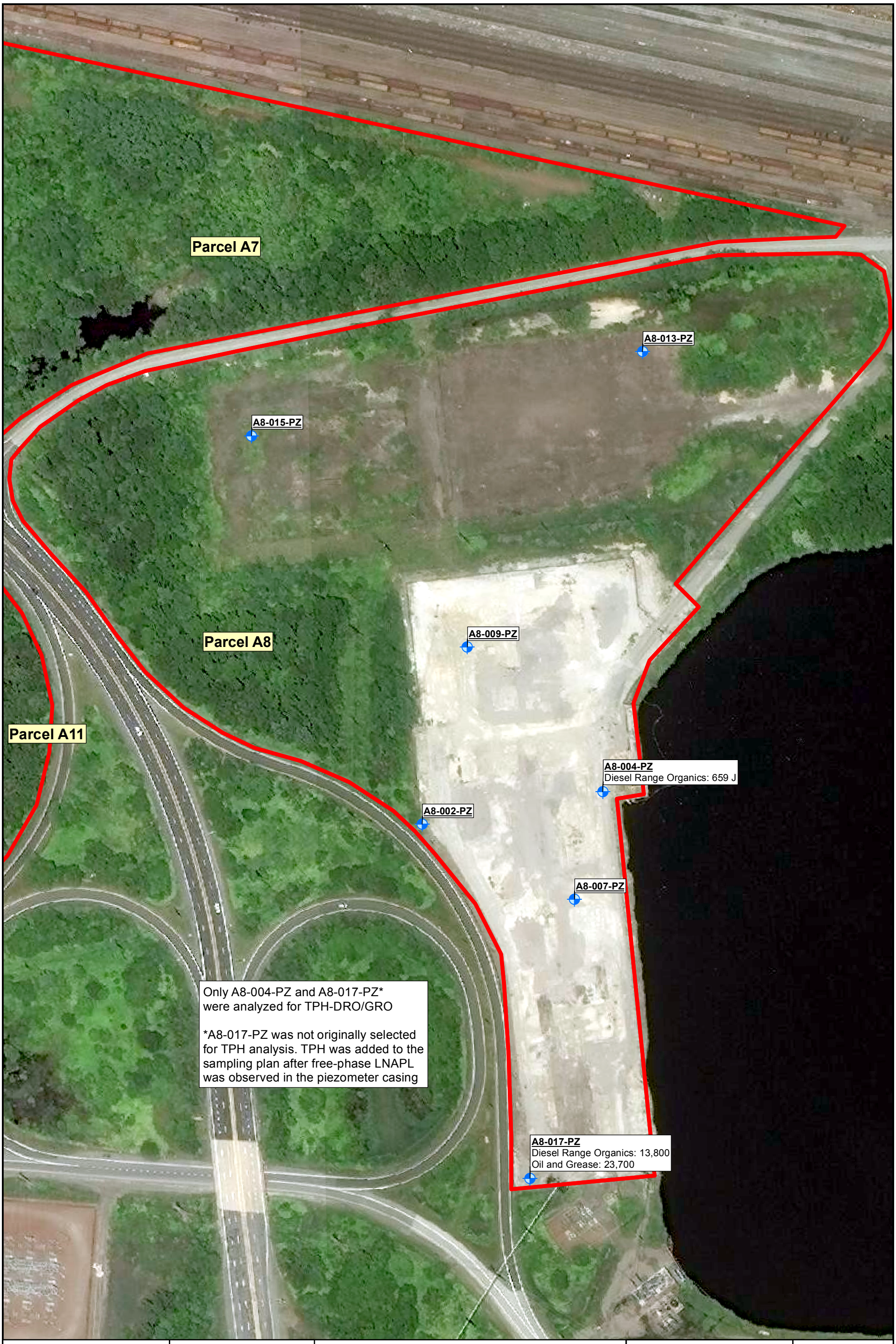
September 14, 2017

EnviroAnalytics Group
ARM Project 150298M-3

Tradepoint Atlantic
Baltimore County, MD

Figure

GW-2



ARM Group Inc.
Earth Resource Engineers and Consultants

0 50 100 200 Feet

Piezometer (Shallow)

Parcel Boundary

Parcel A8 Shallow Groundwater
Phase II TPH/O&G Exceedances (ug/L)

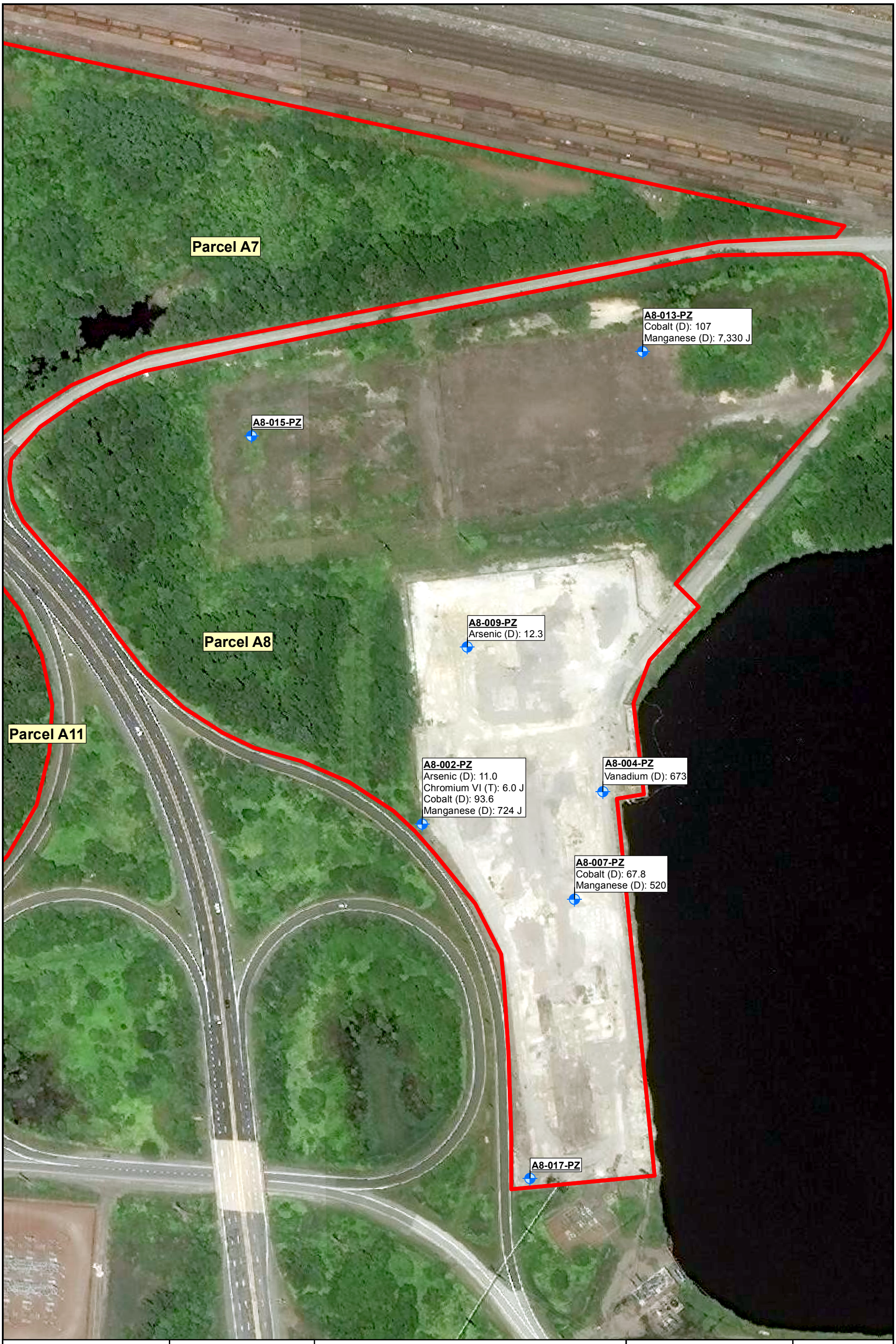
October 28, 2016

EnviroAnalytics Group
ARM Project 150298M-3

Tradepoint Atlantic
Baltimore County, MD

Figure

GW-3



ARM Group Inc.
Earth Resource Engineers and Consultants

0 50 100 200 Feet

Piezometer (Shallow)

Parcel Boundary

(D) = Dissolve
(T) = Total

Parcel A8 Groundwater Samples
Phase II Inorganic Exceedances (ug/L)

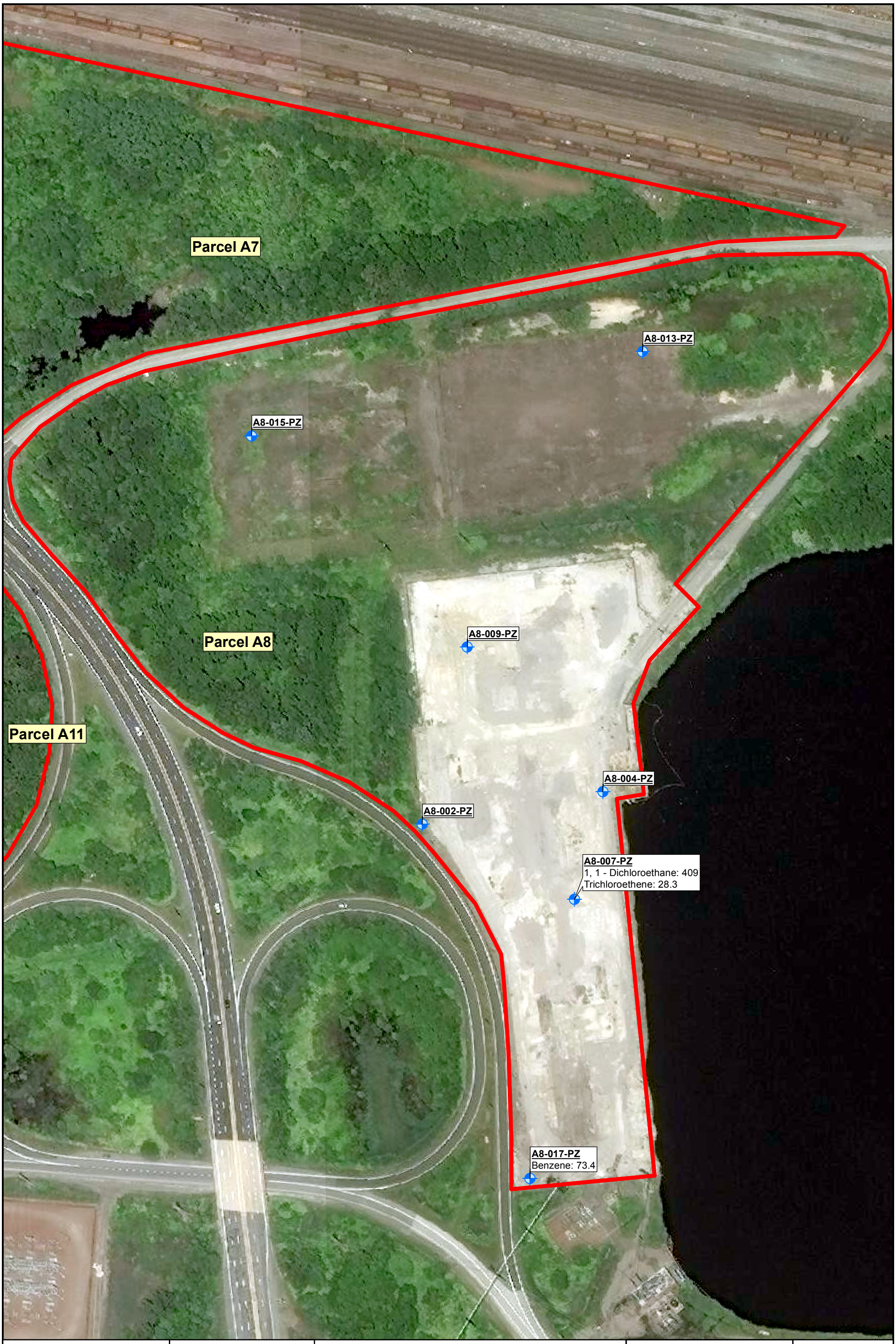
September 14, 2017

EnviroAnalytics Group
ARM Project 150298M-3

Tradepoint Atlantic
Baltimore County, MD

Figure

GW-4



ARM Group Inc.
Earth Resource Engineers and Consultants

0 50 100 200 Feet

Piezometer (Shallow)

Parcel Boundary

Parcel A8 Shallow Groundwater
Vapor Intrusion Exceedances (ug/L)

October 26, 2016

EnviroAnalytics Group
ARM Project 150298M-3

Tradepoint Atlantic
Baltimore County, MD

Figure

GW-5

ARM Group Inc.
Earth Resource Engineers and Consultants

0 5 10 20 Feet

Original Piezometer (Detection)
Delineation Piezometer (No Detection)
Parcel Boundary
*LNAPL thickness after 30 days

Parcel A8: LNAPL Delineation Temporary Piezometer Locations

September 14, 2017

EnviroAnalytics Group
ARM Project 150298M-3

Tradepoint Atlantic
Baltimore County, MD

Figure
5

TABLES

TABLE 1 GROUNDWATER ELEVATION DATA				
Location Name	TOC Elevation (feet AMSL)	Ground Elevation (feet AMSL)	Measured DTW (ft)	Groundwater Elevation (feet AMSL)
A8-002-PZ	16.14	13.21	7.87	8.27
A8-004-PZ	16.73	12.85	8.93	7.8
A8-007-PZ	15.86	12.60	8.08	7.78
A8-009-PZ	16.73	12.81	7.15	9.58
A8-013-PZ	20.01	16.10	9.92	10.09
A8-015-PZ	16.18	11.91	7.41	8.77
A8-017-PZ	16.59	13.26	8.5	8.09

DTW = Depth to water
TOC = Top of casing
AMSL = Above mean sea level

TABLE 2 HISTORICAL SITE DRAWINGS DETAILS				
Set Name	Typical Features Shown	Drawing Number	Original Date Drawn	Latest Revision Date
Plant Arrangement	Roads, water bodies, building/structure footprints, electric lines, above-ground pipelines (e.g.: steam, nitrogen, etc.)	5056	4/27/1959	3/11/1982
		5061	2/8/1962	3/11/1982
Plant Index	Roads, water bodies, demolished buildings/structures, electric lines, above-ground pipelines	5156	*Unknown*	11/10/2008
		5161	*Unknown*	3/6/2008
Plant Sewer Lines	Same as above plus trenches, sumps, underground piping (includes pipe materials)	5556	4/5/1961	2/4/1976
		5561	2/5/1976	2/5/1976

TABLE 3
FIELD SHIFTED BORING LOCATIONS

Location ID	Sample Target	Proposed Location[¥]		Final Location[¥]		Relocation Distance & Direction		Rationale
		Northing	Easting	Northing	Easting			
A8-004-SB/PZ	Oily Surface Water Discharge	573,649	1,462,117	573,657	1,462,089	28 ft	NW	Access restrictions
A8-005-SB	Oily Surface Water Discharge	573,692	1,462,147	573,702	1,462,131	19 ft	NW	Access restrictions
A8-006-SB	Oily Surface Water Discharge	573,755	1,462,139	573,753	1,462,112	27 ft	W	Access restrictions

[¥]Reported northings and eastings are not survey accurate. Coordinates are reported in NAD 1983 Maryland State Plane (US feet).

TABLE 4
TCLP RESULTS FOR SOLID IDW

Parameter	Result (mg/L)	TCLP Limit (mg/L)	TCLP Exceedance	Laboratory Flag	Laboratory LOQ (mg/L)
1,1-Dichloroethene	0.05	0.7	no	U	0.05
1,2-Dichloroethane	0.05	0.5	no	U	0.05
1,4-Dichlorobenzene	0.5	7.5	no	U	0.5
2,4,5-Trichlorophenol	5	400	no	U	5
2,4,6-Trichlorophenol	0.1	2	no	U	0.1
2,4-Dinitrotoluene	0.1	0.13	no	U	0.1
2-Butanone (MEK)	5	200	no	U	5
2-Methylphenol	2	200	no	U	2
3&4-Methylphenol(m&p Cresol)	2	200	no	U	2
Arsenic	0.0074	5	no	J	0.05
Barium	0.29	100	no	J	1
Benzene	0.05	0.5	no	U	0.05
Cadmium	0.00056	1	no	J	0.05
Carbon tetrachloride	0.05	0.5	no	U	0.05
Chlorobenzene	1	100	no	U	1
Chloroform	0.5	6	no	U	0.5
Chromium	0.0031	5	no	J	0.05
Hexachlorobenzene	0.1	0.13	no	UL2	0.1
Hexachloroethane	0.5	3	no	U	0.5
Lead	0.25	5	no	U	0.25
Mercury	0.001	0.2	no	U	0.001
Nitrobenzene	0.1	2	no	U	0.1
Pentachlorophenol	5	100	no	U	5
Selenium	0.0052	1	no	J	0.1
Silver	0.05	5	no	U	0.05
Tetrachloroethene	0.05	0.7	no	U	0.05
Trichloroethene	0.05	0.5	no	U	0.05
Vinyl chloride	0.05	0.2	no	U	0.05

J = The positive result reported for this analyte is a quantitative estimate below the laboratory LOQ.
Uxx = The analyte was not detected in the sample. The numeric value represents the sample LOQ.
TCLP = Toxicity characteristic leaching procedure
LOQ = Limit of Quantitation

TABLE 5 TCLP RESULTS FOR LIQUID IDW						
Location ID	Parameter	Result (mg/L)	TCLP Limit (mg/L)	TCLP Exceedance	Laboratory Flag	Laboratory LOQ (mg/L)
Water Disposal 1	1,1-Dichloroethene	0.001	0.7	no	U	0.001
Water Disposal 1	1,2-Dichloroethane	0.001	0.5	no	U	0.001
Water Disposal 1	1,4-Dichlorobenzene	0.001	7.5	no	U	0.001
Water Disposal 1	2-Butanone (MEK)	0.01	200	no	U	0.01
Water Disposal 1	Arsenic	0.005	5	no	U	0.005
Water Disposal 1	Barium	0.0338	100	no		0.01
Water Disposal 1	Benzene	0.001	0.5	no	U	0.001
Water Disposal 1	Cadmium	0.0006	1	no	J	0.003
Water Disposal 1	Carbon tetrachloride	0.001	0.5	no	U	0.001
Water Disposal 1	Chlorobenzene	0.001	100	no	U	0.001
Water Disposal 1	Chloroform	0.001	6	no	U	0.001
Water Disposal 1	Chromium	0.0016	5	no	J	0.005
Water Disposal 1	Lead	0.005	5	no	U	0.005
Water Disposal 1	Mercury	0.0002	0.2	no	U	0.0002
Water Disposal 1	Selenium	0.008	1	no	U	0.008
Water Disposal 1	Silver	0.006	5	no	U	0.006
Water Disposal 1	Tetrachloroethene	0.001	0.7	no	U	0.001
Water Disposal 1	Trichloroethene	0.001	0.5	no	U	0.001
Water Disposal 1	Vinyl chloride	0.001	0.2	no	U	0.001
Water Disposal 2	1,1-Dichloroethene	0.001	0.7	no	U	0.001
Water Disposal 2	1,2-Dichloroethane	0.001	0.5	no	U	0.001
Water Disposal 2	1,4-Dichlorobenzene	0.001	7.5	no	U	0.001
Water Disposal 2	2-Butanone (MEK)	0.01	200	no	U	0.01
Water Disposal 2	Arsenic	0.005	5	no	U	0.005
Water Disposal 2	Barium	0.0811	100	no		0.01
Water Disposal 2	Benzene	0.001	0.5	no	U	0.001
Water Disposal 2	Cadmium	0.003	1	no	U	0.003
Water Disposal 2	Carbon tetrachloride	0.001	0.5	no	U	0.001
Water Disposal 2	Chlorobenzene	0.001	100	no	U	0.001
Water Disposal 2	Chloroform	0.0029	6	no		0.001
Water Disposal 2	Chromium	0.0012	5	no	J	0.005
Water Disposal 2	Lead	0.005	5	no	U	0.005
Water Disposal 2	Mercury	0.0002	0.2	no	U	0.0002
Water Disposal 2	Selenium	0.008	1	no	U	0.008
Water Disposal 2	Silver	0.006	5	no	U	0.006
Water Disposal 2	Tetrachloroethene	0.001	0.7	no	U	0.001
Water Disposal 2	Trichloroethene	0.001	0.5	no	U	0.001
Water Disposal 2	Vinyl chloride	0.001	0.2	no	U	0.001

TABLE 5
TCLP RESULTS FOR LIQUID IDW

Location ID	Parameter	Result (mg/L)	TCLP Limit (mg/L)	TCLP Exceedance	Laboratory Flag	Laboratory LOQ (mg/L)
Water Disposal 3	1,1-Dichloroethene	0.001	0.7	no	U	0.001
Water Disposal 3	1,2-Dichloroethane	0.001	0.5	no	U	0.001
Water Disposal 3	1,4-Dichlorobenzene	0.001	7.5	no	U	0.001
Water Disposal 3	2-Butanone (MEK)	0.01	200	no	U	0.01
Water Disposal 3	Arsenic	0.005	5	no	U	0.005
Water Disposal 3	Barium	0.0051	100	no	J	0.01
Water Disposal 3	Benzene	0.001	0.5	no	U	0.001
Water Disposal 3	Cadmium	0.003	1	no	U	0.003
Water Disposal 3	Carbon tetrachloride	0.001	0.5	no	U	0.001
Water Disposal 3	Chlorobenzene	0.001	100	no	U	0.001
Water Disposal 3	Chloroform	0.0016	6	no		0.001
Water Disposal 3	Chromium	0.00085	5	no	J	0.005
Water Disposal 3	Lead	0.005	5	no	U	0.005
Water Disposal 3	Mercury	0.0002	0.2	no	U	0.0002
Water Disposal 3	Selenium	0.008	1	no	U	0.008
Water Disposal 3	Silver	0.006	5	no	U	0.006
Water Disposal 3	Tetrachloroethene	0.001	0.7	no	U	0.001
Water Disposal 3	Trichloroethene	0.001	0.5	no	U	0.001
Water Disposal 3	Vinyl chloride	0.001	0.2	no	U	0.001
Water Disposal 4	1,1-Dichloroethene	0.001	0.7	no	U	0.001
Water Disposal 4	1,2-Dichloroethane	0.001	0.5	no	U	0.001
Water Disposal 4	1,4-Dichlorobenzene	0.001	7.5	no	U	0.001
Water Disposal 4	2-Butanone (MEK)	0.01	200	no	U	0.01
Water Disposal 4	Arsenic	0.0094	5	no		0.005
Water Disposal 4	Barium	0.101	100	no		0.01
Water Disposal 4	Benzene	0.001	0.5	no	U	0.001
Water Disposal 4	Cadmium	0.003	1	no	U	0.003
Water Disposal 4	Carbon tetrachloride	0.001	0.5	no	U	0.001
Water Disposal 4	Chlorobenzene	0.001	100	no	U	0.001
Water Disposal 4	Chloroform	0.0024	6	no		0.001
Water Disposal 4	Chromium	0.0012	5	no	J	0.005
Water Disposal 4	Lead	0.005	5	no	U	0.005
Water Disposal 4	Mercury	0.0002	0.2	no	U	0.0002
Water Disposal 4	Selenium	0.008	1	no	U	0.008
Water Disposal 4	Silver	0.006	5	no	U	0.006
Water Disposal 4	Tetrachloroethene	0.001	0.7	no	U	0.001
Water Disposal 4	Trichloroethene	0.001	0.5	no	U	0.001
Water Disposal 4	Vinyl chloride	0.001	0.2	no	U	0.001

TABLE 5 TCLP RESULTS FOR LIQUID IDW						
Location ID	Parameter	Result (mg/L)	TCLP Limit (mg/L)	TCLP Exceedance	Laboratory Flag	Laboratory LOQ (mg/L)
Water Disposal 5	1,1-Dichloroethene	0.001	0.7	no	U	0.001
Water Disposal 5	1,2-Dichloroethane	0.001	0.5	no	U	0.001
Water Disposal 5	1,4-Dichlorobenzene	0.001	7.5	no	U	0.001
Water Disposal 5	2-Butanone (MEK)	0.01	200	no	U	0.01
Water Disposal 5	Arsenic	0.005	5	no	U	0.005
Water Disposal 5	Barium	0.398	100	no		0.01
Water Disposal 5	Benzene	0.001	0.5	no	U	0.001
Water Disposal 5	Cadmium	0.00058	1	no	J	0.003
Water Disposal 5	Carbon tetrachloride	0.001	0.5	no	U	0.001
Water Disposal 5	Chlorobenzene	0.001	100	no	U	0.001
Water Disposal 5	Chloroform	0.0039	6	no		0.001
Water Disposal 5	Chromium	0.0012	5	no	J	0.005
Water Disposal 5	Lead	0.005	5	no	U	0.005
Water Disposal 5	Mercury	0.0002	0.2	no	U	0.0002
Water Disposal 5	Selenium	0.008	1	no	U	0.008
Water Disposal 5	Silver	0.006	5	no	U	0.006
Water Disposal 5	Tetrachloroethene	0.001	0.7	no	U	0.001
Water Disposal 5	Trichloroethene	0.001	0.5	no	U	0.001
Water Disposal 5	Vinyl chloride	0.001	0.2	no	U	0.001
Water Disposal 6	1,1-Dichloroethene	0.001	0.7	no	U	0.001
Water Disposal 6	1,2-Dichloroethane	0.001	0.5	no	U	0.001
Water Disposal 6	1,4-Dichlorobenzene	0.001	7.5	no	U	0.001
Water Disposal 6	2-Butanone (MEK)	0.01	200	no	U	0.01
Water Disposal 6	Arsenic	0.005	5	no	U	0.005
Water Disposal 6	Barium	2.14	100	no		0.01
Water Disposal 6	Benzene	0.001	0.5	no	U	0.001
Water Disposal 6	Cadmium	0.001	1	no	J	0.003
Water Disposal 6	Carbon tetrachloride	0.001	0.5	no	U	0.001
Water Disposal 6	Chlorobenzene	0.001	100	no	U	0.001
Water Disposal 6	Chloroform	0.00058	6	no	J	0.001
Water Disposal 6	Chromium	0.005	5	no	U	0.005
Water Disposal 6	Lead	0.005	5	no	U	0.005
Water Disposal 6	Mercury	0.0002	0.2	no	U	0.0002
Water Disposal 6	Selenium	0.008	1	no	U	0.008
Water Disposal 6	Silver	0.006	5	no	U	0.006
Water Disposal 6	Tetrachloroethene	0.001	0.7	no	U	0.001
Water Disposal 6	Trichloroethene	0.001	0.5	no	U	0.001
Water Disposal 6	Vinyl chloride	0.001	0.2	no	U	0.001

TABLE 5
TCLP RESULTS FOR LIQUID IDW

Location ID	Parameter	Result (mg/L)	TCLP Limit (mg/L)	TCLP Exceedance	Laboratory Flag	Laboratory LOQ (mg/L)
Water Disposal 7	1,1-Dichloroethene	0.001	0.7	no	U	0.001
Water Disposal 7	1,2-Dichloroethane	0.001	0.5	no	U	0.001
Water Disposal 7	1,4-Dichlorobenzene	0.001	7.5	no	U	0.001
Water Disposal 7	2-Butanone (MEK)	0.01	200	no	U	0.01
Water Disposal 7	Arsenic	0.005	5	no	U	0.005
Water Disposal 7	Barium	0.0889	100	no		0.01
Water Disposal 7	Benzene	0.001	0.5	no	U	0.001
Water Disposal 7	Cadmium	0.00067	1	no	J	0.003
Water Disposal 7	Carbon tetrachloride	0.001	0.5	no	U	0.001
Water Disposal 7	Chlorobenzene	0.001	100	no	U	0.001
Water Disposal 7	Chloroform	0.00075	6	no	J	0.001
Water Disposal 7	Chromium	0.005	5	no	U	0.005
Water Disposal 7	Lead	0.005	5	no	U	0.005
Water Disposal 7	Mercury	0.0002	0.2	no	U	0.0002
Water Disposal 7	Selenium	0.008	1	no	U	0.008
Water Disposal 7	Silver	0.006	5	no	U	0.006
Water Disposal 7	Tetrachloroethene	0.001	0.7	no	U	0.001
Water Disposal 7	Trichloroethene	0.00065	0.5	no	J	0.001
Water Disposal 7	Vinyl chloride	0.001	0.2	no	U	0.001
Water Disposal 8	1,1-Dichloroethene	0.001	0.7	no	U	0.001
Water Disposal 8	1,2-Dichloroethane	0.001	0.5	no	U	0.001
Water Disposal 8	1,4-Dichlorobenzene	0.001	7.5	no	U	0.001
Water Disposal 8	2-Butanone (MEK)	0.01	200	no	U	0.01
Water Disposal 8	Arsenic	0.005	5	no	U	0.005
Water Disposal 8	Barium	0.01	100	no	J	0.01
Water Disposal 8	Benzene	0.001	0.5	no	U	0.001
Water Disposal 8	Cadmium	0.003	1	no	U	0.003
Water Disposal 8	Carbon tetrachloride	0.001	0.5	no	U	0.001
Water Disposal 8	Chlorobenzene	0.001	100	no	U	0.001
Water Disposal 8	Chloroform	0.001	6	no	U	0.001
Water Disposal 8	Chromium	0.005	5	no	U	0.005
Water Disposal 8	Lead	0.005	5	no	U	0.005
Water Disposal 8	Mercury	0.0002	0.2	no	U	0.0002
Water Disposal 8	Selenium	0.008	1	no	U	0.008
Water Disposal 8	Silver	0.006	5	no	U	0.006
Water Disposal 8	Tetrachloroethene	0.001	0.7	no	U	0.001
Water Disposal 8	Trichloroethene	0.001	0.5	no	U	0.001
Water Disposal 8	Vinyl chloride	0.001	0.2	no	U	0.001

J = The positive result reported for this analyte is a quantitative estimate below the laboratory PQL.
U = The analyte was not detected in the sample. The numeric value represents the sample LOQ.
TCLP = Toxicity characteristic leaching procedure
LOQ = Limit of Quantitation

Table 6
Summary of Organics Detected in Soil
Parcel A8
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	A8-001-SB-1	A8-001-SB-4	A8-001-SB-10	A8-002-SB-1	A8-002-SB-5	A8-003-SB-1	A8-003-SB-5	A8-004-SB-1	A8-004-SB-5	A8-004-SB-10	A8-005-SB-1	A8-005-SB-5	A8-005-SB-10	A8-006-SB-1	A8-006-SB-4
Volatile Organic Compounds																	
1,1-Dichloroethane	mg/kg	16	0.0048 U	0.0053 U	N/A	0.0041 U	0.0046 U	0.0072 U	**0.0084**	0.0048 U	0.0047 U	N/A	0.0048 U	0.0044 U	N/A-M	0.0044 U	0.0055 U
1,1-Dichloroethene	mg/kg	1,000	0.0048 U	0.0053 U	N/A	0.0041 U	0.0046 U	0.0072 U	0.0048 U	0.0048 U	0.0047 U	N/A	0.0048 U	**0.0008 J**	N/A-M	0.0044 U	0.0055 U
2-Butanone (MEK)	mg/kg	190,000	**0.0029 J**	**0.0029 J**	N/A	0.0081 U	0.0092 U	**0.022**	0.0095 U	**0.027**	**0.0056 J**	N/A	**0.071**	**0.0036 J**	N/A-M	**0.0053 J**	**0.0039 J**
2-Hexanone	mg/kg	1,300	0.0096 U	0.011 U	N/A	0.0081 UJ	0.0092 UJ	0.014 UJ	0.0095 UJ	**0.0065 J**	0.0093 U	N/A	**0.018**	0.0089 U	N/A-M	0.0087 U	0.011 U
Acetone	mg/kg	670,000	**0.022**	**0.018**	N/A	**0.042 J**	0.0092 UJ	**0.12 J**	0.0095 U	**0.088**	**0.039**	N/A	**0.26**	**0.027**	N/A-M	**0.03**	**0.027**
Benzene	mg/kg	5.1	**0.0023 J**	**0.0027 J**	N/A	0.0041 U	0.0046 U	0.0072 U	0.0048 U	0.0048 U	**0.0013 J**	N/A	**0.0013 J**	**0.003 J**	N/A-M	**0.0024 J**	**0.0014 J**
Carbon disulfide	mg/kg	3,500	0.0048 U	0.0053 U	N/A	0.0041 U	0.0046 U	0.0072 U	0.0048 U	0.0048 U	0.0047 U	N/A	0.0048 U	0.0044 U	N/A-M	0.0044 U	0.0055 U
Chloroform	mg/kg	1.4	0.0048 U	0.0053 U	N/A	0.0041 U	0.0046 U	0.0072 U	0.0048 U	**0.021**	**0.0063**	N/A	0.0048 U	**0.0031 J**	N/A-M	0.0044 U	**0.005 J**
Cyclohexane	mg/kg	27,000	0.0096 U	**0.00042 J**	N/A	0.0081 U	0.0092 U	0.014 U	0.0095 U	0.0096 U	0.0093 U	N/A	**0.0014 J**	**0.00075 J**	N/A-M	0.0087 U	**0.0012 J**
Isopropylbenzene	mg/kg	9,900	0.0048 U	0.0053 U	N/A	0.0041 U	0.0046 U	0.0072 U	0.0048 U	0.0048 U	0.0047 U	N/A	0.0048 U	0.0044 U	N/A-M	0.0044 U	0.0055 U
Methylene Chloride	mg/kg	1,000	**0.0039 J**	**0.0063 J**	N/A	0.0041 U	0.0046 U	0.0072 U	0.0048 U	**0.0031 J**	**0.0023 J**	N/A	**0.017 J**	**0.085**	N/A-M	0.0044 UJ	**0.008 J**
Styrene	mg/kg	35,000	0.0048 U	0.0053 U	N/A	0.0041 U	0.0046 U	**0.025**	0.0048 U	0.0048 U	0.0047 U	N/A	0.0048 U	0.0044 U	N/A-M	0.0044 U	0.0055 U
Tetrachloroethene	mg/kg	100	0.0048 U	0.0053 U	N/A	0.0041 U	0.0046 U	0.0072 U	0.0048 U	**0.029**	**0.01**	N/A	**0.0045 J**	**0.0098**	N/A-M	**0.0049**	**0.029**
Toluene	mg/kg	47,000	**0.0011 J**	**0.0024 J**	N/A	0.0041 U	0.0046 U	0.0072 U	0.0048 U	**0.00052 J**	**0.00077 J**	N/A	**0.00077 J**	**0.0016 J**	N/A-M	**0.0011 J**	**0.00077 J**
Trichloroethene	mg/kg	6	**0.0029 J**	**0.0029 J**	N/A	0.0041 U	0.0046 U	0.0072 U	0.0048 U	**0.0043 J**	**0.0028 J**	N/A	**0.00072 J**	**0.0027 J**	N/A-M	0.0044 U	**0.0026 J**
Trichlorofluoromethane	mg/kg	3,100	0.0048 U	0.0053 U	N/A	0.0041 U	0.0046 U	**0.0084**	0.0048 U	**0.0025 J**	0.0047 U	N/A	0.0048 U	0.0044 U	N/A-M	0.0044 U	0.0055 U
Xylenes	mg/kg	2,800	0.014 U	**0.004 J**	N/A	0.012 U	0.014 U	0.021 U	0.014 U	0.014 U	0.014 U	N/A	0.014 U	0.013 U	N/A-M	0.013 U	0.016 U
Semi-Volatile Organic Compounds*																	
1,1-Biphenyl	mg/kg	200	**0.024 J**	0.081 U	N/A	0.079 U	0.083 U	**0.028 J**	0.077 U	**0.02 J**	0.071 U	**0.048 J**	0.075 U	**0.03 J**	0.08 U	**0.026 J**	**0.06 J**
2,4-Dimethylphenol	mg/kg	16,000	0.072 U	0.081 U	N/A	0.079 U	0.083 U	**0.019 J**	0.077 U	0.071 UJ	0.071 U	0.082 U	0.075 U	0.073 U	0.08 UJ	0.072 U	**0.037 J**
2-Methylnaphthalene	mg/kg	3,000	**0.22**	**6**	**0.0043 J**	0.14 U	0.008 U	**0.015**	0.0078 U	**0.057 J**	**0.059**	**0.0018 J**	**0.064 J**	**0.19**	N/A-M	**0.017**	**0.35**
2-Methylphenol	mg/kg	41,000	0.072 U	0.081 U	N/A	0.079 U	0.083 U	0.076 R	0.077 U	0.071 UJ	0.071 U	0.082 U	0.075 U	0.073 U	0.08 UJ	0.072 U	**0.027 J**
3&4-Methylphenol(m&p Cresol)	mg/kg	41,000	0.14 U	0.16 U	N/A	0.16 U	0.17 U	**0.035 J**	0.15 U	0.14 UJ	0.14 U	0.16 U	0.15 U	0.15 U	0.16 UJ	0.14 U	**0.061 J**
Acenaphthene	mg/kg	45,000	**1.4**	**1.7**	**0.0021 J**	0.14 U	0.008 U	**0.11**	0.0078 U	**0.19**	**0.41**	**0.0036 J**	0.15 U	**1.2**	N/A-M	**0.065**	**2.7**
Acenaphthylene	mg/kg	45,000	**0.075**	**11.5**	**0.003 J**	0.14 U	0.008 U	**0.0043 J**	0.0078 U	**0.03 J**	**0.016**	0.0084 U	0.15 U	**0.038**	N/A-M	**0.0074**	**0.2**
Acetophenone	mg/kg	120,000	0.072 U	0.081 U	N/A	0.079 U	0.083 U	0.076 U	0.077 U	0.071 U	0.071 U	0.082 U	0.075 U	0.073 U	0.08 U	0.072 U	0.074 U
Anthracene	mg/kg	230,000	**0.46**	**29.2**	**0.0082 J**	0.14 U	0.008 U	**0.048**	0.0078 U	**0.42**	**0.084**	**0.007 J**	**0.073 J**	**0.37**	N/A-M	**0.029**	**1.3**
Benz[a]anthracene	mg/kg	2.9	**3.1**	**24.6**	**0.0075 J**	**0.095 J**	0.008 U	**0.3**	**0.0027 J**	**0.78**	**0.73**	**0.0035 J**	**0.34**	**2.9**	N/A-M	**0.17**	**10**
Benzaldehyde	mg/kg	120,000	0.072 R	0.081 R	N/A	0.079 R	0.083 R	**0.056 J**	0.077 R	0.071 R	0.071 R	**0.02 J**	0.075 R	**0.017 J**	0.08 R	0.072 R	**0.032 J**
Benzo[a]pyrene	mg/kg	0.29	**6.1 J**	**16.4 J**	**0.0017 J**	**0.18**	0.008 U	**0.6**	0.0078 U	**1.2 J**	**1.3 J**	**0.0015 J**	**0.63 J**	**6.8 J**	N/A-M	**0.34 J**	**16.6 J**
Benzo[b]fluoranthene	mg/kg	2.9	**8.2**	**29.5**	**0.0034 J**	**0.23**	0.008 U	**0.9**	**0.005 J**	**2**	**1.4**	**0.0024 J**	**0.93**	**7.6**	N/A-M	**0.47**	**18.3**
Benzo[g,h,i]perylene	mg/kg		**1.2**	**2.2 J**	0.0085 U	**0.12 J**	**0.0016 J**	**0.31**	**0.0024 J**	**0.51**	**0.38**	0.0084 U	**0.76**	**6.6**	N/A-M	**0.17**	**13.8**
Benzo[k]fluoranthene	mg/kg	29	**4.4**	**12**	**0.0017 J**	**0.18**	0.008 U	**0.65**	**0.003 J**	**0.79**	**1**	**0.0011 J**	**0.39**	**3**	N/A-M	**0.39**	**8.5**
bis(2-Ethylhexyl)phthalate	mg/kg	160	**0.025 J**	0.081 U	N/A	0.079 U	0.083 U	**0.025 J**	0.077 U	0.071 U	0.071 U	0.082 U	**0.043 J**	**0.016 J**	0.08 U	**0.024 J**	**0.023 J**
Carbazole	mg/kg		**0.072 J**	**0.032 J**	N/A	0.079 U	0.083 U	**0.19**	0.077 U	**0.021 J**	**0.02 J**	**0.045 J**	0.075 U	**0.065 J**	0.08 U	**0.11 J**	**0.39**
Chrysene	mg/kg	290	**3.1**	**20**	**0.0081 J**	**0.11 J**	**0.00096 J**	**0.31**	**0.002 J**	**1.1**	**0.81**	**0.0024 J**	**0.42**	**3**	N/A-M	**0.22**	**9.7**
Dibenz[a,h]anthracene	mg/kg	0.29	**1.2**	**0.23**	0.0085 U	0.14 U	0.008 U	**0.11**	0.0078 U	0.15 U	**0.17**	0.0084 U	0.15 U	**0.93**	N/A-M	**0.063**	**3.9**
Di-n-butylphthalate	mg/kg	82,000	0.072 U	0.081 U	N/A	0.079 U	0.083 U	0.076 U	0.077 U	0.071 U	0.071 U	0.082 U	0.075 U	0.073 U	0.08 U	0.072 U	0.074 U
Fluoranthene	mg/kg	30,000	**2.7**	**61.9**	**0.049**	**0.095 J**	**0.00089 J**	**0.25**	**0.0018 J**	**1.2**	**0.65**	**0.0097**	**0.54**	**2.5**	N/A-M	**0.25**	**12.2**
Fluorene	mg/kg	30,000	**0.26**	**17.9**	**0.0053 J**	0.14 U	0.008 U	**0.016**	0.0078 U	**0.032 J**	**0.043**	**0.0042 J**	0.15 U	**0.17**	N/A-M	**0.0077**	**0.38**
Indeno[1,2,3-c,d]pyrene	mg/kg	2.9	**1.3**	4.3 U	0.0085 U	0.14 U	0.008 U	**0.32**	0.0078 U	**0.42**	**0.5**	0.0084 U	**0.58**	**5.7**	N/A-M	**0.2**	**13.6**
Naphthalene	mg/kg	17	**0.44**	**11.4**	**0.013**	0.14 U	0.008 U	**0.025**	**0.005 J**	**0.092 J**	**0.097**	**0.0055 J**	**0.079 J**	**0.23**	N/A-M	**0.028**	**0.52**
N-Nitrosodiphenylamine	mg/kg	470	0.072 U	0.081 U	N/A	0.079 U	0.083 U	0.076 U	0.077 U	0.071 U	0.071 U	0.082 U	0.075 U	0.073 U	0.08 U	0.072 U	**0.068 J**
Phenanthrene	mg/kg		**1.3**	**69**	**0.033**	0.14 U	0.008 U	**0.12**	0.0078 U	**0.3**	**0.26**	**0.021**	**0.29**	**1.3**	N/A-M	**0.11**	**3.8**
Phenol	mg/kg	250,000	0.072 U	0.081 U	N/A	0.079 U	0.083 U	**0.025 J**	0.077 U	0.071 UJ	0.071 U	0.082 U	0.075 U	0.073 U	0.08 UJ	0.072 U	**0.051 J**
Pyrene	mg/kg	23,000	**2.6**	**43.6**	**0.041**	**0.1 J**	**0.00086 J**	**0.27**	**0.0018 J**	**1.1**	**0.68**	**0.0072 J**	**0.43**	**2.4**	N/A-M	**0.21**	**11.3**
PCBs																	
Aroclor 1254	mg/kg	0.97	0.089 U	N/A	N/A	**0.047 J**	N/A	0.23 U	N/A	0.18 U	N/A	N/A	**0.16 J**	N/A	N/A-M	0.018 U	N/A
Aroclor 1260	mg/kg	0.99	0.089 U	N/A	N/A	0.017 U	N/A	**0.3**	N/A	0.18 U	N/A	N/A	0.19 U	N/A	N/A-M	**0.03**	N/A
PCBs (total)	mg/kg	0.97	0.62 U	N/A	N/A	**0.047 J**	N/A	1.6 U	N/A	1.3 U	N/A	N/A	1.3 U	N/A	N/A-M	0.13 U	N/A
TPH/Oil and Grease																	
Diesel Range Organics	mg/kg	6,200	N/A	N/A	N/A	N/A	N/A	N/A	N/A	**187**	**69.1**	N/A	**329**	**113**	N/A-M	**29**	**175**
Oil and Grease	mg/kg	6,200	**891**	**1,160**	N/A	**166**	**95.4 J**	**457**	**178**	**3,740**	**798**	N/A	**7,740**	**937**	N/A-M	**554**	**1,320**

Detections in bold
N/A: This parameter was not analyzed for this sample.
N/A-M: This parameter was not analyzed for this sample based on the scope of the SVOC Microwave method resampling event
*PAH compounds were analyzed via SIM
Values in red indicate an exceedance of the Project Action Limit (PAL)

R: The analytical result was rejected during validation.
U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit.
UJ: This analyte was not detected in the sample. The actual quantitation/detection limit may be higher than reported.
J: The positive result reported for this analyte is a quantitative estimate.
B: This analyte was not detected substantially above the level of the associated method blank/preparation or field blank.

