RESPONSE ACTION COMPLETION REPORT

AREA A: PARCEL A3
METALS RESPONSE AREAS
TRADEPOINT ATLANTIC
SPARROWS POINT, MARYLAND

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1.0 INTRODUCTION

1.1. BACKGROUND

ARM Group LLC (ARM), on behalf of Tradepoint Atlantic, has prepared this Response Action Completion Report to document activities performed on a portion of the Tradepoint Atlantic property that has been designated as Area A: Parcel A3 (the Site) that were completed under the direction of EnviroAnalytics Group (EAG). The location of Parcel A3 is shown on **Figure 1**. A Phase II Investigation of soil and groundwater conditions was performed for the Site in accordance with the requirements outlined in the Administrative Consent Order (ACO) as further described in the approved Phase II and Pre-Design Investigation Work Plan – Parcel A3 (Final), prepared by EAG (dated September 17, 2015). Findings from the Phase II Investigation have been presented in the Phase II Investigation Report – Area A: Parcel A3 (dated June 10, 2016).

Three of the soil borings completed during the Phase II Investigation of Parcel A3 were identified as containing elevated metals warranting additional delineation. Results from location RW-021-SB indicated an arsenic concentration in soil of 492 milligrams per kilogram (mg/kg) in the shallow (0 to 1 foot below ground surface (bgs)) sample. A lead concentration of 44,700 mg/kg was identified in the shallow soil sample from location RW-055-SB, and boring RW-052-SB had a concentration of 16,400 mg/kg in a deeper (4 to 5 foot bgs) sample. Based on direction from the Maryland Department of the Environment (MDE) and United States Environmental Protection Agency (USEPA), these boring locations were investigated for elevated levels of arsenic (RW-021-SB) and lead (RW-052-SB and RW-055-SB).

Based on the results of the Phase II Investigation, a Response Action Work Plan entitled Lead and NAPL/Oil & Grease Delineation and Excavation Work Plan, Revision 2, was submitted to the agencies on March 1, 2017.

A Response Action Completion Report will be prepared and submitted under separate cover to document the excavations of the non-aqueous phase liquid (NAPL)/Oil & Grease impacted material that was also identified during the Phase II Investigation on Parcel A3.

1.2. IMPACTED SOIL DELINEATIONS

Following the conclusion of the Phase II Investigation, additional investigation activities were conducted between June 27 and June 29, 2016 to delineate the extent of elevated arsenic and lead concentrations identified in borings RW-021-SB (arsenic), and RW-052-SB and RW-055-SB (lead). Delineation criteria were established for the supplementary investigations for arsenic and lead as 300 mg/kg and 2,000 mg/kg, respectively.

The delineation sampling procedure, results, and remedial approach are described in detail in the Work Plan. Delineation borings were completed using a Geoprobe® direct push rig. Analytical

samples were collected from select intervals (typically 0 to 1 foot bgs, 4 to 5 feet bgs, and 9 to 10 feet bgs unless prevented by concrete, groundwater, or other field conditions) for laboratory analysis for metals via USEPA Method 6010. Additionally, composite soil samples were collected and analyzed for Toxicity Characteristic Leaching Procedure (TCLP) metals to give a preliminary assessment of whether excavated soils would require disposal at a permitted hazardous waste landfill.

The first location to be completed for each delineation activity corresponded to the sample location collected during the Phase II Investigation (RW-021-SB, RW-052-SB, or RW-055-SB). Once concentrations below the delineation criterion for arsenic (300 mg/kg) and/or lead (2,000 mg/kg) were identified surrounding the initial location, the delineation was deemed to be complete.

Once each of the three elevated areas was delineated, a remedial approach was developed to remove soil impacted by lead and arsenic as required by the agencies. EAG elected to excavate these three lead and arsenic locations to expedite the remedial process due to the proposed redevelopment by Tradepoint Atlantic. The response actions are discussed in this Response Action Completion Report.

2.0 SITE RESPONSE ACTIVITIES

The preliminary extents of the proposed excavations at the three Response Areas were determined by the results of the soil boring delineations. The actual extents of the excavations were in some cases expanded based on confirmation sampling data following the initial excavations. The following sections provide detailed descriptions of each aspect of the completed response activities at each of the three Response Areas. **Figures 2a** and **2b** show the location of each Response Area within Parcel A3. The Response Areas are presented in chronological order (based on excavation start date) within each section. Additional details relevant to individual Response Areas are included in separate sub-sections below. A photograph log of the excavation completed for each Response Area is included as **Appendix A**.

Excavation oversight was performed by ARM. Hillis-Carnes Engineering Associates (HCEA) provided oversight and approvals for all backfilling, geotechnical, and engineering concerns for the three Response Areas.

2.1. EXCAVATION ACTIVITIES

Impacted material was excavated from the each of the three Response Areas on the dates indicated below in **Table 1**. The approximate excavated material volume is also indicated for each Response Area. The final excavation extents are shown for each Response Area on **Figure 3** through **Figure 5**. Response areas with notable observations are discussed in detail in the sub-sections following **Table 1**. A photographic log of the excavation completed for each Response Area is included as **Appendix A**.

Table 1 – Response Area Excavation Details

Response Area	Excavation Start Date	Excavation End Date	Excavated Volume (CY)	Average Depth (ft)	Excavated Area (ft^2)
RW-021	3/6/2017	3/7/2017	13	5.0	70
RW-052	4/3/2017	5/10/2017	1,310	1.8	19,166
RW-055	4/11/2017	4/11/2017	4	1.0	95

CY: Cubic yards

2.1.1. RW-052 and RW-055 Response Areas

While ultimately connected by subsequent excavations due to co-located NAPL/Oil & Grease impacts, the RW-055 and RW-052 Metals Response Areas have been considered separately for area and volume calculations and are discussed separately in this Response Action Completion Report and are shown separately on relevant figures. Excavation of the co-located NAPL/Oil & Grease impacted soil will be addressed in a separate Response Action Completion Report to be submitted under separate cover.

2.2. SOIL SCREENING

In accordance with the Work Plan, field screening with a hand-held X-ray fluorescence (XRF) instrument (per SOP No. 23 in the Quality Assurance Project Plan (QAPP)) was utilized to screen the soil and to delineate the horizontal and vertical extent of impacts within the RW-021, RW-052, and RW-055 Response Areas. Calibration of the XRF instrument was completed prior to and at the conclusion of all work each day with National Institute of Standards & Technology (NIST) calibration standards NIST 2709a (low-level lead standard with a concentration of 17.3 ± 0.1 mg/kg) and NIST 2711a (high-level lead standard with a median concentration of 1,300 mg/kg).

To reduce costs and volume of materials transported to Greys Landfill, the agency approved procedure described below was used to further characterize the extent of lead to ensure only material exceeding the threshold criteria was treated. This procedure also minimized the amount of potentially hazardous material removed from the subsurface prior to in-situ treatment and removal.

Pothole lift screening procedure:

- Screening with the XRF was conducted in 1-foot lifts to five feet below ground surface. Using the excavator, a pothole sample of soil from each consecutive 1-foot interval was collected on a grid spacing of 25 feet laterally and was screened with the hand-held XRF. Each pothole consisted of a single scoop from the excavator bucket to the depth of each proposed lift of the excavation. The pothole sample for field screening was collected as a composite from the excavator scoop. The field technician collected aliquots from several locations in the excavator bucket, biasing the selections to include any locations with visible discoloration or other indications of possible metals contamination.
- The XRF field reading was recorded for the composite sample to determine whether the material exceeds 10,000 mg/kg of lead. The location and depth of the results of the XRF screening data were documented.
- Soil from the potholes with a concentration of lead that exceeded 10,000 mg/kg was replaced in the hole prior to in-situ treatment. Soil from the potholes with a concentration of lead less than 10,000 mg/kg was placed in a stockpile designated to receive only untreated soil.

This process was repeated until the anticipated depths were reached and preliminary screening with the XRF indicated all lead contamination above 10,000 mg/kg had been delineated.

To confirm that all soil above the action level of 10,000 mg/kg was removed, the XRF field screening method was performed at a rate of one reading per 200 square feet of the excavation's sidewalls (unless limited by concrete) and from the bottom of each excavation (unless limited by the water table or concrete) at a minimum of one reading per 1,000 square feet. An XRF reading was collected even if the surface area of an independent sidewall was less than 200 square feet.

The location of each XRF reading was biased to target any apparent contamination remaining in place, or was placed in the center of the sidewall/bottom if no biased location was apparent.

If a sidewall or bottom sample returned an analytical result in excess of the lead excavation criterion (10,000 mg/kg), additional material was removed, and that location was tested again. Laboratory confirmation samples were collected at a rate of 30% of the sidewall/bottom screening locations to confirm the accuracy of the XRF equipment. This process is described in more detail in Section 2.7.

2.2.1. RW-021 and RW-055 Response Areas

At the RW-021 and RW-055 Response areas, delineation revealed no additional sources of contamination beyond the original boring locations. Thus, due to the minimal extent of the delineation areas for RW-021 and RW-055, an approximately 10 foot by 10 foot excavation boundary was centered on the original boring location. The soil removed from these response areas were still screened with the XRF to verify that the soil at the extents of the excavation were below the 10,000 milligrams per liter (mg/)L threshold.

2.2.2. RW-052 Response Area

Due to the widespread area of concentrations exceeding the 10,000 mg/L threshold for lead at the RW-052 Response Area, a 25-foot horizontal grid was applied to delineate the horizontal and vertical extent of lead within this Response Area. **Figure 3** through **Figure 5** illustrate this horizontal and vertical data. Concrete structures restricted accessibility in some areas of this Response Area and are discussed further in Section 2.7.

2.3. IN-SITU TREATMENT

Soils at the Response Areas were mixed in-situ with TerraBond$^{®Mg}$ to stabilize the metals present. TerraBond$^{®Mg}$ reagents are primarily sulfur-based waste stabilization products which reduce the leachability of metals from soil. These pH buffered products surround and bind metal ions in the soil for long-term waste treatment to reduce the leachability of heavy metals, including lead. The Safety Data Sheet (SDS) for TerraBond$^{®Mg}$ is included in **Appendix B**.

TerraBond$^{®Mg}$ was mixed in place within areas of impacted soil (greater than 10,000 mg/kg of lead) based on the data from screening procedure described in Section 2.2. The TerraBond$^{®Mg}$ was mixed at an approximate 1:1 ratio with the impacted soil prior to removing from the excavation. The field procedure used is described as follows:

- The excavator bucket was used to apply a uniform layer of TerraBond$^{®Mg}$ reagent over each defined exceedance area of the 1-foot lift with lead above 10,000 mg/kg.

- Once the TerraBond®Mg reagent had been placed, the excavator mixed the soils in place until the operator determined that the reagent had been evenly distributed throughout the volume of the 1-foot lift in each targeted area.
- After mixing, the treated soil from each 1-foot lift was excavated and placed in the stockpile designated to receive only lead contaminated soil.
- The remaining soil from each 1-foot lift where the concentration of lead was less than 10,000 mg/kg level was then excavated. This material was placed in a stockpile designated to receive untreated soil.

Regardless of the field screening results, the 0 to 1 foot bgs interval in RW-021-SB and the 4 to 5 foot bgs interval in RW-055-SB were treated with TerraBond®Mg prior to removal, based on the previous delineation results at these locations.

Excavated materials were placed on polyethylene sheeting in their designated stockpile areas. In order to minimize dust and prevent run-on/runoff, all stockpiles were covered when they were not being used and at the end of each day. A weighted cover system was used to keep the covers in place.

2.4. WASTE CHARACTERIZATION

Treated and untreated soils from the stockpiles were characterized independently for proper disposal. Soil from the stockpiles was tested at a minimum rate of one sample for every 500 cubic yards (CY) of material and analyzed for TCLP metals to determine if the material must be disposed of at an off-site hazardous waste landfill or at the on-site landfill (Greys) if non-hazardous. Each waste characterization composite sample from the excavation stockpiles consisted of at least ten grab aliquots (selected randomly).

Waste characterization samples were submitted to Caliber Analytical Services (Caliber) for laboratory testing at a rate of one 10-point composite sample for every 500 CY. All waste characterization samples were analyzed for TCLP metals. One sample of stockpiled soil originating from RW-052 was additionally analyzed for TCLP volatile organic compounds (VOCs) and TCLP semi-volatile organic compounds (SVOCs). The waste characterization laboratory results from Caliber are included as an electronic attachment. Please note that laboratory reports are included for all excavations performed on Parcel A3 (Metals and NAPL/Oil & Grease Response Areas).

All excavated soil from the RW-021 and RW-055 Response Areas were determined to be non-hazardous. A total of 22 tons of materials excavated from the RW-052 Response Area exceeded the Resource Conservation and Recovery Act (RCRA) non-hazardous limit of 5.0 mg/L for lead and was classified as hazardous waste. It should be noted that the waste characterization data indicated that the TerraBond®Mg stabilized the potentially hazardous material and therefore yielded

non-hazardous material for disposal. The 22 tons of excavated materials that was managed as hazardous waste were not treated with TerraBond®Mg because no elevated XRF readings were detected during excavation activities.

2.5. SOIL DISPOSAL

Dimension calculations of the excavations indicate approximately 1,300 bank CY of non-hazardous material was transported from the excavation stockpiles associated with the Metals Response Areas on Parcel A3 to Greys Landfill for disposal. Approximately 22 tons of lead-impacted regulated hazardous waste from the RW-052 Response Area was transported and disposed of at Envirite of Pennsylvania, Inc. in York, PA. Since the hazard waste profile included both lead and cadmium, the lead-impacted hazardous waste from the RW-052 Response Area was shipped and disposed of with the 2,000 tons of cadmium-impacted regulated hazardous waste generated from the RW-003 Response Area, which will be discussed in a Response Action Completion Report for NAPL/Oil & Grease Response Areas to be submitted under separate cover. The waste manifests for all regulated hazardous waste removed from Parcel A3 (both Metals and NAPL/Oil & Grease Response Areas) are included as an electronic attachment.

2.6. WATER MANAGEMENT & DISPOSAL

Groundwater/surface water was encountered while completing the RW-052 excavation. During excavation activities, the excavator operator allowed the excavator's bucket to drain a practical amount of water back into the excavation prior to placing the material in the dump truck. Water accumulated in the excavation was pumped to a storm sewer that carried flow directly to the Humphreys Creek Wastewater Treatment Plant. Tradepoint Atlantic personnel approved the pumping location and use of the on-site wastewater treatment plant to treat the groundwater/surface water accumulated within the excavation.

2.7. CONFIRMATION SAMPLING

The Work Plan stated that confirmation samples would be collected to verify the accuracy of the XRF field screening data at a rate of 30% of the sidewall/bottom screening locations (randomly selected) and were submitted to Pace Analytical Services (PACE) to be analyzed for lead via USEPA Method 6010C. Response Areas RW-021 and RW-055 were completed and approved using this method.

However, after receiving the first set of field screening data and confirmation analytical data, the MDE stated via email correspondence dated May 4, 2017 that there was an inconsistency between the XRF field screening data and the analytical results from the samples collected to confirm the field screening data. The MDE requested that six locations be resampled and submitted for analytical analysis. On May 18, 2017, the MDE sent an email correspondence requesting that 50% of the XRF field screening locations receive laboratory confirmation analysis and that a location

with an XRF field screening result within 50% of the cleanup goal would also require laboratory confirmation. These MDE requests were implemented for the RW-052 Response Area.

As described in Section 2.2, the XRF field screening method was performed at a rate of one reading per 200 square feet of the excavation's sidewalls (unless limited by concrete) and from the bottom of each excavation (unless limited by the water table or concrete) at a minimum of one reading per 1,000 square feet. At each field screening location, enough soil was bagged prior to the XRF scanning to allow for the collection of the confirmation sample. Confirmation samples were sent to PACE and analyzed for metals via USEPA Method 6010. Laboratory results have been included as an electronic attachment.

Once all confirmation samples from a Response Area yielded results below 10,000 ppm of lead, the excavation was considered complete. The confirmation sample results and a figure of each Response Area were provided to the MDE and USEPA for review and backfill approval as discussed in Section 2.8. The locations of the confirmation samples collected are shown on the excavation figure for each Response Area attached as **Figure 3** through **Figure 5**. A brief description of confirmation sampling for each Response Area is described below.

2.7.1. RW-021 Response Area

All sidewalls and the bottom of the excavation were screened with the XRF, and the bottom and northwest sidewall samples were submitted for laboratory confirmation. The target and final depth of this Response Area was 5 feet bgs.

2.7.2. RW-052 Response Area

During excavation activities at this Response Area, multiple concrete floors, walls, and boxes were observed within this excavation. These structures restricted the excavator's ability to meet the target depths in certain areas, and a response letter was submitted to the MDE and USEPA on May 18, 2017. This response letter included a figure and data table to present the concrete encountered, the XRF screening data, and the analytical confirmation sampling data. For this Response Area, all sidewalls and various locations of the bottom of the excavation, where accessible, were screened with the XRF, and the bottom and northwest sidewall samples were submitted for laboratory confirmation. The target and final depths of this Response Area varied throughout the excavation and are illustrated on **Figure 4**.

2.7.3. RW-055 Response Area

All sidewalls and the bottom of the excavation were screened with the XRF, and the bottom and east sidewall samples were submitted for laboratory confirmation. The target and final depth of this Response Area was 1 foot bgs.

2.8. BACKFILLING

The MDE sent its approval to backfill the Response Areas via email on the dates provided in **Table 2** below. The excavations were backfilled in accordance with HCEA requirements and/or were approved by an on-site HCEA field technician. The excavations were backfilled in accordance with HCEA requirements with the following materials: 5-6 inch stone, 2-3 inch stone, #57 stone, slag fines, and/or non-impacted surface soil. All backfill materials originated from the Tradepoint Atlantic property. Based on availability, not all backfill materials mentioned herein were utilized in every excavation; however, HCEA backfill requirements were still met. For soil and slag fine lifts, the HCEA field technician utilized a Troxler nuclear density gauge to confirm proper compaction. The backfill start and completion dates for each excavation are also provided in **Table 2** below.

Table 2 – Response Area Backfill Details

Response Area	Backfill Approval Date	Backfill Start Date	Backfill Completion Date
RW-021	3/23/2017	3/27/2017	3/27/2017
RW-052	5/18/2017	5/18/2017	6/2/2017
RW-055	5/4/2017	5/18/2017	6/2/2017

2.9. HEALTH & SAFETY

Due to the intrusive work and the known contaminants impacting the soil and groundwater in the three Response Areas, the EAG Health and Safety Plan (HASP) dated January 2015 was followed. Every morning, a tailgate safety meeting was completed to discuss the daily activities and the health and safety protocols associated with such activities.

2.9.1. Air Monitoring

Air monitoring protocols and the action levels for general site work, as presented in Section 7.0 and Table 7-2 of the EAG HASP, were enforced daily. A calibrated PID was utilized to monitor the worker's breathing zone in order to ensure safe working conditions during excavation due to the possibility of encountering soil exhibiting volatile impacts.

2.9.2. Dust Monitoring

During the initial phase of the excavation work, February 6 to March 9, 2017, a ThermoElectron Corporation Personal Data RAM 1000AN dust meter was utilized to monitor the dust produced during excavation activities and from large equipment traveling to and from the stockpile areas. Dust concentrations were recorded in the field book by on-site personnel every 15 minutes during excavation activities. Daily calibration of the real-time dust meter was performed to ensure

accurate readings by the instrument. The action level used for the purpose of determining the need for dust suppression techniques (e.g. watering and/or misting) and/or continuous monitoring during the response activities at the Site was 3.0 milligrams per cubic meter (mg/m^3) as required during development activities. At this concentration, heavy visible dust could be observed. No exceedances of the action level (exceeding 3.0 mg/m^3) were noted.

Beginning on March 10, 2017, a water truck was utilized on-site for dust suppression. Daily dust monitoring was discontinued for the remainder of the excavation work on Parcel A3 since no exceedances of the dust action level were previously noted and this daily monitoring was not required by the HASP or Work Plan. If visible dust was generated during response work, dust monitoring would have been implemented.

3.0 CONCLUSION

Between March and June 2017, response actions were conducted to address metals impacts in support of subsequently planned development activities. Excavations were completed at three locations, and the identified metals impacted soils were removed to the requisite delineation levels in accordance with the approved Response Action Work Plan entitled Lead and NAPL/Oil & Grease Delineation and Excavation Work Plan, Revision 2, dated March 1, 2017.

Subsequent development of the sub-parcel is addressed in the following documents:

- Sub-Parcel A3-1 Response and Development Work Plan (RADWP), Revision 3, (dated April 24, 2017, updated June 5, 2017) and the accompanying Comment Response Letter (dated June 5, 2017);
- Sub-Parcel A3-1 RADWP Addendum (dated December 13, 2019) and the accompanying Comment Response Letter (dated January 16, 2020); and
- Sub-Parcel A3-1 Response and Development Completion Report (dated December 3, 2021, to which this Response Action Completion Report for the Parcel A3 Metals Response Areas is attached).

Conduit #8 – one stockpile in eastern exclusion zone). A 10-point composite sample was collected from each of the stockpiles and submitted to Phase Separation Science, Inc. and tested for DRO, Oil & Grease, PCBs, total metals, and vanadium and manganese. Based on the laboratory results, the MDE requested additional sampling with full TCLP analysis. One composite sample was collected from the two stockpiles in the western exclusion zone on May 1, 2018 and analyzed for full TCLP. The materials in all three sampled stockpiles were approved for transport to Greys Landfill by the MDE on May 15, 2018 and the material was transported to Greys Landfill on May 24, 2018.

3.4.2.2. Second Phase of Development Work

During the second phase of development work, stockpiled soil from the East Pond Exclusion Zone, containing approximately 150 cy, was sampled on July 13, 2020. A 10-point composite sample was collected from each of the stockpiles and submitted to Phase Separation Science, Inc. and tested for TCLP metals and total cadmium. The soil was approved for reuse under an industrial cap by the MDE via email on September 8, 2020. The soil was transported to Sub-Parcel B2-3 and used during mass grading activities.

During second phase of development work, stockpiled soil from the Storage Bin Exclusion Zone during the second phase of development work, containing approximately 100 cy was sampled on September 10. A 10-point composite sample was collected from each of the stockpiles and submitted to Phase Separation Science, Inc. and tested for manganese, PCBs, TPH-DRO, and TPH-GRO. The soil was approved for reuse under an industrial cap by the MDE via email on October 14, 2020. The soil was transported to Sub-Parcel B2-3 and used during mass grading activities.

3.5. COAL TAR-IMPACTED MATERIAL

During first phase of development work, material was excavated during a conduit line excavation through an area containing coal tar. Approximately 190 CY of material impacted by coal tar were stockpiled. A sample of the coal tar-impacted material was collected on April 5, 2018 and submitted to Phase Separation Science, Inc. and tested for TCLP metals, TCLP VOCs, TCLP semi-volatile organic compounds (SVOCs), Target Analyte List (TAL) metals, and PCBs. The coal tar-impacted material was approved for transport to Greys Landfill by the MDE via email on April 24, 2018 (see **Appendix B**). The laboratory report and Greys Landfill disposal manifest are included in **Appendix N**.

3.6. WATER MANAGEMENT

Dewatering during construction was necessary for underground utility work (trenches/excavations) and light pole installation. The EP inspected the water that collected in the excavations/trenches. If the water exhibited indications of significant contamination (sheen, odor, discoloration, presence of product), or if the excavation/trench was within a known area of

significant groundwater contamination (if groundwater is the source of the intrusive water) or a significant Phase II Investigation target, the water was sampled and analyzed in order to determine the appropriate discharge action. Two aqueous samples were collected from excavations/trenches during Sub-Parcel A3-1 development activities. The samples were submitted to Phase Separation Science, Inc. At the direction of Tradepoint Atlantic, the sample collected on March 3, 2017 during demolition activities was analyzed for RCRA metals, total zinc, and dissolved zinc. At the direction of Tradepoint Atlantic, the sample collected on September 11, 2017 from a pre-existing 60-inch water line was analyzed for PCBs, VOCs, zinc, and cadmium. The analytical results, included in **Appendix J**, were submitted to Tradepoint Atlantic. Tradepoint Atlantic personnel approved the discharge of the water in question to the HCWWTP based on known threshold limits of the plant.

During the first phase of development work, water that collected in excavations/trenches due to intrusion of groundwater and/or stormwater was pumped to a frac tank before being pumped to a storm drain leading to the HCWWTP at the direction of Tradepoint Atlantic personnel. During second phase of development work, at the direction of Tradepoint Atlantic personnel, all dewatering discharges were pumped to a drain identified by Tradepoint Atlantic that conveyed to the HCWWTP. When limited amounts of dewatering were required, the contractor conveyed the water to the HCWWTP via truck. The water conveyed to the HCWWTP was treated and discharged in accordance with NPDES Permit No. 90-DP-0064A; I. Special Conditions; A.4; Effluent Limitations and Monitoring Requirements.

3.7. DUST CONTROL

General construction operations, including removal of existing foundations or utilities, soil excavation and transport, soil grading, trenching for utilities, and cap construction activities were performed at the Site. To limit worker exposure to contaminants borne on dust and windblown particulates, dust control measures were to be implemented, if warranted when the above activities were performed. The action level used for the purpose of determining the need for dust suppression techniques (e.g. watering and/or misting) and/or continuous monitoring during the response and development activities on Site was 3.0 milligrams per cubic meter (mg/m^3).

Dust monitoring was performed with a ThermoElectron Corporation Personal Data RAM 1000AN Dust Monitor from October 2016 to May 2017. Three MetOne E-sampler dust monitors were used from May 2017 to the conclusion of intrusive activities. Three dust monitors were placed daily upwind of, downwind of, and inside the active work zone. Dust readings were recorded at each monitor at a rate of once per minute. Daily summaries of 15-minute average dust readings are provided as an electronic attachment. Dust control measures were to be implemented if a sustained level above 3.0 mg/m^3 was observed. Some exceedances of the 3.0 mg/m^3 action level were observed during construction activities. However, the exceedances appeared to be associated with trucks passing near the monitor and did not last more than five minutes. Dust monitoring was terminated on February 15, 2018 after the majority of the Site had been capped. After this date,

the EP continued to visually inspect the site for visible dust until the conclusion of all development activities. Electronic dust monitoring was not performed during the second phase of development work because the majority of the Site had been capped and because intrusive activities outside the constructed building were limited. The Contractor utilized a water truck to mitigate dust generation during the development work operations.

3.8. HEALTH AND SAFETY

A site-specific Health and Safety Plan (HASP) was developed by the on-site contractor to present the minimum requirements for worker health and safety protection for the project. All site work was performed under the site-specific HASP. The contractor was responsible for following safety procedures, including schedule limitations, to control contact with potentially contaminated soil or groundwater. During the first phase of development work, the contractor complied with the 120-day allowable duration for intrusive work outside the building footprint and 60-day allowable duration for intrusive work inside the building footprint. In lieu of tracking exposure days, Modified Level D personal protection equipment (PPE) was implemented during the second phase of development work. The contractor Health and Safety acknowledgement documentation in included in **Appendix K**. Details regarding the Screening Level Risk Assessment (SLRA) completed for the sub-parcel and the determination of the allowable duration for intrusive work are presented in the Sub-Parcel A3-1 RADWP.

3.9. CONSTRUCTION OF STORMWATER MANAGEMENT FEATURES

On October 9, 2017, a letter was submitted to the agencies to request approval to modify the design of the liner for the stormwater pond constructed as part of the development within Sub-Parcel A3-1. The requested modification to install 2 feet of clay in place of the 30-mil liner, with 6 inches of clean topsoil placed above the clay layer met the approved requirements for landscaped caps installed at the site. The proposed modification was approved by the MDE by email on October 26, 2017 (**Appendix B**) with the following conditions:

1. All clay material used must be documented to comply with the Voluntary Cleanup Program (VCP) clean fill requirement.

2. The clay material must be placed in such a manner as to ensure that the final permeability is demonstrated to be similar to or better than the original 30-ml plastic liner and all documentation must be included in the final completion report.

Permeability tests were conducted by HCEA on a selected clay material, and the results were submitted to the MDE. The MDE approved the use of the selected clay material via email on March 27, 2018 (see **Appendix B**).

3.10. LANDSCAPED AREAS

As stated in the Notice of Completion of Remedial Actions (**Appendix D**), capping in the landscaped areas was installed under the oversight of an HCEA EP to meet the specifications established in the Sub-Parcel A3-1 RADWP and the RADWP Addendum. As discussed above in Section 3.4 (Fill Materials), the materials used in landscaped areas were approved by the MDE (**Appendix H**).

The selected marker fabric (see **Appendix O**) meets the specifications given in the RADWP and the RADWP Addendum.

Landscape capping inside the Sub-Parcel A3-1 boundary but outside the project's limit of disturbance (LOD) was completed separately under the oversight and direction of EnviroAnalytics Group (EAG), as discussed in detail in the following section.

3.11. ACCESS ROAD AND NORTHERN CAPPING AREA

On July 18, 2018, a letter was submitted to the agencies to clarify that the northern access road connecting Sub-Parcel A3-1 to Bethlehem Boulevard was being implemented as shown on a revised set of development drawings included in the approved RADWP and to notify the agencies that EAG (instead of Tradepoint Atlantic) would be implementing the landscape capping remedy in the northern portion of the Site (located inside the Sub-Parcel A3-1 boundary but outside the Contractor's Limit of Disturbance (LOD)). The access road was constructed in accordance with the development plan and red line drawing provided as Attachment 1 and Attachment 2 to the referenced letter, which has been included in **Appendix P**.

The landscape capping remedy in the northern portion of the site was installed between March and October 2020. A layer of geotextile marker fabric was placed throughout the capping area prior to placing clean fill. A minimum of 24 inches of clean fill was placed above the geotextile marker fabric throughout the capping area. Clean fill material from a virgin source was imported from Mountain Materials and Reclamation of Joppa, MD, an MDE-approved clean fill facility. Stone placed around electrical towers was sourced from Martin Marietta. A photograph log of the landscape capping work is included as **Appendix Q**.

Tradepoint Atlantic coordinated with Baltimore Gas and Electric (BGE), which maintains a substation and electrical structures in the area, to ensure that electrical features were protected throughout the site work. Due to the site's relatively flat topography, extra care had to be taken to ensure that drainage swales would have positive drainage toward existing stormwater inlets along Bethlehem Boulevard. Grade adjustments were made to the cap and its swales in several areas to ensure drainage away from the substation. Following the completion of regrading activities, each section of the capped area was seeded and stabilized.

3.12. NOTABLE OCCURRENCES

Monitoring wells RW06-MW(S) and RW06-MW(D) were damaged during construction in the first quarter of 2018 and were replaced on April 30 and May 1, 2018.

3.13. POST REMEDIATION REQUIREMENTS

Long-term conditions related to future use of the Site will be described within the NFA and COC. Post remediation requirements will include compliance with the conditions specified in the NFA, COC, and the deed restrictions recorded for the Site. Deed restrictions as defined by the MDE VCP in the NFA and COC will be recorded by the responsible party within 30 days after receipt of the final NFA. In addition, no enclosed buildings may be constructed within the area where NAPL-contaminated soils could not be removed due to physical barriers without further evaluation of the potential for vapor intrusion.

The entire Site will be subject to a restriction that limits the use of the property to non-residential land use as well as a restriction prohibiting the use of groundwater for any purpose at the Site and a requirement to characterize, containerize, and properly dispose of groundwater in the event of deep excavations encountering groundwater.

Maintenance requirements will include inspection and maintenance of landscape and hardscape capped areas to minimize degradation of the cap and exposure to the underlying soil. Specific inspection protocols and maintenance schedules will be addressed in an Institutional Controls and Operations & Maintenance Plan, specific to Sub-Parcel A3-1, to be submitted under separate cover.

The responsible party will perform cap maintenance inspections, perform maintenance of the cap, and retain cap inspection records. Areas of the cap that have degraded will be repaired in accordance with the Institutional Controls and Operations & Maintenance Plan. The MDE shall be notified within ten business days of any repairs that are the result of cap failure. The notification will include documentation of the conditions being repaired and the location of the repair.

The MDE will be provided with a written notice at least 30 days prior to any planned excavation activities at the Site that will penetrate through the cap. Written notice of planned excavation activities will include the proposed date(s) for the excavation, location of the excavation, health and safety protocols (as required), clean fill source (as required), and proposed characterization and disposal procedures in accordance with applicable local, state and federal requirements.

4.0 CONCLUSION

From October 2016 through December 2017 and January 2020 through July 2020, response and development actions were conducted as part of the redevelopment of the Site identified as Sub-Parcel A3-1. The primary response and development actions included soil delineation and excavations, abandonment of temporary groundwater collection points and wells, construction of a slab on-grade warehouse with associated stormwater management features, underground utilities, lighting improvements, parking areas, and landscaped areas.

A Notice of Completion of Remedial Actions prepared by the EP is enclosed in **Appendix D** to certify that the response actions have been completed in accordance with the requirements described in the RADWP and the Site is suitable for occupancy and use.

As a result of the information contained herein, it has been demonstrated that the response and development actions have been completed in accordance with the approved RADWP and RADWP Addendum. With construction of the containment remedy (caps) in conjunction with redevelopment of the Site, the applicable requirements for obtaining a NFA Letter and COC for this Site have been fulfilled. Therefore, Tradepoint Atlantic is respectfully requesting issuance of a NFA Letter for the Site at this time. It is ARM's understanding that Tradepoint Atlantic will record the NFA Letter and the deed restrictions identified in the RADWP and RADWP Addendum within 30 days after receipt of the final NFA Letter. Proof of recordation will be submitted to MDE upon receipt from Baltimore County.

ATTACHMENT 1

RESPONSE ACTION COMPLETION REPORT

AREA A: PARCEL A3
NAPL/OIL & GREASE RESPONSE AREAS
TRADEPOINT ATLANTIC
SPARROWS POINT, MARYLAND

Prepared For:

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Revision 0 – December 3, 2021

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1.0 INTRODUCTION

1.1. BACKGROUND

ARM Group LLC (ARM), on behalf of Tradepoint Atlantic, has prepared this Response Action Completion Report to document activities performed on a portion of the Tradepoint Atlantic property that has been designated as Area A: Parcel A3 that were completed under the direction of EnviroAnalytics Group (EAG). The location of Parcel A3, is shown on **Figure 1**. A Phase II Investigation of soil and groundwater conditions was performed for Parcel A3 in accordance with the requirements outlined in the Administrative Consent Order (ACO) and as detailed in the approved Phase II and Pre-Design Investigation Work Plan – Parcel A3 (Final), prepared by EAG, dated September 17, 2015. Findings from the Phase II Investigation have been presented in the Phase II Investigation Report – Area A: Parcel A3 (dated June 10, 2016). Redevelopment of a portion of Parcel A3, designated as Sub-Parcel A3-1, has been completed. All response activities that were performed during the development were discussed in the Response and Development Work Plan (RADWP) – Area A: Sub-Parcel A3-1 (Revision 3; dated April 24, 2017; updated June 5, 2017; and approved on June 20, 2017).

All soil samples collected during the Phase II investigation of Parcel A3 were analyzed for Oil & Grease. Based on the specific sampling plan targets, select samples were also analyzed for both diesel range organics (DRO) and gasoline range organics (GRO). The validated results for Oil & Grease, DRO, and GRO were compared to their Project Action Limit (PAL) of 6,200 milligrams per kilogram (mg/kg). Four shallow soil samples (RW-025-SB-1, RW-029-SB-1, RW-033-SB-1, and RW-040-SB-1), collected from the 0-1' below ground surface (bgs) interval, had concentrations of Oil & Grease that exceeded its PAL; with the highest concentration (14,700 mg/kg) identified in sample RW-029-SB-1. Eight subsurface samples (RW-004-SB-5, RW-010-SB-7, RW-029-SB-7, RW-041-SB-5, RW-045-SB-5, RW-047-SB-6, RW-052-SB-5, and RW-055-SB-5), collected from a depth greater than 1' bgs, had concentrations of Oil & Grease that exceeded its PAL; with the highest concentration (39,000 mg/kg) also identified in soil boring RW-029-SB (sample RW-029-SB-7).

Three soil boring locations (RW-029-SB, RW-045-SB, and RW-052-SB) had exceedances of the Oil & Grease PAL that were also accompanied by observations of possible non-aqueous phase liquid (NAPL) in their soil cores. Two additional boring locations (RW-003-SB and RW-056-SB) had visible sheens or NAPL noted in the soil cores.

Due to the elevated concentrations of Oil and Grease, and observations of NAPL in soil cores within a close proximity to proposed utilities and water conveyance systems contained in the proposed development plan for Parcel A3, remedial actions were warranted. As specified in the agency-approved Lead and NAPL/Oil & Grease Delineation and Excavation Work Plan Revision 2 dated March 1, 2017, the impacted material was to be excavated as the response action. This

Response Action Completion Report describes the excavations that were conducted for the 13 Response Areas (RW-003, RW-004, RW-010, RW-025, RW-029, RW-033, RW-040, RW-041, RW-045, RW-047, RW-052, RW-055, and RW-056) to remove soil impacted by NAPL and/or Oil & Grease (**Figure 2**). A Response Action Completion Report will be prepared and submitted under separate cover to document the excavations of the lead and arsenic impacted material that was also identified during the Phase II Investigation on Parcel A3.

1.2. IMPACTED SOIL DELINEATIONS

In an effort to expedite the remedial process in support of the impending redevelopment of Parcel A3 by Tradepoint Atlantic, EAG elected to excavate all 13 locations with elevated Oil & Grease concentrations above the PAL (6,200 mg/kg) and/or evidence of NAPL. To determine the initial excavation boundaries for the 13 Response Areas, additional delineation soil borings were completed for 10 of the 13 Response Areas; the results of which were considered along with field observations and existing information from the Phase II investigation.

The delineation borings were completed using a Geoprobe® direct push rig. Each soil core that was recovered from a delineation boring was inspected for the possible presence of NAPL contamination and screened using a photoionization detector (PID). Analytical samples were then collected from pre-determined intervals for laboratory analysis for Oil & Grease via United States Environmental Protection Agency (USEPA) Method 9071. If NAPL was noted within the soil core, it was assumed to represent an exceedance of the Oil & Grease PAL; therefore, a soil sample was not collected for that soil boring. The sampling approach is further described in the Lead and NAPL/Oil & Grease Delineation and Excavation Work Plan (Revision 2 dated March 1, 2017). Please note that the delineation activities were simply intended to provide additional information to guide the excavations in the field. While complete delineation was not achieved in all cases with the additional borings, and in many instances the excavations extended beyond the initial boundaries based on field observations or confirmation sampling data, the response actions were completed at every location.

2.0 SITE RESPONSE ACTIVITIES

The following sections provide detailed descriptions of each aspect of the completed response activities at each of the 13 Response Areas (**Figure 2)**. The Response Areas are presented in chronological order (based on excavation start date) within each section. Additional details relevant to individual Response Areas are included in a corresponding sub-section.

Excavation oversight was performed by ARM. Hillis-Carnes Engineering Associates (HCEA), provided oversight and approvals for all backfilling activities for the 13 Response Areas.

2.1. EXCAVATION ACTIVITIES

Impacted material was excavated from the each of the 13 Response Areas on the dates indicated below in **Table 1**. The approximate volume of excavated material is also indicated for each Response Area. The final extent of each excavation is shown for each Response Area on **Figure 3** through **Figure 14**. Response areas with notable observations are discussed in detail in the sub-sections following **Table 1**. A photographic log of the excavation completed for each Response Area is included as **Appendix A**.

Table 1 – Response Area Excavation Details

Response Area	Excavation Start Date	Excavation End Date	Excavated Volume (CY)	Average Depth (ft)	Excavated Area (ft^2)
RW-025	2/16/2017	2/17/2017	8	2.1	107
RW-041	2/17/2017	2/17/2017	500	5.9	2,262
RW-029	2/17/2017	3/13/2017	3,200	8.3	10,320
RW-033	3/14/2017	4/4/2017	9,100	3.1	70
RW-056	3/17/2017	3/29/2017	90	7.3	33,614
RW-010	3/22/2017	3/22/2017	70	4.4	531
RW-040	3/22/2017	3/22/2017	12	9.0	200
RW-047	3/22/2017	3/22/2017	60	1.6	200
RW-052	4/17/2017	4/25/2017	2,250	8.0	200
RW-045	4/21/2017	4/28/2017	2,700	1.7	19,264
RW-055	4/21/2017	4/28/2017	*	5.8	10,355
RW-003	5/1/2017	7/7/2017	6,700	8.2	8,875
RW-004	5/18/2017	5/18/2017	6	NA	NA

CY: Cubic yards ft: feet ft^2: square feet

Notes: * = The excavation dimensions for RW-045 includes RW-055 due to final excavated area of RW-045 encompassing RW-055.

2.1.1. RW-041 Response Area

During excavation activities at the RW-041 Response Area, the excavated material was predominantly building materials including concrete, brick, and steel rebar. The presence of these materials made it difficult to visually determine if the material was impacted; therefore, multiple confirmation sampling events were required to ensure all impacted material above the Oil & Grease PAL was removed.

2.1.2. RW-029 Response Area

During excavation activities at the RW-029 Response Area, the following were encountered: numerous utility pipes including NAPL bearing pipes, a concrete box filled with NAPL located along the southeast corner of the excavation, heavily impacted soil throughout excavation, and concrete saturated with NAPL that was located throughout the excavation but mostly along the eastern portion of the excavation.

2.1.3. RW-033 Response Area

During excavation activities at the RW-033 Response Area, steel sheeting was uncovered with NAPL impacted soil in the vicinity. Utility lines were also observed in the area. The sheeting and utility lines were removed during excavation activities.

2.1.4. RW-045, RW-055, and RW-052 Response Areas

Due to proximity and co-located lead impacts, the RW-045, RW-052, and RW-055 Response Area excavations were connected. The combined excavation was bounded to the north by the southern extents of the Rod & Wire Mill groundwater remedial trenches previously installed by EAG. A discussion of the lead excavation areas will be submitted under a separate cover to document the excavation of lead-impacted material from Parcel A3.

The RW-055 Response Area was located entirely within the RW-045 Response Area and is included in the overall calculations of side-wall and bottom areas for confirmation sampling as well as excavation volumes. While ultimately connected to the RW-045 and RW-055 Response Areas due to associated lead impacts (see above), the RW-052 Response Area has been considered separately for area and volume calculations and is discussed separately in this Response Action Completion Report.

During the start of the RW-052 Response Area, five fiberglass tank bottoms were observed on a concrete pad. These tanks appeared to be cut just below grade, potentially as a result of historical on-site building demolition. Several liquid pumps and pipes saturated in NAPL were also removed from the vicinity of these tanks. The tank bottoms were removed during excavation activities.

While completing the excavation in the RW-045 Response Area, a large concrete box with a raised section in the middle was observed. NAPL impacted water and material were removed from trench drains surrounding the raised concrete section and from within the concrete box. The entire concrete box was stained by NAPL; therefore, it was broken up and removed from the excavation. Minimal impacts were observed below the removed concrete. Also, an open-face dipping tank was observed along the eastern sidewall of the excavated area. Impacted material was observed below the open-face tank and removed from the excavation along with the tank.

2.1.5. RW-003 Response Area

The RW-003 Response Area excavation was bounded to the south by the northern extent of the remedial trenches installed by EAG, and to the north by low overhead utility lines and a Baltimore Gas and Electric (BGE) easement for their high voltage overhead utility lines, as authorized in an email from the Maryland Department of the Environment (MDE) on July 6, 2017. During excavation activities, numerous fragments of steel drums with NAPL were removed from this area.

Coal tar impacted material was encountered during the excavation at the RW-003 Response Area. Additional details are provided in Section 2.2 (Soil Management).

2.1.6. RW-004 Response Area

The excavation at the RW-004 Response Area could not be completed due to the presence of very hard slag at a shallow depth. Additional details may be found in the RW-004-SB Excavation Update dated June 19, 2017. This letter is attached for reference as **Appendix B**.

2.2. SOIL MANAGEMENT

Excavated materials were placed in stockpiles that were positioned adjacent to the excavations and placed on polyethylene sheeting. In order to minimize dust and prevent run-on/runoff, all stockpiles were covered when they were not being used, and at the end of each day. A weighted cover system was used to keep the covers in place.

Coal tar impacted material was encountered during the excavation at the RW-003 Response Area. During the first two days of excavation (May 1 and May 2, 2017), the soil impacted by coal tar was stockpiled on polyethylene sheeting. Excavation work was halted on May 2, 2017 due to air quality concerns, which is discussed in further detail in Section 2.9. At the end of the work day, the exposed soil impacted by coal tar was covered with clean soil to minimize odors. EAG decided TerraBond®Mg would be a suitable material to stabilize the coal tar present in the soil. Once TerraBond®Mg was delivered to the site, excavation activities resumed on May 18, 2017. The TerraBond®Mg was mixed at an approximate 1:1 ratio with the impacted soil in-situ prior to removing it from the excavation and stockpiling as described above. The Safety Data Sheet (SDS) for TerraBond®Mg is included in **Appendix C**.

2.3. WASTE CHARACTERIZATION

Waste characterization samples were submitted to Caliber Analytical Services (Caliber) for laboratory testing at a rate of one 10-point composite sample for every 500 cubic yards (CY) of stockpiled soil. All waste characterization samples were analyzed for Toxicity Characteristic Leaching Procedure (TCLP) metals and polychlorinated biphenyls (PCBs) to characterize the stockpiles for proper disposal. In addition, a sample from the stockpiled material excavated from the RW-003 Response Area required additional testing for TCLP volatile organic compounds (VOCs) and TCLP semi-volatile organic compounds (SVOCs) to verify its waste characterization composition. The laboratory results for the waste characterization samples taken from the NAPL and Oil & Grease Response Areas in Parcel A3 are included as an electronic attachment. The remaining laboratory reports will be provided in the Parcel A3 Metals Response Action Completion Report. The waste characterization sample results indicated that the majority of excavated materials were non-hazardous. Samples which exceeded the Resource Conservation and Recovery Act (RCRA) non-hazardous limit for any compound are discussed in further detail below.

2.3.1. RW-045 and RW-055 Response Areas

One waste characterization sample collected on April 11, 2018 (from the stockpile designated as Cell 2) returned an elevated level of lead that exceeded the RCRA non-hazardous limit of 10 milligrams per liter (mg/L). Therefore, the stockpile was divided into four quadrants to potentially minimize the amount of hazardous soil disposed off-site, and one additional 10-point sample was collected from each quadrant of the stockpile. The resampling event indicated the lead-impacted soil could be regulated as RCRA non-hazardous.

2.3.2. RW-003 Response Area

Waste characterization results from four stockpiles sampled on May 2 and May 3, 2017 (designated as Cell 8, Cell 9, Cell 10, and Cell 3) indicated elevated levels of cadmium that exceeded its RCRA non-hazardous limit of 1.0 mg/L. Therefore, each stockpile was divided into four quadrants, and a 10-point sample was collected from each quadrant. The results of the resampling event indicated cadmium concentrations were present at concentrations greater than 1.0 parts per million (ppm) for 15 of the 16 quadrants. The stockpiles exceeding the RCRA non-hazardous limit were required to be managed as hazardous waste as described below in Section 2.4.

2.4. SOIL DISPOSAL

Dimension calculations of the excavations indicates approximately 23,500 bank CY of non-hazardous material were transported from the excavation stockpiles associated with the NAPL/ Oil & Grease Response Areas on Parcel A3 to Greys Landfill for disposal. After receiving MDE

approval, the majority of the treated soil from the RW-003 Response Area was also transported to Greys Landfill.

A total of 2,022 tons of regulated hazardous waste from the RW-052 and RW-003 Response Areas were disposed of at Envirite of Pennsylvania, Inc. in York, PA. This included 2,000 tons of cadmium-impacted soil from the RW-003 Response Area and 22 tons of lead-impacted soil from the RW-052 Response Area (discussed in the Parcel A3 Metals Response Action Completion Report) was transported to the approved Envirite of Pennsylvania, Inc. facility. Copies of the waste manifests for all regulated hazardous waste removed from Parcel A3 (the RW-052 and RW-003 Response Areas) are included as an electronic attachment.

2.5. WATER MANAGEMENT & DISPOSAL

Groundwater was encountered within the excavation associated with certain Response Areas on Parcel A3. During excavation activities, the excavator operator allowed the excavator bucket to drain water to the extent practical prior to placing the material in the dump truck. Dry excavated material was occasionally utilized to stabilize wet material prior to removal from the excavation. At the RW-041 Response Area, the excavations were dewatered into frac tanks using pumps.

Aqueous samples were collected from the frac tanks and submitted to Caliber and analyzed for VOCs, SVOCs, metals, and PCBs. The results of the aqueous testing were provided to Tradepoint Atlantic personnel who approved the discharge of the groundwater to the on-site wastewater treatment plant. Subsequently, water was pumped from the frac tanks and directly from the excavations (when feasible) to a storm drain leading to the Humphrey's Creek Wastewater Treatment Plant (HCWWTP). The laboratory results from the aqueous testing are included as an electronic attachment.

Due to the known elevated metal concentrations and the NAPL/sheen observed on the groundwater's surface, a water sample was collected directly from the RW-003 Response Area excavation to verify the on-site treatment plant could properly treat this water. The water sample was submitted to Caliber for analysis of VOCs, SVOCs, and metals. The results of the testing were provided to Tradepoint Atlantic personnel and are included as an electronic attachment. Tradepoint Atlantic personnel approved the discharge of accumulated groundwater to the HCWWTP. Following approval, water was pumped directly from the RW-003 Response Area excavation to a storm drain leading to the HCWWTP.

2.6. CONFIRMATION SAMPLING

Once all of the apparent impacted material was removed from an excavation, soil confirmation samples were collected from each sidewall and the bottom of the excavation. Confirmation soil samples were collected from each side wall of the excavation (unless limited by clean concrete) at a frequency of one sample for every 500 square feet. Each confirmation sample was collected

from the midpoint depth and bottom depth of each interior-facing wall. Confirmation samples were collected from the bottom of the excavation at a minimum of one sample for every 1,000 square feet. Confirmation sample locations were biased to target suspected impacted soil and/or were evenly spaced on the sidewall/bottom of the excavation.

Confirmation samples were sent to Pace Analytical Services (PACE) and analyzed for Oil & Grease via USEPA Method 9071. Laboratory results for samples collected from all Response Areas on Parcel A3 have been included as an electronic attachment. If a confirmation sample had a concentration above the Oil & Grease PAL, the excavation was extended, and another confirmation sample was collected from the new sidewall or bottom. The location where each confirmation sample was collected is shown on the excavation figure for each of the Response Areas, which are attached as **Figure 3** through **Figure 14**. If all confirmation samples from a Response Area yielded results below the PAL, the excavation was considered complete, and the confirmation sample results and a figure of each Response Area were provided to the MDE.

2.6.1. RW-041 Response Area

The bottom, south sidewall, and north sidewall of the RW-041 Response Area excavation were bounded by concrete; therefore, no confirmation samples were collected from these areas.

2.6.2. RW-003 Response Area

Confirmation samples were not required by the MDE at the RW-003 Response Area. As described above, the excavation at the RW-003 Response Area was bounded to the north by low overhead utility lines and a BGE easement for their high voltage overhead utility lines. Therefore, a representative from the MDE inspected the Response Area and verbally approved the excavations for backfilling. The MDE requested the installation of a monitoring well network north of the excavation due to the NAPL impacted material left in place. A total of 11 piezometers were installed between April 27 and April 28, 2017 to define the extent of the NAPL, as documented in the Notification of Well Installation and Piezometer Abandonment for the RW-003-SB Excavation Area letter dated August 8, 2017. The piezometers were later replaced with three permanent wells, which were installed between August 23 and August 25, 2017, as documented in the letter entitled Completion of Well Installation Activities and Piezometer Abandonments for Parcel B8: B8-018-PZ and B8-020-PZ and Parcel A3: RW-003-SB Excavation Area dated February 16, 2018. The MDE approved all piezometer and permanent well locations prior to installation.

2.7. BACKFILLING

MDE approval, based on the information provided and/or their site visit to an excavation, was required prior to backfilling any Response Area. The MDE approvals were sent via email on the dates provided in **Table 2** below. Verbal approvals to backfill the RW-052 and RW-003 Response Area excavations were received during site visits by MDE personnel. The excavations were

backfilled in accordance with HCEA requirements with the following materials: 5-6 inch stone, 2-3 inch stone, #57 stone, slag fines, and/or non-impacted surface soil. All backfill materials originated from the Tradepoint Atlantic property. Based on availability, not all backfill materials mentioned herein were utilized in every excavation; however, HCEA backfill requirements were still met. For soil and slag fine lifts, the HCEA field technician utilized a Troxler nuclear density gauge to confirm proper compaction. The backfill start and completion dates for each excavation are provided in **Table 2** below. All excavations were backfilled as described above with the exception of the RW-004 Response Area excavation, which was not backfilled due to excavator refusal at a final depth of 1-foot bgs. The RW-004 Response Area and surrounding area was subsequently excavated during Site development activities conducted under the Sub-Parcel A3-1 RADWP.

Table 2 – Response Area Backfill Details

Response Area	Backfill Approval Date	Backfill Start Date	Backfill Completion Date
RW-025	3/23/2017	3/27/2017	3/27/2017
RW-041	3/23/2017	3/28/2017	3/30/2017
RW-029	3/23/2017	3/24/2017	3/30/2017
RW-033	4/10/2017	4/10/2017	4/21/2017
RW-056	4/10/2017	4/7/2017	4/11/2017
RW-010	3/30/2017	4/3/2017	4/3/2017
RW-040	3/30/2017	4/3/2017	4/3/2017
RW-047	3/30/2017	4/3/2017	4/3/2017
RW-052	Verbal Approval	5/3/2017	6/2/2017
RW-045	5/4/2017	5/18/2017	6/2/2017
RW-055	5/4/2017	5/18/2017	6/2/2017
RW-003	Verbal Approval	7/17/2017	8/5/17
RW-004	N/A	N/A	N/A

N/A = Not Applicable

2.8. HEALTH & SAFETY

Due to the intrusive nature of these activities and the known petroleum contaminants impacting the soil and groundwater in the Response Areas, the EAG Health and Safety Plan (HASP) dated January 2015 was utilized daily to keep all parties safe. Every morning, a tailgate safety meeting was held to facilitate discussions about the daily activities and the health and safety protocols associated with such activities.

2.8.1. Air Monitoring

Each day, a calibrated PID was utilized to monitor the workers' breathing zone in order to ensure safe working conditions while excavating the petroleum impacted soil. Air monitoring protocols and the action levels for general site work and handling NAPL, as presented in Section 7.0 and Table 7-2 of the EAG HASP, were enforced daily.

On May 2, 2017 while excavating in the vicinity of the coal tar impacts in the RW-003 Response Area, a sustained PID reading greater than 1 ppm for a duration greater than 3 minutes was noted in the worker's breathing zone. Due to the sustained PID reading, excavation work was stopped and a tailgate meeting was completed to discuss the required personal protection equipment (PPE) upgrade. All personnel working in the vicinity of the RW-003 Response Area were required to upgrade to Level C PPE which included a half-mask respirator with the proper air filter cartridge. At the end of the day, clean soil was used to cover the exposed excavation surface to minimize the spread of odors and vapors. When excavation work was resumed on May 18, 2017, soils were stabilized by mixing with TerraBond$^{®Mg}$. Air monitoring on May 18, 2017 indicated that the TerraBond$^{®Mg}$ mixing alleviated the workers breathing zone concerns, as no sustained levels over 1 ppm were noted.

2.8.2. Dust Monitoring

Although not required in the HASP or workplan, dust monitoring was performed during the initial phase of the excavation work performed from February 6 to March 9, 2017. Beginning on March 10, 2017, a water truck was utilized for dust suppression. During the initial phase of the excavation work, a ThermoElectron Corporation Personal Data RAM 1000AN dust meter was utilized to monitor the dust produced during excavation activities and from large equipment traveling to and from the stockpile areas. Dust concentrations were recorded in the field book by on-site personnel every 15 minutes during excavation activities. Daily calibration of the real-time dust meter was performed to ensure accurate readings by the instrument. The action level used for the purpose of determining the need for dust suppression techniques (e.g. watering and/or misting) and/or continuous monitoring during the response activities at Parcel A3 was 3.0 milligrams per cubic meter (mg/m³), the level utilized during development activities. At this concentration, heavy visible dust could be observed. No exceedances of the action level (3.0 mg/m^3) were noted. Since no exceedances of the action level were noted when dust monitoring was performed and dust monitoring was not required by the HASP or work plan, dust monitoring was discontinued for the remainder of the excavation work on Parcel A3. If visible dust was generated during response work, dust monitoring would be resumed. After dust monitoring was terminated, a water truck was used for dust suppression, and no significant visible dust was generated during excavation activities.

3.0 CONCLUSION

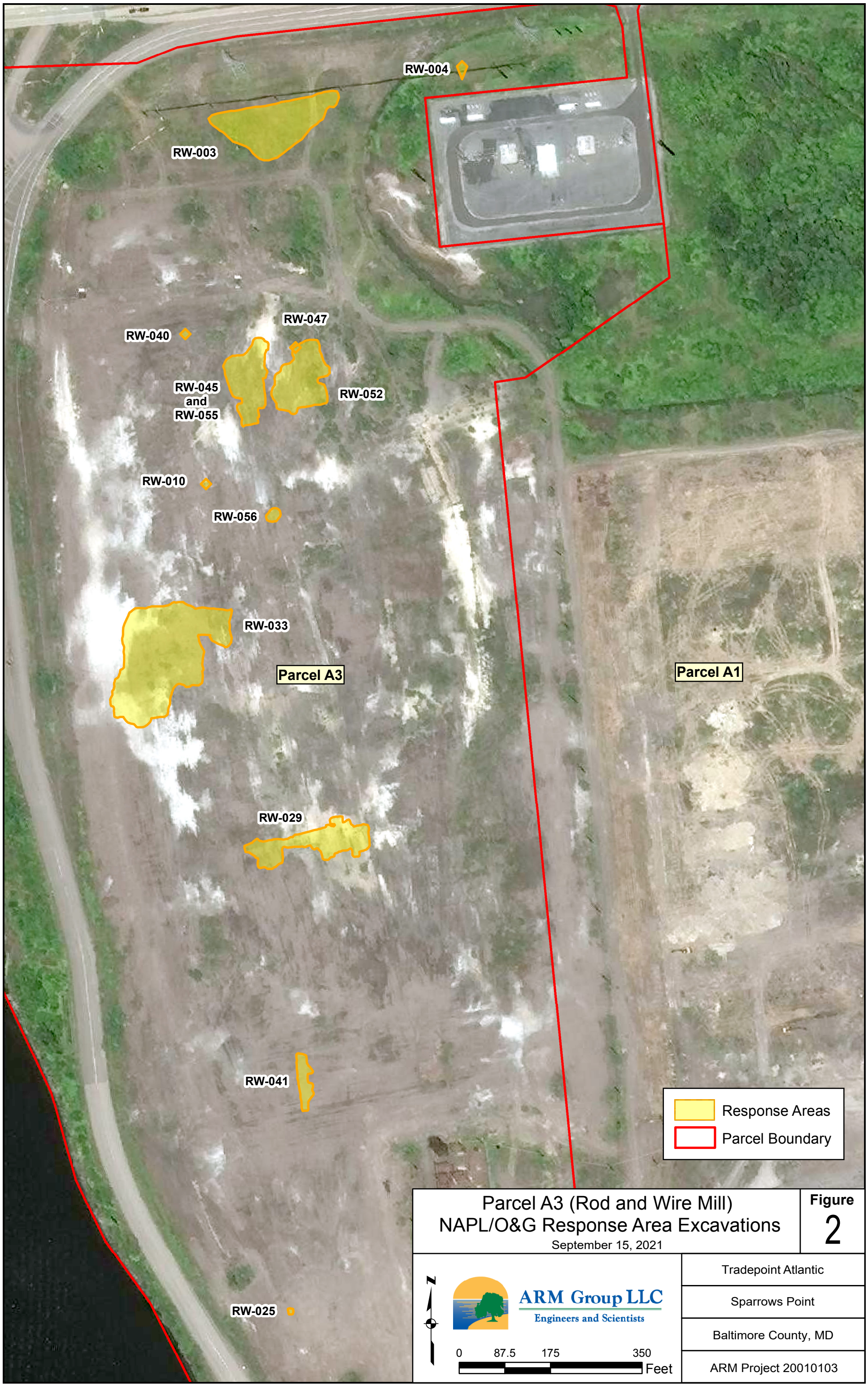
Between February and August 2017, response actions were conducted to address NAPL and Oil & Grease impacts in support of subsequently planned development activities. Excavations were completed at 13 locations, and the identified NAPL and Oil & Grease impacted soils were removed to the requisite delineation levels in accordance with the approved Response Action Work Plan entitled Lead and NAPL/Oil & Grease Delineation and Excavation Work Plan, Revision 2, dated March 1, 2017, with the exception of the area immediately to the north of the RW-003 Response Area, where the excavation was terminated with MDE permission due to physical barriers.

Subsequent development of the sub-parcel is addressed in the following documents:

- Sub-Parcel A3-1 RADWP, Revision 3, (dated April 24, 2017, updated June 5, 2017) and the accompanying Comment Response Letter (dated June 5, 2017);
- Sub-Parcel A3-1 RADWP Addendum (dated December 13, 2019) and the accompanying Comment Response Letter (dated January 16, 2020); and
  Sub-Parcel A3-1 Response and Development Completion Report (dated October 29, 2021, to which this Response Action Completion Report for the Parcel A3 NAPL/Oil & Grease Response Areas is attached).