Table 6
Summary of Organics Detected in Soil
Parcel A8
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	A8-006-SB-10	A8-007-SB-1	A8-007-SB-5	A8-008-SB-1	A8-008-SB-5	A8-009-SB-1	A8-009-SB-5	A8-010-SB-1	A8-010-SB-5	A8-011-SB-1	A8-011-SB-5	A8-012-SB-1	A8-012-SB-5	A8-013-SB-1	A8-013-SB-5
Volatile Organic Compounds																	
1,1-Dichloroethane	mg/kg	16	N/A	0.005 U	0.0046 U	0.0049 U	0.0048 U	0.005 U	0.0048 U	0.0041 U	0.005 U	0.0048 U	0.0048 U	0.0053 U	**0.001 J**	0.0049 U	0.0051 U
1,1-Dichloroethene	mg/kg	1,000	N/A	0.005 U	0.0046 U	0.0049 U	0.0048 U	0.005 U	0.0048 U	0.0041 U	0.005 U	0.0048 U	0.0048 U	0.0053 U	0.0045 U	0.0049 U	0.0051 U
2-Butanone (MEK)	mg/kg	190,000	N/A	**0.01**	0.0092 U	0.0098 U	0.0096 U	**0.0051 J**	**0.0019 J**	0.0081 U	**0.0021 J**	**0.0075 J**	0.0096 U	**0.015 J**	0.0091 U	0.0099 U	0.01 U
2-Hexanone	mg/kg	1,300	N/A	0.0099 UJ	0.0092 UJ	0.0098 UJ	0.0096 UJ	0.01 U	0.0096 U	0.0081 U	0.01 U	0.0097 U	0.0096 U	0.011 U	0.0091 U	0.0099 U	0.01 U
Acetone	mg/kg	670,000	N/A	**0.057 J**	0.0092 UJ	**0.055 J**	0.0096 U	**0.039**	**0.016**	**0.0098**	**0.023**	**0.049 J**	**0.025 J**	**0.11 J**	**0.03 J**	**0.045**	0.01 U
Benzene	mg/kg	5.1	N/A	0.005 U	0.0046 U	0.0049 U	0.0048 U	0.005 U	**0.00094 J**	0.0041 U	0.005 U	**0.0012 J**	0.0048 U	**0.0011 J**	0.0045 U	0.0049 U	0.0051 U
Carbon disulfide	mg/kg	3,500	N/A	0.005 U	0.0046 U	0.0049 U	0.0048 U	0.005 U	0.0048 U	0.0041 U	0.005 U	0.0048 U	0.0048 U	0.0053 U	0.0045 U	0.0049 U	**0.0029 J**
Chloroform	mg/kg	1.4	N/A	0.005 U	0.0046 U	0.0049 U	0.0048 U	0.005 U	0.0048 U	0.0041 U	0.005 U	0.0048 U	0.0048 U	0.0053 U	0.0045 U	0.0049 U	0.0051 U
Cyclohexane	mg/kg	27,000	N/A	0.0099 U	0.0092 U	0.0098 U	0.0096 U	0.01 U	0.0096 U	0.0081 U	0.01 U	0.0097 U	0.0096 U	0.011 U	0.0091 U	0.0099 U	0.01 U
Isopropylbenzene	mg/kg	9,900	N/A	0.005 U	0.0046 U	0.0049 U	0.0048 U	0.005 U	**0.00031 J**	0.0041 U	0.005 U	0.0048 U	0.0048 U	0.0053 U	0.0045 U	0.0049 U	0.0051 U
Methylene Chloride	mg/kg	1,000	N/A	0.005 U	0.0046 U	0.0049 U	0.0048 U	**0.005 J**	**0.0067 J**	0.0041 UJ	**0.0034 J**	0.0048 U	**0.0029 J**	0.0053 U	0.0045 U	0.0049 U	0.0051 U
Styrene	mg/kg	35,000	N/A	0.005 U	0.0046 U	0.0049 U	0.0048 U	0.005 U	0.0048 U	0.0041 U	0.005 U	0.0048 U	0.0048 U	0.0053 U	0.0045 U	0.0049 U	0.0051 U
Tetrachloroethene	mg/kg	100	N/A	0.005 U	0.0046 U	**0.005**	0.0048 U	0.005 U	0.0048 U	0.0041 U	0.005 U	**0.00058 J**	0.0048 U	**0.0016 J**	0.0045 U	0.0049 U	0.0051 U
Toluene	mg/kg	47,000	N/A	0.005 U	0.0046 U	0.0049 U	0.0048 U	**0.0023 J**	**0.0011 J**	**0.00031 J**	0.005 U	**0.00071 J**	0.0048 U	**0.0014 J**	0.0045 U	0.0049 U	0.0051 U
Trichloroethene	mg/kg	6	N/A	0.005 U	0.0046 U	0.0049 U	0.0048 U	0.005 U	0.0048 U	0.0041 U	0.005 U	0.0048 U	0.0048 U	0.0053 U	0.0045 U	0.0049 U	0.0051 U
Trichlorofluoromethane	mg/kg	3,100	N/A	**0.0085**	0.0046 U	0.0049 U	0.0048 U	0.005 U	0.0048 U	0.0041 U	0.005 U	0.0048 U	0.0048 U	0.0053 U	0.0045 U	0.0049 U	0.0051 U
Xylenes	mg/kg	2,800	N/A	0.015 U	0.014 U	0.015 U	0.014 U	0.015 U	**0.0025 J**	**0.0011 J**	0.015 U	0.014 U	0.014 U	0.016 U	0.014 U	0.015 U	0.015 U
Semi-Volatile Organic Compounds*																	
1,1-Biphenyl	mg/kg	200	0.084 U	0.072 U	0.072 U	0.072 U	0.081 U	0.078 U	0.077 U	0.077 U	0.079 U	0.07 U	0.078 U	0.069 U	0.079 U	**0.034 J**	0.079 U
2,4-Dimethylphenol	mg/kg	16,000	0.084 U	0.072 U	0.072 U	0.072 U	0.081 U	0.078 UJ	0.077 U	0.077 U	0.079 U	0.07 UJ	0.078 U	0.069 U	0.079 U	0.071 R	0.079 U
2-Methylnaphthalene	mg/kg	3,000	**0.0014 J**	0.15 U	0.0077 U	0.15 U	0.0081 U	**0.0034 J**	**0.04 J**	0.0069 U	**0.0028 J**	**0.067**	**0.0033 J**	**0.0077**	**0.0019 J**	**0.1**	0.0084 U
2-Methylphenol	mg/kg	41,000	0.084 U	0.072 U	0.072 U	0.072 U	0.081 U	0.078 UJ	0.077 U	0.077 U	0.079 U	0.07 UJ	0.078 U	0.069 U	0.079 U	0.071 R	0.079 U
3&4-Methylphenol(m&p Cresol)	mg/kg	41,000	0.17 U	0.14 U	0.14 U	0.14 U	0.16 U	0.16 UJ	0.15 U	0.15 U	0.16 U	0.14 UJ	0.15 U	0.14 U	0.16 U	0.14 R	0.16 U
Acenaphthene	mg/kg	45,000	**0.0054 J**	0.15 U	0.0077 U	**0.046 J**	0.0081 U	0.0078 U	**0.1 J**	0.0069 U	**0.013**	**0.0052 J**	0.0082 U	0.0073 U	0.0082 U	0.0071 U	0.0084 U
Acenaphthylene	mg/kg	45,000	0.0084 U	0.15 U	0.0077 U	0.15 U	0.0081 U	0.0078 U	**0.012 J**	0.0069 U	**0.015**	**0.0019 J**	0.0082 U	**0.0034 J**	0.0082 U	**0.032**	0.0084 U
Acetophenone	mg/kg	120,000	0.084 U	0.072 U	0.072 U	0.072 U	0.081 U	0.078 U	0.077 U	0.077 U	0.079 U	0.07 U	0.078 U	0.069 U	0.079 U	0.071 U	0.079 U
Anthracene	mg/kg	230,000	**0.0023 J**	**0.022 J**	0.0077 U	**0.13 J**	0.0081 U	**0.0098**	**0.04 J**	0.0069 U	**0.063**	**0.024**	**0.0021 J**	**0.015**	**0.0012 J**	**0.11**	0.0084 U
Benz[a]anthracene	mg/kg	2.9	**0.0085**	**0.27**	0.0077 U	**0.49**	0.0081 U	**0.056**	**0.16**	0.0069 U	**0.067**	**0.059**	**0.0084**	**0.061**	**0.004 J**	**0.21**	0.0084 U
Benzaldehyde	mg/kg	120,000	0.084 R	0.072 R	0.072 R	0.072 R	0.081 R	0.078 R	0.077 R	0.077 R	0.079 R	0.07 R	0.078 R	0.069 R	0.079 R	0.071 R	0.079 R
Benzo[a]pyrene	mg/kg	0.29	**0.018**	**0.23**	0.0077 U	**0.43**	0.0081 U	**0.048 J**	**0.26 J**	0.0069 U	**0.075 J**	**0.032**	0.0069 B	**0.073**	0.0031 B	**0.23 J**	0.0084 U
Benzo[b]fluoranthene	mg/kg	2.9	**0.02**	**0.4**	0.0077 U	**0.65**	0.0081 U	**0.067**	**0.31**	0.0069 U	**0.12**	**0.086**	**0.017**	**0.1**	**0.0079 J**	**0.5**	0.0084 U
Benzo[g,h,i]perylene	mg/kg		**0.014**	**0.098 J**	0.0077 U	**0.21**	0.0081 U	**0.02**	**0.15**	**0.0011 J**	**0.042**	**0.022**	**0.0042 J**	**0.026**	**0.0024 J**	**0.041**	0.0084 U
Benzo[k]fluoranthene	mg/kg	29	**0.012**	**0.16**	0.0077 U	**0.56**	0.0081 U	**0.033**	**0.14**	0.0069 U	**0.061**	**0.038**	**0.0062 J**	**0.072**	**0.0045 J**	**0.27**	0.0084 U
bis(2-Ethylhexyl)phthalate	mg/kg	160	0.084 U	0.072 UJ	0.072 U	0.042 B	0.081 U	**0.042 J**	0.077 U	0.077 U	0.079 U	0.07 UJ	0.078 U	**0.038 J**	0.079 U	0.071 U	0.079 U
Carbazole	mg/kg		0.084 U	0.072 U	0.072 U	0.072 U	0.081 U	0.078 U	0.077 U	0.077 U	0.079 U	0.07 U	0.078 U	0.069 U	0.079 U	0.071 U	0.079 U
Chrysene	mg/kg	290	**0.0089**	**0.31**	0.0077 U	**0.5**	**0.001 J**	**0.059**	**0.17**	0.0069 U	**0.088**	**0.1**	**0.011**	**0.073**	**0.006 J**	**0.26**	0.0084 U
Dibenz[a,h]anthracene	mg/kg	0.29	**0.0043 J**	0.15 U	0.0077 U	0.15 U	0.0081 U	0.0078 U	**0.053**	0.0069 U	**0.017**	**0.0084**	0.0082 U	**0.011**	0.0082 U	**0.013**	0.0084 U
Di-n-butylphthalate	mg/kg	82,000	0.084 U	0.072 U	0.072 U	**0.11 J**	0.081 U	**0.081**	0.077 U	0.077 U	0.079 U	0.07 U	0.078 U	**0.024 J**	0.079 U	0.071 U	0.079 U
Fluoranthene	mg/kg	30,000	**0.0075 J**	**0.3**	**0.0011 J**	**0.82**	**0.0013 J**	**0.11**	**0.24 J**	0.0069 U	**0.21**	**0.22**	**0.015**	**0.084**	**0.0088**	**0.64**	0.0084 U
Fluorene	mg/kg	30,000	**0.0014 J**	0.15 U	**0.00089 J**	**0.026 J**	0.0081 U	**0.0051 J**	**0.034 J**	0.0069 U	**0.021**	**0.0032 J**	**0.0021 J**	**0.0023 J**	**0.0011 J**	0.0039 B	0.0084 U
Indeno[1,2,3-c,d]pyrene	mg/kg	2.9	**0.013**	0.15 U	0.0077 U	**0.2**	0.0081 U	**0.02**	**0.17**	0.0069 U	**0.048**	**0.021**	**0.004 J**	**0.026**	0.0082 U	**0.05**	0.0084 U
Naphthalene	mg/kg	17	**0.0023 J**	**0.079 J**	0.0077 U	0.15 U	0.0081 U	**0.0076 J**	**0.082**	0.0069 U	**0.0097**	**0.43**	0.0053 B	**0.028**	0.0044 B	**0.89**	0.0084 U
N-Nitrosodiphenylamine	mg/kg	470	0.084 U	0.072 U	0.072 U	0.072 U	0.081 U	0.078 U	0.077 U	0.077 U	0.079 U	0.07 U	0.078 U	0.069 U	0.079 U	0.071 U	0.079 U
Phenanthrene	mg/kg		**0.0051 J**	**0.056 J**	0.0077 U	**0.33**	0.0081 U	**0.036**	**0.12 J**	0.0069 U	**0.019**	**0.14**	**0.012**	**0.048**	**0.0057 J**	**0.52**	0.0084 U
Phenol	mg/kg	250,000	0.084 U	0.072 U	0.072 U	0.072 U	0.081 U	0.078 UJ	0.077 U	0.077 U	0.079 U	**0.035 J**	0.078 U	0.069 U	0.079 U	0.071 R	0.079 U
Pyrene	mg/kg	23,000	**0.0076 J**	**0.33**	**0.00089 J**	**0.74**	**0.0013 J**	**0.083**	**0.22 J**	0.0069 U	**0.17**	**0.16**	**0.012**	**0.075**	**0.0063 J**	**0.44**	**0.0039 J**
PCBs																	
Aroclor 1254	mg/kg	0.97	N/A	0.018 U	N/A	**0.071 J**	N/A	0.02 U	N/A	0.017 U	N/A	0.018 U	N/A	0.018 U	N/A	0.018 U	N/A
Aroclor 1260	mg/kg	0.99	N/A	**0.18**	N/A	0.019 U	N/A	0.02 U	N/A	0.017 U	N/A	0.018 U	N/A	**0.012 J**	N/A	0.018 U	N/A
PCBs (total)	mg/kg	0.97	N/A	**0.18**	N/A	**0.071 J**	N/A	0.14 U	N/A	0.12 U	N/A	0.12 U	N/A	0.13 U	N/A	0.12 U	N/A
TPH/Oil and Grease																	
Diesel Range Organics	mg/kg	6,200	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Oil and Grease	mg/kg	6,200	N/A	**662**	**206**	**1,120**	**182**	**354**	**486**	**669**	**537**	**1,040**	**419**	**2,180**	**557**	**342**	**464**

Detections in bold
N/A: This parameter was not analyzed for this sample.
N/A-M: This parameter was not analyzed for this sample based on the scope of the SVOC Microwave method resampling event
*PAH compounds were analyzed via SIM
Values in red indicate an exceedance of the Project Action Limit (PAL)

R: The analytical result was rejected during validation.
U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit.
UJ: This analyte was not detected in the sample. The actual quantitation/detection limit may be higher than reported.
J: The positive result reported for this analyte is a quantitative estimate.
B: This analyte was not detected substantially above the level of the associated method blank/preparation or field blank.

Table 6
Summary of Organics Detected in Soil
Parcel A8
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	A8-014-SB-1	A8-014-SB-5	A8-015-SB-1	A8-015-SB-7	A8-016-SB-1	A8-016-SB-5	A8-017-SB-1	A8-017-SB-7	A8-018-SB-1	A8-018-SB-5	A8-019-SB-1	A8-019-SB-5	A8-020-SB-1	A8-020-SB-5
Volatile Organic Compounds																
1,1-Dichloroethane	mg/kg	16	0.0042 U	0.0053 U	0.0048 U	0.0048 U	0.0046 U	0.0048 U	0.0065 U	0.0049 U	0.0045 U	0.0051 U	0.0048 U	0.0048 U	0.0046 U	0.0054 U
1,1-Dichloroethene	mg/kg	1,000	0.0042 U	0.0053 U	0.0048 U	0.0048 U	0.0046 U	0.0048 U	0.0065 U	0.0049 U	0.0045 U	0.0051 U	0.0048 U	0.0048 U	0.0046 U	0.0054 U
2-Butanone (MEK)	mg/kg	190,000	0.0085 U	0.011 U	**0.02**	0.0096 U	0.0091 U	0.0095 U	**0.025 J**	0.0099 U	**0.015**	0.01 U	0.0096 U	0.0096 U	**0.0029 J**	0.011 U
2-Hexanone	mg/kg	1,300	0.0085 U	0.011 U	0.0095 U	0.0096 U	0.0091 U	0.0095 U	0.013 UJ	0.0099 UJ	**0.0033 J**	0.01 U	0.0096 U	0.0096 U	0.0091 U	0.011 U
Acetone	mg/kg	670,000	**0.022 J**	**0.043**	**0.082**	0.0096 U	0.0091 U	**0.015**	**0.18 J**	0.0099 U	**0.088**	0.01 U	**0.041**	0.0096 U	**0.025**	**0.012**
Benzene	mg/kg	5.1	0.0042 U	0.0053 U	0.0048 U	0.0048 U	0.0046 U	0.0048 U	0.0065 U	0.0049 U	0.0045 U	0.0051 U	0.0048 U	0.0048 U	**0.00061 J**	0.0054 U
Carbon disulfide	mg/kg	3,500	0.0042 U	**0.008**	0.0048 U	**0.011**	0.0046 U	0.0048 U	0.0065 U	0.0049 U	0.0045 U	0.0051 U	0.0048 U	0.0048 U	0.0046 U	0.0054 U
Chloroform	mg/kg	1.4	0.0042 U	0.0053 U	0.0048 U	0.0048 U	0.0046 U	0.0048 U	0.0065 U	0.0049 U	0.0045 U	0.0051 U	0.0048 U	0.0048 U	0.0046 U	0.0054 U
Cyclohexane	mg/kg	27,000	0.0085 U	0.011 U	0.0095 U	0.0096 U	0.0091 U	0.0095 U	0.013 U	0.0099 U	0.009 U	0.01 U	0.0096 U	0.0096 U	**0.00055 J**	0.011 U
Isopropylbenzene	mg/kg	9,900	0.0042 U	0.0053 U	0.0048 U	0.0048 U	0.0046 U	0.0048 U	0.0065 U	0.0049 U	0.0045 U	0.0051 U	0.0048 U	0.0048 U	0.0046 U	0.0054 U
Methylene Chloride	mg/kg	1,000	0.0042 U	0.0053 U	0.0048 U	0.0048 U	0.0046 U	0.0048 U	0.0065 U	0.0049 U	0.0045 U	**0.0043 J**	0.0048 U	0.0048 U	**0.0063 J**	**0.0035 J**
Styrene	mg/kg	35,000	0.0042 U	0.0053 U	0.0048 U	0.0048 U	0.0046 U	0.0048 U	0.0065 U	0.0049 U	0.0045 U	0.0051 U	0.0048 U	0.0048 U	0.0046 U	0.0054 U
Tetrachloroethene	mg/kg	100	0.0042 U	0.0053 U	0.0048 U	0.0048 U	0.0046 U	0.0048 U	0.0065 U	0.0049 U	0.0045 U	0.0051 U	0.0048 U	0.0048 U	0.0046 U	0.0054 U
Toluene	mg/kg	47,000	0.0042 U	0.0053 U	0.0048 U	0.0048 U	0.0046 U	0.0048 U	0.0065 U	0.0049 U	0.0045 U	0.0051 U	0.0048 U	0.0048 U	**0.00058 J**	0.0054 U
Trichloroethene	mg/kg	6	0.0042 U	0.0053 U	0.0048 U	0.0048 U	0.0046 U	0.0048 U	0.0065 U	0.0049 U	0.0045 U	0.0051 U	0.0048 U	0.0048 U	0.0046 U	0.0054 U
Trichlorofluoromethane	mg/kg	3,100	0.0042 U	0.0053 U	0.0048 U	0.0048 U	0.0046 U	0.0048 U	0.0065 U	0.0049 U	0.0045 U	0.0051 U	0.0048 U	0.0048 U	0.0046 U	0.0054 U
Xylenes	mg/kg	2,800	0.013 U	0.016 U	0.014 U	0.014 U	0.014 U	0.014 U	0.019 U	**0.021**	0.013 U	0.015 U	0.014 U	0.014 U	0.014 U	0.016 U
Semi-Volatile Organic Compounds*																
1,1-Biphenyl	mg/kg	200	**0.7**	0.076 U	0.079 U	0.084 U	**0.064 J**	**0.074 J**	**0.089**	0.081 U	**0.046 J**	0.079 U	**0.97**	0.083 U	0.082 U	0.082 U
2,4-Dimethylphenol	mg/kg	16,000	0.071 R	0.076 UJ	0.079 U	0.084 U	0.072 R	0.082 UJ	0.076 U	0.081 U	0.069 UJ	0.079 U	0.074 R	0.083 U	0.082 U	0.082 U
2-Methylnaphthalene	mg/kg	3,000	**0.43 J**	**0.0052 J**	**0.028**	0.008 U	**0.068**	0.0077 U	**0.13 J**	**0.011**	**0.098**	0.0083 U	**0.022**	0.0078 U	**0.05**	0.0086 U
2-Methylphenol	mg/kg	41,000	0.071 R	0.076 UJ	0.079 U	0.084 U	0.072 R	0.082 UJ	0.076 U	0.081 U	0.069 UJ	0.079 U	0.074 R	0.083 U	0.082 U	0.082 U
3&4-Methylphenol(m&p Cresol)	mg/kg	41,000	0.14 R	0.15 UJ	0.16 U	0.17 U	0.14 R	0.16 UJ	0.15 U	0.16 U	0.14 UJ	0.16 U	**0.022 J**	0.17 U	0.16 U	0.16 U
Acenaphthene	mg/kg	45,000	**0.0097**	0.0077 U	**0.091**	0.008 U	**0.21**	0.0077 U	**0.033 J**	0.0082 U	**0.027**	0.0083 U	0.0071 U	0.0078 U	**0.074**	0.0086 U
Acenaphthylene	mg/kg	45,000	**0.11**	0.0077 U	**0.021**	0.008 U	**0.035**	0.0077 U	**0.075 J**	0.0082 U	**0.044**	0.0083 U	**0.021**	0.0078 U	**0.7**	0.0086 U
Acetophenone	mg/kg	120,000	**0.082**	0.076 U	0.079 U	0.084 U	0.072 U	0.082 U	0.076 U	0.081 U	0.069 U	0.079 U	**0.052 J**	0.083 U	0.082 U	0.082 U
Anthracene	mg/kg	230,000	**0.28 J**	**0.0059 J**	**0.095**	0.008 U	**0.15**	0.0077 U	**0.4**	0.0082 U	**0.1**	**0.0023 J**	**0.056**	0.0078 U	**1.4**	0.0086 U
Benz[a]anthracene	mg/kg	2.9	**0.95 J**	**0.028**	**0.44**	0.008 U	**0.89**	0.0077 U	0.16 U	0.0082 U	**0.26**	**0.0053 J**	**0.12**	0.0078 U	**3.6**	0.0086 U
Benzaldehyde	mg/kg	120,000	**0.043 J**	0.076 R	0.079 R	0.084 R	0.072 R	0.082 R	0.076 R	0.081 R	0.069 R	0.079 R	**0.091 J**	0.083 R	0.082 R	0.082 R
Benzo[a]pyrene	mg/kg	0.29	**0.8 J**	**0.051 J**	**0.82 J**	0.008 U	**1.3 J**	0.0077 U	0.046 B	0.001 B	**0.39 J**	0.0083 U	**0.12 J**	0.0078 U	**3.1 J**	0.0086 U
Benzo[b]fluoranthene	mg/kg	2.9	**1.1**	**0.082**	**0.96**	0.008 U	**1.5**	0.0077 U	**0.071 J**	0.0082 U	**0.84**	0.0083 U	**0.26**	0.0078 U	**6.4**	0.0086 U
Benzo[g,h,i]perylene	mg/kg		**0.11 J**	**0.0098**	**0.087**	0.008 U	**0.2**	**0.0017 J**	**0.038 J**	0.0082 U	**0.079**	0.0083 U	**0.027**	0.0078 U	**0.52**	0.0086 U
Benzo[k]fluoranthene	mg/kg	29	**0.69 J**	**0.042**	**0.76**	0.008 U	**1.1**	0.0077 U	**0.042 J**	0.0082 U	**0.4**	0.0083 U	**0.13**	0.0078 U	**3.8**	0.0086 U
bis(2-Ethylhexyl)phthalate	mg/kg	160	0.027 B	0.076 U	0.079 U	0.084 U	0.072 U	0.082 U	0.076 UJ	0.081 U	0.069 U	0.079 U	0.026 B	0.083 U	0.082 U	0.082 U
Carbazole	mg/kg		**0.75**	0.076 U	0.079 U	0.084 U	**0.17**	0.082 U	0.076 U	0.081 U	**0.017 J**	0.079 U	**0.53**	0.083 U	0.082 U	0.082 U
Chrysene	mg/kg	290	**1**	**0.029**	**0.45**	0.008 U	**0.91**	0.0077 U	**0.082 J**	0.0082 U	**0.43**	**0.0044 J**	**0.15**	0.0078 U	**3.4**	0.0086 U
Dibenz[a,h]anthracene	mg/kg	0.29	**0.051**	0.0077 U	**0.042**	0.008 U	**0.13**	0.0077 U	0.16 U	0.0082 U	**0.032**	0.0083 U	0.0071 U	0.0078 U	**0.77**	0.0086 U
Di-n-butylphthalate	mg/kg	82,000	0.071 U	0.076 U	0.079 U	0.084 U	0.072 U	0.082 U	0.076 U	0.081 U	0.069 U	0.079 U	0.074 U	0.083 U	0.082 U	0.082 U
Fluoranthene	mg/kg	30,000	**2**	**0.041**	**0.61**	0.008 U	**1**	0.0077 U	**0.069 J**	0.0082 U	**0.59**	**0.01**	**0.27**	0.0078 U	**7.3**	**0.0058 J**
Fluorene	mg/kg	30,000	**0.013**	0.002 B	**0.033**	0.008 U	**0.037**	0.0077 U	**0.079 J**	**0.0015 J**	**0.0074**	0.0083 U	0.0071 U	0.0078 U	**0.13**	0.0086 U
Indeno[1,2,3-c,d]pyrene	mg/kg	2.9	**0.15**	0.0077 U	**0.11**	0.008 U	**0.29**	0.0077 U	0.16 U	0.0082 U	**0.096**	0.0083 U	**0.033**	0.0078 U	0.38 U	0.0086 U
Naphthalene	mg/kg	17	**1.1 J**	**0.021**	**0.058**	0.008 U	**0.18**	**0.006 J**	**0.071 J**	**0.019**	**0.62**	**0.038**	**0.12**	0.0078 U	**0.079**	0.0086 U
N-Nitrosodiphenylamine	mg/kg	470	0.071 U	0.076 U	0.079 U	0.084 U	0.072 U	0.082 U	0.076 U	0.081 U	0.069 U	0.079 U	0.074 U	0.083 U	0.082 U	0.082 U
Phenanthrene	mg/kg		**1.4**	**0.03**	**0.36**	0.008 U	**0.43**	0.0077 U	**0.57**	**0.0041 J**	**0.45**	**0.0098**	**0.21**	0.0078 U	**4**	0.0086 U
Phenol	mg/kg	250,000	0.071 R	0.076 UJ	0.079 U	0.084 U	0.072 R	0.082 UJ	0.076 U	0.081 U	0.069 UJ	0.079 U	**0.026 J**	0.083 U	0.082 U	0.082 U
Pyrene	mg/kg	23,000	**2**	**0.036**	**0.55**	0.008 U	**0.95**	0.0077 U	**0.18**	0.0082 U	**0.51**	**0.008 J**	**0.21**	0.0078 U	**6**	**0.0056 J**
PCBs																
Aroclor 1254	mg/kg	0.97	0.18 U	N/A	0.089 U	N/A	0.18 U	N/A	0.019 U	N/A	0.088 U	N/A	0.018 U	N/A	0.37 U	N/A
Aroclor 1260	mg/kg	0.99	0.18 U	N/A	0.089 U	N/A	0.18 U	N/A	0.019 U	N/A	0.088 U	N/A	0.018 U	N/A	0.37 U	N/A
PCBs (total)	mg/kg	0.97	1.2 U	N/A	0.62 U	N/A	1.3 U	N/A	0.13 U	N/A	0.62 U	N/A	0.12 U	N/A	2.6 U	N/A
TPH/Oil and Grease																
Diesel Range Organics	mg/kg	6,200	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Oil and Grease	mg/kg	6,200	**519**	**364**	**791**	**710**	**530**	**305**	**4,150**	**144**	**526**	**358**	**342**	**340**	**1,060**	**420**

Detections in bold
N/A: This parameter was not analyzed for this sample.
N/A-M: This parameter was not analyzed for this sample based on the scope of the SVOC Microwave method resampling event
*PAH compounds were analyzed via SIM
Values in red indicate an exceedance of the Project Action Limit (PAL)

R: The analytical result was rejected during validation.
U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit.
UJ: This analyte was not detected in the sample. The actual quantitation/detection limit may be higher than reported.
J: The positive result reported for this analyte is a quantitative estimate.
B: This analyte was not detected substantially above the level of the associated method blank/preparation or field blank.