FIGURES


Parcel A3 (Rod and Wire Mill)
Site Boundary
Parcel Boundaries
Private Property
Parcel A9
Parcel A13
Parcel A5
Parcel A7
Parcel A14
Parcel A11
Parcel A8
Parcel A12
Parcel A15
Parcel A2
Parcel A17
Parcel A18
Parcel A16
Parcel A6
Parcel A10
Parcel A4
Parcel A3
Parcel A1
Parcel B6
Parcel B8
Parcel B14
Parcel B21
Parcel B22
Parcel B16
Parcel B24
Parcel B15
Parcel B23
Parcel B7
Parcel B25
Parcel B1
Parcel B2
Parcel B3
Parcel B17
Parcel B19
Parcel B4
Parcel B5
Parcel B9
Parcel B18
Parcel B10
Parcel B13
Parcel B20
Parcel B11
Parcel B12
Source: Esri, IGN, and the
Tradepoint Atlantic
Area A and Area B Parcels
September 15, 2021
Figure
1
ARM Group LLC
Engineers and Scientists
0 500 1,000 2,000
Feet
Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
Area A: Project 200101
Area B: Project 200102
B14-1: Project 20010214



Parcel A3 (Rod and Wire Mill)
NAPL/O&G Response Area Excavations

September 15, 2021

Figure
2

ARM Group LLC
Engineers and Scientists

Tradepoint Atlantic

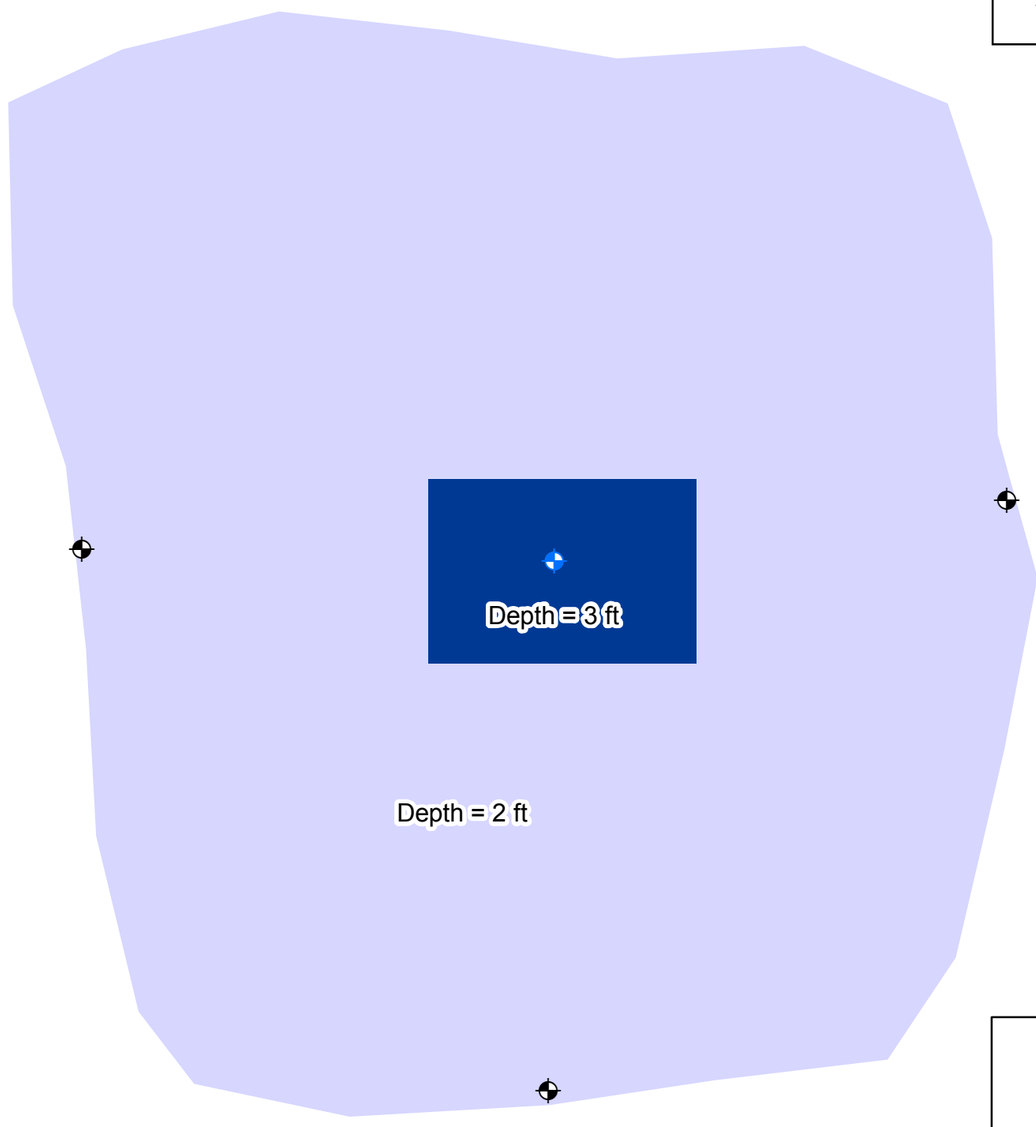
Sparrows Point

Baltimore County, MD

ARM Project 20010103

Depth (ft)	Area (ft^2)
2	102
3	6
Volume (ft^3)	**220**
Volume (yd^3)	**8**

Relevant Laboratory Reports
30211151



Parcel A3 (Rod and Wire Mill)
RW-025 Response Area Excavation
September 15, 2021

Figure 3

N

ARM Group LLC
Engineers and Scientists

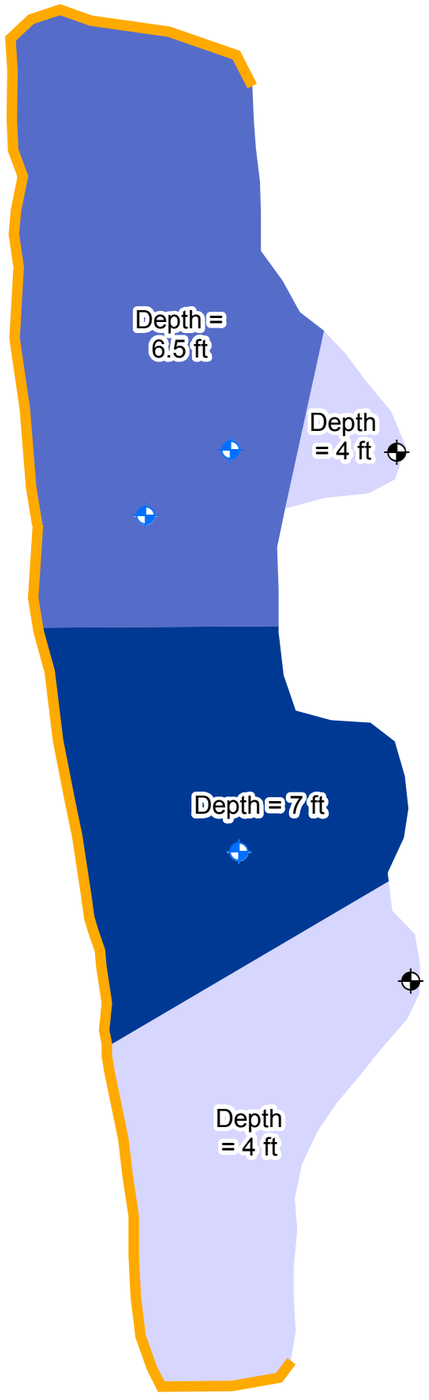
0 1.5 3
Feet

Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 20010103

Depth (ft)	Area (ft²)
4	635
6.5	986
7	641
Volume (ft³)	**13,435**
Volume (yd³)	**500**

Relevant Laboratory Reports
30211151
30211608
30211990
30212257
30212558
30212948

Concrete floor throughout excavation



Approximate Bottom Confirmation Sample Location

Sidewall Confirmation Sample Location

Concrete Wall

Parcel A3 (Rod and Wire Mill)
RW-041 Response Area Excavation
September 15, 2021

Figure 4

N

ARM Group LLC
Engineers and Scientists

0 5 10 20
Feet

Tradepoint Atlantic

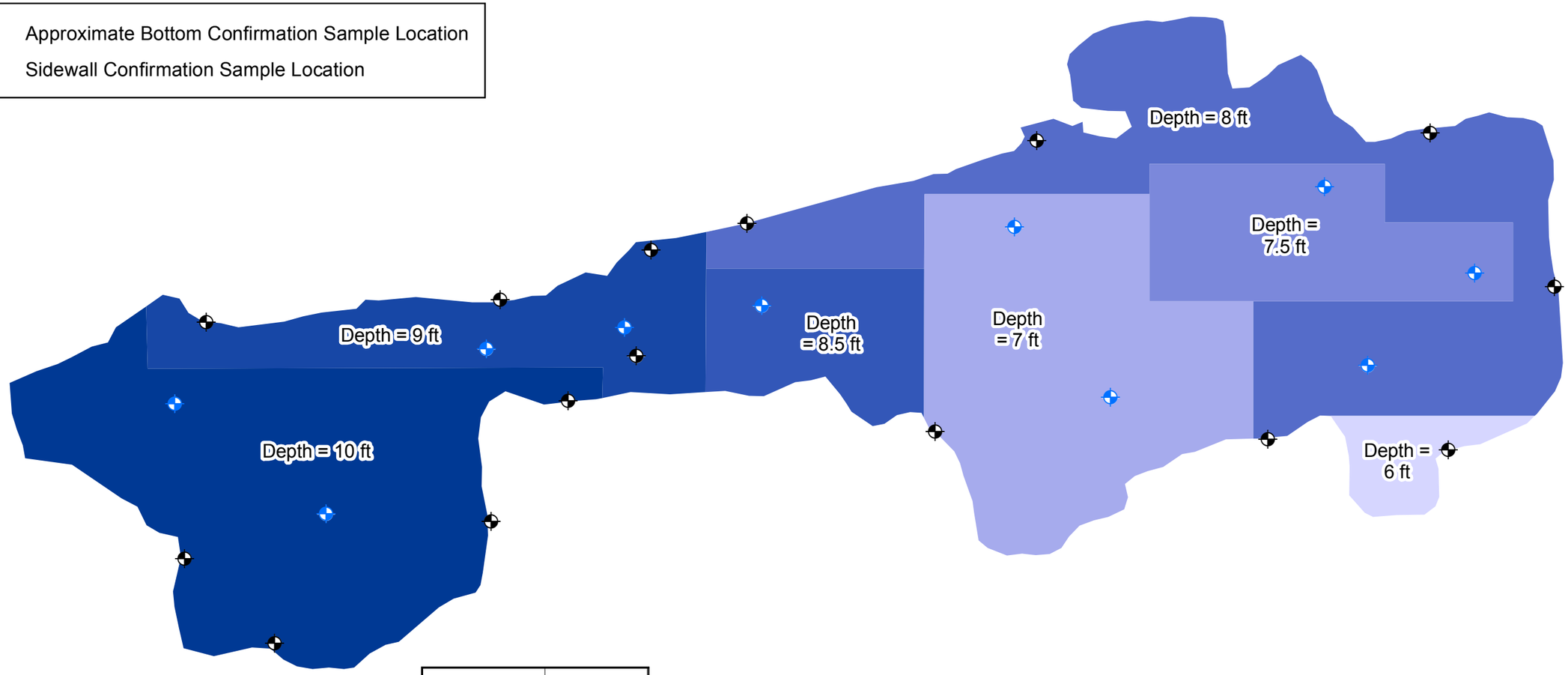
Sparrows Point

Baltimore County, MD

ARM Project 20010103

Approximate Bottom Confirmation Sample Location

Sidewall Confirmation Sample Location



Depth (ft)	Area (ft²)
6	264
7	2,081
7.5	1,009
8	2,614
8.5	678
9	1,056
10	2,618
Volume (ft³)	**86,079**
Volume (yd³)	**3,200**

Relevant Laboratory Reports
30212069
30212468
30212687
30213219

Parcel A3 (Rod and Wire Mill)
RW-029 Response Area Excavation

September 15, 2021

Figure 5

N

ARM Group LLC
Engineers and Scientists

0 10 20 40 Feet

Tradepoint Atlantic

Sparrows Point

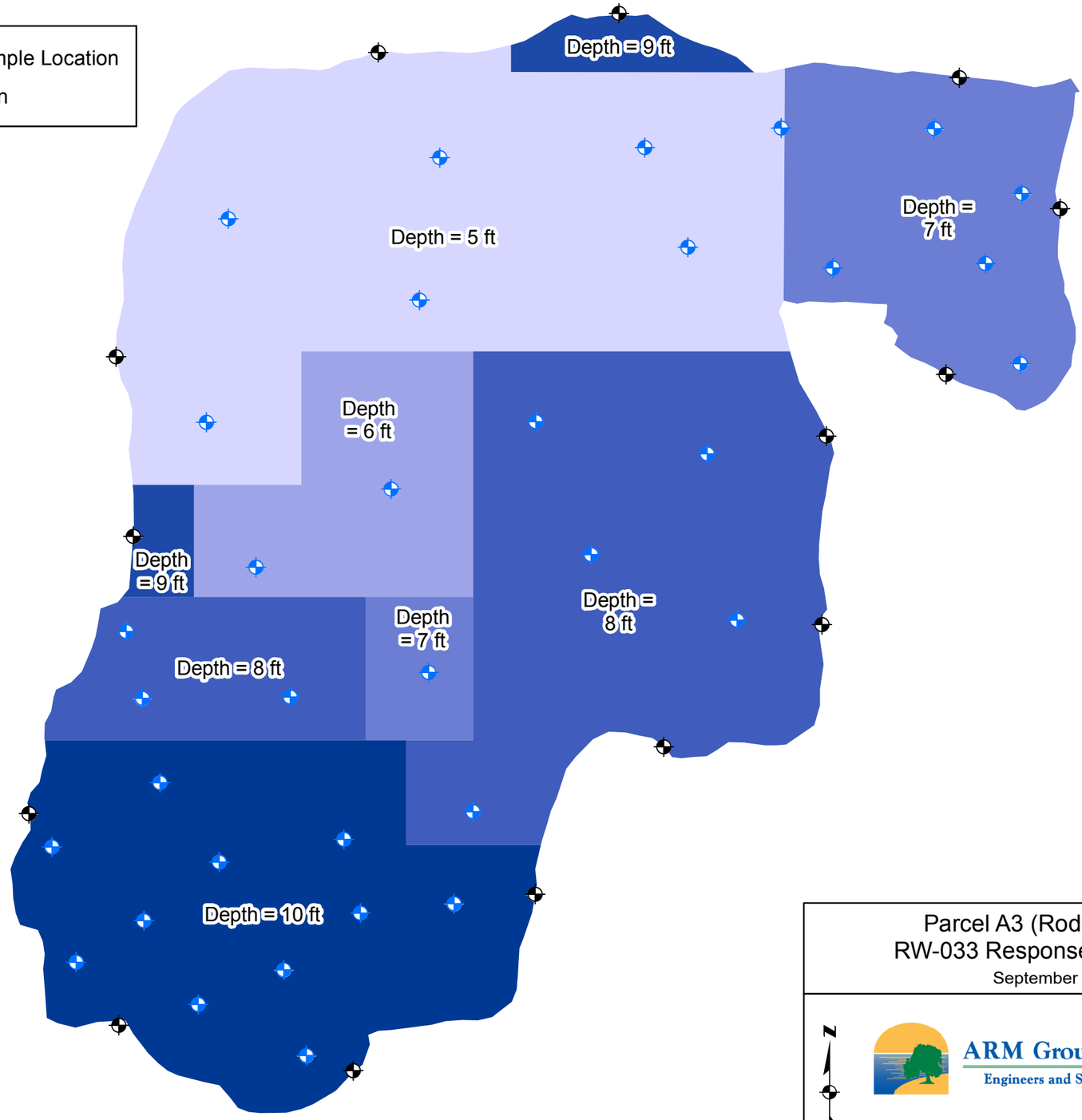
Baltimore County, MD

ARM Project 20010103

Approximate Bottom Confirmation Sample Location

Sidewall Confirmation Sample Location

Depth (ft)	Area (ft²)
5	9,779
6	2,585
7	4,474
8	9,188
9	805
10	6,782
Volume (ft³)	**244,294**
Volume (yd³)	**9,100**



Relevant Laboratory Reports
30213731
30213825
30213912
30214033
30214209
30214573
30214699
30214985
30215114

Parcel A3 (Rod and Wire Mill)
RW-033 Response Area Excavation
September 15, 2021

Figure 6

N

ARM Group LLC
Engineers and Scientists

0 15 30 60
Feet

Tradepoint Atlantic

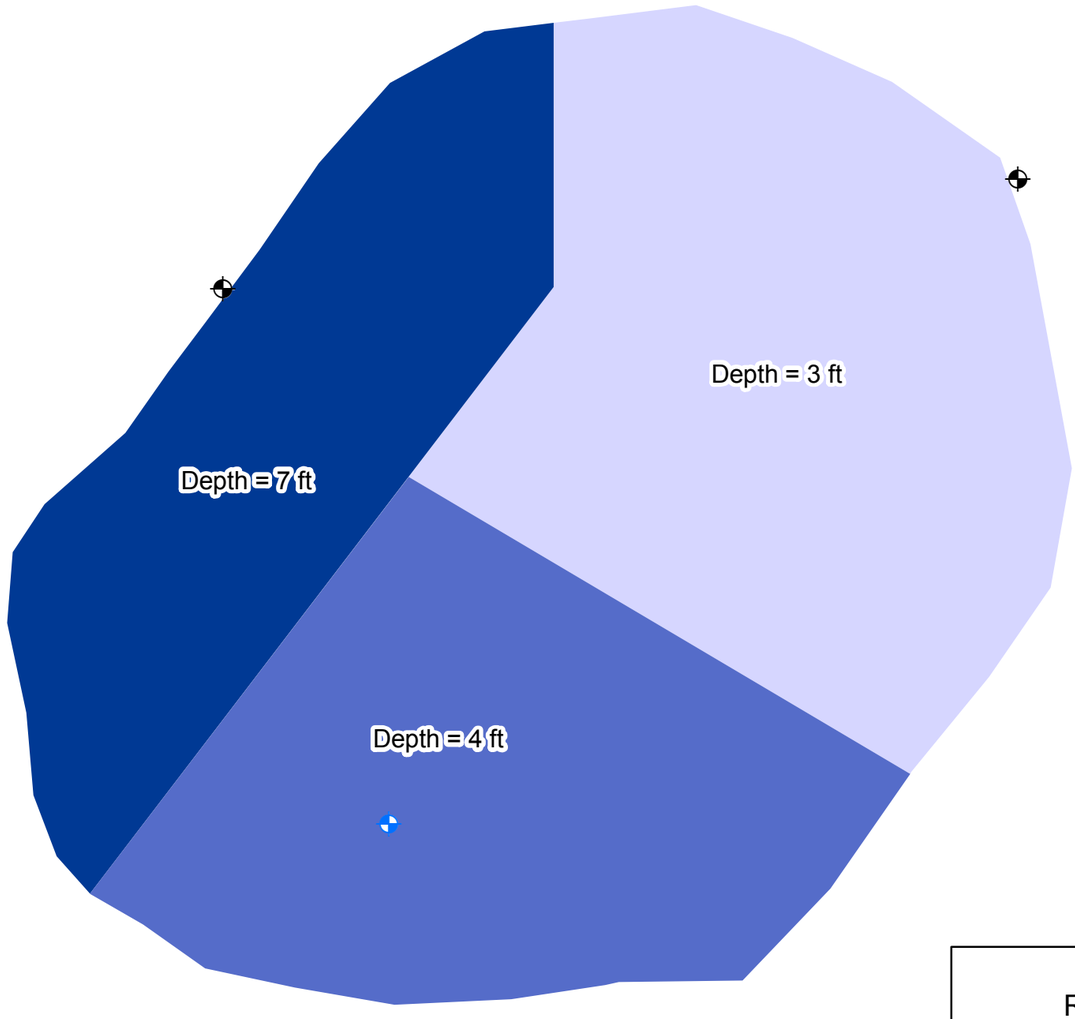
Sparrows Point

Baltimore County, MD

ARM Project 20010103

Depth (ft)	Area (ft^2)
3	218
4	173
7	141
Volume (ft^3)	**2,329**
Volume (ft^3)	**90**

Relevant Laboratory Reports
30213912



Parcel A3 (Rod and Wire Mill)
RW-056 Response Area Excavation
September 15, 2021

Figure 7

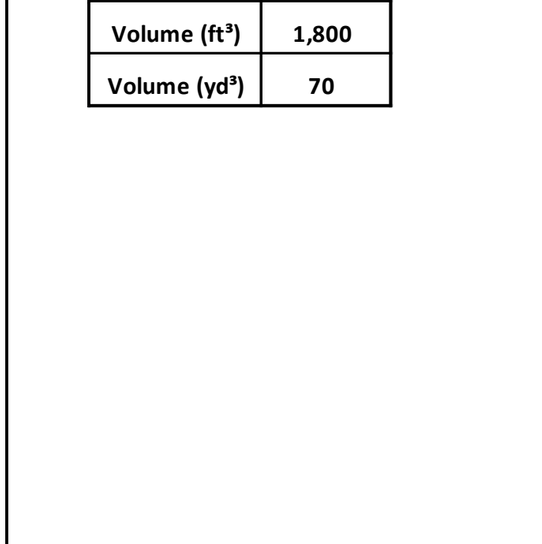
ARM Group LLC
Engineers and Scientists

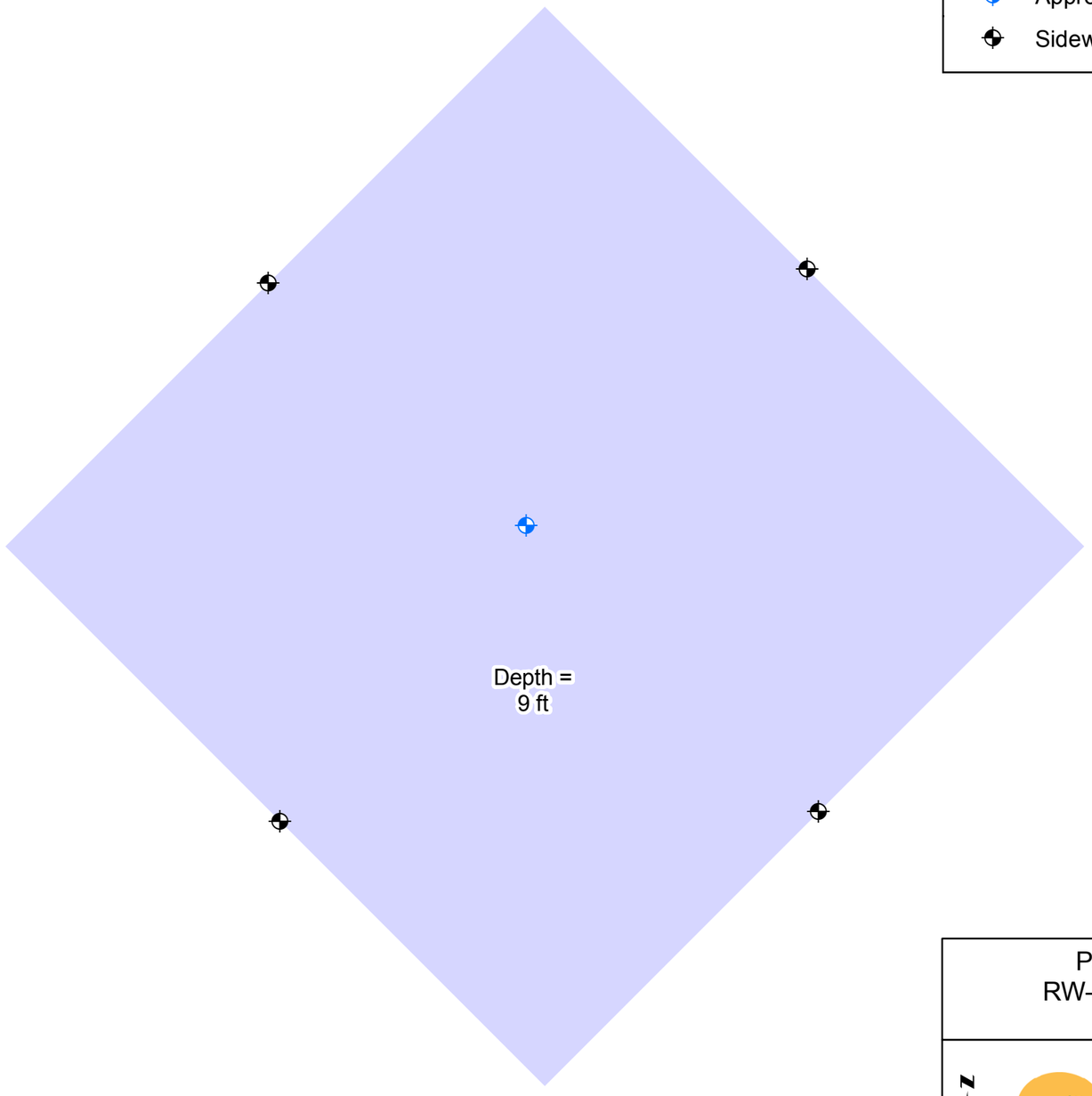
0 2 4 8 Feet

Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 20010103

Depth (ft)	Area (ft^2)
9	200
Volume (ft^3)	**1,800**
Volume (yd^3)	**70**

Relevant Laboratory Reports
30213912





Parcel A3 (Rod and Wire Mill)
RW-010 Response Area Excavation
September 15, 2021

Figure
8

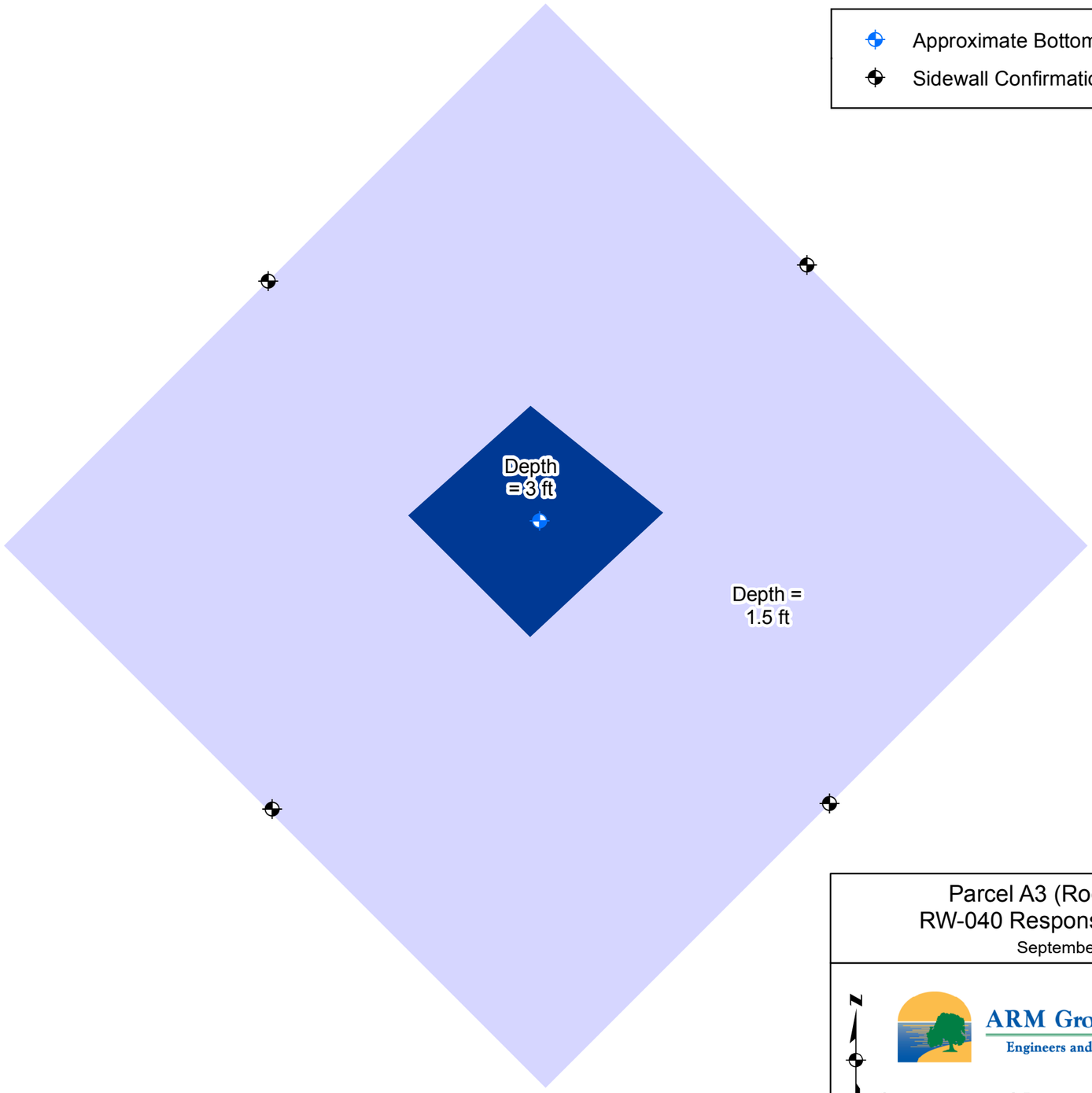
ARM Group LLC
Engineers and Scientists

0 2.5 5
Feet

Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 20010103

Depth (ft)	Area (ft^2)
1.5	190
3	10
Volume (ft^3)	**315**
Volume (yd^3)	**12**

Relevant Laboratory Reports
30213912



Parcel A3 (Rod and Wire Mill)
RW-040 Response Area Excavation
September 15, 2021

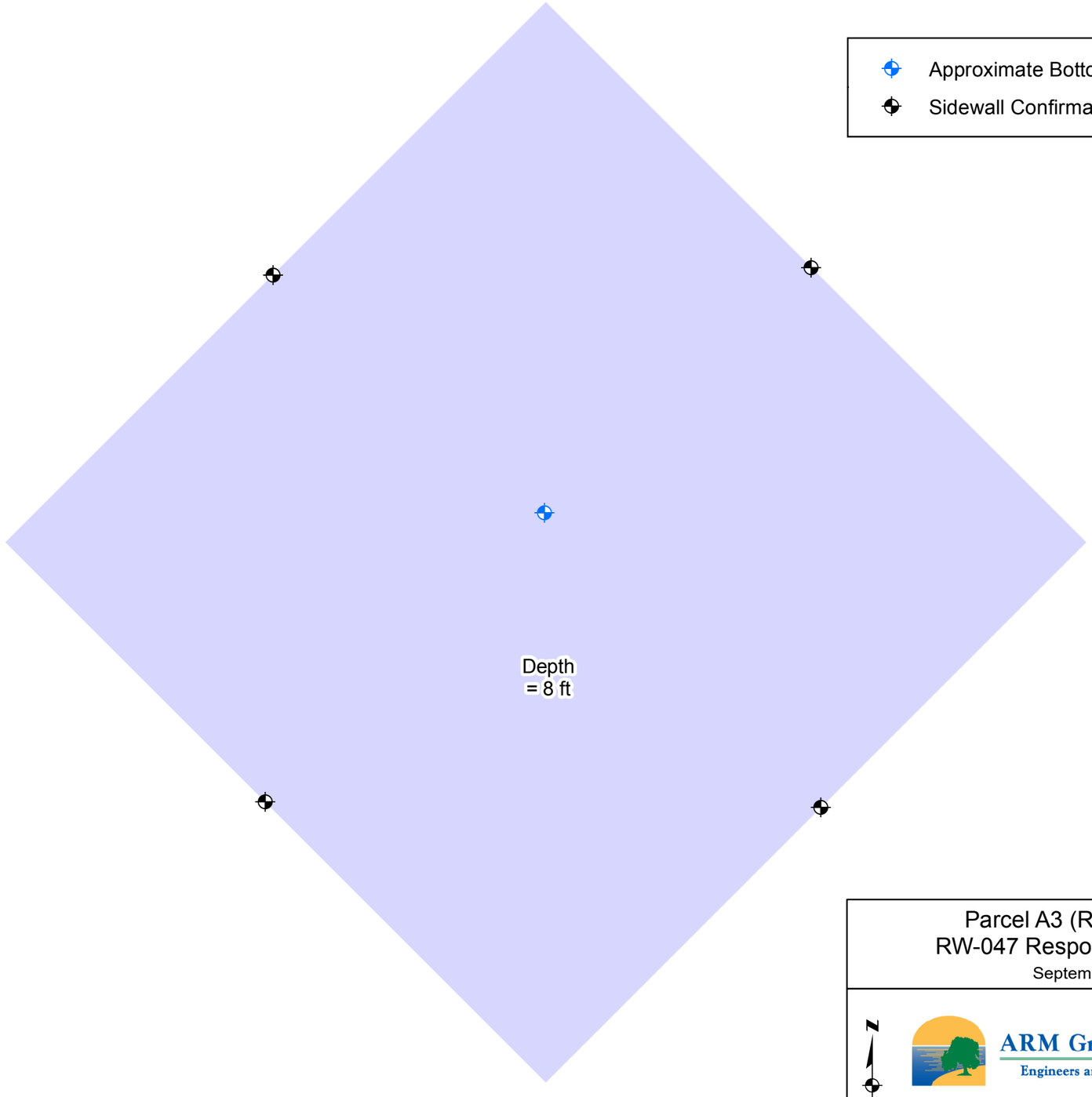
Figure 9

ARM Group LLC
Engineers and Scientists

0 2.5 5 Feet

Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 20010103

Depth (ft)	Area (ft^2)
8	200
Volume (ft^3)	**1,600**
Volume (yd^3)	**60**



Approximate Bottom Confirmation Sample Location

Sidewall Confirmation Sample Location

Relevant Laboratory Reports

30213912

Parcel A3 (Rod and Wire Mill)
RW-047 Response Area Excavation
September 15, 2021

Figure 10

ARM Group LLC
Engineers and Scientists

0 2.5 5 Feet

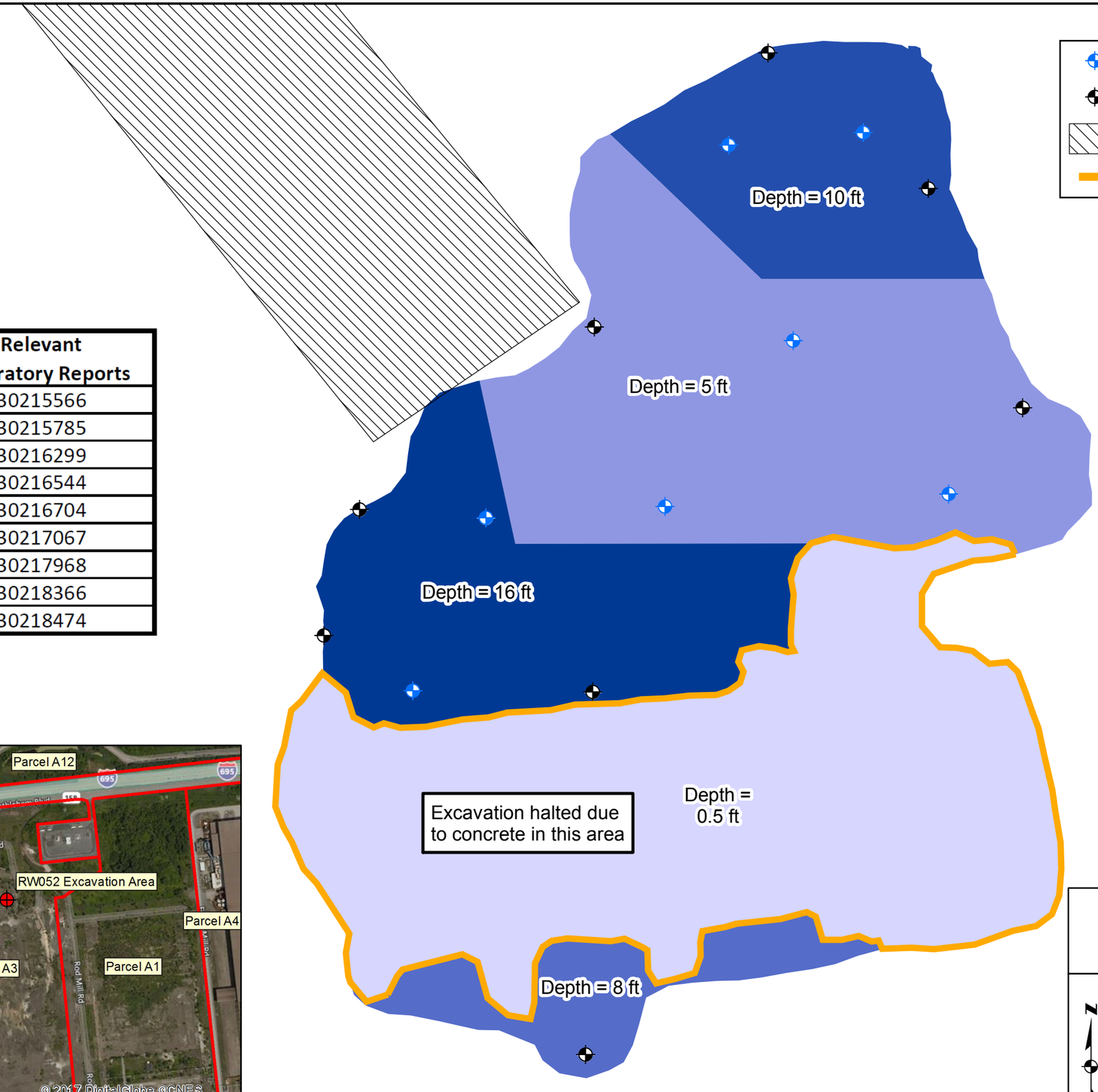
Tradepoint Atlantic

Sparrows Point

Baltimore County, MD

ARM Project 20010103

Relevant Laboratory Reports
30215566
30215785
30216299
30216544
30216704
30217067
30217968
30218366
30218474



Depth (ft)	Area (ft²)
0.5	4,038
5	2,903
8	539
10	1,170
16	1,705
Volume (ft³)	**59,820**
Volume (yd³)	**2,250**

Parcel A3 (Rod and Wire Mill)
RW-052 Response Area Excavation
September 15, 2021

Figure 11

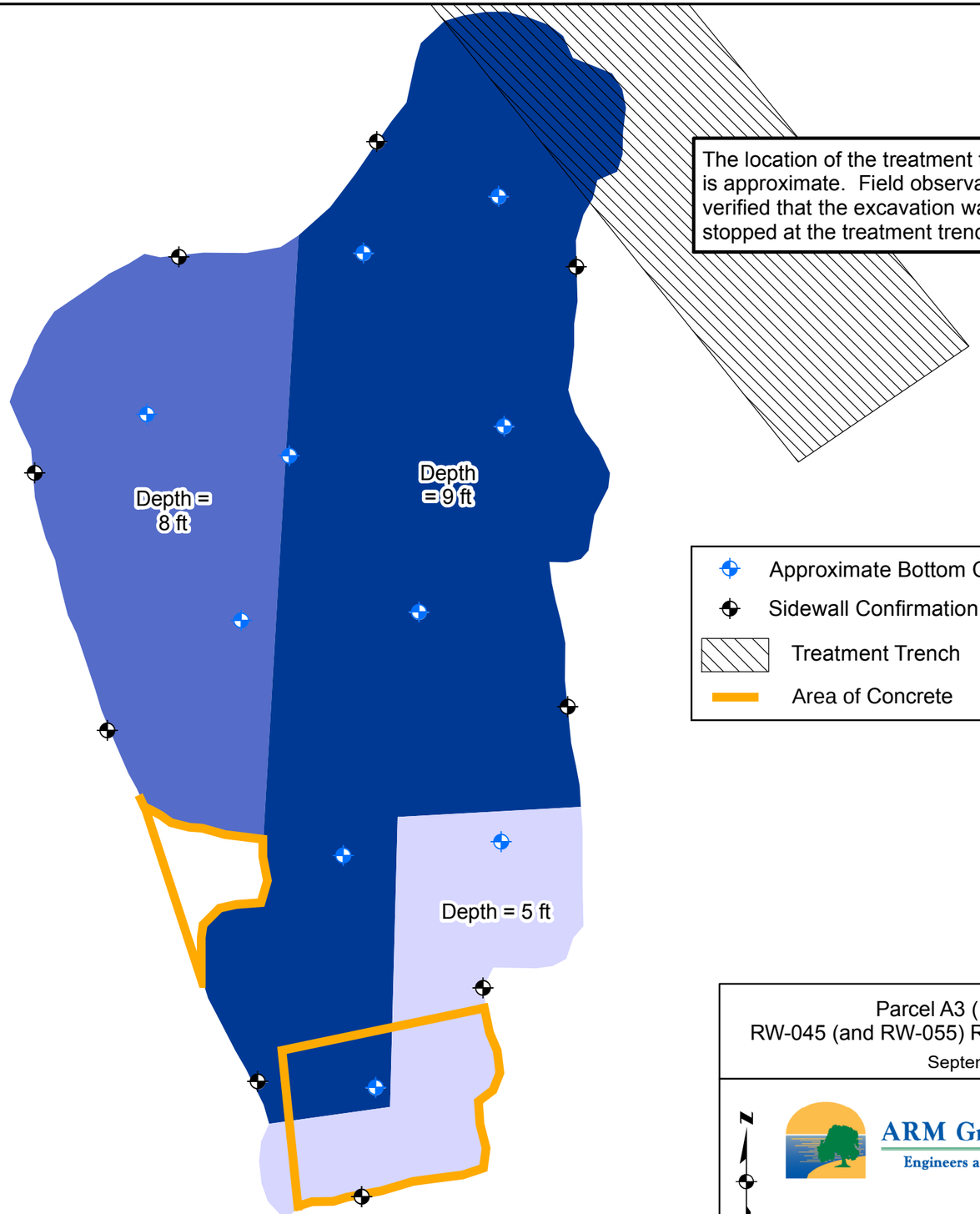
ARM Group LLC
Engineers and Scientists

0 5 10 20 Feet

Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 20010103

Depth (ft)	Area (ft²)
5	1,188
8	2,413
9	5,274
Volume (ft³)	**72,708**
Volume (yd³)	**2,700**

Relevant Laboratory Reports
30217176
30217501
30215785



The location of the treatment trench is approximate. Field observations verified that the excavation was stopped at the treatment trench.

- Approximate Bottom Confirmation Sample Location
- Sidewall Confirmation Sample Location
- Treatment Trench
- Area of Concrete

Parcel A3 (Rod and Wire Mill)
RW-045 (and RW-055) Response Area Excavation(s)
September 15, 2021

Figure 12

N

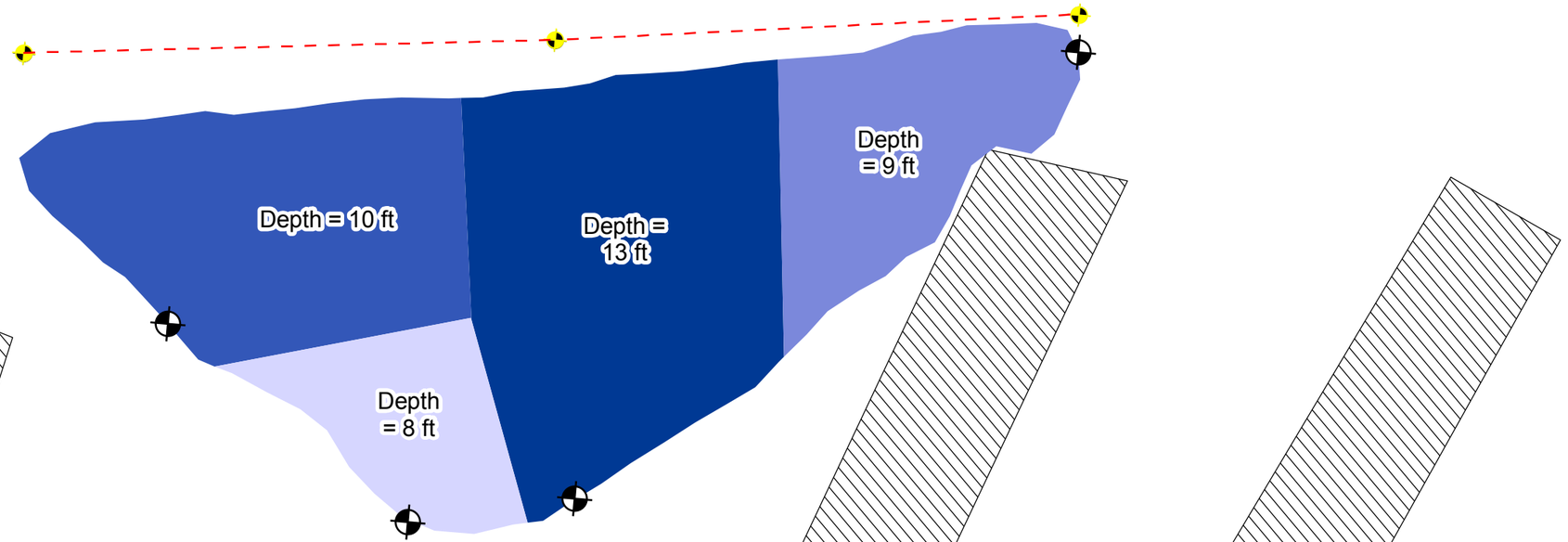
0 10 20 40 Feet

ARM Group LLC
Engineers and Scientists

Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 20010103

Depth (ft)	Area (ft²)
8	1,986
9	3,192
10	5,043
13	6,457
Volume (ft³)	**178,978**
Volume (yd³)	**6,700**

Relevant Laboratory Reports
No samples collected



Electric Poles

Treatment Trench

Excavation Sidewall PID Reading

Overhead Power Line

Parcel A3 (Rod and Wire Mill)
RW-003 Response Area Excavation
September 15, 2021

Figure 13

ARM Group LLC
Engineers and Scientists

0 15 30 60 Feet

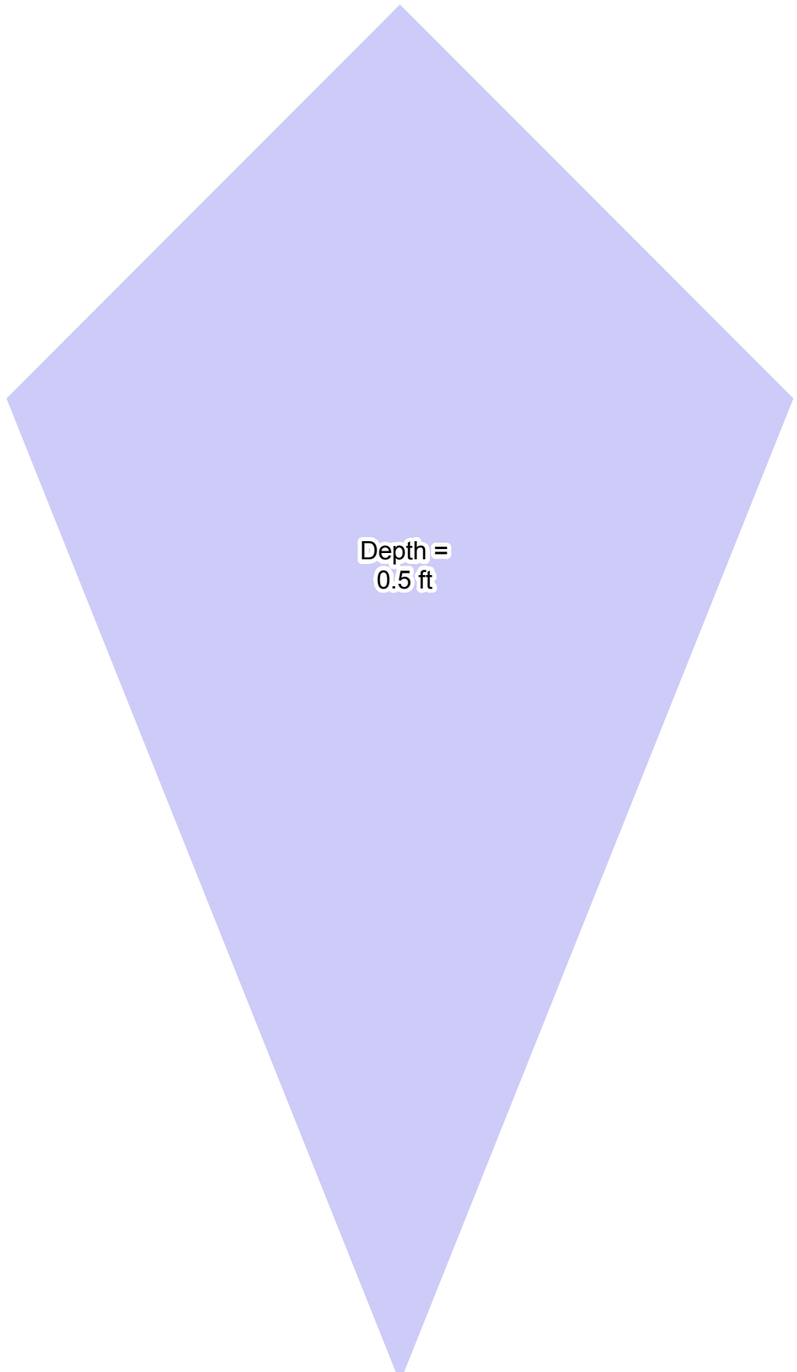
Tradepoint Atlantic

Sparrows Point

Baltimore County, MD

ARM Project 20010103

Depth (ft)	Area (ft^2)
0.5	350
Volume (ft^3)	**175**
Volume (yd^3)	**6**



Relevant Laboratory Reports
No samples collected

Parcel A3 (Rod and Wire Mill)
RW-004 Response Area Excavation
September 15, 2021

Figure 14

ARM Group LLC
Engineers and Scientists

0 2 4 8 Feet

Tradepoint Atlantic

Sparrows Point

Baltimore County, MD

ARM Project 20010103

APPENDIX A

021617-1: Excavation in progress.

021617-2: Excavation in progress.

021617-3: Completed excavation. Take note of the concrete wall along the northern sidewall of the RW-025 Response Area.

021617-4: Completed excavation. Little to none impacts were observed.

032717-1: Backfilling in progress.

032817-1: View to the west of final backfilled state of RW-025 Response Area.

030717-1: View to the southeast of the RW-041 Response Area. Take note of the backfill debris along the east sidewall; this backfill material was common throughout the entire excavation.

030717-1: View of the southern concrete sidewall.

030917-1: View of the northern concrete sidewall.

032717-1: View to the south of excavation in progress. The excavator with a hammer attachment can be observed making holes along the concrete bottom of this excavation. Take note that the west sidewall is concrete.

032817-1: View to the south of backfilling in progress.

023017-1: View to the south of backfilling in progress.

021717-1: View to the south of the start of excavation activities at the RW-029 Response Area.

021717-2: A NAPL bearing pipe was observed and removed from the excavation.

022017-1: NAPL observed in the groundwater during excavation activities.

022117-1: Excavation in progress. Visible in background is an Adler tank used as a temporary storage unit to dewater the excavation.

022417-1: Soil waste stockpile contained and covered with plastic.

022417-2: View of concrete box filled with black NAPL located along the southeast corner of the excavation.

022417-3: Another view of the NAPL found in the photo above leaching out of the concrete box.

022417-4: View of the southeast corner of the exaction where the NAPL filled concrete box was located along with other concrete boxes and structures.

030217-1: Excavator with hammer attachment used to break up and remove NAPL stained concrete floors, walls, footers, and boxes.

030317-1: An Oil & Grease exceedance was identified along the west wall where the excavator is located; this area was extended.

030917-1: Extension of excavation in progress. NAPL saturated soil removed in and around brick box.

031017-1: View of removal of impacted material from excavation extension.

031017-2: View of excavation extension facing east.

031017-3: View of excavation extension facing south.

032417-1: Backfilling excavation in progress. Visible in bottom-right corner is dewatering hose.

032417-2: Dewatering discharge to existing manhole. Water was conveyed to Tradepoint Atlantic's on-site wastewater treatment plant.

032517-1: Backfilling in progress.

032717-1: View to the east of the RW-029 Response Area backfilled to grade.

031417-1: View to the south of the start of excavation activities at RW-033 Response Area.

031617-1: View of a metallic tank located along the southeast corner of the excavation. Black NAPL impacted soil was observed in and around the tank.

041017-1: View to the southwest of excavation in progress.

041017-2: View to the southeast of excavation in progress.

041017-3: View to the west of dewatering the excavation prior to backfilling.

041117-1: View to the east of backfilling in progress.

041317-1: View to the northwest of backfilling in progress.

042117-1: View to the north of the excavation backfilled to grade.

032617-1: Excavation in progress. No impacts observed around the concrete boxes.

032917-1: View of dewatering completed excavation for backfilling. Concrete boxes were not NAPL stained.

041117-1: Backfilling in progress

042017-1: Final view of the RW-056 Response Area backfilled to grade.

032217-1: View to the south of initial excavation activities.

032217-2: Excavation in progress.

032217-3: Completed excavation to target depth. Little to none impacts observed.

040417-1: View to the south of the excavation backfilled to grade.

032217-1: View to the southeast of the start of excavation activities at the RW-040 Response Area.

032217-2: View to the east of the complete excavation. Little to none impacts were observed.

032217-1: View of the RW-040 Response Area backfilled to grade.

032217-1: View to the south of the start of excavation at the RW-047 Response Area.

032217-2: View of the completed excavation. Little to none impacts observed.

032217-3: View of the completed excavation .

032217-1: Backfilling in progress.

041817-1: View to the west of excavation in progress.

041917-1: View of bottom fragments of a fiberglass tank. Soil impacts were observed around the location of this along with four other tanks of similar size in the same vicinity. Tanks were located on the concrete pad.

041917-2: View to the northwest of the EAG remedial trench.

042017-1: View to the south of concrete pad encountered during excavation activities. This concrete pad was not removed due to no impacts beneath.

042117-1: View to the southeast of the completed excavation.

042117-2: View to the west of the completed excavation.

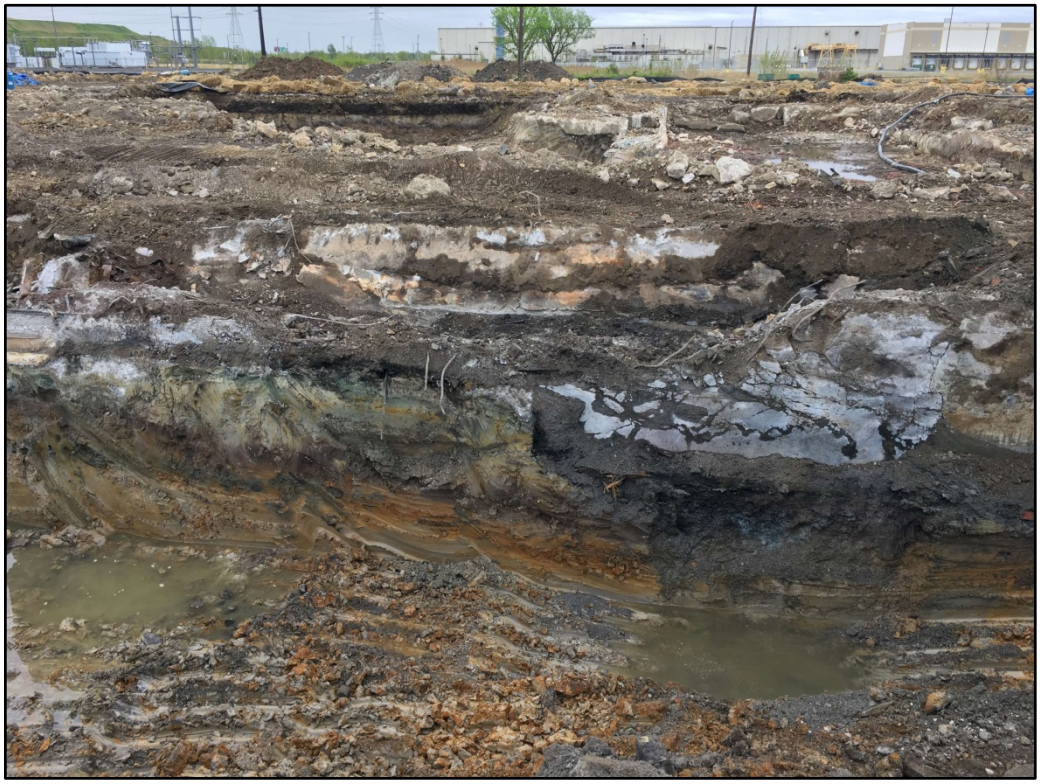
050317-1: View to the northeast of backfilling in progress.

050417-1: View to the east of backfilling in progress.

042117-1: Excavation in progress.

042117-2: Excavation in progress. Take note of the NAPL stained concrete box.

042217-1: Trench drains located around the raised concrete box.



042417-1: View to the east of open face concrete structure with impacted soil underneath.

042417-2: View of the top of open face concrete structure facing north.

042717-1: View of impacted concrete being removed.

042817-1: View to the southeast of the completed excavation.

042817-2: View to the east of the completed excavation.

042817-3: View to the south of the completed excavation.

042817-4: View to the north of the completed excavation.

050117-1: View to the west of excavation in progress.

050117-2: View to the west of excavation in progress. An empty corroded utility pipe was found and removed.

050117-3: Fragments of steel drums saturated in NAPL from the RW-003 Response Area.

050217-1: View to the north of the RW-003 Response Area with oily sheen on accumulated groundwater.

050217-2: View to the east of excavation in progress. The abandoned utility line identified above was removed.

051817-1: Fragments of steel drums and large sections of slag material that were excavated from the RW-003 Response Area.

070617-1: View to the west of excavation and mixing with Terrabond in progress.

072217-1: View to the east of the start of backfilling.

072417-1: View to the north of backfilling in progress.

072717-1: View to the west of backfilling in progress.

051817-1: View to the southwest of the start of excavation.

051817-2: View to the northwest of the approximate excavation area.

051817-3: View to the south. of excavation to 1 foot below ground surface (bgs).

051817-4: Close-up view of excavation attempt below 1 foot bgs.

051817-5: View to the southeast showing the proximity of the low overhead power lines to the excavation.

051817-6: View to the southwest showing the low overhead power lines running through the excavation.

APPENDIX B

ARM Group Inc.
Earth Resource Engineers and Consultants

June 19, 2017

Ms. Barbara Brown
Project Coordinator
Maryland Department of the Environment
1800 Washington Boulevard
Baltimore, MD 21230

Re: Excavation Update – RW-004-SB
Area A: Sub-Parcel A3-1
Tradepoint Atlantic
Sparrows Point, MD 21219

Dear Ms. Brown:

On behalf of EnviroAnalytics Group, LLC (EAG), ARM Group Inc. (ARM) is providing this notification letter to the Maryland Department of the Environment (MDE) regarding the excavation work associated with soil boring RW-004-SB within Area A: Sub-Parcel A3-1 of the Tradepoint Atlantic property located in Sparrows Point, Maryland. The Phase II Investigation soil boring RW-004-SB was completed on October 6, 2015. Oil & Grease was detected above the Project Action Limit (PAL) of 6,200 mg/kg in the soil sample interval collected from 4 to 5 feet below ground surface (bgs) within RW-004-SB, with a reported value of 12,400 mg/kg. Oil & Grease was not detected above the PAL in the 1-foot bgs sample from the same boring. There was no physical evidence of non-aqueous phase liquid (NAPL) identified in the soil core.

To determine the extent of the Oil & Grease impacts in the vicinity of this boring, eight delineation borings were proposed surrounding RW-004-SB. The delineation borings were completed on February 24, 2017 in accordance with the Sub-Parcel A3-1 Lead and NAPL/Oil & Grease Delineation and Excavation Plan (final version: Revision 2 dated March 1, 2017) at the positions shown on **Figure 1**. The Oil & Grease analytical results from these borings are included on the figure. None of the delineation borings exhibited evidence of potential NAPL contamination based on field screening of the soil cores. Note that boring RW-004C-SB was not attempted due to a concern for worker health and safety based on the presence of overhead high voltage power lines. **Figure 1** also indicates the positions of the utility poles holding the power lines. The power lines pass directly through the southern portion of the delineation area.

Excavation was proposed following completion of the delineation activities at RW-004-SB to remove soil potentially impacted by Oil & Grease. The proposed excavation boundary is indicated on **Figure 1**. The excavation had an initial proposed area of 350 square feet and a preliminary depth of 6 feet bgs (one foot deeper than the elevated Oil & Grease detection).

Excavation began at RW-004-SB on May 18, 2017. A layer of very hard slag, which could not be penetrated, was encountered by the excavation crew at a depth of 1-foot bgs throughout the entire 350 square foot excavation area. An excavator with a hammer attachment could not be safely used to break up the slag due to the proximity of the excavation to the overhead power lines. It was not feasible to shut off power to the overhead lines via lockout/tagout procedures because the overhead lines actively deliver power to the nearby community of Edgemere, Maryland. Consequently, the excavation at RW-004-SB could not be completed to the target depth of 6 feet bgs due to the health and safety concern created by the power lines. A photograph log is included as **Attachment 1**, documenting the excavation activities and proximity to the overhead lines. A video documenting a portion of the excavation attempt can be provided to the MDE at a later date if requested.

As shown on **Figure 1**, Oil & Grease was not detected above the PAL at any of the delineation boring locations, and evidence of NAPL was not identified within any of the applicable soil cores. The original Oil & Grease exceedance in RW-004-SB-5 appears to be isolated and does not appear to be indicative of more wide-spread contamination in the vicinity of this boring. Due to this apparent isolated occurrence of the original Oil & Grease PAL exceedance, and the fact that the excavation work is in close proximity to overhead power lines causing concern for worker health and safety, no further action is recommended.

If you have any questions, or if we can provide any additional information at this time, please do not hesitate to contact ARM Group Inc. at 410-290-7775.

Respectfully submitted,
ARM Group Inc.

Taylor R. Smith
Staff Engineer

Eric S. Magdar
Vice President

FIGURES

RW-004A-SB
OG (1ft): ND
OG (5ft): 1,150
OG (10ft): ND

RW-004B-SB
OG (1ft): 173
OG (4ft): 1,390
OG (10ft): ND

RW-004-SB
OG (1ft): 301
OG (5ft): 12,400

RW-004E-SB
OG (1ft): ND
OG (4ft): ND
OG (10ft): ND

RW-004H-SB
OG (1ft): ND
OG (5ft): ND

RW-004G-SB
OG (1ft): 121
OG (3ft): 241

RW-004F-SB
OG (1ft): ND

RW-004C-SB

RW-004D-SB
OG (1ft): 933

Location Inset

Parcel A3 (Rod and Wire Mill)
RW-004-SB Oil & Grease (OG) Excavation

June 13, 2017

Figure 1

EnviroAnalytics Group
ARM Project 160443M-1
Tradepoint Atlantic
Baltimore County, MD

ARM Group Inc.
Earth Resource Engineers and Consultants

0 3.75 7.5 15
Feet

Utility Pole
Excavation Boundary
Parcel Boundary
Impacted Location
Clean Delineation Boring
Not Collected Delineation Boring

ND = Non-detect

Attachment 1

051817-1: RW-004 Excavation – facing southwest. Start of excavation.

051817-2: RW-004 Excavation – facing northwest. Main excavation area.

051817-3: RW-004 Excavation – facing south. Excavation to 1 foot below ground surface (bgs).

051817-4: RW-004 Excavation – close-up view. Excavation attempt below 1 foot bgs.

051817-5: RW-004 Excavation – facing southeast. Proximity of excavation area to overhead power lines.

051817-6: RW-004 Excavation – facing southwest. Proximity of excavation area to overhead power lines.

APPENDIX C

SAFETY DATA SHEET

TerraBond®Mg

1. Product And Company Identification

Remedium Services Group, LLC
d/b/a Terra Materials
11711 N. College Avenue, Suite 170
Carmel, IN 46032

Company Contact: Tom McCullough
Telephone Number: (317) 660-6868
Web Site: www.terramaterials.com

Supplier Emergency Contacts & Phone Number
Terra Materials: (317) 660-6868

Issue Date: 7/26/12
Revision Date: 5/20/21

Product Name: TerraBond®Mg
Chemical Formula: Proprietary Formulation

2. Hazards Identification

Pictograms:

Signal Word: Warning

Hazard Statements:
H315 May cause skin irritation
H319 May cause eye irritation
H335 May cause respiratory irritation

Precautionary Statements:
P280 Wear Protective gloves and eye protection
P305 & P351 If in eye rinse cautiously with water for several minutes.
P337 & P313 If eye irritation persists, get medical advice/attention.
P302 & P352 If on skin wash with plenty of soap and water.
P261 Avoid breathing dust

3. Composition/Information On Ingredients

Ingredient Name	CAS Number		Percent of Total Weight
Propprietary Magnesiuim/Calcium Blend	N/A		90-99
Silica Quartz	14808-60-7		1-10

4. First Aid Measures

Eye

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician

Skin

Wash off promptly when exposure ceases. Do not allow dried sludge to remain on skin for prolonged periods as this may cause skin irritation.

Ingestion

Drink plenty of water. **Do not induce vomiting unless directed by a physician**

Inhalation

Remove from exposure. Get medical attention if experiencing cough, irritation or difficulty breathing.

5. Fire Fighting Measures

Fire and Explosion Hazards

Material is not considered to be combustible.

Extinguishing Media

Any means suitable for extinguishing surrounding fire.

6. Accidental Release Measure

Absorb with suitable material and dispose of in accordance with regulations. Ventilate if necessary.

7. Handling And Storage

Handling And Storage Precautions

Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin and eyes.

8. Exposure Controls/Personal Protection

Eye/Face Protection

Safety glasses or safety goggles.

Skin Protection

Chemical resistant gloves. Sufficient protective clothing to minimize skin exposure. Launder contaminated clothing before reuse

Respiratory Protection

None required if adequate ventilation is provided.

SAFETY DATA SHEET

TerraBond®Mg

9. Physical And Chemical Properties

Appearance	Tan colored powder
Odor	Odorless
Density:	90 to 105 lbs/ft3
Vapor Density:	Not applicable
Solubility:	Slightly soluble
pH	10-11

10. Stability and Reactivity

Chemical Stability
Stable under normal temperature and pressures.

Hazardous Polymerization
Has not been reported

Conditions To Avoid (Stability)
None known

Incompatible Materials
None known.

11. Toxicological Information

Component Information:

Proprietary Formulation: No information availabld

SAFETY DATA SHEET

TerraBond®Mg

12. Ecological Information

Ecotoxicity:

No Data Found

13. Disposal Considerations

Dispose of in accordance with local, state and federal regulations.

14. Transport Information

Proper Shipping Name:

Non-Hazardous, Non-Regulated Solid

15. Regulatory Information

CERCLA

Not applicable- contains no hazardous substances at or above de minimis concentrations.

SARA TITLE III:

Section 302 Extremely Hazardous Substances: None at or above de minimis concentrations.

Section 311/312 Health and Physical Hazards: Delayed (chronic) health hazard from long-term inhalation of dust.

Section 313 Toxic Chemicals: None at or above de minimis concentrations.

TSCA: All components of this product are in compliance or are exempt from inventory listing requirements of the United States Toxic Substance Control Act (TSCA) Chemical Substance Inventory

16. NFPA

Health – 1 **Flammability – 0** **Reactivity – 0** **Special Hazard=None**

SAFETY DATA SHEET

TerraBond®Mg

17. Disclaimer

Terra Materials provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. The information is based upon our current knowledge and experience of our product and is not exhaustive. It applies to the product as defined by the specifications. In case of combinations or mixtures with other chemicals, one must confirm that no new hazards are likely to exist. In any case, the user is not exempt from observing all legal, administrative, and regulatory procedures relating to the product, personal hygiene, and integrity of the work environment.

This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose and does not relate to the use of this product in combination with any other substance or other process.

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ATTACHMENT 2

RESPONSE ACTION COMPLETION REPORT

AREA A: PARCEL A3
METALS RESPONSE AREAS
TRADEPOINT ATLANTIC
SPARROWS POINT, MARYLAND

Prepared For:

TRADEPOINT ATLANTIC
1600 Sparrows Point Boulevard
Sparrows Point, Maryland 21219

Prepared By:

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9175 Guilford Road
Suite 310
Columbia, Maryland 20146

ARM Project No. 21010103

Respectfully Submitted,
ARM Group LLC

Melissa Replogle Hritz, E.I.T.
Project Engineer

T. Neil Peters, P.E.
Senior Vice President

Revision 0 – December 3, 2021

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1.0 INTRODUCTION

1.1. BACKGROUND

ARM Group LLC (ARM), on behalf of Tradepoint Atlantic, has prepared this Response Action Completion Report to document activities performed on a portion of the Tradepoint Atlantic property that has been designated as Area A: Parcel A3 (the Site) that were completed under the direction of EnviroAnalytics Group (EAG). The location of Parcel A3 is shown on **Figure 1**. A Phase II Investigation of soil and groundwater conditions was performed for the Site in accordance with the requirements outlined in the Administrative Consent Order (ACO) as further described in the approved Phase II and Pre-Design Investigation Work Plan – Parcel A3 (Final), prepared by EAG (dated September 17, 2015). Findings from the Phase II Investigation have been presented in the Phase II Investigation Report – Area A: Parcel A3 (dated June 10, 2016).

Three of the soil borings completed during the Phase II Investigation of Parcel A3 were identified as containing elevated metals warranting additional delineation. Results from location RW-021-SB indicated an arsenic concentration in soil of 492 milligrams per kilogram (mg/kg) in the shallow (0 to 1 foot below ground surface (bgs)) sample. A lead concentration of 44,700 mg/kg was identified in the shallow soil sample from location RW-055-SB, and boring RW-052-SB had a concentration of 16,400 mg/kg in a deeper (4 to 5 foot bgs) sample. Based on direction from the Maryland Department of the Environment (MDE) and United States Environmental Protection Agency (USEPA), these boring locations were investigated for elevated levels of arsenic (RW-021-SB) and lead (RW-052-SB and RW-055-SB).

Based on the results of the Phase II Investigation, a Response Action Work Plan entitled Lead and NAPL/Oil & Grease Delineation and Excavation Work Plan, Revision 2, was submitted to the agencies on March 1, 2017.

A Response Action Completion Report will be prepared and submitted under separate cover to document the excavations of the non-aqueous phase liquid (NAPL)/Oil & Grease impacted material that was also identified during the Phase II Investigation on Parcel A3.

1.2. IMPACTED SOIL DELINEATIONS

Following the conclusion of the Phase II Investigation, additional investigation activities were conducted between June 27 and June 29, 2016 to delineate the extent of elevated arsenic and lead concentrations identified in borings RW-021-SB (arsenic), and RW-052-SB and RW-055-SB (lead). Delineation criteria were established for the supplementary investigations for arsenic and lead as 300 mg/kg and 2,000 mg/kg, respectively.

The delineation sampling procedure, results, and remedial approach are described in detail in the Work Plan. Delineation borings were completed using a Geoprobe® direct push rig. Analytical

samples were collected from select intervals (typically 0 to 1 foot bgs, 4 to 5 feet bgs, and 9 to 10 feet bgs unless prevented by concrete, groundwater, or other field conditions) for laboratory analysis for metals via USEPA Method 6010. Additionally, composite soil samples were collected and analyzed for Toxicity Characteristic Leaching Procedure (TCLP) metals to give a preliminary assessment of whether excavated soils would require disposal at a permitted hazardous waste landfill.

The first location to be completed for each delineation activity corresponded to the sample location collected during the Phase II Investigation (RW-021-SB, RW-052-SB, or RW-055-SB). Once concentrations below the delineation criterion for arsenic (300 mg/kg) and/or lead (2,000 mg/kg) were identified surrounding the initial location, the delineation was deemed to be complete.

Once each of the three elevated areas was delineated, a remedial approach was developed to remove soil impacted by lead and arsenic as required by the agencies. EAG elected to excavate these three lead and arsenic locations to expedite the remedial process due to the proposed redevelopment by Tradepoint Atlantic. The response actions are discussed in this Response Action Completion Report.

2.0 SITE RESPONSE ACTIVITIES

The preliminary extents of the proposed excavations at the three Response Areas were determined by the results of the soil boring delineations. The actual extents of the excavations were in some cases expanded based on confirmation sampling data following the initial excavations. The following sections provide detailed descriptions of each aspect of the completed response activities at each of the three Response Areas. **Figures 2a** and **2b** show the location of each Response Area within Parcel A3. The Response Areas are presented in chronological order (based on excavation start date) within each section. Additional details relevant to individual Response Areas are included in separate sub-sections below. A photograph log of the excavation completed for each Response Area is included as **Appendix A**.

Excavation oversight was performed by ARM. Hillis-Carnes Engineering Associates (HCEA) provided oversight and approvals for all backfilling, geotechnical, and engineering concerns for the three Response Areas.

2.1. EXCAVATION ACTIVITIES

Impacted material was excavated from the each of the three Response Areas on the dates indicated below in **Table 1**. The approximate excavated material volume is also indicated for each Response Area. The final excavation extents are shown for each Response Area on **Figure 3** through **Figure 5**. Response areas with notable observations are discussed in detail in the sub-sections following **Table 1**. A photographic log of the excavation completed for each Response Area is included as **Appendix A**.

Table 1 – Response Area Excavation Details

Response Area	Excavation Start Date	Excavation End Date	Excavated Volume (CY)	Average Depth (ft)	Excavated Area (ft^2)
RW-021	3/6/2017	3/7/2017	13	5.0	70
RW-052	4/3/2017	5/10/2017	1,310	1.8	19,166
RW-055	4/11/2017	4/11/2017	4	1.0	95

CY: Cubic yards

2.1.1. RW-052 and RW-055 Response Areas

While ultimately connected by subsequent excavations due to co-located NAPL/Oil & Grease impacts, the RW-055 and RW-052 Metals Response Areas have been considered separately for area and volume calculations and are discussed separately in this Response Action Completion Report and are shown separately on relevant figures. Excavation of the co-located NAPL/Oil & Grease impacted soil will be addressed in a separate Response Action Completion Report to be submitted under separate cover.

2.2. SOIL SCREENING

In accordance with the Work Plan, field screening with a hand-held X-ray fluorescence (XRF) instrument (per SOP No. 23 in the Quality Assurance Project Plan (QAPP)) was utilized to screen the soil and to delineate the horizontal and vertical extent of impacts within the RW-021, RW-052, and RW-055 Response Areas. Calibration of the XRF instrument was completed prior to and at the conclusion of all work each day with National Institute of Standards & Technology (NIST) calibration standards NIST 2709a (low-level lead standard with a concentration of 17.3 ± 0.1 mg/kg) and NIST 2711a (high-level lead standard with a median concentration of 1,300 mg/kg).

To reduce costs and volume of materials transported to Greys Landfill, the agency approved procedure described below was used to further characterize the extent of lead to ensure only material exceeding the threshold criteria was treated. This procedure also minimized the amount of potentially hazardous material removed from the subsurface prior to in-situ treatment and removal.

Pothole lift screening procedure:

- Screening with the XRF was conducted in 1-foot lifts to five feet below ground surface. Using the excavator, a pothole sample of soil from each consecutive 1-foot interval was collected on a grid spacing of 25 feet laterally and was screened with the hand-held XRF. Each pothole consisted of a single scoop from the excavator bucket to the depth of each proposed lift of the excavation. The pothole sample for field screening was collected as a composite from the excavator scoop. The field technician collected aliquots from several locations in the excavator bucket, biasing the selections to include any locations with visible discoloration or other indications of possible metals contamination.
- The XRF field reading was recorded for the composite sample to determine whether the material exceeds 10,000 mg/kg of lead. The location and depth of the results of the XRF screening data were documented.
- Soil from the potholes with a concentration of lead that exceeded 10,000 mg/kg was replaced in the hole prior to in-situ treatment. Soil from the potholes with a concentration of lead less than 10,000 mg/kg was placed in a stockpile designated to receive only untreated soil.

This process was repeated until the anticipated depths were reached and preliminary screening with the XRF indicated all lead contamination above 10,000 mg/kg had been delineated.

To confirm that all soil above the action level of 10,000 mg/kg was removed, the XRF field screening method was performed at a rate of one reading per 200 square feet of the excavation's sidewalls (unless limited by concrete) and from the bottom of each excavation (unless limited by the water table or concrete) at a minimum of one reading per 1,000 square feet. An XRF reading was collected even if the surface area of an independent sidewall was less than 200 square feet.

The location of each XRF reading was biased to target any apparent contamination remaining in place, or was placed in the center of the sidewall/bottom if no biased location was apparent.

If a sidewall or bottom sample returned an analytical result in excess of the lead excavation criterion (10,000 mg/kg), additional material was removed, and that location was tested again. Laboratory confirmation samples were collected at a rate of 30% of the sidewall/bottom screening locations to confirm the accuracy of the XRF equipment. This process is described in more detail in Section 2.7.

2.2.1. RW-021 and RW-055 Response Areas

At the RW-021 and RW-055 Response areas, delineation revealed no additional sources of contamination beyond the original boring locations. Thus, due to the minimal extent of the delineation areas for RW-021 and RW-055, an approximately 10 foot by 10 foot excavation boundary was centered on the original boring location. The soil removed from these response areas were still screened with the XRF to verify that the soil at the extents of the excavation were below the 10,000 milligrams per liter (mg/)L threshold.

2.2.2. RW-052 Response Area

Due to the widespread area of concentrations exceeding the 10,000 mg/L threshold for lead at the RW-052 Response Area, a 25-foot horizontal grid was applied to delineate the horizontal and vertical extent of lead within this Response Area. **Figure 3** through **Figure 5** illustrate this horizontal and vertical data. Concrete structures restricted accessibility in some areas of this Response Area and are discussed further in Section 2.7.

2.3. IN-SITU TREATMENT

Soils at the Response Areas were mixed in-situ with TerraBond$^{®Mg}$ to stabilize the metals present. TerraBond$^{®Mg}$ reagents are primarily sulfur-based waste stabilization products which reduce the leachability of metals from soil. These pH buffered products surround and bind metal ions in the soil for long-term waste treatment to reduce the leachability of heavy metals, including lead. The Safety Data Sheet (SDS) for TerraBond$^{®Mg}$ is included in **Appendix B**.

TerraBond$^{®Mg}$ was mixed in place within areas of impacted soil (greater than 10,000 mg/kg of lead) based on the data from screening procedure described in Section 2.2. The TerraBond$^{®Mg}$ was mixed at an approximate 1:1 ratio with the impacted soil prior to removing from the excavation. The field procedure used is described as follows:

- The excavator bucket was used to apply a uniform layer of TerraBond$^{®Mg}$ reagent over each defined exceedance area of the 1-foot lift with lead above 10,000 mg/kg.

- Once the TerraBond®Mg reagent had been placed, the excavator mixed the soils in place until the operator determined that the reagent had been evenly distributed throughout the volume of the 1-foot lift in each targeted area.
- After mixing, the treated soil from each 1-foot lift was excavated and placed in the stockpile designated to receive only lead contaminated soil.
- The remaining soil from each 1-foot lift where the concentration of lead was less than 10,000 mg/kg level was then excavated. This material was placed in a stockpile designated to receive untreated soil.

Regardless of the field screening results, the 0 to 1 foot bgs interval in RW-021-SB and the 4 to 5 foot bgs interval in RW-055-SB were treated with TerraBond®Mg prior to removal, based on the previous delineation results at these locations.

Excavated materials were placed on polyethylene sheeting in their designated stockpile areas. In order to minimize dust and prevent run-on/runoff, all stockpiles were covered when they were not being used and at the end of each day. A weighted cover system was used to keep the covers in place.

2.4. WASTE CHARACTERIZATION

Treated and untreated soils from the stockpiles were characterized independently for proper disposal. Soil from the stockpiles was tested at a minimum rate of one sample for every 500 cubic yards (CY) of material and analyzed for TCLP metals to determine if the material must be disposed of at an off-site hazardous waste landfill or at the on-site landfill (Greys) if non-hazardous. Each waste characterization composite sample from the excavation stockpiles consisted of at least ten grab aliquots (selected randomly).

Waste characterization samples were submitted to Caliber Analytical Services (Caliber) for laboratory testing at a rate of one 10-point composite sample for every 500 CY. All waste characterization samples were analyzed for TCLP metals. One sample of stockpiled soil originating from RW-052 was additionally analyzed for TCLP volatile organic compounds (VOCs) and TCLP semi-volatile organic compounds (SVOCs). The waste characterization laboratory results from Caliber are included as an electronic attachment. Please note that laboratory reports are included for all excavations performed on Parcel A3 (Metals and NAPL/Oil & Grease Response Areas).

All excavated soil from the RW-021 and RW-055 Response Areas were determined to be non-hazardous. A total of 22 tons of materials excavated from the RW-052 Response Area exceeded the Resource Conservation and Recovery Act (RCRA) non-hazardous limit of 5.0 mg/L for lead and was classified as hazardous waste. It should be noted that the waste characterization data indicated that the TerraBond®Mg stabilized the potentially hazardous material and therefore yielded

non-hazardous material for disposal. The 22 tons of excavated materials that was managed as hazardous waste were not treated with TerraBond®Mg because no elevated XRF readings were detected during excavation activities.

2.5. SOIL DISPOSAL

Dimension calculations of the excavations indicate approximately 1,300 bank CY of non-hazardous material was transported from the excavation stockpiles associated with the Metals Response Areas on Parcel A3 to Greys Landfill for disposal. Approximately 22 tons of lead-impacted regulated hazardous waste from the RW-052 Response Area was transported and disposed of at Envirite of Pennsylvania, Inc. in York, PA. Since the hazard waste profile included both lead and cadmium, the lead-impacted hazardous waste from the RW-052 Response Area was shipped and disposed of with the 2,000 tons of cadmium-impacted regulated hazardous waste generated from the RW-003 Response Area, which will be discussed in a Response Action Completion Report for NAPL/Oil & Grease Response Areas to be submitted under separate cover. The waste manifests for all regulated hazardous waste removed from Parcel A3 (both Metals and NAPL/Oil & Grease Response Areas) are included as an electronic attachment.

2.6. WATER MANAGEMENT & DISPOSAL

Groundwater/surface water was encountered while completing the RW-052 excavation. During excavation activities, the excavator operator allowed the excavator's bucket to drain a practical amount of water back into the excavation prior to placing the material in the dump truck. Water accumulated in the excavation was pumped to a storm sewer that carried flow directly to the Humphreys Creek Wastewater Treatment Plant. Tradepoint Atlantic personnel approved the pumping location and use of the on-site wastewater treatment plant to treat the groundwater/surface water accumulated within the excavation.

2.7. CONFIRMATION SAMPLING

The Work Plan stated that confirmation samples would be collected to verify the accuracy of the XRF field screening data at a rate of 30% of the sidewall/bottom screening locations (randomly selected) and were submitted to Pace Analytical Services (PACE) to be analyzed for lead via USEPA Method 6010C. Response Areas RW-021 and RW-055 were completed and approved using this method.

However, after receiving the first set of field screening data and confirmation analytical data, the MDE stated via email correspondence dated May 4, 2017 that there was an inconsistency between the XRF field screening data and the analytical results from the samples collected to confirm the field screening data. The MDE requested that six locations be resampled and submitted for analytical analysis. On May 18, 2017, the MDE sent an email correspondence requesting that 50% of the XRF field screening locations receive laboratory confirmation analysis and that a location

with an XRF field screening result within 50% of the cleanup goal would also require laboratory confirmation. These MDE requests were implemented for the RW-052 Response Area.

As described in Section 2.2, the XRF field screening method was performed at a rate of one reading per 200 square feet of the excavation's sidewalls (unless limited by concrete) and from the bottom of each excavation (unless limited by the water table or concrete) at a minimum of one reading per 1,000 square feet. At each field screening location, enough soil was bagged prior to the XRF scanning to allow for the collection of the confirmation sample. Confirmation samples were sent to PACE and analyzed for metals via USEPA Method 6010. Laboratory results have been included as an electronic attachment.

Once all confirmation samples from a Response Area yielded results below 10,000 ppm of lead, the excavation was considered complete. The confirmation sample results and a figure of each Response Area were provided to the MDE and USEPA for review and backfill approval as discussed in Section 2.8. The locations of the confirmation samples collected are shown on the excavation figure for each Response Area attached as **Figure 3** through **Figure 5**. A brief description of confirmation sampling for each Response Area is described below.

2.7.1. RW-021 Response Area

All sidewalls and the bottom of the excavation were screened with the XRF, and the bottom and northwest sidewall samples were submitted for laboratory confirmation. The target and final depth of this Response Area was 5 feet bgs.

2.7.2. RW-052 Response Area

During excavation activities at this Response Area, multiple concrete floors, walls, and boxes were observed within this excavation. These structures restricted the excavator's ability to meet the target depths in certain areas, and a response letter was submitted to the MDE and USEPA on May 18, 2017. This response letter included a figure and data table to present the concrete encountered, the XRF screening data, and the analytical confirmation sampling data. For this Response Area, all sidewalls and various locations of the bottom of the excavation, where accessible, were screened with the XRF, and the bottom and northwest sidewall samples were submitted for laboratory confirmation. The target and final depths of this Response Area varied throughout the excavation and are illustrated on **Figure 4**.

2.7.3. RW-055 Response Area

All sidewalls and the bottom of the excavation were screened with the XRF, and the bottom and east sidewall samples were submitted for laboratory confirmation. The target and final depth of this Response Area was 1 foot bgs.

2.8. BACKFILLING

The MDE sent its approval to backfill the Response Areas via email on the dates provided in **Table 2** below. The excavations were backfilled in accordance with HCEA requirements and/or were approved by an on-site HCEA field technician. The excavations were backfilled in accordance with HCEA requirements with the following materials: 5-6 inch stone, 2-3 inch stone, #57 stone, slag fines, and/or non-impacted surface soil. All backfill materials originated from the Tradepoint Atlantic property. Based on availability, not all backfill materials mentioned herein were utilized in every excavation; however, HCEA backfill requirements were still met. For soil and slag fine lifts, the HCEA field technician utilized a Troxler nuclear density gauge to confirm proper compaction. The backfill start and completion dates for each excavation are also provided in **Table 2** below.

Table 2 – Response Area Backfill Details

Response Area	Backfill Approval Date	Backfill Start Date	Backfill Completion Date
RW-021	3/23/2017	3/27/2017	3/27/2017
RW-052	5/18/2017	5/18/2017	6/2/2017
RW-055	5/4/2017	5/18/2017	6/2/2017

2.9. HEALTH & SAFETY

Due to the intrusive work and the known contaminants impacting the soil and groundwater in the three Response Areas, the EAG Health and Safety Plan (HASP) dated January 2015 was followed. Every morning, a tailgate safety meeting was completed to discuss the daily activities and the health and safety protocols associated with such activities.

2.9.1. Air Monitoring

Air monitoring protocols and the action levels for general site work, as presented in Section 7.0 and Table 7-2 of the EAG HASP, were enforced daily. A calibrated PID was utilized to monitor the worker's breathing zone in order to ensure safe working conditions during excavation due to the possibility of encountering soil exhibiting volatile impacts.

2.9.2. Dust Monitoring

During the initial phase of the excavation work, February 6 to March 9, 2017, a ThermoElectron Corporation Personal Data RAM 1000AN dust meter was utilized to monitor the dust produced during excavation activities and from large equipment traveling to and from the stockpile areas. Dust concentrations were recorded in the field book by on-site personnel every 15 minutes during excavation activities. Daily calibration of the real-time dust meter was performed to ensure

accurate readings by the instrument. The action level used for the purpose of determining the need for dust suppression techniques (e.g. watering and/or misting) and/or continuous monitoring during the response activities at the Site was 3.0 milligrams per cubic meter (mg/m^3) as required during development activities. At this concentration, heavy visible dust could be observed. No exceedances of the action level (exceeding 3.0 mg/m^3) were noted.

Beginning on March 10, 2017, a water truck was utilized on-site for dust suppression. Daily dust monitoring was discontinued for the remainder of the excavation work on Parcel A3 since no exceedances of the dust action level were previously noted and this daily monitoring was not required by the HASP or Work Plan. If visible dust was generated during response work, dust monitoring would have been implemented.

3.0 CONCLUSION

Between March and June 2017, response actions were conducted to address metals impacts in support of subsequently planned development activities. Excavations were completed at three locations, and the identified metals impacted soils were removed to the requisite delineation levels in accordance with the approved Response Action Work Plan entitled Lead and NAPL/Oil & Grease Delineation and Excavation Work Plan, Revision 2, dated March 1, 2017.

Subsequent development of the sub-parcel is addressed in the following documents:

- Sub-Parcel A3-1 Response and Development Work Plan (RADWP), Revision 3, (dated April 24, 2017, updated June 5, 2017) and the accompanying Comment Response Letter (dated June 5, 2017);
- Sub-Parcel A3-1 RADWP Addendum (dated December 13, 2019) and the accompanying Comment Response Letter (dated January 16, 2020); and
- Sub-Parcel A3-1 Response and Development Completion Report (dated December 3, 2021, to which this Response Action Completion Report for the Parcel A3 Metals Response Areas is attached).

FIGURES

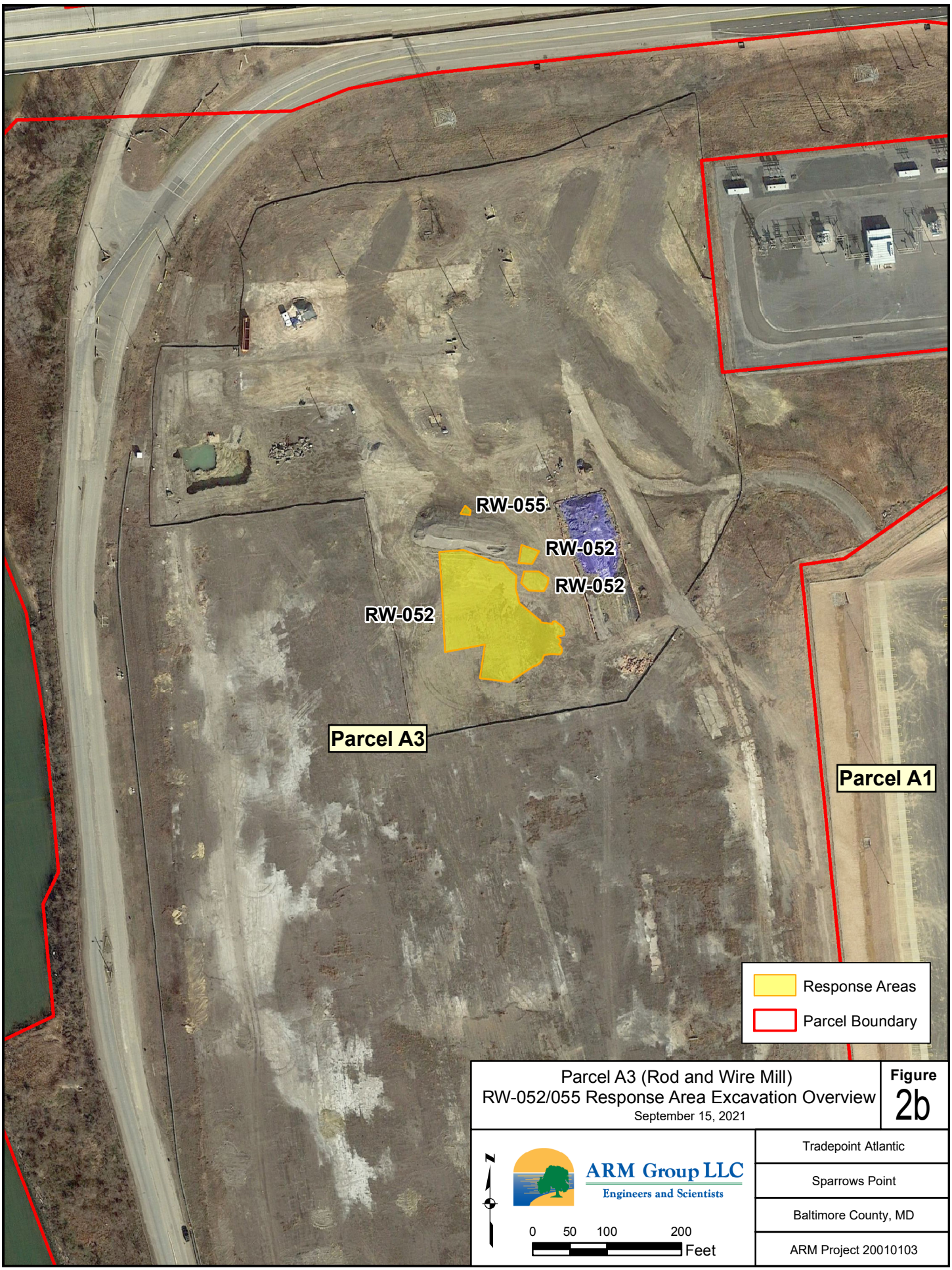

Parcel A3 (Rod and Wire Mill)
Site Boundary
Parcel Boundaries
Private Property
Parcel A9
Parcel A13
Parcel A5
Parcel A7
Parcel A14
Parcel A11
Parcel A8
Parcel A12
Parcel A15
Parcel A2
Parcel A17
Parcel A18
Parcel A16
Parcel A6
Parcel A10
Parcel A4
Parcel A3
Parcel A1
Parcel B6
Parcel B8
Parcel B14
Parcel B21
Parcel B22
Parcel B16
Parcel B24
Parcel B15
Parcel B23
Parcel B7
Parcel B25
Parcel B1
Parcel B2
Parcel B3
Parcel B17
Parcel B19
Parcel B4
Parcel B5
Parcel B9
Parcel B18
Parcel B10
Parcel B13
Parcel B20
Parcel B11
Parcel B12
Source: Esri, IGN, and the
Tradepoint Atlantic
Area A and Area B Parcels
September 15, 2021
Figure
1
ARM Group LLC
Engineers and Scientists
0 500 1,000 2,000
Feet
Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
Area A: Project 200101
Area B: Project 200102
B14-1: Project 20010214

Parcel A3 (Rod and Wire Mill)
RW-021 Response Area Excavation Overview
September 15, 2021

Figure 2a

ARM Group LLC
Engineers and Scientists

Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 20010103



Parcel A3 (Rod and Wire Mill)
RW-052/055 Response Area Excavation Overview
September 15, 2021

Figure 2b

ARM Group LLC
Engineers and Scientists

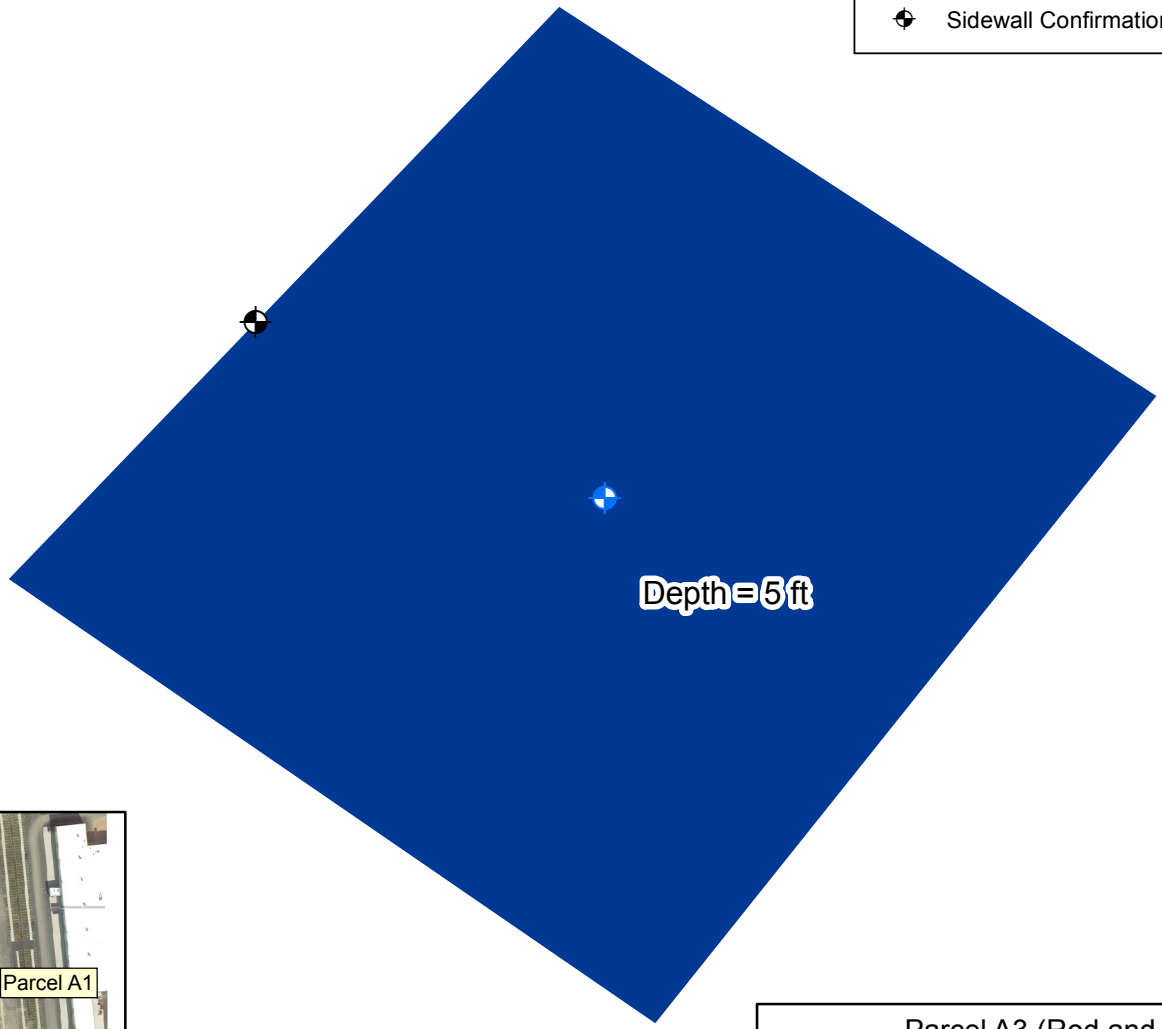
0 50 100 200 Feet

Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 20010103

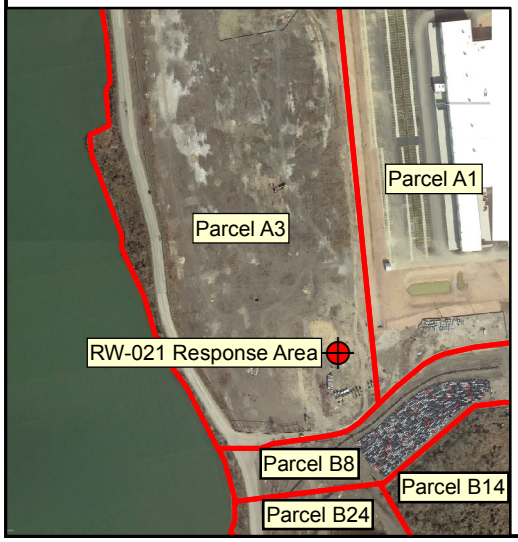
Depth (ft)	Area (ft^2)
5	70
Volume (ft^3)	**349**
Volume (yd^3)	**13**

Approximate Bottom Confirmation Sample Location

Sidewall Confirmation Sample Location



Relevant Laboratory Reports
30212688



Parcel A3 (Rod and Wire Mill)
RW-021 Response Area
September 15, 2021

Figure 3

N

ARM Group LLC
Engineers and Scientists

0 0.75 1.5 3 Feet

Tradepoint Atlantic

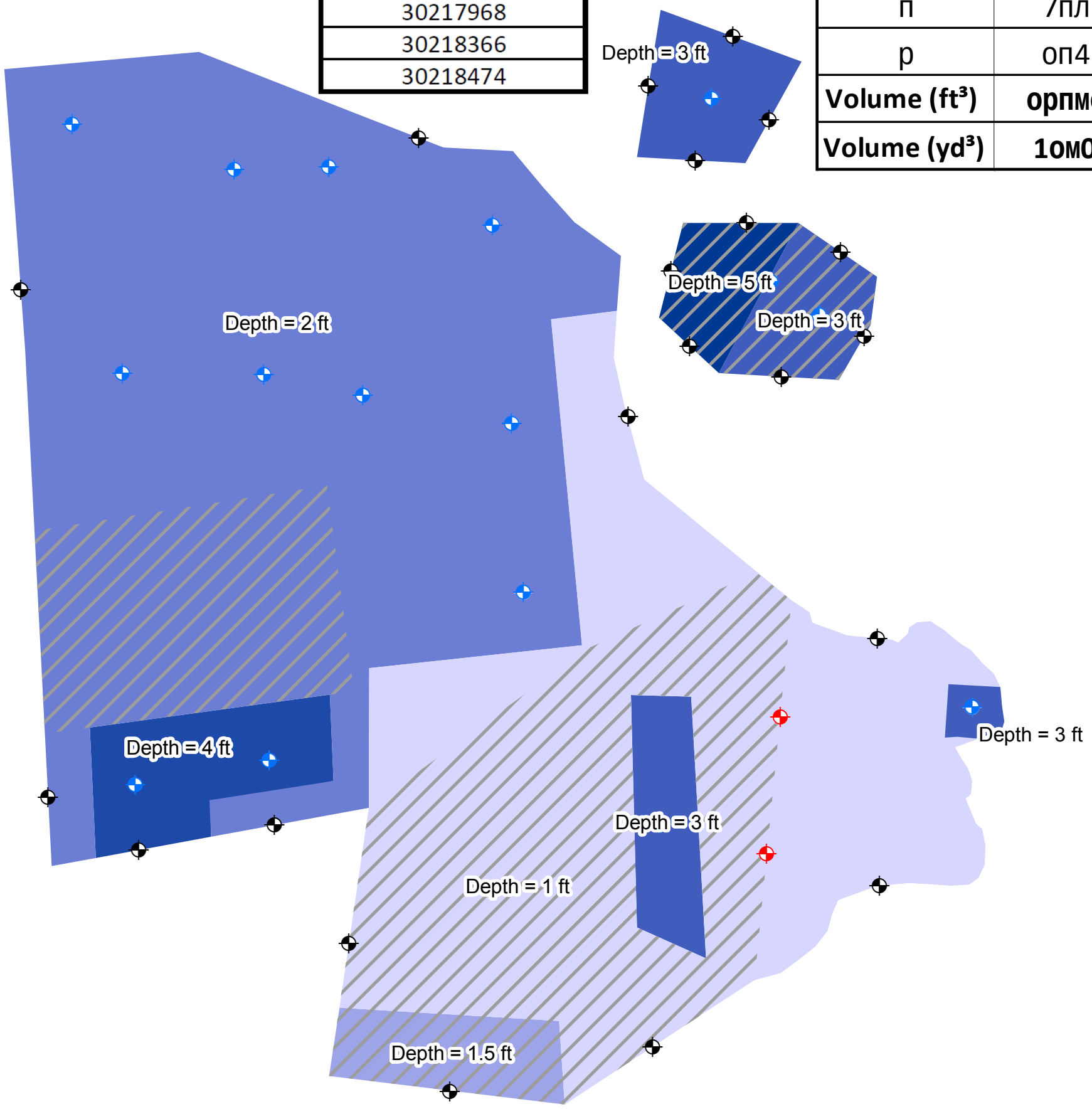
Sparrows Point

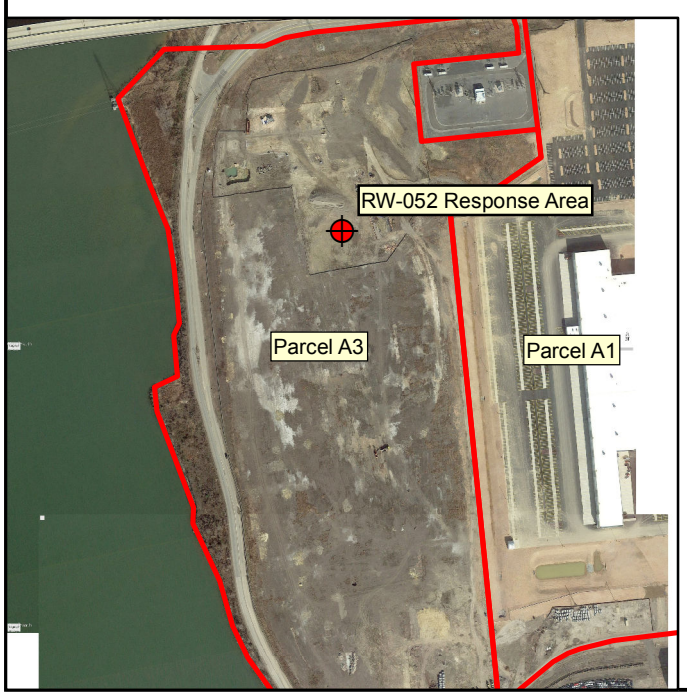
Baltimore County, MD

ARM Project 20010103

Relevant Laboratory Reports
30215566
30215785
30216299
30216544
30216704
30217067
30217968
30218366
30218474

Depth (ft)	Area (ft²)
м	сслр
мфр	п9н
н	9рср
о	мп2л
п	7пл
р	оп4
Volume (ft³)	**орпмо**
Volume (yd³)	**1ом0**





Approximate Bottom Confirmation Sample Location

Former Sidewall Confirmation Sample Location

Sidewall Confirmation Sample Location

Area of Concrete

Parcel A3 (Rod and Wire Mill)
RW-052 Response Area

September 15, 2021

Figure 4

ARM Group LLC
Engineers and Scientists

0 10 20 40 Feet

Tradepoint Atlantic

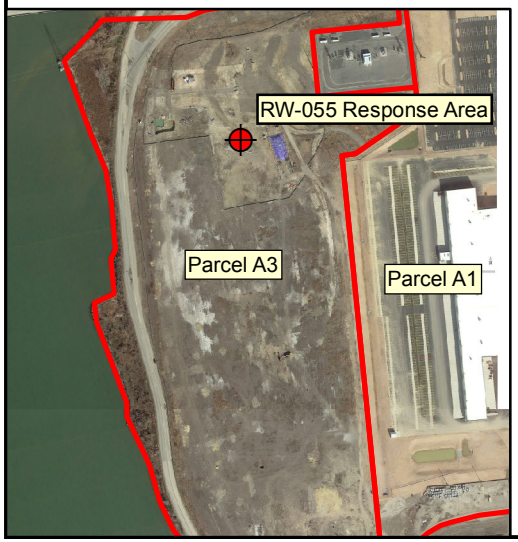
Sparrows Point

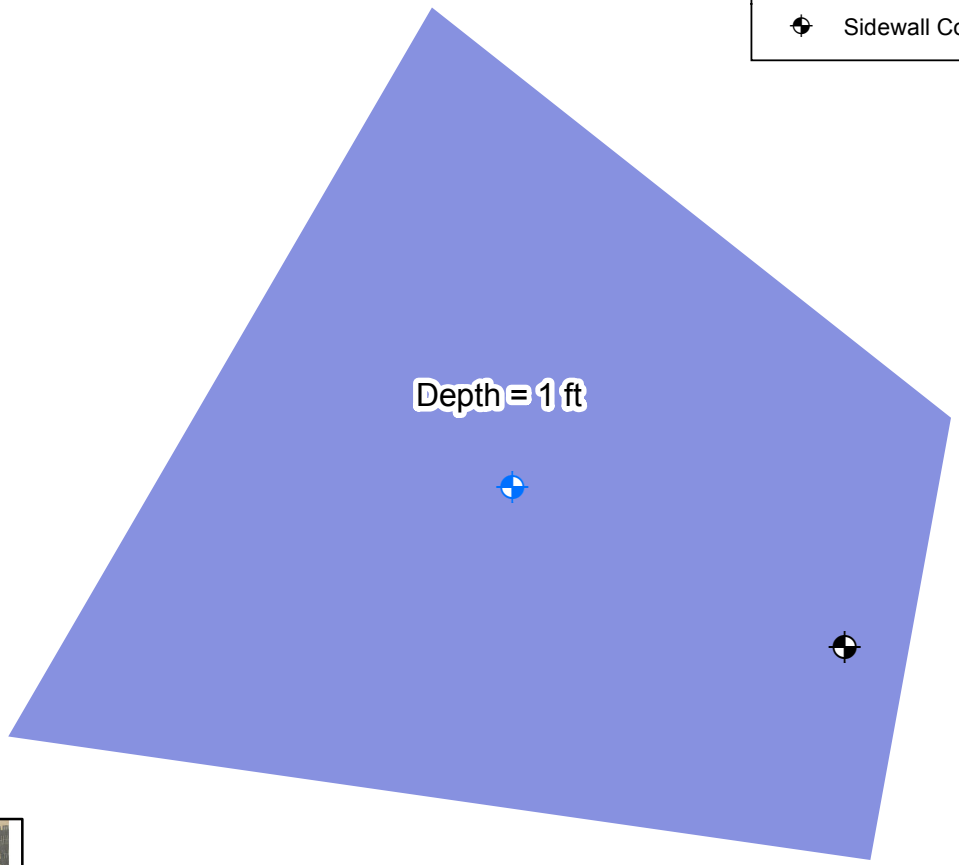
Baltimore County, MD

ARM Project 20010103

Depth (ft)	Area (ft²)
1	95
Volume (ft³)	**95**
Volume (yd³)	**4**

Relevant Laboratory Reports
30215785





Parcel A3 (Rod and Wire Mill)
RW-055 Response Area
September 15, 2021

Figure 5

N

ARM Group LLC
Engineers and Scientists

0 1 2 4
Feet

Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 20010103

APPENDIX A

030617-1: RW-021 Excavation – View to the north of initial excavation activities. Visible to the northeast of the excavator bucket is Terrabond material for mixing with excavated soils.

030617-2: RW-021 Excavation – Excavated soils stockpile staging area

.

030717-1: RW-021 Excavation – Excavation in progress

030717-2: RW-021 Excavation – Excavation in progress

032717-1: RW-021 Excavation – Backfilling and compaction in progress

032817-1: RW-021 Excavation – View to the northwest of the final backfilled state of the excavation area

040317-1: View to the north of the start of excavation

040717-1: View to the north of excavation in progress

041117-1: View to the south of pothole sampling in progress

041717-1: View to the northwest of excavation in progress

050917-1: View to the east of excavation filled with water

051017-1: View to the east of dewatered excavation in progress

051917-1: View to the southeast of backfilling in progress

060217-1: View to the north of final backfilled excavation

SAFETY DATA SHEET

TerraBond®Mg

1. Product And Company Identification

Remedium Services Group, LLC
d/b/a Terra Materials
11711 N. College Avenue, Suite 170
Carmel, IN 46032

Company Contact: Tom McCullough
Telephone Number: (317) 660-6868
Web Site: www.terramaterials.com

Supplier Emergency Contacts & Phone Number
Terra Materials: (317) 660-6868

Issue Date: 7/26/12
Revision Date: 5/20/21

Product Name: TerraBond®Mg
Chemical Formula: Proprietary Formulation

2. Hazards Identification

Pictograms:

Signal Word: Warning

Hazard Statements:
H315 May cause skin irritation
H319 May cause eye irritation
H335 May cause respiratory irritation

Precautionary Statements:
P280 Wear Protective gloves and eye protection
P305 & P351 If in eye rinse cautiously with water for several minutes.
P337 & P313 If eye irritation persists, get medical advice/attention.
P302 & P352 If on skin wash with plenty of soap and water.
P261 Avoid breathing dust

3. Composition/Information On Ingredients

Ingredient Name	CAS Number		Percent of Total Weight
Propprietary Magnesiuim/Calcium Blend	N/A		90-99
Silica Quartz	14808-60-7		1-10

APPENDIX B

4. First Aid Measures

Eye

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician

Skin

Wash off promptly when exposure ceases. Do not allow dried sludge to remain on skin for prolonged periods as this may cause skin irritation.

Ingestion

Drink plenty of water. **Do not induce vomiting unless directed by a physician**

Inhalation

Remove from exposure. Get medical attention if experiencing cough, irritation or difficulty breathing.

5. Fire Fighting Measures

Fire and Explosion Hazards

Material is not considered to be combustible.

Extinguishing Media

Any means suitable for extinguishing surrounding fire.

6. Accidental Release Measure

Absorb with suitable material and dispose of in accordance with regulations. Ventilate if necessary.

7. Handling And Storage

Handling And Storage Precautions

Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin and eyes.

8. Exposure Controls/Personal Protection

Eye/Face Protection

Safety glasses or safety goggles.

Skin Protection

Chemical resistant gloves. Sufficient protective clothing to minimize skin exposure. Launder contaminated clothing before reuse

Respiratory Protection

None required if adequate ventilation is provided.

SAFETY DATA SHEET

TerraBond®Mg

9. Physical And Chemical Properties

Appearance	Tan colored powder
Odor	Odorless
Density:	90 to 105 lbs/ft3
Vapor Density:	Not applicable
Solubility:	Slightly soluble
pH	10-11

10. Stability and Reactivity

Chemical Stability
Stable under normal temperature and pressures.

Hazardous Polymerization
Has not been reported

Conditions To Avoid (Stability)
None known

Incompatible Materials
None known.

11. Toxicological Information

Component Information:

Proprietary Formulation: No information availabld

SAFETY DATA SHEET

TerraBond®Mg

12. Ecological Information

Ecotoxicity:

No Data Found

13. Disposal Considerations

Dispose of in accordance with local, state and federal regulations.

14. Transport Information

Proper Shipping Name:

Non-Hazardous, Non-Regulated Solid

15. Regulatory Information

CERCLA

Not applicable- contains no hazardous substances at or above de minimis concentrations.

SARA TITLE III:

Section 302 Extremely Hazardous Substances: None at or above de minimis concentrations.

Section 311/312 Health and Physical Hazards: Delayed (chronic) health hazard from long-term inhalation of dust.

Section 313 Toxic Chemicals: None at or above de minimis concentrations.

TSCA: All components of this product are in compliance or are exempt from inventory listing requirements of the United States Toxic Substance Control Act (TSCA) Chemical Substance Inventory

16. NFPA

Health – 1 **Flammability – 0** **Reactivity – 0** **Special Hazard=None**

SAFETY DATA SHEET

TerraBond®Mg

17. Disclaimer

Terra Materials provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. The information is based upon our current knowledge and experience of our product and is not exhaustive. It applies to the product as defined by the specifications. In case of combinations or mixtures with other chemicals, one must confirm that no new hazards are likely to exist. In any case, the user is not exempt from observing all legal, administrative, and regulatory procedures relating to the product, personal hygiene, and integrity of the work environment.

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FIGURES


Sub-Parcel A3-1 Development Area
Site Boundary
Parcel Boundaries
Private Property
Parcel A9
Parcel A13
Parcel A5
Parcel A7
Parcel A14
Parcel A11
Parcel A8
Parcel A12
Parcel A15
Parcel A2
Parcel A17
Parcel A18
Parcel A16
Parcel A6
Parcel A10
Parcel A4
Parcel A3
Parcel A1
Parcel B6
Parcel B8
Parcel B14
Parcel B21
Parcel B22
Parcel B16
Parcel B24
Parcel B15
Parcel B23
Parcel B7
Parcel B25
Parcel B1
Parcel B2
Parcel B3
Parcel B17
Parcel B19
Parcel B4
Parcel B5
Parcel B9
Parcel B18
Parcel B10
Parcel B13
Parcel B20
Parcel B11
Parcel B12
Source: Esri,
AeroGRID, I
Tradepoint Atlantic
Area A and Area B Parcels
September 14, 2021
Figure
1
ARM Group LLC
Engineers and Scientists
0 500 1,000 2,000
Feet
Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
Area A: Project 200101
Area B: Project 200102
B14-1: Project 20010214

ARM Group LLC
Engineers and Scientists

Sub-Parcel A3-1 Development Area

September 10, 2021

Sparrows Point
ARM Project 21010103

Tradepoint Atlantic
Baltimore County, MD

Figure
2

ARM Group LLC
Engineers and Scientists

Sub-Parcel A3-1 Development Area Abandoned Groundwater Points

September 14, 2021

Sparrows Point
ARM Project 21010103

Tradepoint Atlantic
Baltimore County, MD

Figure
3

Parcel A3

Parcel A1

Parcel B8

MATCHLINE SEE SHEET C2.1

Remediation Trenches

Existing Shallow Monitoring Well

Existing Intermediate Monitoring Well

Sub-Parcel A3-1 Development Boundary

Parcel Boundary

N

0 125 250 500 Feet

ARM Group LLC
Engineers and Scientists

Sub-Parcel A3-1 Development Area Interim Measures Groundwater Monitoring

September 14, 2021

Sparrows Point
ARM Project 21010103

Tradepoint Atlantic
Baltimore County, MD

Figure
4

ARM Group LLC
Engineers and Scientists

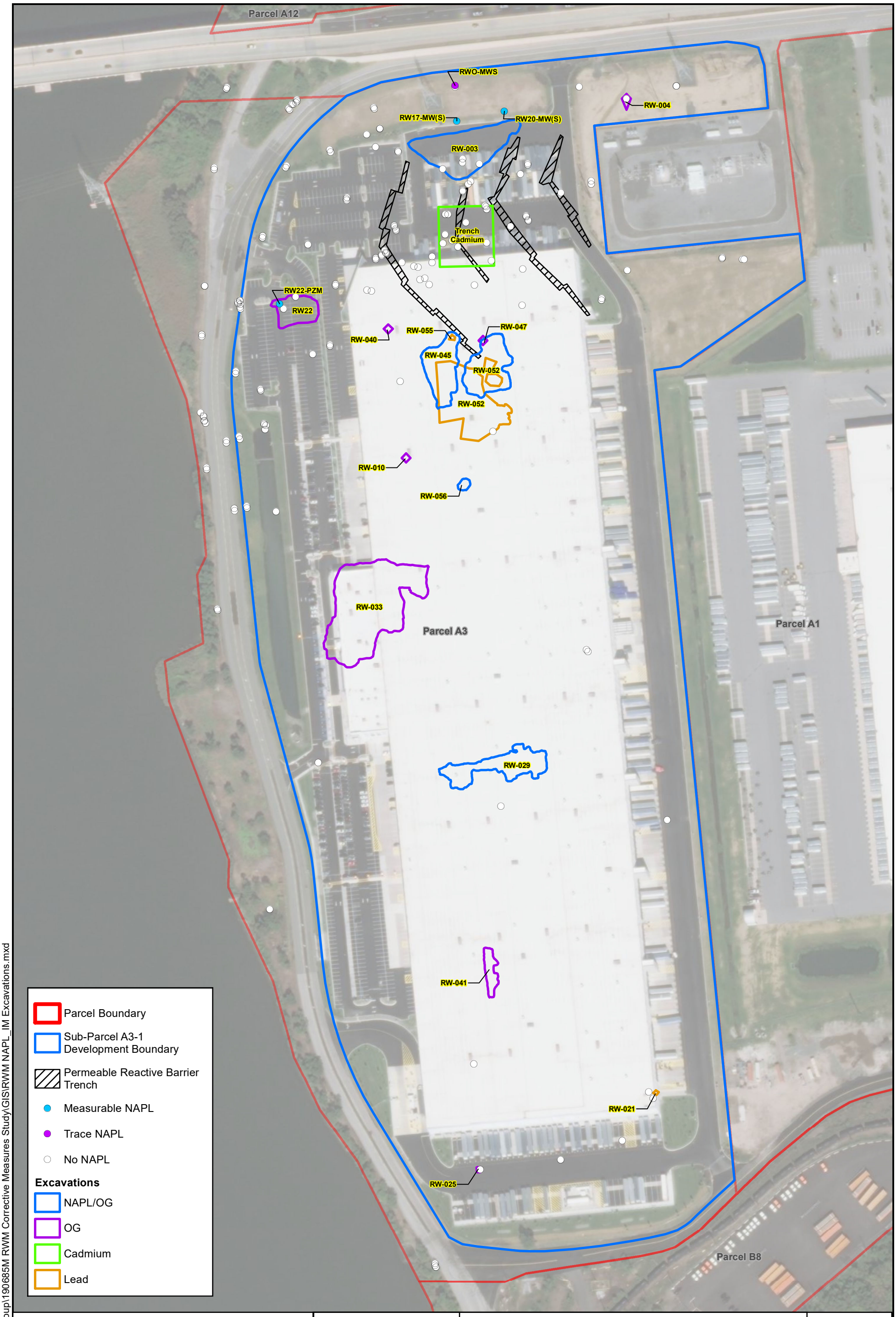
Sub-Parcel A3-1 Development Area RW-003 Remaining NAPL Area

September 14, 2021

Sparrows Point
ARM Project 21010103

Tradepoint Atlantic
Baltimore County, MD

Figure
5


Parcel A12
RWO-MWS
RW-004
RW17-MW(S)
RW20-MW(S)
RW-003
Trench
Cadmium
RW22-PZM
RW22
RW-040
RW-055
RW-047
RW-045
RW-052
RW-052
RW-010
RW-056
RW-033
Parcel A3
Parcel A1
RW-029
RW-041
RW-021
RW-025
Parcel B8
Parcel Boundary
Sub-Parcel A3-1
Development Boundary
Permeable Reactive Barrier
Trench
Measurable NAPL
Trace NAPL
No NAPL
Excavations
NAPL/OG
OG
Cadmium
Lead
N
ARM Group LLC
Engineers and Scientists
1 inch = 200 feet
0 100 200
Feet
Sub-Parcel A3-1
NAPL and IM Excavation Areas
Figure
6
P:\EnviroAnalytics Group\190685M RWM Corrective Measures Study\GIS\RWM NAPL_IM Excavations.mxd

ARM Group LLC
Engineers and Scientists

Sub-Parcel A3-1 Development Area Capping Areas Layout

September 9, 2021

Sparrows Point
ARM Project 21010103

Tradepoint Atlantic
Baltimore County, MD

Figure
7

APPENDIX A

Reference List

Sub-Parcel A3-1

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Weaver Boos Consultants (2014). *Phase I Environmental Site Assessment: Former RG Steel Facility*. Final Draft. May 19, 2014.

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ARM Group, Inc. (2018). *Area A: Sub-Parcel A3-1 Development Status Update (Second Quarter 2018).* August 21, 2018.

Reference List

Sub-Parcel A3-1

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APPENDIX B

Melissa Replogle

From: James Calenda <jcalenda@enviroanalyticsgroup.com>
Sent: Friday, April 28, 2017 3:20 PM
To: Neil Peters; Eric Magdar; Taylor Smith
Subject: FW: A-3-1 Response and Development Work Plan Rev 3

FYI

From: Barbara Brown -MDE- [mailto:barbara.brown1@maryland.gov]
Sent: Friday, April 28, 2017 2:40 PM
To: Pete Haid <phaid@tradepointatlantic.com>; James Calenda <jcalenda@enviroanalyticsgroup.com>; Jennifer Sohns -MDE- <jennifer.sohns@maryland.gov>; Erich Weissbart <weissbart.erich@epa.gov>; Dorgan, Doug <ddorgan@wcgrp.com>; Prince.Ruth@epa.gov; Mark Mank -MDE- <mark.mank@maryland.gov>; pizarro.luis@epa.gov; Russ Becker <rbecker@enviroanalyticsgroup.com>; RLUTZ@SAUL.COM; Hilary Miller -MDE- <hilary.miller@maryland.gov>; Hennessy, Joel <Hennessy.Joel@epa.gov>
Subject: A-3-1 Response and Development Work Plan Rev 3

Hello All

The Agencies have reviewed revision 3 of the A-3-1 Response and Development Work Plan and TPA may proceed with the implementation of the plan. As noted, ARM is providing EPA with additional information to complete the QC review. As discussed at the site visit on April 26, 2017, EAG is aware of the issues related to the excavation planned for RW-3, which will remove both cadmium and petroleum and will proceed under HASP and material management plans previously outlined in the Response and Development Work Plan and Interim Measures work plan.

If you have any questions regarding this approval please contact me

Barbara Brown
MDE Project Manager
--
Barbara Brown
MDE-LRP-VCP Section Head
direct 410 537 3212
general 410 537 3493

From: Russ Becker [mailto:rbecker@enviroanalyticsgroup.com]
Sent: Tuesday, June 20, 2017 11:12 AM
To: Prince, Ruth; James Calenda; Neil Peters; Pete Haid
Cc: Weissbart, Erich; barbara.brown1@maryland.gov; Jennifer Sohns -MDE-
Subject: RE: Sub-Parcel A3-1 Response and Development Work Plan Revision 3, Updated June 2017

Thanks Ruth

From: Prince, Ruth [mailto:Prince.Ruth@epa.gov]
Sent: Tuesday, June 20, 2017 11:10 AM
To: James Calenda <jcalenda@enviroanalyticsgroup.com>; Neil Peters <npeters@armgroup.net>; Pete Haid <phaid@tradepointatlantic.com>; Russ Becker <rbecker@enviroanalyticsgroup.com>
Cc: Weissbart, Erich <Weissbart.Erich@epa.gov>; barbara.brown1@maryland.gov; Jennifer Sohns -MDE- <jennifer.sohns@maryland.gov>
Subject: Sub-Parcel A3-1 Response and Development Work Plan Revision 3, Updated June 2017

Hi All – The responses and revisions to the A3-1 R& D WP as a result of EPA's QC review are acceptable and this document is considered final.

Ruth Prince, PhD Toxicologist
3LC10, Office of Remediation
Land and Chemicals Division
U.S. Environmental Protection Agency Region III
1650 Arch St.
Philadelphia, PA 19103-2029
215-814-3118
prince.ruth@epa.gov

From:	James Calenda
To:	Neil Peters; Taylor Smith; Eric Magdar
Subject:	FW: RADWP Addendum Area A: Parcel A3-1
Date:	Thursday, January 23, 2020 3:25:52 PM
Attachments:	RADWPapproval.pdf

FYI

From: Barbara Brown -MDE- <barbara.brown1@maryland.gov>
Sent: Thursday, January 23, 2020 3:12 PM
To: Pete Haid <phaid@tradepointatlantic.com>; James Calenda <jcalenda@enviroanalyticsgroup.com>; Matthew Newman <mnewman@tradepointatlantic.com>
Cc: Jennifer Sohns -MDE- <jennifer.sohns@maryland.gov>; Oduwole, Moshood <Oduwole.Moshood@epa.gov>; pizarro.luis@epa.gov
Subject: RADWP Addendum Area A: Parcel A3-1

Hello All

Copy of approval letter mailed yesterday.

If anyone has any questions please contact me.

Barbara Brown
MDE Project Coordinator

--

Barbara H. Brown
Voluntary Cleanup Program Section Head
Land and Materials Administration
Maryland Department of the Environment
1800 Washington Boulevard
Baltimore, Maryland 21230
Barbara.brown1@maryland.gov
410-537-3493 (O)
410-537-3212 (Direct)
Website | Facebook | Twitter

Click here to complete a three question customer experience survey.

Click here to complete a three question customer experience survey.

Maryland
Department of
the Environment

Larry Hogan, Governor
Boyd K. Rutherford, Lt. Governor

Ben Grumbles, Secretary
Horacio Tablada, Deputy Secretary

January 21, 2020

Peter Haid
Senior Director of Environmental
Tradepoint Atlantic
1600 Sparrows Point Boulevard
Baltimore, Maryland 21219

Re: RADWP Area A: Sub-Parcel A3-1

Dear Mr. Haid:

The Agencies (The Maryland Department of the Environment Land Restoration Program and the US EPA Region III, Land, Chemicals & Development Division) have reviewed the Response and Development Work Plan (RADWP) Addendum Area A: Sub-Parcel A3-1 dated December 13, 2019 for modifications to the A3-1 parcel to accommodate the new tenant requirements and the response to comment letter dated January 16, 2020, confirming Agency approval will be obtained prior to reuse of soil removed from the former East Pond area that may contain elevated levels of cadmium. Based on this review, Tradepoint Atlantic may proceed with the work proposed in the Area A: Sub-Parcel A3-1 RADWP Addendum, as modified in the January 16, 2020 response to comment letter.

If you have any questions regarding this approval please contact me at 410-537-3493 or barbara.brown1@maryland.gov.

Sincerely,

Barbara H. Brown

Barbara H. Brown, Project Coordinator
Land Restoration Program

cc: Mr. Moshood Oluwole, US EPA Region III, Remedial Project Manager

From: Craven, Laura <lcraven@wcgrp.com>
Sent: Wednesday, April 24, 2019 1:48 PM
To: Eric Magdar <emagdar@armgroup.net>
Cc: Taylor Smith <tsmith@armgroup.net>
Subject: FW: Parcel A3 Phase II Investigation Report, Rev. 1 - July 8, 2016

Please see below.

From: Jennifer Sohns -MDE- [mailto:jennifer.sohns@maryland.gov]
Sent: Tuesday, November 28, 2017 12:20 PM
To: James Calenda; Pete Haid; Craven, Laura; Barbara Brown -MDE-
Subject: Parcel A3 Phase II Investigation Report, Rev. 1 - July 8, 2016

Hi James,
I'm going through Laura's document tracking table and realized that there is not an official approval of the Parcel A3 Phase II Investigation Report, Rev. 1, dated June 8, 2016 and the Response to MDE/USEPA Comments, June 8, 2016. The Agency's sent a comment via email on June 15, 2016 related to laboratory analysis. The comment was satisfactorily addressed in an email from EAG dated August 4, 2016. The Agency's had no other comments related to the report or response to comments and all changes are acceptable. Let me know if you have any questions.

Thank you,

--
Jennifer Sohns

Laura Craven
Project Manager

Weaver Consultants Group
1316 Bond Street | Suite 108
Naperville, IL 60563
O: 630-717-4848 | D: 630-687-6212 | F: 630-717-4850 | M: 630-913-6591
www.wcgrp.com | lcraven@wcgrp.com

Keith Progin

From: Barbara Brown -MDE- <barbara.brown1@maryland.gov>
Sent: Monday, August 7, 2017 12:39 PM
To: Keith Progin
Subject: Re: Sparrows Point - Parcel A3-1 - Enviro sampling and testing of stockpiled soils for re-use

Hi Keith

As long as its not under a building-the original Option C -under aggregate base in paved areas is acceptable.

On Mon, Aug 7, 2017 at 12:15 PM, Keith Progin <kprogin@hcea.com> wrote:

> It is my understanding that using the stockpiled samples in the excavation on the northern end of the Site (Option A in the emails below) is no longer an option. The General Contractor is seeking permission to place the material beneath the aggregate base in future paved areas. Please let me know at your earliest convenience if this is acceptable.
>
> Thanks!
>
> **Keith Progin | Project Manager, Environmental Division**
> **HILLIS-CARNES ENGINEERING ASSOCIATES**
>
> Cell (443) 250-9467
> Phone +1 (410) 880-4788 X1145
> Fax +1 (410) 880-4098
>
> **From:** Barbara Brown -MDE- [mailto:barbara.brown1@maryland.gov]
> **Sent:** Tuesday, July 25, 2017 1:58 PM
> **To:** Gina L. Galimberti
> **Cc:** Barbara Brown (BBrown@mde.state.md.us); Jennifer Sohns -MDE-; Pete Haid; Keith Progin
> **Subject:** Re: Sparrows Point - Parcel A3-1 - Enviro sampling and testing of stockpiled soils for re-use
>
> Hi All
>
> Option A would be acceptable-please document where material is placed in the completion report.
>
> On Tue, Jul 25, 2017 at 1:37 PM, Gina L. Galimberti <ggalimberti@hcea.com> wrote:
>
> Good afternoon Barbara – For your review, I have attached a package of information related to the stockpile sampling conducted by HCEA at Parcel A3-1. The submittal includes our daily report for the sampling, the approved sampling plan, and the laboratory report for the analysis of the composite sample for Oil & Grease (ND), TPH-DRO (31 ppm), PCBs (all ND except PCB-1260 at 0.058 ppm) and TCLP Metals (all ND).

Per the sampling plan, the Contractor was seeking permission to place the material in one or more of the following ways:

a) beneath the geotextile marker fabric in landscaped areas;
b) beneath the impermeable liner in storm water management ponds; and/or;

c) beneath the compacted aggregate base in paved areas.

Since submittal of the sampling plan, the Contactor has expressed interest in placing the material in a different manner, described as follows:

a) The first and most desirable option would be to use the material to backfill an excavation on the northern end of the Site where impacted soil had been remediated via excavation by ARM/EAG. The northern end of the Site consists of parking lot and some landscaping. If the material is approved to go to the north end of the Site, the material would, in the future, be capped with 2 feet of VCP-approved clean fill if placed within future landscaped areas.

b) The second option would be to use the material as part of the building pad;

c) The third option would be to take the material to Gray's Landfill.

Please advise as to the acceptability of the re-use of the material for the options presented above.

I look forward to hearing from you upon completion of your review. Thank you in advance for your convenience.

Gina

Gina Galimberti | Environmental Services Manager

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--

Barbara Brown

MDE-LRP-VCP Section Head

direct 410 537 3212

general 410 537 3493

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--
Barbara Brown
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general 410 537 3493

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Keith Progin

From: Barbara Brown -MDE- <barbara.brown1@maryland.gov>
Sent: Tuesday, September 19, 2017 9:10 AM
To: Keith Progin
Cc: Jennifer Sohns -MDE- (jennifer.sohns@maryland.gov)
Subject: Re: Stockpile Sample - A3-1

Hello Keith

The soil from the stockpile may be used under the cap in the paved/concrete areas. Please be sure to document in the completion report where the soil was placed.

On Tue, Sep 19, 2017 at 9:01 AM, Keith Progin <kprogin@hcea.com> wrote:

> HCEA collected one composite sample from the stockpile on A3-1 as outlined in the emails below. The laboratory report is attached. The general contractor is requesting that this material be used as fill under future paved areas (i.e., asphalt or concrete). Please advise.
>
> Thanks!
>
> **Keith Progin | Project Manager, Environmental Division**
> **HILLIS-CARNES ENGINEERING ASSOCIATES**
>
> Cell (443) 250-9467
> Phone +1 (410) 880-4788 X1145
> Fax +1 (410) 880-4098
>
> **From:** Barbara Brown -MDE- [mailto:barbara.brown1@maryland.gov]
> **Sent:** Thursday, August 31, 2017 11:25 AM
> **To:** Keith Progin
> **Cc:** Jennifer Sohns -MDE- (jennifer.sohns@maryland.gov); Gina L. Galimberti
> **Subject:** Re: Stockpile Sample - A3-1
>
> Hi Keith
>
> Please sample as described using 10 grab samples for one composite instead of 5.
>
> Trip was amazing!