Table 7
Summary of Inorganics Detected in Soil
Parcel A8
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	A8-001-SB-1	A8-001-SB-4	A8-001-SB-10	A8-002-SB-1	A8-002-SB-5	A8-002-SB-10	A8-003-SB-1	A8-003-SB-5
Metals										
Aluminum	mg/kg	1,100,000	**20,200**	**22,300**	N/A	**3,560**	**16,800**	N/A	**20,200**	**17,200**
Antimony	mg/kg	470	2.3 UJ	2.6 UJ	N/A	2.2 UJ	2.7 UJ	N/A	4 UJ	3.3 UJ
Arsenic	mg/kg	3	**4.1**	**5.2**	**7.4**	**3.3 J**	**3.8 J**	**1.9**	**7.4 J**	**5.7 J**
Barium	mg/kg	220,000	**173**	**112**	N/A	**39.1**	**61.6**	N/A	**203**	**85.6**
Beryllium	mg/kg	2,300	**2**	**1**	N/A	0.73 U	**0.73 J**	N/A	**2**	**0.81 J**
Cadmium	mg/kg	980	0.61 B	1.3 U	N/A	**0.61 J**	1.4 U	N/A	**1.1 J**	1.6 U
Chromium	mg/kg	120,000	**266**	**49**	N/A	**11.7**	**29**	N/A	**81.3**	**20.5**
Chromium VI	mg/kg	6.3	1.1 UJ	1.3 UJ	N/A	1 UJ	1.2 UJ	N/A	1.4 UJ	1.2 UJ
Cobalt	mg/kg	350	**7.3**	**5.7**	N/A	1.7 B	**7.2**	N/A	3.9 B	4.9 B
Copper	mg/kg	47,000	**36.6**	**13.6**	N/A	**5.9**	**13.1**	N/A	**130**	**8.6**
Iron	mg/kg	820,000	**75,000 J**	**20,100 J**	N/A	**11,000**	**15,500**	N/A	**19,900**	**13,900**
Lead	mg/kg	800	**40.7**	**14.5**	N/A	**9.4**	**9.9**	N/A	**103**	**10.5**
Manganese	mg/kg	26,000	**9,290**	**1,190**	N/A	**305**	**70.5**	N/A	**2,140**	**44.1**
Mercury	mg/kg	350	**0.024 J**	**0.017 J**	N/A	**0.0029 J**	**0.0058 J**	N/A	**0.066 J**	**0.0067 J**
Nickel	mg/kg	22,000	**14.1**	**14.1**	N/A	5.3 B	**15.1**	N/A	**16.3**	**14.5**
Selenium	mg/kg	5,800	3.1 U	3.4 U	N/A	2.9 U	3.7 U	N/A	5.3 U	4.4 U
Thallium	mg/kg	12	1.9 B	8.5 U	N/A	7.3 U	9.2 U	N/A	13.3 U	11 U
Vanadium	mg/kg	5,800	**853**	**135**	N/A	**16.3 J**	**36.4 J**	N/A	**105 J**	**35.2 J**
Zinc	mg/kg	350,000	**173**	**36.4**	N/A	**88.7 J**	**42.9 J**	N/A	**315 J**	**23.6 J**
Other										
Cyanide	mg/kg	150	**0.76 J-**	**0.2 J-**	N/A	**0.11 J**	0.74 U	N/A	**1.8**	0.58 U

Detections in bold
R1: Relative percent difference was outside control limits (retained laboratory flag).
U: This analyte was not detected in the sample. The numeric value represents the sample.
UJ: This analyte was not detected in the sample. The actual quantitation/detection limit may be higher than reported.
J: The positive result reported for this analyte is a quantitative estimate.
J-: The positive result reported for this analyte is a quantitative estimate, but may be biased low.
B: This analyte was not detected substantially above the level of the associated method blank/preparation or field blank.
N/A: This parameter was not analyzed for this sample.
Values in red indicate an exceedance of the Project Action Limit (PAL)

Table 7
Summary of Inorganics Detected in Soil
Parcel A8
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	A8-003-SB-10	A8-004-SB-1	A8-004-SB-5	A8-004-SB-10	A8-005-SB-1	A8-005-SB-5	A8-006-SB-1	A8-006-SB-4
Metals										
Aluminum	mg/kg	1,100,000	N/A	**11,700**	**14,800**	N/A	**15,900**	**12,700**	**5,910**	**14,100**
Antimony	mg/kg	470	N/A	2.7 UJ	2.4 UJ	N/A	1.8 UJ	2.4 UJ	1.8 UJ	2 UJ
Arsenic	mg/kg	3	1.8 U	**3.7**	**3.8**	**13.5**	**3.1**	**3**	**15.8**	**2.5**
Barium	mg/kg	220,000	N/A	**140**	**141**	N/A	**178**	**122**	**79.4**	**119**
Beryllium	mg/kg	2,300	N/A	0.75 B	0.73 B	N/A	**2.1**	**1.1**	0.6 U	**1.7**
Cadmium	mg/kg	980	N/A	**0.61 J**	**0.61 J**	N/A	**1.1**	**0.54 J**	**0.6 J**	**0.44 J**
Chromium	mg/kg	120,000	N/A	**938**	**1,130**	N/A	**332**	**380**	**1,020**	**561**
Chromium VI	mg/kg	6.3	N/A	1.1 UJ	1.1 UJ	N/A	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ
Cobalt	mg/kg	350	N/A	**7.4**	**8.3**	N/A	**4.3**	**3.9 J**	**22.8**	**15.4**
Copper	mg/kg	47,000	N/A	**49.6**	**61.1**	N/A	**28.2**	**141**	**395**	**27.6**
Iron	mg/kg	820,000	N/A	**141,000 J**	**193,000 J**	N/A	**54,000 J**	**71,400 J**	**330,000 J**	**39,200 J**
Lead	mg/kg	800	N/A	**34**	**32.8**	N/A	**30.3**	**25.9**	**28**	**17.6**
Manganese	mg/kg	26,000	N/A	**21,600**	**24,600**	N/A	**13,400**	**14,900**	**21,900**	**2,790**
Mercury	mg/kg	350	N/A	**0.033 J**	**0.03 J**	N/A	**0.022 J**	**0.012 J**	**0.042 J**	**0.048 J**
Nickel	mg/kg	22,000	N/A	**26.5**	**27.8**	N/A	**9.8**	**10.3**	**104**	**109**
Selenium	mg/kg	5,800	N/A	3.6 U	3.3 U	N/A	2.5 U	3.2 U	**2.2 J**	2.7 U
Thallium	mg/kg	12	N/A	**3.2 J**	4.8 B	N/A	6.2 U	1.5 B	3.3 B	6.8 U
Vanadium	mg/kg	5,800	N/A	**1,820**	**2,260**	N/A	**838**	**1,130**	**1,890**	**256**
Zinc	mg/kg	350,000	N/A	**132**	**174**	N/A	**89.8**	**137**	**116**	**71.2**
Other										
Cyanide	mg/kg	150	N/A	**0.14 J-**	**0.23 J-**	N/A	**0.54 J-**	**1.2 J-**	**0.3 J-**	**1 J-**

Detections in bold
R1: Relative percent difference was outside control limits (retained laboratory flag).
U: This analyte was not detected in the sample. The numeric value represents the sample.
UJ: This analyte was not detected in the sample. The actual quantitation/detection limit may be higher than reported.
J: The positive result reported for this analyte is a quantitative estimate.
J-: The positive result reported for this analyte is a quantitative estimate, but may be biased low.
B: This analyte was not detected substantially above the level of the associated method blank/preparation or field blank.
N/A: This parameter was not analyzed for this sample.
Values in red indicate an exceedance of the Project Action Limit (PAL)

Table 7
Summary of Inorganics Detected in Soil
Parcel A8
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	A8-007-SB-1	A8-007-SB-5	A8-008-SB-1	A8-008-SB-5	A8-008-SB-10	A8-009-SB-1	A8-009-SB-5	A8-009-SB-10
Metals										
Aluminum	mg/kg	1,100,000	**58,300**	**12,600**	**22,900**	**16,400**	N/A	**9,500**	**12,700**	N/A
Antimony	mg/kg	470	**5.5 J**	3.1 UJ	3.3 UJ	3.6 UJ	N/A	2.2 UJ	2.5 UJ	N/A
Arsenic	mg/kg	3	**3.6 J**	**2.9 J**	**6.4 J**	**12 J**	2.4 U	**3.8**	**4.8**	3.1 U
Barium	mg/kg	220,000	**199**	**36**	**329**	**78.2**	N/A	**85**	**60.8**	N/A
Beryllium	mg/kg	2,300	**1.8**	**0.31 J**	**3.6**	**1.4**	N/A	0.36 B	**0.53 J**	N/A
Cadmium	mg/kg	980	**1 J**	1.6 U	**1.4 J**	**0.27 J**	N/A	**0.17 J**	0.27 B	N/A
Chromium	mg/kg	120,000	**600**	**20.4**	**380**	**45**	N/A	**32.9**	**224**	N/A
Chromium VI	mg/kg	6.3	1.1 UJ	1.2 UJ	1.1 UJ	**0.54 J-**	N/A	1.2 UJ	1.1 UJ	N/A
Cobalt	mg/kg	350	4.2 B	2.9 B	**5.6**	**6.5**	N/A	**3.9**	**4.9**	N/A
Copper	mg/kg	47,000	**68**	**6.7**	**409**	**17**	N/A	**15.2**	**15.9**	N/A
Iron	mg/kg	820,000	**77,800**	**10,200**	**77,100**	**30,000**	N/A	**11,000 J**	**35,000 J**	N/A
Lead	mg/kg	800	**110**	**7.4**	**221**	**14.6**	N/A	**5.1**	**17.1**	N/A
Manganese	mg/kg	26,000	**20,800**	**243**	**15,100**	**601**	N/A	**197**	**4,320**	N/A
Mercury	mg/kg	350	**0.081 J**	**0.044 J**	**0.0035 J**	**0.01 J**	N/A	**0.0033 J**	**0.017 J**	N/A
Nickel	mg/kg	22,000	**19.4**	7.8 B	**28.5**	**16.3**	N/A	**26.5**	**15.4**	N/A
Selenium	mg/kg	5,800	4.3 U	4.1 U	3.5 B	4.8 U	N/A	2.9 U	3.4 U	N/A
Thallium	mg/kg	12	10.7 U	10.3 U	11 U	11.9 U	N/A	7.3 U	1.5 B	N/A
Vanadium	mg/kg	5,800	**1,360 J**	**32.9 J**	**1,380 J**	**98.4 J**	N/A	**28.4**	**434**	N/A
Zinc	mg/kg	350,000	**447 J**	**33.9 J**	**356 J**	**62.3 J**	N/A	**92.1**	**54**	N/A
Other										
Cyanide	mg/kg	150	**0.31 J**	0.57 U	**0.48 J**	0.62 U	N/A	0.65 UJ	0.7 UJ	N/A

Detections in bold
R1: Relative percent difference was outside control limits (retained laboratory flag).
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UJ: This analyte was not detected in the sample. The actual quantitation/detection limit may be higher than reported.
J: The positive result reported for this analyte is a quantitative estimate.
J-: The positive result reported for this analyte is a quantitative estimate, but may be biased low.
B: This analyte was not detected substantially above the level of the associated method blank/preparation or field blank.
N/A: This parameter was not analyzed for this sample.
Values in red indicate an exceedance of the Project Action Limit (PAL)

Table 7
Summary of Inorganics Detected in Soil
Parcel A8
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	A8-010-SB-1	A8-010-SB-5	A8-010-SB-10	A8-011-SB-1	A8-011-SB-5	A8-011-SB-10	A8-012-SB-1	A8-012-SB-5
Metals										
Aluminum	mg/kg	1,100,000	**5,320**	**18,100**	N/A	**11,700**	**10,800**	N/A	**12,200**	**11,800**
Antimony	mg/kg	470	2 UJ	3.2 UJ	N/A	2.9 B	2.9 U	N/A	2.3 U	2.6 U
Arsenic	mg/kg	3	**3**	**5.6**	**16.6**	**9.4**	**3.7**	**2.4 J**	**6**	**3.6**
Barium	mg/kg	220,000	**33.6**	**61**	N/A	**195**	**62.2**	N/A	**82.6**	**58.3**
Beryllium	mg/kg	2,300	0.65 U	0.72 B	N/A	**0.48 J**	**0.42 J**	N/A	**0.43 J**	**0.43 J**
Cadmium	mg/kg	980	**0.46 J**	1.6 U	N/A	**7**	0.44 B	N/A	**2.2**	1.3 U
Chromium	mg/kg	120,000	**7.4**	**27.9**	N/A	**1,200**	**25.2**	N/A	**472**	**18.2**
Chromium VI	mg/kg	6.3	1.1 UJ	1.2 UJ	N/A	1.1 UJ	1.2 UJ	N/A	1.1 UJ	1.2 UJ
Cobalt	mg/kg	350	2 B	**5.4**	N/A	**9.8**	**8.6**	N/A	**8.1**	**5.3**
Copper	mg/kg	47,000	**3.7**	**12.8**	N/A	**98.8**	**21.2**	N/A	**51.3**	**18.7**
Iron	mg/kg	820,000	**6,680 J**	**20,500 J**	N/A	**128,000**	**17,600**	N/A	**66,400**	**12,900**
Lead	mg/kg	800	**10.9**	**15.1**	N/A	**457**	**54**	N/A	**102**	**46.7**
Manganese	mg/kg	26,000	**161**	**173**	N/A	**23,200**	**354**	N/A	**11,000**	**102**
Mercury	mg/kg	350	0.1 UJ	**0.019 J**	N/A	**0.028 J**	**0.055 J**	N/A	0.1 U	**0.05 J**
Nickel	mg/kg	22,000	**5 J**	**13.1**	N/A	**90.5**	**16**	N/A	**31.3**	**13.1**
Selenium	mg/kg	5,800	2.6 U	4.2 U	N/A	4.3 U	3.9 U	N/A	3.1 U	3.5 U
Thallium	mg/kg	12	6.5 U	10.6 U	N/A	2.6 B	9.7 U	N/A	1.6 B	8.7 U
Vanadium	mg/kg	5,800	**8.7**	**38.6**	N/A	**2,020**	**73.1**	N/A	**1,080**	**26.7**
Zinc	mg/kg	350,000	**94.9**	**48.7**	N/A	**600**	**178**	N/A	**296**	**58.5**
Other										
Cyanide	mg/kg	150	0.58 UJ	0.59 UJ	N/A	**0.95**	0.59 U	N/A	**0.52 J**	0.6 U

Detections in bold
R1: Relative percent difference was outside control limits (retained laboratory flag).
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N/A: This parameter was not analyzed for this sample.
Values in red indicate an exceedance of the Project Action Limit (PAL)

Table 7
Summary of Inorganics Detected in Soil
Parcel A8
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	A8-012-SB-10	A8-013-SB-1	A8-013-SB-5	A8-013-SB-10	A8-014-SB-1	A8-014-SB-5	A8-014-SB-10	A8-015-SB-1
Metals										
Aluminum	mg/kg	1,100,000	N/A	**6,400**	**22,600**	N/A	**6,240**	**16,800**	N/A	**7,010**
Antimony	mg/kg	470	N/A	0.89 B	3.2 UJ	N/A	1.8 UJ	2.5 UJ	N/A	**2.1 J**
Arsenic	mg/kg	3	5.6 R1	**7.3**	**4.8**	**11.3**	**5.9**	**3.9**	**3.6**	**4.7**
Barium	mg/kg	220,000	N/A	**78.7 J**	**67.6 J**	N/A	**87.7 J**	**51.5 J**	N/A	**76.7 J**
Beryllium	mg/kg	2,300	N/A	0.67 U	0.5 B	N/A	0.6 U	0.44 B	N/A	0.6 U
Cadmium	mg/kg	980	N/A	0.71 B	1.6 U	N/A	**1.6**	0.19 B	N/A	0.48 B
Chromium	mg/kg	120,000	N/A	**2,090**	**94.2**	N/A	**1,570**	**86.2**	N/A	**1,660**
Chromium VI	mg/kg	6.3	N/A	**1.7 J-**	1.3 UJ	N/A	**0.68 J-**	1.2 UJ	N/A	1.1 UJ
Cobalt	mg/kg	350	N/A	**3.9**	**3.2 J**	N/A	**4.1**	**4.8**	N/A	**7.2**
Copper	mg/kg	47,000	N/A	**39.6**	**9.7**	N/A	**41.8**	**11.3**	N/A	**38**
Iron	mg/kg	820,000	N/A	**203,000**	**20,500**	N/A	**193,000**	**23,200**	N/A	**212,000**
Lead	mg/kg	800	N/A	**18.6 J**	**11.7 J**	N/A	**51.8 J**	**13.7 J**	N/A	**71.9 J**
Manganese	mg/kg	26,000	N/A	**27,200**	**1,050**	N/A	**27,000**	**1,270**	N/A	**28,000**
Mercury	mg/kg	350	N/A	**0.0039 J**	**0.034 J**	N/A	**0.0066 J**	**0.036 J**	N/A	**0.01 J**
Nickel	mg/kg	22,000	N/A	**16.6**	**8.8 J**	N/A	**13.2**	**11.4**	N/A	**19.5**
Selenium	mg/kg	5,800	N/A	**1.6 J**	4.2 U	N/A	2.4 U	3.3 U	N/A	2.4 U
Thallium	mg/kg	12	N/A	6.7 UJ	10.5 UJ	N/A	6 UJ	8.2 UJ	N/A	6 UJ
Vanadium	mg/kg	5,800	N/A	**2,570 J**	**154 J**	N/A	**3,180 J**	**190 J**	N/A	**4,220 J**
Zinc	mg/kg	350,000	N/A	**136**	**25.5**	N/A	**263**	**56.7**	N/A	**60.6**
Other										
Cyanide	mg/kg	150	N/A	**1.2**	0.66 U	N/A	**0.25 J**	0.67 U	N/A	**0.44 J**

Detections in bold
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N/A: This parameter was not analyzed for this sample.
Values in red indicate an exceedance of the Project Action Limit (PAL)

Table 7
Summary of Inorganics Detected in Soil
Parcel A8
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	A8-015-SB-7	A8-015-SB-10	A8-016-SB-1	A8-016-SB-5	A8-016-SB-10	A8-017-SB-1	A8-017-SB-7	A8-017-SB-10
Metals										
Aluminum	mg/kg	1,100,000	**15,700**	N/A	**7,730**	**17,800**	N/A	**34,400**	**16,400**	N/A
Antimony	mg/kg	470	2.1 UJ	N/A	2.7 UJ	2.2 UJ	N/A	1.9 UJ	2.7 UJ	N/A
Arsenic	mg/kg	3	**5.7**	**7.9**	**6.8**	**3.9**	**2.7**	**3.9 J**	**27.7 J**	**4.8**
Barium	mg/kg	220,000	**62.2 J**	N/A	**90.3 J**	**42.3 J**	N/A	**341**	**30.7**	N/A
Beryllium	mg/kg	2,300	**1**	N/A	0.28 B	0.42 B	N/A	**4.2**	**0.94**	N/A
Cadmium	mg/kg	980	1 U	N/A	0.85 B	1.1 U	N/A	**0.33 J**	**0.16 J**	N/A
Chromium	mg/kg	120,000	**15**	N/A	**511**	**28.8**	N/A	**178**	**35.8**	N/A
Chromium VI	mg/kg	6.3	1.2 UJ	N/A	1.1 UJ	1.2 UJ	N/A	1.2 UJ	1.2 UJ	N/A
Cobalt	mg/kg	350	**5.4**	N/A	**19.6**	**5.2**	N/A	2.8 B	**5.2**	N/A
Copper	mg/kg	47,000	**6.3**	N/A	**93.6**	**11.4**	N/A	**16.6**	**15.9**	N/A
Iron	mg/kg	820,000	**25,700**	N/A	**109,000**	**12,000**	N/A	**25,900**	**30,100**	N/A
Lead	mg/kg	800	**7.3 J**	N/A	**139 J**	**10.3 J**	N/A	**17**	**15.5**	N/A
Manganese	mg/kg	26,000	**189**	N/A	**9,890**	**98.3**	N/A	**9,360**	**51.3**	N/A
Mercury	mg/kg	350	**0.0044 J**	N/A	**0.088 J**	**0.0066 J**	N/A	0.11 U	**0.0062 J**	N/A
Nickel	mg/kg	22,000	**10**	N/A	**26.2**	**12.7**	N/A	**8.4**	**14.9**	N/A
Selenium	mg/kg	5,800	**2 J**	N/A	3.7 U	2.9 U	N/A	2.2 B	3.6 U	N/A
Thallium	mg/kg	12	**1.4 J**	N/A	9.1 UJ	7.3 UJ	N/A	6.3 U	9.1 U	N/A
Vanadium	mg/kg	5,800	**19.7 J**	N/A	**1,230 J**	**40.4 J**	N/A	**722 J**	**66.3 J**	N/A
Zinc	mg/kg	350,000	**21.9**	N/A	**153**	**37.6**	N/A	**73.9 J**	**48.1 J**	N/A
Other										
Cyanide	mg/kg	150	0.7 U	N/A	**0.35 J**	0.7 U	N/A	**0.23 J**	0.67 U	N/A

Detections in bold
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Values in red indicate an exceedance of the Project Action Limit (PAL)

Table 7
Summary of Inorganics Detected in Soil
Parcel A8
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	A8-018-SB-1	A8-018-SB-5	A8-018-SB-10	A8-019-SB-1	A8-019-SB-5	A8-019-SB-10	A8-020-SB-1	A8-020-SB-5
Metals										
Aluminum	mg/kg	1,100,000	**6,430**	**18,800**	N/A	**5,280**	**18,800**	N/A	**31,000**	**19,700**
Antimony	mg/kg	470	1.7 UJ	2.4 UJ	N/A	2.4 UJ	3.2 UJ	N/A	2.2 UJ	3 UJ
Arsenic	mg/kg	3	**6.5**	**5.8**	**21.3**	**5.1**	**4.4**	**6.8**	**3.8**	**2.1 J**
Barium	mg/kg	220,000	**129 J**	**77 J**	N/A	**636 J**	**66 J**	N/A	**166**	**36.5**
Beryllium	mg/kg	2,300	0.57 U	0.74 B	N/A	0.79 U	0.74 B	N/A	**3.7**	0.43 B
Cadmium	mg/kg	980	0.54 B	1.2 U	N/A	0.66 B	1.6 U	N/A	0.28 B	1.5 U
Chromium	mg/kg	120,000	**1,850**	**48.2**	N/A	**1,380**	**25.6**	N/A	**37.2**	**28.2**
Chromium VI	mg/kg	6.3	1.1 UJ	1.2 UJ	N/A	**0.47 J-**	1.2 UJ	N/A	1.1 UJ	1.3 UJ
Cobalt	mg/kg	350	**4.8**	**5.5**	N/A	**12.8**	**4.9 J**	N/A	3.1 B	**1.5 J**
Copper	mg/kg	47,000	**63.8**	**11.7**	N/A	**80.6**	**10.4**	N/A	**10.3**	**11.4**
Iron	mg/kg	820,000	**243,000**	**17,100**	N/A	**209,000**	**17,800**	N/A	**15,500 J**	**18,000 J**
Lead	mg/kg	800	**22.5 J**	**12 J**	N/A	**18.1 J**	**11.5 J**	N/A	**10.3**	**10.1**
Manganese	mg/kg	26,000	**21,700**	**485**	N/A	**25,000**	**147**	N/A	**1,880**	**15.8**
Mercury	mg/kg	350	**0.0094 J**	**0.0064 J**	N/A	0.11 U	**0.023 J**	N/A	**0.017 J**	**0.053 J**
Nickel	mg/kg	22,000	**19.5**	**14.9**	N/A	**22.9**	**11.6**	N/A	**8**	4.6 B
Selenium	mg/kg	5,800	2.3 U	3.2 U	N/A	3.2 U	4.3 U	N/A	3 U	4 U
Thallium	mg/kg	12	5.7 UJ	8 UJ	N/A	7.9 UJ	10.8 UJ	N/A	7.4 U	9.9 U
Vanadium	mg/kg	5,800	**2,780 J**	**77.5 J**	N/A	**2,950 J**	**36.1 J**	N/A	**92.8**	**46.4**
Zinc	mg/kg	350,000	**92.6**	**34.5**	N/A	**117**	**25.2**	N/A	**43.5**	**18.3**
Other										
Cyanide	mg/kg	150	**0.14 J**	0.65 U	N/A	**0.57 J**	0.69 U	N/A	**0.26 J-**	0.62 UJ

Detections in bold
R1: Relative percent difference was outside control limits (retained laboratory flag).
U: This analyte was not detected in the sample. The numeric value represents the sample.
UJ: This analyte was not detected in the sample. The actual quantitation/detection limit may be higher than reported.
J: The positive result reported for this analyte is a quantitative estimate.
J-: The positive result reported for this analyte is a quantitative estimate, but may be biased low.
B: This analyte was not detected substantially above the level of the associated method blank/preparation or field blank.
N/A: This parameter was not analyzed for this sample.
Values in red indicate an exceedance of the Project Action Limit (PAL)

TABLE 8
SUMMARY OF SOIL PAL EXCEEDANCES

Parameter	CAS#	Frequency of Detections (%)	Frequency of PAL Exceedances (%)	Sample ID of Max Result	Unit	PAL Solid	Max Result
Arsenic	7440-38-2	95	84	A8-017-SB-7	mg/kg	3	27.7
Benz[a]anthracene	56-55-3	74	12	A8-001-SB-4	mg/kg	2.9	24.6
Benzo[a]pyrene	50-32-8	65	35	A8-006-SB-4	mg/kg	0.29	16.6
Benzo[b]fluoranthene	205-99-2	74	12	A8-001-SB-4	mg/kg	2.9	29.5
Dibenz[a,h]anthracene	53-70-3	42	9	A8-006-SB-4	mg/kg	0.29	3.9
Indeno[1,2,3-c,d]pyrene	193-39-5	51	5	A8-006-SB-4	mg/kg	2.9	13.6
Manganese	7439-96-5	100	8	A8-015-SB-1	mg/kg	26,000	28,000
Oil & Grease	O&G	100	3	A8-005-SB-1	mg/kg	6,200	7,740

TABLE 9
SOIL PAL EXCEEDANCES FOR SPECIFIC TARGETS

Target Feature	Boring ID	Sample Depth (ft)	Parameter	PAL (mg/kg)	Result (mg/kg)	Final Flag
Exposed Cold Box Insulation	A8-001-SB	1	Arsenic	3	4.1	
		1	Benz[a]anthracene	2.9	3.1	
		1	Benzo[a]pyrene	0.29	6.1	J
		1	Benzo[b]fluoranthene	2.9	8.2	
		1	Dibenz[a,h]anthracene	0.29	1.2	
		4	Arsenic	3	5.2	
		4	Benz[a]anthracene	2.9	24.6	
		4	Benzo[a]pyrene	0.29	16.4	J
		4	Benzo[b]fluoranthene	2.9	29.5	
		10	Arsenic	3	7.4	
	A8-002-SB	1	Arsenic	3	3.3	J
		5	Arsenic	3	3.8	J
	A8-003-SB	1	Arsenic	3	7.4	J
		1	Benzo[a]pyrene	0.29	0.6	
		5	Arsenic	3	5.7	J
	A8-020-SB	1	Arsenic	3	3.8	
		1	Benz[a]anthracene	2.9	3.6	
		1	Benzo[a]pyrene	0.29	3.1	J
		1	Benzo[b]fluoranthene	2.9	6.4	
		1	Dibenz[a,h]anthracene	0.29	0.77	
Oily Surface Water Discharge	A8-004-SB	1	Arsenic	3	3.7	
		1	Benzo[a]pyrene	0.29	1.2	J
		5	Arsenic	3	3.8	
		5	Benzo[a]pyrene	0.29	1.3	J
		10	Arsenic	3	13.5	
	A8-005-SB	1	Arsenic	3	3.1	
		1	Benzo[a]pyrene	0.29	0.63	J
		1	Oil & Grease	6,200	7,740	
		5	Arsenic	3	3	
		5	Benz[a]anthracene	2.9	2.9	
		5	Benzo[a]pyrene	0.29	6.8	J
		5	Benzo[b]fluoranthene	2.9	7.60	
		5	Dibenz[a,h]anthracene	0.29	0.93	
		5	Indeno[1,2,3-cd]pyrene	2.9	5.7	
	A8-006-SB	1	Arsenic	3	15.8	
		1	Benzo[a]pyrene	0.29	0.34	J
		4	Benz[a]anthracene	2.9	10	
		4	Benzo[a]pyrene	0.29	16.6	J
		4	Benzo[b]fluoranthene	2.9	18.3	
		4	Dibenz[a,h]anthracene	0.29	3.9	
		4	Indeno[1,2,3-c,d]pyrene	2.9	13.6	

TABLE 9
SOIL PAL EXCEEDANCES FOR SPECIFIC TARGETS

Target Feature	Boring ID	Sample Depth (ft)	Parameter	PAL (mg/kg)	Result (mg/kg)	Final Flag
Air Products Facility	A8-007-SB	1	Arsenic	3	3.6	J
	A8-008-SB	1	Arsenic	3	6.4	J
		1	Benzo[a]pyrene	0.29	0.43	
		5	Arsenic	3	12	J
	A8-009-SB	1	Arsenic	3	3.8	
		5	Arsenic	3	4.8	
	A8-010-SB	1	Arsenic	3	3	
		5	Arsenic	3	5.6	
		10	Arsenic	3	16.6	
Flammable Materical Storage Area	A8-011-SB	1	Arsenic	3	9.4	
		5	Arsenic	3	3.7	
	A8-012-SB	1	Arsenic	3	6	
		5	Arsenic	3	3.6	
		10	Arsenic	3	5.6	R1

J = The positive result is a quantitative estimate.
R1= Relative percent difference was outside control limits (retained laboratory flag)

Table 10
Summary of Organics Detected in Groundwater
Parcel A8
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	A8-002-PZ	A8-004-PZ	A8-007-PZ	A8-009-PZ	A8-013-PZ	A8-015-PZ	A8-017-PZ
Volatile Organic Compounds									
1,1,1-Trichloroethane	µg/L	200	1 U	1 U	**41.4**	1 U	1 U	1 U	1 U
1,1-Dichloroethane	µg/L	2.7	**1.3**	**2**	**409**	**4.7**	1 U	1 U	1 U
1,1-Dichloroethene	µg/L	7	**0.94 J**	1 U	**874**	**1.2**	1 U	1 U	1 U
1,2-Dichloroethane	µg/L	5	1 U	1 U	**2.4**	1 U	1 U	1 U	1 U
1,2-Dichloroethene (Total)	µg/L	70	2 U	2 U	**4.1**	2 U	2 U	2 U	2 U
Acetone	µg/L	14,000	10 R	10 R	10 R	10 R	**8.3 J**	10 R	10 R
Benzene	µg/L	5	1 U	1 U	**0.61 J**	1 U	1 U	1 U	**73.4**
Carbon disulfide	µg/L	810	1 U	1 U	**1.2**	1 U	1 U	1 U	1 U
Chloroform	µg/L	0.22	1 U	**14**	**0.55 J**	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	µg/L	70	1 U	1 U	**3.4**	**0.32 J**	1 U	1 U	1 U
Cyclohexane	µg/L	13,000	10 U	10 U	10 U	10 U	10 U	10 U	**15.4**
Ethylbenzene	µg/L	700	1 U	1 U	1 U	1 U	1 U	1 U	**50.9**
Isopropylbenzene	µg/L	450	1 U	1 U	1 U	1 U	1 U	1 U	**12.8**
Methyl tert-butyl ether (MTBE)	µg/L	14	1 U	1 U	1 U	1 U	**2.1**	1 U	1 U
Tetrachloroethene	µg/L	5	1 U	**3.3**	**0.99 J**	1 U	1 U	1 U	1 U
Toluene	µg/L	1,000	1 U	**0.38 J**	1 U	**0.22 J**	1 U	**0.23 J**	**160**
trans-1,2-Dichloroethene	µg/L	100	1 U	1 U	**0.69 J**	1 U	1 U	1 U	1 U
Trichloroethene	µg/L	5	**0.76 J**	**1.3**	**28.3**	**2.9**	1 U	1 U	1 U
Trichlorofluoromethane	µg/L	1,100	1 U	**2.2**	**0.71 J**	1 U	1 U	1 U	1 U
Vinyl chloride	µg/L	2	1 U	1 U	**1.7**	1 U	1 U	1 U	1 U
Xylenes	µg/L	10,000	3 U	**1.6 J**	3 U	**1.6 J**	3 U	3 U	**241**
Semi-Volatile Organic Compounds*									
1,1-Biphenyl	µg/L	0.83	1 U	1 U	1 U	1 U	1 U	1 U	**12.7**
1,4-Dioxane	µg/L	0.46	**0.39**	**0.39**	**44.7**	**1.6**	**0.078 J**	0.1 U	0.1 U
2-Methylnaphthalene	µg/L	36	0.1 U	0.1 U	0.1 U	**0.39**	0.1 U	0.1 U	**352**
2-Methylphenol	µg/L	930	1 U	1 U	1 U	1 U	1 U	1 U	**0.36 J**
Acenaphthene	µg/L	530	0.1 U	0.1 U	0.1 U	**1.3**	0.1 U	0.1 U	**11.5**
Acenaphthylene	µg/L	530	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	**1.5 J**
Acetophenone	µg/L	1,900	1 U	1 U	1 U	1 U	1 U	1 U	**16**
Anthracene	µg/L	1,800	0.1 U	0.1 U	**0.014 J**	**0.029 J**	0.1 U	**0.029 J**	**0.91 J**
Benz[a]anthracene	µg/L	0.012	**0.068 J**	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	5.1 U
Benzo[a]pyrene	µg/L	0.2	**0.15 J**	0.1 U	**0.044 J**	0.1 U	0.1 U	0.1 U	5.1 U
Benzo[b]fluoranthene	µg/L	0.034	**0.15**	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	5.1 U
Benzo[g,h,i]perylene	µg/L		**0.17**	0.1 U	**0.026 J**	0.1 U	**0.023 J**	0.1 U	5.1 U
Benzo[k]fluoranthene	µg/L	0.34	**0.1**	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	5.1 U
bis(2-Ethylhexyl)phthalate	µg/L	6	0.29 B	0.25 B	1 U	0.26 B	1 U	0.24 B	**0.32 J**
Carbazole	µg/L		1 U	1 U	1 U	1 U	1 U	1 U	**10.8**
Chrysene	µg/L	3.5	**0.062 J**	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	5.1 U
Di-n-butylphthalate	µg/L	900	1 U	1 U	1 U	1 U	1 U	1 U	**0.54 J**
Fluoranthene	µg/L	800	0.1 U	**0.079 J**	**0.074 J**	**0.068 J**	0.1 U	**0.12**	5.1 U
Fluorene	µg/L	290	0.1 U	**0.017 J**	**0.097 J**	**0.48**	0.1 U	0.1 U	**16**
Indeno[1,2,3-c,d]pyrene	µg/L	0.034	**0.13**	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	5.1 U
Naphthalene	µg/L	0.17	0.1 U	**0.11**	**0.1**	**0.63**	**0.15**	**0.64**	**168**
Pentachlorophenol	µg/L	1	2.6 U	**0.65 J**	2.6 U	**1.1 J**	2.6 U	**4.5**	2.6 U
Phenanthrene	µg/L		0.1 U	0.1 U	**0.076 J**	**0.19**	0.1 U	**0.2**	**23.4**
Pyrene	µg/L	120	0.1 U	**0.077 J**	**0.069 J**	**0.046 J**	0.1 U	**0.087 J**	5.1 U
TPH/Oil and Grease									
Diesel Range Organics	µg/L	47	N/A	**659 J**	N/A	N/A	N/A	N/A	**13,800**
Oil and Grease	µg/L	47	4,800 U	4,800 U	4,850 U	4,770 U	4,770 U	4,800 U	**23,700**

Detections in bold
Values in red indicate an exceedance of the Project Action Limit (PAL)
*PAH compounds were analyzed via SIM
N/A: This parameter was not analyzed for this sample.

B: This analyte was not detected substantially above the level of the associated method blank/preparation or field blank.
U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit.
R: The analytical result was rejected during validation.
J: The positive result reported for this analyte is a quantitative estimate.

Table 11
Summary of Inorganics Detected in Groundwater
Parcel A8
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	A8-002-PZ	A8-004-PZ	A8-007-PZ	A8-009-PZ	A8-013-PZ	A8-015-PZ	A8-017-PZ
Total Metals									
Chromium VI	µg/L	0.035	**6 J**	10 U	10 UJ	**70 J ***	10 U	10 U	10 UJ
Dissolved Metals									
Aluminum, Dissolved	µg/L	20,000	33.6 B	**362**	**19.3 J**	**116**	**178**	**1,400**	**823**
Arsenic, Dissolved	µg/L	10	**11**	5 U	5 U	**12.3**	5 U	2.8 B	**8.5**
Barium, Dissolved	µg/L	2,000	**56.9**	**20.6**	**29.6**	8.3 B	**32**	**156**	**39.3**
Beryllium, Dissolved	µg/L	4	0.57 B	1 U	0.45 B	1 U	0.37 B	1 U	1 U
Cadmium, Dissolved	µg/L	5	1.6 B	3 U	0.69 B	3 U	3 U	3 U	3 U
Chromium, Dissolved	µg/L	100	1.1 B	1.4 B	1.6 B	5 U	1.6 B	1.4 B	5 U
Cobalt, Dissolved	µg/L	6	**93.6**	5 U	**67.8**	0.84 B	**107**	5 U	5 U
Copper, Dissolved	µg/L	1,300	5 U	**1.6 J**	5 U	**2.6 J**	5 U	5 U	5 U
Iron, Dissolved	µg/L	14,000	**11,200**	44.8 B	**4,090**	**191**	**2,880**	**22.9 J**	**15.7 J**
Manganese, Dissolved	µg/L	430	**724 J**	**5.5 J**	**520**	**46.1 J**	**7,330 J**	**6.9 J**	5 U
Mercury, Dissolved	µg/L	2	0.04 B	0.05 B	0.07 B	0.06 B	0.06 B	0.07 B	0.07 B
Nickel, Dissolved	µg/L	390	**129**	1.3 B	**102**	4.5 B	**28.7**	0.72 B	1.4 B
Selenium, Dissolved	µg/L	50	8 U	6.3 B	8 U	3.4 B	8 U	7.7 B	8 U
Thallium, Dissolved	µg/L	2	10 U	5.1 B	10 U	10 U	10 U	10 U	10 U
Vanadium, Dissolved	µg/L	86	0.76 B	**673**	1.4 B	**19.4**	**10.7**	**12.3**	**40.3**
Zinc, Dissolved	µg/L	6,000	**153**	0.86 B	**58.2**	1.8 B	**36.9**	0.72 B	10 U

Detections in bold
U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit.
J: The positive result reported for this analyte is a quantitative estimate.
B: This analyte was not detected substantially above the level of the associated method blank/preparation or field blank.
UJ: This analyte was not detected in the sample. The actual quantitation/detection limit may be higher than reported.
Values in red indicate an exceedance of the Project Action Limit (PAL)

*A8-009-PZ was resampled on 8/30/16 and analyzed for dissolved hexavalent chromium, which was not detected above the reporting limit of 1 ug/L.

Table 12
Vapor Intrusion Criteria Comparison

Sample Location	Parameter	Result (ug/L)	Final Flag	Target Groundwater Concentration (ug/L) TCR=1E-05 or THQ=1	Exceeds Criteria	Comparison = Result / Target	Toxicity Type
A8-007-PZ	1,1-Dichloroethane	409		330	YES	1.24	C
A8-007-PZ	1,1-Dichloroethene	874		820	YES	1.07	NC
A8-007-PZ	Trichloroethene	28.3		22 (74)	YES	1.29 (0.38)	NC (C)
A8-017-PZ	Benzene	73.4		69	YES	1.06	C

C indicates carcinogenic
NC indicates non-carcinogenic

Table 13
Cumulative Vapor Intrusion Comparison

Parameter	Type	Organ Systems	VI Screening Criteria (ug/L)	A8-002-PZ		A8-004-PZ		A8-007-PZ	
				Conc. (ug/L)	Cancer Risk	Conc. (ug/L)	Cancer Risk	Conc. (ug/L)	Cancer Risk
Cancer Risk									
1,4-Dioxane	SVOC		130,000	0.39	3.0E-11	0.39	3.0E-11	44.7	3.4E-09
Naphthalene	SVOC		200	0.1 U	0	0.11	5.5E-09	0.1	5.0E-09
1,1-Dichloroethane	VOC		330	1.3	3.9E-08	2	6.1E-08	409	1.2E-05
1,2-Dichloroethane	VOC		98	1 U	0	1 U	0	2.4	2.4E-07
Benzene	VOC		69	1 U	0	1 U	0	0.61 J	8.8E-08
Chloroform	VOC		36	1 U	0	14	3.9E-06	0.55 J	1.5E-07
Ethylbenzene	VOC		150	1 U	0	1 U	0	1 U	0
Methyl tert-butyl ether (MTBE)	VOC		20,000	1 U	0	1 U	0	1 U	0
Trichloroethene	VOC		74	0.76 J	1.0E-07	1.3	1.8E-07	28.3	3.8E-06
Vinyl chloride	VOC		25	1 U	0	1 U	0	1.7	6.8E-07
Cumulative Vapor Intrusion Cancer Risk					1E-07		4E-06		2E-05
Non-Cancer Hazard									
				Conc. (ug/L)	Non-Cancer HQ	Conc. (ug/L)	Non-Cancer HQ	Conc. (ug/L)	Non-Cancer HQ
1,1-Dichloroethene	VOC	Hepatic	820	0.94 J	0.001	1 U	0	874	1
Cumulative Vapor Intrusion Non-Cancer Hazard					0		0		1
Trichloroethene	VOC	Cardiovascular; Developmental; Immune	22	0.76 J	0.03	1.3	0.06	28.3	1
Cumulative Vapor Intrusion Non-Cancer Hazard					0		0		1
Xylenes	VOC	Nervous	1,600	3 U	0	1.6 J	0.001	3 U	0
Cumulative Vapor Intrusion Non-Cancer Hazard					0		0		0

Highlighted values indicate exceedances of the cumulative vapor intrusion criteria
TCR > 1E-05
THI > 1
Conc. = Concentration
U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit.
J: The positive result reported for this analyte is a quantitative estimate.