Barbara Brown

On Thu, Aug 31, 2017 at 11:21 AM, Keith Progin <kprogin@hcea.com> wrote:

Barbara,

There is one relatively small stockpile of soil (approximately 100 cubic yards) located on the northeastern side of A3-1. The soils were generated during pre-digging activities associated with the future storm drain utility on the southeastern side of the building. The Response and Development Work Plan calls for any soil with PID readings greater than 10 ppm to be stockpiled. The soils exhibited relatively minor odors and PID readings as high 20 ppm. HCEA did not observe evidence of staining or pooled liquids in the soils. Due to the relatively low PID readings, minor odors, and absence of staining, HCEA is requesting that the stockpiled soil be permitted for use as fill beneath parking areas without conducting the sampling protocol as outlined in the RDWP.

If the MDE requires sampling, HCEA is proposing using a stainless steel hand auger to collect 5 grab samples from the stockpile. The 5 grab samples will be mixed in a stainless steel mixing bowl to generate one composite sample. The one composite sample will be submitted for laboratory analyses for TPH-DRO, Oil & Grease, PCBs, and TCLP Metals.

Please advise.

Hope you enjoyed your trip to Oregon and had a better show than what we got in Maryland. Thanks!

Keith Progin | Project Manager, Environmental Division

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Barbara Brown

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--

Barbara Brown
MDE-LRP-VCP Section Head
direct 410 537 3212
general 410 537 3493

Click here to complete a three question customer experience survey.

Keith Progin

From: Barbara Brown -MDE- <barbara.brown1@maryland.gov>
Sent: Tuesday, September 8, 2020 12:35 PM
To: Keith Progin
Cc: Jennifer Sohns -MDE- (jennifer.sohns@maryland.gov); Pete Haid; Matthew Newman (mnewman@tradepointatlantic.com)
Subject: Re: TPA_A3-1 Addition - Impacted Stockpile

Hi Keith

This soil must go to the landfill or other approved disposal facility and cannot be reused.

On Tue, Sep 8, 2020 at 12:35 PM Keith Progin <kprogin@hcea.com> wrote:

> During the A3-1 Addition, approximately 50 cu yds of soil exhibited odors and elevated PID readings. These soils were stockpiled and sampled for PCBs, VOCs, Oil & Grease, PP Metals, Manganese, Hexavalent Chromium, TPH-DRO, and TPH-GRO. Please see the attached package that includes the laboratory report, table of results, and a photograph.
>
> TPA is inquiring whether this material can be reused beneath the cap on an industrial parcel. Please advise.
>
> Thanks!
>
> **Keith Progin | Senior Environmental Project Manager**
>
> **HILLIS-CARNES ENGINEERING ASSOCIATES**
>
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--

Barbara H. Brown
Voluntary Cleanup Program Section Head
Land and Materials Administration
Maryland Department of the Environment
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Barbara.brown1@maryland.gov
410-537-3493 (O)
410-537-3212 (Direct)
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Keith Progin

From: Barbara Brown -MDE- <barbara.brown1@maryland.gov>
Sent: Tuesday, June 9, 2020 1:06 PM
To: Keith Progin
Cc: Jennifer Sohns -MDE- (jennifer.sohns@maryland.gov); Matthew Newman
Subject: Re: TPA- A3-1_Excess Slag Stockpile

Hi Keith

As long as the slag did not have any odors or elevated PID readings it may be reused elsewhere on the Sparrows Point site as fill material.

On Tue, Jun 9, 2020 at 12:43 PM Keith Progin <kprogin@hcea.com> wrote:

> Barbara,
>
> The A3-1 addition includes the excavation and grading of previously placed slag for utilities and parking. Any excess slag generated during this project is being transported and stockpiled in the vicinity of the former Power Plant. Since this material originated from the Slag Processing area and was used during the initial redevelopment of A3-1, TPA is proposing to reuse this slag on future redevelopment projects at TPA. It should be noted that this material only includes slag that was previously processed and does not include "native" soils that were in place prior to the initial redevelopment. All quantities and final placement of this material will be tracked and recorded.
>
> Thanks!
>
> **Keith Progin | Senior Environmental Project Manager**
>
> **HILLIS-CARNES ENGINEERING ASSOCIATES**
>
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>
> Website www.hcea.com

From: James Calenda <jcalenda@enviroanalyticsgroup.com>
Sent: Monday, October 30, 2017 11:21 AM
To: Taylor Smith <tsmith@armgroup.net>; Neil Peters <npeters@armgroup.net>
Subject: FW: FW: Parcel A-3 Development - Proposed Modification to SW Pond Liner

FYI

From: Barbara Brown -MDE- [mailto:barbara.brown1@maryland.gov]
Sent: Thursday, October 26, 2017 3:49 PM
To: Pete Haid <phaid@tradepointatlantic.com>
Cc: James Calenda <jcalenda@enviroanalyticsgroup.com>; Jennifer Sohns -MDE- <jennifer.sohns@maryland.gov>; Dorgan, Doug <ddorgan@wcgrp.com>
Subject: Re: FW: Parcel A-3 Development - Proposed Modification to SW Pond Liner

Hello Pete

The modification to the stormwater pond liner is approved with the following conditions:

1. All clay material used must be documented to comply with the VCP clean fill requirement.
2. Placement of the clay material must made in such a manor as to ensure that the final permeability is demonstrated to be similar to or better than the original 30-ml plastic liner and all documentation must be included in the final completion report for A3.

If you have any questions on these requirements please contact me.

On Thu, Oct 26, 2017 at 8:35 AM, Pete Haid <phaid@tradepointatlantic.com> wrote:

Good morning Barbara - Good seeing you last night.

Have you had a chance to review the requested pond liner modification?

Thanks.

Pete

From: James Calenda [mailto:jcalenda@enviroanalyticsgroup.com]
Sent: Monday, October 16, 2017 4:57 PM
To: Barbara Brown -MDE- <barbara.brown1@maryland.gov>; Jennifer Sohns -MDE- <jennifer.sohns@maryland.gov>; Weissbart, Erich <Weissbart.Erich@epa.gov>; Prince, Ruth <Prince.Ruth@epa.gov>
Cc: Russ Becker <rbecker@enviroanalyticsgroup.com>; Pete Haid <phaid@tradepointatlantic.com>; Dorgan, Doug <ddorgan@wcgrp.com>; Craven, Laura <lcraven@wcgrp.com>
Subject: Parcel A-3 Development - Proposed Modification to SW Pond Liner

Barbara,

Attached please find a letter requesting approval to modify the design of the liner for the stormwater pond being constructed as part of the development within Parcel A-3. The requested modification is to install 2 feet of clay in place of the 30-mil liner, with 6 inches of clean topsoil placed above the clay layer. The proposed modification meets the approved requirements for landscaped caps installed at the site. If you have any questions or wish to discuss further, please feel free to contact me directly.

Thanks

James

James Calenda

Senior Project Manager

EnviroAnalytics Group

(314) 620-3056 Direct

jcalenda@enviroanalyticsgroup.com

http://www.enviroanalyticsgroup.com

Keith Progin

From: Barbara Brown -MDE- <barbara.brown1@maryland.gov>
Sent: Tuesday, March 27, 2018 10:32 AM
To: Keith Progin
Cc: Jennifer Sohns -MDE-
Subject: Re: A3-1 Clay Material for Basin

Hello Keith

The material is acceptable for use for the basin at A3-1. This approval is only for the material in the stockpile that was tested.

If you have any additional questions please contact me.

Barbara Brown

On Thu, Mar 22, 2018 at 11:54 AM, Keith Progin <kprogin@hcea.com> wrote:

Please see the attached laboratory results for the clay soil proposed for use in the basin at A3-1. I've also included the soil classification performed by HCEA as well as the permeability test run by HCEA since 2-feet of clay will be used in place of a liner. The permeability test showed a 2.3E-07 at 85% compaction. Please confirm that this material is approved for use in the basin.

Thank you!

Keith Progin | Project Manager, Environmental Division
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From: Jennifer Sohns -MDE- [mailto:jennifer.sohns@maryland.gov]
Sent: Tuesday, February 20, 2018 11:49 AM
To: Keith Progin
Cc: Barbara Brown -MDE-
Subject: Re: A3-1 Clay Material for Basin

Hey Keith,

We have reviewed the plan for sampling clay material from the Tanyard Cove development in Pasadena, MD. The plan is approved with the following comments:

Depending on size of pile-need to get deeper than 1-2 feet for a few of the composite points..I'm sure they have a backhoe or something similar to get inside pile.

Ensure that nothing is added or removed from pile after sampling. Load Tickets must be accurate and legible for the completion report.

Also a few photographs of piles and sampling would be useful.

If you have any questions please contact me.

Thank you,

Jennifer Sohns

On Mon, Feb 19, 2018 at 4:03 PM, Keith Progin <kprogin@hcea.com> wrote:

Barbara – per your request below, please see the attached Sampling Plan for the clay proposed for use in the sediment basin at A3-1.

Thanks!

Keith Progin | Project Manager, Environmental Division
HILLIS-CARNES ENGINEERING ASSOCIATES

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From: Barbara Brown -MDE- [mailto:barbara.brown1@maryland.gov]
Sent: Tuesday, February 13, 2018 1:24 PM
To: Keith Progin; Gina L. Galimberti
Cc: Jennifer Sohns -MDE- (jennifer.sohns@maryland.gov); Pete Haid
Subject: Re: A3-1 Clay Material for Basin

Hello All

Please disregard the previous email...sent in error- not done typing yet-The material does test as a clay and would be acceptable as a liner but Tanyard Cove is a housing development not a quarry directly supplying the material therefore the certification from a third party intermediary is not acceptable. Therefore, sampling would be required to use at Sparrows Point..

If you wish to use this material provide additional information on the size, location and source of stockpile and a sampling plan.

Barbara Brown

On Tue, Feb 13, 2018 at 1:11 PM, Barbara Brown -MDE- <barbara.brown1@maryland.gov> wrote:

Hello Keith

The clay material is acceptable for the liner. Please provide a brief description of the geotechnical testing to be preformed to ensure that the final material placement meets the permeability requirements.

Barbara Brown

On Tue, Feb 6, 2018 at 3:24 PM, Keith Progin <kprogin@hcea.com> wrote:

The plans for the sediment basin at A3-1 have eliminated the need for a liner and called for 2-feet of clay. Please see the attached clean fill affidavit and soil proctor for clay from the Tanyard Cove facility proposed for use in the sediment basin at A3-1.

Thanks!

Keith Progin | Project Manager, Environmental Division

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Website www.hcea.com

Melissa Replogle

From: Barbara Brown -MDE- <barbara.brown1@maryland.gov>
Sent: Thursday, October 5, 2017 10:31 AM
To: Keith Progin
Cc: Jennifer Sohns -MDE- (jennifer.sohns@maryland.gov)
Subject: Re: Exclusion Zone Stockpile Sample - A3-1

Hello Keith

The material is approved for use under a cap. Please track appropriately for the final completion report.

On Wed, Oct 4, 2017 at 4:13 PM, Keith Progin <kprogin@hcea.com> wrote:

> HCEA collected one composite sample from the Exclusion Zone stockpile on A3-1 as approved via email on 10/2/17. The laboratory report is attached. The general contractor is requesting that this material be used as fill under future paved areas (i.e., asphalt or concrete). Please advise.
>
> Thanks!
>
> **Keith Progin | Project Manager, Environmental Division**
> **HILLIS-CARNES ENGINEERING ASSOCIATES**
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--
Barbara Brown
MDE-LRP-VCP Section Head
direct 410 537 3212
general 410 537 3493

Hi Keith

It can go under a cap at A3 or to Greys.

On Tue, Oct 24, 2017 at 11:29 AM, Keith Progin <kprogin@hcea.com> wrote:

Barbara – please see the attached laboratory report for the 3 composite samples collected from the Exclusion Zone stockpiles. At this time, the general contractor is hoping to remove the majority of the stockpiled soil to Grey's Landfill. If some of the material meets the compaction standards the general contractor may elect to re-use that material below the cap. Please advise.

Thanks!

Keith Progin | Project Manager, Environmental Division
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From: Barbara Brown -MDE- [mailto:barbara.brown1@maryland.gov]
Sent: Monday, October 16, 2017 3:30 PM
To: Keith Progin
Cc: Jennifer Sohns -MDE-; Gina L. Galimberti
Subject: Re: A3-1 Stockpile Sample - Exclusion Zone (Second Round)

Hello Keith

You may proceed with the proposed A3 stockpile sampling plan.

On Mon, Oct 16, 2017 at 3:24 PM, Keith Progin <kprogin@hcea.com> wrote:

The contractor has completed the excavation of a second utility line in the exclusion zone at A3-1. During this second round of excavation within the exclusion zone, three 500 yard stockpiles were generated and covered with plastic. With the exception of approximately 6 bucket-loads of material (high PID reading of 72), none of the excavated soils exhibited evidence of staining, odors, or elevated PID readings.

HCEA is proposing using a stainless steel hand auger to collect 10 grab samples from each of the three stockpiles. The 10 grab samples will be mixed in a stainless steel mixing bowl to generate one composite sample for each stockpile (total of 3 composite samples). The three composite samples will be submitted for laboratory analyses for TPH-DRO, Oil & Grease, PCBs, and RCRA 13 Metals.

Upon your approval of the work plan, HCEA will collect the stockpile sample.

Thanks!

Keith Progin | Project Manager, Environmental Division
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Barbara Brown

MDE-LRP-VCP Section Head

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Thank you

Keith Progin | Project Manager, Environmental Division
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From: Barbara Brown -MDE- [mailto:barbara.brown1@maryland.gov]
Sent: Thursday, October 12, 2017 2:16 PM
To: Keith Progin
Cc: Jennifer Sohns -MDE- (jennifer.sohns@maryland.gov)
Subject: Re: Exclusion Zone Stockpile Sample - A3-1

Hello Keith

MDE does not have any issues with the plan. Please document as you have noted in your e-mail.

On Thu, Oct 12, 2017 at 2:11 PM, Keith Progin <kprogin@hcea.com> wrote:

I've been notified by the General Contractor that some of the material within the exclusion zone stockpile at A3-1 consists of clay and is unsuitable to be re-used as backfill. James Calenda with EAG has approved the material to be transported and disposed of at the Greys Landfill. Since you approved the material for use under the cap, I wanted to let you know we are planning on segregating the clay and hauling it to Grey's Landfill. HCEA will document the removal as well as the quantity. Please let me know if the MDE has any issues with our plan.

Thanks!

Keith Progin | Project Manager, Environmental Division
HILLIS-CARNES ENGINEERING ASSOCIATES

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Fax +1 (410) 880-4098

From: Barbara Brown -MDE- [mailto:barbara.brown1@maryland.gov]
Sent: Thursday, October 5, 2017 10:31 AM
To: Keith Progin
Cc: Jennifer Sohns -MDE- (jennifer.sohns@maryland.gov)
Subject: Re: Exclusion Zone Stockpile Sample - A3-1

Hello Keith

The material is approved for use under a cap. Please track appropriately for the final completion report.

On Wed, Oct 4, 2017 at 4:13 PM, Keith Progin <kprogin@hcea.com> wrote:

HCEA collected one composite sample from the Exclusion Zone stockpile on A3-1 as approved via email on 10/2/17. The laboratory report is attached. The general contractor is requesting that this material be used as fill under future paved areas (i.e., asphalt or concrete). Please advise.

Thanks!

Keith Progin | Project Manager, Environmental Division
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Barbara Brown

MDE-LRP-VCP Section Head

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Melissa Replogle

From: Keith Progin <kprogin@hcea.com>
Sent: Thursday, October 12, 2017 2:38 PM
To: 'gsnyder@arco1.com'; 'jrook@arcomurray.com'; 'phaid@tradepointatlantic.com'; James Calenda (jcalenda@enviroanalyticsgroup.com)
Cc: Gina L. Galimberti; Ariel Gillis
Subject: A3-1 Exclusion Zone Stockpile - Clay Material

Although the MDE approved re-using the stockpiled soil from the exclusion zone beneath the cap at A3-1, Arco informed HCEA that there is clay material within the stockpile that is not suitable for use as backfill. Per Arco's request, James Calenda with EAG approved transporting the clay material to the Grey's Landfill for disposal. The MDE was informed of this request and has approved this plan. EAG has requested that they be notified in advance prior to hauling the material to the landfill so that they can coordinate the location of disposal. HCEA will need truck tickets and the exact quantity of material removed to the landfill. These documents are required by the MDE as part of the final close out.

Please let me know if you have any questions or comments.

Thanks!

Keith Progin | Project Manager, Environmental Division
HILLIS-CARNES ENGINEERING ASSOCIATES

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ENGINEERING ASSOCIATES

Keith Progin

From: Barbara Brown -MDE- <barbara.brown1@maryland.gov>
Sent: Wednesday, October 25, 2017 4:08 PM
To: Keith Progin
Subject: Re: A3-1 Stockpile Sample - Exclusion Zone (Second Round)

Hi Keith

It can go under a cap at A3 or to Greys.

On Tue, Oct 24, 2017 at 11:29 AM, Keith Progin <kprogin@hcea.com> wrote:

> Barbara – please see the attached laboratory report for the 3 composite samples collected from the Exclusion Zone stockpiles. At this time, the general contractor is hoping to remove the majority of the stockpiled soil to Grey's Landfill. If some of the material meets the compaction standards the general contractor may elect to re-use that material below the cap. Please advise.
>
> Thanks!
>
> **Keith Progin | Project Manager, Environmental Division**
> **HILLIS-CARNES ENGINEERING ASSOCIATES**
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> Cell (443) 250-9467
> Phone +1 (410) 880-4788 X1145
> Fax +1 (410) 880-4098
>
> **From:** Barbara Brown -MDE- [mailto:barbara.brown1@maryland.gov]
> **Sent:** Monday, October 16, 2017 3:30 PM
> **To:** Keith Progin
> **Cc:** Jennifer Sohns -MDE-; Gina L. Galimberti
> **Subject:** Re: A3-1 Stockpile Sample - Exclusion Zone (Second Round)
>
> Hello Keith
>
> You may proceed with the proposed A3 stockpile sampling plan.
>
> On Mon, Oct 16, 2017 at 3:24 PM, Keith Progin <kprogin@hcea.com> wrote:
>
> The contractor has completed the excavation of a second utility line in the exclusion zone at A3-1. During this second round of excavation within the exclusion zone, three 500 yard stockpiles were generated and covered with

plastic. With the exception of approximately 6 bucket-loads of material (high PID reading of 72), none of the excavated soils exhibited evidence of staining, odors, or elevated PID readings.

HCEA is proposing using a stainless steel hand auger to collect 10 grab samples from each of the three stockpiles. The 10 grab samples will be mixed in a stainless steel mixing bowl to generate one composite sample for each stockpile (total of 3 composite samples). The three composite samples will be submitted for laboratory analyses for TPH-DRO, Oil & Grease, PCBs, and RCRA 13 Metals.

Upon your approval of the work plan, HCEA will collect the stockpile sample.

Thanks!

Keith Progin | Project Manager, Environmental Division
HILLIS-CARNES ENGINEERING ASSOCIATES

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Barbara Brown
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Click here to complete a three question customer experience survey.

Keith Progin

From: Jennifer Sohns -MDE- <jennifer.sohns@maryland.gov>
Sent: Wednesday, February 7, 2018 3:34 PM
To: Keith Progin
Cc: Barbara Brown -MDE-
Subject: Re: A3-1 Stockpile Sample - Exclusion Zone (Third Round)

Keith,
Based on the sampling results, you may place this stockpiled material underneath the landscaped cap areas on Parcel A3-1. Any other soils excavated from that area would need to be sampled separately for our review and approval for placement. Let me know if you have any questions.
Thank you,
Jennifer Sohns

On Tue, Feb 6, 2018 at 2:32 PM, Keith Progin <kprogin@hcea.com> wrote:

Please let me know the outcome of you conversation with TPA.

Are you able to make a comment regarding placing the stockpiled soils from the exclusion zone below the cap in landscaped areas at A3-1?

Keith Progin | Project Manager, Environmental Division
HILLIS-CARNES ENGINEERING ASSOCIATES

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From: Jennifer Sohns -MDE- [mailto:jennifer.sohns@maryland.gov]
Sent: Tuesday, February 6, 2018 2:17 PM
To: Keith Progin
Cc: Barbara Brown -MDE-

Subject: Re: A3-1 Stockpile Sample - Exclusion Zone (Third Round)

Hey Keith,

Barbara and I are meeting with TPA on Thursday and one of our point of discussion will be soil management throughout the Sparrow's Point property since this is something we are going to continue to run up against now that Grey's is being very selective and development is moving along. Also, the area on A3 is under EPA oversight so we may want to get their input re: placement of those excavated soils. We should have an answer for you by Friday.

Thanks,

Jennifer

On Tue, Feb 6, 2018 at 1:52 PM, Keith Progin <kprogin@hcea.com> wrote:

Per the email request below, please see the attached laboratory results for the composite sample collected last week from the exclusion zone at A3-1. The contractor is requesting the re-use of this material below the cap in the landscaped areas (below the 2-feet of clean fill and below the marker fabric).

In addition, the contractor has between 700-1,000 yards of soil that has been excavated from the utility lines at A3-1. The material has been screened by HCEA's on-site technician for elevated PID readings, odors, and staining. There was no evidence of environmental impact detected in these soils. The contractor is running out of room on-site to lose the material and is requesting permission to spread the material on the northern portion of the B-22 parcel.

Keith Progin | Project Manager, Environmental Division
HILLIS-CARNES ENGINEERING ASSOCIATES

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From: Keith Progin
Sent: Monday, January 29, 2018 12:40 PM
To: 'Barbara Brown -MDE-'
Cc: Jennifer Sohns -MDE-
Subject: RE: A3-1 Stockpile Sample - Exclusion Zone (Third Round)

Thank you

Keith Progin | Project Manager, Environmental Division
HILLIS-CARNES ENGINEERING ASSOCIATES

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From: Barbara Brown -MDE- [mailto:barbara.brown1@maryland.gov]
Sent: Monday, January 29, 2018 12:40 PM

To: Keith Progin
Cc: Jennifer Sohns -MDE-
Subject: Re: A3-1 Stockpile Sample - Exclusion Zone (Third Round)

Hi Keith

For under the cap-also add vanadium and manganese-otherwise proceed.

On Mon, Jan 29, 2018 at 10:29 AM, Keith Progin <kprogin@hcea.com> wrote:

Sorry that I didn't clarity in my email below. They would like to use it under the cap.

Keith Progin | Project Manager, Environmental Division
HILLIS-CARNES ENGINEERING ASSOCIATES

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Fax +1 (410) 880-4098

From: Barbara Brown -MDE- [mailto:barbara.brown1@maryland.gov]
Sent: Monday, January 29, 2018 10:29 AM
To: Keith Progin
Cc: Jennifer Sohns -MDE-
Subject: Re: A3-1 Stockpile Sample - Exclusion Zone (Third Round)

Hi Keith

Do they want to use it as "clean fill" or under a cap...

On Mon, Jan 29, 2018 at 10:22 AM, Keith Progin <kprogin@hcea.com> wrote:

The contractor has completed the excavation of an electric duct bank in the exclusion zone at A3-1. During this excavation, approximately 250 yards of soil was excavated and stockpiled on plastic and covered with the same. None of the excavated soils exhibited evidence of staining, odors, or elevated PID readings.

HCEA is proposing using a stainless steel hand auger to collect 10 grab samples from the stockpile. The 10 grab samples will be mixed in a stainless steel mixing bowl to generate one composite sample. The composite sample will be submitted for laboratory analyses for TPH-DRO, Oil & Grease, PCBs, and PP 13 Metals. Upon your approval of the work plan, HCEA will collect the stockpile sample.

Thanks!

Keith Progin | Project Manager, Environmental Division
HILLIS-CARNES ENGINEERING ASSOCIATES

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--

Barbara Brown

MDE-LRP-VCP Section Head

direct 410 537 3212

general 410 537 3493

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--

Barbara Brown

MDE-LRP-VCP Section Head

direct 410 537 3212

general 410 537 3493

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--

Jennifer Sohns

Click here to complete a three question customer experience survey.

--
Jennifer Sohns

Click here to complete a three question customer experience survey.

Keith Progin

From: Barbara Brown -MDE- <barbara.brown1@maryland.gov>
Sent: Tuesday, May 15, 2018 2:16 PM
To: Keith Progin; Pete Haid
Cc: Jennifer Sohns -MDE- (jennifer.sohns@maryland.gov)
Subject: Re: SPT - A3-1 Exclusion Zone Sampling

Hello Pete

Based on the results from sample 6 and 7 and 6B and 7B in a later email-the material may be transported to Greys landfill.

If you have any questions please contact me.

On Tue, Apr 17, 2018 at 3:39 PM, Keith Progin <kprogin@hcea.com> wrote:

Please see the attached laboratory results for the two composite samples collected from the exclusion zone during the excavation for the BGE conduit. On behalf of Tradepoint, we are requesting transporting the stockpiled soil from the exclusion zone to backfill the pit at B-21.

I should note that the contractor should be completing the work at the BGE conduit in the next day or so and HCEA will be collecting one more composite soil sample from material excavated from the exclusion zone. I will forward the results of that sample after we collect the sample later this week.

Thanks!

Keith Progin | Project Manager, Environmental Division

HILLIS-CARNES ENGINEERING ASSOCIATES

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Email kprogin@hcea.com

Website www.hcea.com

Keith Progin

From: Barbara Brown -MDE- <barbara.brown1@maryland.gov>
Sent: Tuesday, September 8, 2020 9:51 AM
To: Keith Progin
Cc: Jennifer Sohns -MDE- (jennifer.sohns@maryland.gov); phaid@tradepointatlantic.com; Matthew Newman (mnewman@tradepointatlantic.com)
Subject: Re: TPA_A3-1_Former East Pond Exclusion Zone Sample

Hello Keith

The material can be placed under a cap at an industrial site at Sparrows-please track where it is placed for the completion report.

On Tue, Sep 8, 2020 at 9:21 AM Keith Progin <kprogin@hcea.com> wrote:

> During redevelopment activities at the A3-1 Addition, approximately 150 yards of material was excavated from one of the designated Exclusion Zones (Former East Pond). This material was stockpiled on plastic and covered with the same. HCEA collected one composite sample for laboratory analyses. Per the RADWP Comment Response Letter dated January 16, 2020, the sample was analyzed for TCLP Metals and total cadmium.
>
> Please see the attached package that includes the laboratory report and a photograph. All TCLP results were non-detect and the total cadmium concentration was 11.3 mg/kg.
>
> TPA is proposing using this material beneath the cap on one of the industrial redevelopment parcels. Please advise.
>
> Thanks!
>
> **Keith Progin | Senior Environmental Project Manager**
>
> **HILLIS-CARNES ENGINEERING ASSOCIATES**
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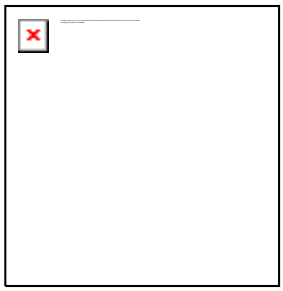
--



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410-537-3212 (Direct)
Website | Facebook | Twitter

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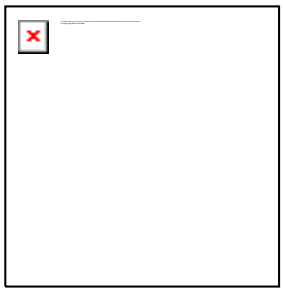
Keith Progin

From: Jennifer Sohns -MDE- <jennifer.sohns@maryland.gov>
Sent: Wednesday, October 14, 2020 10:15 AM
To: Keith Progin
Cc: Barbara Brown -MDE-; Matthew Newman (mnewman@tradepointatlantic.com)
Subject: Re: TPA_A3-1_Former Sludge Bin Exclusion Zone Sample

Keith,
This soil may be used underneath an approved cap on another parcel within the Sparrows Point property. Please continue to track where this soil is placed. The information will be needed in the Completion Report for whatever development project it is placed on.
Thanks,

Because of the COVID-19 virus and the need for safety precautions, many state employees are working remotely, including myself. During this period the best way to contact me is via email or to leave a voicemail at my direct line and allow me to return your call.
In addition to a mailed hard copy, please send digital copies of reports via email, if possible.



Jennifer Sohns
Project Manager
Land Management Administration
Maryland Department of the Environment
1800 Washington Boulevard
Baltimore, Maryland 21230
jennifer.sohns@maryland.gov
410-537-4472 (O)
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On Tue, Oct 13, 2020 at 11:50 AM Keith Progin <kprogin@hcea.com> wrote:

> Barbara,
>
> During work at the A3-1 Addition, approximately 100 cu yds of soil was excavated and stockpiled from the Former Sludge Bin Exclusion Zone. This stockpile was previously sampled and approved for reuse under the cap at A3-1. Since there was no space available under the cap at A3-1, the MDE requested additional sampling for reuse on other parcels at TPA. Per the email below dated September 10, 2020, HCEA collected a second sample for laboratory analyses (TPH-DRO, TPH-GRO, PCBs, and Manganese).

Please see the attached package that includes the laboratory report, a comparison table, and a photograph.

Please confirm that this material is approved for reuse under the cap on industrial parcels at TPA.

Thanks!

Keith Progin | Senior Environmental Project Manager

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From: Barbara Brown -MDE- <barbara.brown1@maryland.gov>
Sent: Thursday, September 10, 2020 8:32 AM
To: Keith Progin <kprogin@hcea.com>
Cc: Jennifer Sohns -MDE- <jennifer.sohns@maryland.gov>; Matthew Newman (mnewman@tradepointatlantic.com) <mnewman@tradepointatlantic.com>
Subject: Re: TPA_A3-1_Former East Pond Exclusion Zone Sample

Hello Keith

That would be acceptable.

On Thu, Sep 10, 2020 at 8:33 AM Keith Progin <kprogin@hcea.com> wrote:

> We will grab another sample from the Former Sludge Bin stockpile. Since the majority of the stockpile is slag that was placed during the initial development (very little actually extended into the actual pre-existing soils) and since there was no evidence of odors or elevated PID readings, we are proposing to run the samples for TPH-DRO, TPH-GRO, PCBs, and manganese.

Thanks!

Keith Progin | Senior Environmental Project Manager

HILLIS-CARNES ENGINEERING ASSOCIATES

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From: Jennifer Sohns -MDE- <jennifer.sohns@maryland.gov>
Sent: Wednesday, September 9, 2020 10:17 AM
To: Keith Progin <kprogin@hcea.com>
Cc: Barbara Brown -MDE- <barbara.brown1@maryland.gov>
Subject: Re: TPA_A3-1_Former East Pond Exclusion Zone Sample

Keith,

Approval for use of those soils on another parcel required additional sampling, as per the following comment sent via email on June 11, 2020 -

"Based on the limited analysis done on this soil, it is acceptable to be reused within Parcel A3, under a cap. Additional sampling in line with the typical fill analysis would be needed for approval to use off the parcel.

Let me know if you have any questions."

Was additional sampling collected from the Former Sludge Bin Area soils that you are referencing? The cadmium is notably higher in those results compared with the results just submitted within this email thread.

Thanks,

Because of the COVID-19 virus and the need for safety precautions, many state employees are working remotely, including myself. During this period the best way to contact me is via email or to leave a voicemail at my direct line and allow me to return your call.

In addition to a mailed hard copy, please send digital copies of reports via email, if possible.

Jennifer Sohns
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410-537-4472 (O)
Website | Facebook | Twitter

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On Tue, Sep 8, 2020 at 9:59 AM Keith Progin <kprogin@hcea.com> wrote:

> Can you please confirm that this also applies to the approximate 100 cu yds of material that was excavated from the Former Sludge Bin Area that we previously sampled and submitted the results on 6/4/20.
>
> Thanks!
>
> **Keith Progin | Senior Environmental Project Manager**
>
> **HILLIS-CARNES ENGINEERING ASSOCIATES**
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> Fax +1 (410) 880-4098
>
> **From:** Barbara Brown -MDE- <barbara.brown1@maryland.gov>
> **Sent:** Tuesday, September 8, 2020 9:51 AM

To: Keith Progin <kprogin@hcea.com>
Cc: Jennifer Sohns -MDE- (jennifer.sohns@maryland.gov) <jennifer.sohns@maryland.gov>; phaid@tradepointatlantic.com; Matthew Newman (mnewman@tradepointatlantic.com) <mnewman@tradepointatlantic.com>
Subject: Re: TPA_A3-1_Former East Pond Exclusion Zone Sample

Hello Keith

The material can be placed under a cap at an industrial site at Sparrows-please track where it is placed for the completion report.

On Tue, Sep 8, 2020 at 9:21 AM Keith Progin <kprogin@hcea.com> wrote:

> During redevelopment activities at the A3-1 Addition, approximately 150 yards of material was excavated from one of the designated Exclusion Zones (Former East Pond). This material was stockpiled on plastic and covered with the same. HCEA collected one composite sample for laboratory analyses. Per the RADWP Comment Response Letter dated January 16, 2020, the sample was analyzed for TCLP Metals and total cadmium.
>
> Please see the attached package that includes the laboratory report and a photograph. All TCLP results were non-detect and the total cadmium concentration was 11.3 mg/kg.
>
> TPA is proposing using this material beneath the cap on one of the industrial redevelopment parcels. Please advise.
>
> Thanks!
>
> **Keith Progin | Senior Environmental Project Manager**
>
> **HILLIS-CARNES ENGINEERING ASSOCIATES**
>
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Keith Progin

From: Barbara Brown -MDE- <barbara.brown1@maryland.gov>
Sent: Tuesday, April 24, 2018 2:13 PM
To: Pete Haid
Cc: Jennifer Sohns -MDE-; James Calenda; Keith Progin
Subject: Re: Coal Tar Laboratory Results

Hello Pete

The coal tar material at A3 as contained in the pile represented by the sample results provided may be moved to Greys in accordance with the landfill operations manual.

Please document the volume of material removed for the completion report.

Barbara Brown

On Mon, Apr 16, 2018 at 5:15 PM, Pete Haid <phaid@tradepointatlantic.com> wrote:
Barbara:

Attached please find the lab results for the coal tar at A3 (RCRA non-hazardous). TPA is proposing to move this material to Greys Landfill pending MDE approval.

Thanks.

Pete

--
Barbara Brown
MDE-LRP-VCP Section Head
direct 410 537 3212
general 410 537 3493

Keith Progin

From: Pete Haid <phaid@tradepointatlantic.com>
Sent: Tuesday, May 15, 2018 2:34 PM
To: Snyder, Gene; Keith Progin
Cc: Joe Rook
Subject: RE: Material testing

Gentlemen:

The MDE has released this material for the landfill. We can also take the pile that was designated for B21 (MCM) to the landfill.

Gene - As discussed, please coordinate with Bill.

Thanks.

Pete

-----Original Message-----
From: Snyder, Gene [mailto:gsnyder@arco1.com]
Sent: Thursday, April 12, 2018 8:08 AM
To: Keith Progin <kprogin@hcea.com>
Cc: Pete Haid <phaid@tradepointatlantic.com>; Joe Rook <jrook@arcomurray.com>; Snyder, Gene <gsnyder@arco1.com>
Subject: RE: Material testing

Any Word Keith

Gener

Gene Snyder | Project Superintendent | ARCO NATIONAL CONSTRUCTION Corporate Headquarters: 900 N. Rock Hill Rd., St. Louis, MO 63119
Office: (314) 963.0715 Mobile: (314) 614.4917 Fax: (314) 963.7114 gsnyder@arco1.com | www.arconational.com
Download my vcard here

-----Original Message-----
From: Keith Progin [mailto:kprogin@hcea.com]
Sent: Tuesday, April 10, 2018 11:21 AM
To: Snyder, Gene <gsnyder@arco1.com>
Cc: Pete Haid <phaid@tradepointatlantic.com>; Rook, Joe <jrook@arcomurray.com>
Subject: RE: Material testing

Revision to my last email. Just got a call from the lab that some of the metals were high in the coal tar sample (higher than their reporting limits) so they are calibrating the equipment and re-running the sample. Therefore, the results will be in sometime tomorrow. Again, I will let everyone know as soon as they come in.

-----Original Message-----
From: Snyder, Gene [mailto:gsnyder@arco1.com]
Sent: Tuesday, April 10, 2018 9:48 AM

To: Keith Progin
Cc: Pete Haid; Rook, Joe; Snyder, Gene
Subject: Material testing

Keith

I know you said you were going to expedite the testing for A-3. On all materials and where we could take them, Please let me know ASAP. And we can get the material removed and Peter said the lady from MDE. Needs to do an inspection before we can go any farther.

Thanks, Gene

Sent from my iPhone

APPENDIX C

Well/Piezometer Abandonment Form

Well/Piezometer ID: RW 01 - MW(I)

Note if this abandonment includes any associated NAPL delineation piezometers:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3 Rod and wire mill

Date: 7/14/17

Abandonment Contractor: Allied

Abandonment Method: Terme grout down PVC well bottom up

Field Equipment: Treme 95% Portland, bentonite powder 5%

ARM Representative(s): Bob Bentz

Additional Comments (if any):

@ 1336 Drillers started mixing 95% Portland 5% Bentonite powder
@ 1405 started grouting From Bottom of PVC Casing to top
@ 1412 finished grouting well
@ 1415 Began Breaking casing down to Below ground Surface with Breaker bar
@ 1423 completed grouting / Abandonment

I was on site at 1130 Drillers arrived on site @ 1150 Lisa Perrin
Picked them up and showed them wells at 1050 Drillers left at 1245
For ice and water Drillers could not pull Casing out I called eric at 1200
about How He wanted it abandoned eric called drillers boss
to figure It out Drillers Came back at 1536

ARM Group Inc.
Earth Resource Engineers and Consultants
9175 Guilford Road - Suite 310
Columbia, Maryland 21046
(410) 290-7775 FAX: (410) 290-7775

Well/Piezometer Abandonment Form

Well/Piezometer ID: RWOI- MW(5)

Note if this abandonment includes any associated NAPL delineation piezometers:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3 Rod and Wire Mill

Date: 7/14/17

Abandonment Contractor: Allied

Abandonment Method: Treme Grout down PVC well from bottom up

Field Equipment: Treme, 95% Portland, Bentonite 5% powder

ARM Representative(s): Bob Bentz

Additional Comments (if any):

@ 1336 Drillers started mixing 95% portland 5% Bentonite Powder

@ 1412 Drillers started grouting from the bottom of PVC casing to top

@ 1418 Drillers started Breaking casing down below ground surface

@ 1423 Completed grouting / Abandoned

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW01-PZm020

Note if this abandonment includes any associated NAPL delineation piezometers:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Date: 6-5-17

Abandonment Contractor: Allied

Abandonment Method: Grout + cut at surface

Field Equipment: Grout

ARM Representative(s): N. Kurtz

Additional Comments (if any):

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW-002-PZ

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 1/4/17

Abandonment Contractor: GSI

Abandonment Method (circle appropriate):

1. PVC → (Pulled) / Split / Perforated / Left-In-Place
2. Abandoned → (Grout) / Bentonite Chips

Field Equipment: Oil-Water Probe

ARM Representative(s): Lisa Perrin

Well Diameter:

Depth to Bottom (TOC)	Final Gauging Prior to Abandonment:
Reported (historical/log):	Depth to Water (TOC): Not recorded
Measured: Not recorded	Depth to NAPL (TOC): Not recorded

Please note if this abandonment is for a known NAPL delineation/monitoring area or individual NAPL screening piezometer and identify the name of the delineation area (e.g., B6-066 NAPL Area or B5-144 Screening Piezometer):

Please Note: If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

Transcribed from ARM field book records. Piezometer was abandoned prior to the MDE directive to gauge piezometers a final time prior to abandonment.

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Engineers and Scientists
9175 Guilford Road - Suite 310
Columbia, Maryland 21046
(410) 290-7775 FAX: (410) 290-7775

Well/Piezometer Abandonment Form

Well/Piezometer ID: RW02 - MW(I)

Note if this abandonment includes any associated NAPL delineation piezometers:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3 Rod and wire Mill

Date: 7/14/17

Abandonment Contractor: Allied

Abandonment Method: Treme grout down casing from bottom up

Field Equipment: Treme, 95% Portland, Bentonite 5% powder

ARM Representative(s): Bob Bente

Additional Comments (if any):

@ 1437 Drillers started breaking casing below ground surface

@ 1447 Drillers began to grout

@ 1452 Well grouted / completed abandonment

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Earth Resource Engineers and Consultants

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Columbia, Maryland 21046

(410) 290-7775 FAX: (410) 290-7775

Well/Piezometer Abandonment Form

Well/Piezometer ID: RW02 - MW(S)

Note if this abandonment includes any associated NAPL delineation piezometers:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3 Rod and Wire Mill

Date: 7/14/17

Abandonment Contractor: Allied

Abandonment Method: Treme grout down casing from bottom up

Field Equipment: Treme; 95% Portland, Bentonite 5% powder

ARM Representative(s): Bob Bente

Additional Comments (if any):

@ 1430 Drillers Started Breaking Casing Below ground surface
@ 1435 Started grouting From bottom of casing to top
@ 1440 Drillers Started Mixing More grout 95% Portland 5% Bentonite
@ 1445 well grouted / completed Abandonment

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW-003A-PZ

Note if this abandonment is for a NAPL delineation area or piezometer (Y/N): N

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 10/5/17

Abandonment Contractor: Allied

Abandonment Method (circle appropriate):

1. PVC → Pulled / Split / Perforated
2. Abandoned → Grout / Bentonite Chips

Field Equipment: Tremie, skid steer, grout + mixer

ARM Representative(s): L. Perra

Final Gauging Prior to Abandonment:

Depth to Bottom (TOC)	Depth to Water (TOC)	Depth to NAPL (TOC)
17-66	9.79	NO DNAPL/LNAPL

If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned… Unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

while removing PVC → screen snapped below surface ~ 1ft. → could not dig sufficiently around to grab; left ~10 ft screen in ground and grouted bottom to top w/tremie

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW-003B-PZ

Note if this abandonment is for a NAPL delineation area or piezometer (Y/N): N

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 10/5/17

Abandonment Contractor: Allied

Abandonment Method (circle appropriate):

1. PVC → Pulled / Split / Perforated
2. Abandoned → Grout / Bentonite Chips

Field Equipment: Tremie, skid steer, grout + mixer

ARM Representative(s): L. Perri

Final Gauging Prior to Abandonment:

Depth to Bottom (TOC)	Depth to Water (TOC)	Depth to NAPL (TOC)
16.97	9.00	NO DNAPL/LNAPL

If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned... Unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

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Columbia, Maryland 21046
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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW-003 ~~S~~ C - P2

Note if this abandonment is for a NAPL delineation area or piezometer (Y/N):

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: ~~10/3/17~~ 10/12/17

Abandonment Contractor: Allied

Abandonment Method (circle appropriate):

1. PVC → (Pulled) / Split / Perforated
2. Abandoned → (Grout) / Bentonite Chips

Field Equipment: Tremie, Skid Steer, grout + mixer

ARM Representative(s): ~~L Perrin~~ S. Kabis

Final Gauging Prior to Abandonment:

Depth to Bottom (TOC)	Depth to Water (TOC)	Depth to NAPL (TOC)
12.21	7.69 [redacted]	Trace [redacted]

If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned… Unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

Diameter: 1 in
Reported depth: 16.92' TOC

Entire bottom screen filted w/ product, 10' screen, ~7' riser removed

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW-003D-PZ

Note if this abandonment is for a NAPL delineation area or piezometer (Y/N): (N)

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 10/12/17

Abandonment Contractor: Allied

Abandonment Method (circle appropriate):

1. PVC → Pulled / Split / Perforated
2. Abandoned → Grout / Bentonite Chips

Field Equipment: Tremie, skid steer, grout + mixer

ARM Representative(s): ~~L. Perrie~~ S. Kabis

Final Gauging Prior to Abandonment:

Depth to Bottom (TOC)	Depth to Water (TOC)	Depth to NAPL (TOC)
~~23.28~~	~~11.02~~	NO DNAPL/UNAPL

If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned… Unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

Diameter: 1

Reported depth: ~25' TOC

15' riser, 10' screen removed

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW-003E-PZ

Note if this abandonment is for a NAPL delineation area or piezometer (Y/N): N

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 10/12/17

Abandonment Contractor: Allied

Abandonment Method (circle appropriate):

1. PVC → Pulled / Split / Perforated
2. Abandoned → Grout / Bentonite Chips

Field Equipment: Tremie, skid steer, grout + mixer

ARM Representative(s): ~~E. Perrin~~ S. Kabis

Final Gauging Prior to Abandonment:

Depth to Bottom (TOC)	Depth to Water (TOC)	Depth to NAPL (TOC)
14.40	9.47	NO DNAPL/LNAPL

If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned... Unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

Diameter: 1

Reported depth: 16.32' TOC

10' screen removed, ~7' riser removed

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW-003F-P2

Note if this abandonment is for a NAPL delineation area or piezometer (Y/N): Y

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 10/12/17

Abandonment Contractor: Allied

Abandonment Method (circle appropriate):

1. PVC → Pulled / Split / Perforated
2. Abandoned → Grout / Bentonite Chips

Field Equipment: Tremie, skid steer, grout + mixer

ARM Representative(s): ~~L. Perrin~~ S. Kabis

Final Gauging Prior to Abandonment:

Depth to Bottom (TOC)	Depth to Water (TOC)	Depth to NAPL (TOC)
19.00	11.94	NO DNAPL/LNAPL

If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned... Unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

Diameter: 1in

Reported depth: 19.72' TOC

10' screen removed, ~9' riser removed

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW-0036-PZ

Note if this abandonment is for a NAPL delineation area or piezometer (Y/N): N

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 10/12/17

Abandonment Contractor: Allied

Abandonment Method (circle appropriate):

1. PVC → Pulled / Split / Perforated
2. Abandoned → Grout / Bentonite Chips

Field Equipment: Tremie, skid steer, grout + mixer

ARM Representative(s): ~~L. Perron~~ S. Kabis

Final Gauging Prior to Abandonment:

Depth to Bottom (TOC)	Depth to Water (TOC)	Depth to NAPL (TOC)
16.78	7.75	NO DNAPL/LNAPL

If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned… Unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

Diameter: 1

Reported depth: 18' TOC

Removed 10' screen, 8' riser

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW-003H-PZ

Note if this abandonment is for a NAPL delineation area or piezometer (Y/N):

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: ~~10/25/17~~ 10-12-17

Abandonment Contractor: Allied

Abandonment Method (circle appropriate):

1. PVC → Pulled / Split / Perforated
2. Abandoned → Grout / Bentonite Chips

Field Equipment: Tremie, Skid steer, grout + mixer

ARM Representative(s): ~~L. Perrin~~ S. Kabis

Final Gauging Prior to Abandonment:

Depth to Bottom (TOC)	Depth to Water (TOC)	Depth to NAPL (TOC)
24.59	12.23	Trace

If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned... Unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

Diameter: 1
Reported depth: 25' TOC

- only 5' riser & 5' screen removed, cap not on bottom section of screen
- well ID clearly marked

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW-003I-P2

Note if this abandonment is for a NAPL delineation area or piezometer (Y/N): Y

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 10-12-17

Abandonment Contractor: Allied

Abandonment Method (circle appropriate):

1. PVC → Pulled / Split / Perforated
2. Abandoned → Grout / Bentonite Chips

Field Equipment: Tremie, skid steer, grout + mixer

ARM Representative(s): ~~L. Perrine~~ S. Kelly

Final Gauging Prior to Abandonment:

Depth to Bottom (TOC)	Depth to Water (TOC)	Depth to NAPL (TOC)
18.82	12.53	ND DNAPL/LNAPL

If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned... Unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

Diameter: 1

Reported depth: [redacted]

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW-003J-P2

Note if this abandonment is for a NAPL delineation area or piezometer (Y/N):

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 10/5/17

Abandonment Contractor: Allied

Abandonment Method (circle appropriate):

1. PVC → (Pulled) / Split / Perforated
2. Abandoned → (Grout) / Bentonite Chips

Field Equipment: Tremie, skid steer, grout + mixer

ARM Representative(s): L. Perrin

Final Gauging Prior to Abandonment:

Depth to Bottom (TOC)	Depth to Water (TOC)	Depth to NAPL (TOC)
11.62	9.11	9.08

If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned... Unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

95% Portland 5% bentonite

~~rod~~ rod to break off point left in ground due to falling through PVC and point 20' bgs(+)

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Well/Piezometer Abandonment Form

Well/Piezometer ID: ~~BB~~-RW-003K-P2

Note if this abandonment is for a NAPL delineation area or piezometer (Y/N): (Y)

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 10/5/17

Abandonment Contractor: Allied

Abandonment Method (circle appropriate):

1. PVC → (Pulled) / Split / Perforated
2. Abandoned → (Grout) / Bentonite Chips

Field Equipment: Tremie, skid steer, grout + mixer

ARM Representative(s): L. Perrin

Final Gauging Prior to Abandonment:

Depth to Bottom (TOC)	Depth to Water (TOC)	Depth to NAPL (TOC)
20.12	12.39	NO DNAPL/LNAPL

If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned… Unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW04-PZM003

Note if this abandonment includes any associated NAPL delineation piezometers:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Date: 6-5-17

Abandonment Contractor: Allied

Abandonment Method: Grout + cut at surface

Field Equipment: Grout.

ARM Representative(s): N. Kurtz

Additional Comments (if any):

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WELL/PIEZOMETER ABANDONMENT FORM

Well ID: RW05-MW(IA) (formerly RW16-PZM020) Site: Sparrows Point, MD

Location of Well (parcel/other area): Parcel A3

ARM Representative: LMG Date: 9/19/2017 Project Number: 170285M

Condition of casing/pad: None; sonotube

Flush Mount or Stick-Up? Stick-Up Well Permit Number N/A

Well ID Marked? Yes If yes, where? On the sonotube

Locking cap? No cap present Lock? No Diameter of Well: 2 inch

Abandonment Contractor: Allied Well Drilling Company

Abandonment Method: Sealant

	Reported	Measured
Depth to Bottom (feet BGS/TOC)	30' BGS	32.58' TOC; 29.60' BGS

Notes: BGS = below ground surface, TOC = top of casing

NAPL Present? No Depth to NAPL N/A NAPL Thickness N/A

List any associated NAPL delineation piezometers:

_____

Additional Comments: DTW: 12.31' TOC. Stick-Up: 2.98'

Area around well was graded after installation.

Tremied grout from bottom up under pressure.

The PVC snapped at approximately 4' bgs.

Pulled out approximately 0' of screen and 7' of PVC (including stick-up).

PICTURES OF WELL/PIEZOMETER BEFORE ABANDONMENT:

Well/Piezometer Abandonment Form

Well/Piezometer ID: RW05-MW1

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 03/13/2020

Abandonment Contractor: GSI

Abandonment Method (circle appropriate):

1. PVC → (Pulled) / Split / Perforated / Left-In-Place
2. Abandoned → (Grout) / Bentonite Chips

Field Equipment: heron dw, 3822DT, GS-1000

ARM Representative(s): LMG

Well Diameter: 2"

Depth to Bottom (TOC)	Final Gauging Prior to Abandonment:
Reported (historical/log): ~33	Depth to Water (TOC): 5.91
Measured: 25.52	Depth to NAPL (TOC): none

Please note if this abandonment is for a known NAPL delineation/monitoring area or individual NAPL screening piezometer and identify the name of the delineation area (e.g., B6-066 NAPL Area or B5-144 Screening Piezometer): RWM

Please Note: If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

FM. gauged other FM to confirm I even though DTB ~ 8' less than historically reported

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW-006-PZ

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 1/4/17

Abandonment Contractor: GSI

Abandonment Method (circle appropriate):

1. PVC → (Pulled) / Split / Perforated / Left-In-Place
2. Abandoned → (Grout) / Bentonite Chips

Field Equipment: Oil-Water Probe

ARM Representative(s): Lisa Perrin

Well Diameter:

Depth to Bottom (TOC)	Final Gauging Prior to Abandonment:
Reported (historical/log):	Depth to Water (TOC): Not recorded
Measured: Not recorded	Depth to NAPL (TOC): Not recorded

Please note if this abandonment is for a known NAPL delineation/monitoring area or individual NAPL screening piezometer and identify the name of the delineation area (e.g., B6-066 NAPL Area or B5-144 Screening Piezometer):

Please Note: If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

Transcribed from ARM field book records. Piezometer was abandoned prior to the MDE directive to gauge piezometers a final time prior to abandonment.

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW08-PZM003

Note if this abandonment includes any associated NAPL delineation piezometers:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Date: 6-6-17

Abandonment Contractor: Allied

Abandonment Method: NA

Field Equipment: NA

ARM Representative(s): N. Kurtz

Additional Comments (if any):

* Well not located → previously destroyed?

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW09-P2M004

Note if this abandonment includes any associated NAPL delineation piezometers:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Date: 6-5-17

Abandonment Contractor: Allied

Abandonment Method: Grout + cut to surface

Field Equipment: Grout

ARM Representative(s): N. Kurtz

Additional Comments (if any):

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW10-PZM~~00~~004

Note if this abandonment includes any associated NAPL delineation piezometers:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Date: 6-6-17

Abandonment Contractor: Allied

Abandonment Method: NA

Field Equipment: NA

ARM Representative(s): N. Kurtz

Additional Comments (if any):

Flush mount: could not locate

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW10-Pzm020

Note if this abandonment includes any associated NAPL delineation piezometers:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Date: 6-5-17

Abandonment Contractor: Allied

Abandonment Method: Grout + cut to surface

Field Equipment: Grout

ARM Representative(s): N. Kurtz

Additional Comments (if any):

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW10-PZM065

Note if this abandonment includes any associated NAPL delineation piezometers:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Date: 6-6-17

Abandonment Contractor: Allied

Abandonment Method: NA

Field Equipment: NA

ARM Representative(s): N. Kurtz

Additional Comments (if any):

* Flush mount: could not locate due to fill covering

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW-007-PZ

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 1/4/17

Abandonment Contractor: GSI

Abandonment Method (circle appropriate):

1. PVC → (Pulled) / Split / Perforated / Left-In-Place
2. Abandoned → (Grout) / Bentonite Chips

Field Equipment: Oil-Water Probe

ARM Representative(s): Lisa Perrin

Well Diameter:

Depth to Bottom (TOC)	Final Gauging Prior to Abandonment:
Reported (historical/log):	Depth to Water (TOC): Not recorded
Measured: Not recorded	Depth to NAPL (TOC): Not recorded

Please note if this abandonment is for a known NAPL delineation/monitoring area or individual NAPL screening piezometer and identify the name of the delineation area (e.g., B6-066 NAPL Area or B5-144 Screening Piezometer):

Please Note: If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

Transcribed from ARM field book records. Piezometer was abandoned prior to the MDE directive to gauge piezometers a final time prior to abandonment.

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW11-PZM004

Note if this abandonment includes any associated NAPL delineation piezometers:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Date: 6-5-17

Abandonment Contractor: Allied

Abandonment Method: Grout + cut to surface

Field Equipment: Grout

ARM Representative(s): N. Kurtz

Additional Comments (if any):

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW12-PZM004

Note if this abandonment includes any associated NAPL delineation piezometers:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Date: 6-5-17

Abandonment Contractor: Allied

Abandonment Method: Grout + cut to surface

Field Equipment: Grout

ARM Representative(s): N. Kurtz

Additional Comments (if any):

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW13 (MW1) RW13-MW(IA)

Note if this abandonment includes any associated NAPL delineation piezometers:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Date: 6-5-17

Abandonment Contractor: Allied

Abandonment Method: Grout + cut to surface

Field Equipment: Grout

ARM Representative(s): N. Kurtz

Additional Comments (if any):

* This well was not supposed to be abandoned. Drillers removed wrong one.

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW13-PZM020

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 6/5/17

Abandonment Contractor: GSI

Abandonment Method (circle appropriate):

1. PVC → Pulled / Split / Perforated / Left-In-Place
2. Abandoned → Grout / Bentonite Chips

Field Equipment: Oil-Water Probe

ARM Representative(s): Nick Kurtz

Well Diameter:

Depth to Bottom (TOC)	Final Gauging Prior to Abandonment:
Reported (historical/log):	Depth to Water (TOC): Not recorded
Measured: Not recorded	Depth to NAPL (TOC): Not recorded

Please note if this abandonment is for a known NAPL delineation/monitoring area or individual NAPL screening piezometer and identify the name of the delineation area (e.g., B6-066 NAPL Area or B5-144 Screening Piezometer):

Please Note: If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

Transcribed from ARM field book records.
Not found. Presumed destroyed or buried.

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Well/Piezometer Abandonment Form

Well/Piezometer ID: "OLD" RW14-MW5

Note if this abandonment includes any associated NAPL delineation piezometers:

DTW: 5.80' TOC
DTB: 7.40' TOC
DTP: NO DNAPL/LNAPL

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Date: 8/2/17

Abandonment Contractor: Allied

Abandonment Method: Poured in ~~grout~~ cement (Portland) through, PVC cut at surface

Field Equipment: Wheelbarrow, portland cement

ARM Representative(s): L. Perrin

Additional Comments (if any):

Allied didn't have tool to crack + remove PVC. Also, could not pull out PVC. Left PVC in grout, cut at surface and poured cement in from ~5' bgs to surface. Well had previously been filled in w/ sand to 5 ft. Well was 10 ft deep.

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WELL/PIEZOMETER ABANDONMENT FORM

Well ID: RW15-MW(I) Site: Sparrows Point, MD

Location of Well (parcel/other area): Parcel A3

ARM Representative: LMG Date: 9/19/2017 Project Number: 170285M

Condition of casing/pad: None; sonotube

Flush Mount or Stick-Up? Stick-Up Well Permit Number N/A

Well ID Marked? Yes If yes, where? On the PVC

Locking cap? Yes Lock? No Diameter of Well: 2 inch

Abandonment Contractor: Allied Well Drilling Company

Abandonment Method: Sealant

	Reported	Measured
Depth to Bottom (feet BGS/TOC)	36.11' BGS	39.91' TOC; 36.87' BGS

Notes: BGS = below ground surface, TOC = top of casing

NAPL Present? No Depth to NAPL N/A NAPL Thickness N/A

List any associated NAPL delineation piezometers:

_____

Additional Comments: DTW: 12.11' TOC. Stick-Up: 3.04'

Area around well was graded after installation.

Tremied grout from bottom up under pressure.

Pulled out approximately 10' of screen and 30' of PVC (including stick-up).

PICTURES OF WELL/PIEZOMETER BEFORE ABANDONMENT:

WELL/PIEZOMETER ABANDONMENT FORM

Well ID: RW15-MW(SA) (formerly RW-RW95) Site: Sparrows Point, MD

Location of Well (parcel/other area): Parcel A3

ARM Representative: LMG Date: 9/19/2017 Project Number: 170285M

Condition of casing/pad: None; sonotube

Flush Mount or Stick-Up? Stick-Up Well Permit Number N/A

Well ID Marked? Yes If yes, where? On the sonotube

Locking cap? Yes Lock? No Diameter of Well: 2 inch

Abandonment Contractor: Allied Well Drilling Company

Abandonment Method: Sealant

	Reported	Measured
Depth to Bottom (feet BGS/TOC)	10' BGS	12.32' TOC; 9.87' BGS

Notes: BGS = below ground surface, TOC = top of casing

NAPL Present? No Depth to NAPL N/A NAPL Thickness N/A

List any associated NAPL delineation piezometers:

_____

Additional Comments: DTW: 8.31' TOC. Stick-Up: 2.45'

Area around well was graded after installation.

Metal surrounding the PVC at approximately 1' bgs prevented the removal of the PVC from the ground. Removed PVC end cap and tremied grouted from bottom up under pressure.

Pulled out approximately 0' of screen and 3' of PVC stick-up.

PICTURES OF WELL/PIEZOMETER BEFORE ABANDONMENT:

ARM Group Inc.

Well/Piezometer Abandonment Form

Well/Piezometer ID: RW15-PZM

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 2/1/17

Abandonment Contractor: Allied

Abandonment Method (circle appropriate):

1. PVC → (Pulled) / Split / Perforated / Left-In-Place
2. Abandoned → (Grout) / Bentonite Chips

Field Equipment: Oil-Water Probe

ARM Representative(s): Nick Kurtz

Well Diameter:

Depth to Bottom (TOC)	Final Gauging Prior to Abandonment:
Reported (historical/log):	Depth to Water (TOC): Not recorded
Measured: Not recorded	Depth to NAPL (TOC): Not recorded

Please note if this abandonment is for a known NAPL delineation/monitoring area or individual NAPL screening piezometer and identify the name of the delineation area (e.g., B6-066 NAPL Area or B5-144 Screening Piezometer):

Please Note: If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

Transcribed from ARM field book records. Piezometer was abandoned prior to the MDE directive to gauge piezometers a final time prior to abandonment.

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW15-Pzm020

Note if this abandonment includes any associated NAPL delineation piezometers:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Date: 6-5-17

Abandonment Contractor: Allied

Abandonment Method: Grout + cut at surface

Field Equipment: Grout

ARM Representative(s): N. Kurtz

Additional Comments (if any):

Per phone call with Lisa on 7/6, she said when she discovered this well in the field it already had grout in it, but she completed the form anyway.

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW16(MW-I)

Note if this abandonment includes any associated NAPL delineation piezometers:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Date: 6-6-17 6-7-2017

Abandonment Contractor: Allied

Abandonment Method: grout + cut at surface

Field Equipment: Grout

ARM Representative(s): N. Kurtz

Additional Comments (if any):

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW16 (MW5)

Note if this abandonment includes any associated NAPL delineation piezometers:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Date: 6-6-17 6-7-2017

Abandonment Contractor: Allied

Abandonment Method: Grout + cut at surface

Field Equipment: Grout

ARM Representative(s): NKurtz

Additional Comments (if any):

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW17-MW(I)

Note if this abandonment includes any associated NAPL delineation piezometers:

Well found destroyed, not abandoned

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: Parcel A3

Date: NA

Abandonment Contractor: NA

Abandonment Method: NA

Field Equipment: NA

ARM Representative(s): L. Perrin

Additional Comments (if any):

* could not locate this well in field. Saw casing in same area that was destroyed and pulled off with no PVC in sight.

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WELL/PIEZOMETER ABANDONMENT FORM

Well ID: RW17-MW(SA) Site: Sparrows Point, MD

Location of Well (parcel/other area): Parcel A3

ARM Representative: LMG Date: 9/19/2017 Project Number: 170285M

Condition of casing/pad: None; sonotube

Flush Mount or Stick-Up? Stick-Up Well Permit Number N/A

Well ID Marked? Yes If yes, where? On the PVC

Locking cap? Yes Lock? No Diameter of Well: 2 inch

Abandonment Contractor: Allied Well Drilling Company

Abandonment Method: Sealant

	Reported	Measured
Depth to Bottom (feet BGS/TOC)	20.89' BGS	24.82' TOC; 20.71' BGS

Notes: BGS = below ground surface, TOC = top of casing

NAPL Present? No Depth to NAPL N/A NAPL Thickness N/A

List any associated NAPL delineation piezometers:

_____

Additional Comments: DTW: 9.63' TOC. Stick-Up: 4.11'

Area around well was graded after installation.

Tremied grout from bottom up under pressure.

Pulled out approximately 10' of screen and 24' of PVC (including stick-up).

PICTURES OF WELL/PIEZOMETER BEFORE ABANDONMENT:

Well/Piezometer Abandonment Form

Well/Piezometer ID: RW17-PZM019

Note if this abandonment includes any associated NAPL delineation piezometers:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Date: 6-5-17

Abandonment Contractor: Allied

Abandonment Method: Grout + cut to surface

Field Equipment: Grout

ARM Representative(s): N. Kurtz

Additional Comments (if any):

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW20 - ~~PZM020~~ MW (I)

Note if this abandonment includes any associated NAPL delineation piezometers:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: Parcel A3

Date: June 6, 2017

Abandonment Contractor: Allied

Abandonment Method: Grouted and cut casing to surface

Field Equipment: Grout and saw

ARM Representative(s): N. Kurtz

Additional Comments (if any):

* may have been a well that was not supposed to have been abandoned

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW20-PZM000

Note if this abandonment includes any associated NAPL delineation piezometers:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Date: 6-6-17

Abandonment Contractor: Allied

Abandonment Method: Grout + cut at surface

Field Equipment: Grout

ARM Representative(s): N. Kurtz

Additional Comments (if any):

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW020-PZM020

Note if this abandonment includes any associated NAPL delineation piezometers:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Date: 6-5-17

Abandonment Contractor: Allied

Abandonment Method: Grout + cut to surface

Field Equipment: Grout

ARM Representative(s): N. Kurtz

Additional Comments (if any):

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW020-PZM050

Note if this abandonment includes any associated NAPL delineation piezometers:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Date: 6-5-17

Abandonment Contractor: Allied

Abandonment Method: Grout + cut to surface

Field Equipment: Grout

ARM Representative(s): N. Kurtz

Additional Comments (if any):

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW-021-PZ

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 1/4/17

Abandonment Contractor: GSI

Abandonment Method (circle appropriate):

1. PVC → (Pulled) / Split / Perforated / Left-In-Place
2. Abandoned → (Grout) / Bentonite Chips

Field Equipment: Oil-Water Probe

ARM Representative(s): Lisa Perrin

Well Diameter:

Depth to Bottom (TOC)	Final Gauging Prior to Abandonment:
Reported (historical/log):	Depth to Water (TOC): Not recorded
Measured: Not recorded	Depth to NAPL (TOC): Not recorded

Please note if this abandonment is for a known NAPL delineation/monitoring area or individual NAPL screening piezometer and identify the name of the delineation area (e.g., B6-066 NAPL Area or B5-144 Screening Piezometer):

Please Note: If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

Transcribed from ARM field book records.
Piezometer not present- previously destroyed.