Table 13
Cumulative Vapor Intrusion Comparison

Parameter	Type	Organ Systems	VI Screening Criteria (ug/L)	A8-009-PZ		A8-013-PZ	
				Conc. (ug/L)	Cancer Risk	Conc. (ug/L)	Cancer Risk
Cancer Risk							
1,4-Dioxane	SVOC		130,000	1.6	1.2E-10	0.078 J	6.0E-12
Naphthalene	SVOC		200	0.63	3.2E-08	0.15	7.5E-09
1,1-Dichloroethane	VOC		330	4.7	1.4E-07	1 U	0
1,2-Dichloroethane	VOC		98	1 U	0	1 U	0
Benzene	VOC		69	1 U	0	1 U	0
Chloroform	VOC		36	1 U	0	1 U	0
Ethylbenzene	VOC		150	1 U	0	1 U	0
Methyl tert-butyl ether (MTBE)	VOC		20,000	1 U	0	2.1	1.1E-09
Trichloroethene	VOC		74	2.9	3.9E-07	1 U	0
Vinyl chloride	VOC		25	1 U	0	1 U	0
Cumulative Vapor Intrusion Cancer Risk					6E-07		9E-09
Non-Cancer Hazard							
				Conc. (ug/L)	Non-Cancer HQ	Conc. (ug/L)	Non-Cancer HQ
1,1-Dichloroethene	VOC	Hepatic	820	1.2	0.001	1 U	0
Cumulative Vapor Intrusion Non-Cancer Hazard					0		0
Trichloroethene	VOC	Cardiovascular; Developmental; Immune	22	2.9	0.1	1 U	0
Cumulative Vapor Intrusion Non-Cancer Hazard					0		0
Xylenes	VOC	Nervous	1,600	1.6 J	0.001	3 U	0
Cumulative Vapor Intrusion Non-Cancer Hazard					0		0

Highlighted values indicate exceedances of the cumulative vapor intrusion criteria
TCR > 1E-05
THI > 1
Conc. = Concentration
U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit.
J: The positive result reported for this analyte is a quantitative estimate.

Table 13
Cumulative Vapor Intrusion Comparison

Parameter	Type	Organ Systems	VI Screening Criteria (ug/L)	A8-015-PZ		A8-017-PZ	
				Conc. (ug/L)	Cancer Risk	Conc. (ug/L)	Cancer Risk
Cancer Risk							
1,4-Dioxane	SVOC		130,000	0.1 U	0	0.1 U	0
Naphthalene	SVOC		200	0.64	3.2E-08	168	8.4E-06
1,1-Dichloroethane	VOC		330	1 U	0	1 U	0
1,2-Dichloroethane	VOC		98	1 U	0	1 U	0
Benzene	VOC		69	1 U	0	73.4	1.1E-05
Chloroform	VOC		36	1 U	0	1 U	0
Ethylbenzene	VOC		150	1 U	0	50.9	3.4E-06
Methyl tert-butyl ether (MTBE)	VOC		20,000	1 U	0	1 U	0
Trichloroethene	VOC		74	1 U	0	1 U	0
Vinyl chloride	VOC		25	1 U	0	1 U	0
Cumulative Vapor Intrusion Cancer Risk					3E-08		2E-05
Non-Cancer Hazard							
				Conc. (ug/L)	Non-Cancer HQ	Conc. (ug/L)	Non-Cancer HQ
1,1-Dichloroethene	VOC	Hepatic	820	1 U	0	1 U	0
Cumulative Vapor Intrusion Non-Cancer Hazard					0		0
Trichloroethene	VOC	Cardiovascular; Developmental; Immune	22	1 U	0	1 U	0
Cumulative Vapor Intrusion Non-Cancer Hazard					0		0
Xylenes	VOC	Nervous	1,600	3 U	0	241	0.2
Cumulative Vapor Intrusion Non-Cancer Hazard					0		0

Highlighted values indicate exceedances of the cumulative vapor intrusion criteria
TCR > 1E-05
THI > 1
Conc. = Concentration
U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit.
J: The positive result reported for this analyte is a quantitative estimate.

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Parcel A8 - Table 14

Rejected Results for Soil

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
Sample: *A8-001-SB-1*					
1,4-Dioxane	0.096	mg/kg	24	no	R
Benzaldehyde	0.072	mg/kg	120,000	no	R
Sample: *A8-001-SB-4*					
1,4-Dioxane	0.11	mg/kg	24	no	R
Benzaldehyde	0.081	mg/kg	120,000	no	R
Sample: *A8-002-SB-1*					
1,4-Dioxane	0.081	mg/kg	24	no	R
Benzaldehyde	0.079	mg/kg	120,000	no	R
Methyl Acetate	0.041	mg/kg	1,200,000	no	R
Sample: *A8-002-SB-5*					
1,4-Dioxane	0.092	mg/kg	24	no	R
Benzaldehyde	0.083	mg/kg	120,000	no	R
Methyl Acetate	0.046	mg/kg	1,200,000	no	R
Sample: *A8-003-SB-1*					
1,4-Dioxane	0.14	mg/kg	24	no	R
2,3,4,6-Tetrachlorophenol	0.076	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.19	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.076	mg/kg	210	no	R
2,4-Dichlorophenol	0.076	mg/kg	2,500	no	R
2,4-Dinitrophenol	0.19	mg/kg	1,600	no	R
2-Chlorophenol	0.076	mg/kg	5,800	no	R
2-Methylphenol	0.076	mg/kg	41,000	no	R
Methyl Acetate	0.072	mg/kg	1,200,000	no	R
Pentachlorophenol	0.19	mg/kg	4	no	R

Rejected Results for Soil

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
Sample:	***A8-003-SB-5***				
1,4-Dioxane	0.095	mg/kg	24	no	R
Benzaldehyde	0.077	mg/kg	120,000	no	R
Methyl Acetate	0.048	mg/kg	1,200,000	no	R
Sample:	***A8-004-SB-1***				
1,4-Dioxane	0.096	mg/kg	24	no	R
Benzaldehyde	0.071	mg/kg	120,000	no	R
Chloroethane	0.0048	mg/kg	57,000	no	R
Sample:	***A8-004-SB-10***				
2,3,4,6-Tetrachlorophenol	0.082	mg/kg	25,000	no	R
Pentachlorophenol	0.2	mg/kg	4	no	R
Sample:	***A8-004-SB-5***				
1,4-Dioxane	0.093	mg/kg	24	no	R
Benzaldehyde	0.071	mg/kg	120,000	no	R
Chloroethane	0.0047	mg/kg	57,000	no	R
Sample:	***A8-005-SB-1***				
1,4-Dioxane	0.095	mg/kg	24	no	R
Benzaldehyde	0.075	mg/kg	120,000	no	R
Sample:	***A8-005-SB-10***				
Benzaldehyde	0.08	mg/kg	120,000	no	R
Sample:	***A8-005-SB-5***				
1,4-Dioxane	0.089	mg/kg	24	no	R
Chloroethane	0.0044	mg/kg	57,000	no	R
Sample:	***A8-006-SB-1***				
1,4-Dioxane	0.087	mg/kg	24	no	R
Benzaldehyde	0.072	mg/kg	120,000	no	R

Rejected Results for Soil

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
Sample: ***A8-006-SB-10***					
Benzaldehyde	0.084	mg/kg	120,000	no	R
Sample: ***A8-006-SB-4***					
1,4-Dioxane	0.11	mg/kg	24	no	R
Sample: ***A8-007-SB-1***					
1,4-Dioxane	0.099	mg/kg	24	no	R
Benzaldehyde	0.072	mg/kg	120,000	no	R
Methyl Acetate	0.05	mg/kg	1,200,000	no	R
Sample: ***A8-007-SB-5***					
1,4-Dioxane	0.092	mg/kg	24	no	R
Benzaldehyde	0.072	mg/kg	120,000	no	R
Methyl Acetate	0.046	mg/kg	1,200,000	no	R
Sample: ***A8-008-SB-1***					
1,4-Dioxane	0.098	mg/kg	24	no	R
Benzaldehyde	0.072	mg/kg	120,000	no	R
Methyl Acetate	0.049	mg/kg	1,200,000	no	R
Sample: ***A8-008-SB-5***					
1,4-Dioxane	0.096	mg/kg	24	no	R
Benzaldehyde	0.081	mg/kg	120,000	no	R
Methyl Acetate	0.048	mg/kg	1,200,000	no	R
Sample: ***A8-009-SB-1***					
1,4-Dioxane	0.1	mg/kg	24	no	R
Benzaldehyde	0.078	mg/kg	120,000	no	R
Sample: ***A8-009-SB-5***					
1,4-Dioxane	0.096	mg/kg	24	no	R
Benzaldehyde	0.077	mg/kg	120,000	no	R

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
Sample:	***A8-010-SB-1***				
1,4-Dioxane	0.081	mg/kg	24	no	R
Benzaldehyde	0.077	mg/kg	120,000	no	R
Sample:	***A8-010-SB-5***				
1,4-Dioxane	0.1	mg/kg	24	no	R
Benzaldehyde	0.079	mg/kg	120,000	no	R
Sample:	***A8-011-SB-1***				
1,4-Dioxane	0.097	mg/kg	24	no	R
Benzaldehyde	0.07	mg/kg	120,000	no	R
Sample:	***A8-011-SB-5***				
1,4-Dioxane	0.096	mg/kg	24	no	R
Benzaldehyde	0.078	mg/kg	120,000	no	R
Sample:	***A8-012-SB-1***				
1,4-Dioxane	0.11	mg/kg	24	no	R
Benzaldehyde	0.069	mg/kg	120,000	no	R
Sample:	***A8-012-SB-5***				
1,4-Dioxane	0.091	mg/kg	24	no	R
Benzaldehyde	0.079	mg/kg	120,000	no	R
Sample:	***A8-013-SB-1***				
1,4-Dioxane	0.099	mg/kg	24	no	R
2,3,4,6-Tetrachlorophenol	0.071	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.18	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.071	mg/kg	210	no	R
2,4-Dichlorophenol	0.071	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.071	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.18	mg/kg	1,600	no	R
2-Chlorophenol	0.071	mg/kg	5,800	no	R
2-Methylphenol	0.071	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.14	mg/kg	41,000	no	R

Rejected Results for Soil

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
Sample:	***A8-013-SB-1***				
Benzaldehyde	0.071	mg/kg	120,000	no	R
Methyl Acetate	0.049	mg/kg	1,200,000	no	R
Pentachlorophenol	0.18	mg/kg	4	no	R
Phenol	0.071	mg/kg	250,000	no	R
Sample:	***A8-013-SB-5***				
1,4-Dioxane	0.1	mg/kg	24	no	R
Benzaldehyde	0.079	mg/kg	120,000	no	R
Methyl Acetate	0.051	mg/kg	1,200,000	no	R
Sample:	***A8-014-SB-1***				
1,4-Dioxane	0.085	mg/kg	24	no	R
2,3,4,6-Tetrachlorophenol	0.071	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.18	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.071	mg/kg	210	no	R
2,4-Dichlorophenol	0.071	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.071	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.18	mg/kg	1,600	no	R
2-Chlorophenol	0.071	mg/kg	5,800	no	R
2-Methylphenol	0.071	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.14	mg/kg	41,000	no	R
Methyl Acetate	0.042	mg/kg	1,200,000	no	R
Pentachlorophenol	0.18	mg/kg	4	no	R
Phenol	0.071	mg/kg	250,000	no	R
Sample:	***A8-014-SB-5***				
1,4-Dioxane	0.11	mg/kg	24	no	R
Benzaldehyde	0.076	mg/kg	120,000	no	R
Methyl Acetate	0.053	mg/kg	1,200,000	no	R
Sample:	***A8-015-SB-1***				
1,4-Dioxane	0.095	mg/kg	24	no	R
Benzaldehyde	0.079	mg/kg	120,000	no	R
Methyl Acetate	0.048	mg/kg	1,200,000	no	R

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
Sample:	***A8-015-SB-7***				
1,4-Dioxane	0.096	mg/kg	24	no	R
Benzaldehyde	0.084	mg/kg	120,000	no	R
Methyl Acetate	0.048	mg/kg	1,200,000	no	R
Sample:	***A8-016-SB-1***				
1,4-Dioxane	0.091	mg/kg	24	no	R
2,3,4,6-Tetrachlorophenol	0.072	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.18	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.072	mg/kg	210	no	R
2,4-Dichlorophenol	0.072	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.072	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.18	mg/kg	1,600	no	R
2-Chlorophenol	0.072	mg/kg	5,800	no	R
2-Methylphenol	0.072	mg/kg	41,000	no	R
3&4-Methylphenol(m&p Cresol)	0.14	mg/kg	41,000	no	R
Benzaldehyde	0.072	mg/kg	120,000	no	R
Methyl Acetate	0.046	mg/kg	1,200,000	no	R
Pentachlorophenol	0.18	mg/kg	4	no	R
Phenol	0.072	mg/kg	250,000	no	R
Sample:	***A8-016-SB-5***				
1,4-Dioxane	0.095	mg/kg	24	no	R
Benzaldehyde	0.082	mg/kg	120,000	no	R
Methyl Acetate	0.048	mg/kg	1,200,000	no	R
Sample:	***A8-017-SB-1***				
1,4-Dioxane	0.13	mg/kg	24	no	R
2,4-Dinitrophenol	0.19	mg/kg	1,600	no	R
Benzaldehyde	0.076	mg/kg	120,000	no	R
Methyl Acetate	0.065	mg/kg	1,200,000	no	R
Sample:	***A8-017-SB-7***				
1,4-Dioxane	0.099	mg/kg	24	no	R
Benzaldehyde	0.081	mg/kg	120,000	no	R

Rejected Results for Soil

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
Sample: ***A8-017-SB-7***					
Methyl Acetate	0.049	mg/kg	1,200,000	no	R
Sample: ***A8-018-SB-1***					
1,4-Dioxane	0.09	mg/kg	24	no	R
Benzaldehyde	0.069	mg/kg	120,000	no	R
Methyl Acetate	0.045	mg/kg	1,200,000	no	R
Sample: ***A8-018-SB-5***					
1,4-Dioxane	0.1	mg/kg	24	no	R
Benzaldehyde	0.079	mg/kg	120,000	no	R
Methyl Acetate	0.051	mg/kg	1,200,000	no	R
Sample: ***A8-019-SB-1***					
1,4-Dioxane	0.096	mg/kg	24	no	R
2,3,4,6-Tetrachlorophenol	0.074	mg/kg	25,000	no	R
2,4,5-Trichlorophenol	0.18	mg/kg	82,000	no	R
2,4,6-Trichlorophenol	0.074	mg/kg	210	no	R
2,4-Dichlorophenol	0.074	mg/kg	2,500	no	R
2,4-Dimethylphenol	0.074	mg/kg	16,000	no	R
2,4-Dinitrophenol	0.18	mg/kg	1,600	no	R
2-Chlorophenol	0.074	mg/kg	5,800	no	R
2-Methylphenol	0.074	mg/kg	41,000	no	R
Methyl Acetate	0.048	mg/kg	1,200,000	no	R
Pentachlorophenol	0.18	mg/kg	4	no	R
Sample: ***A8-019-SB-5***					
1,4-Dioxane	0.096	mg/kg	24	no	R
Benzaldehyde	0.083	mg/kg	120,000	no	R
Methyl Acetate	0.048	mg/kg	1,200,000	no	R
Sample: ***A8-020-SB-1***					
1,4-Dioxane	0.091	mg/kg	24	no	R
Benzaldehyde	0.082	mg/kg	120,000	no	R

Rejected Results for Soil

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
Sample:	*A8-020-SB-5*				
1,4-Dioxane	0.11	mg/kg	24	no	R
Benzaldehyde	0.082	mg/kg	120,000	no	R

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Parcel A8 - Table 15

Rejected Results for Groundwater

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
Sample: *A8-002-PZ*					
3,3'-Dichlorobenzidine	1	µg/L	0.12	**YES**	R
Acetone	10	µg/L	14,000	no	R
Methyl Acetate	5	µg/L	20,000	no	R
Sample: *A8-004-PZ*					
3,3'-Dichlorobenzidine	1	µg/L	0.12	**YES**	R
Acetone	10	µg/L	14,000	no	R
Methyl Acetate	5	µg/L	20,000	no	R
Sample: *A8-007-PZ*					
3,3'-Dichlorobenzidine	1	µg/L	0.12	**YES**	R
Acetone	10	µg/L	14,000	no	R
Methyl Acetate	5	µg/L	20,000	no	R
Sample: *A8-009-PZ*					
3,3'-Dichlorobenzidine	1	µg/L	0.12	**YES**	R
Acetone	10	µg/L	14,000	no	R
Methyl Acetate	5	µg/L	20,000	no	R
Sample: *A8-013-PZ*					
3,3'-Dichlorobenzidine	1	µg/L	0.12	**YES**	R
Methyl Acetate	5	µg/L	20,000	no	R
Sample: *A8-015-PZ*					
3,3'-Dichlorobenzidine	1	µg/L	0.12	**YES**	R
Acetone	10	µg/L	14,000	no	R
Methyl Acetate	5	µg/L	20,000	no	R
Sample: *A8-017-PZ*					
3,3'-Dichlorobenzidine	1	µg/L	0.12	**YES**	R

Rejected Results for Groundwater

Parameter	Result	Units	PAL	Exceeds PAL?	Flag
Sample:	***A8-017-PZ***				
Acetone	10	µg/L	14,000	no	R
Methyl Acetate	5	µg/L	20,000	no	R

Table 16 - Parcel A8
COPC Screening Analysis

Parameter	CAS#	Location of Max Result	Max Detection (mg/kg)	Final Flag	Min Detection (mg/kg)	Average Detection (mg/kg)	Total Samples	Frequency of Detection (%)	Cancer TR=1E-06 (mg/kg)	Non-Cancer HQ=0.1 (mg/kg)	COPC?
1,1-Biphenyl	92-52-4	A8-019-SB-1	0.97		0.02	0.16	43	32.56	410	20	no
1,1-Dichloroethane	75-34-3	A8-003-SB-5	0.0084		0.001	0.005	40	5.00	16	23,000	no
1,1-Dichloroethene	75-35-4	A8-005-SB-5	0.0008	J	0.0008	0.001	40	2.50		100	no
2,4-Dimethylphenol	105-67-9	A8-006-SB-4	0.037	J	0.019	0.03	39	5.13		1,600	no
2-Butanone (MEK)	78-93-3	A8-005-SB-1	0.071		0.0019	0.01	40	47.50		19,000	no
2-Hexanone	591-78-6	A8-005-SB-1	0.018		0.0033	0.01	40	7.50		130	no
2-Methylnaphthalene	91-57-6	A8-001-SB-4	6		0.0014	0.28	43	67.44		300	no
2-Methylphenol	95-48-7	A8-006-SB-4	0.027	J	0.027	0.03	38	2.63		4,100	no
Acenaphthene	83-32-9	A8-006-SB-4	2.7		0.0021	0.40	43	48.84		4,500	no
Acenaphthylene	208-96-8	A8-001-SB-4	11.5		0.0019	0.62	43	48.84			no
Acetone	67-64-1	A8-005-SB-1	0.26		0.0098	0.05	40	75.00		67,000	no
Acetophenone	98-86-2	A8-014-SB-1	0.082		0.052	0.07	43	4.65		12,000	no
Aluminum	7429-90-5	A8-007-SB-1	58,300		3,560	15,720	40	100.00		110,000	no
Anthracene	120-12-7	A8-001-SB-4	29.2		0.0012	1.13	43	72.09		23,000	no
Antimony	7440-36-0	A8-007-SB-1	5.5	J	2.1	3.80	40	5.00		47	no
Aroclor 1254	11097-69-1	A8-005-SB-1	0.16	J	0.047	0.09	20	15.00	0.97	1.5	no
Aroclor 1260	11096-82-5	A8-003-SB-1	0.3		0.012	0.13	20	20.00	0.99		no
Arsenic	7440-38-2	A8-017-SB-7	27.7	J	1.9	6.31	56	94.64	3	48	YES (C)
Barium	7440-39-3	A8-019-SB-1	636	J	30.7	119	40	100.00		22,000	no
Benz[a]anthracene	56-55-3	A8-001-SB-4	24.6		0.0027	1.58	43	74.42	21		YES (C)
Benzaldehyde	100-52-7	A8-019-SB-1	0.091	J	0.017	0.04	6	100.00	820	12,000	no
Benzene	71-43-2	A8-005-SB-5	0.003	J	0.00061	0.002	40	27.50	5.1	42	no
Benzo[a]pyrene	50-32-8	A8-006-SB-4	16.6	J	0.0015	2.08	43	65.12	2.1	22	YES (C)
Benzo[b]fluoranthene	205-99-2	A8-001-SB-4	29.5		0.0024	2.59	43	74.42	21		YES (C)
Benzo[g,h,i]perylene	191-24-2	A8-006-SB-4	13.8		0.0011	0.84	43	76.74			no
Benzo[k]fluoranthene	207-08-9	A8-001-SB-4	12		0.0011	1.24	43	74.42	210		no
Beryllium	7440-41-7	A8-017-SB-1	4.2		0.31	1.46	40	52.50	6,900	230	no
bis(2-Ethylhexyl)phthalate	117-81-7	A8-005-SB-1	0.043	J	0.016	0.03	43	18.60	160	1,600	no
Cadmium	7440-43-9	A8-011-SB-1	7		0.16	1.12	40	45.00	9,300	98	no
Carbazole	86-74-8	A8-014-SB-1	0.75		0.017	0.19	43	30.23			no
Carbon disulfide	75-15-0	A8-015-SB-7	0.011		0.0029	0.01	40	7.50		350	no
Chloroform	67-66-3	A8-004-SB-1	0.021		0.0031	0.01	40	10.00	1.4	100	no
Chromium	7440-47-3	A8-013-SB-1	2,090		7.4	438	40	100.00		180,000	no
Chromium VI	18540-29-9	A8-013-SB-1	1.7	J-	0.47	0.85	40	10.00	6.3	350	no
Chrysene	218-01-9	A8-001-SB-4	20		0.00096	1.34	43	81.40	2,100		no
Cobalt	7440-48-4	A8-006-SB-1	22.8		1.5	7.14	40	80.00	1,900	35	no
Copper	7440-50-8	A8-008-SB-1	409		3.7	53.0	40	100.00		4,700	no
Cyanide	57-12-5	A8-003-SB-1	1.8		0.11	0.54	40	55.00		120	no
Cyclohexane	110-82-7	A8-005-SB-1	0.0014	J	0.00042	0.001	40	12.50		2,700	no
Dibenz[a,h]anthracene	53-70-3	A8-006-SB-4	3.9		0.0043	0.43	43	41.86	2.1		YES (C)
Di-n-butylphthalate	84-74-2	A8-008-SB-1	0.11	J	0.024	0.07	43	6.98		8,200	no

Table 16 - Parcel A8
COPC Screening Analysis

Parameter	CAS#	Location of Max Result	Max Detection (mg/kg)	Final Flag	Min Detection (mg/kg)	Average Detection (mg/kg)	Total Samples	Frequency of Detection (%)	Cancer TR=1E-06 (mg/kg)	Non-Cancer HQ=0.1 (mg/kg)	COPC?
Fluoranthene	206-44-0	A8-001-SB-4	61.9		0.00089	2.62	43	86.05		3,000	no
Fluorene	86-73-7	A8-001-SB-4	17.9		0.00089	0.71	43	62.79		3,000	no
Indeno[1,2,3-c,d]pyrene	193-39-5	A8-006-SB-4	13.6		0.004	1.08	43	51.16	21		no
Iron	7439-89-6	A8-006-SB-1	330,000	J	6,680	71,300	40	100.00		82,000	YES (NC)
Isopropylbenzene	98-82-8	A8-009-SB-5	0.00031	J	0.00031	0.0003	40	2.50		990	no
Lead^	7439-92-1	A8-011-SB-1	457		5.1	46.5	40	100.00		800	no
Manganese	7439-96-5	A8-015-SB-1	28,000		15.8	8,545	40	100.00		2,600	YES (NC)
Mercury	7439-97-6	A8-016-SB-1	0.088	J	0.0029	0.03	40	90.00		35	no
Methylene Chloride	75-09-2	A8-005-SB-5	0.085		0.0023	0.01	40	35.00	1,000	320	no
Naphthalene	91-20-3	A8-001-SB-4	11.4		0.0023	0.54	43	72.09	17	59	no
Nickel	7440-02-0	A8-006-SB-4	109		5	23.1	40	92.50	64,000	2,200	no
N-Nitrosodiphenylamine	86-30-6	A8-006-SB-4	0.068	J	0.068	0.07	43	2.33	470		no
PCBs (total)*	1336-36-3	A8-007-SB-1	0.18		0.047	0.10	20	15.00	0.94		no
Phenanthrene	85-01-8	A8-001-SB-4	69		0.0041	2.67	43	74.42			no
Phenol	108-95-2	A8-006-SB-4	0.051	J	0.025	0.03	40	10.00		25,000	no
Pyrene	129-00-0	A8-001-SB-4	43.6		0.00086	1.99	43	88.37		2,300	no
Selenium	7782-49-2	A8-006-SB-1	2.2	J	1.6	1.93	40	7.50		580	no
Styrene	100-42-5	A8-003-SB-1	0.025		0.025	0.03	40	2.50		3,500	no
Tetrachloroethene	127-18-4	A8-006-SB-4 & A8-004-SB-1	0.029		0.00058	0.01	40	22.50	100	39	no
Thallium	7440-28-0	A8-004-SB-1	3.2	J	1.4	2.30	40	5.00		1.2	YES (NC)
Toluene	108-88-3	A8-001-SB-4	0.0024	J	0.00031	0.001	40	35.00		4,700	no
Trichloroethene	79-01-6	A8-004-SB-1	0.0043	J	0.00072	0.003	40	17.50	6	1.9	no
Trichlorofluoromethane	75-69-4	A8-007-SB-1	0.0085		0.0025	0.01	40	7.50		35,000	no
Vanadium	7440-62-2	A8-015-SB-1	4,220	J	8.7	858	40	100.00		580	YES (NC)
Xylenes	1330-20-7	A8-017-SB-7	0.021		0.0011	0.01	40	10.00		250	no
Zinc	7440-66-6	A8-011-SB-1	600		18.3	123	40	100.00		35,000	no

J: The positive result reported for this analyte is a quantitative estimate.
J-: The positive result reported for this analyte is a quantitative estimate, but may be biased low.

COPC = Constituent of Potential Concern
C = Compound was identified as a cancer COPC
NC = Compound was identified as a non-cancer COPC
TR = Target Risk
HQ = Hazard Quotient

*PCBs (total) include the sum of all detected aroclor mixtures, including those without regional screening levels (e.g. Aroclor 1262, Aroclor 1268) which are not displayed.
^The COPC screening level for lead was not adjusted to the HQ=0.1 because lead is not assessed in the SLRA. The 800 mg/kg PAL is relevant to the Adult Lead Model procedure.

Table 17 - Parcel A8
Assessment of Lead

Exposure Unit	Surface/Sub-Surface	Arithmetic Mean (mg/kg)
Site-Wide (27.1 ac.)	Surface	75.03
	Sub-Surface	17.91
	Pooled	46.47

Adult Lead Model (ALM) Risk Levels	
Soil Concentration (mg/kg)	Probability of Blood Concentration of 10 ug/dL
2,518 mg/kg	5%
3,216 mg/kg	10%

Table 18 - Parcel A8
Soil Exposure Point Concentrations

			EPCs - Surface Soils		**EPCs - Sub-Surface Soils**		**EPCs - Pooled Soils**	
Parameter	Cancer COPC Screening Level (mg/kg)	Non-Cancer COPC Screening Level (mg/kg)	EPC Type Site-Wide Exposure Unit	EPC Site-Wide Exposure Unit (mg/kg)	EPC Type Site-Wide Exposure Unit	EPC Site-Wide Exposure Unit (mg/kg)	EPC Type Site-Wide Exposure Unit	EPC Site-Wide Exposure Unit (mg/kg)
Arsenic	3.00	48.0	95% Student's-t UCL	**6.82**	95% KM (Chebyshev) UCL	**10.4**	95% KM (Chebyshev) UCL	**8.90**
Iron		82,000	95% Student's-t UCL	**146,500**	95% Chebyshev (Mean, Sd) UCL	71,384	95% Chebyshev (Mean, Sd) UCL	**127,300**
Manganese		2,600	95% Student's-t UCL	**18,317**	95% Chebyshev (Mean, Sd) UCL	**8,634**	95% Adjusted Gamma UCL	**13,896**
Thallium		1.20	Maximum Result	**3.20**	Maximum Result	**1.40**	Maximum Result	**3.20**
Vanadium		580	95% Student's-t UCL	**1,925**	95% Chebyshev (Mean, Sd) UCL	**779**	95% Chebyshev (Mean, Sd) UCL	**1,620**
Benz[a]anthracene	21.0		95% KM (Chebyshev) UCL	1.57	99% KM (Chebyshev) UCL	13.1	99% KM (Chebyshev) UCL	7.31
Benzo[a]pyrene	2.10	22.0	95% KM (Chebyshev) UCL	**2.23**	95% GROS Adjusted Gamma UCL	**7.99**	99% KM (Chebyshev) UCL	**6.96**
Benzo[b]fluoranthene	21.0		95% KM (Chebyshev) UCL	3.38	95% GROS Adjusted Gamma UCL	10.4	99% KM (Chebyshev) UCL	10.2
Dibenz[a,h]anthracene	2.10		95% GROS Adjusted Gamma UCL	0.42	95% Adjusted Gamma KM-UCL	1.54	95% Adjusted Gamma KM-UCL	0.59

Bold indicates EPC exceedance of lowest COPC SL
COPC = Constituent of Potential Concern

Table 19 - Parcel A8
Surface Soils
Composite Worker Risk Ratios

Parameter	Target Organs	Site-Wide Exposure Unit (27.1 ac.)				
			Composite Worker			
			RSLs (mg/kg)		Risks	
		EPC mg/kg	Cancer	Non-Cancer	Cancer Risk	Non-Cancer HQ
Arsenic	**Cardiovascular; Dermal**	6.82	3.0	480	2.3E-06	0.01
Iron	**Gastrointestinal**	146,500		820,000		0.2
Manganese	**Nervous**	18,317		26,000		0.7
Thallium	**Dermal**	**3.20**		12.0		0.3
Vanadium	**Dermal**	1,925		5,800		0.3
Benz(a)anthracene		1.57	21		7.5E-08	
Benzo(a)pyrene	**Developmental**	2.23	2.1	220	1.1E-06	0.01
Benzo(b)fluoranthene		3.38	21		1.6E-07	
Dibenz(a,h)anthracene		0.42	2.1		2.0E-07	
					4E-06	↓

Bold indicates maximum result

RSLs were obtained from the EPA Regional Screening Levels at https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search

Total HI	Cardiovascular	0
	Dermal	1
	Gastrointestinal	0
	Nervous	1
	Developmental	0

Table 20 - Parcel A8
Sub-Surface Soils
Composite Worker Risk Ratios

Parameter	Target Organs	Site-Wide Exposure Unit (27.1 ac.)				
			Composite Worker			
			RSLs (mg/kg)		Risks	
		EPC mg/kg	Cancer	Non-Cancer	Cancer Risk	Non-Cancer HQ
Arsenic	**Cardiovascular; Dermal**	10.4	3.0	480	3.5E-06	0.02
Iron	**Gastrointestinal**	71,384		820,000		0.09
Manganese	**Nervous**	8,634		26,000		0.3
Thallium	**Dermal**	**1.40**		12.0		0.1
Vanadium	**Dermal**	779		5,800		0.1
Benz(a)anthracene		13.1	21		6.2E-07	
Benzo(a)pyrene	**Developmental**	7.99	2.1	220	3.8E-06	0.04
Benzo(b)fluoranthene		10.4	21		5.0E-07	
Dibenz(a,h)anthracene		1.54	2.1		7.3E-07	
					9E-06	↓

Bold indicates maximum result

RSLs were obtained from the EPA Regional Screening Levels at https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search

Total HI	Cardiovascular	0
	Dermal	0
	Gastrointestinal	0
	Nervous	0
	Developmental	0

Table 21 - Parcel A8
Pooled Soils
Composite Worker Risk Ratios

Parameter	Target Organs	Site-Wide Exposure Unit (27.1 ac.)				
			Composite Worker			
			RSLs (mg/kg)		Risks	
		EPC mg/kg	Cancer	Non-Cancer	Cancer Risk	Non-Cancer HQ
Arsenic	**Cardiovascular; Dermal**	8.90	3.0	480	3.0E-06	0.02
Iron	**Gastrointestinal**	127,300		820,000		0.2
Manganese	**Nervous**	13,896		26,000		0.5
Thallium	**Dermal**	**3.20**		12.0		0.3
Vanadium	**Dermal**	1,620		5,800		0.3
Benz(a)anthracene		7.31	21		3.5E-07	
Benzo(a)pyrene	**Developmental**	6.96	2.1	220	3.3E-06	0.03
Benzo(b)fluoranthene		10.2	21		4.9E-07	
Dibenz(a,h)anthracene		0.59	2.1		2.8E-07	
					7E-06	↓

Bold indicates maximum result
RSLs were obtained from the EPA Regional Screening Levels at
https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search

Total HI	Cardiovascular	0
	Dermal	1
	Gastrointestinal	0
	Nervous	1
	Developmental	0

Table 22 - Parcel A8
Surface Soils
Construction Worker Risk Ratios

250 Day		Site-Wide Exposure Unit (27.1 ac.)				
			Construction Worker			
			SSLs (mg/kg)		Risks	
Parameter	Target Organs	EPC mg/kg	Cancer	Non-Cancer	Cancer Risk	Non-Cancer HQ
Arsenic	**Cardiovascular; Dermal**	6.82	15.1	96.2	4.5E-07	0.07
Iron	**Gastrointestinal**	146,500		240,541		0.6
Manganese	**Nervous**	18,317		4,099		4
Thallium	**Dermal**	**3.20**		13.7		0.2
Vanadium	**Dermal**	1,925		1,594		1
Benz[a]anthracene		1.57	155		1.0E-08	
Benzo[a]pyrene	**Developmental**	2.23	17.3	9.61	1.3E-07	0.2
Benzo[b]fluoranthene		3.38	173		2.0E-08	
Dibenz[a,h]anthracene		0.42	17.6		2.4E-08	
					6E-07	↓

Bold indicates maximum result
SSLs calculated using equations in the EPA Supplemental Guidance dated 2002
Guidance Equation Input Assumptions:
5 cars/day (2 tons/car)
5 trucks/day (20 tons/truck)
3 meter source depth thickness

Total HI	Cardiovascular	0
	Dermal	2
	Gastrointestinal	1
	Nervous	4
	Developmental	0

Table 23 - Parcel A8
Sub-Surface Soils
Construction Worker Risk Ratios

250 Day		Site-Wide Exposure Unit (27.1 ac.)				
			Construction Worker			
			SSLs (mg/kg)		Risks	
Parameter	Target Organs	EPC mg/kg	Cancer	Non-Cancer	Cancer Risk	Non-Cancer HQ
Arsenic	**Cardiovascular; Dermal**	10.4	15.1	96.2	6.9E-07	0.1
Iron	**Gastrointestinal**	71,384		240,541		0.3
Manganese	**Nervous**	8,634		4,099		2
Thallium	**Dermal**	**1.40**		13.7		0.1
Vanadium	**Dermal**	779		1,594		0.5
Benz[a]anthracene		13.1	155		8.5E-08	
Benzo[a]pyrene	**Developmental**	7.99	17.3	9.61	4.6E-07	0.8
Benzo[b]fluoranthene		10.4	173		6.0E-08	
Dibenz[a,h]anthracene		1.54	17.6		8.8E-08	
					1E-06	↓

Bold indicates maximum result
SSLs calculated using equations in the EPA Supplemental Guidance dated 2002
Guidance Equation Input Assumptions:
5 cars/day (2 tons/car)
5 trucks/day (20 tons/truck)
3 meter source depth thickness

Total HI	Cardiovascular	0
	Dermal	1
	Gastrointestinal	0
	Nervous	2
	Developmental	1

Table 24 - Parcel A8
Pooled Soils
Construction Worker Risk Ratios

250 Day		Site-Wide Exposure Unit (27.1 ac.)				
			Construction Worker			
			SSLs (mg/kg)		Risks	
Parameter	Target Organs	EPC mg/kg	Cancer	Non-Cancer	Cancer Risk	Non-Cancer HQ
Arsenic	**Cardiovascular; Dermal**	8.90	15.1	96.2	5.9E-07	0.09
Iron	**Gastrointestinal**	127,300		240,541		0.5
Manganese	**Nervous**	13,896		4,099		3
Thallium	**Dermal**	**3.20**		13.7		0.2
Vanadium	**Dermal**	1,620		1,594		1
Benz[a]anthracene		7.31	155		4.7E-08	
Benzo[a]pyrene	**Developmental**	6.96	17.3	9.61	4.0E-07	0.7
Benzo[b]fluoranthene		10.2	173		5.9E-08	
Dibenz[a,h]anthracene		0.59	17.6		3.4E-08	
					1E-06	↓

Bold indicates maximum result
SSLs calculated using equations in the EPA Supplemental Guidance dated 2002
Guidance Equation Input Assumptions:
5 cars/day (2 tons/car)
5 trucks/day (20 tons/truck)
3 meter source depth thickness

Total HI	Cardiovascular	0
	Dermal	1
	Gastrointestinal	1
	Nervous	3
	Developmental	1

APPENDIX A

Parcel A8 Sampling Plan Summary
Former Sparrows Point Steel Mill
Sparrows Point, Maryland

Table 1 - Soil Sampling Summary

Source Area/ Description	REC & Finding/ SWMU/ AOC	Figure or Drawing of Reference	RATIONALE	Number of Locations	Sample Locations	Boring Depth	Sample Depth	Analytical Parameters: Soil Samples
Exposed Cold Box Insulation	Finding 242, REC 11A	REC Location Map	Investigate potenital impacts from released insulation. When the Air Products Facility was abandoned, partial demolition occurred and cold boxes were cut open. The friable insulation of the cryogenic cold boxes was thought to contain asbestos which could enter water and soil in the area. Subsequent testing of the insulation revealed no evidence of asbestos.	4	A8-001 through A8-003; A8-020	Total depth of 20 feet or groundwater.	0-1', 4-5', 9-10' bgs. 4-5' interval may be adjusted in the field based on observations or field screening.	VOC, SVOC, Metals, O&G, PCBs (0-1'), Asbestos (0-1')
Oily Surface Water Discharge	Finding 243, REC 11B	REC Location Map	Investigate potential impacts from the oily surface water discharge pipe. During a site visit, oily surface water was observed on the High Head Reservoir. Booms were placed around a discharge pipe coming from the Air Products Facility, although oil was observed on both sides of the booms. The source and nature of the oily surface layer are unknown.	3	A8-004 through A8-006	Total depth of 20 feet or groundwater.	0-1', 4-5', 9-10' bgs. 4-5' interval may be adjusted in the field based on observations or field screening.	VOC, SVOC, Metals, O&G, PCBs (0-1'), Asbestos (0-1'), DRO/GRO
Air Products Facility		Drawings 5156 and 5161	Investigate potential impacts related to historical activities at the Air Products Facility. The facility supplied oxygen and nitrogen gas to RG Steel during its operation.	4	A8-007 through A8-010	Total depth of 20 feet or groundwater.	0-1', 4-5', 9-10' bgs. 4-5' interval may be adjusted in the field based on observations or field screening.	VOC, SVOC, Metals, O&G, PCBs (0-1'), Asbestos (0-1')
Flammable Material Storage Area			Investigate potential impacts related to the Flammable Material Storage Area observed during an MDE site visit.	2	A8-011 and A8-012	Total depth of 20 feet or groundwater.	0-1', 4-5', 9-10' bgs. 4-5' interval may be adjusted in the field based on observations or field screening.	VOC, SVOC, Metals, O&G, PCBs (0-1'), Asbestos (0-1')
Parcel A8 coverage			Investigate potential impacts related to historical activities and characterize groundwater conditions.	7	A8-013 through A8-019	Total depth of 20 feet or groundwater.	0-1', 4-5', 9-10' bgs. 4-5' interval may be adjusted in the field based on observations or field screening.	VOC, SVOC, Metals, O&G, PCBs (0-1'), Asbestos (0-1')
			Total:	20				

Soil Borings Sampling Density Requirements (from **Worksheet 17 - Sampling Design and Rationale**)
Engineered Barrier (1-15 acres): 0.5 boring per acre with no less than 2 borings
No Engineered Barrier (16 to 40 acres): 1 boring per 1.5 acres with no less than 15
No Engineered Barrier (25.1 acres) = **17 Borings**
Engineered Barrier - Paving (2.0 acres) = **2 Borings**

VOCs - Volatile Organic Compounds (Target Compound List)
SVOCs - Semivolatile Organic Compounds (Target Compound List)
Metals - (Target Analyte List plus Hexavalent Chromium and Cyanide)
PCBs - Polychlorinated Biphenyls
O&G - Oil and Grease
DRO/GRO - Diesel Range Organics/Gasoline Range Organics
bgs - Below Ground Surface

Parcel A8 Sampling Plan Summary
Former Sparrows Point Steel Mill
Sparrows Point, Maryland

Table 2 - Groundwater Samples

Source Area/ Description	REC & Finding/ SWMU/ AOC	Figure or Drawing of Reference	Condition of Existing Well	Number of Locations	Sample Locations	Boring Depth	Screen Interval	Analytical Parameters: Groundwater Samples†
Exposed Cold Box Insulation	Finding 242, REC 11A	REC Location Map	*N/A*	1	A8-002	Total depth of 7 feet below water table.	7 feet below water table to 3 feet above water table.	VOC, SVOC, O&G, Dissolved Metals
Oily Surface Water Discharge	Finding 243, REC 11B	REC Location Map	*N/A*	1	A8-004	Total depth of 7 feet below water table.	7 feet below water table to 3 feet above water table.	VOC, SVOC, O&G, Dissolved Metals, DRO/GRO
Air Products Facility		Drawings 5156 and 5161	*N/A*	2	A8-007 and A8-009	Total depth of 7 feet below water table.	7 feet below water table to 3 feet above water table.	VOC, SVOC, O&G, Dissolved Metals
Parcel A8 coverage			*N/A*	3	A8-013, A8-015, A8-017	Total depth of 7 feet below water table.	7 feet below water table to 3 feet above water table.	VOC, SVOC, O&G, Dissolved Metals
			Total:	7				

†Field measurements include pH, DO, ORP, conductivity, temperature.