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW21-PZM023

Note if this abandonment includes any associated NAPL delineation piezometers:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Date: 6-5-17

Abandonment Contractor: Allied

Abandonment Method: Grout + cut to surface

Field Equipment: Grout

ARM Representative(s): N. Kurtz

Additional Comments (if any):

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW22A-PZM-9

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 2/1/17

Abandonment Contractor: Allied

Abandonment Method (circle appropriate):

1. PVC → (Pulled) / Split / Perforated / Left-In-Place
2. Abandoned → Grout / (Bentonite Chips)

Field Equipment: Oil-Water Probe

ARM Representative(s): Nick Kurtz

Well Diameter:

Depth to Bottom (TOC)	Final Gauging Prior to Abandonment:
Reported (historical/log):	Depth to Water (TOC): Not recorded
Measured: Not recorded	Depth to NAPL (TOC): Not recorded

Please note if this abandonment is for a known NAPL delineation/monitoring area or individual NAPL screening piezometer and identify the name of the delineation area (e.g., B6-066 NAPL Area or B5-144 Screening Piezometer):

Please Note: If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

Transcribed from ARM field book records. Piezometer was abandoned prior to the MDE directive to gauge piezometers a final time prior to abandonment.

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW22A-PZM-18

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 2/1/17

Abandonment Contractor: Allied

Abandonment Method (circle appropriate):

1. PVC → (Pulled) / Split / Perforated / Left-In-Place
2. Abandoned → Grout / (Bentonite Chips)

Field Equipment: Oil-Water Probe

ARM Representative(s): Nick Kurtz

Well Diameter:

Depth to Bottom (TOC)	Final Gauging Prior to Abandonment:
Reported (historical/log):	Depth to Water (TOC): Not recorded
Measured: Not recorded	Depth to NAPL (TOC): Not recorded

Please note if this abandonment is for a known NAPL delineation/monitoring area or individual NAPL screening piezometer and identify the name of the delineation area (e.g., B6-066 NAPL Area or B5-144 Screening Piezometer):

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Additional Comments (if any):

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW22B-PZM-9

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 2/1/17

Abandonment Contractor: Allied

Abandonment Method (circle appropriate):

1. PVC → (Pulled) / Split / Perforated / Left-In-Place
2. Abandoned → Grout / (Bentonite Chips)

Field Equipment: Oil-Water Probe

ARM Representative(s): Nick Kurtz

Well Diameter:

Depth to Bottom (TOC)	Final Gauging Prior to Abandonment:
Reported (historical/log):	Depth to Water (TOC): Not recorded
Measured: Not recorded	Depth to NAPL (TOC): Not recorded

Please note if this abandonment is for a known NAPL delineation/monitoring area or individual NAPL screening piezometer and identify the name of the delineation area (e.g., B6-066 NAPL Area or B5-144 Screening Piezometer):

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Additional Comments (if any):

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW22B-PZM-18

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 2/1/17

Abandonment Contractor: Allied

Abandonment Method (circle appropriate):

1. PVC → (Pulled) / Split / Perforated / Left-In-Place
2. Abandoned → Grout / (Bentonite Chips)

Field Equipment: Oil-Water Probe

ARM Representative(s): Nick Kurtz

Well Diameter:

Depth to Bottom (TOC)	Final Gauging Prior to Abandonment:
Reported (historical/log):	Depth to Water (TOC): Not recorded
Measured: Not recorded	Depth to NAPL (TOC): Not recorded

Please note if this abandonment is for a known NAPL delineation/monitoring area or individual NAPL screening piezometer and identify the name of the delineation area (e.g., B6-066 NAPL Area or B5-144 Screening Piezometer):

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Additional Comments (if any):

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW22C-PZM-9

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 2/1/17

Abandonment Contractor: Allied

Abandonment Method (circle appropriate):

1. PVC → (Pulled) / Split / Perforated / Left-In-Place
2. Abandoned → Grout / (Bentonite Chips)

Field Equipment: Oil-Water Probe

ARM Representative(s): Nick Kurtz

Well Diameter:

Depth to Bottom (TOC)	Final Gauging Prior to Abandonment:
Reported (historical/log):	Depth to Water (TOC): Not recorded
Measured: Not recorded	Depth to NAPL (TOC): Not recorded

Please note if this abandonment is for a known NAPL delineation/monitoring area or individual NAPL screening piezometer and identify the name of the delineation area (e.g., B6-066 NAPL Area or B5-144 Screening Piezometer):

Please Note: If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW22C-PZM-18

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 2/1/17

Abandonment Contractor: Allied

Abandonment Method (circle appropriate):

1. PVC → (Pulled) / Split / Perforated / Left-In-Place
2. Abandoned → Grout / (Bentonite Chips)

Field Equipment: Oil-Water Probe

ARM Representative(s): Nick Kurtz

Well Diameter:

Depth to Bottom (TOC)	Final Gauging Prior to Abandonment:
Reported (historical/log):	Depth to Water (TOC): Not recorded
Measured: Not recorded	Depth to NAPL (TOC): Not recorded

Please note if this abandonment is for a known NAPL delineation/monitoring area or individual NAPL screening piezometer and identify the name of the delineation area (e.g., B6-066 NAPL Area or B5-144 Screening Piezometer):

Please Note: If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW22D-PZM-9

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 2/1/17

Abandonment Contractor: Allied

Abandonment Method (circle appropriate):

1. PVC → (Pulled) / Split / Perforated / Left-In-Place
2. Abandoned → Grout / (Bentonite Chips)

Field Equipment: Oil-Water Probe

ARM Representative(s): Nick Kurtz

Well Diameter:

Depth to Bottom (TOC)	Final Gauging Prior to Abandonment:
Reported (historical/log):	Depth to Water (TOC): Not recorded
Measured: Not recorded	Depth to NAPL (TOC): Not recorded

Please note if this abandonment is for a known NAPL delineation/monitoring area or individual NAPL screening piezometer and identify the name of the delineation area (e.g., B6-066 NAPL Area or B5-144 Screening Piezometer):

Please Note: If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW22D-PZM-18

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 2/1/17

Abandonment Contractor: Allied

Abandonment Method (circle appropriate):

1. PVC → (Pulled) / Split / Perforated / Left-In-Place
2. Abandoned → Grout / (Bentonite Chips)

Field Equipment: Oil-Water Probe

ARM Representative(s): Nick Kurtz

Well Diameter:

Depth to Bottom (TOC)	Final Gauging Prior to Abandonment:
Reported (historical/log):	Depth to Water (TOC): Not recorded
Measured: Not recorded	Depth to NAPL (TOC): Not recorded

Please note if this abandonment is for a known NAPL delineation/monitoring area or individual NAPL screening piezometer and identify the name of the delineation area (e.g., B6-066 NAPL Area or B5-144 Screening Piezometer):

Please Note: If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

Transcribed from ARM field book records. Piezometer was abandoned prior to the MDE directive to gauge piezometers a final time prior to abandonment.

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW22E-PZM

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 2/1/17

Abandonment Contractor: Allied

Abandonment Method (circle appropriate):

1. PVC → (Pulled) / Split / Perforated / Left-In-Place
2. Abandoned → Grout / (Bentonite Chips)

Field Equipment: Oil-Water Probe

ARM Representative(s): Nick Kurtz

Well Diameter:

Depth to Bottom (TOC)	Final Gauging Prior to Abandonment:
Reported (historical/log):	Depth to Water (TOC): Not recorded
Measured: Not recorded	Depth to NAPL (TOC): Not recorded

Please note if this abandonment is for a known NAPL delineation/monitoring area or individual NAPL screening piezometer and identify the name of the delineation area (e.g., B6-066 NAPL Area or B5-144 Screening Piezometer):

Please Note: If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

Transcribed from ARM field book records. Piezometer was abandoned prior to the MDE directive to gauge piezometers a final time prior to abandonment.

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW22F-PZM

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 2/1/17

Abandonment Contractor: Allied

Abandonment Method (circle appropriate):

1. PVC → (Pulled) / Split / Perforated / Left-In-Place
2. Abandoned → Grout / (Bentonite Chips)

Field Equipment: Oil-Water Probe

ARM Representative(s): Nick Kurtz

Well Diameter:

Depth to Bottom (TOC)	Final Gauging Prior to Abandonment:
Reported (historical/log):	Depth to Water (TOC): Not recorded
Measured: Not recorded	Depth to NAPL (TOC): Not recorded

Please note if this abandonment is for a known NAPL delineation/monitoring area or individual NAPL screening piezometer and identify the name of the delineation area (e.g., B6-066 NAPL Area or B5-144 Screening Piezometer):

Please Note: If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

Transcribed from ARM field book records. Piezometer was abandoned prior to the MDE directive to gauge piezometers a final time prior to abandonment.

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW22G-PZM

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 2/1/17

Abandonment Contractor: Allied

Abandonment Method (circle appropriate):

1. PVC → (Pulled) / Split / Perforated / Left-In-Place
2. Abandoned → Grout / (Bentonite Chips)

Field Equipment: Oil-Water Probe

ARM Representative(s): Nick Kurtz

Well Diameter:

Depth to Bottom (TOC)	Final Gauging Prior to Abandonment:
Reported (historical/log):	Depth to Water (TOC): Not recorded
Measured: Not recorded	Depth to NAPL (TOC): Not recorded

Please note if this abandonment is for a known NAPL delineation/monitoring area or individual NAPL screening piezometer and identify the name of the delineation area (e.g., B6-066 NAPL Area or B5-144 Screening Piezometer):

Please Note: If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

Transcribed from ARM field book records. Piezometer was abandoned prior to the MDE directive to gauge piezometers a final time prior to abandonment.

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW22H-PZM

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 2/1/17

Abandonment Contractor: Allied

Abandonment Method (circle appropriate):

1. PVC → (Pulled) / Split / Perforated / Left-In-Place
2. Abandoned → Grout / (Bentonite Chips)

Field Equipment: Oil-Water Probe

ARM Representative(s): Nick Kurtz

Well Diameter:

Depth to Bottom (TOC)	Final Gauging Prior to Abandonment:
Reported (historical/log):	Depth to Water (TOC): Not recorded
Measured: Not recorded	Depth to NAPL (TOC): Not recorded

Please note if this abandonment is for a known NAPL delineation/monitoring area or individual NAPL screening piezometer and identify the name of the delineation area (e.g., B6-066 NAPL Area or B5-144 Screening Piezometer):

Please Note: If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

Transcribed from ARM field book records. Piezometer was abandoned prior to the MDE directive to gauge piezometers a final time prior to abandonment.

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW22I-PZM

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 2/1/17

Abandonment Contractor: Allied

Abandonment Method (circle appropriate):

1. PVC → (Pulled) / Split / Perforated / Left-In-Place
2. Abandoned → Grout / (Bentonite Chips)

Field Equipment: Oil-Water Probe

ARM Representative(s): Nick Kurtz

Well Diameter:

Depth to Bottom (TOC)	Final Gauging Prior to Abandonment:
Reported (historical/log):	Depth to Water (TOC): Not recorded
Measured: Not recorded	Depth to NAPL (TOC): Not recorded

Please note if this abandonment is for a known NAPL delineation/monitoring area or individual NAPL screening piezometer and identify the name of the delineation area (e.g., B6-066 NAPL Area or B5-144 Screening Piezometer):

Please Note: If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

Transcribed from ARM field book records. Piezometer was abandoned prior to the MDE directive to gauge piezometers a final time prior to abandonment.

ARM Group Inc.
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9175 Guilford Road - Suite 310
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(410) 290-7775 FAX: (410) 290-7775

Well/Piezometer Abandonment Form

Well/Piezometer ID: RW22J-PZM

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 2/1/17

Abandonment Contractor: Allied

Abandonment Method (circle appropriate):

1. PVC → (Pulled) / Split / Perforated / Left-In-Place
2. Abandoned → Grout / (Bentonite Chips)

Field Equipment: Oil-Water Probe

ARM Representative(s): Nick Kurtz

Well Diameter:

Depth to Bottom (TOC)	Final Gauging Prior to Abandonment:
Reported (historical/log):	Depth to Water (TOC): Not recorded
Measured: Not recorded	Depth to NAPL (TOC): Not recorded

Please note if this abandonment is for a known NAPL delineation/monitoring area or individual NAPL screening piezometer and identify the name of the delineation area (e.g., B6-066 NAPL Area or B5-144 Screening Piezometer):

Please Note: If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

Transcribed from ARM field book records. Piezometer was abandoned prior to the MDE directive to gauge piezometers a final time prior to abandonment.

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW22K-PZM

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 2/1/17

Abandonment Contractor: Allied

Abandonment Method (circle appropriate):

1. PVC → (Pulled) / Split / Perforated / Left-In-Place
2. Abandoned → Grout / (Bentonite Chips)

Field Equipment: Oil-Water Probe

ARM Representative(s): Nick Kurtz

Well Diameter:

Depth to Bottom (TOC)	Final Gauging Prior to Abandonment:
Reported (historical/log):	Depth to Water (TOC): Not recorded
Measured: Not recorded	Depth to NAPL (TOC): Not recorded

Please note if this abandonment is for a known NAPL delineation/monitoring area or individual NAPL screening piezometer and identify the name of the delineation area (e.g., B6-066 NAPL Area or B5-144 Screening Piezometer):

Please Note: If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

Transcribed from ARM field book records. Piezometer was abandoned prior to the MDE directive to gauge piezometers a final time prior to abandonment.

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW22L-PZM

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 2/1/17

Abandonment Contractor: Allied

Abandonment Method (circle appropriate):

1. PVC → (Pulled) / Split / Perforated / Left-In-Place
2. Abandoned → Grout / (Bentonite Chips)

Field Equipment: Oil-Water Probe

ARM Representative(s): Nick Kurtz

Well Diameter:

Depth to Bottom (TOC)	Final Gauging Prior to Abandonment:
Reported (historical/log):	Depth to Water (TOC): Not recorded
Measured: Not recorded	Depth to NAPL (TOC): Not recorded

Please note if this abandonment is for a known NAPL delineation/monitoring area or individual NAPL screening piezometer and identify the name of the delineation area (e.g., B6-066 NAPL Area or B5-144 Screening Piezometer):

Please Note: If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

Transcribed from ARM field book records. Piezometer was abandoned prior to the MDE directive to gauge piezometers a final time prior to abandonment.

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW22M-PZM

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 2/1/17

Abandonment Contractor: Allied

Abandonment Method (circle appropriate):

1. PVC → (Pulled) / Split / Perforated / Left-In-Place
2. Abandoned → Grout / (Bentonite Chips)

Field Equipment: Oil-Water Probe

ARM Representative(s): Nick Kurtz

Well Diameter:

Depth to Bottom (TOC)	Final Gauging Prior to Abandonment:
Reported (historical/log):	Depth to Water (TOC): Not recorded
Measured: Not recorded	Depth to NAPL (TOC): Not recorded

Please note if this abandonment is for a known NAPL delineation/monitoring area or individual NAPL screening piezometer and identify the name of the delineation area (e.g., B6-066 NAPL Area or B5-144 Screening Piezometer):

Please Note: If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

Transcribed from ARM field book records. Piezometer was abandoned prior to the MDE directive to gauge piezometers a final time prior to abandonment.

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW22-MW1

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 03/17/2020

Abandonment Contractor: GSI

Abandonment Method (circle appropriate):

1. (PVC) → Pulled / Split / Perforated / Left-In-Place
2. Abandoned → (Grout / Bentonite Chips)

Field Equipment: heron dw, 7822-DT, GS-1000, chains (to pull slug)

ARM Representative(s): LMG

Well Diameter: 2"

Depth to Bottom (TOC)	Final Gauging Prior to Abandonment:
Reported (historical/log): ~33 bgs	Depth to Water (TOC): 14.21
Measured: 34.87	Depth to NAPL (TOC): none

Please note if this abandonment is for a known NAPL delineation/monitoring area or individual NAPL screening piezometer and identify the name of the delineation area (e.g., B6-066 NAPL Area or B5-144 Screening Piezometer): RWM

Please Note: If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

s/w: 0.6' ags

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW22N-PZM

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 2/1/17

Abandonment Contractor: Allied

Abandonment Method (circle appropriate):

1. PVC → (Pulled) / Split / Perforated / Left-In-Place
2. Abandoned → Grout / (Bentonite Chips)

Field Equipment: Oil-Water Probe

ARM Representative(s): Nick Kurtz

Well Diameter:

Depth to Bottom (TOC)	Final Gauging Prior to Abandonment:
Reported (historical/log):	Depth to Water (TOC): Not recorded
Measured: Not recorded	Depth to NAPL (TOC): Not recorded

Please note if this abandonment is for a known NAPL delineation/monitoring area or individual NAPL screening piezometer and identify the name of the delineation area (e.g., B6-066 NAPL Area or B5-144 Screening Piezometer):

Please Note: If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

Transcribed from ARM field book records. Piezometer was abandoned prior to the MDE directive to gauge piezometers a final time prior to abandonment.

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW22-PZM (50 ft)

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 2/1/17

Abandonment Contractor: Allied

Abandonment Method (circle appropriate):

1. PVC → (Pulled) / Split / Perforated / Left-In-Place
2. Abandoned → (Grout) / Bentonite Chips

Field Equipment: Oil-Water Probe

ARM Representative(s): Nick Kurtz

Well Diameter:

Depth to Bottom (TOC)	Final Gauging Prior to Abandonment:
Reported (historical/log):	Depth to Water (TOC): Not recorded
Measured: Not recorded	Depth to NAPL (TOC): Not recorded

Please note if this abandonment is for a known NAPL delineation/monitoring area or individual NAPL screening piezometer and identify the name of the delineation area (e.g., B6-066 NAPL Area or B5-144 Screening Piezometer):

Please Note: If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

Transcribed from ARM field book records. Piezometer was abandoned prior to the MDE directive to gauge piezometers a final time prior to abandonment.

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW22-PZM

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 2/1/17

Abandonment Contractor: Allied

Abandonment Method (circle appropriate):

1. PVC → (Pulled) / Split / Perforated / Left-In-Place
2. Abandoned → (Grout) / Bentonite Chips

Field Equipment: Oil-Water Probe

ARM Representative(s): Nick Kurtz

Well Diameter:

Depth to Bottom (TOC)	Final Gauging Prior to Abandonment:
Reported (historical/log):	Depth to Water (TOC): Not recorded
Measured: Not recorded	Depth to NAPL (TOC): Not recorded

Please note if this abandonment is for a known NAPL delineation/monitoring area or individual NAPL screening piezometer and identify the name of the delineation area (e.g., B6-066 NAPL Area or B5-144 Screening Piezometer):

Please Note: If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

Transcribed from ARM field book records. Piezometer was abandoned prior to the MDE directive to gauge piezometers a final time prior to abandonment.

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW23 50 ft

Note if this abandonment includes any associated NAPL delineation piezometers:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Date: 6-5-17

Abandonment Contractor: Allied

Abandonment Method: Grout + cut to surface

Field Equipment: Grout

ARM Representative(s): N. Kurtz

Additional Comments (if any):

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW23-PZM

Note if this abandonment includes any associated NAPL delineation piezometers:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Date: 6-5-17

Abandonment Contractor: Allied

Abandonment Method: Grout + cut to surface

Field Equipment: Grout

ARM Representative(s): N. Kurtz

Additional Comments (if any):

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW24 SOA

Note if this abandonment includes any associated NAPL delineation piezometers:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Date: 6-5-17

Abandonment Contractor: Allied

Abandonment Method: Grout + cut to surface

Field Equipment: Grout.

ARM Representative(s): N. Kurtz

Additional Comments (if any):

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW24-PZM

Note if this abandonment includes any associated NAPL delineation piezometers:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Date: 6-6-17

Abandonment Contractor: Alice

Abandonment Method: NA

Field Equipment: NA

ARM Representative(s): N. Kurtz

Additional Comments (if any):

* Could not locate → previously destroyed?

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW-025-PZ

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 1/4/17

Abandonment Contractor: GSI

Abandonment Method (circle appropriate):

1. PVC → (Pulled) / Split / Perforated / Left-In-Place
2. Abandoned → (Grout) / Bentonite Chips

Field Equipment: Oil-Water Probe

ARM Representative(s): Lisa Perrin

Well Diameter:

Depth to Bottom (TOC)	Final Gauging Prior to Abandonment:
Reported (historical/log):	Depth to Water (TOC): Not recorded
Measured: Not recorded	Depth to NAPL (TOC): Not recorded

Please note if this abandonment is for a known NAPL delineation/monitoring area or individual NAPL screening piezometer and identify the name of the delineation area (e.g., B6-066 NAPL Area or B5-144 Screening Piezometer):

Please Note: If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

Transcribed from ARM field book records. Piezometer was abandoned prior to the MDE directive to gauge piezometers a final time prior to abandonment.

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW-027-PZ

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 1/4/17

Abandonment Contractor: GSI

Abandonment Method (circle appropriate):

1. PVC → (Pulled) / Split / Perforated / Left-In-Place
2. Abandoned → (Grout) / Bentonite Chips

Field Equipment: Oil-Water Probe

ARM Representative(s): Lisa Perrin

Well Diameter:

Depth to Bottom (TOC)	Final Gauging Prior to Abandonment:
Reported (historical/log):	Depth to Water (TOC): Not recorded
Measured: Not recorded	Depth to NAPL (TOC): Not recorded

Please note if this abandonment is for a known NAPL delineation/monitoring area or individual NAPL screening piezometer and identify the name of the delineation area (e.g., B6-066 NAPL Area or B5-144 Screening Piezometer):

Please Note: If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

Transcribed from ARM field book records. Piezometer was abandoned prior to the MDE directive to gauge piezometers a final time prior to abandonment.

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW-048-PZ

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 1/4/17

Abandonment Contractor: GSI

Abandonment Method (circle appropriate):

1. PVC → (Pulled) / Split / Perforated / Left-In-Place
2. Abandoned → (Grout) / Bentonite Chips

Field Equipment: Oil-Water Probe

ARM Representative(s): Lisa Perrin

Well Diameter:

Depth to Bottom (TOC)	Final Gauging Prior to Abandonment:
Reported (historical/log):	Depth to Water (TOC): Not recorded
Measured: Not recorded	Depth to NAPL (TOC): Not recorded

Please note if this abandonment is for a known NAPL delineation/monitoring area or individual NAPL screening piezometer and identify the name of the delineation area (e.g., B6-066 NAPL Area or B5-144 Screening Piezometer):

Please Note: If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

Transcribed from ARM field book records. Piezometer was abandoned prior to the MDE directive to gauge piezometers a final time prior to abandonment.

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW-050-PZ

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 1/4/17

Abandonment Contractor: GSI

Abandonment Method (circle appropriate):

1. PVC → (Pulled) / Split / Perforated / Left-In-Place
2. Abandoned → (Grout) / Bentonite Chips

Field Equipment: Oil-Water Probe

ARM Representative(s): Lisa Perrin

Well Diameter:

Depth to Bottom (TOC)	Final Gauging Prior to Abandonment:
Reported (historical/log):	Depth to Water (TOC): Not recorded
Measured: Not recorded	Depth to NAPL (TOC): Not recorded

Please note if this abandonment is for a known NAPL delineation/monitoring area or individual NAPL screening piezometer and identify the name of the delineation area (e.g., B6-066 NAPL Area or B5-144 Screening Piezometer):

Please Note: If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

Transcribed from ARM field book records. Piezometer was abandoned prior to the MDE directive to gauge piezometers a final time prior to abandonment.

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW-057-PZ

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 1/4/17

Abandonment Contractor: GSI

Abandonment Method (circle appropriate):

1. PVC → (Pulled) / Split / Perforated / Left-In-Place
2. Abandoned → (Grout) / Bentonite Chips

Grout to surface, pull some PVC

Field Equipment: Oil-Water Probe

ARM Representative(s): Lisa Perrin

Well Diameter:

Depth to Bottom (TOC)	Final Gauging Prior to Abandonment:
Reported (historical/log):	Depth to Water (TOC): Not recorded
Measured: Not recorded	Depth to NAPL (TOC): Not recorded

Please note if this abandonment is for a known NAPL delineation/monitoring area or individual NAPL screening piezometer and identify the name of the delineation area (e.g., B6-066 NAPL Area or B5-144 Screening Piezometer):

Please Note: If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

Transcribed from ARM field book records. Piezometer was abandoned prior to the MDE directive to gauge piezometers a final time prior to abandonment.

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW-063-PZ

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 1/4/17

Abandonment Contractor: GSI

Abandonment Method (circle appropriate):

1. PVC → (Pulled) / Split / Perforated / Left-In-Place
2. Abandoned → (Grout) / Bentonite Chips

Field Equipment: Oil-Water Probe

ARM Representative(s): Lisa Perrin

Well Diameter:

Depth to Bottom (TOC)	Final Gauging Prior to Abandonment:
Reported (historical/log):	Depth to Water (TOC): Not recorded
Measured: Not recorded	Depth to NAPL (TOC): Not recorded

Please note if this abandonment is for a known NAPL delineation/monitoring area or individual NAPL screening piezometer and identify the name of the delineation area (e.g., B6-066 NAPL Area or B5-144 Screening Piezometer):

Please Note: If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

Transcribed from ARM field book records. Piezometer was abandoned prior to the MDE directive to gauge piezometers a final time prior to abandonment.

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW-067-PZ

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 1/4/17

Abandonment Contractor: GSI

Abandonment Method (circle appropriate):

1. PVC → Pulled / Split / Perforated / Left-In-Place
2. Abandoned → Grout / Bentonite Chips

Field Equipment: Oil-Water Probe

ARM Representative(s): Lisa Perrin

Well Diameter:

Depth to Bottom (TOC)	Final Gauging Prior to Abandonment:
Reported (historical/log):	Depth to Water (TOC): Not recorded
Measured: Not recorded	Depth to NAPL (TOC): Not recorded

Please note if this abandonment is for a known NAPL delineation/monitoring area or individual NAPL screening piezometer and identify the name of the delineation area (e.g., B6-066 NAPL Area or B5-144 Screening Piezometer):

Please Note: If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

Transcribed from ARM field book records.
Piezometer not found, likely destroyed. Pit present now.

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW-070-PZ

General Project Information:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Abandonment Date: 1/4/17

Abandonment Contractor: GSI

Abandonment Method (circle appropriate):

1. PVC → (Pulled) / Split / Perforated / Left-In-Place
2. Abandoned → (Grout) / Bentonite Chips

Field Equipment: Oil-Water Probe

ARM Representative(s): Lisa Perrin

Well Diameter:

Depth to Bottom (TOC)	Final Gauging Prior to Abandonment:
Reported (historical/log):	Depth to Water (TOC): Not recorded
Measured: Not recorded	Depth to NAPL (TOC): Not recorded

Please note if this abandonment is for a known NAPL delineation/monitoring area or individual NAPL screening piezometer and identify the name of the delineation area (e.g., B6-066 NAPL Area or B5-144 Screening Piezometer):

Please Note: If NAPL is identified in a piezometer, the Project Manager should be notified and the piezometer may not be abandoned unless the presence of NAPL is already known and a decision has been made to abandon the NAPL monitoring network.

Additional Comments (if any):

Transcribed from ARM field book records. Piezometer was abandoned prior to the MDE directive to gauge piezometers a final time prior to abandonment.

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW-RW89

Note if this abandonment includes any associated NAPL delineation piezometers:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Date: 6-5-17

Abandonment Contractor: Allied

Abandonment Method: NA

Field Equipment: NA

ARM Representative(s): N. Kurtz

Additional Comments (if any):

* Could not locate → previously destroyed?

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Well/Piezometer Abandonment Form

Well/Piezometer ID: RW-RW90

Note if this abandonment includes any associated NAPL delineation piezometers:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Date: 6-5-17

Abandonment Contractor: Allied

Abandonment Method: NA

Field Equipment: NA

ARM Representative(s): N. Kurtz

Additional Comments (if any):

* Could not locate → previously destroyed

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9175 Guilford Road - Suite 310
Columbia, Maryland 21046
(410) 290-7775 FAX: (410) 290-7775

Well/Piezometer Abandonment Form

Well/Piezometer ID: RW-RW93

Note if this abandonment includes any associated NAPL delineation piezometers:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Date: 6-6-17

Abandonment Contractor: Allied

Abandonment Method: NA

Field Equipment: NA

ARM Representative(s): N. Kurtz

Additional Comments (if any):

* Well not located → previously destroyed?

ARM Group Inc.
Earth Resource Engineers and Consultants
9175 Guilford Road - Suite 310
Columbia, Maryland 21046
(410) 290-7775 FAX: (410) 290-7775

Well/Piezometer Abandonment Form

Well/Piezometer ID: RW-RW97

Note if this abandonment includes any associated NAPL delineation piezometers:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Date: 6-5-17

Abandonment Contractor: Allied

Abandonment Method: NA

Field Equipment: NA

ARM Representative(s): N. Kurtz

Additional Comments (if any):

RW-RW97

* could not locate → previously destroyed

ARM Group Inc.
Earth Resource Engineers and Consultants
9175 Guilford Road - Suite 310
Columbia, Maryland 21046
(410) 290-7775 FAX: (410) 290-7775

Well/Piezometer Abandonment Form

Well/Piezometer ID: RW-RWBW-20

Note if this abandonment includes any associated NAPL delineation piezometers:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Date: 6-5-17

Abandonment Contractor: Allied

Abandonment Method: Grout + Cut at surface

Field Equipment: Grout

ARM Representative(s): N. Kurtz

Additional Comments (if any):

ARM Group Inc.
Earth Resource Engineers and Consultants
9175 Guilford Road - Suite 310
Columbia, Maryland 21046
(410) 290-7775 FAX: (410) 290-7775

Well/Piezometer Abandonment Form

Well/Piezometer ID: RW-RWBW-21

Note if this abandonment includes any associated NAPL delineation piezometers:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: A3

Date: 6-5-17

Abandonment Contractor: Allied

Abandonment Method: Grout + cut at surface

Field Equipment: Grout

ARM Representative(s): NKurtz

Additional Comments (if any):

ARM Group Inc.
Earth Resource Engineers and Consultants
9175 Guilford Road - Suite 310
Columbia, Maryland 21046
(410) 290-7775 FAX: (410) 290-7775

Well/Piezometer Abandonment Form

Well/Piezometer ID: SW03 - PZM003

Note if this abandonment includes any associated NAPL delineation piezometers:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: Parcel A3

Date: 7/5/17

Abandonment Contractor: Allied

Abandonment Method: Pulled casing + PVC then grouted

Field Equipment: Grout + Geoprobe

ARM Representative(s): L. Perrin, L. Glumac

Additional Comments (if any):

PVC broke while removing casing @ about 5' below surface. Only 1/2" PVC. → attempted to grout to bottom as best as possible.

ARM Group Inc.
Earth Resource Engineers and Consultants
9175 Guilford Road - Suite 310
Columbia, Maryland 21046
(410) 290-7775 FAX: (410) 290-7775

Well/Piezometer Abandonment Form

Well/Piezometer ID: SW03-PZM060

Note if this abandonment includes any associated NAPL delineation piezometers:

Client: EAG

Site Location: Sparrows Point, MD

Parcel ID: Parcel A3

Date: 7/5/17

Abandonment Contractor: Allied

Abandonment Method: Removed casing and 20' PVC > grouted to bottom

Field Equipment: Grout + Geoprobe

ARM Representative(s): L. Perrin, L. Glumac

Additional Comments (if any):

ARM Group Inc.
Earth Resource Engineers and Consultants
9175 Guilford Road - Suite 310
Columbia, Maryland 21046
(410) 290-7775 FAX: (410) 290-7775

APPENDIX D

HILLIS-CARNES
ENGINEERING ASSOCIATES

10975 Guilford Road, Suite A
Annapolis Junction, MD 20701
Phone (410) 880-4788
Fax (410) 880-4098
www.hcea.com

November 10, 2020

Mr. Pete Haid
Tradepoint Atlantic
1600 Sparrows Point Boulevard
Baltimore, Maryland 21219

RE: Notice of Completion of Remedial Actions
Area A: Sub-Parcel A3-1
Baltimore County, Maryland
HCEA Project Number 16280B

Mr. Haid:

Hillis-Carnes Engineering Associates, Inc. (HCEA) is pleased to provide this Notice of Completion of Remedial Actions (Notice) for Area A: Sub-Parcel A3-1 in the Sparrows Point area of Baltimore County, Maryland (Site).

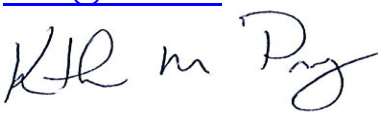
In conjunction with HCEA's environmental services at the Site, HCEA was provided with the Response and Development Work Plan for Area A: Sub-Parcel A3-1 (Revision 3 – April 24, 2017) and the Response and Development Work Plan Addendum (dated December 13, 2019), hereafter referred to as the RDWPs. Based on observations made during HCEA's environmental monitoring at the Site, to the best of our knowledge, understanding, and belief, the project (e.g., grading, utility installation, pavement thickness, use of geotextile fabric, VCP-approved clean fill thickness) was completed in general accordance with the RDWPs.

This Notice has been prepared for the exclusive use of the Client pursuant to the agreement between the Client and HCEA, dated February 27, 2017, in accordance with generally accepted industry practices. All terms and conditions set forth in the agreement are incorporated herein. No warranty, express or implied, is made herein. Use and reproduction of this Notice by any other person is unauthorized.

HCEA appreciates the opportunity to have been of assistance on this project. If you have any questions regarding this Notice, please feel free to contact us at 410-880-4788.

Sincerely,
HILLIS-CARNES ENGINEERING ASSOCIATES, INC.

Christopher J. Hillis, P.E.
Project Engineer
chillis@hcea.com



Keith M. Progin
Senior Environmental Project Manager
kprogin@hcea.com

APPENDIX E

Development Photograph Log
Sub-Parcel B6-2 Retail Area #1 – Royal Farms
Sparrows Point, Maryland

Photo 1: Utility installation

Photo 2: Placement of clay in basin

Photo 3: Placement of fabric in basin

Photo 4: Basin construction in progress

Photo 5: Paving in progress

Photo 6: Paving in progress

Photo 7: Placement of fabric in western portion of Site

Photo 8: Placement of fabric in northern portion of Site

Photo 9: Placement of fabric and clean fill

Photo 10: Utility installation during Addition development work

APPENDIX F

ARM Group Inc.
Earth Resource Engineers and Consultants

November 1, 2017

Ms. Barbara Brown
Project Coordinator
Maryland Department of the Environment
1800 Washington Boulevard
Baltimore, MD 21230

Re: Quarterly Development Status Update
Third Quarter 2017
Area A: Sub-Parcel A3-1
Tradepoint Atlantic
Sparrows Point, Maryland

Dear Ms. Brown,

ARM Group Inc. (ARM), on behalf of EnviroAnalytics Group (EAG), has prepared this Quarterly Development Status Update to document ongoing and completed development activities performed on Sub-Parcel A3-1 during the third quarter of 2017. The Sub-Parcel A3-1 Response and Development Work Plan (RADWP), Revision 3, dated April 24, 2017, and updated June 5, 2017, was approved by the Maryland Department of the Environment (MDE) on April 28, 2017 and by the United States Environmental Protection Agency (USEPA) on June 20, 2017. The expected development of Sub-Parcel A3-1 generally includes grading, placement of subbase, construction of floor slabs, paving, installation of underground utility and foundation structures, lighting improvements, and landscaping improvements.

Environmental Oversight

Full-time oversight was performed by an Environmental Professional (EP) provided by Hillis Carnes Engineering Associates (HCEA) during pre-development (demolition phase) and development activities. In addition general oversight to ensure compliance with environmental regulations and the development plans, the EP was responsible for performing dust monitoring and soil screening services.

Development Progress

The pre-development phase began on April 24, 2017. Development activities began on July 5, 2017 with ARCO as the General Contractor. To date, the building pad has been laid and graded. Concrete pouring of the building slab commenced on September 13, 2017. The installation of the stormwater management and underground utility systems is ongoing.

Dust Monitoring

Dust monitoring was performed with a ThermoElectron Corporation Personal Data RAM 1000AN Dust Monitor. Dust control measures would be implemented if a sustained level above 3.0 mg/m^3 was observed. During the third quarter of 2017, some exceedances of the 3.0 mg/m^3 action level were observed. However, the exceedances appeared to be associated with trucks passing near the monitor and did not last more than five minutes. When dust generation was anticipated due to site conditions and planned development work, the Contractor utilized a water truck to suppress dust.

Soil Management

All slag and stone materials brought to the site for use as fill were approved for their intended use by the MDE.

The EP screened excavated material with a MultiRAE Photoionization Detector (PID). Any excavated material that exhibited visual or olfactory evidence of impacts or a PID reading above 10 ppm would be segregated and covered with plastic sheeting. During the third quarter of 2017, some soils were segregated and stockpiled on site and covered with plastic sheeting. The majority of the soil segregated during development has been sampled and tested for Diesel Range Organics, Oil & Grease, Polychlorinated Biphenyls, and Priority Pollutant Metals. One additional stockpile remains and has not yet been sampled. Following receipt of the sampling results, the MDE approved the stockpiled soil for reuse on site. The approved soil was placed as fill under paved areas.

Exclusion Zones

As specified in the Sub-Parcel A3-1 RADWP, all soil excavated within the exclusion zones was segregated, stockpiled, and covered with plastic sheeting. The four stockpiles generated from the exclusion zones were sampled during two discrete sampling events. The MDE approved the first stockpile for reuse as on-site backfill within the exclusion zones; however, the Contractor deemed the soil to be unsuitable for compaction, and it was disposed of at Greys Landfill. HCEA awaits approval from the MDE regarding the acceptability of the remaining three stockpiles for on-site reuse within the exclusion zones.

Water Management

The EP advised the Contractor that all dewatering discharges must be directed to the on-site water treatment facility. All dewatering discharges associated with the development of Sub-Parcel A3-1 were transmitted to a storm drain identified by Tradepoint Atlantic personnel as leading to the on-site water treatment facility.

If you have questions regarding any information covered in this document please feel free to contact the undersigned at (410) 290-7775.

Respectfully Submitted,
ARM Group Inc.

Melissa A. Replogle, E.I.T.
Staff Engineer

T. Neil Peters, P.E.
Senior Vice President

ARM Group Inc.
Earth Resource Engineers and Consultants

January 29, 2018

Ms. Barbara Brown
Project Coordinator
Maryland Department of the Environment
1800 Washington Boulevard
Baltimore, MD 21230

Re: Quarterly Development Status Updates
Third and Fourth Quarter 2017
Area A: Sub-Parcel A3-1; Area B: Sub-Parcel B5-1;
Sub-Parcel B6-1; Parcel B22, Phase 1
Responses to Agency Comments
Tradepoint Atlantic
Sparrows Point, MD 21219

Dear Ms. Brown:

On behalf of EnviroAnalytics Group, LLC (EAG), ARM Group Inc. (ARM) is pleased to provide the following responses to comments received from the Maryland Department of the Environment (MDE) in an email dated December 7, 2017. The MDE provided comments on the Third Quarter Development Status Updates for Sub-Parcels A3-1, B5-1, B6-1, and Parcel B22, Phase 1 dated October 27 to November 1, 2017. No comments were received from the United States Environmental Protection Agency (USEPA). The updates discussed in this letter have been applied, as applicable, to the Quarterly Development Status Updates for the fourth quarter of 2017 that accompany this letter. Responses to specific comments are provided below; original comments are included in italics with responses following.

1. *General: Soil Management – This section should include an estimate for how much soil has been segregated and stockpiled on-site. In addition, include estimates for the amount of soil disposed of at Grey's Landfill during each quarter. Please note that soil disposed of at Grey's Landfill must be tracked and details from the disposal tracking must be submitted in Completion Reports.*

Sub-Parcel B5-1:

During the third and fourth quarters of 2017, no soils were segregated due to elevated PID readings, odors, or staining on Sub-Parcel B5-1. No soils were removed from the site for disposal at Greys Landfill or elsewhere.

Sub-Parcel B6-1:

During the third quarter of 2017, no soils were segregated due to elevated PID readings, odors, or staining on Sub-Parcel B6-1. No soils were removed from the site for disposal at Greys Landfill or elsewhere.

Information regarding soils stockpiled during the fourth quarter of 2017 is provided in the Fourth Quarter Sub-Parcel B6-1 Quarterly Development Status Update.

Parcel B22, Phase 1:

During the pre-development (demolition) phase on Parcel B22, Phase 1 approximately 8,500 cubic yards (cy) of soil exhibiting evidence of impacts (elevated PID readings, odors, or staining) were stockpiled on site prior to the third quarter of 2017. The MDE was notified of this stockpiled soil via email from Hillis-Carnes Engineering Associates (HCEA) on January 12, 2017. A sampling plan to test for diesel range organics (DRO), gasoline range organics (GRO), Oil & Grease, and polychlorinated biphenyls (PCBs) was submitted by HCEA and approved by the MDE. Following the receipt of laboratory data, the MDE approved the use of the stockpiled soil as fill material under the cap in Parcel B22, Phase 1 in an email dated February 21, 2017.

During storm drain development work on Parcel B22, Phase 1, approximately 200 cy of soil were segregated and placed in two stockpiles. This soil was visually inspected by the MDE on April 13, 2017 and approved for placement beneath paved areas via email on April 19, 2017.

Two additional stockpiles, each containing approximately 100 cy of soil, were segregated during the Road and Utility development associated with Parcel B22, Phase 1. The management of these two stockpiles is discussed in the Parcel B22, Phase 1 Quarterly Development Status Update for the fourth quarter of 2017.

No soils were removed from the site for disposal at Greys Landfill or elsewhere.

Sub-Parcel A3-1:

Three approximately 100 cy stockpiles were segregated due to evidence of impacts (elevated PID readings, odors, or staining) during the pre-development (demolition) phase on Sub-Parcel A3-1. The soil was sampled on July 19, 2017 and tested for Oil & Grease, DRO, PCBs, and TCLP metals. The soil was approved for re-use under aggregate base in paved areas outside the building footprint by the MDE in an email dated August 7, 2017 and was placed under a parking area.

Approximately 100 cy of soil were segregated during storm drain work on Sub-Parcel A3-1. The soil was sampled on July 20, 2017 and tested for Oil & Grease, DRO, PCBs, and TCLP metals. The sampled soil was approved for re-use under the cap in paved areas by the MDE in an email dated September 19, 2017.

Two areas of stockpiled soil containing approximately 500 cy (1 stockpile) and 1,500 cy (3 stockpiles) were generated during excavation inside the exclusion zones in Sub-Parcel A3-1. The soils were sampled during two sampling events on September 28, 2017 (one sample from 500 cy stockpile) and October 18, 2017 (one sample from each of three 500 cy stockpiles). A sample was collected from each stockpile and submitted to Phase Separation Science, Inc. and tested for DRO, GRO, Oil & Grease, PCBs, total metals, and hexavalent chromium. The soils from the two stockpile areas (500 cy and 1,500 cy) were approved for re-use under capped areas on-site by the MDE in emails dated October 5, 2017 and October 25, 2017, respectively. However, because the contractor determined that the soils were not suitable for compaction, the soils were disposed of at Greys Landfill. The soils were approved for disposal by the MDE in emails dated October 12, 2017 and October 25, 2017 for the first and second rounds of sampling, respectively. Disposal manifests will be included with the Sub-Parcel A3-1 Development Completion Report.

2. *Soil and Water Management – Parcel B6-1: "All slag materials brought to the site for use as structural fill were approved for their intended use by the MDE." Could you please clarify this statement? Is "structural fill" referring to the building foundation pad on this parcel? Also, define "intended use" and provide a reference for the MDE approval referred to in this statement.*

Slag brought to the site was placed under capped areas, i.e. under the building pad foundation, for use as structural fill, and as utility trench backfill. The placement of slag as fill under capped areas has been approved by the MDE in various documents, e.g. the B5-1 Response and Development Work Plan (RADWP) dated September 27, 2017. The use of slag under capped areas was also approved in an email from the MDE regarding the Parcel A4 RADWP dated August 22, 2017. Slag has been approved by the MDE for use as utility trench backfill in areas requiring capping in an email dated November 28, 2017. If slag is used to backfill utility trenches in uncapped areas, capping of the utility trench would be necessary.

3. *Soil Management – Parcel B5-1: "All slag materials brought to the site for use as fill were approved for their intended use by the MDE." Please make this statement more specific to the site. Slag materials were approved for use as fill on this area of Parcel B5-1 due to its location underneath a VCP cap. This level of detail is necessary since there are portions of this parcel that do not require a VCP cap and there are requirements for approval of slag on those areas that have not yet been completed.*

Slag brought to the site was placed under capped areas, i.e. under the building pad foundation, for use as structural fill, and as utility trench backfill. If slag is used to backfill utility trenches in uncapped areas (or if the trench will function as part of the cap including the section to be installed through the B5 Building exposure unit) capping of the utility trench would be necessary.

4. *Notable Occurrences – Parcel B22 - Phase 1: Provide more detail regarding this event, including: date and method (i.e., email, phone call) for notifying the MDE. Also, it is assumed that the excavated soils were sampled for disposal or reuse on the site but this detail is not provided. Please provide additional details regarding the handling of these stockpiled soils.*

On May 17, 2017 a buried utility line containing a large quantity of an oily substance exhibiting strong petroleum odors was damaged. A sample of the oily water was collected the same day and submitted to Phase Separation Science, Inc. and analyzed for volatile organic compounds (VOCs) and polychlorinated biphenyls (PCBs). The oily water was pumped into a sedimentation basin by an on-site contractor. A vacuum truck was used to pump approximately 4,000 gallons of oily water from the sedimentation basin into a frac tank. The on-site contractor received approval from Tradepoint Atlantic personnel to pump the material to a storm drain leading to the on-site water treatment plant.

All materials excavated from the impacted area were segregated and placed on plastic and covered with additional plastic sheeting. The concrete slab under the containment area was inspected and observed to contain no obvious cracks or holes. An email requesting permission to sample the soil was sent to the MDE on October 24, 2017. The MDE provided approval to sample in an email dated October 25, 2017. The segregated materials were sampled during the fourth quarter of 2017 (on October 27, 2017), and samples were sent to Phase Separation Science, Inc. for analysis of DRO, GRO, Oil & Grease, PCBs, total metals, and hexavalent chromium. Following receipt of the sampling results, the MDE provided approval in an email dated November 7, 2017 to spread the soil from both stockpiles in an area north of the Parcel B22, Phase 1 Development Area.

A sample of the oily water was collected on May 17, 2017 and submitted to Phase Separation Science, Inc. and analyzed for volatile organic compounds (VOCs) and PCBs. The on-site Contractor received approval from Tradepoint Atlantic personnel to pump the material to a storm drain leading to the on-site water treatment plant.

If you have any questions, or if we can provide any additional information at this time, please do not hesitate to contact ARM Group Inc. at 410-290-7775.

Respectfully submitted,
ARM Group Inc.

Melissa A. Replogle, E.I.T.
Staff Engineer

T. Neil Peters, P.E.
Senior Vice President

ARM Group Inc.
Earth Resource Engineers and Consultants

January 29, 2018

Ms. Barbara Brown
Project Coordinator
Maryland Department of the Environment
1800 Washington Boulevard
Baltimore, MD 21230

Re: Quarterly Development Status Update
Fourth Quarter 2017
Area A: Sub-Parcel A3-1
Tradepoint Atlantic
Sparrows Point, Maryland

Dear Ms. Brown,

ARM Group Inc. (ARM), on behalf of EnviroAnalytics Group (EAG), has prepared this Quarterly Development Status Update to document ongoing and completed development activities performed on Sub-Parcel A3-1 (the Site) during the fourth quarter of 2017. The Sub-Parcel A3-1 Response and Development Work Plan (RADWP), Revision 3, dated April 24, 2017, and updated June 5, 2017, was approved by the Maryland Department of the Environment (MDE) on April 28, 2017 and by the United States Environmental Protection Agency (USEPA) on June 20, 2017. The expected development of Sub-Parcel A3-1 generally includes grading, placement of subbase, construction of floor slabs, paving, installation of underground utility and foundation structures, lighting improvements, and landscaping improvements. Development work completed on Sub-Parcel A3-1 prior to October 1, 2017 is discussed in the Quarterly Development Status Update for the third quarter of 2017 (dated November 1, 2017).

Environmental Oversight

Full-time oversight was performed by an Environmental Professional (EP) provided by Hillis Carnes Engineering Associates (HCEA) during pre-development (demolition phase) and development activities. In addition general oversight to ensure compliance with environmental regulations and the development plans, the EP was responsible for performing dust monitoring and soil screening services during intrusive activities.

Development Progress

The pre-development phase began on April 24, 2017. Development activities began on July 5, 2017 with ARCO as the General Contractor. To date, the majority of the building's structure has

been installed. The installation of the stormwater management and underground utility systems is ongoing.

Dust Monitoring

Dust monitoring was performed with MetOne E-Sampler dust monitors. During the fourth quarter of 2017, some exceedances of the 3.0 mg/m^3 action level were observed. However, the exceedances appeared to be associated with trucks passing near the monitor and did not last more than one minute. When dust generation was anticipated due to site conditions and planned development work, the Contractor utilized a water truck to suppress dust.

Soil Management

Slag brought to the site was placed under capped areas, i.e. under the building pad foundation, for use as structural fill, and as utility trench backfill.

The EP screened excavated material with a MultiRAE photoionization detector (PID). During the fourth quarter of 2017, approximately 2,000 cubic yards (cy) of soil were segregated into two areas on-site containing approximately 500 cy (1 stockpile) and 1,500 cy (3 stockpiles) and covered with plastic sheeting. Soil sampling and disposal are discussed in further detail below.

Exclusion Zones:

As specified in the Sub-Parcel A3-1 RADWP, all soils excavated within the exclusion zones were segregated, stockpiled, and covered with plastic sheeting. The four stockpiles generated from the exclusion zones were sampled during two discrete sampling events. Soil sampling and disposal are discussed below.

Water Management

All dewatering discharges associated with the development of Sub-Parcel A3-1 were transmitted to a storm drain identified by Tradepoint Atlantic personnel as leading to the on-site water treatment facility.

Soil Sampling and Disposal

Two areas of stockpiled soil containing approximately 500 cy (1 stockpile) and 1,500 cy (3 stockpiles) were generated prior to and during the fourth quarter of 2017 during excavation inside the exclusion zones in Sub-Parcel A3-1. The soils were sampled during two sampling events on September 28, 2017 (one sample from 500 cy stockpile) and October 18, 2017 (one sample from each of three 500 cy stockpiles). A 10-point composite sample was collected from each stockpile and submitted to Phase Separation Science, Inc. and tested for diesel range organics (DRO), gasoline range organics (GRO), Oil & Grease, polychlorinated biphenyls (PCBs), total metals, and hexavalent chromium. The soils from the two stockpile areas (500 cy and 1,500 cy) were approved for re-use under capped areas on-site by the MDE in emails dated

October 5, 2017 and October 25, 2017, respectively. However, because the Contractor determined that the soils were not suitable for compaction, the soils were disposed of at Greys Landfill. The soils were approved for disposal by the MDE in emails dated October 12, 2017 and October 25, 2017 for the first and second rounds of sampling, respectively. During the disposal of soil from the exclusion zones, a stockpile of less than 100 cy of soil originating from a water line excavation that occurred on September 20, 2017 was inadvertently transported to Greys Landfill and disposed of prior to sampling and testing. The soil had been segregated due to mild odors and a maximum PID reading of 250 ppm. No evidence of oily substances or staining was observed. Disposal manifests for all soil transported to Greys Landfill will be included with the Sub-Parcel A3-1 Development Completion Report.

If you have questions regarding any information covered in this document please feel free to contact the undersigned at (410) 290-7775.

Respectfully Submitted,
ARM Group Inc.

Melissa A. Replogle, E.I.T.
Staff Engineer

T. Neil Peters, P.E.
Senior Vice President

ARM Group Inc.
Earth Resource Engineers and Consultants

July 17, 2018

Ms. Barbara Brown
Project Coordinator
Maryland Department of the Environment
1800 Washington Boulevard
Baltimore, MD 21230

Re: Quarterly Development Status Updates
First Quarter 2018
Area A: Sub-Parcel A3-1;
Area B: Sub-Parcel B5-1 and Sub-Parcel B6-1
Responses to Agency Comments
Tradepoint Atlantic
Sparrows Point, MD 21219

Dear Ms. Brown:

On behalf of EnviroAnalytics Group, LLC (EAG), ARM Group Inc. (ARM) is pleased to provide the following responses to comments received from the Maryland Department of the Environment (MDE) in an email dated May 7, 2018. The MDE provided comments on the 2018 First Quarter Development Status Updates for Sub-Parcels A3-1, B5-1, and B6-1, each of which was dated May 3, 2018. No comments were received from the United States Environmental Protection Agency (USEPA). This Comment Response Letter accompanies revised submissions of the Sub-Parcel A3-1 and Sub-Parcel B6-1 Quarterly Development Status Updates for the First Quarter of 2018 (Revision 1). A new revision was not prepared for the Sub-Parcel B5-1 Quarterly Development Status Update due to the minor nature of the MDE comment on this document. Responses to specific comments are provided below; original comments are included in italics with responses following.

Sub-Parcel A3-1:

1. *Did the electronic dust monitoring get discontinued based on a certain portion of the site being paved? What was the rationale for switching to visual observations only?*

   Electronic dust monitoring was discontinued after the majority of the parcel had been capped and the site contractor informed the Environmental Professional (EP) that all subsurface excavations had been completed. No exceedances of the 3.0 mg/m^3 dust action level were detected during the first quarter of 2018. Beginning on February 15, 2018 the EP continued monitoring for visible dust during development work, which

included excavations not originally anticipated by the site contractor. The Quarterly Development Status Update has been updated to include these details.

2. *Was the BGE underground utility line that ran through the coal tar area installed in the 2nd Quarter 2018? Is this why details are not provided in this progress report?*

   The utility line installation through the coal tar area (near the RW-003 Excavation Area) occurred in March 2018. At the time of the excavation, the EP was not aware that the excavation passed through the area with potential coal tar contamination. However, excavated soils were screened using a PID as was required during all development work on the parcel. Excavated material exhibiting elevated PID readings and odors was segregated on plastic and covered with plastic. The Sub-Parcel A3-1 Quarterly Development Status Update for the First Quarter of 2018 (Revision 1) has been updated to include these details. These excavated materials were sampled during the second quarter of 2018. Details will be provided in the Sub-Parcel A3-1 Quarterly Development Status Update for the Second Quarter of 2018.

3. Can we expect to see the details re: well abandonment and installation in the upcoming IM progress report for Parcel A3?

   Permanent monitoring wells RW06-MW(S) and RW06-MW(D) were damaged during construction and thus could not be properly abandoned. Installation details for the replacement wells will be provided in the upcoming Interim Measures Progress Report.

Sub-Parcel B5-1:

4. *Is the excavated and stockpiled soil covered on site?*

   The excavated soil on Sub-Parcel B5-1 is not covered because no physical evidence of contamination was observed during excavation at the Site. As stated in the approved Sub-Parcel B5-1 Response and Development Work Plan (RADWP), soil designated for replacement on-site which does not otherwise exhibit evidence of contamination (as determined by the EP) may be managed in large stockpiles as long as they remain within the erosion and sediment controls. Grass has begun to grow on the stockpiled soil in Sub-Parcel B5-1. Since there is no information to add, a new revision has not been prepared for the Sub-Parcel B5-1 Quarterly Development Status Update for the First Quarter of 2018.

Sub-Parcel B6-1:

5. *Is the utility area on this parcel considered a "capped" area? I had thought that the only area officially requiring a VCP cap was the building foundation. However, this progress report identifies slag placed as utility backfill as a capped area, different from the*

parking areas that are undergoing sampling to determine if they can remain uncapped. Please clarify.

Slag was placed under the building pad as well as under parking areas. Based on clarification received from the subcontractor, the Sub-Parcel B6-1 Quarterly Development Status Update has been revised to clarify that slag was not brought onto the site as utility trench backfill. Rather, pre-existing slag that was removed during excavations for utility installation was either placed back into the trench as backfill or was placed under parking areas. The pre-existing slag fill was determined to not require capping in the Sub-Parcel B6-1 RADWP. A determination has not yet been made regarding whether capping is required for areas where imported slag has been placed.

If you have questions regarding any information covered in this document please feel free to contact the undersigned at (410) 290-7775.

Respectfully submitted,
ARM Group Inc.

Melissa A. Replogle, E.I.T.
Staff Engineer

T. Neil Peters, P.E.
Senior Vice President

ARM Group Inc.
Earth Resource Engineers and Consultants

July 17, 2018

Ms. Barbara Brown
Project Coordinator
Maryland Department of the Environment
1800 Washington Boulevard
Baltimore, MD 21230

Re: Quarterly Development Status Update
First Quarter 2018
Area A: Sub-Parcel A3-1
Tradepoint Atlantic
Sparrows Point, Maryland

Dear Ms. Brown,

ARM Group Inc. (ARM), on behalf of EnviroAnalytics Group (EAG), has prepared this Quarterly Development Status Update to document ongoing and completed development activities performed on Sub-Parcel A3-1 (the Site) during the fourth quarter of 2017. The Sub-Parcel A3-1 Response and Development Work Plan (RADWP), Revision 3, dated April 24, 2017, and updated June 5, 2017, was approved by the Maryland Department of the Environment (MDE) on April 28, 2017 and by the United States Environmental Protection Agency (USEPA) on June 20, 2017. The expected development of Sub-Parcel A3-1 generally includes grading, placement of subbase, construction of floor slabs, paving, installation of underground utility and foundation structures, lighting improvements, and landscaping improvements. Development work completed on Sub-Parcel A3-1 prior to January 1, 2018 is discussed in previously submitted Quarterly Development Status Updates (dated November 1, 2017 and January 29, 2018).

Environmental Oversight

Full-time oversight was performed by an Environmental Professional (EP) provided by Hillis Carnes Engineering Associates (HCEA) during pre-development (demolition phase) and development activities. In addition general oversight to ensure compliance with environmental regulations and the development plans, the EP was responsible for performing dust monitoring and soil screening services during intrusive activities.

Development Progress

Development activities began prior to the first quarter of 2018 with ARCO as the General Contractor. To date, the building's structure has been installed. Installation of stormwater management and underground utility systems as well as grading and paving were performed.

The EP noted that the geotextile marker fabric originally installed beneath landscaped areas did not meet project specifications. The overlying clean fill was removed and the marker fabric replaced with a product meeting project specifications.

Dust Monitoring

Dust monitoring was performed with MetOne E-Sampler dust monitors prior to February 15, 2018. During this time during the first quarter of 2018, no exceedances of the 3.0 mg/m^3 action level were observed. When dust generation was anticipated due to site conditions and planned development work, the Contractor utilized a water truck to suppress dust. Electronic dust monitoring was discontinued after the majority of the parcel had been capped and the Contractor informed the Environmental Professional (EP) that all subsurface excavations had been completed. After February 15, 2018, HCEA continued to inspect the site for visible dust, but no data were collected.

Soil Management

Slag brought to the site was placed under capped areas, i.e. under the building pad foundation, for use as structural fill, and as utility trench backfill.

In addition, approximately 4,500 cubic yards (cy) of clay were transported to the site from Tanyard Cove. Five composite samples were collected on February 26, 2018 and the clay was approved for use on March 27, 2018. This clay was then used on-site as a part of the two-foot clay requirement for the sediment basin. Also, approximately 5,000 cy of topsoil were transported to the site from the Waugh Chapel Plant. Five composite samples were collected on February 19, 2018 and the topsoil was approved for use on February 27, 2018. This topsoil was then used as part of the cap in landscaped areas. Documentation will be provided with the Sub-Parcel A3-1 Development Completion Report.

The EP screened excavated material with a MultiRAE photoionization detector (PID). Soil sampling and disposal are discussed in further detail below.

Exclusion Zones:

As specified in the Sub-Parcel A3-1 RADWP, all soils excavated within the exclusion zones were segregated, stockpiled, and covered with plastic sheeting. The single stockpile generated from the exclusion zones was sampled during one sampling event. Soil sampling and disposal are discussed below.

Soil Sampling and Disposal

Stockpiled soil from within the exclusion zone containing approximately 250 cy (1 stockpile) was generated during the first quarter of 2018. The soil was approved to be sampled on January 29, 2018 and was sampled during one sampling event on January 30, 2018. A 10-point composite sample was collected from the stockpile and submitted to Phase Separation Science, Inc. and tested for diesel range organics (DRO), Oil & Grease, polychlorinated biphenyls (PCBs), total metals, and vanadium and manganese. The stockpiled soil was approved for re-use beneath capped landscaped areas and for the sediment basin on-site by the MDE on February 7, 2018. Disposal manifests for any soil transported to Greys Landfill will be included with the Sub-Parcel A3-1 Development Completion Report.

Water Management

All dewatering discharges associated with the development of Sub-Parcel A3-1 were transmitted to a storm drain identified by Tradepoint Atlantic personnel as leading to the on-site water treatment facility.

Notable Occurrences

Permanent monitoring wells RW06-MW(S) and RW06-MW(D) were damaged during construction in the first quarter of 2018 and were replaced on April 30 and May 1, 2018. Construction details for the replacement wells will be provided in the upcoming Interim Measures Progress Report for Parcel A3.

A utility line excavation near the RW-003 Excavation Area encountered suspected coal tar contamination in March 2018. No free NAPL was encountered during the utility excavation. Excavated materials were screened using a PID during excavation. Excavated material exhibiting elevated PID readings and odors was segregated on plastic and covered with plastic. These excavated materials were sampled during the second quarter of 2018. Details will be provided in the Sub-Parcel A3-1 Quarterly Development Status Update for the Second Quarter of 2018.

If you have questions regarding any information covered in this document please feel free to contact the undersigned at (410) 290-7775.

Respectfully Submitted,
ARM Group Inc.

Melissa A. Replogle, E.I.T.
Staff Engineer

T. Neil Peters, P.E.
Senior Vice President

ARM Group Inc.
Engineers and Scientists

August 21, 2018

Ms. Barbara Brown
Project Coordinator
Maryland Department of the Environment
1800 Washington Boulevard
Baltimore, MD 21230

Re: Quarterly Development Status Update
Second Quarter 2018
Area A: Sub-Parcel A3-1
Tradepoint Atlantic
Sparrows Point, Maryland

Dear Ms. Brown,

ARM Group Inc. (ARM), on behalf of EnviroAnalytics Group (EAG), has prepared this Quarterly Development Status Update to document ongoing and completed development activities performed on Sub-Parcel A3-1 (the Site) during the second quarter of 2018. The Sub-Parcel A3-1 Response and Development Work Plan (RADWP), Revision 3, dated April 24, 2017, and updated June 5, 2017, was approved by the Maryland Department of the Environment (MDE) on April 28, 2017 and by the United States Environmental Protection Agency (USEPA) on June 20, 2017. The development of Sub-Parcel A3-1 generally includes grading, placement of subbase, construction of floor slabs, paving, installation of underground utility and foundation structures, lighting improvements, and landscaping improvements. Development work completed on Sub-Parcel A3-1 prior to April 1, 2018 is discussed in previously submitted Quarterly Development Status Updates (dated November 1, 2017, January 29, 2018, and July 17, 2018).

Environmental Oversight

Full-time oversight was performed by an Environmental Professional (EP) provided by Hillis Carnes Engineering Associates (HCEA) during pre-development (demolition phase) and development activities. In addition to general oversight to ensure compliance with environmental regulations and the development plans, the EP was responsible for performing dust monitoring and soil screening services during intrusive activities.

Development Progress

Development activities began prior to the second quarter of 2018 with ARCO as the General Contractor. To date, the building's structure has been installed. Installation of stormwater management and underground utility systems as well as grading and paving were performed.

Dust Monitoring

Electronic dust monitoring was discontinued after the majority of the parcel had been capped and the Contractor informed the Environmental Professional (EP) that all planned intrusive activities had been completed during the first quarter. During the second quarter of 2018, HCEA the EP continued monitoring for visible dust during development work, which included excavations not originally anticipated by the site contractor. Excessive dust was not observed during the second quarter of 2018.

Soil Management

Clay fill was transported to the site for use as part of the two-foot clay requirement for the sediment basin. This clay was approved as discussed in the Sub-Parcel A3-1 Development Status Update for the 1st Quarter of 2018. Documentation will be provided with the Sub-Parcel A3-1 Development Completion Report.