APPENDIX B

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: A8-001-SB

(page 1 of 1)

Client	: EnviroAnalytics Group	Date	: 10/29/2015
ARM Project No.	: 150298M-3-3	Weather	: 70s, sunny
Project Description	: Sparrows Point - Parcel A8		
Site Location	: Sparrows Point, MD		
ARM Representative	: L. Perrin		
Checked by	: W. Mader P.G., CPSS	Northing (US ft)	: 573,771.510
Drilling Company	: Green Services, Inc	Easting (US ft)	: 1,461,852.477
Driller	: Don Marchese		
Drilling Equipment	: Geoprobe 7822DT		

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0		-		(0-1') Asphalt and concrete	N/A	
		2.0	A8-001-SB-1	(1-3') Slag, sand to gravel sized, soft, loose, dry, no cohesion	SW/GW	
	80	13.6				
		0.6	A8-001-SB-4	(3-3.66') Silty CLAY, dark brown, dry, firm, low cohesion, low plasticity	CL	
					CH	Strong petroleum odor
		0.7		(3.66-4') Sandy CLAY, brown with black streaks, very soft, strong odor, high cohesion, high plasticity	SC	
5		10.0		(4-5') Clayey SAND, brown, dry, firm, low cohesion, very low plasticity		
		7.1		(5-10') CLAY, gray with orange mottling, firm to very firm, high cohesion, high plasticity, sand pocket at 7' bgs		
	90	4.8			CH	
		3.2				
		2.9	A8-001-SB-10			
10		0.0		(10-15') CLAY, beige with orange mottling, soft to very soft, moist, high cohesion, high plasticity		
		0.0				
	100	0.0			CH	
		-				
		-				
15		-		(15-18') Sandy CLAY, beige, very soft, very high cohesion, very high plasticity		
		-			CH	
	76	-				Wet at 17.5' bgs
		-		(18-20') SAND, light beige, wet, soft		
		-			SW	
20		-				Boring terminated at 20' bgs

Total Borehole Depth: 20' bgs.

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: A8-002-SB

(page 1 of 1)

Client	: EnviroAnalytics Group
ARM Project No.	: 150298M-3-3
Project Description	: Sparrows Point - Parcel A8
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: W. Mader P.G., CPSS
Drilling Company	: Green Services, Inc
Driller	: Kevin Pumphrey
Drilling Equipment	: Geoprobe 7822DT

Date	: 10/27/2015
Weather	: 60s, cloudy
Northing (US ft)	: 573,596.224
Easting (US ft)	: 1,461,764.456

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0		-	A8-002-SB-1	(0-0.7') Topsoil, moist	ML	
				(0.7-1.3') SAND with gravel, white to light beige, loose, soft, dry	SW	
		0.1		(1.3-2') Slag, brown, sand to gravel sized, loose, dry	SW/GW	
	90	7.4		(2-5') SILT, gray with orange streaks, with trace clay, very firm, dry, medium cohesion, low plasticity		
		2.7			ML/CL	
		2.1	A8-002-SB-5			
5		3.4		(5-7.5') CLAY, gray with orange streaks, firm, dry, medium cohesion, high plasticity		
		2.9			CH	
	90	3.0				
				(7.5-8.5') Clayey SAND, gray, moist, soft, moist, medium cohesion, medium plasticity	SC	
		1.4		(8.5-10') Sandy CLAY, black, very soft, moist, high cohesion, high plasticity	CH	
		0.2	A8-002-SB-10			
10		0.0		(10-15') CLAY, gray with orange mottling, firm grading to soft, moist, high cohesion, high plasticity		
		0.0				
	100	0.0			CH	
		-				
		-				
15		-		(15-17.75') CLAY, gray, very soft, very moist, high cohesion, very high plasticity		
		0.0			CH	
	100	0.0				
				(17.75-18') SAND, orange, soft, wet	SW	
		-		(18-19') CLAY, gray, very soft, very moist, high cohesion, high plasticity	CH	Wet at 18.5' bgs
		-		(19-20') SAND, light gray, wet, soft	SW	
20						Boring terminated at 20' bgs

Total Borehole Depth: 20' bgs.

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: A8-003-SB

(page 1 of 1)

Client	: EnviroAnalytics Group
ARM Project No.	: 150298M-3-3
Project Description	: Sparrows Point - Parcel A8
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: W. Mader P.G., CPSS
Drilling Company	: Green Services, Inc
Driller	: Kevin Pumphrey
Drilling Equipment	: Geoprobe 7822DT

Date	: 10/27/2015
Weather	: 60s, cloudy
Northing (US ft)	: 573,586.568
Easting (US ft)	: 1,461,915.909

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0		-	A8-003-SB-1	(0-2') Slag with sand, light beige to black, loose, dry, little fines	GW-GM	
		0.6				
	100	0.2		(2-5') SILT, light beige to gray, moist, firm, medium cohesion, low plasticity	ML-CL	
		0.4				
		0.2	A8-003-SB-5			
5		0.3		(5-7.2') CLAY, grayish beige, firm, moist, high cohesion, high plasticity	CH	
		2.5				
	100	6.0		(7.2-8.3') Clayey SAND, brown to gray with orange mottling, moist, soft, low cohesion, low plasticity	SC	
		6.6		(8.3-10') CLAY, gray with orange streaks, firm, moist, high cohesion, high plasticity	CH	
		6.7	A8-003-SB-10			
10		-		(10-15') CLAY, grayish brown, soft, moist, high cohesion, high plasticity, very soft at 13.5' bgs	CH	
		0.0				
	100	0.0				
		0.0				
		-				
15		-		(15-17.5') CLAY, gray, very soft, very moist, high cohesion, high plasticity	CH	
		0.0				
	100	0.0		(17.5-20') SAND, beige, wet, soft	SW	Wet at 17.5' bgs
		-				
20		-				Boring terminated at 20' bgs

Total Borehole Depth: 20' bgs.

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: A8-004-SB

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Client	: EnviroAnalytics Group
ARM Project No.	: 150298M-3-3
Project Description	: Sparrows Point - Parcel A8
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: W. Mader P.G., CPSS
Drilling Company	: Green Services, Inc
Driller	: Don Marchese
Drilling Equipment	: Geoprobe 7822DT

Date	: 10/29/2015
Weather	: 70s, sunny
Northing (US ft)	: 573,657.090
Easting (US ft)	: 1,462,089.320

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0		2.4		(0-0.5') Concrete, light gray, gravel sized, loose, dry	GW	
		14.1	A8-004-SB-1	(0.5-5') Slag, brown, sand and gravel sized, dry, soft, loose; light beige well sorted sand lens at 1.16' bgs; gray rock at 4' bgs, areas of red oxidation.		
	93	15.0			SW-GW	
		24.3				
		24.7	A8-004-SB-5			
5		3.4		(5-8') Slag, light gray, coarse sand to gravel sized; wet, 3" clay lens at 6.16' bgs		Wet at 5' bgs - perched
		3.8			SW-GW	
	100	0.1				
		0.8		(8-8.3') GRAVEL, light tan, hard, dry, no cohesion, no plasticity	GW	
		0.1	A8-004-SB-10	(8.3-15') CLAY, light gray to beige, moist, soft, high cohesion, high plasticity; trace sand below 11.3' bgs		
10		-				
		-			CH	
	73	0.0				
		0.0				
		0.0				
15		-		(15-20') CLAY, light to dark gray, very soft, moist, high cohesion, high plasticity		
		-				
	93	0.0			CH	
		0.0				
		-				Wet at 19.7' bgs
20						Boring terminated at 20' bgs

Total Borehole Depth: 20' bgs.

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: A8-005-SB

(page 1 of 1)

Client	: EnviroAnalytics Group
ARM Project No.	: 150298M-3-3
Project Description	: Sparrows Point - Parcel A8
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: W. Mader P.G., CPSS
Drilling Company	: Green Services, Inc
Driller	: Don Marchese
Drilling Equipment	: Geoprobe 7822DT

Date	: 10/29/2015
Weather	: 70s, sunny
Northing (US ft)	: 573,702.210
Easting (US ft)	: 1,462,130.900

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0		-	A8-005-SB-1	(0-1.3') Quartz GRAVEL	GW	
		-		(1.3-5') Slag, brown, medium grained to gravel sized, lenses of clay throughout, cobble sized bluish gray spotted rock at 4' bgs	GM/GC	
	60	6.6				
		6.7				
		9.7	A8-005-SB-5			
5		-		(5-11') Slag, black to dark brown, coarse sand to gravel sized, wet	SW/GW	Wet at 7.5' bgs - perched
		-				
	50	-				
		-				
		-				
10		-				
		-		(11-12.8') CLAY, black to light gray, firm, moist, high cohesion, high plasticity	CH	
	60	0.0				
		-		(12.8-15.5') CLAY, beige, firm to very soft, moist, high cohesion, high plasticity	CH	
		-				
15		-		(15.5-17.75') CLAY, light gray, very soft, moist, trace sand to with sand, high cohesion, high plasticity	CH	
		-				
	73	0.0				Wet at 17.5' bgs
		-		(17.75-20') SAND, light beige, wet, soft	SW	
20		-				Boring terminated at 20' bgs

Total Borehole Depth: 20' bgs.

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: A8-006-SB

(page 1 of 1)

Client	: EnviroAnalytics Group
ARM Project No.	: 150298M-3-3
Project Description	: Sparrows Point - Parcel A8
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: W. Mader P.G., CPSS
Drilling Company	: Green Services, Inc
Driller	: Don Marchese
Drilling Equipment	: Geoprobe 7822DT

Date	: 10/29/2015
Weather	: 70s, sunny
Northing (US ft)	: 573,753.320
Easting (US ft)	: 1,462,112.220

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0		0.6	A8-006-SB-1	(0-4.1') Slag, dark brown, sand to gravel sized, dry, loose, soft	SW/GW	
		3.4				
	90	82.5				
		281.9	A8-006-SB-4			
		2.0		(4.1-5.5') Sandy CLAY, brown to olive green, soft, moist, strong odor, high cohesion, medium plasticity	CL	
5		-				
		7.3		(5.5-10') Silty CLAY, light gray with orange mottling, trace sand, dry, low cohesion, low plasticity	CL	
	80	6.7				
		1.6				
		2.0	A8-006-SB-10			
10		-		(10-15') CLAY, light beige, soft to very soft, trace sand, high cohesion, high plasticity	CH	
		0.0				
	100	0.0				
		0.0				
		0.0				
15		0.0		(15-15.7') Clayey SAND, light gray with orange mottling, moist, soft	SC	Wet at 15.8' bgs
		-		(15.7-20') SAND, orange, medium to fine grained, wet, soft	SW	
	100	-				
		-				
		-				
20						Boring terminated at 20' bgs

Total Borehole Depth: 20' bgs.

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: A8-007-SB

(page 1 of 1)

Client	: EnviroAnalytics Group
ARM Project No.	: 150298M-3-3
Project Description	: Sparrows Point - Parcel A8
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: W. Mader P.G., CPSS
Drilling Company	: Green Services, Inc
Driller	: Kevin Pumphrey
Drilling Equipment	: Geoprobe 7822DT

Date	: 10/27/2015
Weather	: Cloudy, 50s
Northing (US ft)	: 573,461.179
Easting (US ft)	: 1,462,035.551

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0						
		0.5	A8-007-SB-1	(0-3.5') SILT, dark beige, trace clay, dry, medium cohesion, no plasticity	ML	
		15.5				
	100	17.7				
		10.4		(3.5-5') SAND, beige to gray, soft, moist	SM	
		0.0	A8-007-SB-5			
5		5.5		(5-6.3') CLAY, beige, very hard, dry, high cohesion, low plasticity	CL	
		6.3		(6.3-6.4') CLAY, mint green, with organic matter, very hard, dry, high cohesion, low plasticity	CL	CL
	100	4.		(6.4-6.7') SAND, beige, moist, loose	SW	SW
		3.9		(6.7-10') CLAY, beige, very hard, dry, high cohesion, low plasticity	CL	
		2.3	A8-007-SB-10			
10		-		(10-18') No Recovery	N/A	
		-				
	0	-				
		-				
		-				
15		-				
		-				
	40	-				
		-		(18-20') SAND, orange, wet, soft, loose	SW	Wet at approximately 18' bgs
		-				
20						Boring terminated at 20' bgs

Total Borehole Depth: 20' bgs.

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ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: A8-008-SB

(page 1 of 1)

Client	: EnviroAnalytics Group
ARM Project No.	: 150298M-3-3
Project Description	: Sparrows Point - Parcel A8
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: W. Mader P.G., CPSS
Drilling Company	: Green Services, Inc
Driller	: Kevin Pumphrey
Drilling Equipment	: Geoprobe 7822DT

Date	: 10/27/2015
Weather	: 50s, cloudy
Northing (US ft)	: 573,220.959
Easting (US ft)	: 1,461,998.445

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interva;	DESCRIPTION	USCS	REMARKS
0		-		(0-0.5') Concrete	N/A	
		10.2	A8-008-SB-1	(0.5-3.5') Slag, dark brown to tan, medium grained to gravel sized, loose, dry, no plasticity	SW/GW	
	80	144.5				
		1698		(3.5-4') Silty SAND with gravel Slag, black to tan, moist, loose, low cohesion, no plasticity	SM	
		1456	A8-008-SB-5	(4-5') SILT, tan to light gray, hard, dry, low cohesion, no plasticity	ML	
5		-		(5-7.3') SILT, light gray, firm, dry, low cohesion, no plasticity	ML	
		68.8				
	100	0.2		(7.3-8.5') CLAY, dark gray, trace silt, very soft, very moist to wet, sticky, high cohesion, high plasticity	CH	
		0.6		(8.5-11') CLAY, beige with orange mottling, hard, dry, medium cohesion, low plasticity	CL	
		34.9	A8-008-SB-10			
10		-				
		-		(11-15') CLAY, grayish beige, soft, moist, high cohesion, high plasticity	CH	
	60	0.0				
		0.0				
		0.0				
15		0.0		(15-19.8') CLAY, beigeish gray, very soft, very moist, high cohesion, very high plasticity	CH	
		0.0				
	100	0.0				Wet at 19.7' bgs
		-				
		-				
20				(19.8-20') SAND, orange, well sorted, soft	SW	Boring terminated at 20' bgs

Total Borehole Depth: 20' bgs.

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: A8-009-SB

(page 1 of 1)

Client	: EnviroAnalytics Group
ARM Project No.	: 150298M-3-3
Project Description	: Sparrows Point - Parcel A8
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: W. Mader P.G., CPSS
Drilling Company	: Green Services, Inc
Driller	: Don Marchese
Drilling Equipment	: Geoprobe 7822DT

Date	: 10/29/2015
Weather	: 70s, sunny
Northing (US ft)	: 573,918.686
Easting (US ft)	: 1,461,844.903

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0		-	A8-009-SB-1	(0-2.5') Slag and Concrete, sand to gravel sized with lenses of Sandy CLAY, dry, brown and gray	GM	
		0.6				
	80	1.4		(2.5-4.7') Slag and Concrete with clay, brown, moist, soft clay exhibits high cohesion ang high plasticity	GM/GC	
		0.5				
		0.0	A8-009-SB-5			
5				(4.7-5') SAND, light gray, moist, firm	SW	
		-		(5-6') Clayey SAND, beige, firm, wet, low cohesion, low plasticity	SC	
		-		(6-10') CLAY, beige with orange mottling, trace sand, firm, medium cohesion, medium plasticity	CL	
	30	-				
		-				Perched at 8.5' bgs
		0.0	A8-009-SB-10			
10		-		(10-13') CLAY, beige, wet, very soft, trace sand, high cohesion, high plasticity	CH	
		-				
	100	-				
		0.0		(13-16.5') Sandy CLAY, beige, moist, high cohesion, high plasticity	CH	
		-				
15		-				
		-		(16.5-19') Clayey SAND, beige, wet, soft, low cohesion, low plasticity	SC	
	40	-				Wet at 18' bgs
		-				
		-		(19-20') SAND, beige, wet, soft	SW	
20						Boring terminated at 20' bgs

Total Borehole Depth: 20' bgs.

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: A8-010-SB

(page 1 of 1)

Client	: EnviroAnalytics Group
ARM Project No.	: 150298M-3-3
Project Description	: Sparrows Point - Parcel A8
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: W. Mader P.G., CPSS
Drilling Company	: Green Services, Inc
Driller	: Don Marchese
Drilling Equipment	: Geoprobe 7822DT

Date	: 10/29/2015
Weather	: 70s, sunny
Northing (US ft)	: 573,985.179
Easting (US ft)	: 1,462,077.194

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0		0.0	A8-010-SB-1	(0-1.5') SAND, light beige, medium to coarse grained, soft, gray, with quartz gravel and concrete	SW	
		0.8		(1.5-3.5') Clayey SILT, brown with maroon streaks, hard, dry, low cohesion, low plasticity	ML/CL	
	90	4.8				
		4.9		(3.5-4.5') SAND and Clayey SAND, beige, soft, moist, medium cohesion, medium plasticity	SC	
		0.1	A8-010-SB-5	(4.5-5.7') Sandy CLAY, dark brown, soft, moist, high cohesion, high plasticity	CH	
5		2.9		(5.7-7') CLAY, dark beige, dry, very firm, low cohesion, low plasticity	CL	
		1.9				
	100	0.8		(7-8') Sandy CLAY, dark beige, firm, dry, low cohesion, low plasticity	CL	
		1.6		(8-10') CLAY, dark beige, firm, dry, medium cohesion, low plasticity	CL	Wet at 10' bgs - perched
		0.1	A8-010-SB-10			
10		-		(10-13.5') Clayey SAND, dark gray, wet, very soft, medium cohesion, slight plasticity	SC	
		-				
	100	0.0				
		-		(13.5-15') CLAY, light beige, moist, soft, high cohesion, high plasticity	CH	
		-				
15		-		(15-17.3') CLAY, light gray, very soft, moist, high cohesion, high plasticity	CH	
		-				Wet at 17' bgs
	95	0.0		(17.3-19.6') SAND, orange to dark orange, wet, medium grained, soft	SW/SP	
		-				
		-		(19.6-20') SAND, very light beige, wet, medium grained, soft	SW/SP	Boring terminated at 20' bgs
20						

Total Borehole Depth: 20' bgs.

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: A8-011-SB

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Client	: EnviroAnalytics Group	Date	: 10/26/2015
ARM Project No.	: 150298M-3-3	Weather	: 60s, sunny
Project Description	: Sparrows Point - Parcel A8		
Site Location	: Sparrows Point, MD		
ARM Representative	: L. Perrin		
Checked by	: W. Mader P.G., CPSS	Northing (US ft)	: 573,016.811
Drilling Company	: Green Services, Inc	Easting (US ft)	: 1,462,145.823
Driller	: Kevin Pumphrey		
Drilling Equipment	: Geoprobe 7822DT		

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0				(0-0.3') Concrete, powdered, white, dry, loose	N/A	
		-	A8-011-SB-1	(0.3-2.3') Slag, dark gray, with sand, loose, dry	GW	
		4.4				
	90	1.1		(2.3-3.3') SILT, brownish gray, firm, dry, no cohesion, no plasticity	ML	Wet at ~3' bgs - perched
		2.9		(3.3-3.8') Slag with clay, light to dark brown, wet, low cohesion, low plasticity	GC	
		0.1	A8-011-SB-5	(3.8-5') CLAY, black ,soft, wet, high cohesion, high plasticity	CH	
5				(5-5.25') Slag, black, wet, loose	GM	
		2.7		(5.25-5.9') Sandy CLAY, brown, moist, medium cohesion, medium plasticity	CL	
		4.2		(5.9-10') SILT, light gray with orange mottling, hard, dry, no cohesion, no plasticity	ML	
	100	3.3				
		1.0				
		1.2	A8-011-SB-10			
10		0.1		(10-15') CLAY, light brown with orange mottling, moist, soft to firm, high cohesion, high plasticity	CH	
		0.1				
	100	0.0				
		0.0				
		0.0				
15		-		(15-17') CLAY, light gray, very soft, moist, high cohesion, high plasticity	CH	
		-				
	100	-		(17-18') Clayey SAND, light gray, moist, low cohesion, low plasticity	SC	Wet at 18' bgs
		-		(18-20') SAND, orange, wet, no cohesion, no plasticity	SW	
		-				
20						Boring terminated at 20' bgs

Total Borehole Depth: 20' bgs.

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: A8-012-SB

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Client	: EnviroAnalytics Group
ARM Project No.	: 150298M-3-3
Project Description	: Sparrows Point - Parcel A8
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: W. Mader P.G., CPSS
Drilling Company	: Green Services, Inc
Driller	: Kevin Pumphrey
Drilling Equipment	: Geoprobe 7822DT

Date	: 10/26/2015
Weather	: 60s, sunny
Northing (US ft)	: 572,998.679
Easting (US ft)	: 1,462,147.270

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0				(0-0.3') Concrete, loose, dry, white	N/A	
		-	A8-012-SB-1	(0.3-1.25') Silty SAND, brown, dry, soft, no cohesion, no plasticity	SM	
		2.2		(1.25-3') Slag, black to gray, gravel sized, loose, dry	GW	
	90	22.3				Wet at ~3' bgs - perched
				(3-3.5') SILT, light brown, stuff, low cohesion, no plasticity	ML	
		0.6		(3.5-4.2') Clayey GRAVEL, brown to black, hard to soft, medium cohesion, medium plasticity	GC	
		0.0	A8-012-SB-5	(4.2-4.7') CLAY, black, trace silt, soft, moist, high cohesion, high plasticity	CH	
5				(4.7-5') SILT, light gray, hard, dry, low cohesion, no plasticity	ML	
		-		(5-6') Silty CLAY, light gray with orange mottling, firm, wet, high cohesion, low plasticity	CL	
		-		(6-7.5') Clayey SAND, light gray, wet, soft, low cohesion, low plasticity	SC	
	100	-		(7.5-10') SILT with Clay, light gray with orange mottling, moist, medium cohesion, low plasticity	ML-CL	
		0.0				
		0.0	A8-012-SB-10			
10		0.0		(10-11') CLAY, gray, moist, little slag, moist, high cohesion, high plasticity	CH	
		0.0		(11-11.25') SAND, orange, soft, wet, no cohesion, no plasticity	SW	Wet at 12' bgs
				(11.25-15') CLAY, gray, firm, wet, high cohesion, medium plasticity	CL	Boring terminated at 12' bgs due to encountering groundwater
	100	-				
		-				
		-				
15						

Total Borehole Depth: 15' bgs.

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: A8-013-SB

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Client	: EnviroAnalytics Group
ARM Project No.	: 150298M-3-3
Project Description	: Sparrows Point - Parcel A8
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: W. Mader P.G., CPSS
Drilling Company	: Green Services, Inc
Driller	: Don Marchese
Drilling Equipment	: Geoprobe 7822DT

Date	: 10/31/2015
Weather	: 50s, sunny
Northing (US ft)	: 574,445.318
Easting (US ft)	: 1,462,162.750

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0						
		0.1	A8-013-SB-1	(0-4') Slag, dark brown, medium grained sand to gravel sized, dry to moist, loose	SW-GW	
		0.7				
	100	1.0				
		3.0				
		3.3	A8-013-SB-5	(4-5') CLAY, light brown with orange mottling, dry, firm, high cohesion, high plasticity	CH	
5		0.1		(5-7.5') Clayey SAND, light gray with orange mottling, firm, dry, low cohesion, low plasticity	SC	
		0.4				
	100	2.4		(7.5-11') CLAY, light gray to beige, dry, very firm, high cohesion, high plasticity	CH	
		3.1				
		2.2	A8-013-SB-10			
10		-				
		-		(11-18') CLAY, light gray to beige, dry, soft to very soft with depth, high cohesion, high plasticity	CH	
	60	0.0				
		0.0				
		0.0				
15		-				
		-				
	80	-				
		-		(18-20') SAND, orange, well sorted, soft, medium grained	SW	Wet at 18' bgs
		-				
20						Boring terminated at 20' bgs

Total Borehole Depth: 20' bgs.

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ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: A8-014-SB

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Client	: EnviroAnalytics Group
ARM Project No.	: 150298M-3-3
Project Description	: Sparrows Point - Parcel A8
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: W. Mader P.G., CPSS
Drilling Company	: Green Services, Inc
Driller	: Don Marchese
Drilling Equipment	: Geoprobe 7822DT

Date	: 10/30/2015
Weather	: 50s, sunny
Northing (US ft)	: 574,261.985
Easting (US ft)	: 1,462,094.000

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0		0.5	A8-014-SB-1	(0-4.3') Slag, dark brown, medium grained to gravel sized, loose, dry, moist near bottom,	SW-GW	
	93	0.5				
		0.8				
		4.6				
		3.9	A8-014-SB-5	(4.3-6.3') Sandy CLAY, beige, very dry to dry, very firm to firm, low cohesion, low plasticity	CL	
5		-				
		0.2		(6.3-11') CLAY, beige with orange mottling, firm, dry, high cohesion, high plasticity	CH	
	90	0.9				
		1.2				
		2.6	A8-014-SB-10			
10		-				
		0.0		(11-17.8') CLAY, gray with orange mottling, soft, moist to very moist, high cohesion, high plasticity	CH	
	80	0.0				
		0.0				
		0.0				
15		-				
		-				
	100	0.0		(17.8-20') SAND, orange, well sorted, medium to coarse grained, wet	SW	Wet at 18' bgs
		0.0				
		-				Boring terminated at 20' bgs
20						

Total Borehole Depth: 20' bgs.

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ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: A8-015-SB

(page 1 of 1)

Client	: EnviroAnalytics Group
ARM Project No.	: 150298M-3-3
Project Description	: Sparrows Point - Parcel A8
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: W. Mader P.G., CPSS
Drilling Company	: Green Services, Inc
Driller	: Don Marchese
Drilling Equipment	: Geoprobe 7822DT

Date	: 10/30/2015
Weather	: 60s, sunny
Northing (US ft)	: 574,296.707
Easting (US ft)	: 1,461,457.194

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0		1.2	A8-015-SB-1	(0-1.5') Slag, brown, medium sand to gravel sized, some fines, dry	SW-GW	
		5.7		(1.5-2') CLAY, beige, dry, hard, low cohesion, low plasticity	CL	
	90	5.1		(2-3.2') SAND, beige, soft, dry, low cohesion, no plasticity	SW-SM	
		5.8		(3.2-3.5') CLAY, brown, hard, dry, low cohesion, low plasticity	CL	Wet at 3.5' bgs - perched
		6.9		(3.5-6.5') Slag, olive gray, gravel sized, loose, slight odor	GW	
5		5.2				
		2.0	A8-015-SB-7	(6.5-8') SAND, beige with orange mottling, moist, soft	SW-SM	
	80	-				
		0.0		(8-11') CLAY, beige with orange mottling, trace sand, dry, firm, medium cohesion, medium plasticity	CL	
		0.0	A8-015-SB-10			
10		-				
		-		(11-18.2') CLAY, beige, soft to very soft, moist to very moist, high cohesion, high plasticity	CH	
	60	0.0				
		0.0				
		-				
15		-				
		-				
	86	0.0				
		-		(18.2-19.7') CLAY, dark gray, very moist, very soft, very high cohesion, very high plasticity	CH	Wet at 19.5' bgs
		-				
20				(19.7-20') SAND, dark gray, wet, soft	SW-SM	Boring terminated at 20' bgs

Total Borehole Depth: 20' bgs.

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ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: A8-016-SB

(page 1 of 1)

Client	: EnviroAnalytics Group
ARM Project No.	: 150298M-3-3
Project Description	: Sparrows Point - Parcel A8
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: W. Mader P.G., CPSS
Drilling Company	: Green Services, Inc
Driller	: Don Marchese
Drilling Equipment	: Geoprobe 7822DT

Date	: 10/30/2015
Weather	: 50s, sunny
Northing (US ft)	: 574,168.565
Easting (US ft)	: 1,461,565.062

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0						
		1.5	A8-016-SB-1	(0-0.5') Quartz GRAVEL and SAND, white to beige, moist, fine grained sand	GW-SW	
				(0.5-1.5') Slag, medium grained to gravel sized, dark brown, dry, loose	GW-SW	
		2.0		(1.5-2.5') CLAY, tan, very hard, very dry, low cohesion, slight plasticity	CL	
	100	2.4		(2.5-4') Slag, dark brown, medium grained to gravel sized	SW-GW	Wet at 3.5' bgs - perched
		1.7				
		1.6	A8-016-SB-5	(4-5') CLAY, light gray, very dry, hard, low cohesion, low plasticity	CL	
5		0.5		(5-7') CLAY, light gray, very dry, hard, medium cohesion, low plasticity	CL	
		2.3				
	100	0.1		(7-8') Clayey SAND, gray, very soft, very moist, low cohesion, medium plasticity	CL	
		3.6		(8-8.5') SAND, beige, moist, soft	SM-SW	
		2.1	A8-016-SB-10	(8.5-10.5') CLAY, light gray to beige, high cohesion, medium plasticity	CL	
10		-		(10.5-15') CLAY, gray, soft, very moist, high cohesion, high plasticity	CH	
		-				
	70	0.0				
		0.0				
		0.0				
15		-		(15-18.5') CLAY, beige with orange mottling, soft, trace sand, high cohesion, high plasticity	CH	
		-				
	80	0.0				
		-				
		-		(18.5-19.5') CLAY, dark gray, soft, trace sand, high cohesion, high plasticity	CH	Wet at 19.5' bgs
20				(19.5-20') SAND, gray, wet, soft, well sorted	SW	Boring terminated at 20' bgs

Total Borehole Depth: 20' bgs.

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: A8-017-SB

(page 1 of 1)

Client	: EnviroAnalytics Group
ARM Project No.	: 150298M-3-3
Project Description	: Sparrows Point - Parcel A8
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: W. Mader P.G., CPSS
Drilling Company	: Green Services, Inc
Driller	: Kevin Pumphrey
Drilling Equipment	: Geoprobe 7822DT

Date	: 10/27/2015
Weather	: 50s, cloudy
Northing (US ft)	: 572,958.341
Easting (US ft)	: 1,461,954.437

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0		73.5	A8-017-SB-1	(0-1') Slag, gray, loose, some red staining, dry	GM	
		48.3		(1-2.5') Silty CLAY, black to olive green, soft to firm, moist, medium cohesion, medium to no plasticity	CL	Petroleum odor
	100	115.3		(2.5-3.2') Slag, medium grained sand sized, black to olive green, loose, dry	SP-SW	
		178.1		(3.2-3.5') SAND and GRAVEL, beige, loose, dry	SW-GW	
		171.2		(3.5-5') CLAY, olive green to black, moist, medium cohesion, medium plasticity	CL	
5		247.5		(5-10') CLAY, light beige to gray with orange mottling from 9-10' bgs, dry to moist at 7' bgs, firm to slighty firm at 8' bgs, medium cohesion, medium plasticity		
		303.1	A8-017-SB-7			
	100	269.3			CL	
		245.0				
		179.2	A8-017-SB-10			
10		67.5		(10-15') CLAY, light gray to beige, moist, soft to very soft, high cohesion, high plasticity		Product from 10-13' bgs (LNAPL)
		53.2				
	100	15.2			CH	
		13.7				
		-				
15		-		(15-18') CLAY, light gray, very moist, very soft, sticky, high cohesion, high plasticity		
		0.0			CH	
	100	0.0				
		-		(18-20') SAND, orange, soft, wet		Wet at 18' bgs
		-			SM	
20						Boring terminated at 20' bgs

Total Borehole Depth: 20' bgs.

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: A8-018-SB

(page 1 of 1)

Client	: EnviroAnalytics Group
ARM Project No.	: 150298M-3-3
Project Description	: Sparrows Point - Parcel A8
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: W. Mader P.G., CPSS
Drilling Company	: Green Services, Inc
Driller	: Don Marchese
Drilling Equipment	: Geoprobe 7822DT

Date	: 10/30/2015
Weather	: 50s, sunny
Northing (US ft)	: 574,395.470
Easting (US ft)	: 1,461,753.950

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0						
		0.7	A8-018-SB-1	(0-3') Slag, dark brown, medium to coarse grained sand sized, dry	SW	
		3.5				
	100	5.6				
		5.7		(3-5') CLAY, beige, slightly moist, firm to soft, high cohesion, high plasticity	CH	
		2.6	A8-018-SB-5			
5		0.0		(5-6') Sandy CLAY, gray, very soft, moist, high cohesion, medium plasticity	CL	
		1.1		(6-7') Clayey SAND, gray, soft, moist, medium cohesion, low plasticity	SC	
	100	2.7		(7-11') CLAY, gray with orange oxidation, firm to soft, dry to moist, high cohesion, medium plasticity	CL	
		2.0				
		0.9	A8-018-SB-10			
10		-				
		-		(11-17.3') CLAY, gray, very soft, very moist, very high cohesion, very high plasticity	CH	
	0	-				
		-				
		-				
15		-				
		-				Wet at 17' bgs
	60	-		(17.25-20') SAND, light beige with orange coloring at 19' bgs, soft, wet	SM	
		-				
		-				Boring terminated at 20' bgs
20						

Total Borehole Depth: 20' bgs.

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ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: A8-019-SB

(page 1 of 1)

Client	: EnviroAnalytics Group
ARM Project No.	: 150298M-3-3
Project Description	: Sparrows Point - Parcel A8
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
W. Mader P.G, CPSS	: W. Mader P.G., CPSS
Drilling Company	: Green Services, Inc
Driller	: Don Marchese
Drilling Equipment	: Geoprobe 7822DT

Date	: 10/30/2015
Weather	: 50s, sunny
Northing (US ft)	: 574,207.477
Easting (US ft)	: 1,461,825.780

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0		1.1	A8-019-SB-1	(0-4') Slag, dark brown, medium to gravel sized, dry	GW	
		4.0				
	100	3.7				
		5.7				
		1.7	A8-019-SB-5	(4-5') CLAY, beige, dry, firm, high cohesion, high plasticity	CH	
5		0.3		(5-7') Sandy CLAY, dark brown, soft, moist, high cohesion, medium plasticity	CH	
		3.5				
	100	1.6		(7-10') Sandy CLAY, light beige, moist, soft, high cohesion, high plasticity	CH	
		0.1				
		0.3	A8-019-SB-10			
10		-		(10-15') CLAY, gray to light gray, soft to very soft, moist, very high cohesion, very high plasticity	CH	
		0.0				
	100	0.0				
		0.0				
		0.0				
15		-		(15-18') CLAY, light gray, very soft, very moist, very high cohesion, very high plasticity	CH	
		-				
	93	0.0				Wet at 18' bgs
		-		(18-20') SAND, orange, wet, soft	SM	
20		-				Boring terminated at 20' bgs

Total Borehole Depth: 20' bgs.

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: A8-020-SB

(page 1 of 1)

Client	: EnviroAnalytics Group
ARM Project No.	: 150298M-3-3
Project Description	: Sparrows Point - Parcel A8
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: W. Mader P.G., CPSS
Drilling Company	: Green Services, Inc
Driller	: Don Marchese
Drilling Equipment	: Geoprobe 7822DT

Date	: 10/30/2015
Weather	: 60s, cloudy
Northing (US ft)	: 573,673.637
Easting (US ft)	: 1,461,824.497

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0		0.6	A8-020-SB-1	(0-2') SAND, gray, loose, moist, with concrete	SW	
		2.6				
	80	2.0		(2-3.5') CLAY, beige, hard, dry, low cohesion, medium plasticity	CL	
		0.1		(3.5-7') CLAY, beige, firm, moist, medium to high cohesion, high plasticity	CH	
		0.1	A8-020-SB-5			
5		0.0				
		0.0				
	100	0.0		(7-7.33') SAND and CLAY, beige, very coarse grained sand, moist, high cohesion, high plasticity	CH	
		0.0		(7.33-9.7') CLAY, beige, firm, high cohesion, high plasticity	CH	
		0.0	A8-020-SB-10			
10		-		(9.7-10') Slag, brown, gravel sized, moist	GW	
		-		(10-14.3') CLAY, beige, very soft, very moist, very high cohesion, very high plasticity	CH	
	100	0.0				
		-				
		-				
15		-		(14.3-16') CLAY, gray to beige, firm, very moist, high cohesion, high plasticity	CH	
		-		(16-18') Clayey SAND, beige, very moist, medium cohesion, medium plasticity	SC	Wet at 17' bgs
	80	-				
		-		(18-20') SAND, light beige, wet, loose, soft	SM	
20		-				Boring terminated at 20' bgs

Total Borehole Depth: 20' bgs.

APPENDIX C

December 4, 2015

Mr. James Calenda
EnviroAnalytis Group, LLC
1650 Des Peres Road, Suite 303
St. Louis, MO 63131

Re: Sparrows Point Piezometer Survey
Sparrows Point, MD
Triad Engineering Job No. 03-15-0343

Mr. Calenda:
Below are the specified surveyed piezometers, date of last field work completed on November 24, 2015. The coordinate values shown were derived from G.P.S. observations based on National Geodetic Surveys stations “GIS 1”, PID AC7684 and “GIS 2”, PID AC7685 which purport to be on NAD83(2011) Maryland Grid coordinate system and NAVD88 elevations.