Exclusion Zones:

As specified in the Sub-Parcel A3-1 RADWP, all soils excavated within the exclusion zones were segregated, stockpiled, and covered with plastic sheeting. Three stockpiles generated from the exclusion zones were sampled during three sampling events. Soil sampling and disposal are discussed below.

Soil Sampling and Disposal

Stockpiled soil from within the exclusion zones, containing approximately 600 cy total (3 stockpiles), was generated prior to and during the second quarter of 2018. The soil was sampled during two sampling events on April 5 (two stockpiles in western exclusion zone) and April 18, 2018 (one stockpile in eastern exclusion zone). A 10-point composite sample was collected from each of the stockpiles and submitted to Phase Separation Science, Inc. and tested for diesel range organics (DRO), Oil & Grease, polychlorinated biphenyls (PCBs), total metals, and vanadium and manganese. Based on the laboratory results, the MDE requested additional sampling with full TCLP analysis. One composite sample was collected from the two stockpiles in the western exclusion zone on May 1, 2018 and analyzed for full TCLP. The materials in all three sampled stockpiles were approved for transport to Greys Landfill by the MDE on May 15, 2018 and the material was transported to Greys Landfill on May 24, 2018. Disposal manifests for any soil transported to Greys Landfill will be included with the Sub-Parcel A3-1 Development Completion Report.

Water Management
No dewatering occurred during the second quarter of 2018.

Notable Occurrences
None

If you have questions regarding any information covered in this document please feel free to contact the undersigned at (410) 290-7775.

Respectfully Submitted,
ARM Group Inc.

Melissa A. Replogle, E.I.T.
Staff Engineer

T. Neil Peters, P.E.
Senior Vice President

ARM Group Inc.
Engineers and Scientists

October 31, 2018

Ms. Barbara Brown
Project Coordinator
Maryland Department of the Environment
1800 Washington Boulevard
Baltimore, MD 21230

Re: Quarterly Development Status Update
Third Quarter 2018
Area A: Sub-Parcel A3-1
Tradepoint Atlantic
Sparrows Point, Maryland

Dear Ms. Brown,

ARM Group Inc. (ARM), on behalf of EnviroAnalytics Group (EAG), has prepared this Quarterly Development Status Update to document ongoing and completed development activities performed on Sub-Parcel A3-1 (the Site) during the third quarter of 2018. The Sub-Parcel A3-1 Response and Development Work Plan (RADWP), Revision 3, dated April 24, 2017, and updated June 5, 2017, was approved by the Maryland Department of the Environment (MDE) on April 28, 2017 and by the United States Environmental Protection Agency (USEPA) on June 20, 2017. The development of Sub-Parcel A3-1 generally includes grading, placement of subbase, construction of floor slabs, paving, installation of underground utility and foundation structures, lighting improvements, and landscaping improvements. Development work completed on Sub-Parcel A3-1 prior to July 1, 2018 is discussed in previously submitted Quarterly Development Status Updates (dated November 1, 2017; January 29, 2018; July 17, 2018; and August 21, 2018).

Environmental Oversight

Full-time oversight was performed by an Environmental Professional (EP) provided by Hillis Carnes Engineering Associates (HCEA) during pre-development (demolition phase) and development activities for the months of July and August 2018. No work was monitored by HCEA during September 2018. In addition to general oversight to ensure compliance with environmental regulations and the development plans, the EP was responsible for performing dust monitoring and soil screening services during intrusive activities.

Development Progress

Development activities began prior to the third quarter of 2018 with ARCO as the General Contractor. To date, the building's structure has been installed, and grading, paving, and landscaping work has been performed. Work on the basin and capping on the northern portion of the site were performed onsite during the third quarter during July and August 2018. All development within the limit of disturbance (LOD) has been completed. The EP reported that no intrusive work requiring monitoring occurred during September 2018.

Dust Monitoring

Electronic dust monitoring was discontinued after the majority of the parcel had been capped and the Contractor informed the EP that all planned intrusive activities had been completed during the first quarter. During the third quarter of 2018, the EP continued monitoring for visible dust during development work. Excessive dust was not observed during the third quarter of 2018.

Soil Management

During the third quarter, MDE-approved clay fill was placed for the sediment basin. Topsoil was transported to the site and placed and graded as appropriate for the top of the basin. Clean fill certification documentation will be provided with the Sub-Parcel A3-1 Development Completion Report.

Exclusion Zones:

No work was performed inside the exclusion zones during the third quarter of 2018.

Soil Sampling and Disposal

During the third quarter of 2018, no excavations were performed. Thus, no sampling of stockpiled soil was required, and no soils were removed from the site for disposal at Greys Landfill or elsewhere.

Water Management

No dewatering occurred during the third quarter of 2018.

Notable Occurrences

A miscommunication regarding the northern extent of the LOD resulted in the placement of marker fabric, clean fill, and topsoil outside the northern extent of the LOD. The contractor removed the topsoil for placement elsewhere within the LOD. The environmental capping of the northern portion of Sub-Parcel A3-1 located outside the LOD will be performed by EAG.

If you have questions regarding any information covered in this document please feel free to contact ARM Group Inc. at (410) 290-7775.

Respectfully Submitted,
ARM Group Inc.

Melissa A. Replogle, E.I.T.
Staff Engineer

T. Neil Peters, P.E.
Senior Vice President

ARM Group LLC
Engineers and Scientists

April 27, 2020

Ms. Barbara Brown
Project Coordinator
Maryland Department of the Environment
1800 Washington Boulevard
Baltimore, MD 21230

Re: Quarterly Development Status Update
First Quarter 2020
Area A: Sub-Parcel A3-1
Tradepoint Atlantic
Sparrows Point, MD 21219

Dear Ms. Brown,

On behalf of EnviroAnalytics Group, LLC (EAG), ARM Group LLC (ARM) has prepared this Quarterly Development Status Update to document ongoing and completed development activities performed on Sub-Parcel A3-1 (the Site) during the first quarter of 2020. The Sub-Parcel A3-1 Response and Development Work Plan (RADWP), Revision 3, dated April 24, 2017, and updated June 5, 2017, was approved by the Maryland Department of the Environment (MDE) on April 28, 2017 and by the United States Environmental Protection Agency (USEPA) on June 20, 2017. The development of Sub-Parcel A3-1 generally includes grading, placement of subbase, construction of floor slabs, paving, installation of underground utility and foundation structures, lighting improvements, and landscaping improvements. Development work completed on Sub-Parcel A3-1 prior to July 1, 2018 is discussed in previously submitted Quarterly Development Status Updates (dated November 1, 2017, January 29, 2018, July 17, 2018, August 21, 2018, and October 31, 2018). No development work was performed between October 2018 and January 2020. Work recommenced on January 6, 2020. Because no development work was performed in the fourth quarter of 2018 or in any quarter of 2019, daily oversight was not performed, and Quarterly Development Status Updates were not prepared.

Piezometer and Well Abandonment

Four permanent wells (RW05-MWI, RW22-MWI, RW17-MW(S), and RW20(-MW(S)) were abandoned during the first quarter of 2020. One permanent well, RW21-MW(P), was installed during the first quarter of 2020.

Additional wells and temporary groundwater collection points (piezometers) installed during or prior to the Phase II Investigation were removed or properly abandoned prior to the first quarter of 2020. The majority of permanent wells and piezometers were retained on the sub-parcel. Additional permanent groundwater monitoring wells were installed within Sub-Parcel A3-1 following the abandonment of the above-mentioned wells and piezometers to facilitate the collection of groundwater data and to monitor the presence of NAPL. Several wells were relocated, re-installed, or renamed, as documented in the Rod and Wire Mill Interim Measures Progress Reports and Supplemental Investigation Report. A total of 79 permanent wells remain on the sub-parcel. Additional details regarding the groundwater monitoring network and ongoing results are presented in the following documents:

- Rod and Wire Mill (RWM) Interim Measures (IM) Progress Report (Revision 0, dated January 26, 2018)
- RMW IM Progress Report – January 2018 (Revision 0, dated November 2, 2018)
- RMW IM Progress Report – August 2018 (Revision 0, dated November 2, 2018)
- RMW IM Progress Report – December 2018 (Revision 0, dated February 15, 2019)
- RWM IM 2019 Progress Report (February 14, 2020)
- RWM IM Supplemental Investigation Work Plan (Revision 1, dated March 7, 2019)
- RWM IM Supplemental Investigation Report (Revision 1, dated April 8, 2020)

Abandonment records will be provided in the Sub-Parcel A3-1 Development Completion Report.

Environmental Oversight

Full-time oversight was performed by an Environmental Professional (EP) provided by Hillis Carnes Engineering Associates (HCEA) during pre-development (demolition phase) and intrusive development activities. In addition to general oversight to ensure compliance with environmental regulations and the development plans, the EP was responsible for performing dust monitoring and soil screening services during intrusive activities. No development work was performed between October 2018 and January 2020. Work recommenced on January 6, 2020.

Development Progress

Development work commenced prior to the first quarter of 2020 with ARCO as the General Contractor. Work to date has included building construction, grading, paving, landscaping work, basin construction, capping, removal of the concrete slab inside the building, excavation for footers, excavation for sewer line inside the building, excavation for utilities (sewer, storm drain, electric, water, gas), and excavation for parking lot expansion. No development work was performed between October 2018 and January 2020. Work recommenced on January 6, 2020.

Work performed under HCEA oversight during the first quarter of 2020 consisted of removal of the concrete slab inside the building, excavation for footers and sewer line inside the building,

excavation for footers for the building and building addition, excavation for parking lot expansion and for sewer line, storm drain, electric line, water line, and gas line.

Capping work began under the direction of EAG during the first quarter of 2020. A preconstruction meeting was held, and topsoil was stripped from the northern portion of the sub-parcel. During the first quarter of 2020, a 40-foot buffer was maintained around the BGE substation. Mass grading was conducted in the southern portion of the sub-parcel. An access road was constructed in the northern portion of the sub-parcel. All soil removed under the direction of EAG was transported to Greys Landfill.

Dust Monitoring

Electronic dust monitoring was not performed during the first quarter of 2020 because the majority of the Site is capped and because intrusive activities outside the constructed building were limited. When dust generation was anticipated due to site conditions and planned development work, the Contractor proactively utilized a water truck to suppress dust.

Soil Management

The EP screened excavated material with a MultiRAE photoionization detector (PID). In the first quarter of 2020, soils exhibiting elevated PID readings and odors were detected on two days. On March 10 and March 24, 2020, approximately 10 yards and approximately 40 cubic yards of material, respectively, were segregated on plastic and covered with the same. No elevated PID readings, odors, or staining were detected in any of the other soils inspected during the first quarter of 2020. Screened soils which exhibited no evidence of contamination were replaced inside utility trenches as backfill or were placed under future paved areas. No soil was removed from the sub-parcel.

Water Management

No dewatering was required in January 2020. In February and March 2020, at the direction of Tradepoint Atlantic personnel, all dewatering discharges associated with the development of Sub-Parcel A3-1 were pumped to a drain identified by Tradepoint Atlantic that conveyed to the Humphreys Creek Wastewater Treatment Plant (HCWWTP). When limited amounts of dewatering were required, the contractor conveyed the water to the HCWWTP via truck.

If you have questions regarding any information covered in this document, please feel free to contact ARM Group LLC at (410) 290-7775.

Respectfully Submitted,
ARM Group LLC

Melissa A. Replogle, E.I.T.
Project Engineer

T. Neil Peters, P.E.
Senior Vice President

ARM Group LLC
Engineers and Scientists

July 31, 2020

Ms. Barbara Brown
Project Coordinator
Maryland Department of the Environment
1800 Washington Boulevard
Baltimore, MD 21230

Re: Quarterly Development Status Update
Second Quarter 2020
Area A: Sub-Parcel A3-1
Tradepoint Atlantic
Sparrows Point, MD 21219

Dear Ms. Brown,

On behalf of EnviroAnalytics Group, LLC (EAG), ARM Group LLC (ARM) has prepared this Quarterly Development Status Update to document both ongoing and completed development activities performed on Sub-Parcel A3-1 (the Site) during the second quarter of 2020. The Sub-Parcel A3-1 Response and Development Work Plan (RADWP), Revision 3, dated April 24, 2017, and updated June 5, 2017, was approved by the Maryland Department of the Environment (MDE) on April 28, 2017 and by the United States Environmental Protection Agency (USEPA) on June 20, 2017. The development of Sub-Parcel A3-1 generally includes grading, placement of subbase, construction of floor slabs, paving, installation of underground utility and foundation structures, lighting improvements, and landscaping improvements. Development work completed on Sub-Parcel A3-1 prior to July 1, 2018 and between January 1, 2020 and March 31, 2020 is discussed in previously submitted Quarterly Development Status Updates (dated November 1, 2017, January 29, 2018, July 17, 2018, August 21, 2018, October 31, 2018, and April 27, 2020). No development work was performed between October 2018 and January 2020. Work recommenced on January 6, 2020. Because no development work was performed in the fourth quarter of 2018 or in any quarter of 2019, daily oversight was not performed, and Quarterly Development Status Updates were not prepared.

Piezometer and Well Abandonment

Four permanent wells (RW05-MWI, RW22-MWI, RW17-MW(S), and RW20(-MW(S)) were abandoned during the first quarter of 2020. One permanent well, RW21-MW(P), was installed during the first quarter of 2020.

Additional wells and temporary groundwater collection points (piezometers) installed during or prior to the Phase II Investigation were removed or properly abandoned prior to the second quarter of 2020. The majority of permanent wells and piezometers were retained on the sub-parcel. Additional permanent groundwater monitoring wells were installed within Sub-Parcel A3-1 following the abandonment of the above-mentioned wells and piezometers to facilitate the collection of groundwater data and to monitor the presence of NAPL. Several wells were relocated, re-installed, or renamed, as documented in the Rod and Wire Mill (RWM) Interim Measures (IM) Progress Reports and Supplemental Investigation Report. A total of 79 permanent wells remain on the sub-parcel. Additional details regarding the groundwater monitoring network and ongoing results are presented in the following documents:

- RWM IM Progress Report (Revision 0, dated January 26, 2018)
- RMW IM Progress Report – January 2018 (Revision 0, dated November 2, 2018)
- RMW IM Progress Report – August 2018 (Revision 0, dated November 2, 2018)
- RMW IM Progress Report – December 2018 (Revision 0, dated February 15, 2019)
- RWM IM 2019 Progress Report (February 14, 2020)
- RWM IM Supplemental Investigation Work Plan (Revision 1, dated March 7, 2019)
- RWM IM Supplemental Investigation Report (Revision 1, dated April 8, 2020)

Abandonment records will be provided in the Sub-Parcel A3-1 Development Completion Report.

Environmental Oversight

Full-time oversight was performed by an Environmental Professional (EP) provided by Hillis Carnes Engineering Associates (HCEA) during pre-development (demolition phase) and intrusive development activities. In addition to general oversight to ensure compliance with environmental regulations and the development plans, the EP was responsible for performing dust monitoring and soil screening services during intrusive activities. No development work was performed between October 2018 and January 2020. Work recommenced on January 6, 2020.

Development Progress

Development work commenced prior to the second quarter of 2020 with ARCO as the General Contractor. Work to date has included building construction, grading, paving, landscaping work, basin construction, capping, removal of the concrete slab inside the building, excavation for footers, excavation for sewer line inside the building, excavation for utilities (sewer, storm drain, electric, water, gas), excavation for parking lot expansion, and placement of clean fill. No development work was performed between October 2018 and January 2020. Work recommenced on January 6, 2020.

Work performed under HCEA oversight during the second quarter of 2020 consisted of excavation for storm drain, water, sewer, gas, and electric utilities, and footers, as well as grading, paving, and placement of clean fill.

In the second quarter of 2020, capping work continued throughout Sub-Parcel A3-1 under the direction of EAG. The sections in the south of the substation and north of the warehouse were regraded, filled, and seeded. Following the completion of work in the area south of the substation, the temporary access road was removed, and the area was restored. Manhole collars 6 inches in height were installed on the two electrical manholes north of the warehouse and north of the substation. Excavation was performed in the area north of the substation to provide sufficient depth for clean fill placement below the final grade. While excavating around the electrical structures, several grounding wires were exposed above the reported burial depths. These wires were removed and replaced before placement of the geotextile fabric and clean fill.

Dust Monitoring

Electronic dust monitoring was not performed during the second quarter of 2020 because the majority of the Site is capped. When dust generation was anticipated due to site conditions and planned development work, the General Contractor proactively utilized a water truck to suppress dust. Excessive dust was not observed by the EP.

Soil Management

The EP screened excavated material with a MultiRAE photoionization detector (PID). In the second quarter of 2020, soils exhibiting elevated PID readings and odors were detected on one day. On April 17, 2020, approximately 10 cubic yards of material were segregated on plastic and covered with the same. No elevated PID readings, odors, or staining were detected among any of the other soils inspected during the second quarter of 2020. The majority of screened soils which exhibited no evidence of contamination was either reused in the excavation or was placed under future parking areas. Some excess material was trucked to Parcel B19 for future use, as approved by the MDE. This excess material had been previously brought to the Site as clean fill or slag and placed during initial development activities. Because the material had been approved by the MDE at the time of initial development, and because HCEA screened the material during the excavation activities in the second quarter of 2020, the MDE allowed the material to be used on other parcels without laboratory testing.

Exclusion Zones:

As specified in the Sub-Parcel A3-1 RADWP, all soils excavated within the exclusion zones were segregated, stockpiled, and covered with plastic sheeting. During the second quarter of 2020, approximately 100 cubic yards of material were removed from the exclusion zones and segregated on plastic and covered with the same.

Water Management

During the second quarter of 2020, at the direction of Tradepoint Atlantic personnel, the majority of dewatering discharges associated with the development of Sub-Parcel A3-1 were pumped to a drain identified by Tradepoint Atlantic that conveyed to the Humphreys Creek Wastewater Treatment Plant (HCWWTP). When limited amounts of dewatering were required, the General Contractor conveyed the water to the HCWWTP via truck.

Notable Occurrences

None

If you have questions regarding any information covered in this document, please feel free to contact ARM Group LLC at (410) 290-7775.

Respectfully Submitted,
ARM Group LLC

Melissa Replogle Hritz, E.I.T.
Project Engineer

T. Neil Peters, P.E.
Senior Vice President

ARM Group LLC
Engineers and Scientists

October 28, 2020

Ms. Barbara Brown
Project Coordinator
Maryland Department of the Environment
1800 Washington Boulevard
Baltimore, MD 21230

Re: Quarterly Development Status Update
Third Quarter 2020
Area A: Sub-Parcel A3-1
Tradepoint Atlantic
Sparrows Point, MD 21219

Dear Ms. Brown,

On behalf of Tradepoint Atlantic, ARM Group LLC (ARM) has prepared this Quarterly Development Status Update to document both ongoing and completed development activities performed on Sub-Parcel A3-1 (the Site) during the third quarter of 2020. The Sub-Parcel A3-1 Response and Development Work Plan (RADWP), Revision 3, dated April 24, 2017, and updated June 5, 2017, was approved by the Maryland Department of the Environment (MDE) on April 28, 2017 and by the United States Environmental Protection Agency (USEPA) on June 20, 2017. The development of Sub-Parcel A3-1 generally includes grading, placement of subbase, construction of floor slabs, paving, installation of underground utility and foundation structures, lighting improvements, and landscaping improvements. Development work completed on Sub-Parcel A3-1 prior to July 1, 2018 and between January 1, 2020 and July 31, 2020 is discussed in previously submitted Quarterly Development Status Updates (dated November 1, 2017, January 29, 2018, July 17, 2018, August 21, 2018, October 31, 2018, April 27, 2020, and July 31, 2020). No development work was performed between October 2018 and January 2020. Work recommenced on January 6, 2020. Because no development work was performed in the fourth quarter of 2018 or in any quarter of 2019, daily oversight was not performed, and Quarterly Development Status Updates were not prepared. Development work requiring the oversight of an Environmental Professional (EP) concluded on July 30, 2020.

Piezometer and Well Abandonment

Four permanent wells (RW05-MWI, RW22-MWI, RW17-MW(S), and RW20(-MW(S)) were abandoned during the first quarter of 2020. One permanent well, RW21-MW(P), was installed during the first quarter of 2020.

Additional wells and temporary groundwater collection points (piezometers) installed during or prior to the Phase II Investigation were removed or properly abandoned prior to the third quarter of 2020. The majority of permanent wells and piezometers were retained on the sub-parcel. Additional permanent groundwater monitoring wells were installed within Sub-Parcel A3-1 following the abandonment of the above-mentioned wells and piezometers to facilitate the collection of groundwater data and to monitor the presence of NAPL. Several wells were relocated, re-installed, or renamed, as documented in the Rod and Wire Mill (RWM) Interim Measures (IM) Progress Reports and Supplemental Investigation Report. A total of 79 permanent wells remain on the sub-parcel. Additional details regarding the groundwater monitoring network and ongoing results are presented in the following documents:

- RWM IM Progress Report (Revision 0, dated January 26, 2018)
- RMW IM Progress Report – January 2018 (Revision 0, dated November 2, 2018)
- RMW IM Progress Report – August 2018 (Revision 0, dated November 2, 2018)
- RMW IM Progress Report – December 2018 (Revision 0, dated February 15, 2019)
- RWM IM 2019 Progress Report (February 14, 2020)
- RWM IM Supplemental Investigation Work Plan (Revision 1, dated March 7, 2019)
- RWM IM Supplemental Investigation Report (Revision 1, dated April 8, 2020)

Abandonment records will be provided in the Sub-Parcel A3-1 Development Completion Report.

Environmental Oversight

Full-time oversight was performed by an EP provided by Hillis Carnes Engineering Associates (HCEA) during pre-development (demolition phase) and intrusive development activities. In addition to general oversight to ensure compliance with environmental regulations and the development plans, the EP was responsible for performing dust monitoring and soil screening services during intrusive activities. No development work was performed between October 2018 and January 2020. Work recommenced on January 6, 2020. Development work requiring EP oversight concluded on July 30, 2020.

Development Progress

Development work commenced prior to the third quarter of 2020 with ARCO as the General Contractor. Work to date has included building construction, grading, paving, landscaping work, basin construction, capping, removal of the concrete slab inside the building, excavation for footers, excavation for sewer line inside the building, excavation for utilities (sewer, storm drain, electric, water, gas), excavation for parking lot expansion, marker fabric placement, and clean fill placement. No development work was performed between October 2018 and January 2020. Work recommenced on January 6, 2020. Development work requiring EP oversight concluded on July 30, 2020.

Work performed under HCEA oversight during the third quarter of 2020 consisted of an excavation for a utility conduit, grading, paving, marker fabric placement, and clean fill placement.

In the third quarter of 2020, capping work continued throughout Sub-Parcel A3-1 under the direction of EnviroAnalytics Group and Tradepoint Atlantic. Geotextile and clean fill material were placed in the area north of the substation following the completion of excavation in the area. Corrugated HDPE drain pipes were installed at four locations around the substation and access driveway. Fill consisting of #57 stone was placed within the footprint of the electrical tower directly north of the substation. Following feedback from Baltimore Gas and Electric (BGE), swales around the substation were cleared and regraded to create positive drainage towards two stormwater intake structures located adjacent to Bethlehem Boulevard.

Dust Monitoring

Electronic dust monitoring was not performed during the third quarter of 2020 because the majority of the Site is capped. When dust generation was anticipated due to site conditions and planned development work, the General Contractor proactively utilized a water truck to suppress dust. Excessive dust was not observed by the EP.

Soil Management

The EP screened excavated material with a MultiRAE photoionization detector (PID). No elevated PID readings, odors, or staining were detected among any of the soils inspected from outside the exclusion zones during the third quarter of 2020. The screened soils which exhibited no evidence of contamination were reused as backfill.

Exclusion Zones:

As specified in the Sub-Parcel A3-1 RADWP, all soils excavated within the exclusion zones were segregated, stockpiled, and covered with plastic sheeting. During the third quarter of 2020, approximately 150 cubic yards of material were removed from the Former East Pond Exclusion Zone and segregated on plastic and covered with the same. The segregated soil was stockpiled south of the FedEx site. All soil segregated during the development completed in 2020 has been characterized with laboratory testing. The soil stockpiles will be transported to Greys Landfill or reused beneath capped areas, as approved by the MDE. Additional details will be provided in the Sub-Parcel A3-1 Development Completion Report.

Water Management

No dewatering was required during the third quarter of 2020.

Notable Occurrences

None

If you have questions regarding any information covered in this document, please feel free to contact ARM Group LLC at (410) 290-7775.

Respectfully Submitted,
ARM Group LLC

Melissa Replogle Hritz, E.I.T.
Project Engineer

T. Neil Peters, P.E.
Senior Vice President

APPENDIX G

HILLIS-CARNES
ENGINEERING ASSOCIATES

Memo

To: Mr. Peter Haid – Tradepoint Atlantic

From: Ms. Gina Galimberti

cc: Mr. Keith Progin

Date: July 12, 2017

Re: Sub-Parcel A3-1 - Pre-Construction Meeting

On May 17, 2017, a pre-construction meeting for Sub-Parcel A3-1 was held at the Tradepoint office at 1600 Sparrows Point Boulevard. In attendance were:

- Mr. Peter Haid – Environmental Director with Tradepoint Atlantic
- Mr. Joe Rook – Project Manager with Arco Murray (General Contractor)
- Mr. Tom Strickland – Operations Manager with Arco Murray
- Mr. James Calenda – Project Manager with EnviroAnalytics Group
- Mr. Keith Progin – Senior Environmental Project Manager with Hillis-Carnes
- Ms. Gina Galimberti – Environmental Services Manager with Hillis-Carnes
- Mr. Mike Vogler – Senior VP of Site Operations with Tradepoint (present during dewatering discussion)

During this meeting, the Environmental Professional roles that will be performed by Hillis-Carnes during the applicable portions of the development project were discussed. The roles generally include: a) monitoring of excavated soil; b) air monitoring for particulate dust; and c) monitoring of dewatering activity. A summary of these roles was provided to the attendees and is attached to this memorandum.

Sparrows Point Terminal - Parcel A3
Sub-Parcel A3-1

Hillis-Carnes Engineering Associates, Inc. (HCEA) - Environmental Professional (EP) Roles

May 17, 2017

Parcel A3 at Sparrows Point Terminal has an area of 64 acres. The Development Area of Parcel A3 consists of 54.7 acres located east of Riverside Drive. This Development Area of Parcel A3 is referred to as Sub-Parcel A3-1. The remaining 9.3 acres of Parcel A3, located west of Riverside Drive, will be addressed in future work and is therefore excluded from the current activities. HCEA is acting as the Environmental Professional (EP) for Sub-Parcel A3-1. The EP's roles are as follows.

- **Monitoring of Excavated Soils**

HCEA is monitoring the environmental condition of soil as it is being excavated, generally during the following activities:

- Site grading, primarily associated with the construction of storm water basins/ponds;
- Excavation of underground utility trenches for new utilities;
- Excavation of foundation structures;
- Excavation for installation of light poles; and
- Excavation for installation of inlet/manholes.

The monitoring includes the following:

- Soils will be monitored with a calibrated photoionization detector (PID) for evidence of volatile organic compounds (VOCs). Evidence of VOCs is considered to be sustained PID readings greater than 10 units on the PID;
- Soils will be inspected for visual indication of environmental impact (i.e., staining apparently due to impact);
- Soils will be inspected for olfactory indication of environment impact (i.e., odors apparently due to impact);
- Soils will be inspected for the presence of waste materials; and/or
- Soils will be inspected for evidence of free oil (i.e., oil which could potentially be drained or otherwise extracted from the soil and which is often referred to as "non-aqueous phase liquids" or NAPL)

If soils meeting any of the criteria above are encountered, HCEA will coordinate with the General Contractor and their Subcontractor(s) to segregate those materials by placing the materials on plastic sheeting (6-mil minimum) and covering the material with plastic sheeting at the end of each work day.

With regard to NAPL as described previously in the last bullet above, if NAPL is encountered in the utility trench, the extents of the impacts shall be delineated by excavating trenches perpendicular to the utility alignment to examine the soil for physical evidence of NAPL. If NAPL is confirmed to be present, trench plugs shall be constructed in the portion of the utility trench where NAPL is confirmed.

- **Air Monitoring During the Development Phase**

HCEA is on-site conducting daily air monitoring for total dust. This includes a work area monitor and two perimeter monitors. Specifically, HCEA's on-site personnel will utilize a monitor to provide mass dust readings throughout the work day within the work area, or immediately downwind of the work area, depending on site conditions and activity. In addition to the work area monitoring, monitors will be stationed daily at two of the four perimeters of Sub-Parcel A3-1. The perimeters will correspond to those that are upwind and downwind of the work area, based on the predicted prevailing wind direction for that day.

Where dust readings are sustained above the total dust action limit of 3.0 milligrams per cubic meter of air (mg/m^3), HCEA will coordinate with the General Contractor to discuss potential methods for supplementing the standard dust suppression methods in order to address the dust levels. Such methods could include, but will not necessary be limited to, an increase in the frequency of water trucks that are spraying roads, covering of soil piles with plastic sheeting, etc.

- **Monitoring of Dewatering Activity**

If dewatering becomes necessary during the Development Phase of the project, the water must be conveyed to the Humphrey Creek Waste Water Treatment Plant (HCWWTP). HCEA will document dewatering activity. If laboratory analysis of water produced as a result of the dewatering becomes necessary, HCEA can collect water samples for transport to an analytical laboratory.

HILLIS-CARNES
ENGINEERING ASSOCIATES

Memo

To: Mr. Peter Haid – Tradepoint Atlantic

From: Mr. Keith Progin

Date: January 7, 2020

Re: Sub-Parcel A3-1 Addition - Pre-Construction Meeting

On January 7, 2020, a pre-construction meeting for Sub-Parcel A3-1 Addition was held at the Tradepoint office at 1600 Sparrows Point Boulevard. In attendance were:

- Mr. Matthew Newman – Tradepoint Atlantic
- Mr. Ethan Zweig – Tradepoint Atlantic
- Mr. Rod Bice – ARCO
- Mr. Gordon Timmons - ARCO
- Mr. Keith Progin – HCEA

During this meeting, the Environmental Professional roles that will be performed by Hillis-Carnes during the applicable portions of the development project were discussed. The roles generally include: a) monitoring of excavated soil; b) air monitoring for particulate dust; c) personal protective equipment; and d) monitoring of dewatering activity. A summary of these roles was provided to the attendees.

APPENDIX H

Keith Progin

From: Gina L. Galimberti
Sent: Wednesday, April 12, 2017 1:51 PM
To: 'Pete Haid'
Subject: RE: Back River Soil

Pete – I spoke with Barbara and she confirmed that the soil from the Back River WWTP is approved for use under areas to be paved and also for use as VCP-approved clean fill for capping.
She is getting back to me on what analyses might be required for the stockpile of soils that has been created due to PID readings. I will hear from her by next Monday at the latest.
Gina

Gina Galimberti | Environmental Services Manager
HILLIS-CARNES ENGINEERING ASSOCIATES

Cell (410) 991-2867
Phone +1 (410) 880-4788 X1146
Fax +1 (410) 880-4098

From: Pete Haid [mailto:phaid@tradepointatlantic.com]
Sent: Wednesday, April 12, 2017 12:18 PM
To: Gina L. Galimberti
Subject: Back River Soil

Gina:

Any luck on getting through to Barbara on the Back River Soil question?

Thanks.

Pete

Keith Progin

From: Barbara Brown -MDE- <barbara.brown1@maryland.gov>
Sent: Tuesday, February 27, 2018 9:45 AM
To: Keith Progin
Cc: Jennifer Sohns -MDE- (jennifer.sohns@maryland.gov); Pete Haid
Subject: Re: A3-1 Topsoil Sampliing Plan

Hello Keith

The material sampled is acceptable for use as topsoil at parcel A3-1, this approval is only applicable to the stockpile sampled. The material is not approved for any area not designated for industrial land use.

If you have any questions regarding this approval please contact me

Barbara Brown
MDE Project Coordinator

On Mon, Feb 26, 2018 at 2:53 PM, Keith Progin <kprogin@hcea.com> wrote:

Barbara – per our work plan and your approval to sample below, please see the attached laboratory report for the five composite samples collected from the topsoil stockpile for use on A3-1.

Thanks!

Keith Progin | Project Manager, Environmental Division
HILLIS-CARNES ENGINEERING ASSOCIATES

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Phone +1 (410) 880-4788 X1145
Fax +1 (410) 880-4098

From: Barbara Brown -MDE- [mailto:barbara.brown1@maryland.gov]
Sent: Friday, February 9, 2018 3:47 PM
To: Keith Progin
Cc: Jennifer Sohns -MDE- (jennifer.sohns@maryland.gov); Pete Haid
Subject: Re: A3-1 Topsoil Sampliing Plan

Hello Keith

Add PCB's, Full SVOC list-8270 not PAHs, TPH DRO, not oil n grease, depending on size of pile-need to get deeper than 1-2 feet for a few of the composite points..I'm sure they have a backhoe or something similar to get inside pile...Otherwise ok.

Ensure that nothing is added or removed from pile after sampling. Load Tickets must be accurate and legible for the completion report.

Also a few photographs of piles and sampling would be useful.

If you have any questions please contact me.

On Fri, Feb 9, 2018 at 3:26 PM, Keith Progin <kprogin@hcea.com> wrote:

Please see the attached Sampling Plan for approximately 5,000 yards of topsoil stockpiled at Chesterfield Farms/Reliable Contracting in Gambrills Maryland. I've also attached the affidavit that I believe you've already seen. The General Contractor at A3-1 is requesting using this topsoil in landscaped areas as part of the cap.

Please let me know if you have any questions or comments prior to sample collection.

Thank you!

Keith Progin | Project Manager, Environmental Division

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HILLIS-CARNES
ENGINEERING ASSOCIATES

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Barbara Brown

MDE-LRP-VCP Section Head

direct 410 537 3212

general 410 537 3493

--
Barbara Brown
MDE-LRP-VCP Section Head
direct 410 537 3212
general 410 537 3493

Click here to complete a three question customer experience survey.

Keith Progin

From: Barbara Brown -MDE- <barbara.brown1@maryland.gov>
Sent: Tuesday, March 27, 2018 10:32 AM
To: Keith Progin
Cc: Jennifer Sohns -MDE-
Subject: Re: A3-1 Clay Material for Basin

Hello Keith

The material is acceptable for use for the basin at A3-1. This approval is only for the material in the stockpile that was tested.

If you have any additional questions please contact me.

Barbara Brown

On Thu, Mar 22, 2018 at 11:54 AM, Keith Progin <kprogin@hcea.com> wrote:

Please see the attached laboratory results for the clay soil proposed for use in the basin at A3-1. I've also included the soil classification performed by HCEA as well as the permeability test run by HCEA since 2-feet of clay will be used in place of a liner. The permeability test showed a 2.3E-07 at 85% compaction. Please confirm that this material is approved for use in the basin.

Thank you!

Keith Progin | Project Manager, Environmental Division
HILLIS-CARNES ENGINEERING ASSOCIATES

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From: Jennifer Sohns -MDE- [mailto:jennifer.sohns@maryland.gov]
Sent: Tuesday, February 20, 2018 11:49 AM
To: Keith Progin
Cc: Barbara Brown -MDE-
Subject: Re: A3-1 Clay Material for Basin

Hey Keith,

We have reviewed the plan for sampling clay material from the Tanyard Cove development in Pasadena, MD. The plan is approved with the following comments:

Depending on size of pile-need to get deeper than 1-2 feet for a few of the composite points..I'm sure they have a backhoe or something similar to get inside pile.

Ensure that nothing is added or removed from pile after sampling. Load Tickets must be accurate and legible for the completion report.

Also a few photographs of piles and sampling would be useful.

If you have any questions please contact me.

Thank you,

Jennifer Sohns

On Mon, Feb 19, 2018 at 4:03 PM, Keith Progin <kprogin@hcea.com> wrote:

Barbara – per your request below, please see the attached Sampling Plan for the clay proposed for use in the sediment basin at A3-1.

Thanks!

Keith Progin | Project Manager, Environmental Division
HILLIS-CARNES ENGINEERING ASSOCIATES

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Phone +1 (410) 880-4788 X1145
Fax +1 (410) 880-4098

From: Barbara Brown -MDE- [mailto:barbara.brown1@maryland.gov]
Sent: Tuesday, February 13, 2018 1:24 PM
To: Keith Progin; Gina L. Galimberti
Cc: Jennifer Sohns -MDE- (jennifer.sohns@maryland.gov); Pete Haid
Subject: Re: A3-1 Clay Material for Basin

Hello All

Please disregard the previous email...sent in error- not done typing yet-The material does test as a clay and would be acceptable as a liner but Tanyard Cove is a housing development not a quarry directly supplying the material therefore the certification from a third party intermediary is not acceptable. Therefore, sampling would be required to use at Sparrows Point..

If you wish to use this material provide additional information on the size, location and source of stockpile and a sampling plan.

Barbara Brown

On Tue, Feb 13, 2018 at 1:11 PM, Barbara Brown -MDE- <barbara.brown1@maryland.gov> wrote:

Hello Keith

The clay material is acceptable for the liner. Please provide a brief description of the geotechnical testing to be preformed to ensure that the final material placement meets the permeability requirements.

Barbara Brown

On Tue, Feb 6, 2018 at 3:24 PM, Keith Progin <kprogin@hcea.com> wrote:

The plans for the sediment basin at A3-1 have eliminated the need for a liner and called for 2-feet of clay. Please see the attached clean fill affidavit and soil proctor for clay from the Tanyard Cove facility proposed for use in the sediment basin at A3-1.

Thanks!

Keith Progin | Project Manager, Environmental Division

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ENGINEERING ASSOCIATES

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Barbara Brown

MDE-LRP-VCP Section Head

direct 410 537 3212

general 410 537 3493

--

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MDE-LRP-VCP Section Head

direct 410 537 3212

general 410 537 3493

Click here to complete a three question customer experience survey.

--

Jennifer Sohns

Click here to complete a three question customer experience survey.

--

Barbara Brown
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direct 410 537 3212
general 410 537 3493

Click here to complete a three question customer experience survey.

Keith Progin

From: Barbara Brown -MDE- <barbara.brown1@maryland.gov>
Sent: Wednesday, May 16, 2018 1:57 PM
To: Keith Progin
Cc: Jennifer Sohns -MDE- (jennifer.sohns@maryland.gov); phaid@tradepointatlantic.com
Subject: Re: SPT - Northern and Southern Sewer Clean Fill Requests

Hello Keith

The stone material from the Texas and Churchville Quarry as documented in the letters from Martin Marietta is acceptable for use at the Sparrows Point site as clean fill material on either commercial or industrial land use areas.

On Fri, May 11, 2018 at 3:09 PM, Keith Progin <kprogin@hcea.com> wrote:

> Please see the attached affidavits for the proposed clean fill to be used during the northern and southern sewer lines. The material comes from Martin Marietta (formerly Blue Grass). Please let me know if this material is suitable.

Thanks!

Keith Progin | Project Manager, Environmental Division

HILLIS-CARNES ENGINEERING ASSOCIATES

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Barbara Brown
MDE-LRP-VCP Section Head
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general 410 537 3493

Click here to complete a three question customer experience survey.

APPENDIX I

Analytical Report for

Hillis Carnes Engineering Associates

Certificate of Analysis No.: 17071916

Project Manager: Keith Progin

Project Name : A3-1 Demo

Project Location: Sparrows Point, MD

Project ID : 16280B

July 24, 2017

Phase Separation Science, Inc.

6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

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

PHASE SEPARATION SCIENCE, INC.

July 24, 2017

Keith Progin
Hillis Carnes Engineering Associates
10975 Guilford Road, Ste. A
Annapolis Junction, MD 20701

Reference: PSS Work Order(s) No: **17071916**
Project Name: A3-1 Demo
Project Location: Sparrows Point, MD
Project ID.: 16280B

Dear Keith Progin :

This report includes the analytical results from the analyses performed on the samples received under the project name referenced above and identified with the Phase Separation Science (PSS) Work Order(s) numbered **17071916**.

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

PSS reserves the right to return any unused samples, extracts or related solutions. Otherwise, the samples are scheduled for disposal, without any further notice, on August 23, 2017, with the exception of air canisters which are cleaned immediately following analysis. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt , the request will be acknowledged by PSS, thus extending the storage period.

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

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

Sincerely,

Dan Prucnal
Laboratory Manager

Sample Summary

Client Name: Hillis Carnes Engineering Associates

Project Name: A3-1 Demo

Work Order Number(s): 17071916

Project ID: 16280B

The following samples were received under chain of custody by Phase Separation Science (PSS) on 07/19/2017 at 03:45 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17071916-001	WC-1	SOIL	07/19/17 11:00

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

Notes:

1. The presence of a common laboratory contaminant such as methylene chloride may be considered a possible laboratory artifact. Where observed, appropriate consideration of data should be taken.
2. Unless otherwise noted in the case narrative, results are reported on a dry weight basis with the exception of pH, flashpoint, moisture, and paint filter test.
3. Drinking water samples collected for the purpose of compliance with SDWA may not be suitable for their intended use unless collected by a certified sampler [COMAR 26.08.05.07.C.2].
4. The analyses of 1,2-dibromo-3-chloropropane (DBCP) and 1,2-dibromoethane (EDB) by EPA 524.2 and calcium, magnesium, sodium and iron by EPA 200.8 are not currently promulgated for use in testing to meet the Safe Drinking Water Act and as such cannot be used for compliance purposes. The listings of the current promulgated methods for testing in compliance with the Safe Drinking Water Act can be found in the 40 CFR part 141.1, for the primary drinking water contaminates, and part 141.3, for the secondary drinking water contaminates.
5. Sample prepared under EPA 3550C with concentrations greater than 20 mg/Kg should employ the microtip extraction procedure if required to meet data quality objectives.
6. The analysis of acrolein by EPA 624 must be analyzed within three days of sampling unless pH is adjusted to 4-5 units [40 CFR part 136.3(e)].
7. Method 180.1, The Determination of Turbidity by Nephelometry, recommends samples over 40 NTU be diluted until the turbidity falls below 40 units. Routine samples over 40 NTU may not be diluted as long as the data quality objectives are not affected.
8. Alkalinity results analyzed by EPA 310.2 that are reported by dilution are estimated and are not in compliance with method requirements.

Standard Flags/Abbreviations:

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

Certifications:

NELAP Certifications: PA 68-03330, VA 460156
State Certifications: MD 179, WV 303
Regulated Soil Permit: P330-12-00268
NSWC USCG Accepted Laboratory
LDBE MWAA LD1997-0041-2015

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17071916

Hillis Carnes Engineering Associates, Annapolis Junction, MD

July 24, 2017

Project Name: A3-1 Demo
Project Location: Sparrows Point, MD
Project ID: 16280B

Sample ID: WC-1 **Date/Time Sampled: 07/19/2017 11:00** **PSS Sample ID: 17071916-001**
Matrix: SOIL **Date/Time Received: 07/19/2017 15:45** **% Solids: 92**

Oil and Grease — Analytical Method: EPA 9071 B-Modified

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Oil & Grease, Total Recovered	ND	mg/kg	54		1	07/20/17	07/20/17 10:45	1022

Total Petroleum Hydrocarbons - DRO — Analytical Method: SW-846 8015 C — Preparation Method: SW3550C

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
TPH-DRO (Diesel Range Organics)	**31**	mg/kg	11		1	07/20/17	07/24/17 10:35	1059

Polychlorinated Biphenyls — Analytical Method: SW-846 8082 A — Preparation Method: SW3550C — Clean up Method: SW846 3665A

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
PCB-1016	ND	mg/kg	0.054		1	07/19/17	07/20/17 14:45	1029
PCB-1221	ND	mg/kg	0.054		1	07/19/17	07/20/17 14:45	1029
PCB-1232	ND	mg/kg	0.054		1	07/19/17	07/20/17 14:45	1029
PCB-1242	ND	mg/kg	0.054		1	07/19/17	07/20/17 14:45	1029
PCB-1248	ND	mg/kg	0.054		1	07/19/17	07/20/17 14:45	1029
PCB-1254	ND	mg/kg	0.054		1	07/19/17	07/20/17 14:45	1029
PCB-1260	**0.058**	mg/kg	0.054		1	07/19/17	07/20/17 14:45	1029

Sample ID: WC-1 **Date/Time Sampled: 07/19/2017 11:00** **PSS Sample ID: 17071916-001**
Matrix: SOIL **Date/Time Received: 07/19/2017 15:45**

TCLP Metals — Analytical Method: SW-846 6020 A — Preparation Method: 3010A

	Result	Units	RL	Flag	Dil	TCLP Limit	Prepared	Analyzed	Analyst
Arsenic	ND	mg/L	0.050		1	5	07/20/17	07/20/17 19:05	1051
Barium	ND	mg/L	1.0		1	100	07/20/17	07/20/17 19:05	1051
Cadmium	ND	mg/L	0.050		1	1	07/20/17	07/20/17 19:05	1051
Chromium	ND	mg/L	0.050		1	5	07/20/17	07/20/17 19:05	1051
Lead	ND	mg/L	0.050		1	5	07/20/17	07/20/17 19:05	1051
Mercury	ND	mg/L	0.0020		1	0.2	07/20/17	07/20/17 19:05	1051
Selenium	ND	mg/L	0.050		1	1	07/20/17	07/20/17 19:05	1051
Silver	ND	mg/L	0.050		1	5	07/20/17	07/20/17 19:05	1051

Case Narrative Summary

Client Name: Hillis Carnes Engineering Associates

Project Name: A3-1 Demo

Work Order Number(s): 17071916

Project ID: 16280B

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

The analyses of chlorine, pH, dissolved oxygen, temperature and sulfite for drinking water and non-potable samples tested for compliance have a maximum holding time of 15 minutes. As such, all laboratory analyses for these analytes exceed holding times.

Matrix spike and matrix spike duplicate analyses may not be performed due to insufficient sample quantity. In these instances, a laboratory control sample and laboratory control sample duplicate are analyzed unless otherwise noted or specified in the method.

Sample Receipt:

All sample receipt conditions were acceptable.

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

EPA 9071 B-Modified: Oil & Grease, Total Recovered

Analytical Data Package Information Summary

Work Order(s): 17071916
Report Prepared For: Hillis Carnes Engineering Associates, Annapo
Project Name: A3-1 Demo
Project Manager: Keith Progin

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
EPA 9071 B-Modified	WC-1	Initial	17071916-001	1022	S	144532	144532	07/19/2017	07/20/2017 10:45	07/20/2017 10:45
	144532-1-BKS	BKS	144532-1-BKS	1022	S	144532	144532	--------	07/20/2017 10:45	07/20/2017 10:45
	144532-1-BLK	BLK	144532-1-BLK	1022	S	144532	144532	--------	07/20/2017 10:45	07/20/2017 10:45
	144532-1-BSD	BSD	144532-1-BSD	1022	S	144532	144532	--------	07/20/2017 10:45	07/20/2017 10:45
	WC-1 S	MS	17071916-001 S	1022	S	144532	144532	07/19/2017	07/20/2017 10:45	07/20/2017 10:45
	WC-1 SD	MSD	17071916-001 SD	1022	S	144532	144532	07/19/2017	07/20/2017 10:45	07/20/2017 10:45
SM2540G	WC-1	Initial	17071916-001	1062	S	144601	144601	07/19/2017	07/21/2017 16:23	07/21/2017 16:23
SW-846 6020 A	WC-1	Initial	17071916-001	1051	W	67049	144567	07/19/2017	07/20/2017 11:00	07/20/2017 19:05
	67049-1-BKS	BKS	67049-1-BKS	1051	W	67049	144567	--------	07/20/2017 11:00	07/20/2017 17:25
	67049-1-BLK	BLK	67049-1-BLK	1051	W	67049	144567	--------	07/20/2017 11:00	07/20/2017 17:18
	S.B301+MS/MSN S	MS	17071911-002 S	1051	W	67049	144567	07/19/2017	07/20/2017 11:00	07/20/2017 17:38
	S.B301+MS/MSN SD	MSD	17071911-002 SD	1051	W	67049	144567	07/19/2017	07/20/2017 11:00	07/20/2017 17:44
SW-846 8015 C	S.B301+MS/MSN S	MS	17071911-002 S	1045	S	67051	144581	07/19/2017	07/20/2017 13:46	07/21/2017 09:58
	S.B301+MS/MSN SD	MSD	17071911-002 SD	1045	S	67051	144581	07/19/2017	07/20/2017 13:46	07/21/2017 10:22
	67051-1-BKS	BKS	67051-1-BKS	1045	S	67051	144582	--------	07/20/2017 13:46	07/21/2017 09:58
	67051-1-BLK	BLK	67051-1-BLK	1045	S	67051	144582	--------	07/20/2017 13:46	07/21/2017 09:33
	67051-1-BSD	BSD	67051-1-BSD	1045	S	67051	144582	--------	07/20/2017 13:46	07/21/2017 10:22
	WC-1	Initial	17071916-001	1059	S	67051	144629	07/19/2017	07/20/2017 13:46	07/24/2017 10:35
SW-846 8082 A	WC-1	Initial	17071916-001	1029	S	67040	144573	07/19/2017	07/19/2017 14:56	07/20/2017 14:45
	67040-1-BKS	BKS	67040-1-BKS	1029	S	67040	144573	--------	07/19/2017 14:56	07/20/2017 10:04
	67040-1-BLK	BLK	67040-1-BLK	1029	S	67040	144573	--------	07/19/2017 14:56	07/20/2017 09:35
	67040-1-BSD	BSD	67040-1-BSD	1029	S	67040	144573	--------	07/19/2017 14:56	07/20/2017 10:32
	S.B301+MS/MSN S	MS	17071911-002 S	1029	S	67040	144573	07/19/2017	07/19/2017 14:56	07/20/2017 11:00
	S.B301+MS/MSN SD	MSD	17071911-002 SD	1029	S	67040	144573	07/19/2017	07/19/2017 14:56	07/20/2017 11:28

PHASE SEPARATION SCIENCE, INC.

QC Summary 17071916

Hillis Carnes Engineering Associates
A3-1 Demo

Analytical Method: SW-846 8082 A Prep Method: SW3550C
Seq Number: 144573 Matrix: Soil Date Prep: 07/19/2017
PSS Sample ID: 17071916-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Decachlorobiphenyl	83		61-150	%	07/20/17 14:45
Tetrachloro-m-xylene	66		42-142	%	07/20/17 14:45

Analytical Method: SW-846 8015 C Prep Method: SW3550C
Seq Number: 144629 Matrix: Soil Date Prep: 07/20/2017
PSS Sample ID: 17071916-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
o-Terphenyl	92		34-133	%	07/24/17 10:35

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

PHASE SEPARATION SCIENCE, INC.

QC Summary 17071916

Hillis Carnes Engineering Associates
A3-1 Demo

Analytical Method: EPA 9071 B-Modified
Seq Number: 144532 Matrix: Solid
MB Sample Id: 144532-1-BLK LCS Sample Id: 144532-1-BKS LCSD Sample Id: 144532-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Oil & Grease, Total Recovered	<49.96	799.4	743.4	93	751.7	94	78-114	1	28	mg/kg	07/20/17 10:45	

Analytical Method: EPA 9071 B-Modified
Seq Number: 144532 Matrix: Soil
Parent Sample Id: 17071916-001 MS Sample Id: 17071916-001 S MSD Sample Id: 17071916-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Oil & Grease, Total Recovered	<54.26	868.2	803.1	93	808	93	78-114	1	28	mg/kg	07/20/17 10:45	

Analytical Method: SW-846 6020 A Prep Method: SW3010A
Seq Number: 144567 Matrix: Water Date Prep: 07/20/17
MB Sample Id: 67049-1-BLK LCS Sample Id: 67049-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Arsenic	<0.05000	0.4000	0.4139	103	80-120	mg/L	07/20/17 17:25	
Barium	<1.000	2.000	2.171	109	80-120	mg/L	07/20/17 17:25	
Cadmium	<0.05000	0.4000	0.4144	104	80-120	mg/L	07/20/17 17:25	
Chromium	<0.05000	0.4000	0.3901	98	80-120	mg/L	07/20/17 17:25	
Lead	<0.05000	0.4000	0.4086	102	80-120	mg/L	07/20/17 17:25	
Mercury	<0.002000	0.01000	0.01000	100	80-120	mg/L	07/20/17 17:25	
Selenium	<0.05000	0.4000	0.3924	98	80-120	mg/L	07/20/17 17:25	
Silver	<0.05000	0.4000	0.4120	103	80-120	mg/L	07/20/17 17:25	

Analytical Method: SW-846 8082 A Prep Method: SW3550C
Seq Number: 144573 Matrix: Solid Date Prep: 07/19/17
MB Sample Id: 67040-1-BLK LCS Sample Id: 67040-1-BKS LCSD Sample Id: 67040-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
PCB-1016	<0.04921	0.4921	0.4006	81	0.3982	80	60-110	1	25	mg/kg	07/20/17 10:04	
PCB-1260	<0.04921	0.4921	0.3391	69	0.3455	69	60-98	2	25	mg/kg	07/20/17 10:04	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Decachlorobiphenyl	80		82		82		61-150	%	07/20/17 10:04
Tetrachloro-m-xylene	79		83		81		42-142	%	07/20/17 10:04

PHASE SEPARATION SCIENCE, INC.

QC Summary 17071916

Hillis Carnes Engineering Associates
A3-1 Demo

Analytical Method: SW-846 8015 C Prep Method: SW3550C
Seq Number: 144582 Matrix: Solid Date Prep: 07/20/17
MB Sample Id: 67051-1-BLK LCS Sample Id: 67051-1-BKS LCSD Sample Id: 67051-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
TPH-DRO (Diesel Range Organics)	<9.875	32.92	29.80	91	31.37	93	54-123	5	25	mg/kg	07/21/17 09:58	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
o-Terphenyl	74		81		84		34-133	%	07/21/17 09:58

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

PHASE SEPARATION SCIENCE, INC.

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

(1)
CLIENT: Hillis-Carnes | OFFICE LOC.: AJ
PROJECT MGR: Keith Progin | PHONE NO.: (410) 880-4788
EMAIL: kprog2@hcen.com | FAX NO.: ( )
PROJECT NAME: A3-1 Demo | PROJECT NO.: 16280B
SITE LOCATION: Sparrows Point, MD | P.O. NO.:
SAMPLERS: K. Progin

PSS Work Order #: 170719160 | PAGE 1 OF 1

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

(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX (See Codes)	No. CONTAINERS	SAMPLE TYPE C = COMP G = GRAB	Preservatives Used	Analysis/ Method Required (3) O.I and Grease	PCBs (8080A)	TCLP Metals	TPH-DRO	REMARKS
1	WC-1	7/19/17	11:00am	Soil	3	C		✓	✓	—	✓	

(5)

Relinquished By: (1)	Date	Time	Received By:
[signature]	7/19/17	2:15pm	[signature]
Relinquished By: (2)	Date	Time	Received By:
[signature]	7/19/17	15:45	Barb Weber
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

(4)
Requested Turnaround Time
☐ 5-Day ☑ 3-Day ☐ 2-Day
☐ Next Day ☐ Emergency ☐ Other

Data Deliverables Required:

# of Coolers: 1
Custody Seal: Abs
Ice Present: Pro Temp: 3-4°C
Shipping Carrier: Client

Special Instructions:

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

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17071916	**Received By**	Barb Weber
Client Name	Hillis Carnes Engineering Associates	**Date Received**	07/19/2017 03:45:00 PM
Project Name	A3-1 Demo	**Delivered By**	Client
Project Number	16280B	**Tracking No**	Not Applicable
Disposal Date	08/23/2017	**Logged In By**	Barb Weber

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	4
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No

Documentation

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

Sample Container

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

Total No. of Samples Received 1 Total No. of Containers Received 3

Preservation

Total Metals	(pH<2)	N/A
Dissolved Metals, filtered within 15 minutes of collection	(pH<2)	N/A
Orthophosphorus, filtered within 15 minutes of collection		N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, DOC (field filtered), COD, Phenols	(pH<2)	N/A
TOX, TKN, NH3, Total Phos	(pH<2)	N/A
VOC, BTEX (VOA Vials Rcvd Preserved)	(pH<2)	N/A
Do VOA vials have zero headspace?		N/A
624 VOC (Rcvd at least one unpreserved VOA vial)		N/A
524 VOC (Rcvd with trip blanks)	(pH<2)	N/A

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

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

Samples Inspected/Checklist Completed By: Barb Weber Date: 07/19/2017

Barb Weber

PM Review and Approval: Amber J Confer Date: 07/20/2017

Amber Confer

Analytical Report for

Hillis Carnes Engineering Associates

Certificate of Analysis No.: 17091106

Project Manager: Keith Progin

Project Name : SPT A3-1

September 14, 2017

Phase Separation Science, Inc.

6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

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

PHASE SEPARATION SCIENCE, INC.

September 14, 2017

Keith Progin
Hillis Carnes Engineering Associates
10975 Guilford Road, Ste. A
Annapolis Junction, MD 20701

Reference: PSS Work Order(s) No: **17091106**
Project Name: SPT A3-1

Dear Keith Progin :

This report includes the analytical results from the analyses performed on the samples received under the project name referenced above and identified with the Phase Separation Science (PSS) Work Order(s) numbered **17091106**.

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

PSS reserves the right to return any unused samples, extracts or related solutions. Otherwise, the samples are scheduled for disposal, without any further notice, on October 16, 2017, with the exception of air canisters which are cleaned immediately following analysis. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt , the request will be acknowledged by PSS, thus extending the storage period.

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

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

Sincerely,

Cathy Thompson
QA Officer

Sample Summary

Client Name: Hillis Carnes Engineering Associates

Project Name: SPT A3-1

Work Order Number(s): 17091106

The following samples were received under chain of custody by Phase Separation Science (PSS) on 09/11/2017 at 11:40 am

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17091106-001	C-1	SOIL	09/11/17 10:45

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

Notes:

1. The presence of a common laboratory contaminant such as methylene chloride may be considered a possible laboratory artifact. Where observed, appropriate consideration of data should be taken.
2. Unless otherwise noted in the case narrative, results are reported on a dry weight basis with the exception of pH, flashpoint, moisture, and paint filter test.
3. Drinking water samples collected for the purpose of compliance with SDWA may not be suitable for their intended use unless collected by a certified sampler [COMAR 26.08.05.07.C.2].
4. The analyses of 1,2-dibromo-3-chloropropane (DBCP) and 1,2-dibromoethane (EDB) by EPA 524.2 and calcium, magnesium, sodium and iron by EPA 200.8 are not currently promulgated for use in testing to meet the Safe Drinking Water Act and as such cannot be used for compliance purposes. The listings of the current promulgated methods for testing in compliance with the Safe Drinking Water Act can be found in the 40 CFR part 141.1, for the primary drinking water contaminates, and part 141.3, for the secondary drinking water contaminates.
5. Sample prepared under EPA 3550C with concentrations greater than 20 mg/Kg should employ the microtip extraction procedure if required to meet data quality objectives.
6. The analysis of acrolein by EPA 624 must be analyzed within three days of sampling unless pH is adjusted to 4-5 units [40 CFR part 136.3(e)].
7. Method 180.1, The Determination of Turbidity by Nephelometry, recommends samples over 40 NTU be diluted until the turbidity falls below 40 units. Routine samples over 40 NTU may not be diluted as long as the data quality objectives are not affected.
8. Alkalinity results analyzed by EPA 310.2 that are reported by dilution are estimated and are not in compliance with method requirements.

Standard Flags/Abbreviations:

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

Certifications:

NELAP Certifications: PA 68-03330, VA 460156
State Certifications: MD 179, WV 303
Regulated Soil Permit: P330-12-00268
NSWC USCG Accepted Laboratory
LDBE MWAA LD1997-0041-2015

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

PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17091106

Hillis Carnes Engineering Associates, Annapolis Junction, MD

September 14, 2017

Project Name: SPT A3-1

Sample ID: C-1 **Date/Time Sampled: 09/11/2017 10:45** **PSS Sample ID: 17091106-001**
Matrix: SOIL **Date/Time Received: 09/11/2017 11:40** **% Solids: 85**

Oil and Grease — Analytical Method: EPA 9071 B-Modified

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Oil & Grease, Total Recovered	**78**	mg/kg	59		1	09/13/17	09/13/17 09:24	1022

Total Petroleum Hydrocarbons - DRO — Analytical Method: SW-846 8015 C — Preparation Method: SW3550C

DF/HF - No. 2/diesel fuel and heavier fuel/oil patterns observed in sample.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
TPH-DRO (Diesel Range Organics)	**40**	mg/kg	12	DF	1	09/12/17	09/13/17 02:52	1059

Polychlorinated Biphenyls — Analytical Method: SW-846 8082 A — Preparation Method: SW3550C — Clean up Method: SW846 3665A

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
PCB-1016	ND	mg/kg	0.060		1	09/11/17	09/12/17 20:37	1029
PCB-1221	ND	mg/kg	0.060		1	09/11/17	09/12/17 20:37	1029
PCB-1232	ND	mg/kg	0.060		1	09/11/17	09/12/17 20:37	1029
PCB-1242	ND	mg/kg	0.060		1	09/11/17	09/12/17 20:37	1029
PCB-1248	ND	mg/kg	0.060		1	09/11/17	09/12/17 20:37	1029
PCB-1254	ND	mg/kg	0.060		1	09/11/17	09/12/17 20:37	1029
PCB-1260	ND	mg/kg	0.060		1	09/11/17	09/12/17 20:37	1029

Sample ID: C-1 **Date/Time Sampled: 09/11/2017 10:45** **PSS Sample ID: 17091106-001**
Matrix: SOIL **Date/Time Received: 09/11/2017 11:40**

TCLP Metals — Analytical Method: SW-846 6020 A — Preparation Method: 3010A

	Result	Units	RL	Flag	Dil	TCLP Limit	Prepared	Analyzed	Analyst
Arsenic	ND	mg/L	0.050		1	5	09/13/17	09/13/17 16:45	1051
Barium	ND	mg/L	1.0		1	100	09/13/17	09/13/17 16:45	1051
Cadmium	ND	mg/L	0.050		1	1	09/13/17	09/13/17 16:45	1051
Chromium	ND	mg/L	0.050		1	5	09/13/17	09/13/17 16:45	1051
Lead	ND	mg/L	0.050		1	5	09/13/17	09/13/17 16:45	1051
Mercury	ND	mg/L	0.0020		1	0.2	09/13/17	09/13/17 16:45	1051
Selenium	ND	mg/L	0.050		1	1	09/13/17	09/13/17 16:45	1051
Silver	ND	mg/L	0.050		1	5	09/13/17	09/13/17 16:45	1051

Case Narrative Summary

Client Name: Hillis Carnes Engineering Associates

Project Name: SPT A3-1

Work Order Number(s): 17091106

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

The analyses of chlorine, pH, dissolved oxygen, temperature and sulfite for drinking water and non-potable samples tested for compliance have a maximum holding time of 15 minutes. As such, all laboratory analyses for these analytes exceed holding times.

Matrix spike and matrix spike duplicate analyses may not be performed due to insufficient sample quantity. In these instances, a laboratory control sample and laboratory control sample duplicate are analyzed unless otherwise noted or specified in the method.

Sample Receipt:

Refer to work order 17091105 for remaining results.

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

EPA 9071 B-Modified: Oil & Grease, Total Recovered

Analytical Data Package Information Summary

Work Order(s): 17091106
Report Prepared For: Hillis Carnes Engineering Associates, Annapo
Project Name: SPT A3-1
Project Manager: Keith Progin

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
EPA 9071 B-Modified	C-1	Initial	17091106-001	1022	S	146020	146020	09/11/2017	09/13/2017 09:24	09/13/2017 09:24
	146020-1-BKS	BKS	146020-1-BKS	1022	S	146020	146020	--------	09/13/2017 09:24	09/13/2017 09:24
	146020-1-BLK	BLK	146020-1-BLK	1022	S	146020	146020	--------	09/13/2017 09:24	09/13/2017 09:24
	146020-1-BSD	BSD	146020-1-BSD	1022	S	146020	146020	--------	09/13/2017 09:24	09/13/2017 09:24
	C-1 S	MS	17091106-001 S	1022	S	146020	146020	09/11/2017	09/13/2017 09:24	09/13/2017 09:24
	C-1 SD	MSD	17091106-001 SD	1022	S	146020	146020	09/11/2017	09/13/2017 09:24	09/13/2017 09:24
SM2540G	C-1	Initial	17091106-001	1061	S	145981	145981	09/11/2017	09/12/2017 09:49	09/12/2017 09:49
SW-846 6020 A	C-1	Initial	17091106-001	1051	W	67765	146053	09/11/2017	09/13/2017 11:41	09/13/2017 16:45
	67765-1-BKS	BKS	67765-1-BKS	1051	W	67765	146053	--------	09/13/2017 11:41	09/13/2017 14:49
	67765-1-BLK	BLK	67765-1-BLK	1051	W	67765	146053	--------	09/13/2017 11:41	09/13/2017 14:43
	7222066 S	MS	17090705-001 S	1051	W	67765	146053	09/06/2017	09/13/2017 11:41	09/13/2017 15:41
	7222066 SD	MSD	17090705-001 SD	1051	W	67765	146053	09/06/2017	09/13/2017 11:41	09/13/2017 15:48
SW-846 8015 C	67744-1-BKS	BKS	67744-1-BKS	1059	S	67744	146029	--------	09/12/2017 10:00	09/12/2017 21:33
	67744-1-BLK	BLK	67744-1-BLK	1059	S	67744	146029	--------	09/12/2017 10:00	09/12/2017 21:08
	67744-1-BSD	BSD	67744-1-BSD	1059	S	67744	146029	--------	09/12/2017 10:00	09/12/2017 21:57
	C-1	Initial	17091106-001	1059	S	67744	146031	09/11/2017	09/12/2017 10:00	09/13/2017 02:52
	GP-2 23-25' S	MS	17091112-014 S	1059	S	67744	146031	09/07/2017	09/12/2017 10:00	09/12/2017 21:33
	GP-2 23-25' SD	MSD	17091112-014 SD	1059	S	67744	146031	09/07/2017	09/12/2017 10:00	09/12/2017 21:57
SW-846 8082 A	C-1	Initial	17091106-001	1029	S	67737	146040	09/11/2017	09/11/2017 18:52	09/12/2017 20:37
	67737-1-BKS	BKS	67737-1-BKS	1029	S	67737	146040	--------	09/11/2017 18:52	09/12/2017 15:28
	67737-1-BLK	BLK	67737-1-BLK	1029	S	67737	146040	--------	09/11/2017 18:52	09/12/2017 14:32
	67737-1-BSD	BSD	67737-1-BSD	1029	S	67737	146040	--------	09/11/2017 18:52	09/12/2017 15:55
	C-1 S	MS	17091106-001 S	1029	S	67737	146040	09/11/2017	09/11/2017 18:52	09/12/2017 16:23
	C-1 SD	MSD	17091106-001 SD	1029	S	67737	146040	09/11/2017	09/11/2017 18:52	09/12/2017 16:51

PHASE SEPARATION SCIENCE, INC.