DESCRIPTION	NORTHING	EASTING	TOP CASING ELEVATION	GROUND AT PIEZOMETER ELEVATION
A2-013-PZ	574018.74	1463788.08	16.17	12.38
A2-022-PZ	572911.38	1463476.53	12.58	9.68
A2-025-PZ	573614.75	1464570.56	11.23	8.51
A2-031-PZ	574485.04	1464939.09	22.88	20.78
A4-001-PZ	571114.57	1458067.91	14.71	12.71
A4-005-PZ	571746.11	1458066.66	15.95	12.94
A4-005a-PZ	571748.15	1458062.51	15.55	12.99
A4-007-PZ	572370.58	1457965.85	15.41	12.88
A4-010-PZ	572631.43	1458703.03	14.67	12.79
A4-012-PZ	570367.73	1458232.61	15.90	12.24
A4-013-PZ	570657.51	1458543.60	12.00	9.76
A4-014-PZ	571109.86	1459218.50	15.39	11.49
A4-019-PZ	571962.55	1458881.91	16.34	12.65
A8-002-PZ	573593.69	1461765.45	16.14	13.21
A8-004-PZ	573652.14	1462090.63	16.73	12.85
A8-007-PZ	573458.80	1462039.43	15.86	12.60
A8-009-PZ	573912.57	1461846.67	16.73	12.81
A8-013-PZ	574444.07	1462162.14	20.01	16.10
A8-015-PZ	574293.04	1461458.35	16.18	11.91
A8-017-PZ	572956.53	1461959.46	16.59	13.26
A8-017a-PZ	572957.82	1461960.12	15.44	13.26

B8-009-PZ	569732.21	1456540.64	13.99	11.76
B8-010-PZ	569657.78	1456741.04	12.73	10.52
B8-013-PZ	569957.71	1457081.01	13.56	9.80
B8-016-PZ	570091.95	1457637.26	13.99	10.54
B8-017-PZ	570261.64	1457914.69	12.00	9.81
B8-018-PZ	570304.18	1458366.07	11.79	9.21
B8-019-PZ	570052.18	1458026.66	13.60	9.97
B8-020-PZ	570151.96	1458265.97	12.50	9.88
RW-002-PZ	572319.86	1456268.80	12.62	9.56
RW-006-PZ	572066.50	1457083.26	14.28	10.87
RW-011-PZ	570954.75	1456139.80	15.15	11.34
RW-021-PZ	570224.93	1456882.30	13.88	10.25
RW-025-PZ	570048.83	1456512.07	15.28	11.61
RW-027-PZ	570825.85	1456912.97	14.77	11.17
RW-048-PZ	571686.96	1456530.55	14.28	11.56
RW-050-PZ	570853.87	1456545.21	15.47	11.40
RW-057-PZ	572112.71	1456434.62	13.14	10.17
RW-063-PZ	572433.51	1456825.40	14.19	11.07
RW-067-PZ	572214.11	1456680.41	13.37	10.68
RW-070-PZ	572063.81	1457082.09	14.14	10.84
RW22 50FT	571963.73	1456061.85	11.25	11.25
RW23 50FT	572002.55	1456257.38	11.46	11.46
RW24 50FT	572055.46	1456360.62	11.05	11.05

APPENDIX D

PID CALIBRATION LOG

PROJECT NAME: Area A, Parcel A8 Phase II	SAMPLER NAME: L. Perrin & N. Kurtz	
PROJECT NUMBER: 150298M-3-4	DATE: October 26, 2015	PAGE 1 of 1

DATE/TIME	SAMPLER INITIALS	FRESH AIR CAL	PID SERIAL #	STANDARD	STANDARD CONCENTRATION	METER READING	COMMENTS
10/26/2015 13:25	LLP	0.0	592-913262	Isobutylene	100 ppm	100.0 ppm	-
10/27/2015 8:00	LLP	0.0	592-913262	Isobutylene	100 ppm	100.0 ppm	-
10/29/2015 8:10	LLP	0.0	592-913262	Isobutylene	100 ppm	100.0 ppm	-
10/30/2015 8:09	LLP	0.0	592-913262	Isobutylene	100 ppm	100.0 ppm	-
12/18/2015 8:25	LLP	0.0	592-913262	Isobutylene	100 ppm	100.0 ppm	-
				Isobutylene	100 ppm		
				Isobutylene	100 ppm		
				Isobutylene	100 ppm		
				Isobutylene	100 ppm		
				Isobutylene	100 ppm		
				Isobutylene	100 ppm		
				Isobutylene	100 ppm		
				Isobutylene	100 ppm		
				Isobutylene	100 ppm		
				Isobutylene	100 ppm		
				Isobutylene	100 ppm		
				Isobutylene	100 ppm		
				Isobutylene	100 ppm		
				Isobutylene	100 ppm		
				Isobutylene	100 ppm		
				Isobutylene	100 ppm		
				Isobutylene	100 ppm		
				Isobutylene	100 ppm		

APPENDIX E

ARM Group Inc.
Earth Resource Engineers and Consultants

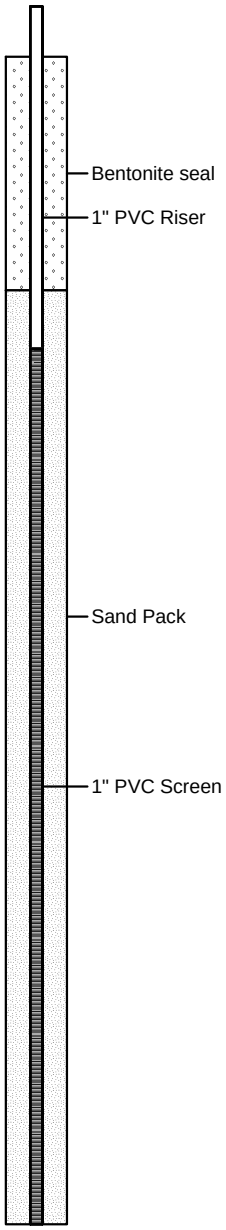
LOG OF TEMPORARY GROUNDWATER SAMPLE COLLECTION POINT: A8-002-PZ

Client: EnviroAnalytics Group
Site: Sparrows Point - Area A Parcel A8
Sparrows Point, MD
ARM Project No.: 150298M-3-3
Page 1 of 1

Date Installed	: 11-3-15	Drilling Company	: Green Services, Inc
Casing/Riser Type	: PVC	TOC Elevation	: 16.14
Borehole Diameter	: 2.25"	0-Hr DTW	: 8.15' BGS
Drilling Method	: 7822DT Geoprobe	24-Hr DTW	: 10.65' TOC
Driller	: Kevin Pumphrey	ARM Representative	: L. Perrin

Depth in Feet	Surf. Elev. 13.21	DESCRIPTION	REMARKS
0	13	Riser Type: PVC Riser Diameter: 1 inch Riser Stickup: 31.2"	Northing (US ft): 573,596.22 Easting (US ft): 1,461,764.46
5	8	Screen Type: PVC Screen Diameter: 1 inch Screen Amount: 15 feet Slot Size: 0.010"	
10	3	Filter (sand) Pack: Top: 4' bgs Bottom: 20' bgs Grain Size: WG #1	
15	-2	Bentonite Seal: Top: 0 (surface) Bottom: 4' bgs Grain Size: granular 30-50 mesh	
20		End of Boring	

PZM Name: A8-002-PZ



Total Depth: 20'
TOC - Top of PVC Casing
DTW - depth to water
DTP - depth to product
BGS - below ground surface

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ARM Group Inc.
Earth Resource Engineers and Consultants

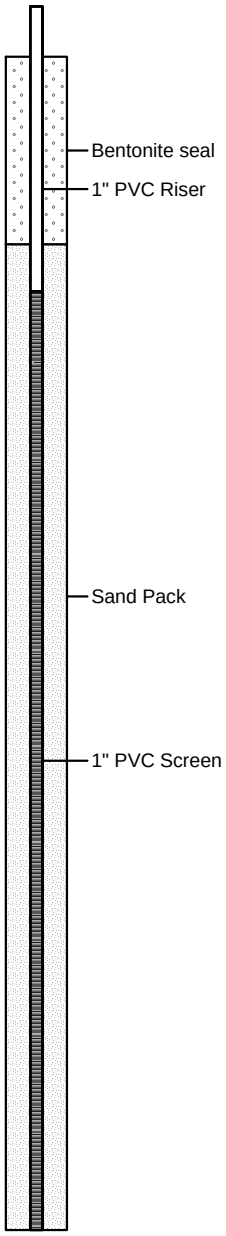
LOG OF TEMPORARY GROUNDWATER SAMPLE COLLECTION POINT: A8-004-PZ

Client: EnviroAnalytics Group
Site: Sparrows Point - Area A Parcel A8
Sparrows Point, MD
ARM Project No.: 150298M-3-3

Date Installed	: 10-29-15	Drilling Company	: Green Services, Inc
Casing/Riser Type	: PVC	TOC Elevation	: 16.73
Borehole Diameter	: 2.25"	0-Hr DTW	: 9.03' TOC
Drilling Method	: 7822DT Geoprobe	24-Hr DTW	: 8.95' TOC
Driller	: Don Marchese	ARM Representative	: L. Perrin

Depth in Feet	Surf. Elev. 12.85	DESCRIPTION
0		
1	12	Riser Type: PVC Riser Diameter: 1 inch Riser Stickup: 43.5"
2	11	
3	10	
4	9	
5	8	
6	7	Screen Type: PVC Screen Diameter: 1 inch Screen Amount: 20 feet Slot Size: 0.010"
7	6	
8	5	
9	4	
10	3	
11	2	Filter (sand) Pack: Top: 4' bgs Bottom: 25' bgs Grain Size: WG #1
12	1	
13	0	
14	-1	
15	-2	
16	-3	Bentonite Seal: Top: 0 (surface) Bottom: 4' bgs Grain Size: granular 30-50 mesh
17	-4	
18	-5	
19	-6	
20	-7	
21	-8	
22	-9	
23	-10	
24	-11	
25	-12	End of Boring

PZM Name: A8-004-PZ



REMARKS

Northing (US ft): 573,657.09
Easting (US ft): 1,462,089.32

Total Depth: 25'
TOC - Top of PVC Casing
DTW - depth to water
DTP - depth to product
BGS - below ground surface

ARM Group Inc.
Earth Resource Engineers and Consultants

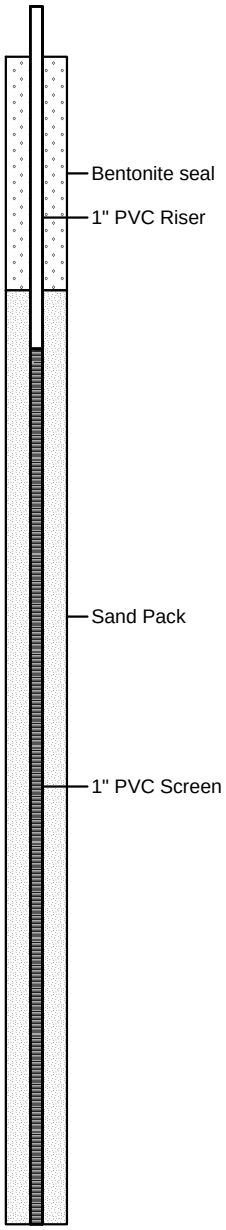
LOG OF TEMPORARY GROUNDWATER SAMPLE COLLECTION POINT: A8-007-PZ

Client: EnviroAnalytics Group
Site: Sparrows Point - Area A Parcel A8
Sparrows Point, MD
ARM Project No.: 150298M-3-3
Page 1 of 1

Date Installed	: 10-27-15	Drilling Company	: Green Services, Inc
Casing/Riser Type	: PVC	TOC Elevation	: 15.86
Borehole Diameter	: 2.25"	0-Hr DTW	: 9.08' TOC
Drilling Method	: 7822DT Geoprobe	24-Hr DTW	: 8.74' TOC
Driller	: Kevin Pumphrey	ARM Representative	: L. Perrin

Depth in Feet	Surf. Elev. 12.60	DESCRIPTION
0	12	Riser Type: PVC Riser Diameter: 1 inch Riser Stickup: 31.5"
5	7	Screen Type: PVC Screen Diameter: 1 inch Screen Amount: 15 feet Slot Size: 0.010"
10	2	Filter (sand) Pack: Top: 4' bgs Bottom: 20' bgs Grain Size: WG #1
15	-3	Bentonite Seal: Top: 0 (surface) Bottom: 4' bgs Grain Size: granular 30-50 mesh
20	-8	End of Boring

PZM Name: A8-007-PZ



REMARKS

Northing (US ft): 573,461.18
Easting (US ft): 1,462,035.55

Total Depth: 20'
TOC - Top of PVC Casing
DTW - depth to water
DTP - depth to product
BGS - below ground surface

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ARM Group Inc.
Earth Resource Engineers and Consultants

LOG OF TEMPORARY GROUNDWATER SAMPLE COLLECTION POINT: A8-009-PZ

Client: EnviroAnalytics Group
Site: Sparrows Point - Area A Parcel A8
Sparrows Point, MD
ARM Project No.: 150298M-3-3
Page 1 of 1

Date Installed	: 10-29-15	Drilling Company	: Green Services, Inc
Casing/Riser Type	: PVC	TOC Elevation	: 16.73
Borehole Diameter	: 2.25"	0-Hr DTW	: 9.55' TOC
Drilling Method	: 7822DT Geoprobe	24-Hr DTW	: 8.89' TOC
Driller	: Don Marchese	ARM Representative	: L. Perrin

Depth in Feet	Surf. Elev. 12.81	DESCRIPTION	PZM Name: A8-009-PZ	REMARKS
0				
1	12	Riser Type: PVC Riser Diameter: 1 inch Riser Stickup: 41"	Bentonite seal 1" PVC Riser	Northing (US ft): 573,918.69 Easting (US ft): 1,461,844.90
2	11			
3	10			
4	9			
5	8	Screen Type: PVC Screen Diameter: 1 inch Screen Amount: 15 feet Slot Size: 0.010"		
6	7			
7	6			
8	5			
9	4			
10	3	Filter (Sand) Pack: Top: 4' bgs Bottom: 20' bgs Grain Size: WG #1	Sand Pack	
11	2			
12	1			
13	0		1" PVC Screen	
14	-1			
15	-2	Bentonite Seal: Top: 0 (surface) Bottom: 4' bgs Grain Size: granular 30-50 mesh		
16	-3			
17	-4			
18	-5			
19	-6			
20	-7	End of Boring		

Total Depth: 20'
TOC - Top of PVC Casing
DTW - depth to water
DTP - depth to product
BGS - below ground surface

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ARM Group Inc.
Earth Resource Engineers and Consultants

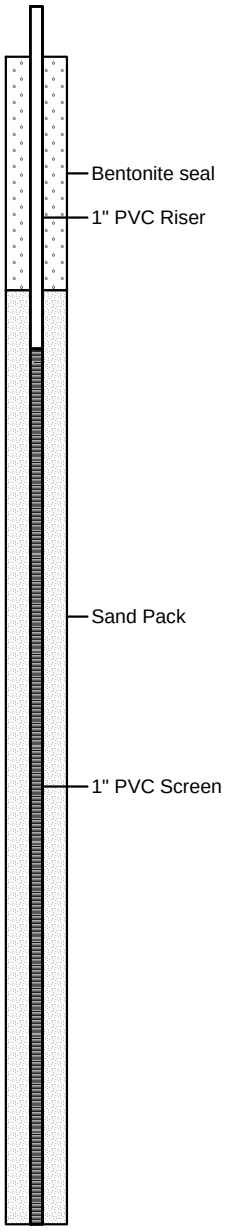
LOG OF TEMPORARY GROUNDWATER SAMPLE COLLECTION POINT: A8-013-PZ

Client: EnviroAnalytics Group
Site: Sparrows Point - Area A Parcel A8
Sparrows Point, MD
ARM Project No.: 150298M-3-3
Page 1 of 1

Date Installed	: 10-30-15	Drilling Company	: Green Services, Inc
Casing/Riser Type	: PVC	TOC Elevation	: 20.01
Borehole Diameter	: 2.25"	0-Hr DTW	: 12.93' TOC
Drilling Method	: 7822DT Geoprobe	24-Hr DTW	: 12.69' TOC
Driller	: Don Marchese	ARM Representative	: L. Perrin

Depth in Feet	Surf. Elev. 16.10	DESCRIPTION
0	16	Riser Type: PVC Riser Diameter: 1 inch Riser Stickup: 41.25"
5	11	Screen Type: PVC Screen Diameter: 1 inch Screen Amount: 15 feet Slot Size: 0.010"
10	6	Filter (sand) Pack: Top: 4' bgs Bottom: 20' bgs Grain Size: WG #1
15	1	Bentonite Seal: Top: 0 (surface) Bottom: 4' bgs Grain Size: granular 30-50 mesh
20		End of Boring

PZM Name: A8-013-PZ



REMARKS

Northing (US ft): 574,445.32
Easting (US ft): 1,462,162.75

Total Depth: 20'
TOC - Top of PVC Casing
DTW - depth to water
DTP - depth to product

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ARM Group Inc.
Earth Resource Engineers and Consultants

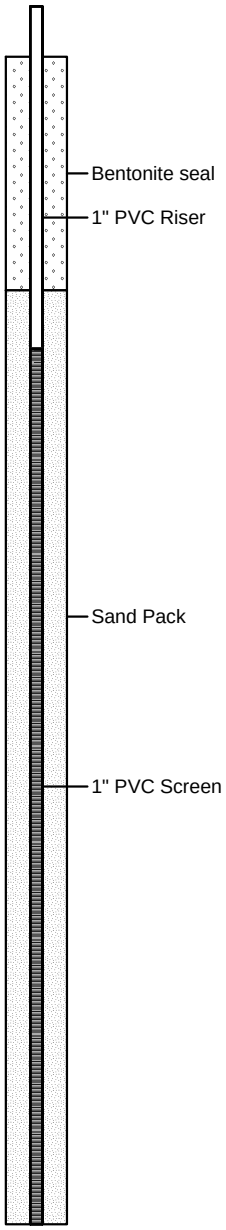
LOG OF TEMPORARY GROUNDWATER SAMPLE COLLECTION POINT: A8-015-PZ

Client: EnviroAnalytics Group
Site: Sparrows Point - Area A Parcel A8
Sparrows Point, MD
ARM Project No.: 150298M-3-3
Page 1 of 1

Date Installed	: 10-30-15	Drilling Company	: Green Services, Inc
Casing/Riser Type	: PVC	TOC Elevation	: 16.18
Borehole Diameter	: 2.25"	0-Hr DTW	: 7.41' TOC
Drilling Method	: 7822DT Geoprobe	24-Hr DTW	: 5.99' TOC
Driller	: Don Marchese	ARM Representative	: L. Perrin

Depth in Feet	Surf. Elev. 11.91	DESCRIPTION	REMARKS
0		Riser Type: PVC Riser Diameter: 1 inch Riser Stickup: 47.5"	Northing (US ft): 574,296.71 Easting (US ft): 1,461,457.19
1	11		
2	10		
3	9		
4	8		
5	7	Screen Type: PVC Screen Diameter: 1 inch Screen Amount: 15 feet Slot Size: 0.010"	
6	6		
7	5		
8	4		
9	3		
10	2	Filter (sand) Pack: Top: 4' bgs Bottom: 20' bgs Grain Size: WG #1	
11	1		
12	0		
13	-1		
14	-2		
15	-3	Bentonite Seal: Top: 0 (surface) Bottom: 4' bgs Grain Size: granular 30-50 mesh	
16	-4		
17	-5		
18	-6		
19	-7		
20	-8	End of Boring	

PZM Name: A8-015-PZ



Total Depth: 20'
TOC - Top of PVC Casing
DTW - depth to water
DTP - depth to product

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ARM Group Inc.
Earth Resource Engineers and Consultants

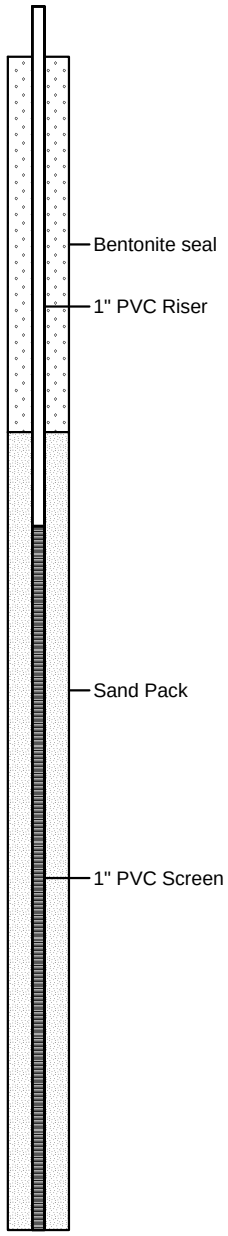
LOG OF TEMPORARY GROUNDWATER SAMPLE COLLECTION POINT: A8-017-PZ

Client: EnviroAnalytics Group
Site: Sparrows Point - Area A Parcel A8
Sparrows Point, MD
ARM Project No.: 150298M-3-3
Page 1 of 1

Date Installed	: 10-30-15	Drilling Company	: Green Services, Inc
Casing/Riser Type	: PVC	TOC Elevation	: 16.59
Borehole Diameter	: 2.25"	0-Hr DTP/DTW	: 6.16/6.57' TOC
Drilling Method	: 7822DT Geoprobe	24-Hr DTP/DTW	: 6.02/6.44' TOC
Driller	: Don Marchese	ARM Representative	: L. Perrin

Depth in Feet	Surf. Elev. 13.26	DESCRIPTION	REMARKS
0 – 1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9 – 10 – 11 – 12 – 13 – 14 – 15 – 16 – 17 – 18 – 19 – 20 – 21 – 22 – 23 – 24 – 25	13 – 12 – 11 – 10 – 9 – 8 – 7 – 6 – 5 – 4 – 3 – 2 – 1 – 0 – -1 – -2 – -3 – -4 – -5 – -6 – -7 – -8 – -9 – -10 – -11	Riser Type: PVC Riser Diameter: 1 inch Riser Stickup: 38.5"	
		Screen Type: PVC Screen Diameter: 1 inch Screen Amount: 15 feet Slot Size: 0.010"	
		Filter (sand) Pack: Top: 8' bgs Bottom: 25' bgs Grain Size: WG #1	Strong gasoline odor
		Bentonite Seal: Top: 0 (surface) Bottom: 8' bgs Grain Size: granular 30-50 mesh	
		End of Boring	

PZM Name: A8-017-PZ



Total Depth: 25'
TOC - Top of PVC Casing
DTW - depth to water
DTP - depth to product

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APPENDIX F

GROUNDWATER SAMPLING RECORD SHEET

Sheet Number _____ of _____

Job Name: _____ Job Location: _____

Job Number: _____ Phase: _____ Task: _____

Sample Location: AB-003-PZ Name(s) of Sampler(s): B. Gehman

Description of Sample: Water _____X_____ Soil _____ Other _____

PURGING

Time/Date Started: _____ / _____

Air Temperature: 75 (°F/°C)

Weather Conditions: Sunny X Rain _____ Overcast ____ Other _____

Depth to Water: _____ ft

Total Well Depth: _____ ft

Height of Water Column: _____ ft

Well Diameter: 1-inch _____ 4-inch _____ 2-inch _____ 6-inch _____

Well Volume Calculation:

_____ ft x _____ gal/ft = _____ gal

Purge Volume = _____ x _____ = _____ gal

Purging Method: Pump __ Bailed ___ Other ___

Gallons Removed: _____ gal

Length of Time Purged _____ min

Yield at End of Purging: _____ gpm

How was yield measured? _____

Color _____ Odor _____

Turbidity _____

Was well cavitated? Yes____ No _____

SAMPLING

Time/Date Started: _____ / 13:20

Air Temperature: _____ (°F/°C)

Weather Conditions: Sunny _____ Rain _____ Overcast ____ Other _____

Depth to Water: _____ ft

Sampling Method: Bailer _____ Submersible Pump_____ Peristaltic Pump _____ Other _____

Number of Bottles Filled: _____

Date Sent To Lab: _____

Laboratory Name: _____

Parameters to Analyze: _____

Chain of Custody Number: _____

Other: _____

FIELD DATA

Time	13:06	13:11	13:16				
Volume of water purged	2.9	3.5	4.1				gal
pH	6.39	5.77	5.54				s.u.
Conductance	0.737	0.736	0.736				ms/cm
Temperature	16.05	15.95	15.95				°C
DO	0.31	0.24	0.22				mg/l
Redox	-157.1	-163.0	-167.5				mV
Turbidity	3357 AU	2194 AU	2012 AU				NTU
SpC	888	889	890				us/cm

Remarks: _____

Pipe Volume:

1" I.D. = 0.041 gal/ft
2" I.D. = 0.163 gal/ft
4" I.D. = 0.653 gal/ft
6" I.D. = 1.47 gal/ft

GROUNDWATER SAMPLING RECORD SHEET

Sheet Number _____ of _____

Job Name: _____ Job Location: _____

Job Number: _____ Phase: _____ Task: _____

Sample Location: AB-004-PZ Name(s) of Sampler(s): B. Gelman

Description of Sample: Water _____X_____ Soil _____ Other _____

PURGING

Time/Date Started: _____ / _____

Air Temperature: 75° (°F/°C)

Weather Conditions: Sunny X Rain _____ Overcast ____ Other _____

Depth to Water: _____ ft

Total Well Depth: _____ ft

Height of Water Column: _____ ft

Well Diameter: 1-inch _____ 4-inch _____ 2-inch _____ 6-inch _____

Well Volume Calculation:

_____ ft x _____ gal/ft = _____ gal

Purge Volume = _____ x _____ = _____ gal

Purging Method: Pump __ Bailed ___ Other ___

Gallons Removed: _____ gal

Length of Time Purged _____ min

Yield at End of Purging: _____ gpm

How was yield measured? _____

Color _____ Odor _____

Turbidity _____

Was well cavitated? Yes____ No _____

SAMPLING

Time/Date Started: _____ / 14:15

Air Temperature: _____ (°F/°C)

Weather Conditions: Sunny _____ Rain _____ Overcast ____ Other _____

Depth to Water: _____ ft

Sampling Method: Bailer _____ Submersible Pump_____ Peristaltic Pump _____ Other _____

Number of Bottles Filled: _____

Date Sent To Lab: _____

Laboratory Name: _____

Parameters to Analyze: _____

Chain of Custody Number: _____

Other: _____

FIELD DATA

Time	14:04	14:09	14:14				
Volume of water purged	2.6	3.1	3.7				gal
pH	10.39	11.11	11.34				s.u.
Conductance	0.579	0.591	0.596				ms/cm
Temperature	19.92	19.87	19.88				°C
DO	0.70	0.32	0.22				mg/l
Redox	-95.0	-118.1	-140.1				mV
Turbidity	110	59.8	12.06				NTU
SpC	642	655	661				us/cm

Remarks: _____

Pipe Volume:

1" I.D. = 0.041 gal/ft
2" I.D. = 0.163 gal/ft
4" I.D. = 0.653 gal/ft
6" I.D. = 1.47 gal/ft

GROUNDWATER SAMPLING RECORD SHEET

Sheet Number _____ of _____

Job Name: _____ Job Location: _____

Job Number: _____ Phase: _____ Task: _____

Sample Location: A8-007-PZ Name(s) of Sampler(s): B. Gehman

Description of Sample: Water _____X_____ Soil _____ Other _____

PURGING

Time/Date Started: _____ / 11-5-15

Air Temperature: 60 (°F/°C)

Weather Conditions: Sunny _____ Rain _____ Overcast X Other _____

Depth to Water: _____ ft

Total Well Depth: _____ ft

Height of Water Column: _____ ft

Well Diameter: 1-inch _____ 4-inch _____ 2-inch _____ 6-inch _____

Well Volume Calculation:

_____ ft x _____ gal/ft = _____ gal

Purge Volume = _____ x _____ = _____ gal

Purging Method: Pump __ Bailed ___ Other ___

Gallons Removed: _____ gal

Length of Time Purged _____ min

Yield at End of Purging: _____ gpm

How was yield measured? _____

Color _____ Odor _____

Turbidity _____

Was well cavitated? Yes____ No _____

SAMPLING

Time/Date Started: _____ / _____

Air Temperature: _____ (°F/°C)

Weather Conditions: Sunny _____ Rain _____ Overcast ____ Other _____

Depth to Water: _____ ft

Sampling Method: Bailer _____ Submersible Pump_____ Peristaltic Pump _____ Other _____

Number of Bottles Filled: _____

Date Sent To Lab: _____

Laboratory Name: _____

Parameters to Analyze: _____

Chain of Custody Number: _____

Other: _____

FIELD DATA

	9:15	9:20	9:25				
Time	~~1015~~	~~1020~~	~~1025~~				
Volume of water purged	3.0	3.5	4.0				gal
pH	6.55	6.13	6.02				s.u.
Conductance	0.855	0.835	0.827				ms/cm
Temperature	17.04	16.97	16.96				°C
DO	0.21	0.17	0.16				mg/l
Redox	-133.3	-149.7	-158.9				mV
Turbidity	1059 AU	1430 AU	1653 AU				NTU
SpC	1003	986	977				us/cm

Remarks: Very turbid brown

Pipe Volume:

1" I.D. = 0.041 gal/ft
2" I.D. = 0.163 gal/ft
4" I.D. = 0.653 gal/ft
6" I.D. = 1.47 gal/ft

GROUNDWATER SAMPLING RECORD SHEET

Sheet Number _____ of _____

Job Name: _____ Job Location: _____

Job Number: _____ Phase: _____ Task: _____

Sample Location: AB-009-PZ Name(s) of Sampler(s): B.Gehman

Description of Sample: Water _____X_____ Soil _____ Other _____

PURGING

Time/Date Started: _____ / 11-4-15

Air Temperature: 75° (°F/°C)

Weather Conditions: Sunny X Rain _____ Overcast ____ Other _____

Depth to Water: _____ ft

Total Well Depth: _____ ft

Height of Water Column: _____ ft

Well Diameter: 1-inch _____ 4-inch _____ 2-inch _____ 6-inch _____

Well Volume Calculation:

_____ ft x _____ gal/ft = _____ gal

Purge Volume = _____ x _____ = _____ gal

Purging Method: Pump __ Bailed ___ Other ___

Gallons Removed: _____ gal

Length of Time Purged _____ min

Yield at End of Purging: _____ gpm

How was yield measured? _____

Color _____ Odor _____

Turbidity _____

Was well cavitated? Yes____ No _____

SAMPLING

Time/Date Started: _____ / 12:25

Air Temperature: _____ (°F/°C)

Weather Conditions: Sunny _____ Rain _____ Overcast ____ Other _____

Depth to Water: _____ ft

Sampling Method: Bailer _____ Submersible Pump_____ Peristaltic Pump _____ Other _____

Number of Bottles Filled: _____

Date Sent To Lab: _____

Laboratory Name: _____

Parameters to Analyze: _____

Chain of Custody Number: _____

Other: _____

FIELD DATA

Time	12:11	12:16	12:21				
Volume of water purged	2.45	3.0	3.6				gal
pH	10.42	10.04	9.77				s.u.
Conductance	0.406	0.403	0.401				ms/cm
Temperature	17.29	17.16	17.18				°C
DO	0.10	0.07	0.06				mg/l
Redox	-229.0	-225.0	-225.8				mV
Turbidity	OVER	OVER	OVER				NTU
SpC	476	473	472				us/cm

Remarks: _____

Pipe Volume:

1" I.D. = 0.041 gal/ft
2" I.D. = 0.163 gal/ft
4" I.D. = 0.653 gal/ft
6" I.D. = 1.47 gal/ft

AB

GROUNDWATER SAMPLING RECORD SHEET

Sheet Number _____ of _____

Job Name: _____ Job Location: _____

Job Number: _____ Phase: _____ Task: _____

Sample Location: AB-013-PZ Name(s) of Sampler(s): _____

Description of Sample: Water _____X_____ Soil _____ Other _____

PURGING

Time/Date Started: _____ / 11-4-15

Air Temperature: 60 (°F/°C)

Weather Conditions: Sunny X Rain _____ Overcast ____ Other _____

Depth to Water: _____ ft

Total Well Depth: _____ ft

Height of Water Column: _____ ft

Well Diameter: 1-inch _____ 4-inch _____ 2-inch _____ 6-inch _____

Well Volume Calculation:

_____ ft x _____ gal/ft = _____ gal

Purge Volume = _____ x _____ = _____ gal

Purging Method: Pump __ Bailed ___ Other ___

Gallons Removed: _____ gal

Length of Time Purged _____ min

Yield at End of Purging: _____ gpm

How was yield measured? _____

Color _____ Odor _____

Turbidity _____

Was well cavitated? Yes____ No _____

SAMPLING

Time/Date Started: _____ / 10:00

Air Temperature: _____ (°F/°C)

Weather Conditions: Sunny _____ Rain _____ Overcast ____ Other _____

Depth to Water: _____ ft

Sampling Method: Bailer _____ Submersible Pump_____ Peristaltic Pump _____ Other _____

Number of Bottles Filled: _____

Date Sent To Lab: _____

Laboratory Name: _____

Parameters to Analyze: _____

Chain of Custody Number: _____

Other: _____

FIELD DATA

Time	9:48	9:53	9:58				
Volume of water purged	2.8	3.4	4.0				gal
pH	7.86	7.24	7.05				s.u.
Conductance	0.376	0.365	0.361				ms/cm
Temperature	18.04	17.96	18.05				°C
DO	0.35	0.35	0.34				mg/l
Redox	-191.5	-198.7	-200.5				mV
Turbidity	3240 AU	3444AU	2870AU				NTU
SpC	435	420	416				us/cm

Remarks: _____

MS/MSD here

Pipe Volume: 1" I.D. = 0.041 gal/ft 2" I.D. = 0.163 gal/ft 4" I.D. = 0.653 gal/ft 6" I.D. = 1.47 gal/ft

9
18
28

GROUNDWATER SAMPLING RECORD SHEET

Sheet Number _____ of _____

Job Name: _____ Job Location: _____

Job Number: _____ Phase: _____ Task: _____

Sample Location: A8-015-PZ Name(s) of Sampler(s): B. Gehman

Description of Sample: Water _____X_____ Soil _____ Other _____

PURGING

Time/Date Started: _____ / _____

Air Temperature: 70s (°F/°C)

Weather Conditions: Sunny X Rain _____ Overcast ____ Other _____

Depth to Water: _____ ft

Total Well Depth: _____ ft

Height of Water Column: _____ ft

Well Diameter: 1-inch X 4-inch _____ 2-inch _____ 6-inch _____

Well Volume Calculation:

_____ ft x _____ gal/ft = _____ gal

Purge Volume = _____ x _____ = _____ gal

Purging Method: Pump __ Bailed ___ Other ___

Gallons Removed: _____ gal

Length of Time Purged _____ min

Yield at End of Purging: _____ gpm

How was yield measured? _____

Color _____ Odor _____

Turbidity _____

Was well cavitated? Yes____ No _____

SAMPLING

Time/Date Started: _____ / 1125

Air Temperature: _____ (°F/°C)

Weather Conditions: Sunny _____ Rain _____ Overcast ____ Other _____

Depth to Water: _____ ft

Sampling Method: Bailer _____ Submersible Pump _____ Peristaltic Pump _____ Other _____

Number of Bottles Filled: _____

Date Sent To Lab: _____

Laboratory Name: _____

Parameters to Analyze: _____

Chain of Custody Number: _____

Other: _____

FIELD DATA

Time	11:11	11:16	11:21				
Volume of water purged	2.6	3.2	3.8				gal
pH	12.48	12.52	12.55				s.u.
Conductance	1.451	~~1.470~~ 1.470	~~1.484~~ 1.484				ms/cm
Temperature	17.48	17.48	17.50				°C
DO	0.18	0.11	0.08				mg/l
Redox	-257.3	-282.4	-284.1				mV
Turbidity	677AU	644 AU	540 AU				NTU
SpC	1692	1713	1732				us/cm

Remarks: Turbid dark green
Pool odor

Pipe Volume:

1" I.D. = 0.041 gal/ft
2" I.D. = 0.163 gal/ft
4" I.D. = 0.653 gal/ft
6" I.D. = 1.47 gal/ft

GROUNDWATER SAMPLING RECORD SHEET

Sheet Number _____ of _____

Job Name: _____ Job Location: _____

Job Number: _____ Phase: _____ Task: _____

Sample Location: AB-017-P2 Name(s) of Sampler(s): _____

Description of Sample: Water _____X_____ Soil _____ Other _____

PURGING

Time/Date Started: _____ / 11-5-15

Air Temperature: 60 (°F/°C)

Weather Conditions: Sunny _____ Rain _____ Overcast X Other _____

Depth to Water: _____ ft

Total Well Depth: _____ ft

Height of Water Column: _____ ft

Well Diameter: 1-inch _____ 4-inch _____ 2-inch _____ 6-inch _____

Well Volume Calculation:

_____ ft x _____ gal/ft = _____ gal

Purge Volume = _____ x _____ = _____ gal

Purging Method: Pump __ Bailed ___ Other ___

Gallons Removed: _____ gal

Length of Time Purged _____ min

Yield at End of Purging: _____ gpm

How was yield measured? _____

Color _____ Odor _____

Turbidity _____

Was well cavitated? Yes____ No _____

SAMPLING

Time/Date Started: _____ / 11:05

Air Temperature: _____ (°F/°C)

Weather Conditions: Sunny _____ Rain _____ Overcast ____ Other _____

Depth to Water: _____ ft

Sampling Method: Bailer _____ Submersible Pump_____ Peristaltic Pump _____ Other _____

Number of Bottles Filled: _____

Date Sent To Lab: _____

Laboratory Name: _____

Parameters to Analyze: _____

Chain of Custody Number: _____

Other: _____

FIELD DATA

Time	10:50	10:55	11:00				
Volume of water purged	3.2	3.8	4.4				gal
pH	11.07	11.32	11.39				s.u.
Conductance	0.886	0.886	0.871				ms/cm
Temperature	20.24	20.23	20.08				°C
DO	0.09	0.07	0.06				mg/l
Redox	-204.4 ↑	-234.5 ↑	-244.8				mV
Turbidity	OVER	OVER	OVER				NTU
SpC	976	975	961				us/cm

Remarks:

~0.3' product in well

strong odor

Turbid greenish gray

Pipe Volume:

1" I.D. = 0.041 gal/ft
2" I.D. = 0.163 gal/ft
4" I.D. = 0.653 gal/ft
6" I.D. = 1.47 gal/ft

TABLE 1
MULTIPARAMETER CALIBRATION LOG

Project Name Parcel A8 Date 11/4/15
Weather Sunny 50s to 70s
Calibrated by B. Gehman Instrument YSI Meter
Serial Number NA

Parameters	Morning Calibration	Morning Temperature	End of Day Calibration Check	End of Day Temperature
Specific Conductance Standard #1	1.413	53 ℉(Est.)	1.336¥	72 ℉ (Est.)
Specific Conductance Standard #2	NA	NA	NA	NA
pH (7)	7.00	53 ℉ (Est.)	7.33	72 ℉ (Est.)
pH (4)	4.00	53 ℉ (Est.)	3.83	72 ℉ (Est.)
pH(10)	10.00	53 ℉ (Est.)	9.41	72 ℉ (Est.)
ORP Zobel Solution	240.0	53 ℉ (Est.)	233	72 ℉ (Est.)
Dissolved Oxygen 100% water saturated air mg/L	30.33¥	53 ℉ (Est.)	30.28¥	72 ℉ (Est.)
Dissolved Oxygen Zero Dissolved Oxygen Solution mg/L	NA	53 ℉ (Est.)	NA	72 ℉ (Est.)
Barometric Pressure mm Hg	770.38	NA	769.11	NA
Turbidity #1 (10 NTU)	calibrated before each sample	NA	NA	NA
Turbidity #2 (0.0 NTU)	calibrated before each sample	NA	NA	NA
Turbidity Standard #3	NA	NA	NA	NA

¥Specific conductance is outside of the post-calibration acceptance criteria. DO is outside of the morning and post-calibration acceptance criteria. Values displayed on field purge logs may be inaccurate.