QC Summary 17091106

Hillis Carnes Engineering Associates
SPT A3-1

Analytical Method: SW-846 8082 A Prep Method: SW3550C
Seq Number: 146040 Matrix: Soil Date Prep: 09/11/2017
PSS Sample ID: 17091106-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Decachlorobiphenyl	81		61-150	%	09/12/17 20:37
Tetrachloro-m-xylene	75		42-142	%	09/12/17 20:37

Analytical Method: SW-846 8015 C Prep Method: SW3550C
Seq Number: 146031 Matrix: Soil Date Prep: 09/12/2017
PSS Sample ID: 17091106-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
o-Terphenyl	87		34-133	%	09/13/17 02:52

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

PHASE SEPARATION SCIENCE, INC.

QC Summary 17091106

Hillis Carnes Engineering Associates

SPT A3-1

Analytical Method: EPA 9071 B-Modified

Seq Number: 146020 Matrix: Solid

MB Sample Id: 146020-1-BLK LCS Sample Id: 146020-1-BKS LCSD Sample Id: 146020-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Oil & Grease, Total Recovered	<49.94	799	731.1	92	705.2	88	78-114	4	28	mg/kg	09/13/17 09:24	

Analytical Method: EPA 9071 B-Modified

Seq Number: 146020 Matrix: Soil

Parent Sample Id: 17091106-001 MS Sample Id: 17091106-001 S MSD Sample Id: 17091106-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Oil & Grease, Total Recovered	77.55	940	895.4	87	942.4	92	78-114	5	28	mg/kg	09/13/17 09:24	

Analytical Method: SW-846 6020 A Prep Method: SW3010A

Seq Number: 146053 Matrix: Water Date Prep: 09/13/17

MB Sample Id: 67765-1-BLK LCS Sample Id: 67765-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Arsenic	<0.05000	0.4000	0.4266	107	80-120	mg/L	09/13/17 14:49	
Barium	<1.000	2.000	2.075	104	80-120	mg/L	09/13/17 14:49	
Cadmium	<0.05000	0.4000	0.3985	100	80-120	mg/L	09/13/17 14:49	
Chromium	<0.05000	0.4000	0.4144	104	80-120	mg/L	09/13/17 14:49	
Lead	<0.05000	0.4000	0.4237	106	80-120	mg/L	09/13/17 14:49	
Mercury	<0.002000	0.01000	0.01070	107	80-120	mg/L	09/13/17 14:49	
Selenium	<0.05000	0.4000	0.4088	102	80-120	mg/L	09/13/17 14:49	
Silver	<0.05000	0.4000	0.4016	100	80-120	mg/L	09/13/17 14:49	

Analytical Method: SW-846 8082 A Prep Method: SW3550C

Seq Number: 146040 Matrix: Solid Date Prep: 09/11/17

MB Sample Id: 67737-1-BLK LCS Sample Id: 67737-1-BKS LCSD Sample Id: 67737-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
PCB-1016	<0.04955	0.4955	0.3671	74	0.3644	76	60-110	1	25	mg/kg	09/12/17 15:28	
PCB-1260	<0.04955	0.4955	0.3402	69	0.3281	69	60-98	4	25	mg/kg	09/12/17 15:28	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Decachlorobiphenyl	82		89		92		61-150	%	09/12/17 15:28
Tetrachloro-m-xylene	85		77		81		42-142	%	09/12/17 15:28

PHASE SEPARATION SCIENCE, INC.

QC Summary 17091106

Hillis Carnes Engineering Associates

SPT A3-1

Analytical Method: SW-846 8082 A Prep Method: SW3550C

Seq Number: 146040 Matrix: Soil Date Prep: 09/11/17

Parent Sample Id: 17091106-001 MS Sample Id: 17091106-001 S MSD Sample Id: 17091106-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
PCB-1016	<0.05984	0.5984	0.4283	72	0.4370	73	45-130	2	30	mg/kg	09/12/17 16:23	
PCB-1260	<0.05984	0.5984	0.5521	92	0.4931	82	30-125	11	30	mg/kg	09/12/17 16:23	

Surrogate	MS Result	MS Flag	MSD Result	MSD Flag	Limits	Units	Analysis Date
Decachlorobiphenyl	96		94		61-150	%	09/12/17 16:23
Tetrachloro-m-xylene	72		74		42-142	%	09/12/17 16:23

Analytical Method: SW-846 8015 C Prep Method: SW3550C

Seq Number: 146029 Matrix: Solid Date Prep: 09/12/17

MB Sample Id: 67744-1-BLK LCS Sample Id: 67744-1-BKS LCSD Sample Id: 67744-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
TPH-DRO (Diesel Range Organics)	<10.02	33.41	32.62	98	33.95	101	54-123	4	25	mg/kg	09/12/17 21:33	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
o-Terphenyl	81		87		93		34-133	%	09/12/17 21:33

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

PHASE SEPARATION SCIENCE, INC.

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

(1) *CLIENT: Hillis-Carnes (HCEA) *OFFICE LOC. AJ
*PROJECT MGR: Keith Prosin *PHONE NO.: (410) 880-4788
EMAIL: kprosin@hcea.com FAX NO.: ( )
*PROJECT NAME: SPT A3-1 PROJECT NO.:
SITE LOCATION: P.O. NO.:
SAMPLER(S): DW CERT NO.:

PSS Work Order #: 17091106 PAGE 1 OF 1

Matrix Codes: SW=Surface Wtr DW=Drinking Wtr GW=Ground Wtr WW=Waste Wtr O=Oil S=Soil L=Liquid SOL=Solid A=Air WI=Wipe

(2)

LAB NO.	*SAMPLE IDENTIFICATION	*DATE (SAMPLED)	*TIME (SAMPLED)	MATRIX (See Codes)	No. CONTAINERS	SAMPLE TYPE (C = COMP, G = GRAB)	Preservatives Used	Analysis/ Method Required (3) * TPH-DRO	Oil & Grease	PCBs	TCLP Metals	VOCs	Zinc	Cadmium	REMARKS
1	C-1	9/11/17	10:45am	S	4	C		X	X	X	X				3-Day Soil
	W-1	9/11/17	11:00am	W	5	G				X		X	X	X	2-Day water

(5)

Relinquished By: (1)	Date	Time	Received By:
	9/11/17	11:40	Barb Weber
Relinquished By: (2)	Date	Time	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

(4)

*Requested TAT (One TAT per COC)
☐ 5-Day ☒ 3-Day ☐ 2-Day
☐ Next Day ☐ Emergency ☐ Other

Data Deliverables Required:
COA ☐ QC SUMM ☐ CLP LIKE ☐ OTHER ____

# of Coolers: 2
Custody Seal: Abs
Ice Present: Pres Temp: 3-11°C
Shipping Carrier: Client

Special Instructions:

DW COMPLIANCE? YES ☐
EDD FORMAT TYPE: ____
STATE RESULTS REPORTED TO: MD ☐ DE ☐ PA ☐ VA ☐ WV ☐ OTHER ____

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

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17091106	**Received By**	Barb Weber
Client Name	Hillis Carnes Engineering Associates	**Date Received**	09/11/2017 11:40:00 AM
Project Name	SPT A3-1	**Delivered By**	Client
Disposal Date	10/16/2017	**Tracking No**	Not Applicable
		Logged In By	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	11
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No

Documentation

		Sampler Name	Not Provided
COC agrees with sample labels?	Yes		N/A
Chain of Custody	Yes		

Sample Container

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

Total No. of Samples Received 1 Total No. of Containers Received 4

Preservation

Total Metals	(pH<2)	N/A
Dissolved Metals, filtered within 15 minutes of collection	(pH<2)	N/A
Orthophosphorus, filtered within 15 minutes of collection		N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, DOC (field filtered), COD, Phenols	(pH<2)	N/A
TOX, TKN, NH3, Total Phos	(pH<2)	N/A
VOC, BTEX (VOA Vials Rcvd Preserved)	(pH<2)	N/A
Do VOA vials have zero headspace?		N/A
624 VOC (Rcvd at least one unpreserved VOA vial)		N/A
524 VOC (Rcvd with trip blanks)	(pH<2)	N/A

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

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

Refer to work order 17091105 for remaining results.

Samples Inspected/Checklist Completed By: Thomas Wingate Date: 09/11/2017

Thomas Wingate

PM Review and Approval: Amber L Confer Date: 09/12/2017

Amber Confer

Maryland spectral Services

Analytical Chemistry Services

1500 Caton Center Dr Suite G
Baltimore MD 21227
410-247-7600
www.mdspectral.com
VELAP ID 460040

Report Revised to correct project name. Original report ID 062520 1519

08 September 2020

Keith Progin
Hillis-Carnes Engineering Associates
10975 Guilford Rd
Annapolis Junction, MD 20701
RE: A3-1

Enclosed are the results of analyses for samples received by the laboratory on 06/22/20 12:01.

Maryland Spectral Services, Inc. is a TNI 2009 Standard accredited laboratory and as such, all analyses performed at Maryland Spectral Services included in this report are 2009 TNI certified except as indicated at the end of this report. Please visit our website at www.mdspectral.com for a complete listing of our TNI 2009 Standard accreditations.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Cory Koons
Laboratory Manager

Maryland spectral Services

Analytical Chemistry Services

1500 Caton Center Dr Suite G
Baltimore MD 21227
410-247-7600
www.mdspectral.com

Analytical Results

Project: A3-1

Project Number: 16280B
Project Manager: Keith Progin

Reported:
09/08/20 10:34

Report Revised to correct project name. Original report ID 062520 1519

Client Sample ID	Alternate Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
S1		0062203-01	Soil	06/22/20 10:45	06/22/20 12:01
S1A		0062203-02	Soil	06/22/20 10:45	06/22/20 12:01
S1B		0062203-03	Soil	06/22/20 10:45	06/22/20 12:01

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Cory Koons, Laboratory Manager

All analyses performed at Maryland Spectral Services included in the report are TNI certified except as indicated at the end of the report.

Analytical Results

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Baltimore MD 21227
410-247-7600
www.mdspectral.com

Project: A3-1

Project Number: 16280B
Project Manager: Keith Progin

Reported:
09/08/20 10:34

Report Revised to correct project name. Original report ID 062520 1519

S1

0062203-01 (Soil)
Sample Date: 06/22/20

Analyte	Result	Notes	Units	Reporting Limit (MRL)	Detection Limit (LOD)	Dilution	Prepared	Analyzed	Analyst
Volatile Organics by EPA 8260B (GC/MS) Prepared by MED SOIL (GC/MS)									
Acetone	ND		ug/kg dry	2910	2910	250	06/25/20	06/25/20 11:44	GM
tert-Amyl alcohol (TAA)	ND		ug/kg dry	14500	14500	250	06/25/20	06/25/20 11:44	GM
tert-Amyl methyl ether (TAME)	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
Benzene	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
Bromobenzene	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
Bromochloromethane	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
Bromodichloromethane	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
Bromoform	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
Bromomethane	ND		ug/kg dry	1450	1450	250	06/25/20	06/25/20 11:44	GM
tert-Butanol (TBA)	ND		ug/kg dry	14500	14500	250	06/25/20	06/25/20 11:44	GM
2-Butanone (MEK)	ND		ug/kg dry	2910	2910	250	06/25/20	06/25/20 11:44	GM
n-Butylbenzene	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
sec-Butylbenzene	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
tert-Butylbenzene	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
Carbon disulfide	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
Carbon tetrachloride	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
Chlorobenzene	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
Chloroethane	ND		ug/kg dry	1450	1450	250	06/25/20	06/25/20 11:44	GM
Chloroform	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
Chloromethane	ND		ug/kg dry	1450	1450	250	06/25/20	06/25/20 11:44	GM
2-Chlorotoluene	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
4-Chlorotoluene	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
1,2-Dibromo-3-chloropropane	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
Dibromochloromethane	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
1,2-Dibromoethane (EDB)	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
Dibromomethane	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
1,2-Dichlorobenzene	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
1,3-Dichlorobenzene	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
1,4-Dichlorobenzene	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
Dichlorodifluoromethane	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
1,1-Dichloroethane	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
1,2-Dichloroethane	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
1,1-Dichloroethene	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM

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Cory Koons, Laboratory Manager

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Analytical Results

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Baltimore MD 21227
410-247-7600
www.mdspectral.com

Project: A3-1

Project Number: 16280B
Project Manager: Keith Progin

Reported:
09/08/20 10:34

Report Revised to correct project name. Original report ID 062520 1519

S1

0062203-01 (Soil)
Sample Date: 06/22/20

Analyte	Result	Notes	Units	Reporting Limit (MRL)	Detection Limit (LOD)	Dilution	Prepared	Analyzed	Analyst
Volatile Organics by EPA 8260B (GC/MS) Prepared by MED SOIL (GC/MS) (continued)									
cis-1,2-Dichloroethene	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
trans-1,2-Dichloroethene	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
Dichlorofluoromethane	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
1,2-Dichloropropane	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
1,3-Dichloropropane	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
2,2-Dichloropropane	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
1,1-Dichloropropene	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
cis-1,3-Dichloropropene	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
trans-1,3-Dichloropropene	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
Diisopropyl ether (DIPE)	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
Ethyl tert-butyl ether (ETBE)	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
Ethylbenzene	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
Hexachlorobutadiene	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
2-Hexanone	ND		ug/kg dry	2910	2910	250	06/25/20	06/25/20 11:44	GM
Isopropylbenzene (Cumene)	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
4-Isopropyltoluene	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
Methyl tert-butyl ether (MTBE)	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
4-Methyl-2-pentanone	ND		ug/kg dry	2910	2910	250	06/25/20	06/25/20 11:44	GM
Methylene chloride	ND		ug/kg dry	5810	5810	250	06/25/20	06/25/20 11:44	GM
Naphthalene	**10000**		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
n-Propylbenzene	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
Styrene	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
1,1,1,2-Tetrachloroethane	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
1,1,2,2-Tetrachloroethane	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
Tetrachloroethene	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
Toluene	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
1,2,3-Trichlorobenzene	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
1,2,4-Trichlorobenzene	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
1,1,1-Trichloroethane	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
1,1,2-Trichloroethane	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
Trichloroethene	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
Trichlorofluoromethane (Freon 11)	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
1,2,3-Trichloropropane	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM

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Cory Koons, Laboratory Manager

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Baltimore MD 21227
410-247-7600
www.mdspectral.com

Analytical Results

Project: A3-1

Project Number: 16280B
Project Manager: Keith Progin

Reported:
09/08/20 10:34

Report Revised to correct project name. Original report ID 062520 1519

S1

0062203-01 (Soil)
Sample Date: 06/22/20

Analyte	Result	Notes	Units	Reporting Limit (MRL)	Detection Limit (LOD)	Dilution	Prepared	Analyzed	Analyst
Volatile Organics by EPA 8260B (GC/MS) Prepared by MED SOIL (GC/MS) (continued)									
1,2,4-Trimethylbenzene	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
1,3,5-Trimethylbenzene	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
Vinyl chloride	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
o-Xylene	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
m- & p-Xylenes	ND		ug/kg dry	1450	581	250	06/25/20	06/25/20 11:44	GM
Surrogate: 1,2-Dichloroethane-d4			*70-130*	*98 %*	*06/25/20*		*06/25/20 11:44*		
Surrogate: Toluene-d8			*75-120*	*99 %*	*06/25/20*		*06/25/20 11:44*		
Surrogate: 4-Bromofluorobenzene			*65-120*	*102 %*	*06/25/20*		*06/25/20 11:44*		
PERCENT SOLIDS BY ASTM D2216-05 Prepared by Percent Solids									
Percent Solids	**86**		%			1	06/23/20	06/24/20 10:14	MH
POLYCHLORINATED BIPHENYLS BY EPA 8082A (GC/ECD) Prepared by 3540-GC(Soxhlet) ClPestPCB									
Aroclor-1016	ND		ug/kg dry	96.5	96.5	1	06/22/20	06/24/20 02:38	SJA
Aroclor-1221	ND		ug/kg dry	198	198	1	06/22/20	06/24/20 02:38	SJA
Aroclor-1232	ND		ug/kg dry	96.5	96.5	1	06/22/20	06/24/20 02:38	SJA
Aroclor-1242	ND		ug/kg dry	96.5	96.5	1	06/22/20	06/24/20 02:38	SJA
Aroclor-1248	ND		ug/kg dry	96.5	96.5	1	06/22/20	06/24/20 02:38	SJA
Aroclor-1254	ND		ug/kg dry	96.5	96.5	1	06/22/20	06/24/20 02:38	SJA
Aroclor-1260	ND		ug/kg dry	96.5	96.5	1	06/22/20	06/24/20 02:38	SJA
Aroclor-1262	ND		ug/kg dry	96.5	96.5	1	06/22/20	06/24/20 02:38	SJA
Aroclor-1268	ND		ug/kg dry	96.5	96.5	1	06/22/20	06/24/20 02:38	SJA
Surrogate: Tetrachloro-m-xylene			*40-150*	*77 %*	*06/22/20*		*06/24/20 02:38*		
Surrogate: Decachlorobiphenyl			*40-150*	*70 %*	*06/22/20*		*06/24/20 02:38*		

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Cory Koons, Laboratory Manager

All analyses performed at Maryland Spectral Services included in the report are TNI certified except as indicated at the end of the report.

Maryland spectral Services

Analytical Chemistry Services

1500 Caton Center Dr Suite G
Baltimore MD 21227
410-247-7600
www.mdspectral.com

Analytical Results

Project: A3-1

Project Number: 16280B
Project Manager: Keith Progin

Reported:
09/08/20 10:34

Report Revised to correct project name. Original report ID 062520 1519

S1

0062203-01 (Soil)
Sample Date: 06/22/20

Analyte	Result	Notes	Units	Reporting Limit (MRL)	Detection Limit (LOD)	Dilution	Prepared	Analyzed	Analyst
TOTAL METALS ANALYSIS BY EPA 6020B Prepared by 3050B-Metals Digestion									
Antimony	**0.439**		mg/kg dry	0.291	0.291	1	06/22/20	06/23/20 11:58	KD
Arsenic	**11.0**		mg/kg dry	0.291	0.291	1	06/22/20	06/23/20 11:58	KD
Beryllium	**1.38**		mg/kg dry	0.291	0.291	1	06/22/20	06/23/20 11:58	KD
Cadmium	**44.0**		mg/kg dry	0.291	0.291	1	06/22/20	06/23/20 11:58	KD
Chromium	**113**		mg/kg dry	0.291	0.291	1	06/22/20	06/23/20 11:58	KD
Copper	**73.8**		mg/kg dry	0.291	0.291	1	06/22/20	06/23/20 11:58	KD
Lead	**298**		mg/kg dry	58.1	58.1	200	06/22/20	06/23/20 13:44	KD
Manganese	**21300**		mg/kg dry	58.1	58.1	200	06/22/20	06/23/20 13:44	KD
Mercury	**0.222**		mg/kg dry	0.0145	0.0145	1	06/22/20	06/23/20 11:58	KD
Nickel	**18.9**		mg/kg dry	0.291	0.291	1	06/22/20	06/23/20 11:58	KD
Selenium	**1.81**		mg/kg dry	0.291	0.291	1	06/22/20	06/23/20 11:58	KD
Silver	**0.875**		mg/kg dry	0.291	0.291	1	06/22/20	06/23/20 11:58	KD
Thallium	**0.402**		mg/kg dry	0.291	0.291	1	06/22/20	06/23/20 11:58	KD
Zinc	**2700**		mg/kg dry	291	291	200	06/22/20	06/23/20 13:44	KD
HEXANE EXTRACTABLE MATERIALS BY EPA 9071B-MODIFIED Prepared by 9071/1664									
Oil and Grease	**2260**		mg/kg dry	93.0	93.0	1	06/24/20	06/25/20 13:21	WEG
EPA 7196A Performed at Pace Analytical Services, LLC - Pittsburgh Lab									
Chromium, Hexavalent	ND		mg/kg dry	1.1	0.71	1	06/24/20	06/25/20 14:08	EKM

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Cory Koons, Laboratory Manager

All analyses performed at Maryland Spectral Services included in the report are TNI certified except as indicated at the end of the report.

Maryland spectral Services

Analytical Chemistry Services

1500 Caton Center Dr Suite G
Baltimore MD 21227
410-247-7600
www.mdspectral.com

Analytical Results

Project: A3-1

Project Number: 16280B
Project Manager: Keith Progin

Reported:
09/08/20 10:34

Report Revised to correct project name. Original report ID 062520 1519

S1A

0062203-02 (Soil)
Sample Date: 06/22/20

Analyte	Result	Notes	Units	Reporting Limit (MRL)	Detection Limit (LOD)	Dilution	Prepared	Analyzed	Analyst
GASOLINE RANGE ORGANICS BY EPA 5030/8015C Prepared by 5030-GC									
Gasoline-Range Organics	ND		mg/kg dry	0.59	0.59	5	06/23/20	06/23/20 12:32	GM
Surrogate: a,a,a-Trifluorotoluene [2C]			*85-115*	*102 %*	*06/23/20*		*06/23/20 12:32*		
DIESEL RANGE ORGANICS BY EPA 3540/8015C Prepared by 3540-GC(Soxhlet)									
Diesel-Range Organics (C10-C28)	**4600**		mg/kg dry	941	941	10	06/22/20	06/23/20 14:51	SJA
Surrogate: o-Terphenyl			*70-130*	*%*	*06/22/20*		*06/23/20 14:51*		*S-01*
PERCENT SOLIDS BY ASTM D2216-05 Prepared by Percent Solids									
Percent Solids	**85**		%			1	06/23/20	06/24/20 10:14	MH

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Cory Koons, Laboratory Manager

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Maryland spectral Services

Analytical Chemistry Services

1500 Caton Center Dr Suite G
Baltimore MD 21227
410-247-7600
www.mdspectral.com

Analytical Results

Project: A3-1

Project Number: 16280B
Project Manager: Keith Progin

Reported:
09/08/20 10:34

Report Revised to correct project name. Original report ID 062520 1519

S1B

0062203-03 (Soil)
Sample Date: 06/22/20

Analyte	Result	Notes	Units	Reporting Limit (MRL)	Detection Limit (LOD)	Dilution	Prepared	Analyzed	Analyst
GASOLINE RANGE ORGANICS BY EPA 5030/8015C Prepared by 5030-GC									
Gasoline-Range Organics	ND		mg/kg dry	0.11	0.11	1	06/23/20	06/23/20 13:03	GM
Surrogate: a,a,a-Trifluorotoluene [2C]			*85-115*	*102 %*	*06/23/20*		*06/23/20 13:03*		
DIESEL RANGE ORGANICS BY EPA 3540/8015C Prepared by 3540-GC(Soxhlet)									
Diesel-Range Organics (C10-C28)	**95.4**		mg/kg dry	18.4	18.4	2	06/22/20	06/23/20 15:18	SJA
Surrogate: o-Terphenyl			*70-130*	*89 %*	*06/22/20*		*06/23/20 15:18*		
PERCENT SOLIDS BY ASTM D2216-05 Prepared by Percent Solids									
Percent Solids	**87**		%			1	06/23/20	06/24/20 10:14	MH

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Cory Koons, Laboratory Manager

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1500 Caton Center Dr Suite G
Baltimore MD 21227
410-247-7600
www.mdspectral.com

Analytical Results

Project: A3-1

Project Number: 16280B
Project Manager: Keith Progin

Reported:
09/08/20 10:34

Report Revised to correct project name. Original report ID 062520 1519

Maryland Spectral Services does not maintain certification for the following analytical parameters:

Maryland Spectral Services

Matrix , Method , Analyte

Soil | 8260 (Full List) | Hexachlorobutadiene

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Cory Koons, Laboratory Manager

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Analytical Results

1500 Caton Center Dr Suite G
Baltimore MD 21227
410-247-7600
www.mdspectral.com

Project: A3-1

Project Number: 16280B
Project Manager: Keith Progin

Reported:
09/08/20 10:34

Report Revised to correct project name. Original report ID 062520 1519

Notes and Definitions

S-01	The surrogate recovery for this sample is not available due to sample dilution required from high analyte concentration and/or matrix interference.
QM-4X	The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.
QM-06	Due to noted non-homogeneity of the QC sample matrix, the MS/MSD or MS/DUP did not provide reliable results for accuracy and precision. Sample results for the QC batch were accepted based on LCS percent recoveries.
J	Detected but below the reporting limit; therefore, result is an estimated concentration (CLP J-Flag).
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
%-Solids	Percent Solids is a supportive test and as such does not require accreditation

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Cory Koons, Laboratory Manager

All analyses performed at Maryland Spectral Services included in the report are TNI certified except as indicated at the end of the report.

CHAIN-OF-CUSTODY RECORD

Maryland Spectral Services, Inc.
1500 Caton Center Drive, Suite G
Baltimore, MD 21227
410–247–7600 • Fax 410–247–7602
reporting@mdspectral.com

Matrix Codes: NW (non-potable water), DW (drinking water)

Company Name: Hillis-Carnes
Project Manager: Keith Progin Kprogin@HCEA.com
Project Name: A - 11
Project ID: 16820D
Sampler(s): Martin Stringer
P.O. Number:

Analysis Requested

Field Sample ID	Date	Time	DW	Water	Soil	Other	No. of Containers	PCB's	Priority Pollutant Metals	Manganese	Oil + Grease	VOC's	TPH - DRO	TPH - GRO	Hexavalent Chromium			Preservative	Field Notes	MSS Lab ID
S1	6/22	10:45			X		3	X	X	X	X	X			X			Ice		0062203-01
S1A	6/22	10:45			X		1						X	X				Ice		-02
S1B	6/22	10:45			X		1						X	X				Ice		-03

Relinquished by: *(Signature)* [signature]
(Printed) Martin Stringer
Date/Time: 6/22 12:01
Received by: *(Signature)* [signature]
(Printed) Chris Knell

Relinquished by: *(Signature)*
(Printed)
Date/Time
Received by: *(Signature)*
(Printed)

Relinquished by: *(Signature)*
(Printed)
Date/Time
Received by Lab: *(Signature)*
(Printed)

Turn Around Time:
- ☐ Normal (7 day)
- ☐ 5 day
- ☐ 4 day
- ☑ 3 day
- ☐ Rush (2 day)
- ☐ Next Day
- ☐ Other: ______
- ☐ Specific Due Date: ______

Lab Use:
Temp: -1.0 °C
- ☑ Received on Ice
- ☑ Received same day

Delivery Method:
- ☑ Courier
- ☐ Client
- ☐ UPS
- ☐ FedEx
- ☐ USPS
- ☐ Other:_____

Special Instructions/QC Requirements & Comments:

Sample Disposal:
- ☐ Return to Client
- ☐ Disposal by lab
- ☐ Archive for _____ days

Report Revised to correct project name. Original report ID 062520 1519

MSS-F001-004

SUBCONTRACT ORDER
Maryland Spectral Services

0062203

WO# : 30369071

30369071

SENDING LABORATORY:

Maryland Spectral Services
1500 Caton Center Dr. Suite G
Halethorpe, MD 21227
Phone: 410.247.7600
Project Manager: Cory Koons
Reports Email: Reporting@mdspectral.com

RECEIVING LABORATORY:

Pace Labs-PA
1638 Roseytown Rd
Greensburg, PA 15601
Phone :(724) 850-5600
Fax:

Due 4:00 PM 06/25/20

			Laboratory ID	Comments
Sample ID: 0062203-01	**S1**	**Soil**	**Sampled:06/22/20 10:45**	
7199-(Chromium6)				101

Containers Supplied:
Glass Jar, 4 oz (C)

Report Revised to correct project name. Original report ID 062520 1519

Released By	Date		Received By	Date	
	6/22/20	15:18		6/22/20	15:24
Released By	Date		Received By	Date	
	6/22/20	17:05		6-22-20	1805
Released By	Date		Received By	Date	
	6-22-20	2100		6-22-2020	2100

Page 1 of 1

APPENDIX J

Analytical Report for

Hillis Carnes Engineering Associates

Certificate of Analysis No.: 17030305

Project Manager: Gina Galimberti

Project Name : SPT Parcel A-3 Manhole

March 8, 2017

Phase Separation Science, Inc.

6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

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

PHASE SEPARATION SCIENCE, INC.

March 8, 2017

Gina Galimberti
Hillis Carnes Engineering Associates
10975 Guilford Road, Ste. A
Annapolis Junction, MD 20701

Reference: PSS Work Order(s) No: **17030305**
Project Name: SPT Parcel A-3 Manhole

Dear Gina Galimberti :

This report includes the analytical results from the analyses performed on the samples received under the project name referenced above and identified with the Phase Separation Science (PSS) Work Order(s) numbered **17030305**.

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

PSS reserves the right to return any unused samples, extracts or related solutions. Otherwise, the samples are scheduled for disposal, without any further notice, on April 7, 2017, with the exception of air canisters which are cleaned immediately following analysis. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt , the request will be acknowledged by PSS, thus extending the storage period.

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

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

Sincerely,

Dan Prucnal
Laboratory Manager

Sample Summary

Client Name: Hillis Carnes Engineering Associates

Project Name: SPT Parcel A-3 Manhole

Work Order Number(s): 17030305

The following samples were received under chain of custody by Phase Separation Science (PSS) on 03/03/2017 at 12:00 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17030305-001	W-1	GROUND WATER	03/03/17 11:00

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

Notes:

1. The presence of a common laboratory contaminant such as methylene chloride may be considered a possible laboratory artifact. Where observed, appropriate consideration of data should be taken.
2. Unless otherwise noted in the case narrative, results are reported on a dry weight basis with the exception of pH, flashpoint, moisture, and paint filter test.
3. Drinking water samples collected for the purpose of compliance with SDWA may not be suitable for their intended use unless collected by a certified sampler [COMAR 26.08.05.07.C.2].
4. The analyses of 1,2-dibromo-3-chloropropane (DBCP) and 1,2-dibromoethane (EDB) by EPA 524.2 and calcium, magnesium, sodium and iron by EPA 200.8 are not currently promulgated for use in testing to meet the Safe Drinking Water Act and as such cannot be used for compliance purposes. The listings of the current promulgated methods for testing in compliance with the Safe Drinking Water Act can be found in the 40 CFR part 141.1, for the primary drinking water contaminates, and part 141.3, for the secondary drinking water contaminates.
5. Sample prepared under EPA 3550C with concentrations greater than 20 mg/Kg should employ the microtip extraction procedure if required to meet data quality objectives.
6. The analysis of acrolein by EPA 624 must be analyzed within three days of sampling unless pH is adjusted to 4-5 units [40 CFR part 136.3(e)].
7. Method 180.1, The Determination of Turbidity by Nephelometry, recommends samples over 40 NTU be diluted until the turbidity falls below 40 units. Routine samples over 40 NTU may not be diluted as long as the data quality objectives are not affected.
8. Alkalinity results analyzed by EPA 310.2 that are reported by dilution are estimated and are not in compliance with method requirements.

Standard Flags/Abbreviations:

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

Certifications:

NELAP Certifications: PA 68-03330, VA 460156
State Certifications: MD 179, WV 303
Regulated Soil Permit: P330-12-00268
NSWC USCG Accepted Laboratory
LDBE MWAA LD1997-0041-2015

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

PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17030305

Hillis Carnes Engineering Associates, Annapolis Junction, MD

March 8, 2017

Project Name: SPT Parcel A-3 Manhole

Sample ID: W-1 **Date/Time Sampled: 03/03/2017 11:00** **PSS Sample ID: 17030305-001**

Matrix: GROUND WATER **Date/Time Received: 03/03/2017 12:00**

Dissolved Zinc — Analytical Method: SW-846 6020 A — Preparation Method: 3005A

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Zinc	**140**	ug/L	20		1	03/06/17	03/06/17 16:49	1051

RCRA Metals + Zinc — Analytical Method: SW-846 6020 A — Preparation Method: 3010A

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Arsenic	**23**	ug/L	1.0		1	03/06/17	03/07/17 18:54	1051
Barium	**320**	ug/L	1.0		1	03/06/17	03/06/17 15:37	1051
Cadmium	**1.4**	ug/L	1.0		1	03/06/17	03/06/17 15:37	1051
Chromium	**74**	ug/L	1.0		1	03/06/17	03/06/17 15:37	1051
Lead	**200**	ug/L	1.0		1	03/06/17	03/06/17 15:37	1051
Mercury	**0.59**	ug/L	0.20		1	03/06/17	03/06/17 15:37	1051
Selenium	**2.0**	ug/L	1.0		1	03/06/17	03/06/17 15:37	1051
Silver	ND	ug/L	1.0		1	03/06/17	03/06/17 15:37	1051
Zinc	**4,600**	ug/L	400		20	03/06/17	03/07/17 18:48	1051

Case Narrative Summary

Client Name: Hillis Carnes Engineering Associates

Project Name: SPT Parcel A-3 Manhole

Work Order Number(s): 17030305

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

The analyses of chlorine, pH, dissolved oxygen, temperature and sulfite for drinking water and non-potable samples tested for compliance have a maximum holding time of 15 minutes. As such, all laboratory analyses for these analytes exceed holding times.

Matrix spike and matrix spike duplicate analyses may not be performed due to insufficient sample quantity. In these instances, a laboratory control sample and laboratory control sample duplicate are analyzed unless otherwise noted or specified in the method.

Sample Receipt:

Sample aliquots for dissolved metals were not field filtered and were received unpreserved.

Analytical:

Dissolved Zinc

Batch: 140573

Matrix spike and/or matrix spike duplicate (MS/MSD) exceedances identified; see MS summary form.

RCRA Metals + Zinc

Batch: 140569

Matrix spike and/or matrix spike duplicate (MS/MSD) exceedances identified; see MS summary form.
The concentration of the following analyte(s) in the reference sample was greater than four times the matrix spike concentration : barium, zinc

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

Analytical Data Package Information Summary

Work Order(s): **17030305**
Report Prepared For: Hillis Carnes Engineering Associates, Annapo
Project Name: SPT Parcel A-3 Manhole
Project Manager: Gina Galimberti

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
SW-846 6020 A	W-1	Initial	17030305-001	1051	W	65133	140569	03/03/2017	03/06/2017 09:20	03/06/2017 15:37
	65133-1-BKS	BKS	65133-1-BKS	1051	W	65133	140569	--------	03/06/2017 09:20	03/06/2017 15:31
	65133-1-BLK	BLK	65133-1-BLK	1051	W	65133	140569	--------	03/06/2017 09:20	03/06/2017 15:25
	W-1 S	MS	17030305-001 S	1051	W	65133	140569	03/03/2017	03/06/2017 09:20	03/06/2017 15:43
	W-1 S	Reanalysis	17030305-001 S	1051	W	65133	140569	03/03/2017	03/06/2017 09:20	03/06/2017 15:43
	W-1 SD	MSD	17030305-001 SD	1051	W	65133	140569	03/03/2017	03/06/2017 09:20	03/06/2017 15:49
	W-1 SD	Reanalysis	17030305-001 SD	1051	W	65133	140569	03/03/2017	03/06/2017 09:20	03/06/2017 15:49
	W-1	Reanalysis	17030305-001	1051	W	65133	140613	03/03/2017	03/06/2017 09:20	03/07/2017 18:54
	W-1	Reanalysis	17030305-001	1051	W	65133	140613	03/03/2017	03/06/2017 09:20	03/07/2017 18:48
SW-846 6020 A	W-1	Initial	17030305-001	1051	W	65138	140573	03/03/2017	03/06/2017 10:25	03/06/2017 16:49
	65138-1-BKS	BKS	65138-1-BKS	1051	W	65138	140573	--------	03/06/2017 10:25	03/06/2017 16:43
	65138-1-BLK	BLK	65138-1-BLK	1051	W	65138	140573	--------	03/06/2017 10:25	03/06/2017 16:37
	W-1 S	MS	17030305-001 S	1051	W	65138	140573	03/03/2017	03/06/2017 10:25	03/06/2017 16:55
	W-1 SD	MSD	17030305-001 SD	1051	W	65138	140573	03/03/2017	03/06/2017 10:25	03/06/2017 17:01

PHASE SEPARATION SCIENCE, INC.

QC Summary 17030305

Hillis Carnes Engineering Associates
SPT Parcel A-3 Manhole

Analytical Method: SW-846 6020 A Prep Method: SW3010A
Seq Number: 140569 Matrix: Water Date Prep: 03/06/17
MB Sample Id: 65133-1-BLK LCS Sample Id: 65133-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Arsenic	<1.000	40.00	43.04	108	80-120	ug/L	03/06/17 15:31	
Barium	<1.000	40.00	39.81	100	80-120	ug/L	03/06/17 15:31	
Cadmium	<1.000	40.00	40.85	102	80-120	ug/L	03/06/17 15:31	
Chromium	<1.000	40.00	42.92	107	80-120	ug/L	03/06/17 15:31	
Lead	<1.000	40.00	38.15	95	80-120	ug/L	03/06/17 15:31	
Mercury	<0.2000	1.000	0.9400	94	80-120	ug/L	03/06/17 15:31	
Selenium	<1.000	40.00	43.63	109	80-120	ug/L	03/06/17 15:31	
Silver	<1.000	40.00	39.36	98	80-120	ug/L	03/06/17 15:31	
Zinc	<20.00	200	211.9	106	80-120	ug/L	03/06/17 15:31	

Analytical Method: SW-846 6020 A Prep Method: SW3005A
Seq Number: 140573 Matrix: Water Date Prep: 03/06/17
MB Sample Id: 65138-1-BLK LCS Sample Id: 65138-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Zinc	<20.00	200	185.5	93	80-120	ug/L	03/06/17 16:43	

Analytical Method: SW-846 6020 A Prep Method: SW3010A
Seq Number: 140569 Matrix: Ground Water Date Prep: 03/06/17
Parent Sample Id: 17030305-001 MS Sample Id: 17030305-001 S MSD Sample Id: 17030305-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Arsenic	22.76	40.00	57.07	86	57.86	88	75-125	1	25	ug/L	03/06/17 15:43	
Barium	321.6	40.00	349.5	70	370.5	122	75-125	6	25	ug/L	03/06/17 15:43	X
Cadmium	1.380	40.00	34.17	82	35.44	85	75-125	4	25	ug/L	03/06/17 15:43	
Chromium	74.33	40.00	111	92	112.8	96	75-125	2	25	ug/L	03/06/17 15:43	
Lead	203.3	40.00	237.6	86	244.9	104	75-125	3	25	ug/L	03/06/17 15:43	
Mercury	0.5900	1.000	1.480	89	1.510	92	75-125	2	25	ug/L	03/06/17 15:43	
Selenium	2.040	40.00	30.73	72	30.57	71	75-125	1	25	ug/L	03/06/17 15:43	X
Silver	<1.000	40.00	32.44	81	33.35	83	75-125	3	25	ug/L	03/06/17 15:43	
Zinc	2935	200	2940	3	2978	22	75-125	1	25	ug/L	03/06/17 15:43	X

Analytical Method: SW-846 6020 A Prep Method: SW3005A
Seq Number: 140573 Matrix: Ground Water Date Prep: 03/06/17
Parent Sample Id: 17030305-001 MS Sample Id: 17030305-001 S MSD Sample Id: 17030305-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Zinc	143	200	283.3	70	314.6	86	75-125	10	25	ug/L	03/06/17 16:55	X

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria

PHASE SEPARATION SCIENCE, INC.

QC Summary 17030305

Hillis Carnes Engineering Associates
SPT Parcel A-3 Manhole

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

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

PHASE SEPARATION SCIENCE, INC.

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

(1) *CLIENT: Hillis-Carnes (HCEA) *OFFICE LOC. AJ

*PROJECT MGR: gina galimberti *PHONE NO.: (410) 880-4788

EMAIL: ggalimberti@hcea.com FAX NO.: ( )

*PROJECT NAME: SPT Parcel A-3 manhole PROJECT NO.:

SITE LOCATION: P.O. NO.:

SAMPLER(S): Sean Harkins DW CERT NO.:

PSS Work Order #: 1703030S PAGE 1 OF 1

Matrix Codes: SW=Surface Wtr DW=Drinking Wtr GW=Ground Wtr WW=Waste Wtr O=Oil S=Soil L=Liquid SOL=Solid A=Air WI=Wipe

(2)

LAB NO.	*SAMPLE IDENTIFICATION	*DATE (SAMPLED)	*TIME (SAMPLED)	MATRIX (See Codes)	No. CONTAINERS	SAMPLE TYPE (C = COMP, G = GRAB)	Preservatives Used	Analysis/ Method Required (3) * RCRA 8 metals	Zinc dissolved	REMARKS
	W-1	3/3/17	11.00am	GW	2	G		X	X	Requesting lab filter for dissolved zinc
										Preserved sample

(4) *Requested TAT (One TAT per COC): ☐ 5-Day ☐ 3-Day ☒ 2-Day ☐ Next Day ☐ Emergency ☐ Other

Data Deliverables Required: COA ☐ QC SUMM ☐ CLP LIKE ☐ OTHER ____

# of Coolers: 1

Custody Seal: Abs

Ice Present: ice pack Temp: 4-7°C

Shipping Carrier: client

Special Instructions:

DW COMPLIANCE? YES ☐

EDD FORMAT TYPE ____

STATE RESULTS REPORTED TO: MD ☐ DE ☐ PA ☐ VA ☐ WV ☐ OTHER ____

(5)

Relinquished By:	Date	Time	Received By:
(1)	3/3/17	1200	Barb Wehr
(2)			
(3)			
(4)			

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Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17030305	**Received By**	Barb Weber
Client Name	Hillis Carnes Engineering Associates	**Date Received**	03/03/2017 12:00:00 PM
Project Name	SPT Parcel A-3 Manhole	**Delivered By**	Client
Disposal Date	04/07/2017	**Tracking No**	Not Applicable
		Logged In By	Barb Weber

Shipping Container(s)

No. of Coolers 1

		Ice	Ice Packs Used
Custody Seal(s) Intact?	N/A	Temp (deg C)	7
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No

Documentation

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

Sample Container

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

Total No. of Samples Received 1 Total No. of Containers Received 2

Preservation

Total Metals	(pH<2)	Yes
Dissolved Metals, filtered within 15 minutes of collection	(pH<2)	No
Orthophosphorus, filtered within 15 minutes of collection		N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, DOC (field filtered), COD, Phenols	(pH<2)	N/A
TOX, TKN, NH3, Total Phos	(pH<2)	N/A
VOC, BTEX (VOA Vials Rcvd Preserved)	(pH<2)	N/A
Do VOA vials have zero headspace?		N/A
624 VOC (Rcvd at least one unpreserved VOA vial)		N/A
524 VOC (Rcvd with trip blanks)	(pH<2)	N/A

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

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

Sample aliquots for dissolved metals were not field filtered and were received unpreserved.

Samples Inspected/Checklist Completed By: Barb Weber Date: 03/03/2017

Barb Weber

PM Review and Approval: Amber J Confer Date: 03/03/2017

Amber Confer

Analytical Report for

Hillis Carnes Engineering Associates

Certificate of Analysis No.: 17091105

Project Manager: Keith Progin

Project Name : SPT A3-1

September 12, 2017

Phase Separation Science, Inc.

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PHASE SEPARATION SCIENCE, INC.

September 12, 2017

Keith Progin
Hillis Carnes Engineering Associates
10975 Guilford Road, Ste. A
Annapolis Junction, MD 20701

Reference: PSS Work Order(s) No: **17091105**
Project Name: SPT A3-1

Dear Keith Progin :

This report includes the analytical results from the analyses performed on the samples received under the project name referenced above and identified with the Phase Separation Science (PSS) Work Order(s) numbered **17091105**.

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

PSS reserves the right to return any unused samples, extracts or related solutions. Otherwise, the samples are scheduled for disposal, without any further notice, on October 16, 2017, with the exception of air canisters which are cleaned immediately following analysis. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt , the request will be acknowledged by PSS, thus extending the storage period.

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

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

Sincerely,

Dan Prucnal
Laboratory Manager

Sample Summary

Client Name: Hillis Carnes Engineering Associates

Project Name: SPT A3-1

Work Order Number(s): 17091105

The following samples were received under chain of custody by Phase Separation Science (PSS) on 09/11/2017 at 11:40 am

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17091105-001	W-1	WATER	09/11/17 11:00

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

Notes:

1. The presence of a common laboratory contaminant such as methylene chloride may be considered a possible laboratory artifact. Where observed, appropriate consideration of data should be taken.
2. Unless otherwise noted in the case narrative, results are reported on a dry weight basis with the exception of pH, flashpoint, moisture, and paint filter test.
3. Drinking water samples collected for the purpose of compliance with SDWA may not be suitable for their intended use unless collected by a certified sampler [COMAR 26.08.05.07.C.2].
4. The analyses of 1,2-dibromo-3-chloropropane (DBCP) and 1,2-dibromoethane (EDB) by EPA 524.2 and calcium, magnesium, sodium and iron by EPA 200.8 are not currently promulgated for use in testing to meet the Safe Drinking Water Act and as such cannot be used for compliance purposes. The listings of the current promulgated methods for testing in compliance with the Safe Drinking Water Act can be found in the 40 CFR part 141.1, for the primary drinking water contaminates, and part 141.3, for the secondary drinking water contaminates.
5. Sample prepared under EPA 3550C with concentrations greater than 20 mg/Kg should employ the microtip extraction procedure if required to meet data quality objectives.
6. The analysis of acrolein by EPA 624 must be analyzed within three days of sampling unless pH is adjusted to 4-5 units [40 CFR part 136.3(e)].
7. Method 180.1, The Determination of Turbidity by Nephelometry, recommends samples over 40 NTU be diluted until the turbidity falls below 40 units. Routine samples over 40 NTU may not be diluted as long as the data quality objectives are not affected.
8. Alkalinity results analyzed by EPA 310.2 that are reported by dilution are estimated and are not in compliance with method requirements.

Standard Flags/Abbreviations:

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

Certifications:

NELAP Certifications: PA 68-03330, VA 460156
State Certifications: MD 179, WV 303
Regulated Soil Permit: P330-12-00268
NSWC USCG Accepted Laboratory
LDBE MWAA LD1997-0041-2015

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17091105

Hillis Carnes Engineering Associates, Annapolis Junction, MD

September 12, 2017

Project Name: SPT A3-1

Sample ID: W-1 **Date/Time Sampled: 09/11/2017 11:00** **PSS Sample ID: 17091105-001**

Matrix: WATER **Date/Time Received: 09/11/2017 11:40**

Total Metals — Analytical Method: SW-846 6020 A — Preparation Method: 3010A

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Cadmium	**140**	ug/L	50		50	09/12/17	09/12/17 15:14	1064
Zinc	**31,000**	ug/L	1,000		50	09/12/17	09/12/17 15:14	1064

Polychlorinated Biphenyls — Analytical Method: SW-846 8082 A — Preparation Method: 3510C — Clean up Method: SW846 3665A

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
PCB-1016	ND	ug/L	0.56		1	09/11/17	09/12/17 14:04	1029
PCB-1221	ND	ug/L	0.56		1	09/11/17	09/12/17 14:04	1029
PCB-1232	ND	ug/L	0.56		1	09/11/17	09/12/17 14:04	1029
PCB-1242	ND	ug/L	0.56		1	09/11/17	09/12/17 14:04	1029
PCB-1248	ND	ug/L	0.56		1	09/11/17	09/12/17 14:04	1029
PCB-1254	ND	ug/L	0.56		1	09/11/17	09/12/17 14:04	1029
PCB-1260	**1.3**	ug/L	0.56		1	09/11/17	09/12/17 14:04	1029

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17091105

Hillis Carnes Engineering Associates, Annapolis Junction, MD

September 12, 2017

Project Name: SPT A3-1

Sample ID: W-1 **Date/Time Sampled: 09/11/2017 11:00** **PSS Sample ID: 17091105-001**

Matrix: WATER **Date/Time Received: 09/11/2017 11:40**

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acetone	**12**	ug/L	10		1	09/12/17	09/12/17 14:16	1045
Benzene	ND	ug/L	1.0		1	09/12/17	09/12/17 14:16	1045
Bromochloromethane	ND	ug/L	1.0		1	09/12/17	09/12/17 14:16	1045
Bromodichloromethane	ND	ug/L	1.0		1	09/12/17	09/12/17 14:16	1045
Bromoform	ND	ug/L	5.0		1	09/12/17	09/12/17 14:16	1045
Bromomethane	ND	ug/L	1.0		1	09/12/17	09/12/17 14:16	1045
2-Butanone (MEK)	ND	ug/L	10		1	09/12/17	09/12/17 14:16	1045
Carbon Disulfide	ND	ug/L	10		1	09/12/17	09/12/17 14:16	1045
Carbon Tetrachloride	ND	ug/L	1.0		1	09/12/17	09/12/17 14:16	1045
Chlorobenzene	ND	ug/L	1.0		1	09/12/17	09/12/17 14:16	1045
Chloroethane	ND	ug/L	1.0		1	09/12/17	09/12/17 14:16	1045
Chloroform	ND	ug/L	1.0		1	09/12/17	09/12/17 14:16	1045
Chloromethane	ND	ug/L	1.0		1	09/12/17	09/12/17 14:16	1045
Cyclohexane	ND	ug/L	10		1	09/12/17	09/12/17 14:16	1045
1,2-Dibromo-3-Chloropropane	ND	ug/L	5.0		1	09/12/17	09/12/17 14:16	1045
Dibromochloromethane	ND	ug/L	1.0		1	09/12/17	09/12/17 14:16	1045
1,2-Dibromoethane (EDB)	ND	ug/L	1.0		1	09/12/17	09/12/17 14:16	1045
1,2-Dichlorobenzene	ND	ug/L	1.0		1	09/12/17	09/12/17 14:16	1045
1,3-Dichlorobenzene	ND	ug/L	1.0		1	09/12/17	09/12/17 14:16	1045
1,4-Dichlorobenzene	ND	ug/L	1.0		1	09/12/17	09/12/17 14:16	1045
Dichlorodifluoromethane	ND	ug/L	1.0		1	09/12/17	09/12/17 14:16	1045
1,1-Dichloroethane	**3.4**	ug/L	1.0		1	09/12/17	09/12/17 14:16	1045
1,2-Dichloroethane	ND	ug/L	1.0		1	09/12/17	09/12/17 14:16	1045
cis-1,2-Dichloroethene	**32**	ug/L	1.0		1	09/12/17	09/12/17 14:16	1045
1,1-Dichloroethene	ND	ug/L	1.0		1	09/12/17	09/12/17 14:16	1045
1,2-Dichloropropane	ND	ug/L	1.0		1	09/12/17	09/12/17 14:16	1045
cis-1,3-Dichloropropene	ND	ug/L	1.0		1	09/12/17	09/12/17 14:16	1045
trans-1,3-Dichloropropene	ND	ug/L	1.0		1	09/12/17	09/12/17 14:16	1045
trans-1,2-Dichloroethene	ND	ug/L	1.0		1	09/12/17	09/12/17 14:16	1045
Ethylbenzene	**2.6**	ug/L	1.0		1	09/12/17	09/12/17 14:16	1045

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17091105

Hillis Carnes Engineering Associates, Annapolis Junction, MD

September 12, 2017

Project Name: SPT A3-1

Sample ID: W-1 **Date/Time Sampled: 09/11/2017 11:00** **PSS Sample ID: 17091105-001**

Matrix: WATER **Date/Time Received: 09/11/2017 11:40**

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
2-Hexanone	ND	ug/L	5.0		1	09/12/17	09/12/17 14:16	1045
Isopropylbenzene	ND	ug/L	1.0		1	09/12/17	09/12/17 14:16	1045
Methyl Acetate	ND	ug/L	10		1	09/12/17	09/12/17 14:16	1045
Methylcyclohexane	ND	ug/L	10		1	09/12/17	09/12/17 14:16	1045
Methylene Chloride	ND	ug/L	1.0		1	09/12/17	09/12/17 14:16	1045
4-Methyl-2-Pentanone	ND	ug/L	5.0		1	09/12/17	09/12/17 14:16	1045
Methyl-t-butyl ether	ND	ug/L	1.0		1	09/12/17	09/12/17 14:16	1045
Naphthalene	**76**	ug/L	1.0		1	09/12/17	09/12/17 14:16	1045
Styrene	ND	ug/L	1.0		1	09/12/17	09/12/17 14:16	1045
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0		1	09/12/17	09/12/17 14:16	1045
Tetrachloroethene	ND	ug/L	1.0		1	09/12/17	09/12/17 14:16	1045
Toluene	**7.3**	ug/L	1.0		1	09/12/17	09/12/17 14:16	1045
1,2,3-Trichlorobenzene	ND	ug/L	1.0		1	09/12/17	09/12/17 14:16	1045
1,2,4-Trichlorobenzene	ND	ug/L	1.0		1	09/12/17	09/12/17 14:16	1045
1,1,1-Trichloroethane	ND	ug/L	1.0		1	09/12/17	09/12/17 14:16	1045
1,1,2-Trichloroethane	ND	ug/L	1.0		1	09/12/17	09/12/17 14:16	1045
Trichloroethene	ND	ug/L	1.0		1	09/12/17	09/12/17 14:16	1045
Trichlorofluoromethane	ND	ug/L	5.0		1	09/12/17	09/12/17 14:16	1045
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ug/L	1.0		1	09/12/17	09/12/17 14:16	1045
Vinyl Chloride	ND	ug/L	1.0		1	09/12/17	09/12/17 14:16	1045
m,p-Xylenes	**3.2**	ug/L	2.0		1	09/12/17	09/12/17 14:16	1045
o-Xylene	**1.7**	ug/L	1.0		1	09/12/17	09/12/17 14:16	1045

Case Narrative Summary

Client Name: Hillis Carnes Engineering Associates

Project Name: SPT A3-1

Work Order Number(s): 17091105

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

The analyses of chlorine, pH, dissolved oxygen, temperature and sulfite for drinking water and non-potable samples tested for compliance have a maximum holding time of 15 minutes. As such, all laboratory analyses for these analytes exceed holding times.

Matrix spike and matrix spike duplicate analyses may not be performed due to insufficient sample quantity. In these instances, a laboratory control sample and laboratory control sample duplicate are analyzed unless otherwise noted or specified in the method.

Sample Receipt:

Received one container for metals unpreserved; preserved upon receipt.
Refer to work order 17091106 for remaining results.

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

Analytical Data Package Information Summary

Work Order(s): 17091105
Report Prepared For: Hillis Carnes Engineering Associates, Annapo
Project Name: SPT A3-1
Project Manager: Keith Progin

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
SW-846 6020 A	W-1	Initial	17091105-001	1064	W	67745	146014	09/11/2017	09/12/2017 10:45	09/12/2017 15:14
	67745-1-BKS	BKS	67745-1-BKS	1064	W	67745	146014	--------	09/12/2017 10:45	09/12/2017 15:09
	67745-1-BLK	BLK	67745-1-BLK	1064	W	67745	146014	--------	09/12/2017 10:45	09/12/2017 15:04
SW-846 8082 A	W-1	Initial	17091105-001	1029	W	67736	146010	09/11/2017	09/11/2017 18:47	09/12/2017 14:04
	67736-1-BKS	BKS	67736-1-BKS	1029	W	67736	146010	--------	09/11/2017 18:47	09/12/2017 13:08
	67736-1-BLK	BLK	67736-1-BLK	1029	W	67736	146010	--------	09/11/2017 18:47	09/12/2017 12:39
	67736-1-BSD	BSD	67736-1-BSD	1029	W	67736	146010	--------	09/11/2017 18:47	09/12/2017 13:36
SW-846 8260 B	W-1	Initial	17091105-001	1045	W	67752	146008	09/11/2017	09/12/2017 10:16	09/12/2017 14:16
	67752-1-BKS	BKS	67752-1-BKS	1045	W	67752	146008	--------	09/12/2017 10:16	09/12/2017 12:35
	67752-1-BLK	BLK	67752-1-BLK	1045	W	67752	146008	--------	09/12/2017 10:16	09/12/2017 13:40
	W-1 S	MS	17091105-001 S	1045	W	67752	146008	09/11/2017	09/12/2017 10:16	09/12/2017 14:37
	W-1 SD	MSD	17091105-001 SD	1045	W	67752	146008	09/11/2017	09/12/2017 10:16	09/12/2017 15:00

PHASE SEPARATION SCIENCE, INC.

QC Summary 17091105

Hillis Carnes Engineering Associates
SPT A3-1

Analytical Method: SW-846 8082 A Prep Method: SW3510C
Seq Number: 146010 Matrix: Water Date Prep: 09/11/2017
PSS Sample ID: 17091105-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Decachlorobiphenyl	73		39-154	%	09/12/17 14:04
Tetrachloro-m-xylene	69		35-131	%	09/12/17 14:04

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 146008 Matrix: Water Date Prep: 09/12/2017
PSS Sample ID: 17091105-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	96		86-111	%	09/12/17 14:16
Dibromofluoromethane	104		91-119	%	09/12/17 14:16
Toluene-D8	103		90-117	%	09/12/17 14:16

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

PHASE SEPARATION SCIENCE, INC.

QC Summary 17091105

Hillis Carnes Engineering Associates

SPT A3-1

Analytical Method: SW-846 6020 A Prep Method: SW3010A

Seq Number: 146014 Matrix: Water Date Prep: 09/12/17

MB Sample Id: 67745-1-BLK LCS Sample Id: 67745-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Cadmium	<1.000	40.00	41.05	103	80-120	ug/L	09/12/17 15:09	
Zinc	<20.00	200	210.2	105	80-120	ug/L	09/12/17 15:09	

Analytical Method: SW-846 8082 A Prep Method: SW3510C

Seq Number: 146010 Matrix: Water Date Prep: 09/11/17

MB Sample Id: 67736-1-BLK LCS Sample Id: 67736-1-BKS LCSD Sample Id: 67736-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
PCB-1016	<0.5000	5.000	3.903	78	3.775	76	56-124	3	20	ug/L	09/12/17 13:08	
PCB-1260	<0.5000	5.000	3.514	70	3.409	68	61-103	3	20	ug/L	09/12/17 13:08	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Decachlorobiphenyl	95		96		95		39-154	%	09/12/17 13:08
Tetrachloro-m-xylene	87		84		83		35-131	%	09/12/17 13:08

PHASE SEPARATION SCIENCE, INC.

QC Summary 17091105

Hillis Carnes Engineering Associates

SPT A3-1

Analytical Method: SW-846 8260 B Prep Method: SW5030B

Seq Number: 146008 Matrix: Water Date Prep: 09/12/17

MB Sample Id: 67752-1-BLK LCS Sample Id: 67752-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Acetone	<10.00	50.00	45.04	90	29-149	ug/L	09/12/17 12:35	
Benzene	<1.000	50.00	47.56	95	85-123	ug/L	09/12/17 12:35	
Bromochloromethane	<1.000	50.00	50.47	101	82-136	ug/L	09/12/17 12:35	
Bromodichloromethane	<1.000	50.00	46.75	94	88-133	ug/L	09/12/17 12:35	
Bromoform	<5.000	50.00	48.05	96	80-126	ug/L	09/12/17 12:35	
Bromomethane	<1.000	50.00	42.93	86	64-139	ug/L	09/12/17 12:35	
2-Butanone (MEK)	<10.00	50.00	47.40	95	39-135	ug/L	09/12/17 12:35	
Carbon Disulfide	<10.00	50.00	42.26	85	85-124	ug/L	09/12/17 12:35	
Carbon Tetrachloride	<1.000	50.00	45.15	90	81-138	ug/L	09/12/17 12:35	
Chlorobenzene	<1.000	50.00	47.83	96	85-120	ug/L	09/12/17 12:35	
Chloroethane	<1.000	50.00	37.35	75	75-129	ug/L	09/12/17 12:35	
Chloroform	<1.000	50.00	42.83	86	85-128	ug/L	09/12/17 12:35	
Chloromethane	<1.000	50.00	41.60	83	60-139	ug/L	09/12/17 12:35	
Cyclohexane	<10.00	50.00	46.53	93	55-131	ug/L	09/12/17 12:35	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	45.80	92	69-127	ug/L	09/12/17 12:35	
Dibromochloromethane	<1.000	50.00	48.98	98	82-127	ug/L	09/12/17 12:35	
1,2-Dibromoethane (EDB)	<1.000	50.00	47.53	95	82-121	ug/L	09/12/17 12:35	
1,2-Dichlorobenzene	<1.000	50.00	49.80	100	82-123	ug/L	09/12/17 12:35	
1,3-Dichlorobenzene	<1.000	50.00	49.89	100	81-123	ug/L	09/12/17 12:35	
1,4-Dichlorobenzene	<1.000	50.00	49.46	99	81-121	ug/L	09/12/17 12:35	
Dichlorodifluoromethane	<1.000	50.00	48.28	97	69-147	ug/L	09/12/17 12:35	
1,1-Dichloroethane	<1.000	50.00	44.02	88	83-123	ug/L	09/12/17 12:35	
1,2-Dichloroethane	<1.000	50.00	45.65	91	86-138	ug/L	09/12/17 12:35	
1,1-Dichloroethene	<1.000	50.00	48.18	96	85-127	ug/L	09/12/17 12:35	
cis-1,2-Dichloroethene	<1.000	50.00	46.68	93	87-127	ug/L	09/12/17 12:35	
1,2-Dichloropropane	<1.000	50.00	45.86	92	79-125	ug/L	09/12/17 12:35	
cis-1,3-Dichloropropene	<1.000	50.00	47.58	95	79-131	ug/L	09/12/17 12:35	
trans-1,3-Dichloropropene	<1.000	50.00	49.22	98	82-133	ug/L	09/12/17 12:35	
trans-1,2-Dichloroethene	<1.000	50.00	47.41	95	85-125	ug/L	09/12/17 12:35	
Ethylbenzene	<1.000	50.00	47.55	95	83-123	ug/L	09/12/17 12:35	
2-Hexanone	<5.000	50.00	47.13	94	37-137	ug/L	09/12/17 12:35	
Isopropylbenzene	<1.000	50.00	48.71	97	70-131	ug/L	09/12/17 12:35	
Methyl Acetate	<10.00	50.00	38.70	77	69-127	ug/L	09/12/17 12:35	
Methylcyclohexane	<10.00	50.00	48.24	96	75-129	ug/L	09/12/17 12:35	
Methylene Chloride	<1.000	50.00	47.45	95	86-124	ug/L	09/12/17 12:35	
4-Methyl-2-Pentanone	<5.000	50.00	45.67	91	39-143	ug/L	09/12/17 12:35	
Methyl-t-butyl ether	<1.000	50.00	45.96	92	75-134	ug/L	09/12/17 12:35	
Naphthalene	<1.000	50.00	50.57	101	61-118	ug/L	09/12/17 12:35	
Styrene	<1.000	50.00	50.83	102	80-120	ug/L	09/12/17 12:35	
1,1,2,2-Tetrachloroethane	<1.000	50.00	44.26	89	64-125	ug/L	09/12/17 12:35	
Tetrachloroethene	<1.000	50.00	52.41	105	83-138	ug/L	09/12/17 12:35	
Toluene	<1.000	50.00	49.03	98	88-126	ug/L	09/12/17 12:35	
1,2,3-Trichlorobenzene	<1.000	50.00	50.85	102	75-124	ug/L	09/12/17 12:35	
1,2,4-Trichlorobenzene	<1.000	50.00	50.27	101	77-131	ug/L	09/12/17 12:35	
1,1,1-Trichloroethane	<1.000	50.00	47.92	96	68-146	ug/L	09/12/17 12:35	
1,1,2-Trichloroethane	<1.000	50.00	47.64	95	85-124	ug/L	09/12/17 12:35	
Trichloroethene	<1.000	50.00	49.18	98	87-127	ug/L	09/12/17 12:35	
Trichlorofluoromethane	<5.000	50.00	47.73	95	77-147	ug/L	09/12/17 12:35	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	49.57	99	68-135	ug/L	09/12/17 12:35	
Vinyl Chloride	<1.000	50.00	46.55	93	74-138	ug/L	09/12/17 12:35	
m,p-Xylenes	<2.000	100	96.88	97	84-124	ug/L	09/12/17 12:35	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17091105

Hillis Carnes Engineering Associates

SPT A3-1

Analytical Method: SW-846 8260 B Prep Method: SW5030B

Seq Number: 146008 Matrix: Water Date Prep: 09/12/17

MB Sample Id: 67752-1-BLK LCS Sample Id: 67752-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
o-Xylene	<1.000	50.00	48.63	97	79-126	ug/L	09/12/17 12:35	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	96		94		86-111	%	09/12/17 12:35
Dibromofluoromethane	102		97		91-119	%	09/12/17 12:35
Toluene-D8	101		99		90-117	%	09/12/17 12:35

PHASE SEPARATION SCIENCE, INC.