TABLE 1
MULTIPARAMETER CALIBRATION LOG

Project Name Parcel A8 Date 11/5/15
Weather Cloudy 50s to 60s
Calibrated by B. Gehman Instrument YSI Meter
Serial Number NA

Parameters	Morning Calibration	Morning Temperature	End of Day Calibration Check	End of Day Temperature
Specific Conductance Standard #1	1.413	58 ℉(Est.)	1.399	64 ℉ (Est.)
Specific Conductance Standard #2	NA	NA	NA	NA
pH (7)	7.00	58 ℉ (Est.)	7.22	64 ℉ (Est.)
pH (4)	4.00	58 ℉ (Est.)	3.97	64 ℉ (Est.)
pH(10)	10.00	58 ℉ (Est.)	9.88	64 ℉ (Est.)
ORP Zobel Solution	240.0	58 ℉ (Est.)	238	64 ℉ (Est.)
Dissolved Oxygen 100% water saturated air mg/L	30.20±0.28¥	58 ℉ (Est.)	30.20¥	64 ℉ (Est.)
Dissolved Oxygen Zero Dissolved Oxygen Solution mg/L	NA	58 ℉ (Est.)	NA	64 ℉ (Est.)
Barometric Pressure mm Hg	NA¥	NA	767.08	NA
Turbidity #1 (10 NTU)	calibrated before each sample	NA	NA	NA
Turbidity #2 (0.0 NTU)	calibrated before each sample	NA	NA	NA
Turbidity Standard #3	NA	NA	NA	NA

¥Sampler noted that DO check was off by 0.28 mg/L. Morning barometric pressure was not recorded. DO is outside of the morning and post-calibration acceptance criteria. Values displayed on field purge logs may be inaccurate.

APPENDIX G

Parcel A8 - IDW Drum Log
Phase II Investigation

Drum ID	Designation	Activity/Phase	Contents	Open Date
5-N. Acid-9/15/15-A	Non-haz.	Area A	Nitric Acid	9/15/2015
6-Hexane-9/15/15-A	Hazardous	Area A	Hexane	9/15/2015
41-Soil-10/26/15-A8	Non-haz.	Parcel A8	Soil	10/26/2015
42-Decon Water-10/26/15-A8	Non-haz.	Parcel A8	Decon water	10/26/2015
43-Liners-10/26/15-A8	Non-haz.	Parcel A8	Liners	10/26/2015
44-PPE-10/26/15-A8	Non-haz.	Parcel A8	PPE	10/26/2015
45-Soil-10/29/15-A8	Non-haz.	Parcel A8	Soil	10/29/2015
46-Soil-10/30/15-A8	Non-haz.	Parcel A8	Soil	10/30/2015
62-Purge Water-11/5/14-A8	Non-haz.	Parcel A8	Purge water	11/5/2015
302-Soil-12/16/15-B8/A8	Non-haz.	LNAPL Delineation	Soil	12/16/2012
303-Liners-12/16/15-B8/A8	Non-haz.	LNAPL Delineation	Liner	12/16/2015
304-Decon water-12/16/15-B8/A8	Non-haz.	LNAPL Delineation	Decon water	12/16/2015

APPENDIX H

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: A8-017A-PZ

(page 1 of 1)

Client	: EnviroAnalytics Group
ARM Project No.	: 150298M-3-3
Project Description	: Sparrows Point - Parcel A8
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: M. Replogle, E.I.T.
Drilling Company	: Green Services, Inc
Driller	: Kevin Pumphrey
Drilling Equipment	: Geoprobe 7822DT

Date	: 10/27/2015
Weather	: 50s, cloudy
Northing (US ft)	: 572,958.34
Easting (US ft)	: 1,461,954.44

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0						
	100	73.5	No samples collected due to product	(0-1') SLAG, gray, loose, some red staining, dry	GM	
		48.3		(1-2.5') SILTY CLAY, black to olive green, soft to firm, moist, medium to low plasticity, cohesive	CL	Petroleum odor
		115.3		(2.5-3.2') SLAG SAND, medium grained, loose, black to olive green, dry	SP-SW	
		178.1		(3.2-3.5') SAND and GRAVEL, beige, loose, dry	SW-GW	
		171.2		(3.5-5') CLAY, olive green to black, moist, medium plasticity, cohesive	CL	
5		247.5		(5-10') CLAY, light beige to gray with reddish yellow mottling from 9-10' bgs, dry to moist at 7' bgs, firm to slighty firm at 8' bgs, medium plasticity, cohesive		
	100	303.1				
		269.3			CL	
		245.0				
		179.2				
10		67.5		(10-15') CLAY, soft to very soft, light gray to beige, moist, high plasticity, cohesive		Product from 10-13' bgs (LNAPL)
		53.2				
	100	15.2			CH	
		13.7				
		-				
15		-		(15-18') CLAY, very soft, light gray, very moist, sticky, high plasticity, cohesive		
		0.0			CH	
	100	0.0				
		-		(18-20') SAND, loose, reddish yellow, wet		Wet at 19' bgs
		-			SM	
20				End of Boring		

Total Borehole Depth: 20' bgs.
Boring terminated at 20' bgs due to water.

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: A8-017B-PZ

(page 1 of 1)

Client	: EnviroAnalytics Group
ARM Project No.	: 150298M-3-3
Project Description	: Sparrows Point - Parcel A8
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: M. Replogle, E.I.T.
Drilling Company	: Green Services, Inc
Driller	: Kevin Pumphrey
Drilling Equipment	: Geoprobe 7822DT

Date	: 12/18/15
Weather	: 40s, Cloudy
Northing (US ft)	: 572983.29
Easting (US ft)	: 1461953.78

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0	80	-	No samples collected due to product	(0-3.5') CONCRETE/ASPHALT, coarse, loose, black, dry, no plasticity, no cohesion	GP/GW	Petroleum odor (2-7' bgs)
		4.0				
		7.7				
		6.7		(3.5-5') CLAYEY SAND, firm, olive green, dry, no plasticity, no cohesion	SC	
5		30.6				
	100	-		(5-7') SAND and GRAVEL, dark brown, saturated, no plasticity, no cohesion	GW/SW	Sheen at 5-7' bgs
		-				
		-		(7-10') CLAY, firm, light grey, dry, high plasticity, cohesive	CL/CH	
		5.7				
		3.1				
10	100	-		(10-13') CLAY, stiff, light grey, moist, high plasticity, cohesive	CL/CH	
		-				
		-				
		-		(13-18') CLAY, stiff, light grey, wet, medium plasticity, no cohesion	CL	Wet at 13' bgs
		-				
15		-				
	100	-				
		-				
		-		(18-19') CLAYEY SAND, loose, medium grey, wet, no plasticity, no cohesion	SC	
		-		(19-20') SAND, dense, reddish yellow, wet, no plasticity, no cohesion	SW/SP	
20		-		(20-23') SAND, dense, orange, saturated, no plasticity, no cohesion	SW/SP	
	100	-				
		-		(23-25') SAND, dense, dark grey, saturated, no plasticity, no cohesion	SW/SP	
		-				
25				End of Boring		

Total Borehole Depth: 25' bgs.
Boring terminated at 25' bgs due to water.

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: A8-017C-PZ

(page 1 of 1)

Client	: EnviroAnalytics Group
ARM Project No.	: 150298M-3-3
Project Description	: Sparrows Point - Parcel A8
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: M. Replogle, E.I.T.
Drilling Company	: Green Services, Inc
Driller	: Kevin Pumphrey
Drilling Equipment	: Geoprobe 7822DT

Date	: 12/18/15
Weather	: 40s, Cloudy
Northing (US ft)	: 572958.64
Easting (US ft)	: 1461979.41

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0		0.9		(0-1') CONCRETE/ASPHALT		
		371.2		(1-2') SAND, trace CLAY, coarse, olive green/grey, dry, no plasticity, no cohesion	SM	Strong petroleum odor
	97	132.3		(2-5') SAND, coarse, olive green, moist, no plasticity, no cohesion	SP	Slight petroleum odor
		57.1				
		16.0				
5		6.9	No samples collected due to product	(5-15') CLAY, firm, softer with depth, light grey, dry, medium to low plasticity, cohesive	CL	
		10.1				
	100	7.9				
		7.0				
		7.4				
10		6.9				
		6.2				
	100	6.0				
		4.8				
		5.1				
15		-		(15-18') CLAYEY SAND, loose, grey, moist, high plasticity, cohesive, sticky	SC	
		-				
		-				
		-		(18-24.5') SAND, coarse, grey to reddish yellow, wet, no plasticity, no cohesion	SP	Wet at 18' bgs
		-				
20		-				
		-				
		-				
		-				
		-				
		-				
25				(24.5-25') SAND, coarse, dark grey, wet, no plasticity, no cohesion	SP	
				End of Boring		

Total Borehole Depth: 25' bgs.
Boring terminated at 25' bgs due to water.

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: A8-017D-PZ

(page 1 of 1)

Client	: EnviroAnalytics Group
ARM Project No.	: 150298M-3-3
Project Description	: Sparrows Point - Parcel A8
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: M. Replogle, E.I.T.
Drilling Company	: Green Services, Inc
Driller	: Kevin Pumphrey
Drilling Equipment	: Geoprobe 7822DT

Date	: 12/18/15
Weather	: 40s, Cloudy
Northing (US ft)	: 572940.20
Easting (US ft)	: 1461955.77

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0		-	No samples collected due to product	(0-1') CONCRETE/APSHALT		
	63	14.9		(1-3') SAND, trace CLAY, coarse, black/grey, dry, no plasticity, no cohesion	SP	
		48.0				
		133.3		(3-4') SAND and GRAVEL, coarse, black, moist, no plasticity, no cohesion	SP/GP	Strong petroleum odor (3-7' bgs)
		25.7		(4-5') CLAYEY SAND, loose, olive green	SC	
5		-		(5-7') SAND and GRAVEL, dark brown, saturated, no plasticity, no cohesion	SW/GW	
	67	-				
		5.6		(7-13') CLAY, firm, light grey, dry, high plasticity, cohesive	CH	
		5.0				
		3.6				
10		3.2				
		-				
	100	-				
		-				
		-		(13-15') CLAY, soft, light grey, dry, high plasticity, cohesive	CL	
15		-		(15-18') CLAYEY SAND, soft clay and coarse sand, medium grey, wet	SC	Wet at 15' bgs
		-				
	100	-				
		-		(18-20') SAND, coarse, tan to reddish yellow, wet, no plasticity, no cohesion	SP	
20		-				
		-		(20-25') SAND, coarse, reddish yellow to dark reddish yellow, wet, no plasticity, no cohesion	SP	
		-				
		-				
		-				
25		-		End of Boring		

Total Borehole Depth: 25' bgs.
Boring terminated at 25' bgs due to water.

ARM Group Inc.
Earth Resource Engineers and Consultants

Boring ID: A8-017E-PZ

(page 1 of 1)

Client	: EnviroAnalytics Group
ARM Project No.	: 150298M-3-3
Project Description	: Sparrows Point - Parcel A8
Site Location	: Sparrows Point, MD
ARM Representative	: L. Perrin
Checked by	: M. Replogle, E.I.T.
Drilling Company	: Green Services, Inc
Driller	: Kevin Pumphrey
Drilling Equipment	: Geoprobe 7822DT

Date	: 12/18/15
Weather	: 40s, Cloudy
Northing (US ft)	: 572958.44
Easting (US ft)	: 1461929.45

Depth (ft.)	% Recovery	PID Reading (PPM)	Sample No/Interval	DESCRIPTION	USCS	REMARKS
0						
	40	-	No samples collected due to product	(0-3') CONCRETE/ASPHALT, coarse, grey		
		-				
		-				
		31.0		(3-4') SAND and GRAVEL, coarse, black to dark olive green, dry, no plasticity, no cohesion	SW/GW	Strong petroleum odor
		252.1		(4-5') CLAYEY SAND, moist	SC	
5		-		(5-7') SAND and ROCK, dark brown, saturated, no plasticity, no cohesion	SW/GW	Strong petroleum odor and sheen (5-7' bgs)
	100	-				
		24.5		(7-13') CLAY, firm, light grey, dry, medium plasticity, cohesive		
		18.0				
		8.0				
10		2.8			CL	
		2.4				
	100	-				
		-				
		-		(13-15') CLAY, soft, moist, no plasticity, no cohesion	ML	
15		-		(15-19') CLAYEY SAND, soft clay and coarse sand, medium grey	SC	
	100	-				
		-				
		-				
		-		(19-23') SAND, coarse, reddish yellow, wet, saturated (20-23'), no plasticity, no cohesion	SP	Wet at 19' bgs
20		-				
		-				
		-				
		-				
		-		(23-25') SAND, coarse, grey to dark grey, wet, no plasticity, no cohesion	SP	
25		-				
				End of Boring		

Total Borehole Depth: 25' bgs.
Boring terminated at 25' bgs due to water.

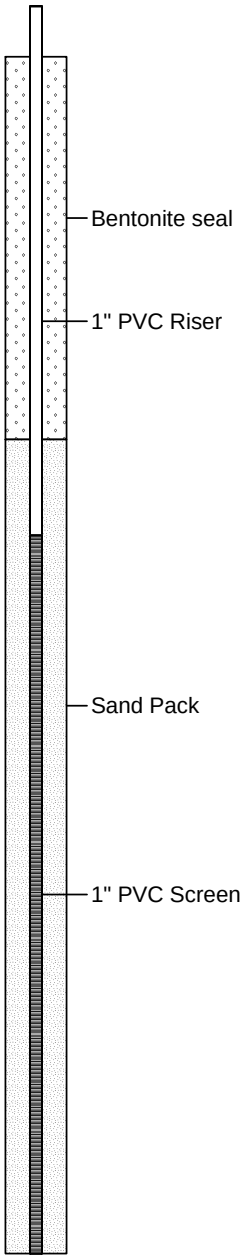
ARM Group Inc.
Earth Resource Engineers and Consultants

Client: EnviroAnalytics Group
Site: Sparrows Point - Area B Parcel A8
Sparrows Point, MD
ARM Project No.: 150298M-3-3
Page 1 of 1

TYPICAL LOG OF TEMPORARY NAPL DELINEATION PIEZOMETER

Installed in the Vicinity of A8-017-PZ

Depth in Feet	Surf. Elev.	DESCRIPTION
0–3		Riser Type: PVC Riser Diameter: 1" Riser Stickup: 36"
3–6		Screen Type: PVC Screen Diameter: 1" Screen Amount: 15' Slot Size: 0.010"
6–10		Sand Pack: Top: 8' bgs Bottom: 25' bgs Grain Size: WG #2
10–25		Bentonite Seal: Top: 0' (surface) Bottom: 8' bgs Grain Size: 3/8" chips/granular (30-50 mesh)



Total Depth: 25'
Borehole Diameter: 2.25"
Driller: Green Services, Inc.
Drilling Method: 7822DT Geoprobe

APPENDIX I

NAPL Measurements and Removal Activities
Parcel A8
Tradepoint Atlantic
Sparrows Point, Maryland

Sample ID	Installation Date	Well Total Depth (Feet bgs)	Screen Interval (Feet bgs)	Riser Stick-Up (Feet)	10/27/2015				11/5/2015				11/25/2015			
					Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)
A8-017-PZ	10/27/2015	25	10-25	3.21	**6.16**	**6.57**	**0.41**	NA	**6.29**	**6.60**	**0.31**	NA	**8.09**	**20.90**	**12.30**	NA
A8-017A-PZ	10/27/2015	8	3-8	2.08	-	-	-	NA	NM	NM	NM	NA	-	4.29	-	NA
A8-017B-PZ	12/18/2015	25	10-25	2.54	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A8-017C-PZ	12/18/2015	25	10-25	NM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A8-017D-PZ	12/18/2015	25	10-25	2.58	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A8-017E-PZ	12/18/2015	25	10-25	3.17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Sample ID	Installation Date	Well Total Depth (Feet bgs)	Screen Interval (Feet bgs)	Riser Stick-Up (Feet)	12/18/2015				12/22/2015				12/30/2015			
					Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)
A8-017-PZ	10/27/2015	25	10-25	3.21	**7.55**	**19.97**	**12.42**	NA	**7.61**	**19.77**	**12.16**	NA	NM	NM	NM	NA
A8-017A-PZ	10/27/2015	8	3-8	2.08	-	4.17	-	NA	-	4.12	-	NA	-	3.64	-	NA
A8-017B-PZ	12/18/2015	25	10-25	2.54	-	8.85	-	NA	-	8.41	-	NA	-	7.55	-	NA
A8-017C-PZ	12/18/2015	25	10-25	NM	-	8.19	-	NA	-	8.71	-	NA	-	7.88	-	NA
A8-017D-PZ	12/18/2015	25	10-25	2.58	-	6.68	-	NA	-	6.89	-	NA	-	6.89	-	NA
A8-017E-PZ	12/18/2015	25	10-25	3.17	-	9.92	-	NA	-	9.50	-	NA	-	8.69	-	NA

Sample ID	Installation Date	Well Total Depth (Feet bgs)	Screen Interval (Feet bgs)	Riser Stick-Up (Feet)	1/7/2016				1/15/2016				1/19/2016			
					Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)
A8-017-PZ	10/27/2015	25	10-25	3.21	**7.10**	**18.40**	**11.30**	NA	**7.30**	**17.75**	**10.45**	NA	**7.08**	**17.95**	**10.87**	NA
A8-017A-PZ	10/27/2015	8	3-8	2.08	-	3.80	-	NA	-	3.70	-	NA	-	3.60	-	NA
A8-017B-PZ	12/18/2015	25	10-25	2.54	-	7.90	-	NA	-	7.72	-	NA	-	7.50	-	NA
A8-017C-PZ	12/18/2015	25	10-25	NM	-	8.20	-	NA	-	8.03	-	NA	-	7.91	-	NA
A8-017D-PZ	12/18/2015	25	10-25	2.58	-	8.10	-	NA	-	8.71	-	NA	-	8.06	-	NA
A8-017E-PZ	12/18/2015	25	10-25	3.17	-	8.86	-	NA	-	8.71	-	NA	-	8.55	-	NA

NA = Not Applicable
NM = Not Measured
SHADED = NAPL Detection

NAPL Measurements and Removal Activities
Parcel A8
Tradepoint Atlantic
Sparrows Point, Maryland

Sample ID	Installation Date	Well Total Depth (Feet bgs)	Screen Interval (Feet bgs)	Riser Stick-Up (Feet)	1/28/2016				2/4/2016				2/12/2016			
					Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)
A8-017-PZ	10/27/2015	25	10-25	3.21	**6.98**	**17.82**	**10.84**	NA	**6.76**	**17.60**	**10.84**	NA	**6.94**	**17.52**	**10.58**	NA
A8-017A-PZ	10/27/2015	8	3-8	2.08	-	3.03	-	NA	-	2.68	-	NA	-	2.86	-	NA
A8-017B-PZ	12/18/2015	25	10-25	2.54	-	7.42	-	NA	-	7.36	-	NA	-	7.55	-	NA
A8-017C-PZ	12/18/2015	25	10-25	NM	-	7.78	-	NA	-	7.70	-	NA	-	7.86	-	NA
A8-017D-PZ	12/18/2015	25	10-25	2.58	-	7.94	-	NA	-	7.85	-	NA	-	7.95	-	NA
A8-017E-PZ	12/18/2015	25	10-25	3.17	-	8.41	-	NA	-	8.36	-	NA	-	8.54	-	NA

Sample ID	Installation Date	Well Total Depth (Feet bgs)	Screen Interval (Feet bgs)	Riser Stick-Up (Feet)	2/23/2016				3/1/2016				3/11/2016			
					Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)
A8-017-PZ	10/27/2015	25	10-25	3.21	**7.24**	**17.35**	**10.11**	**0.5**	**8.33**	**9.64**	**1.31**	**0.5**	**8.82**	**8.85**	**0.03**	**0.1**
A8-017A-PZ	10/27/2015	8	3-8	2.08	-	3.39	-	NA	-	3.44	-	NA	NM	NM	NM	NA
A8-017B-PZ	12/18/2015	25	10-25	2.54	-	7.73	-	NA	-	7.64	-	NA	NM	NM	NM	NA
A8-017C-PZ	12/18/2015	25	10-25	NM	-	8.01	-	NA	-	7.92	-	NA	NM	NM	NM	NA
A8-017D-PZ	12/18/2015	25	10-25	2.58	-	8.09	-	NA	-	8.06	-	NA	NM	NM	NM	NA
A8-017E-PZ	12/18/2015	25	10-25	3.17	-	8.71	-	NA	-	8.83	-	NA	NM	NM	NM	NA

Sample ID	Installation Date	Well Total Depth (Feet bgs)	Screen Interval (Feet bgs)	Riser Stick-Up (Feet)	3/18/2016				3/24/2016				3/29/2016			
					Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)
A8-017-PZ	10/27/2015	25	10-25	3.21	**8.21**	**8.21**	**trace**	**0.5**	-	8.48	-	NA	**9.74**	**9.76**	**0.02**	**0.0**
A8-017A-PZ	10/27/2015	8	3-8	2.08	NM	NM	NM	NA	-	3.83	-	NA	-	3.95	-	NA
A8-017B-PZ	12/18/2015	25	10-25	2.54	NM	NM	NM	NA	-	7.63	-	NA	-	7.91	-	NA
A8-017C-PZ	12/18/2015	25	10-25	NM	NM	NM	NM	NA	-	7.95	-	NA	-	8.21	-	NA
A8-017D-PZ	12/18/2015	25	10-25	2.58	NM	NM	NM	NA	-	8.03	-	NA	-	8.29	-	NA
A8-017E-PZ	12/18/2015	25	10-25	3.17	NM	NM	NM	NA	-	8.62	-	NA	-	8.95	-	NA

NA = Not Applicable
NM = Not Measured
SHADED = NAPL Detection

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Sample ID	Installation Date	Well Total Depth (Feet bgs)	Screen Interval (Feet bgs)	Riser Stick-Up (Feet)	4/6/2016				4/8/2016				4/14/2016			
					Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)
A8-017-PZ	10/27/2015	25	10-25	3.21	**8.73**	**8.74**	**0.01**	NA	-	8.50	-	NA	**trace**	**8.79**	**trace**	NA
A8-017A-PZ	10/27/2015	8	3-8	2.08	-	3.98	-	NA	-	3.91	-	NA	-	4.21	-	NA
A8-017B-PZ	12/18/2015	25	10-25	2.54	-	7.92	-	NA	-	7.74	-	NA	-	7.94	-	NA
A8-017C-PZ	12/18/2015	25	10-25	NM	-	8.21	-	NA	-	8.08	-	NA	-	8.24	-	NA
A8-017D-PZ	12/18/2015	25	10-25	2.58	-	8.30	-	NA	-	8.14	-	NA	-	8.25	-	NA
A8-017E-PZ	12/18/2015	25	10-25	3.17	-	9.03	-	NA	-	8.76	-	NA	-	8.97	-	NA

Sample ID	Installation Date	Well Total Depth (Feet bgs)	Screen Interval (Feet bgs)	Riser Stick-Up (Feet)	4/25/2016				5/2/2016				5/9/2016			
					Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)
A8-017-PZ	10/27/2015	25	10-25	3.21	**8.85**	**8.86**	**0.01**	NA	-	8.59	-	NA	-	8.62	-	NA
A8-017A-PZ	10/27/2015	8	3-8	2.08	-	4.21	-	NA	-	3.95	-	NA	-	3.73	-	NA
A8-017B-PZ	12/18/2015	25	10-25	2.54	-	7.99	-	NA	-	7.92	-	NA	-	7.84	-	NA
A8-017C-PZ	12/18/2015	25	10-25	NM	-	8.29	-	NA	-	8.19	-	NA	-	8.14	-	NA
A8-017D-PZ	12/18/2015	25	10-25	2.58	-	8.31	-	NA	-	8.11	-	NA	-	7.88	-	NA
A8-017E-PZ	12/18/2015	25	10-25	3.17	-	9.04	-	NA	-	8.96	-	NA	-	8.87	-	NA

Sample ID	Installation Date	Well Total Depth (Feet bgs)	Screen Interval (Feet bgs)	Riser Stick-Up (Feet)	5/16/2016				5/23/2016				6/1/2016			
					Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)
A8-017-PZ	10/27/2015	25	10-25	3.21	-	8.74	-	NA	-	8.39	-	NA	**7.58**	**7.66**	**0.08**	NA
A8-017A-PZ	10/27/2015	8	3-8	2.08	-	3.91	-	NA	-	3.74	-	NA	-	3.95	-	NA
A8-017B-PZ	12/18/2015	25	10-25	2.54	-	7.86	-	NA	-	7.63	-	NA	-	7.79	-	NA
A8-017C-PZ	12/18/2015	25	10-25	NM	-	8.14	-	NA	-	7.92	-	NA	-	8.05	-	NA
A8-017D-PZ	12/18/2015	25	10-25	2.58	-	7.91	-	NA	-	7.62	-	NA	-	7.77	-	NA
A8-017E-PZ	12/18/2015	25	10-25	3.17	-	8.90	-	NA	-	8.68	-	NA	-	8.83	-	NA

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Sample ID	Installation Date	Well Total Depth (Feet bgs)	Screen Interval (Feet bgs)	Riser Stick-Up (Feet)	6/7/2016				6/13/2016				6/20/2016			
					Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)
A8-017-PZ	10/27/2015	25	10-25	3.21	-	8.51	-	NA	-	9.07	-	NA	**9.23**	**9.25**	**0.02**	NA
A8-017A-PZ	10/27/2015	8	3-8	2.08	-	4.03	-	NA	-	4.28	-	NA	-	4.28	-	NA
A8-017B-PZ	12/18/2015	25	10-25	2.54	-	7.73	-	NA	-	8.29	-	NA	-	8.46	-	NA
A8-017C-PZ	12/18/2015	25	10-25	NM	-	8.02	-	NA	-	8.58	-	NA	-	8.75	-	NA
A8-017D-PZ	12/18/2015	25	10-25	2.58	-	7.55	-	NA	-	8.02	-	NA	-	8.32	-	NA
A8-017E-PZ	12/18/2015	25	10-25	3.17	-	8.80	-	NA	-	9.33	-	NA	-	9.54	-	NA

Sample ID	Installation Date	Well Total Depth (Feet bgs)	Screen Interval (Feet bgs)	Riser Stick-Up (Feet)	7/15/2016				7/26/2016				8/2/2016			
					Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)
A8-017-PZ	10/27/2015	25	10-25	3.21	**9.00**	**9.12**	**0.12**	**trace**	**9.31**	**9.56**	**0.25**	NA	-	8.66	-	NA
A8-017A-PZ	10/27/2015	8	3-8	2.08	-	3.76	-	NA	-	4.42	-	NA	-	3.51	-	NA
A8-017B-PZ	12/18/2015	25	10-25	2.54	-	8.29	-	NA	-	8.58	-	NA	-	7.96	-	NA
A8-017C-PZ	12/18/2015	25	10-25	NM	-	8.57	-	NA	-	8.86	-	NA	-	8.25	-	NA
A8-017D-PZ	12/18/2015	25	10-25	2.58	-	8.62	-	NA	-	9.09	-	NA	-	8.52	-	NA
A8-017E-PZ	12/18/2015	25	10-25	3.17	-	9.35	-	NA	-	9.62	-	NA	-	9.02	-	NA

Sample ID	Installation Date	Well Total Depth (Feet bgs)	Screen Interval (Feet bgs)	Riser Stick-Up (Feet)	8/8/2016				8/16/2016				8/23/2016			
					Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)
A8-017-PZ	10/27/2015	25	10-25	3.21	-	9.09	-	NA	-	9.06	-	NA	-	9.06	-	NA
A8-017A-PZ	10/27/2015	8	3-8	2.08	-	4.24	-	NA	-	4.08	-	NA	-	3.93	-	NA
A8-017B-PZ	12/18/2015	25	10-25	2.54	-	8.36	-	NA	-	8.34	-	NA	-	8.35	-	NA
A8-017C-PZ	12/18/2015	25	10-25	NM	-	8.67	-	NA	-	8.63	-	NA	-	8.64	-	NA
A8-017D-PZ	12/18/2015	25	10-25	2.58	-	8.95	-	NA	-	8.92	-	NA	-	8.93	-	NA
A8-017E-PZ	12/18/2015	25	10-25	3.17	-	9.42	-	NA	-	9.4	-	NA	-	9.4	-	NA

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Sample ID	Installation Date	Well Total Depth (Feet bgs)	Screen Interval (Feet bgs)	Riser Stick-Up (Feet)	8/29/2016				9/22/2016				9/28/2016			
					Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)
A8-017-PZ	10/27/2015	25	10-25	3.21	-	9.19	-	NA	**trace**	**9.94**	**trace**	NA	**trace**	**10.03**	**trace**	NA
A8-017A-PZ	10/27/2015	8	3-8	2.08	-	4.33	-	NA	**trace**	**4.60**	**trace**	NA	-	4.66	-	NA
A8-017B-PZ	12/18/2015	25	10-25	2.54	-	8.44	-	NA	NM	NM	NM	NA	NM	NM	NM	NA
A8-017C-PZ	12/18/2015	25	10-25	NM	-	8.73	-	NA	NM	NM	NM	NA	NM	NM	NM	NA
A8-017D-PZ	12/18/2015	25	10-25	2.58	-	9.04	-	NA	NM	NM	NM	NA	NM	NM	NM	NA
A8-017E-PZ	12/18/2015	25	10-25	3.17	-	9.51	-	NA	NM	NM	NM	NA	NM	NM	NM	NA

Sample ID	Installation Date	Well Total Depth (Feet bgs)	Screen Interval (Feet bgs)	Riser Stick-Up (Feet)	10/6/2016				10/12/2016				10/19/2016			
					Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)
A8-017-PZ	10/27/2015	25	10-25	3.21	**9.36**	**9.62**	**0.26**	NA	**9.47**	**9.69**	**0.22**	NA	**9.76**	**10.04**	**0.28**	NA
A8-017A-PZ	10/27/2015	8	3-8	2.08	-	4.36	-	NA	-	4.31	-	NA	-	4.49	-	NA
A8-017B-PZ	12/18/2015	25	10-25	2.54	-	8.6	-	NA	-	8.68	-	NA	-	8.97	-	NA
A8-017C-PZ	12/18/2015	25	10-25	NM	-	8.89	-	NA	-	8.97	-	NA	-	9.3	-	NA
A8-017D-PZ	12/18/2015	25	10-25	2.58	-	9.18	-	NA	-	9.25	-	NA	-	9.53	-	NA
A8-017E-PZ	12/18/2015	25	10-25	3.17	-	9.67	-	NA	-	9.75	-	NA	-	10.05	-	NA

Sample ID	Installation Date	Well Total Depth (Feet bgs)	Screen Interval (Feet bgs)	Riser Stick-Up (Feet)	10/26/2016				11/1/2016				11/11/2016			
					Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)
A8-017-PZ	10/27/2015	25	10-25	3.21	**10.07**	**10.31**	**0.24**	NA	**10.22**	**10.49**	**0.27**	NA	**10.15**	**10.3**	**0.15**	NA
A8-017A-PZ	10/27/2015	8	3-8	2.08	-	4.64	-	NA	-	4.73	-	NA	-	4.9	-	NA
A8-017B-PZ	12/18/2015	25	10-25	2.54	-	9.28	-	NA	-	9.42	-	NA	-	9.36	-	NA
A8-017C-PZ	12/18/2015	25	10-25	NM	-	9.56	-	NA	-	9.7	-	NA	-	9.63	-	NA
A8-017D-PZ	12/18/2015	25	10-25	2.58	-	9.82	-	NA	-	9.94	-	NA	-	9.97	-	NA
A8-017E-PZ	12/18/2015	25	10-25	3.17	-	10.37	-	NA	-	10.51	-	NA	-	10.43	-	NA

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Sample ID	Installation Date	Well Total Depth (Feet bgs)	Screen Interval (Feet bgs)	Riser Stick-Up (Feet)	11/18/2016				12/2/2016				12/9/2016			
					Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)
A8-017-PZ	10/27/2015	25	10-25	3.21	**10.51**	**10.66**	**0.15**	NA	**10.38**	**10.49**	**0.11**	NA	**10.23**	**10.33**	**0.10**	NA
A8-017A-PZ	10/27/2015	8	3-8	2.08	-	5.18	-	NA	-	4.4	-	NA	-	3.93	-	NA
A8-017B-PZ	12/18/2015	25	10-25	2.54	-	9.63	-	NA	-	9.47	-	NA	-	9.35	-	NA
A8-017C-PZ	12/18/2015	25	10-25	NM	-	9.89	-	NA	-	9.75	-	NA	-	9.64	-	NA
A8-017D-PZ	12/18/2015	25	10-25	2.58	-	10.27	-	NA	-	10.14	-	NA	-	9.99	-	NA
A8-017E-PZ	12/18/2015	25	10-25	3.17	-	10.74	-	NA	-	10.6	-	NA	-	10.46	-	NA

Sample ID	Installation Date	Well Total Depth (Feet bgs)	Screen Interval (Feet bgs)	Riser Stick-Up (Feet)	12/16/2016				12/22/2016				12/29/2016			
					Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)
A8-017-PZ	10/27/2015	25	10-25	3.21	**10.2**	**10.45**	**0.25**	NA	**9.58**	**9.98**	**0.40**	NA	**9.36**	**9.46**	**0.10**	NA
A8-017A-PZ	10/27/2015	8	3-8	2.08	-	4.24	-	NA	-	4.03	-	NA	-	3.92	-	NA
A8-017B-PZ	12/18/2015	25	10-25	2.54	-	9.26	-	NA	-	8.68	-	NA	-	8.42	-	NA
A8-017C-PZ	12/18/2015	25	10-25	NM	-	9.56	-	NA	-	8.96	-	NA	-	8.69	-	NA
A8-017D-PZ	12/18/2015	25	10-25	2.58	-	9.93	-	NA	-	9.46	-	NA	-	9.05	-	NA
A8-017E-PZ	12/18/2015	25	10-25	3.17	-	10.41	-	NA	-	9.8	-	NA	-	9.54	-	NA

Sample ID	Installation Date	Well Total Depth (Feet bgs)	Screen Interval (Feet bgs)	Riser Stick-Up (Feet)	1/5/2017				1/13/2017				1/19/2017			
					Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)
A8-017-PZ	10/27/2015	25	10-25	3.21	**9.03**	**9.15**	**0.12**	NA	**9.40**	**9.50**	**0.10**	NA	**9.10**	**9.18**	**0.08**	NA
A8-017A-PZ	10/27/2015	8	3-8	2.08	-	3.84	-	NA	-	3.73	-	NA	-	3.65	-	NA
A8-017B-PZ	12/18/2015	25	10-25	2.54	-	8.26	-	NA	-	8.50	-	NA	-	8.19	-	NA
A8-017C-PZ	12/18/2015	25	10-25	NM	-	8.41	-	NA	-	8.79	-	NA	-	8.50	-	NA
A8-017D-PZ	12/18/2015	25	10-25	2.58	-	8.85	-	NA	-	9.12	-	NA	-	8.83	-	NA
A8-017E-PZ	12/18/2015	25	10-25	3.17	-	9.29	-	NA	-	9.59	-	NA	-	9.27	-	NA

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Sample ID	Installation Date	Well Total Depth (Feet bgs)	Screen Interval (Feet bgs)	Riser Stick-Up (Feet)	1/25/2017				2/2/2017				2/8/2017			
					Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)
A8-017-PZ	10/27/2015	25	10-25	3.21	**8.94**	**9.22**	**0.28**	NA	**9.35**	**9.39**	**0.04**	NA	**9.14**	**9.44**	**0.30**	NA
A8-017A-PZ	10/27/2015	8	3-8	2.08	-	3.61	-	NA	-	3.97	-	NA	-	3.99	-	NA
A8-017B-PZ	12/18/2015	25	10-25	2.54	-	8.02	-	NA	-	8.43	-	NA	-	8.16	-	NA
A8-017C-PZ	12/18/2015	25	10-25	NM	-	8.33	-	NA	-	8.72	-	NA	-	8.45	-	NA
A8-017D-PZ	12/18/2015	25	10-25	2.58	-	8.68	-	NA	-	9.05	-	NA	-	8.81	-	NA
A8-017E-PZ	12/18/2015	25	10-25	3.17	-	9.04	-	NA	-	9.52	-	NA	-	9.27	-	NA

Sample ID	Installation Date	Well Total Depth (Feet bgs)	Screen Interval (Feet bgs)	Riser Stick-Up (Feet)	2/16/2017				2/23/2017				3/16/2017			
					Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)
A8-017-PZ	10/27/2015	25	10-25	3.21	**9.52**	**9.58**	**0.06**	NA	**9.75**	**9.82**	**0.07**	NA	**9.20**	**9.25**	**0.05**	NA
A8-017A-PZ	10/27/2015	8	3-8	2.08	-	4.06	-	NA	-	3.94	-	NA	-	3.85	-	NA
A8-017B-PZ	12/18/2015	25	10-25	2.54	-	8.21	-	NA	-	8.42	-	NA	-	8.26	-	NA
A8-017C-PZ	12/18/2015	25	10-25	NM	-	8.53	-	NA	-	8.64	-	NA	-	8.42	-	NA
A8-017D-PZ	12/18/2015	25	10-25	2.58	-	8.95	-	NA	-	9.06	-	NA	-	8.91	-	NA
A8-017E-PZ	12/18/2015	25	10-25	3.17	-	9.34	-	NA	-	9.44	-	NA	-	9.26	-	NA

Sample ID	Installation Date	Well Total Depth (Feet bgs)	Screen Interval (Feet bgs)	Riser Stick-Up (Feet)	3/28/2017				5/3/2017				8/10/2017			
					Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)
A8-017-PZ	10/27/2015	25	10-25	3.21	**8.91**	**8.96**	**0.05**	NA	**8.92**	**8.93**	**0.01**	NA	-	10.44	-	NA
A8-017A-PZ	10/27/2015	8	3-8	2.08	-	3.91	-	NA	-	4.03	-	NA	-	4.12	-	NA
A8-017B-PZ	12/18/2015	25	10-25	2.54	-	8.01	-	NA	-	8.24	-	NA	-	8.63	-	NA
A8-017C-PZ	12/18/2015	25	10-25	NM	-	8.29	-	NA	-	8.53	-	NA	-	8.93	-	NA
A8-017D-PZ	12/18/2015	25	10-25	2.58	-	8.64	-	NA	-	8.83	-	NA	-	9.28	-	NA
A8-017E-PZ	12/18/2015	25	10-25	3.17	-	9.10	-	NA	-	9.28	-	NA	-	9.71	-	NA

NA = Not Applicable
NM = Not Measured
SHADED = NAPL Detection

NAPL Measurements and Removal Activities
Parcel A8
Tradepoint Atlantic
Sparrows Point, Maryland

Sample ID	Installation Date	Well Total Depth (Feet bgs)	Screen Interval (Feet bgs)	Riser Stick-Up (Feet)	8/14/2017				9/8/2017				10/3/2017			
					Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)	Depth to NAPL (Feet TOC)	Depth to Water (Feet TOC)	NAPL Thickness (Feet)	NAPL Removed (Gallons)
A8-017-PZ	10/27/2015	25	10-25	3.21	**8.97**	**9.85**	**0.88**	NA	**9.02**	**9.89**	**0.87**	NA	**9.73**	**10.68**	**0.95**	NA
A8-017A-PZ	10/27/2015	8	3-8	2.08	-	3.90	-	NA	-	3.80	-	NA	-	4.61	-	NA
A8-017B-PZ	12/18/2015	25	10-25	2.54	-	8.36	-	NA	-	8.26	-	NA	-	9.56	-	NA
A8-017C-PZ	12/18/2015	25	10-25	NM	-	8.65	-	NA	-	8.59	-	NA	-	9.36	-	NA
A8-017D-PZ	12/18/2015	25	10-25	2.58	-	8.97	-	NA	-	8.90	-	NA	-	9.70	-	NA
A8-017E-PZ	12/18/2015	25	10-25	3.17	-	9.44	-	NA	-	9.36	-	NA	-	10.17	-	NA

NA = Not Applicable
NM = Not Measured
SHADED = NAPL Detection

APPENDIX J

QA/QC Tracking Log

Date:		Sample IDs	
10/26/2015	1)	A8-012-SB-1	
	2)	A8-012-SB-5	
	3)	A8-012-SB-10	
	4)	A8-011-SB-1	
	5)	A8-011-SB-5	
	6)	A8-011-SB-10	
10/27/2015	7)	A8-017-SB-1	Duplicate: A8-008-SB-1
	8)	A8-017-SB-7	Date: 10/27/2015
	9)	A8-017-SB-10	MS/MSD: A8-017-SB-7
	10)	A8-008-SB-1	Date: 10/27/2015
	11)	A8-008-SB-5	Field Blank:
	12)	A8-008-SB-10	Date: 10/26/2015
	13)	A8-007-SB-1	Eq. Blank:
	14)	A8-007-SB-5	Date: 10/26/2015
	15)	A8-007-SB-10	
	16)	A8-003-SB-1	
	17)	A8-003-SB-5	
	18)	A8-003-SB-10	
	19)	A8-002-SB-1	
	20)	A8-002-SB-5	

Date:		Sample IDs	
10/29/2015	1)	A8-004-SB-10	
10/30/2015	2)	A8-013-SB-1	
	3)	A8-013-SB-5	
	4)	A8-013-SB-10	
	5)	A8-014-SB-1	
	6)	A8-014-SB-5	
	7)	A8-014-SB-10	Duplicate: A8-013-SB-5
	8)	A8-019-SB-1	Date: 10/30/2015
	9)	A8-019-SB-5	MS/MSD: A8-014-SB-1
	10)	A8-019-SB-10	Date: 10/30/2015
	11)	A8-018-SB-1	Field Blank:
	12)	A8-018-SB-5	Date: 10/30/2015
	13)	A8-018-SB-10	Eq. Blank:
	14)	A8-016-SB-1	Date: 10/30/2015
	15)	A8-016-SB-5	Notes: *SVOCs only
	16)	A8-016-SB-10	and no trip blank
	17)	A8-015-SB-1	
	18)	A8-015-SB-7	
	19)	A8-015-SB-10	
*3/17/2016	20)	A8-006-SB-1	

10/27/2015	1)	A8-002-SB-10	
10/29/2015	2)	A8-020-SB-1	
	3)	A8-020-SB-5	
	4)	A8-020-SB-10	
	5)	A8-001-SB-1	
	6)	A8-001-SB-4	
	7)	A8-001-SB-10	Duplicate: A8-020-SB-5
	8)	A8-009-SB-1	Date: 10/29/2015
	9)	A8-009-SB-5	MS/MSD: A8-009-SB-5
	10)	A8-009-SB-10	Date: 10/29/2015
	11)	A8-010-SB-1	Field Blank:
	12)	A8-010-SB-5	Date: 10/29/2015
	13)	A8-010-SB-10	Eq. Blank:
	14)	A8-006-SB-1	Date: 10/29/2015
	15)	A8-006-SB-4	
	16)	A8-006-SB-10	
	17)	A8-005-SB-1	
	18)	A8-005-SB-5	
	19)	A8-004-SB-1	
	20)	A8-004-SB-5	

*3/17/2016	1)	A8-006-SB-4	
	2)	A8-005-SB-1	
	3)	A8-005-SB-5	
	4)	A8-004-SB-1	
	5)	A8-004-SB-5	
	6)	A8-007-SB-1	
	7)	A8-007-SB-5	Duplicate: A8-007-SB-5
	8)	A8-011-SB-1	Date: 3/17/2016
	9)	A8-011-SB-5	MS/MSD: A8-017-SB-1
	10)	A8-012-SB-1	Date: 3/17/2016
	11)	A8-012-SB-5	Field Blank:
	12)	A8-017-SB-1	Date: 3/18/2016
	13)	A8-017-SB-7	Eq. Blank:
*3/18/2016	14)	A8-008-SB-1	Date: 3/18/2016
	15)	A8-008-SB-5	Notes: *SVOCs only
	16)	A8-003-SB-1	and no trip blank
	17)	A8-003-SB-5	
	18)	A8-002-SB-1	
	19)	A8-002-SB-5	
	20)	A8-020-SB-1	

Trip Blanks: 10/26/2015, 10/27/2015, 10/29/2015, 10/30/2015

QA/QC Tracking Log

Date:		Sample IDs	
	1)	A8-020-SB-5	
	2)	A8-001-SB-1	
	3)	A8-001-SB-4	
	4)	A8-009-SB-1	
	5)	A8-009-SB-5	
	6)	A8-010-SB-1	
	7)	A8-010-SB-5	Duplicate: A8-020-SB-1
	8)	A8-013-SB-1	Date: 3/18/2016
	9)	A8-013-SB-5	MS/MSD: A8-013-SB-5
*3/18/2016	10)	A8-014-SB-1	Date: 3/18/2016
	11)	A8-014-SB-5	Field Blank:
	12)	A8-019-SB-1	Date: 3/18/2016
	13)	A8-019-SB-5	Eq. Blank:
	14)	A8-018-SB-1	Date: 3/18/2016
	15)	A8-018-SB-5	Notes: *SVOCs only
	16)	A8-015-SB-1	and no trip blank
	17)	A8-015-SB-7	
	18)	A8-016-SB-1	
	19)	A8-016-SB-5	
*4/13/2016	20)	A8-006-SB-10	

Date:		Sample IDs	
	1)		
	2)		
	3)		
	4)		
	5)		
	6)		
	7)		Duplicate:
	8)		Date:
	9)		MS/MSD:
	10)		Date:
	11)		Field Blank:
	12)		Date:
	13)		Eq. Blank:
	14)		Date:
	15)		
	16)		
	17)		
	18)		
	19)		
	20)		

*4/13/2016	1)	A8-005-SB-10	
	2)	A8-004-SB-10	
	3)		
	4)		
	5)		
	6)		
	7)		Duplicate: A8-006-SB-10
	8)		Date: 4/13/2016
	9)		MS/MSD: A8-004-SB-10
	10)		Date: 4/13/2016
	11)		Field Blank:
	12)		Date: 4/13/2016
	13)		Eq. Blank:
	14)		Date: 4/13/2016
	15)		Notes: *SVOCs only
	16)		and no trip blank
	17)		
	18)		
	19)		
	20)		

1)		
2)		
3)		
4)		
5)		
6)		
7)		Duplicate:
8)		Date:
9)		MS/MSD:
10)		Date:
11)		Field Blank:
12)		Date:
13)		Eq. Blank:
14)		Date:
15)		
16)		
17)		
18)		
19)		
20)		

Trip Blanks:

APPENDIX K

EVALUATION OF DATA COMPLETENESS
Percentage of Non-rejected Results vs. Total Results

Parameter	Parameter Group	Matrix	Unit	Number of Result	Detections	Number of Rejected Results	Number of Non-rejected Results	Completeness
Cyanide	CN	Soil	mg/kg	40	22	0	40	100.00%
Aluminum	Metal	Soil	mg/kg	40	40	0	40	100.00%
Antimony	Metal	Soil	mg/kg	40	2	0	40	100.00%
Arsenic	Metal	Soil	mg/kg	56	53	0	56	100.00%
Barium	Metal	Soil	mg/kg	40	40	0	40	100.00%
Beryllium	Metal	Soil	mg/kg	40	21	0	40	100.00%
Cadmium	Metal	Soil	mg/kg	40	18	0	40	100.00%
Chromium	Metal	Soil	mg/kg	40	40	0	40	100.00%
Chromium VI	Metal	Soil	mg/kg	40	4	0	40	100.00%
Cobalt	Metal	Soil	mg/kg	40	32	0	40	100.00%
Copper	Metal	Soil	mg/kg	40	40	0	40	100.00%
Iron	Metal	Soil	mg/kg	40	40	0	40	100.00%
Lead	Metal	Soil	mg/kg	40	40	0	40	100.00%
Manganese	Metal	Soil	mg/kg	40	40	0	40	100.00%
Mercury	Metal	Soil	mg/kg	40	36	0	40	100.00%
Nickel	Metal	Soil	mg/kg	40	37	0	40	100.00%
Selenium	Metal	Soil	mg/kg	40	3	0	40	100.00%
Silver	Metal	Soil	mg/kg	40	0	0	40	100.00%
Thallium	Metal	Soil	mg/kg	40	2	0	40	100.00%
Vanadium	Metal	Soil	mg/kg	40	40	0	40	100.00%
Zinc	Metal	Soil	mg/kg	40	40	0	40	100.00%
Aroclor 1016	PCB	Soil	mg/kg	20	0	0	20	100.00%
Aroclor 1221	PCB	Soil	mg/kg	20	0	0	20	100.00%
Aroclor 1232	PCB	Soil	mg/kg	20	0	0	20	100.00%
Aroclor 1242	PCB	Soil	mg/kg	20	0	0	20	100.00%
Aroclor 1248	PCB	Soil	mg/kg	20	0	0	20	100.00%
Aroclor 1254	PCB	Soil	mg/kg	20	3	0	20	100.00%
Aroclor 1260	PCB	Soil	mg/kg	20	4	0	20	100.00%
PCBs (total)	PCB	Soil	mg/kg	20	3	0	20	100.00%
1,1-Biphenyl	SVOC	Soil	mg/kg	43	14	0	43	100.00%
1,2,4,5-Tetrachlorobenzene	SVOC	Soil	mg/kg	43	0	0	43	100.00%
2,3,4,6-Tetrachlorophenol	SVOC	Soil	mg/kg	43	0	6	37	86.05%
2,4,5-Trichlorophenol	SVOC	Soil	mg/kg	43	0	5	38	88.37%
2,4,6-Trichlorophenol	SVOC	Soil	mg/kg	43	0	5	38	88.37%
2,4-Dichlorophenol	SVOC	Soil	mg/kg	43	0	5	38	88.37%
2,4-Dimethylphenol	SVOC	Soil	mg/kg	43	2	4	39	90.70%
2,4-Dinitrophenol	SVOC	Soil	mg/kg	43	0	6	37	86.05%
2,4-Dinitrotoluene	SVOC	Soil	mg/kg	43	0	0	43	100.00%
2,6-Dinitrotoluene	SVOC	Soil	mg/kg	43	0	0	43	100.00%
2-Chloronaphthalene	SVOC	Soil	mg/kg	43	0	0	43	100.00%
2-Chlorophenol	SVOC	Soil	mg/kg	43	0	5	38	88.37%
2-Methylnaphthalene	SVOC	Soil	mg/kg	43	29	0	43	100.00%
2-Methylphenol	SVOC	Soil	mg/kg	43	1	5	38	88.37%
2-Nitroaniline	SVOC	Soil	mg/kg	43	0	0	43	100.00%
3&4-Methylphenol(m&p Cresol)	SVOC	Soil	mg/kg	43	3	3	40	93.02%
3,3'-Dichlorobenzidine	SVOC	Soil	mg/kg	43	0	0	43	100.00%
4-Chloroaniline	SVOC	Soil	mg/kg	43	0	0	43	100.00%
4-Nitroaniline	SVOC	Soil	mg/kg	43	0	0	43	100.00%
Acenaphthene	SVOC	Soil	mg/kg	43	21	0	43	100.00%
Acenaphthylene	SVOC	Soil	mg/kg	43	21	0	43	100.00%
Acetophenone	SVOC	Soil	mg/kg	43	2	0	43	100.00%
Anthracene	SVOC	Soil	mg/kg	43	31	0	43	100.00%
Benz[a]anthracene	SVOC	Soil	mg/kg	43	32	0	43	100.00%
Benzaldehyde	SVOC	Soil	mg/kg	43	6	37	6	13.95%
Benzo[a]pyrene	SVOC	Soil	mg/kg	43	28	0	43	100.00%
Benzo[b]fluoranthene	SVOC	Soil	mg/kg	43	32	0	43	100.00%
Benzo[g,h,i]perylene	SVOC	Soil	mg/kg	43	33	0	43	100.00%

EVALUATION OF DATA COMPLETENESS
Percentage of Non-rejected Results vs. Total Results

Parameter	Parameter Group	Matrix	Unit	Number of Result	Detections	Number of Rejected Results	Number of Non-rejected Results	Completeness
Benzo[k]fluoranthene	SVOC	Soil	mg/kg	43	32	0	43	100.00%
bis(2-chloroethoxy)methane	SVOC	Soil	mg/kg	43	0	0	43	100.00%
bis(2-Chloroethyl)ether	SVOC	Soil	mg/kg	43	0	0	43	100.00%
bis(2-Chloroisopropyl)ether	SVOC	Soil	mg/kg	43	0	0	43	100.00%
bis(2-Ethylhexyl)phthalate	SVOC	Soil	mg/kg	43	8	0	43	100.00%
Caprolactam	SVOC	Soil	mg/kg	43	0	0	43	100.00%
Carbazole	SVOC	Soil	mg/kg	43	13	0	43	100.00%
Chrysene	SVOC	Soil	mg/kg	43	35	0	43	100.00%
Dibenz[a,h]anthracene	SVOC	Soil	mg/kg	43	18	0	43	100.00%
Diethylphthalate	SVOC	Soil	mg/kg	43	0	0	43	100.00%
Di-n-butylphthalate	SVOC	Soil	mg/kg	43	3	0	43	100.00%
Di-n-ocytlphthalate	SVOC	Soil	mg/kg	43	0	0	43	100.00%
Fluoranthene	SVOC	Soil	mg/kg	43	37	0	43	100.00%
Fluorene	SVOC	Soil	mg/kg	43	27	0	43	100.00%
Hexachlorobenzene	SVOC	Soil	mg/kg	43	0	0	43	100.00%
Hexachlorobutadiene	SVOC	Soil	mg/kg	43	0	0	43	100.00%
Hexachlorocyclopentadiene	SVOC	Soil	mg/kg	43	0	0	43	100.00%
Hexachloroethane	SVOC	Soil	mg/kg	43	0	0	43	100.00%
Indeno[1,2,3-c,d]pyrene	SVOC	Soil	mg/kg	43	22	0	43	100.00%
Isophorone	SVOC	Soil	mg/kg	43	0	0	43	100.00%
Naphthalene	SVOC	Soil	mg/kg	43	31	0	43	100.00%
Nitrobenzene	SVOC	Soil	mg/kg	43	0	0	43	100.00%
N-Nitroso-di-n-propylamine	SVOC	Soil	mg/kg	43	0	0	43	100.00%
N-Nitrosodiphenylamine	SVOC	Soil	mg/kg	43	1	0	43	100.00%
Pentachlorophenol	SVOC	Soil	mg/kg	43	0	6	37	86.05%
Phenanthrene	SVOC	Soil	mg/kg	43	32	0	43	100.00%
Phenol	SVOC	Soil	mg/kg	43	4	3	40	93.02%
Pyrene	SVOC	Soil	mg/kg	43	38	0	43	100.00%
Diesel Range Organics	TPH	Soil	mg/kg	6	6	0	6	100.00%
Gasoline Range Organics	TPH	Soil	mg/kg	12	0	0	12	100.00%
Oil and Grease	TPH	Soil	mg/kg	40	40	0	40	100.00%
1,1,1-Trichloroethane	VOC	Soil	mg/kg	40	0	0	40	100.00%
1,1,2,2-Tetrachloroethane	VOC	Soil	mg/kg	40	0	0	40	100.00%
1,1,2-Trichloro-1,2,2-Trifluoroethane	VOC	Soil	mg/kg	40	0	0	40	100.00%
1,1,2-Trichloroethane	VOC	Soil	mg/kg	40	0	0	40	100.00%
1,1-Dichloroethane	VOC	Soil	mg/kg	40	2	0	40	100.00%
1,1-Dichloroethene	VOC	Soil	mg/kg	40	1	0	40	100.00%
1,2,3-Trichlorobenzene	VOC	Soil	mg/kg	40	0	0	40	100.00%
1,2,4-Trichlorobenzene	VOC	Soil	mg/kg	40	0	0	40	100.00%
1,2-Dibromo-3-chloropropane	VOC	Soil	mg/kg	40	0	0	40	100.00%
1,2-Dibromoethane	VOC	Soil	mg/kg	40	0	0	40	100.00%
1,2-Dichlorobenzene	VOC	Soil	mg/kg	40	0	0	40	100.00%
1,2-Dichloroethane	VOC	Soil	mg/kg	40	0	0	40	100.00%
1,2-Dichloroethene (Total)	VOC	Soil	mg/kg	40	0	0	40	100.00%
1,2-Dichloropropane	VOC	Soil	mg/kg	40	0	0	40	100.00%
1,3-Dichlorobenzene	VOC	Soil	mg/kg	40	0	0	40	100.00%
1,4-Dichlorobenzene	VOC	Soil	mg/kg	40	0	0	40	100.00%
2-Butanone (MEK)	VOC	Soil	mg/kg	40	19	0	40	100.00%
2-Hexanone	VOC	Soil	mg/kg	40	3	0	40	100.00%
4-Methyl-2-pentanone (MIBK)	VOC	Soil	mg/kg	40	0	0	40	100.00%
Acetone	VOC	Soil	mg/kg	40	30	0	40	100.00%
Benzene	VOC	Soil	mg/kg	40	11	0	40	100.00%
Bromodichloromethane	VOC	Soil	mg/kg	40	0	0	40	100.00%
Bromoform	VOC	Soil	mg/kg	40	0	0	40	100.00%
Bromomethane	VOC	Soil	mg/kg	40	0	0	40	100.00%
Carbon disulfide	VOC	Soil	mg/kg	40	3	0	40	100.00%
Carbon tetrachloride	VOC	Soil	mg/kg	40	0	0	40	100.00%

EVALUATION OF DATA COMPLETENESS
Percentage of Non-rejected Results vs. Total Results

Parameter	Parameter Group	Matrix	Unit	Number of Result	Detections	Number of Rejected Results	Number of Non-rejected Results	Completeness
Chlorobenzene	VOC	Soil	mg/kg	40	0	0	40	100.00%
Chloroethane	VOC	Soil	mg/kg	40	0	3	37	92.50%
Chloroform	VOC	Soil	mg/kg	40	4	0	40	100.00%
Chloromethane	VOC	Soil	mg/kg	40	0	0	40	100.00%
cis-1,2-Dichloroethene	VOC	Soil	mg/kg	40	0	0	40	100.00%
cis-1,3-Dichloropropene	VOC	Soil	mg/kg	40	0	0	40	100.00%
Cyclohexane	VOC	Soil	mg/kg	40	5	0	40	100.00%
Dibromochloromethane	VOC	Soil	mg/kg	40	0	0	40	100.00%
Dichlorodifluoromethane	VOC	Soil	mg/kg	40	0	0	40	100.00%
Ethylbenzene	VOC	Soil	mg/kg	40	0	0	40	100.00%
Isopropylbenzene	VOC	Soil	mg/kg	40	1	0	40	100.00%
Methyl Acetate	VOC	Soil	mg/kg	40	0	22	18	45.00%
Methyl tert-butyl ether (MTBE)	VOC	Soil	mg/kg	40	0	0	40	100.00%
Methylene Chloride	VOC	Soil	mg/kg	40	14	0	40	100.00%
Styrene	VOC	Soil	mg/kg	40	1	0	40	100.00%
Tetrachloroethene	VOC	Soil	mg/kg	40	9	0	40	100.00%
Toluene	VOC	Soil	mg/kg	40	14	0	40	100.00%
trans-1,2-Dichloroethene	VOC	Soil	mg/kg	40	0	0	40	100.00%
trans-1,3-Dichloropropene	VOC	Soil	mg/kg	40	0	0	40	100.00%
Trichloroethene	VOC	Soil	mg/kg	40	7	0	40	100.00%
Trichlorofluoromethane	VOC	Soil	mg/kg	40	3	0	40	100.00%
Vinyl chloride	VOC	Soil	mg/kg	40	0	0	40	100.00%
Xylenes	VOC	Soil	mg/kg	40	4	0	40	100.00%
1,4-Dioxane	VOC/SVOC	Soil	mg/kg	40	0	40	0	0.00%
Cyanide	CN	Water	ug/L	7	0	0	7	100.00%
Aluminum	Metal	Water	ug/L	7	6	0	7	100.00%
Antimony	Metal	Water	ug/L	7	0	0	7	100.00%
Arsenic	Metal	Water	ug/L	7	3	0	7	100.00%
Barium	Metal	Water	ug/L	7	6	0	7	100.00%
Beryllium	Metal	Water	ug/L	7	0	0	7	100.00%
Cadmium	Metal	Water	ug/L	7	0	0	7	100.00%
Chromium	Metal	Water	ug/L	7	0	0	7	100.00%
Chromium VI	Metal	Water	ug/L	8	2	0	8	100.00%
Cobalt	Metal	Water	ug/L	7	3	0	7	100.00%
Copper	Metal	Water	ug/L	7	2	0	7	100.00%
Iron	Metal	Water	ug/L	7	6	0	7	100.00%
Lead	Metal	Water	ug/L	7	0	0	7	100.00%
Manganese	Metal	Water	ug/L	7	6	0	7	100.00%
Mercury	Metal	Water	ug/L	7	0	0	7	100.00%
Nickel	Metal	Water	ug/L	7	3	0	7	100.00%
Selenium	Metal	Water	ug/L	7	0	0	7	100.00%
Silver	Metal	Water	ug/L	7	0	0	7	100.00%
Thallium	Metal	Water	ug/L	7	0	0	7	100.00%
Vanadium	Metal	Water	ug/L	7	5	0	7	100.00%
Zinc	Metal	Water	ug/L	7	3	0	7	100.00%
1,1-Biphenyl	SVOC	Water	ug/L	7	1	0	7	100.00%
1,2,4,5-Tetrachlorobenzene	SVOC	Water	ug/L	7	0	0	7	100.00%
2,3,4,6-Tetrachlorophenol	SVOC	Water	ug/L	7	0	0	7	100.00%
2,4,5-Trichlorophenol	SVOC	Water	ug/L	7	0	0	7	100.00%
2,4,6-Trichlorophenol	SVOC	Water	ug/L	7	0	0	7	100.00%
2,4-Dichlorophenol	SVOC	Water	ug/L	7	0	0	7	100.00%
2,4-Dimethylphenol	SVOC	Water	ug/L	7	0	0	7	100.00%
2,4-Dinitrophenol	SVOC	Water	ug/L	7	0	0	7	100.00%
2,4-Dinitrotoluene	SVOC	Water	ug/L	7	0	0	7	100.00%
2,6-Dinitrotoluene	SVOC	Water	ug/L	7	0	0	7	100.00%
2-Chloronaphthalene	SVOC	Water	ug/L	7	0	0	7	100.00%
2-Chlorophenol	SVOC	Water	ug/L	7	0	0	7	100.00%

EVALUATION OF DATA COMPLETENESS
Percentage of Non-rejected Results vs. Total Results

Parameter	Parameter Group	Matrix	Unit	Number of Result	Detections	Number of Rejected Results	Number of Non-rejected Results	Completeness
2-Methylnaphthalene	SVOC	Water	ug/L	7	2	0	7	100.00%
2-Methylphenol	SVOC	Water	ug/L	7	1	0	7	100.00%
2-Nitroaniline	SVOC	Water	ug/L	7	0	0	7	100.00%
3&4-Methylphenol(m&p Cresol)	SVOC	Water	ug/L	7	0	0	7	100.00%
3,3'-Dichlorobenzidine	SVOC	Water	ug/L	7	0	7	0	0.00%
4-Chloroaniline	SVOC	Water	ug/L	7	0	0	7	100.00%
4-Nitroaniline	SVOC	Water	ug/L	7	0	0	7	100.00%
Acenaphthene	SVOC	Water	ug/L	7	2	0	7	100.00%
Acenaphthylene	SVOC	Water	ug/L	7	1	0	7	100.00%
Acetophenone	SVOC	Water	ug/L	7	1	0	7	100.00%
Anthracene	SVOC	Water	ug/L	7	4	0	7	100.00%
Benz[a]anthracene	SVOC	Water	ug/L	7	1	0	7	100.00%
Benzaldehyde	SVOC	Water	ug/L	7	0	0	7	100.00%
Benzo[a]pyrene	SVOC	Water	ug/L	7	2	0	7	100.00%
Benzo[b]fluoranthene	SVOC	Water	ug/L	7	1	0	7	100.00%
Benzo[g,h,i]perylene	SVOC	Water	ug/L	7	3	0	7	100.00%
Benzo[k]fluoranthene	SVOC	Water	ug/L	7	1	0	7	100.00%
bis(2-chloroethoxy)methane	SVOC	Water	ug/L	7	0	0	7	100.00%
bis(2-Chloroethyl)ether	SVOC	Water	ug/L	7	0	0	7	100.00%
bis(2-Chloroisopropyl)ether	SVOC	Water	ug/L	7	0	0	7	100.00%
bis(2-Ethylhexyl)phthalate	SVOC	Water	ug/L	7	1	0	7	100.00%
Caprolactam	SVOC	Water	ug/L	7	0	0	7	100.00%
Carbazole	SVOC	Water	ug/L	7	1	0	7	100.00%
Chrysene	SVOC	Water	ug/L	7	1	0	7	100.00%
Dibenz[a,h]anthracene	SVOC	Water	ug/L	7	0	0	7	100.00%
Diethylphthalate	SVOC	Water	ug/L	7	0	0	7	100.00%
Di-n-butylphthalate	SVOC	Water	ug/L	7	1	0	7	100.00%
Di-n-ocytlphthalate	SVOC	Water	ug/L	7	0	0	7	100.00%
Fluoranthene	SVOC	Water	ug/L	7	4	0	7	100.00%
Fluorene	SVOC	Water	ug/L	7	4	0	7	100.00%
Hexachlorobenzene	SVOC	Water	ug/L	7	0	0	7	100.00%
Hexachlorobutadiene	SVOC	Water	ug/L	7	0	0	7	100.00%
Hexachlorocyclopentadiene	SVOC	Water	ug/L	7	0	0	7	100.00%
Hexachloroethane	SVOC	Water	ug/L	7	0	0	7	100.00%
Indeno[1,2,3-c,d]pyrene	SVOC	Water	ug/L	7	1	0	7	100.00%
Isophorone	SVOC	Water	ug/L	7	0	0	7	100.00%
Naphthalene	SVOC	Water	ug/L	7	6	0	7	100.00%
Nitrobenzene	SVOC	Water	ug/L	7	0	0	7	100.00%
N-Nitroso-di-n-propylamine	SVOC	Water	ug/L	7	0	0	7	100.00%
N-Nitrosodiphenylamine	SVOC	Water	ug/L	7	0	0	7	100.00%
Pentachlorophenol	SVOC	Water	ug/L	7	3	0	7	100.00%
Phenanthrene	SVOC	Water	ug/L	7	4	0	7	100.00%
Phenol	SVOC	Water	ug/L	7	0	0	7	100.00%
Pyrene	SVOC	Water	ug/L	7	4	0	7	100.00%
Diesel Range Organics	TPH	Water	ug/L	2	2	0	2	100.00%
Gasoline Range Organics	TPH	Water	ug/L	2	0	0	2	100.00%
Oil and Grease	TPH	Water	ug/L	7	1	0	7	100.00%
1,1,1-Trichloroethane	VOC	Water	ug/L	7	1	0	7	100.00%
1,1,2,2-Tetrachloroethane	VOC	Water	ug/L	7	0	0	7	100.00%
1,1,2-Trichloro-1,2,2-Trifluoroethane	VOC	Water	ug/L	7	0	0	7	100.00%
1,1,2-Trichloroethane	VOC	Water	ug/L	7	0	0	7	100.00%
1,1-Dichloroethane	VOC	Water	ug/L	7	4	0	7	100.00%
1,1-Dichloroethene	VOC	Water	ug/L	7	3	0	7	100.00%
1,2,3-Trichlorobenzene	VOC	Water	ug/L	7	0	0	7	100.00%
1,2,4-Trichlorobenzene	VOC	Water	ug/L	7	0	0	7	100.00%
1,2-Dibromo-3-chloropropane	VOC	Water	ug/L	7	0	0	7	100.00%
1,2-Dibromoethane	VOC	Water	ug/L	7	0	0	7	100.00%

EVALUATION OF DATA COMPLETENESS
Percentage of Non-rejected Results vs. Total Results

Parameter	Parameter Group	Matrix	Unit	Number of Result	Detections	Number of Rejected Results	Number of Non-rejected Results	Completeness
1,2-Dichlorobenzene	VOC	Water	ug/L	7	0	0	7	100.00%
1,2-Dichloroethane	VOC	Water	ug/L	7	1	0	7	100.00%
1,2-Dichloroethene (Total)	VOC	Water	ug/L	7	1	0	7	100.00%
1,2-Dichloropropane	VOC	Water	ug/L	7	0	0	7	100.00%
1,3-Dichlorobenzene	VOC	Water	ug/L	7	0	0	7	100.00%
1,4-Dichlorobenzene	VOC	Water	ug/L	7	0	0	7	100.00%
2-Butanone (MEK)	VOC	Water	ug/L	7	0	0	7	100.00%
2-Hexanone	VOC	Water	ug/L	7	0	0	7	100.00%
4-Methyl-2-pentanone (MIBK)	VOC	Water	ug/L	7	0	0	7	100.00%
Acetone	VOC	Water	ug/L	7	1	6	1	14.29%
Benzene	VOC	Water	ug/L	7	2	0	7	100.00%
Bromodichloromethane	VOC	Water	ug/L	7	0	0	7	100.00%
Bromoform	VOC	Water	ug/L	7	0	0	7	100.00%
Bromomethane	VOC	Water	ug/L	7	0	0	7	100.00%
Carbon disulfide	VOC	Water	ug/L	7	1	0	7	100.00%
Carbon tetrachloride	VOC	Water	ug/L	7	0	0	7	100.00%
Chlorobenzene	VOC	Water	ug/L	7	0	0	7	100.00%
Chloroethane	VOC	Water	ug/L	7	0	0	7	100.00%
Chloroform	VOC	Water	ug/L	7	2	0	7	100.00%
Chloromethane	VOC	Water	ug/L	7	0	0	7	100.00%
cis-1,2-Dichloroethene	VOC	Water	ug/L	7	2	0	7	100.00%
cis-1,3-Dichloropropene	VOC	Water	ug/L	7	0	0	7	100.00%
Cyclohexane	VOC	Water	ug/L	7	1	0	7	100.00%
Dibromochloromethane	VOC	Water	ug/L	7	0	0	7	100.00%
Dichlorodifluoromethane	VOC	Water	ug/L	7	0	0	7	100.00%
Ethylbenzene	VOC	Water	ug/L	7	1	0	7	100.00%
Isopropylbenzene	VOC	Water	ug/L	7	1	0	7	100.00%
Methyl Acetate	VOC	Water	ug/L	7	0	7	0	0.00%
Methyl tert-butyl ether (MTBE)	VOC	Water	ug/L	7	1	0	7	100.00%
Methylene Chloride	VOC	Water	ug/L	7	0	0	7	100.00%
Styrene	VOC	Water	ug/L	7	0	0	7	100.00%
Tetrachloroethene	VOC	Water	ug/L	7	2	0	7	100.00%
Toluene	VOC	Water	ug/L	7	4	0	7	100.00%
trans-1,2-Dichloroethene	VOC	Water	ug/L	7	1	0	7	100.00%
trans-1,3-Dichloropropene	VOC	Water	ug/L	7	0	0	7	100.00%
Trichloroethene	VOC	Water	ug/L	7	4	0	7	100.00%
Trichlorofluoromethane	VOC	Water	ug/L	7	2	0	7	100.00%
Vinyl chloride	VOC	Water	ug/L	7	1	0	7	100.00%
Xylenes	VOC	Water	ug/L	7	3	0	7	100.00%
1,4-Dioxane	VOC/SVOC	Water	ug/L	7	5	0	7	100.00%

APPENDIX L

Construction Worker Soil Screening Levels
250 Work Day Exposure
Calculation Spreadsheet - Parcel A8

Description	Variable	Value
Days worked per week	DW	5
Exposure duration (yr)	ED	1
Hours worked per day	ET	8
A/constant (unitless) - particulate emission factor	Aconst	12.9351
B/constant (unitless) - particulate emission factor	Bconst	5.7383
C/constant (unitless) - particulate emission factor	Cconst	71.7711
Dispersion correction factor (unitless)	FD	0.185
Days per year with at least .01" precipitation	P	130
Target hazard quotient (unitless)	THQ	1
Body weight (kg)	BW	80
Averaging time - noncancer (yr)	ATnc	1
Soil ingestion rate (mg/d)	IR	330
Skin-soil adherence factor (mg/cm2)	AF	0.3
Skin surface exposed (cm2)	SA	3300
Event frequency (ev/day)	EV	1
Target cancer risk (unitless)	TR	01E-06
Averaging time - cancer (yr)	ATc	70
A/constant (unitless) - volatilization	Aconstv	2.4538
B/constant (unitless) - volatilization	Bconstv	17.566
C/constant (unitless) - volatilization	Cconstv	189.0426
Dry soil bulk density (kg/L)	Pb	1.5
Average source depth (m)	ds	3
Soil particle density (g/cm3)	Ps	2.65
Total soil porosity	Lpore/Lsoil	0.43
Air-filled soil porosity	Lair/Lsoil	0.28

Construction Worker Soil Screening Levels
250 Work Day Exposure
Calculation Spreadsheet - Parcel A8

Area of site (ac)	Ac	27.1
Overall duration of construction (wk/yr)	EW	50
Exposure frequency (day/yr)	EF	**250**
Cars per day	Ca	5
Tons per car	CaT	2
Trucks per day	Tru	5
Tons per truck	TrT	20
Mean vehicle weight (tons)	w	**11**
Derivation of dispersion factor - particulate emission factor (g/m2-s per kg/m3)	Q/Csr	**14.1**
Overall duration of traffic (s)	Tt	**7,200,000**
Surface area (m2)	AR	**109,670**
Length (m)	LR	**331**
Distance traveled (km)	ΣVKT	**828**
Particulate emission factor (m3/kg)	PEFsc	**120,355,340**
Derivation of dispersion factor - volatilization (g/m2-s per kg/m3)	Q/Csa	**7.20**
Total time of construction (s)	Tcv	**7,200,000**

Input
Calculation

Chemical	Toxicity Criteria Source	^Ingestion SF (mg/kg-day)$^{-1}$	^Inhalation Unit Risk (ug/m^3)$^{-1}$	^Subchronic RfD (mg/kg-day)	^Subchronic RfC (mg/m^3)	^GIABS	Dermally Adjusted RfD (mg/kg-day)	^ABS	^RBA	*Dia	*Diw	*Henry's Law Constant (unitless)	*Kd	*Koc	DA	Volatilization Factor - Unlimited Reservoir (m^3/kg)	Carcinogenic Ingestion/ Dermal SL (SLing/der)	Carcinogenic Inhalation SL (SLinh)	Carcinogenic SL (mg/kg)	Non-Carcinogenic Ingestion/ Dermal SL (SLing/der)	Non-Carcinogenic Inhalation SL (SLinh)	Non-Carcinogenic SL (mg/kg)
Arsenic, Inorganic	I/C	1.50E+00	4.30E-03	3.00E-04	1.50E-05	1	3.00E-04	0.03	0.6			-	2.90E+01				15.2	8,582	15.1	97.4	7,907	96.2
Iron	P	-	-	7.00E-01	-	1	7.00E-01	**0.01**	1			-	2.50E+01							240,541		240,541
Manganese (Non-diet)	I	-	-	2.40E-02	5.00E-05	0.04	9.60E-04	**0.01**	1			-	6.50E+01							4,854	26,358	4,099
Thallium (Soluble Salts)	P	-	-	4.00E-05	-	1	4.00E-05	**0.01**	1			-	7.10E+01							13.7		13.7
Vanadium and Compounds	A	-	-	1.00E-02	1.00E-04	0.026	2.60E-04	**0.01**	1			-	1.00E+03							1,643	52,716	1,594
Benz[a]anthracene	I	1.00E-01	6.00E-05	-	-	1		0.13	1	2.60E-02	6.70E-06	4.91E-04	1.08E+03	1.80E+05	6.71E-10	2.38E+5	178	1,214	155			
Benzo[a]pyrene	I	1.00E+00	6.00E-04	3.00E-04	2.00E-06	1	3.00E-04	0.13	1	4.80E-02	5.60E-06	1.87E-05	3.54E+03	5.90E+05	2.37E-11	1.27E+6	17.8	641	17.3	76.4	11.0	9.61
Benzo[b]fluoranthene	I	1.00E-01	6.00E-05	-	-	1		0.13	1	4.80E-02	5.60E-06	2.69E-05	3.60E+03	6.00E+05	2.91E-11	1.14E+6	178	5,787	173			
Dibenz[a,h]anthracene	I	1.00E+00	6.00E-04	-	-	1		0.13	1	4.50E-02	5.20E-06	5.76E-06	1.14E+04	1.90E+06	4.13E-12	3.04E+6	17.8	1,513	17.6			

*chemical specific parameters found in Chemical Specific Parameters Spreadsheet at https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-may-2016
^chemical specific parameters found in Unpaved Road Traffic calculator at https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search
I: chemical specific parameters found in the IRIS at https://www.epa.gov/iris or IRIS 2017 Recent Additions at https://www.epa.gov/iris/iris-recent-additions ; in addition, PAH compounds were adjusted based on the relative potency factor
C: chemical specific parameters found in Cal EPA at https://www.dtsc.ca.gov/AssessingRisk/upload/HHRA-Note-3-2016-01.pdf
A: chemical specific parameters found in Agency for Toxic Substances and Disease Registry Minimal Risk Levels (MRLs) at https://www.atsdr.cdc.gov/mrls/pdfs/atsdr_mrls.pdf
P: chemical specific parameters found in the Database of EPA PPRTVs at https://hhpprtv.ornl.gov/quickview/pprtv.php