QC Summary 17091105

Hillis Carnes Engineering Associates

SPT A3-1

Analytical Method: SW-846 8260 B Prep Method: SW5030B

Seq Number: 146008 Matrix: Water Date Prep: 09/12/17

Parent Sample Id: 17091105-001 MS Sample Id: 17091105-001 S MSD Sample Id: 17091105-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Acetone	12.45	50.00	45.85	67	63.31	102	46-138	32	25	ug/L	09/12/17 14:37	F
Benzene	<1.000	50.00	47.10	94	48.35	97	77-126	3	25	ug/L	09/12/17 14:37	
Bromochloromethane	<1.000	50.00	49.13	98	51.74	103	74-133	5	25	ug/L	09/12/17 14:37	
Bromodichloromethane	<1.000	50.00	53.73	107	46.78	94	79-130	14	25	ug/L	09/12/17 14:37	
Bromoform	<5.000	50.00	48.58	97	47.40	95	69-120	2	25	ug/L	09/12/17 14:37	
Bromomethane	<1.000	50.00	21.82	44	31.12	62	64-130	35	25	ug/L	09/12/17 14:37	XF
2-Butanone (MEK)	<10.00	50.00	34.63	69	48.51	97	34-126	33	25	ug/L	09/12/17 14:37	F
Carbon Disulfide	<10.00	50.00	59.23	118	55.65	111	76-126	6	25	ug/L	09/12/17 14:37	
Carbon Tetrachloride	<1.000	50.00	48.54	97	44.13	88	77-137	10	25	ug/L	09/12/17 14:37	
Chlorobenzene	<1.000	50.00	47.08	94	48.41	97	74-120	3	25	ug/L	09/12/17 14:37	
Chloroethane	<1.000	50.00	39.99	80	38.99	78	68-133	3	25	ug/L	09/12/17 14:37	
Chloroform	<1.000	50.00	42.51	85	43.34	87	77-127	2	25	ug/L	09/12/17 14:37	
Chloromethane	<1.000	50.00	49.29	99	43.80	88	50-143	12	25	ug/L	09/12/17 14:37	
Cyclohexane	<10.00	50.00	43.16	86	40.49	81	53-139	6	25	ug/L	09/12/17 14:37	
1,2-Dibromo-3-Chloropropane	<5.000	50.00	51.63	103	48.36	97	56-123	7	25	ug/L	09/12/17 14:37	
Dibromochloromethane	<1.000	50.00	50.27	101	48.49	97	70-125	4	25	ug/L	09/12/17 14:37	
1,2-Dibromoethane (EDB)	<1.000	50.00	49.01	98	48.09	96	69-121	2	25	ug/L	09/12/17 14:37	
1,2-Dichlorobenzene	<1.000	50.00	47.96	96	47.41	95	69-118	1	25	ug/L	09/12/17 14:37	
1,3-Dichlorobenzene	<1.000	50.00	46.62	93	46.33	93	68-119	1	25	ug/L	09/12/17 14:37	
1,4-Dichlorobenzene	<1.000	50.00	46.77	94	47.09	94	67-117	1	25	ug/L	09/12/17 14:37	
Dichlorodifluoromethane	<1.000	50.00	57.64	115	52.94	106	68-139	9	25	ug/L	09/12/17 14:37	
1,1-Dichloroethane	3.390	50.00	49.23	92	48.21	90	78-126	2	25	ug/L	09/12/17 14:37	
1,2-Dichloroethane	<1.000	50.00	38.83	78	46.36	93	78-134	18	25	ug/L	09/12/17 14:37	
1,1-Dichloroethene	<1.000	50.00	50.90	102	47.43	95	78-125	7	25	ug/L	09/12/17 14:37	
cis-1,2-Dichloroethene	31.66	50.00	77.50	92	79.17	95	78-128	2	25	ug/L	09/12/17 14:37	
1,2-Dichloropropane	<1.000	50.00	51.09	102	46.22	92	73-126	10	25	ug/L	09/12/17 14:37	
cis-1,3-Dichloropropene	<1.000	50.00	53.39	107	48.03	96	67-126	11	25	ug/L	09/12/17 14:37	
trans-1,3-Dichloropropene	<1.000	50.00	54.49	109	49.83	100	68-129	9	25	ug/L	09/12/17 14:37	
trans-1,2-Dichloroethene	<1.000	50.00	49.63	99	47.28	95	76-128	5	25	ug/L	09/12/17 14:37	
Ethylbenzene	2.580	50.00	49.32	93	49.33	94	74-123	0	25	ug/L	09/12/17 14:37	
2-Hexanone	<5.000	50.00	58.05	116	49.12	98	38-125	17	25	ug/L	09/12/17 14:37	
Isopropylbenzene	<1.000	50.00	45.86	92	44.83	90	58-129	2	25	ug/L	09/12/17 14:37	
Methyl Acetate	<10.00	50.00	27.38	55	39.90	80	63-115	37	25	ug/L	09/12/17 14:37	XF
Methylcyclohexane	<10.00	50.00	45.46	91	39.81	80	69-130	13	25	ug/L	09/12/17 14:37	
Methylene Chloride	<1.000	50.00	55.30	111	52.98	106	76-124	4	25	ug/L	09/12/17 14:37	
4-Methyl-2-Pentanone	<5.000	50.00	58.99	118	50.36	101	35-123	16	25	ug/L	09/12/17 14:37	
Methyl-t-butyl ether	<1.000	50.00	41.68	83	47.34	95	64-129	13	25	ug/L	09/12/17 14:37	
Naphthalene	76.13	50.00	124.3	96	125.6	99	45-109	1	25	ug/L	09/12/17 14:37	
Styrene	<1.000	50.00	52.34	105	51.43	103	61-124	2	25	ug/L	09/12/17 14:37	
1,1,2,2-Tetrachloroethane	<1.000	50.00	47.38	95	45.74	91	47-130	4	25	ug/L	09/12/17 14:37	
Tetrachloroethene	<1.000	50.00	55.30	111	49.98	100	68-139	10	25	ug/L	09/12/17 14:37	
Toluene	7.340	50.00	61.56	108	57.84	101	79-128	6	25	ug/L	09/12/17 14:37	
1,2,3-Trichlorobenzene	<1.000	50.00	44.49	89	46.36	93	48-122	4	25	ug/L	09/12/17 14:37	
1,2,4-Trichlorobenzene	<1.000	50.00	42.52	85	43.81	88	54-124	3	25	ug/L	09/12/17 14:37	
1,1,1-Trichloroethane	<1.000	50.00	50.58	101	47.65	95	73-140	6	25	ug/L	09/12/17 14:37	
1,1,2-Trichloroethane	<1.000	50.00	55.98	112	48.16	96	78-124	15	25	ug/L	09/12/17 14:37	
Trichloroethene	<1.000	50.00	53.91	108	49.36	99	77-131	9	25	ug/L	09/12/17 14:37	
Trichlorofluoromethane	<5.000	50.00	53.17	106	49.58	99	73-144	7	25	ug/L	09/12/17 14:37	
1,1,2-Trichloro-1,2,2-Trifluoroethane	<1.000	50.00	51.45	103	46.48	93	65-140	10	25	ug/L	09/12/17 14:37	
Vinyl Chloride	<1.000	50.00	71.30	143	59.63	119	60-146	18	25	ug/L	09/12/17 14:37	
m,p-Xylenes	3.240	100	98.13	95	99.07	96	75-125	1	25	ug/L	09/12/17 14:37	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17091105

Hillis Carnes Engineering Associates

SPT A3-1

Analytical Method: SW-846 8260 B Prep Method: SW5030B

Seq Number: 146008 Matrix: Water Date Prep: 09/12/17

Parent Sample Id: 17091105-001 MS Sample Id: 17091105-001 S MSD Sample Id: 17091105-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
o-Xylene	1.690	50.00	50.98	99	49.90	96	69-126	2	25	ug/L	09/12/17 14:37	

Surrogate	MS Result	MS Flag	MSD Result	MSD Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	96		95		86-111	%	09/12/17 14:37
Dibromofluoromethane	92		97		91-119	%	09/12/17 14:37
Toluene-D8	112		101		90-117	%	09/12/17 14:37

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

PHASE SEPARATION SCIENCE, INC.

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

(1) *CLIENT: Hills-Carnes (HCEA) *OFFICE LOC. AJ

*PROJECT MGR: Keith Prosin *PHONE NO.: (410) 880-4788

EMAIL: kprosin@hcea.com FAX NO.: ( )

*PROJECT NAME: SPT A3-1 PROJECT NO.:

SITE LOCATION: P.O. NO.:

SAMPLER(S): DW CERT NO.:

PSS Work Order #: 17091105 PAGE 1 OF 1

Matrix Codes: SW=Surface Wtr DW=Drinking Wtr GW=Ground Wtr WW=Waste Wtr O=Oil S=Soil L=Liquid SOL=Solid A=Air WI=Wipe

(2)

LAB NO.	*SAMPLE IDENTIFICATION	*DATE (SAMPLED)	*TIME (SAMPLED)	MATRIX (See Codes)	No. CONTAINERS	SAMPLE TYPE C = COMP G = GRAB	Preservatives Used	Analysis/ Method Required (3) * TPH-DRO	Oil & Grease	PCBs	TCLP Metals	VOCs	Zinc	Cadmium	REMARKS
X[illegible]	C-1	9/11/17	10:45am	S	4	C		X	X	X	X				3-Day soil
t	W-1	9/11/17	11:00am	W	5	G				X		X	X	X	2-Day water

(5)

Relinquished By: (1)	Date	Time	Received By:
[signature]	9/11/17	11:40	Barb Weber
Relinquished By: (2)	Date	Time	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

(4) *Requested TAT (One TAT per COC)
☐ 5-Day ☒ 3-Day ☐ 2-Day
☐ Next Day ☐ Emergency ☐ Other

Data Deliverables Required:
COA ☐ QC SUMM ☐ CLP LIKE ☐ OTHER ____

# of Coolers: 2

Custody Seal: Abs

Ice Present: Pres Temp: 3-11°C

Shipping Carrier: Client

Special Instructions:

DW COMPLIANCE? YES ☐

EDD FORMAT TYPE ____

STATE RESULTS REPORTED TO:
MD ☐ DE ☐ PA ☐ VA ☐ WV ☐ OTHER ____

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

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17091105	**Received By**	Barb Weber
Client Name	Hillis Carnes Engineering Associates	**Date Received**	09/11/2017 11:40:00 AM
Project Name	SPT A3-1	**Delivered By**	Trans Time Express
Disposal Date	10/16/2017	**Tracking No**	Not Applicable
		Logged In By	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	Yes	Temp (deg C)	11
Seal(s) Signed / Dated?	Yes	Temp Blank Present	No

Documentation

		Sampler Name	Not Provided
COC agrees with sample labels?	Yes		N/A
Chain of Custody	Yes		

Sample Container

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

Total No. of Samples Received 1 Total No. of Containers Received 5

Preservation

Total Metals	(pH<2)	No
Dissolved Metals, filtered within 15 minutes of collection	(pH<2)	N/A
Orthophosphorus, filtered within 15 minutes of collection		N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, DOC (field filtered), COD, Phenols	(pH<2)	N/A
TOX, TKN, NH3, Total Phos	(pH<2)	N/A
VOC, BTEX (VOA Vials Rcvd Preserved)	(pH<2)	Yes
Do VOA vials have zero headspace?		Yes
624 VOC (Rcvd at least one unpreserved VOA vial)		N/A
524 VOC (Rcvd with trip blanks)	(pH<2)	N/A

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

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

Received one container for metals unpreserved; preserved upon receipt.
Refer to work order 17091106 for remaining results.

Samples Inspected/Checklist Completed By: Thomas Wingate Date: 09/11/2017

Thomas Wingate

PM Review and Approval: Lynn Jackson Date: 09/11/2017

Lynn Jackson

APPENDIX K

Modified Level D Contractor Certification
Ground Intrusive Work

In accordance with the *Response and Development Work Plan (RDWP) for Area A: Sub-Parcel A3-1, Revision 3* dated April 24, 2017 and updated June 5, 2017, Section 3.4.2, *Sub-Parcel A3-1 SLRA Results and Risk Characterization*, a site-specific ground intrusive work exposure durations of 120 work days for the EU Outside the Building Footprint and 60 days for the EU Inside the Building Footprint were established. In lieu of tracking exposure days for each employee, Modified Level D personal protective equipment (PPE) or equivalent elevated PPE was proposed to be implemented as required by Site conditions during construction in the *RADWP Addendum Area A: Sub-Parcel A3-1* dated December 13, 2019. Modified Level D is defined below. For the expansion/fitout project the contractor adopted Modified Level D PPE as a condition of all Subcontracts prior to starting work.

Project Statement:

During construction activities, ARCO as well as their subcontractors adopted Modified Level D as the baseline PPE for all personnel involved in ground intrusive work. Modified Level D was included as a condition of all Subcontracts prior to starting work.

Statement Certification:

Company: ARCO National Construction

Name: Jason Roberts

Title: Project Manager

Signature: [signature]

Date: 9/23/21

Modified Level D PPE

Modified Level D PPE will include, at a minimum, overalls such as polyethylene-coated Tyvek or clean washable cloth overalls, latex (or similar) disposable gloves (when working in wet/chemical surroundings) or work gloves, steel-toe/steel-shank high ankle work boots with taped chemical-protective over-boots (as necessary), dust mask, hard hat, safety glasses with side shields, and hearing protection (as necessary). If chemical-protective over-boots create increased slip/trip/fall hazardous, then standard leather or rubber work boots could be used, but visible soils from the sides and bottoms of the boots must be removed upon exiting the Exclusion Zone.

APPENDIX L

Analytical Report for

Hillis Carnes Engineering Associates

Certificate of Analysis No.: 17092817

Project Manager: Keith Progin

Project Name : A3-1

Project ID : 16280B

October 3, 2017

Phase Separation Science, Inc.

6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

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

PHASE SEPARATION SCIENCE, INC.

October 3, 2017

Keith Progin
Hillis Carnes Engineering Associates
10975 Guilford Road, Ste. A
Annapolis Junction, MD 20701

Reference: PSS Work Order(s) No: **17092817**
Project Name: A3-1

Project ID.: 16280B

Dear Keith Progin :

This report includes the analytical results from the analyses performed on the samples received under the project name referenced above and identified with the Phase Separation Science (PSS) Work Order(s) numbered **17092817**.

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

PSS reserves the right to return any unused samples, extracts or related solutions. Otherwise, the samples are scheduled for disposal, without any further notice, on November 2, 2017, with the exception of air canisters which are cleaned immediately following analysis. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt , the request will be acknowledged by PSS, thus extending the storage period.

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

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

Sincerely,

Dan Prucnal

Dan Prucnal
Laboratory Manager

Sample Summary

Client Name: Hillis Carnes Engineering Associates

Project Name: A3-1

Work Order Number(s): 17092817

Project ID: 16280B

The following samples were received under chain of custody by Phase Separation Science (PSS) on 09/28/2017 at 02:50 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17092817-001	Exclusion -1	SOIL	09/28/17 10:30

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

Notes:

1. The presence of a common laboratory contaminant such as methylene chloride may be considered a possible laboratory artifact. Where observed, appropriate consideration of data should be taken.
2. Unless otherwise noted in the case narrative, results are reported on a dry weight basis with the exception of pH, flashpoint, moisture, and paint filter test.
3. Drinking water samples collected for the purpose of compliance with SDWA may not be suitable for their intended use unless collected by a certified sampler [COMAR 26.08.05.07.C.2].
4. The analyses of 1,2-dibromo-3-chloropropane (DBCP) and 1,2-dibromoethane (EDB) by EPA 524.2 and calcium, magnesium, sodium and iron by EPA 200.8 are not currently promulgated for use in testing to meet the Safe Drinking Water Act and as such cannot be used for compliance purposes. The listings of the current promulgated methods for testing in compliance with the Safe Drinking Water Act can be found in the 40 CFR part 141.1, for the primary drinking water contaminates, and part 141.3, for the secondary drinking water contaminates.
5. Sample prepared under EPA 3550C with concentrations greater than 20 mg/Kg should employ the microtip extraction procedure if required to meet data quality objectives.
6. The analysis of acrolein by EPA 624 must be analyzed within three days of sampling unless pH is adjusted to 4-5 units [40 CFR part 136.3(e)].
7. Method 180.1, The Determination of Turbidity by Nephelometry, recommends samples over 40 NTU be diluted until the turbidity falls below 40 units. Routine samples over 40 NTU may not be diluted as long as the data quality objectives are not affected.
8. Alkalinity results analyzed by EPA 310.2 that are reported by dilution are estimated and are not in compliance with method requirements.

Standard Flags/Abbreviations:

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

Certifications:

NELAP Certifications: PA 68-03330, VA 460156
State Certifications: MD 179, WV 303
Regulated Soil Permit: P330-12-00268
NSWC USCG Accepted Laboratory
LDBE MWAA LD1997-0041-2015

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17092817

Hillis Carnes Engineering Associates, Annapolis Junction, MD

October 3, 2017

Project Name: A3-1

Project ID: 16280B

Sample ID: Exclusion -1 **Date/Time Sampled: 09/28/2017 10:30** **PSS Sample ID: 17092817-001**

Matrix: SOIL **Date/Time Received: 09/28/2017 14:50** **% Solids: 90**

Oil and Grease — Analytical Method: EPA 9071 B-Modified

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Oil & Grease, Total Recovered	**160**	mg/kg	56		1	10/02/17	10/02/17 10:29	1022

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Antimony	ND	mg/kg	2.1		1	09/29/17	09/29/17 21:53	1051
Arsenic	**28**	mg/kg	0.42		1	09/29/17	09/29/17 21:53	1051
Beryllium	ND	mg/kg	2.1		1	09/29/17	09/29/17 21:53	1051
Cadmium	**25**	mg/kg	2.1		1	09/29/17	09/29/17 21:53	1051
Chromium	**51**	mg/kg	2.1		1	09/29/17	09/29/17 21:53	1051
Copper	**20**	mg/kg	2.1		1	09/29/17	09/29/17 21:53	1051
Lead	**94**	mg/kg	2.1		1	09/29/17	09/29/17 21:53	1051
Mercury	**0.12**	mg/kg	0.085		1	09/29/17	09/29/17 21:53	1051
Nickel	**8.0**	mg/kg	2.1		1	09/29/17	09/29/17 21:53	1051
Selenium	ND	mg/kg	2.1		1	09/29/17	09/29/17 21:53	1051
Silver	ND	mg/kg	2.1		1	09/29/17	09/29/17 21:53	1051
Thallium	ND	mg/kg	1.7		1	09/29/17	09/29/17 21:53	1051
Zinc	**940**	mg/kg	85		10	09/29/17	10/02/17 18:44	1051

Total Petroleum Hydrocarbons - DRO — Analytical Method: SW-846 8015 C — Preparation Method: SW3550C

DF/HF - No. 2/diesel fuel and heavier fuel/oil patterns observed in sample.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
TPH-DRO (Diesel Range Organics)	**23**	mg/kg	11	DF	1	09/29/17	09/30/17 05:06	1055

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BALTIMORE, MD 21228
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FAX 410-788-8723

PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17092817

Hillis Carnes Engineering Associates, Annapolis Junction, MD

October 3, 2017

Project Name: A3-1

Project ID: 16280B

Sample ID: Exclusion -1 **Date/Time Sampled: 09/28/2017 10:30** **PSS Sample ID: 17092817-001**

Matrix: SOIL **Date/Time Received: 09/28/2017 14:50** **% Solids: 90**

Polychlorinated Biphenyls

Analytical Method: SW-846 8082 A

Preparation Method: SW3550C

Clean up Method: SW846 3665A

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
PCB-1016	ND	mg/kg	0.054		1	09/29/17	10/02/17 17:33	1029
PCB-1221	ND	mg/kg	0.054		1	09/29/17	10/02/17 17:33	1029
PCB-1232	ND	mg/kg	0.054		1	09/29/17	10/02/17 17:33	1029
PCB-1242	ND	mg/kg	0.054		1	09/29/17	10/02/17 17:33	1029
PCB-1248	**0.066**	mg/kg	0.054		1	09/29/17	10/02/17 17:33	1029
PCB-1254	ND	mg/kg	0.054		1	09/29/17	10/02/17 17:33	1029
PCB-1260	ND	mg/kg	0.054		1	09/29/17	10/02/17 17:33	1029

Case Narrative Summary

Client Name: Hillis Carnes Engineering Associates

Project Name: A3-1

Work Order Number(s): 17092817
Project ID: 16280B

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

The analyses of chlorine, pH, dissolved oxygen, temperature and sulfite for drinking water and non-potable samples tested for compliance have a maximum holding time of 15 minutes. As such, all laboratory analyses for these analytes exceed holding times.

Matrix spike and matrix spike duplicate analyses may not be performed due to insufficient sample quantity. In these instances, a laboratory control sample and laboratory control sample duplicate are analyzed unless otherwise noted or specified in the method.

Sample Receipt:

All sample receipt conditions were acceptable.

Analytical:

Total Petroleum Hydrocarbons - DRO

Batch: 146614

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

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

EPA 9071 B-Modified: Oil & Grease, Total Recovered

Analytical Data Package Information Summary

Work Order(s): 17092817
Report Prepared For: Hillis Carnes Engineering Associates, Annapo
Project Name: A3-1
Project Manager: Keith Progin

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
EPA 9071 B-Modified	Exclusion -1	Initial	17092817-001	1022	S	146567	146567	09/28/2017	10/02/2017 10:29	10/02/2017 10:29
	146567-1-BKS	BKS	146567-1-BKS	1022	S	146567	146567	--------	10/02/2017 10:29	10/02/2017 10:29
	146567-1-BLK	BLK	146567-1-BLK	1022	S	146567	146567	--------	10/02/2017 10:29	10/02/2017 10:29
	146567-1-BSD	BSD	146567-1-BSD	1022	S	146567	146567	--------	10/02/2017 10:29	10/02/2017 10:29
	Test Pits S	MS	17092906-001 S	1022	S	146567	146567	09/28/2017	10/02/2017 10:29	10/02/2017 10:29
	Test Pits SD	MSD	17092906-001 SD	1022	S	146567	146567	09/28/2017	10/02/2017 10:29	10/02/2017 10:29
SM2540G	Exclusion -1	Initial	17092817-001	1059	S	146581	146581	09/28/2017	10/02/2017 12:33	10/02/2017 12:33
SW-846 6020 A	Exclusion -1	Initial	17092817-001	1051	S	68001	146598	09/28/2017	09/29/2017 09:59	09/29/2017 21:53
	68001-1-BKS	BKS	68001-1-BKS	1051	S	68001	146598	--------	09/29/2017 09:59	09/29/2017 18:59
	68001-1-BLK	BLK	68001-1-BLK	1051	S	68001	146598	--------	09/29/2017 09:59	09/29/2017 18:52
	B117-Sample 4 S	MS	17092722-004 S	1051	S	68001	146598	09/27/2017	09/29/2017 09:59	09/29/2017 19:12
	B117-Sample 4 SD	MSD	17092722-004 SD	1051	S	68001	146598	09/27/2017	09/29/2017 09:59	09/29/2017 19:18
	68001-1-BKS	BKS	68001-1-BKS	1051	S	68001	146627	--------	09/29/2017 09:59	10/02/2017 18:57
	68001-1-BLK	BLK	68001-1-BLK	1051	S	68001	146627	--------	09/29/2017 09:59	10/02/2017 18:51
	Exclusion -1	Reanalysis	17092817-001	1051	S	68001	146627	09/28/2017	09/29/2017 09:59	10/02/2017 18:44
SW-846 8015 C	Exclusion -1	Initial	17092817-001	1055	S	68013	146614	09/28/2017	09/29/2017 14:12	09/30/2017 05:06
	68013-1-BKS	BKS	68013-1-BKS	1055	S	68013	146614	--------	09/29/2017 14:12	09/29/2017 23:46
	68013-1-BLK	BLK	68013-1-BLK	1055	S	68013	146614	--------	09/29/2017 14:12	09/29/2017 23:21
	68013-1-BSD	BSD	68013-1-BSD	1055	S	68013	146614	--------	09/29/2017 14:12	09/30/2017 00:10
	092517-MCL-B5-14.5 S	MS	17092623-007 S	1055	S	68013	146615	09/25/2017	09/29/2017 14:12	09/29/2017 23:46
	092517-MCL-B5-14.5 SD	MSD	17092623-007 SD	1055	S	68013	146615	09/25/2017	09/29/2017 14:12	09/30/2017 00:10
SW-846 8082 A	Exclusion -1	Initial	17092817-001	1029	S	68021	146621	09/28/2017	09/29/2017 18:23	10/02/2017 17:33
	68021-1-BKS	BKS	68021-1-BKS	1029	S	68021	146621	--------	09/29/2017 18:23	10/02/2017 10:02
	68021-1-BLK	BLK	68021-1-BLK	1029	S	68021	146621	--------	09/29/2017 18:23	10/02/2017 09:34
	68021-1-BSD	BSD	68021-1-BSD	1029	S	68021	146621	--------	09/29/2017 18:23	10/02/2017 10:30
	B206-S1A S	MS	17091923-001 S	1029	S	68021	146621	09/19/2017	09/29/2017 18:23	10/02/2017 14:16

Analytical Data Package Information Summary

Work Order(s): **17092817**
Report Prepared For: Hillis Carnes Engineering Associates, Annapo
Project Name: A3-1
Project Manager: Keith Progin

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
SW-846 8082 A	B206-S1A SD	MSD	17091923-001 SD	1029	S	68021	146621	09/19/2017	09/29/2017 18:23	10/02/2017 14:44

PHASE SEPARATION SCIENCE, INC.

QC Summary 17092817

Hillis Carnes Engineering Associates

A3-1

Analytical Method: SW-846 8082 A Prep Method: SW3550C

Seq Number: 146621 Matrix: Soil Date Prep: 09/29/2017

PSS Sample ID: 17092817-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Decachlorobiphenyl	81		61-150	%	10/02/17 17:33
Tetrachloro-m-xylene	69		42-142	%	10/02/17 17:33

Analytical Method: SW-846 8015 C Prep Method: SW3550C

Seq Number: 146614 Matrix: Soil Date Prep: 09/29/2017

PSS Sample ID: 17092817-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
o-Terphenyl	87		34-133	%	09/30/17 05:06

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

PHASE SEPARATION SCIENCE, INC.

QC Summary 17092817

Hillis Carnes Engineering Associates

A3-1

Analytical Method: EPA 9071 B-Modified

Seq Number: 146567 Matrix: Solid

MB Sample Id: 146567-1-BLK LCS Sample Id: 146567-1-BKS LCSD Sample Id: 146567-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Oil & Grease, Total Recovered	<49.99	799.8	749.9	94	757.4	95	78-114	1	28	mg/kg	10/02/17 10:29	

Analytical Method: SW-846 6020 A Prep Method: SW3050B

Seq Number: 146598 Matrix: Solid Date Prep: 09/29/17

MB Sample Id: 68001-1-BLK LCS Sample Id: 68001-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Antimony	<2.301	18.41	19.71	107	80-120	mg/kg	09/29/17 18:59	
Arsenic	<0.4603	18.41	18.48	100	80-120	mg/kg	09/29/17 18:59	
Beryllium	<2.301	18.41	18.48	100	80-120	mg/kg	09/29/17 18:59	
Cadmium	<2.301	18.41	17.67	96	80-120	mg/kg	09/29/17 18:59	
Chromium	<2.301	18.41	18.28	99	80-120	mg/kg	09/29/17 18:59	
Copper	<2.301	18.41	18.16	99	80-120	mg/kg	09/29/17 18:59	
Lead	<2.301	18.41	18.07	98	80-120	mg/kg	09/29/17 18:59	
Mercury	<0.09206	.4603	.1933	42	80-120	mg/kg	10/02/17 18:57	L
Nickel	<2.301	18.41	17.77	97	80-120	mg/kg	09/29/17 18:59	
Selenium	<2.301	18.41	16.79	91	80-120	mg/kg	09/29/17 18:59	
Silver	<2.301	18.41	17.50	95	80-120	mg/kg	09/29/17 18:59	
Thallium	<1.841	18.41	16.07	87	80-120	mg/kg	09/29/17 18:59	
Zinc	<9.206	92.06	85.06	92	80-120	mg/kg	09/29/17 18:59	

Analytical Method: SW-846 6020 A Prep Method: SW3050B

Seq Number: 146627 Matrix: Solid Date Prep: 09/29/17

MB Sample Id: 68001-1-BLK LCS Sample Id: 68001-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Antimony	<2.301	18.41	20.47	111	80-120	mg/kg	10/02/17 18:57	
Arsenic	<0.4603	18.41	20.14	109	80-120	mg/kg	10/02/17 18:57	
Beryllium	<2.301	18.41	19.04	103	80-120	mg/kg	10/02/17 18:57	
Cadmium	<2.301	18.41	19.27	105	80-120	mg/kg	10/02/17 18:57	
Chromium	<2.301	18.41	20.31	110	80-120	mg/kg	10/02/17 18:57	
Copper	<2.301	18.41	20.13	109	80-120	mg/kg	10/02/17 18:57	
Lead	<2.301	18.41	19.84	108	80-120	mg/kg	10/02/17 18:57	
Mercury	<0.09206	.4603	.1933	42	80-120	mg/kg	10/02/17 18:57	L
Nickel	<2.301	18.41	19.10	104	80-120	mg/kg	10/02/17 18:57	
Selenium	<2.301	18.41	17.97	98	80-120	mg/kg	10/02/17 18:57	
Silver	<2.301	18.41	18.45	100	80-120	mg/kg	10/02/17 18:57	
Thallium	<1.841	18.41	17.95	98	80-120	mg/kg	10/02/17 18:57	
Zinc	<9.206	92.06	94.03	102	80-120	mg/kg	10/02/17 18:57	

PHASE SEPARATION SCIENCE, INC.

QC Summary 17092817

Hillis Carnes Engineering Associates

A3-1

Analytical Method: SW-846 8082 A Prep Method: SW3550C

Seq Number: 146621 Matrix: Solid Date Prep: 09/29/17

MB Sample Id: 68021-1-BLK LCS Sample Id: 68021-1-BKS LCSD Sample Id: 68021-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
PCB-1016	<0.04794	0.4794	0.3468	72	0.3549	72	60-110	2	25	mg/kg	10/02/17 10:02	
PCB-1260	<0.04794	0.4794	0.3085	64	0.3127	63	60-98	1	25	mg/kg	10/02/17 10:02	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Decachlorobiphenyl	82		85		81		61-150	%	10/02/17 10:02
Tetrachloro-m-xylene	75		77		77		42-142	%	10/02/17 10:02

Analytical Method: SW-846 8015 C Prep Method: SW3550C

Seq Number: 146614 Matrix: Solid Date Prep: 09/29/17

MB Sample Id: 68013-1-BLK LCS Sample Id: 68013-1-BKS LCSD Sample Id: 68013-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
TPH-DRO (Diesel Range Organics)	<9.970	33.23	26.45	80	16.97	50	54-123	44	25	mg/kg	09/29/17 23:46	LF

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
o-Terphenyl	81		71		67		34-133	%	09/29/17 23:46

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

PHASE SEPARATION SCIENCE, INC.

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

(1) CLIENT: Hillis Carnes OFFICE LOC. AJ
PROJECT MGR: Keith Progin PHONE NO.: (410)880-4788
EMAIL: Kprogin@hcea.com FAX NO.: ( )
PROJECT NAME: A3-1 PROJECT NO.: 16280B
SITE LOCATION: P.O. NO.:
SAMPLERS:

PSS Work Order #: 17092817 PAGE 1 OF 1

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

(2) (3)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX (See Codes)	No. CONTAINERS	SAMPLE TYPE C = COMP G = GRAB	Preservatives Used	Analysis/ Method Required: TPH-DRO	Oil & Grease	PCBs	PP Metals	REMARKS
1	Exclusion-1	9/28/17	10:30am	Soil	4	C		✓	✓	✓	✓	

(5)

Relinquished By:	Date	Time	Received By:
(1) KPrm B	9/28/17	2:50pm	Barb Weber
(2)			
(3)			
(4)			

(4) **Requested Turnaround Time**
☐ 5-Day ☑ 3-Day ☐ 2-Day
☐ Next Day ☐ Emergency ☐ Other

Data Deliverables Required:

# of Coolers: 1
Custody Seal: Abs
Ice Present: Pres Temp: 2-2°C
Shipping Carrier: client

Special Instructions:

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

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17092817	**Received By**	Barb Weber
Client Name	Hillis Carnes Engineering Associates	**Date Received**	09/28/2017 02:50:00 PM
Project Name	A3-1	**Delivered By**	Client
Project Number	16280B	**Tracking No**	Not Applicable
Disposal Date	11/02/2017	**Logged In By**	Barb Weber

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	2
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No

Documentation

		Sampler Name	Not Provided
COC agrees with sample labels?	Yes		N/A
Chain of Custody	Yes		

Sample Container

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

Total No. of Samples Received 1 Total No. of Containers Received 4

Preservation

Total Metals	(pH<2)	N/A
Dissolved Metals, filtered within 15 minutes of collection	(pH<2)	N/A
Orthophosphorus, filtered within 15 minutes of collection		N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, DOC (field filtered), COD, Phenols	(pH<2)	N/A
TOX, TKN, NH3, Total Phos	(pH<2)	N/A
VOC, BTEX (VOA Vials Rcvd Preserved)	(pH<2)	N/A
Do VOA vials have zero headspace?		N/A
624 VOC (Rcvd at least one unpreserved VOA vial)		N/A
524 VOC (Rcvd with trip blanks)	(pH<2)	N/A

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

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

Samples Inspected/Checklist Completed By: Barb Weber Date: 09/28/2017

Barb Weber

PM Review and Approval: Amber J Confer Date: 09/28/2017

Amber Confer

Analytical Report for

Hillis Carnes Engineering Associates

Certificate of Analysis No.: 17101823

Project Manager: Keith Progin

Project Name : A3-1

Project Location: Sparrows Point, MD

Project ID : 16280B

October 23, 2017

Phase Separation Science, Inc.

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Baltimore, MD 21228
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Fax: (410) 788-8723

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PHASE SEPARATION SCIENCE, INC.

October 23, 2017

Keith Progin
Hillis Carnes Engineering Associates
10975 Guilford Road, Ste. A
Annapolis Junction, MD 20701

Reference: PSS Work Order(s) No: **17101823**
Project Name: A3-1
Project Location: Sparrows Point, MD
Project ID.: 16280B

Dear Keith Progin :

This report includes the analytical results from the analyses performed on the samples received under the project name referenced above and identified with the Phase Separation Science (PSS) Work Order(s) numbered **17101823**.

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

PSS reserves the right to return any unused samples, extracts or related solutions. Otherwise, the samples are scheduled for disposal, without any further notice, on November 22, 2017, with the exception of air canisters which are cleaned immediately following analysis. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt , the request will be acknowledged by PSS, thus extending the storage period.

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

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

Sincerely,

Dan Prucnal

Dan Prucnal
Laboratory Manager

Sample Summary

Client Name: Hillis Carnes Engineering Associates

Project Name: A3-1

Work Order Number(s): 17101823

Project ID: 16280B

The following samples were received under chain of custody by Phase Separation Science (PSS) on 10/18/2017 at 04:00 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
17101823-001	Exclusion 2	SOIL	10/18/17 00:00
17101823-002	Exclusion 3	SOIL	10/18/17 00:00
17101823-003	Exclusion 4	SOIL	10/18/17 00:00

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

Notes:

1. The presence of a common laboratory contaminant such as methylene chloride may be considered a possible laboratory artifact. Where observed, appropriate consideration of data should be taken.
2. Unless otherwise noted in the case narrative, results are reported on a dry weight basis with the exception of pH, flashpoint, moisture, and paint filter test.
3. Drinking water samples collected for the purpose of compliance with SDWA may not be suitable for their intended use unless collected by a certified sampler [COMAR 26.08.05.07.C.2].
4. The analyses of 1,2-dibromo-3-chloropropane (DBCP) and 1,2-dibromoethane (EDB) by EPA 524.2 and calcium, magnesium, sodium and iron by EPA 200.8 are not currently promulgated for use in testing to meet the Safe Drinking Water Act and as such cannot be used for compliance purposes. The listings of the current promulgated methods for testing in compliance with the Safe Drinking Water Act can be found in the 40 CFR part 141.1, for the primary drinking water contaminates, and part 141.3, for the secondary drinking water contaminates.
5. Sample prepared under EPA 3550C with concentrations greater than 20 mg/Kg should employ the microtip extraction procedure if required to meet data quality objectives.
6. The analysis of acrolein by EPA 624 must be analyzed within three days of sampling unless pH is adjusted to 4-5 units [40 CFR part 136.3(e)].
7. Method 180.1, The Determination of Turbidity by Nephelometry, recommends samples over 40 NTU be diluted until the turbidity falls below 40 units. Routine samples over 40 NTU may not be diluted as long as the data quality objectives are not affected.
8. Alkalinity results analyzed by EPA 310.2 that are reported by dilution are estimated and are not in compliance with method requirements.

Standard Flags/Abbreviations:

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

Certifications:

NELAP Certifications: PA 68-03330, VA 460156
State Certifications: MD 179, WV 303
Regulated Soil Permit: P330-12-00268
NSWC USCG Accepted Laboratory
LDBE MWAA LD1997-0041-2015

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17101823

Hillis Carnes Engineering Associates, Annapolis Junction, MD

October 23, 2017

Project Name: A3-1
Project Location: Sparrows Point, MD
Project ID: 16280B

Sample ID: Exclusion 2 | **Date/Time Sampled: 10/18/2017 00:00** | **PSS Sample ID: 17101823-001**
Matrix: SOIL | **Date/Time Received: 10/18/2017 16:00** | **% Solids: 87**

Oil and Grease — Analytical Method: EPA 9071 B-Modified

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Oil & Grease, Total Recovered	ND	mg/kg	57		1	10/20/17	10/20/17 16:33	1022

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Antimony	ND	mg/kg	2.2		1	10/19/17	10/19/17 22:13	1064
Arsenic	**4.6**	mg/kg	0.44		1	10/19/17	10/19/17 22:13	1064
Beryllium	ND	mg/kg	2.2		1	10/19/17	10/19/17 22:13	1064
Cadmium	**20**	mg/kg	2.2		1	10/19/17	10/19/17 22:13	1064
Chromium	**25**	mg/kg	2.2		1	10/19/17	10/19/17 22:13	1064
Copper	**11**	mg/kg	2.2		1	10/19/17	10/19/17 22:13	1064
Lead	**24**	mg/kg	2.2		1	10/19/17	10/19/17 22:13	1064
Mercury	ND	mg/kg	0.088		1	10/19/17	10/19/17 22:13	1064
Nickel	**8.2**	mg/kg	2.2		1	10/19/17	10/19/17 22:13	1064
Selenium	ND	mg/kg	2.2		1	10/19/17	10/19/17 22:13	1064
Silver	ND	mg/kg	2.2		1	10/19/17	10/19/17 22:13	1064
Thallium	ND	mg/kg	1.8		1	10/19/17	10/19/17 22:13	1064
Zinc	**860**	mg/kg	8.8		1	10/19/17	10/19/17 22:13	1064

Total Petroleum Hydrocarbons - DRO — Analytical Method: SW-846 8015 C — Preparation Method: SW3550C

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
TPH-DRO (Diesel Range Organics)	ND	mg/kg	11		1	10/19/17	10/20/17 10:12	1059

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17101823

Hillis Carnes Engineering Associates, Annapolis Junction, MD

October 23, 2017

Project Name: A3-1
Project Location: Sparrows Point, MD
Project ID: 16280B

Sample ID: Exclusion 2 **Date/Time Sampled: 10/18/2017 00:00** **PSS Sample ID: 17101823-001**
Matrix: SOIL **Date/Time Received: 10/18/2017 16:00** **% Solids: 87**

Polychlorinated Biphenyls

Analytical Method: SW-846 8082 A

Preparation Method: SW3550C
Clean up Method: SW846 3665A

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
PCB-1016	ND	mg/kg	0.059		1	10/18/17	10/19/17 21:54	1029
PCB-1221	ND	mg/kg	0.059		1	10/18/17	10/19/17 21:54	1029
PCB-1232	ND	mg/kg	0.059		1	10/18/17	10/19/17 21:54	1029
PCB-1242	ND	mg/kg	0.059		1	10/18/17	10/19/17 21:54	1029
PCB-1248	ND	mg/kg	0.059		1	10/18/17	10/19/17 21:54	1029
PCB-1254	ND	mg/kg	0.059		1	10/18/17	10/19/17 21:54	1029
PCB-1260	ND	mg/kg	0.059		1	10/18/17	10/19/17 21:54	1029

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17101823

Hillis Carnes Engineering Associates, Annapolis Junction, MD

October 23, 2017

Project Name: A3-1
Project Location: Sparrows Point, MD
Project ID: 16280B

Sample ID: Exclusion 3 **Date/Time Sampled: 10/18/2017 00:00** **PSS Sample ID: 17101823-002**
Matrix: SOIL **Date/Time Received: 10/18/2017 16:00** **% Solids: 91**

Oil and Grease — Analytical Method: EPA 9071 B-Modified

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Oil & Grease, Total Recovered	ND	mg/kg	55		1	10/20/17	10/20/17 16:33	1022

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Antimony	ND	mg/kg	2.3		1	10/19/17	10/19/17 22:18	1064
Arsenic	**11**	mg/kg	0.45		1	10/19/17	10/19/17 22:18	1064
Beryllium	ND	mg/kg	2.3		1	10/19/17	10/19/17 22:18	1064
Cadmium	**26**	mg/kg	2.3		1	10/19/17	10/19/17 22:18	1064
Chromium	**23**	mg/kg	2.3		1	10/19/17	10/19/17 22:18	1064
Copper	**15**	mg/kg	2.3		1	10/19/17	10/19/17 22:18	1064
Lead	**400**	mg/kg	23		10	10/19/17	10/20/17 18:33	1064
Mercury	**0.14**	mg/kg	0.090		1	10/19/17	10/19/17 22:18	1064
Nickel	**7.2**	mg/kg	2.3		1	10/19/17	10/19/17 22:18	1064
Selenium	ND	mg/kg	2.3		1	10/19/17	10/19/17 22:18	1064
Silver	ND	mg/kg	2.3		1	10/19/17	10/19/17 22:18	1064
Thallium	ND	mg/kg	1.8		1	10/19/17	10/19/17 22:18	1064
Zinc	**1,100**	mg/kg	90		10	10/19/17	10/20/17 18:33	1064

Total Petroleum Hydrocarbons - DRO — Analytical Method: SW-846 8015 C — Preparation Method: SW3550C

LF/HF - Lighter and heavier fuel/oil patterns observed in sample.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
TPH-DRO (Diesel Range Organics)	**23**	mg/kg	11	LF	1	10/19/17	10/20/17 09:47	1059

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17101823

Hillis Carnes Engineering Associates, Annapolis Junction, MD

October 23, 2017

Project Name: A3-1
Project Location: Sparrows Point, MD
Project ID: 16280B

Sample ID: Exclusion 3 | **Date/Time Sampled: 10/18/2017 00:00** | **PSS Sample ID: 17101823-002**
Matrix: SOIL | **Date/Time Received: 10/18/2017 16:00** | **% Solids: 91**

Polychlorinated Biphenyls

Analytical Method: SW-846 8082 A

Preparation Method: SW3550C
Clean up Method: SW846 3665A

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
PCB-1016	ND	mg/kg	0.055		1	10/18/17	10/19/17 22:21	1029
PCB-1221	ND	mg/kg	0.055		1	10/18/17	10/19/17 22:21	1029
PCB-1232	ND	mg/kg	0.055		1	10/18/17	10/19/17 22:21	1029
PCB-1242	ND	mg/kg	0.055		1	10/18/17	10/19/17 22:21	1029
PCB-1248	ND	mg/kg	0.055		1	10/18/17	10/19/17 22:21	1029
PCB-1254	ND	mg/kg	0.055		1	10/18/17	10/19/17 22:21	1029
PCB-1260	ND	mg/kg	0.055		1	10/18/17	10/19/17 22:21	1029

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17101823

Hillis Carnes Engineering Associates, Annapolis Junction, MD

October 23, 2017

Project Name: A3-1
Project Location: Sparrows Point, MD
Project ID: 16280B

Sample ID: Exclusion 4 **Date/Time Sampled: 10/18/2017 00:00** **PSS Sample ID: 17101823-003**
Matrix: SOIL **Date/Time Received: 10/18/2017 16:00** **% Solids: 88**

Oil and Grease — Analytical Method: EPA 9071 B-Modified

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Oil & Grease, Total Recovered	ND	mg/kg	57		1	10/20/17	10/20/17 16:33	1022

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Antimony	ND	mg/kg	2.4		1	10/19/17	10/19/17 22:51	1064
Arsenic	**11**	mg/kg	0.47		1	10/19/17	10/19/17 22:51	1064
Beryllium	ND	mg/kg	2.4		1	10/19/17	10/19/17 22:51	1064
Cadmium	**22**	mg/kg	2.4		1	10/19/17	10/19/17 22:51	1064
Chromium	**110**	mg/kg	2.4		1	10/19/17	10/19/17 22:51	1064
Copper	**30**	mg/kg	2.4		1	10/19/17	10/19/17 22:51	1064
Lead	**86**	mg/kg	2.4		1	10/19/17	10/19/17 22:51	1064
Mercury	ND	mg/kg	0.095		1	10/19/17	10/19/17 22:51	1064
Nickel	**23**	mg/kg	2.4		1	10/19/17	10/19/17 22:51	1064
Selenium	ND	mg/kg	2.4		1	10/19/17	10/19/17 22:51	1064
Silver	ND	mg/kg	2.4		1	10/19/17	10/19/17 22:51	1064
Thallium	ND	mg/kg	1.9		1	10/19/17	10/19/17 22:51	1064
Zinc	**2,100**	mg/kg	95		10	10/19/17	10/20/17 18:37	1064

Total Petroleum Hydrocarbons - DRO — Analytical Method: SW-846 8015 C — Preparation Method: SW3550C

DF/HF - No. 2/diesel fuel and heavier fuel/oil patterns observed in sample.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
TPH-DRO (Diesel Range Organics)	**41**	mg/kg	23	DF	1	10/19/17	10/20/17 11:25	1059

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 17101823

Hillis Carnes Engineering Associates, Annapolis Junction, MD

October 23, 2017

Project Name: A3-1
Project Location: Sparrows Point, MD
Project ID: 16280B

Sample ID: Exclusion 4 **Date/Time Sampled: 10/18/2017 00:00** **PSS Sample ID: 17101823-003**

Matrix: SOIL **Date/Time Received: 10/18/2017 16:00** **% Solids: 88**

Polychlorinated Biphenyls

Analytical Method: SW-846 8082 A

Preparation Method: SW3550C
Clean up Method: SW846 3665A

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
PCB-1016	ND	mg/kg	0.054		1	10/18/17	10/19/17 22:49	1029
PCB-1221	ND	mg/kg	0.054		1	10/18/17	10/19/17 22:49	1029
PCB-1232	ND	mg/kg	0.054		1	10/18/17	10/19/17 22:49	1029
PCB-1242	ND	mg/kg	0.054		1	10/18/17	10/19/17 22:49	1029
PCB-1248	ND	mg/kg	0.054		1	10/18/17	10/19/17 22:49	1029
PCB-1254	ND	mg/kg	0.054		1	10/18/17	10/19/17 22:49	1029
PCB-1260	ND	mg/kg	0.054		1	10/18/17	10/19/17 22:49	1029

Case Narrative Summary

Client Name: Hillis Carnes Engineering Associates

Project Name: A3-1

Work Order Number(s): 17101823
Project ID: 16280B

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

The analyses of chlorine, pH, dissolved oxygen, temperature and sulfite for drinking water and non-potable samples tested for compliance have a maximum holding time of 15 minutes. As such, all laboratory analyses for these analytes exceed holding times.

Matrix spike and matrix spike duplicate analyses may not be performed due to insufficient sample quantity. In these instances, a laboratory control sample and laboratory control sample duplicate are analyzed unless otherwise noted or specified in the method.

Sample Receipt:

All sample receipt conditions were acceptable.

General Comments:
Per client, metals analysis should be priority pollutant list.
NELAP accreditation was held for all analyses performed unless noted below. See www.phaseonline.com for complete PSS scope of accreditation.

EPA 9071 B-Modified: Oil & Grease, Total Recovered

Analytical Data Package Information Summary

Work Order(s): 17101823
Report Prepared For: Hillis Carnes Engineering Associates, Annapo
Project Name: A3-1
Project Manager: Keith Progin

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
EPA 9071 B-Modified	Exclusion 2	Initial	17101823-001	1022	S	147213	147213	10/18/2017	10/20/2017 16:33	10/20/2017 16:33
	Exclusion 3	Initial	17101823-002	1022	S	147213	147213	10/18/2017	10/20/2017 16:33	10/20/2017 16:33
	Exclusion 4	Initial	17101823-003	1022	S	147213	147213	10/18/2017	10/20/2017 16:33	10/20/2017 16:33
	147213-1-BKS	BKS	147213-1-BKS	1022	S	147213	147213	--------	10/20/2017 16:33	10/20/2017 16:33
	147213-1-BLK	BLK	147213-1-BLK	1022	S	147213	147213	--------	10/20/2017 16:33	10/20/2017 16:33
	147213-1-BSD	BSD	147213-1-BSD	1022	S	147213	147213	--------	10/20/2017 16:33	10/20/2017 16:33
	Exclusion 2 S	MS	17101823-001 S	1022	S	147213	147213	10/18/2017	10/20/2017 16:33	10/20/2017 16:33
	Exclusion 2 SD	MSD	17101823-001 SD	1022	S	147213	147213	10/18/2017	10/20/2017 16:33	10/20/2017 16:33
SM2540G	Exclusion 2	Initial	17101823-001	1045	S	147148	147148	10/18/2017	10/19/2017 10:32	10/19/2017 10:32
	Exclusion 3	Initial	17101823-002	1045	S	147148	147148	10/18/2017	10/19/2017 10:32	10/19/2017 10:32
	Exclusion 4	Initial	17101823-003	1045	S	147148	147148	10/18/2017	10/19/2017 10:32	10/19/2017 10:32
SW-846 6020 A	Exclusion 2	Initial	17101823-001	1064	S	68306	147214	10/18/2017	10/19/2017 10:39	10/19/2017 22:13
	Exclusion 3	Initial	17101823-002	1064	S	68306	147214	10/18/2017	10/19/2017 10:39	10/19/2017 22:18
	Exclusion 4	Initial	17101823-003	1064	S	68306	147214	10/18/2017	10/19/2017 10:39	10/19/2017 22:51
	68306-1-BKS	BKS	68306-1-BKS	1064	S	68306	147214	--------	10/19/2017 10:39	10/19/2017 21:41
	68306-1-BLK	BLK	68306-1-BLK	1064	S	68306	147214	--------	10/19/2017 10:39	10/19/2017 21:36
	D001 S	MS	17101725-001 S	1064	S	68306	147214	10/16/2017	10/19/2017 10:39	10/19/2017 21:50
	D001 SD	MSD	17101725-001 SD	1064	S	68306	147214	10/16/2017	10/19/2017 10:39	10/19/2017 21:55
	Exclusion 3	Reanalysis	17101823-002	1064	S	68306	147242	10/18/2017	10/19/2017 10:39	10/20/2017 18:33
	Exclusion 4	Reanalysis	17101823-003	1064	S	68306	147242	10/18/2017	10/19/2017 10:39	10/20/2017 18:37
SW-846 8015 C	Sample #1 S	MS	17101811-001 S	1059	S	68308	147228	10/17/2017	10/19/2017 11:59	10/19/2017 19:54
	Sample #1 SD	MSD	17101811-001 SD	1059	S	68308	147228	10/17/2017	10/19/2017 11:59	10/19/2017 20:18
	68308-1-BKS	BKS	68308-1-BKS	1059	S	68308	147230	--------	10/19/2017 11:59	10/19/2017 19:54
	68308-1-BLK	BLK	68308-1-BLK	1059	S	68308	147230	--------	10/19/2017 11:59	10/19/2017 19:29
	68308-1-BSD	BSD	68308-1-BSD	1059	S	68308	147230	--------	10/19/2017 11:59	10/19/2017 20:18
	Exclusion 2	Initial	17101823-001	1059	S	68308	147231	10/18/2017	10/19/2017 11:59	10/20/2017 10:12
	Exclusion 3	Initial	17101823-002	1059	S	68308	147232	10/18/2017	10/19/2017 11:59	10/20/2017 09:47
	Exclusion 4	Initial	17101823-003	1059	S	68308	147232	10/18/2017	10/19/2017 11:59	10/20/2017 11:25

Analytical Data Package Information Summary

Work Order(s): **17101823**
Report Prepared For: Hillis Carnes Engineering Associates, Annapo
Project Name: A3-1
Project Manager: Keith Progin

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
SW-846 8082 A	Exclusion 2	Initial	17101823-001	1029	S	68298	147207	10/18/2017	10/18/2017 18:52	10/19/2017 21:54
	Exclusion 3	Initial	17101823-002	1029	S	68298	147207	10/18/2017	10/18/2017 18:52	10/19/2017 22:21
	Exclusion 4	Initial	17101823-003	1029	S	68298	147207	10/18/2017	10/18/2017 18:52	10/19/2017 22:49
	68298-1-BKS	BKS	68298-1-BKS	1029	S	68298	147207	--------	10/18/2017 18:52	10/19/2017 15:21
	68298-1-BLK	BLK	68298-1-BLK	1029	S	68298	147207	--------	10/18/2017 18:52	10/19/2017 14:54
	68298-1-BSD	BSD	68298-1-BSD	1029	S	68298	147207	--------	10/18/2017 18:52	10/19/2017 15:49
	12881-TP-2-0-10' S	MS	17101821-003 S	1029	S	68298	147207	10/17/2017	10/18/2017 18:52	10/19/2017 16:17
	12881-TP-2-0-10' SD	MSD	17101821-003 SD	1029	S	68298	147207	10/17/2017	10/18/2017 18:52	10/19/2017 16:45

PHASE SEPARATION SCIENCE, INC.

QC Summary 17101823

Hillis Carnes Engineering Associates

A3-1

Analytical Method: SW-846 8082 A Prep Method: SW3550C

Seq Number: 147207 Matrix: Soil Date Prep: 10/18/2017

PSS Sample ID: 17101823-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Decachlorobiphenyl	85		61-150	%	10/19/17 21:54
Tetrachloro-m-xylene	77		42-142	%	10/19/17 21:54

Analytical Method: SW-846 8015 C Prep Method: SW3550C

Seq Number: 147231 Matrix: Soil Date Prep: 10/19/2017

PSS Sample ID: 17101823-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
o-Terphenyl	82		34-133	%	10/20/17 10:12

Analytical Method: SW-846 8082 A Prep Method: SW3550C

Seq Number: 147207 Matrix: Soil Date Prep: 10/18/2017

PSS Sample ID: 17101823-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Decachlorobiphenyl	85		61-150	%	10/19/17 22:21
Tetrachloro-m-xylene	70		42-142	%	10/19/17 22:21

Analytical Method: SW-846 8015 C Prep Method: SW3550C

Seq Number: 147232 Matrix: Soil Date Prep: 10/19/2017

PSS Sample ID: 17101823-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
o-Terphenyl	69		34-133	%	10/20/17 09:47

Analytical Method: SW-846 8082 A Prep Method: SW3550C

Seq Number: 147207 Matrix: Soil Date Prep: 10/18/2017

PSS Sample ID: 17101823-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Decachlorobiphenyl	91		61-150	%	10/19/17 22:49
Tetrachloro-m-xylene	71		42-142	%	10/19/17 22:49

PHASE SEPARATION SCIENCE, INC.

QC Summary 17101823

Hillis Carnes Engineering Associates

A3-1

Analytical Method: SW-846 8015 C Prep Method: SW3550C

Seq Number: 147232 Matrix: Soil Date Prep: 10/19/2017

PSS Sample ID: 17101823-003

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
o-Terphenyl	73		34-133	%	10/20/17 11:25

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

PHASE SEPARATION SCIENCE, INC.

QC Summary 17101823

Hillis Carnes Engineering Associates

A3-1

Analytical Method: EPA 9071 B-Modified

Seq Number: 147213 Matrix: Solid

MB Sample Id: 147213-1-BLK LCS Sample Id: 147213-1-BKS LCSD Sample Id: 147213-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Oil & Grease, Total Recovered	<49.94	799	753.1	94	714.7	89	78-114	5	28	mg/kg	10/20/17 16:33	

Analytical Method: EPA 9071 B-Modified

Seq Number: 147213 Matrix: Soil

Parent Sample Id: 17101823-001 MS Sample Id: 17101823-001 S MSD Sample Id: 17101823-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Oil & Grease, Total Recovered	<57.40	918.4	851.9	93	836.6	91	78-114	2	28	mg/kg	10/20/17 16:33	

Analytical Method: SW-846 6020 A Prep Method: SW3050B

Seq Number: 147214 Matrix: Solid Date Prep: 10/19/17

MB Sample Id: 68306-1-BLK LCS Sample Id: 68306-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Antimony	<2.197	17.58	35.68	203	80-120	mg/kg	10/19/17 21:41	H
Arsenic	<0.4394	17.58	33.15	189	80-120	mg/kg	10/19/17 21:41	H
Beryllium	<2.197	17.58	30.26	172	80-120	mg/kg	10/19/17 21:41	H
Cadmium	<2.197	17.58	32.00	182	80-120	mg/kg	10/19/17 21:41	H
Chromium	<2.197	17.58	31.31	178	80-120	mg/kg	10/19/17 21:41	H
Copper	<2.197	17.58	30.66	174	80-120	mg/kg	10/19/17 21:41	H
Lead	<2.197	17.58	32.25	183	80-120	mg/kg	10/19/17 21:41	H
Mercury	<0.08788	0.4394	0.7857	179	80-120	mg/kg	10/19/17 21:41	H
Nickel	<2.197	17.58	31.72	180	80-120	mg/kg	10/19/17 21:41	H
Selenium	<2.197	17.58	30.98	176	80-120	mg/kg	10/19/17 21:41	H
Silver	<2.197	17.58	32.28	184	80-120	mg/kg	10/19/17 21:41	H
Thallium	<1.758	17.58	29.30	167	80-120	mg/kg	10/19/17 21:41	H
Zinc	<8.788	87.88	152.8	174	80-120	mg/kg	10/19/17 21:41	H

PHASE SEPARATION SCIENCE, INC.

QC Summary 17101823

Hillis Carnes Engineering Associates

A3-1

Analytical Method: SW-846 6020 A Prep Method: SW3050B

Seq Number: 147242 Matrix: Solid Date Prep: 10/19/17

REBLK Sample Id: 68306-1-BLK LCS Sample Id: 68306-1-BKS

Parameter	REBLK Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Antimony	<2.197	17.58	19.44	111	75-125	mg/kg	10/20/17 18:23	
Arsenic	<0.4394	17.58	18.32	104	75-125	mg/kg	10/20/17 18:23	
Beryllium	<2.197	17.58	18.26	104	75-125	mg/kg	10/20/17 18:23	
Cadmium	<2.197	17.58	17.99	102	75-125	mg/kg	10/20/17 18:23	
Chromium	<2.197	17.58	17.51	100	75-125	mg/kg	10/20/17 18:23	
Copper	<2.197	17.58	17.42	99	75-125	mg/kg	10/20/17 18:23	
Lead	<2.197	17.58	18.29	104	75-125	mg/kg	10/20/17 18:23	
Mercury	<0.08788	0.4394	0.4442	101	75-125	mg/kg	10/20/17 18:23	
Nickel	<2.197	17.58	17.63	100	75-125	mg/kg	10/20/17 18:23	
Selenium	<2.197	17.58	18.36	104	75-125	mg/kg	10/20/17 18:23	
Silver	<2.197	17.58	18.05	103	75-125	mg/kg	10/20/17 18:23	
Thallium	<1.758	17.58	16.45	94	75-125	mg/kg	10/20/17 18:23	
Zinc	<8.788	17.58	90.16	513	75-125	mg/kg	10/20/17 18:23	H

Analytical Method: SW-846 8082 A Prep Method: SW3550C

Seq Number: 147207 Matrix: Solid Date Prep: 10/18/17

MB Sample Id: 68298-1-BLK LCS Sample Id: 68298-1-BKS LCSD Sample Id: 68298-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
PCB-1016	<0.04892	0.4892	0.4054	83	0.3756	76	60-110	8	25	mg/kg	10/19/17 15:21	
PCB-1260	<0.04892	0.4892	0.3402	70	0.3231	65	60-98	5	25	mg/kg	10/19/17 15:21	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Decachlorobiphenyl	79		86		82		61-150	%	10/19/17 15:21
Tetrachloro-m-xylene	74		85		79		42-142	%	10/19/17 15:21

Analytical Method: SW-846 8015 C Prep Method: SW3550C

Seq Number: 147230 Matrix: Solid Date Prep: 10/19/17

MB Sample Id: 68308-1-BLK LCS Sample Id: 68308-1-BKS LCSD Sample Id: 68308-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
TPH-DRO (Diesel Range Organics)	<9.875	32.92	23.68	72	13.22	39	54-123	57	25	mg/kg	10/19/17 19:54	FLFLF

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
o-Terphenyl	67		66		32	*	34-133	%	10/19/17 19:54

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

PHASE SEPARATION SCIENCE, INC.

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

(1) *CLIENT: Hillis Carnes *OFFICE LOC. AJ
*PROJECT MGR: Keith Progin *PHONE NO.: (410) 880-4788
EMAIL: kprogin@hcea.com FAX NO.: ( )
*PROJECT NAME: A3-1 PROJECT NO.: 16480B
SITE LOCATION: Sparrows Point, MD P.O. NO.: POHCI06019
SAMPLER(S): DW CERT NO.:

PSS Work Order #: 1710 1823 PAGE 1 OF 1

Matrix Codes: SW=Surface Wtr DW=Drinking Wtr GW=Ground Wtr WW=Waste Wtr O=Oil S=Soil L=Liquid SOL=Solid A=Air WI=Wipe

(2)

LAB NO.	*SAMPLE IDENTIFICATION	*DATE (SAMPLED)	*TIME (SAMPLED)	MATRIX (See Codes)	No. CONTAINERS	SAMPLE TYPE (C = COMP, G = GRAB)	Preservatives Used	Analysis/Method Required (3) * TPH-DRO	Oil & Grease	PCBs	2 CERCLA 13 Metals	REMARKS
1	Exclusion 2	10/16/17		Soil	4	C		✓	✓	✓	✓	
2	Exclusion 3	10/18/17		Soil	4	C		✓	✓	✓	✓	
3	Exclusion 4	10/18/17		Soil	4	C		✓	✓	✓	✓	

(5)

Relinquished By:	Date	Time	Received By:
(1)	10/18/17	3:00pm	
(2)	10/18/17	1600	
(3)			
(4)			

(4) *Requested TAT (One TAT per COC)
☐ 5-Day ☑ 3-Day ☐ 2-Day
☐ Next Day ☐ Emergency ☐ Other

Data Deliverables Required:
COA ☐ QC SUMM ☐ CLP LIKE ☐ OTHER ____

# of Coolers: 1
Custody Seal: ABS
Ice Present: PRES Temp: 4°-4°C
Shipping Carrier: Client

Special Instructions:

DW COMPLIANCE? YES ☐
EDD FORMAT TYPE ____
STATE RESULTS REPORTED TO: MD ☐ DE ☐ PA ☐ VA ☐ WV ☐ OTHER ____

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

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	17101823	**Received By**	Thomas Wingate
Client Name	Hillis Carnes Engineering Associates	**Date Received**	10/18/2017 04:00:00 PM
Project Name	A3-1	**Delivered By**	Client
Project Number	16280B	**Tracking No**	Not Applicable
Disposal Date	11/22/2017	**Logged In By**	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	4
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No

Documentation

		Sampler Name	Not Provided
COC agrees with sample labels?	Yes		N/A
Chain of Custody	Yes		

Sample Container

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

Total No. of Samples Received 3 Total No. of Containers Received 12

Preservation

Total Metals	(pH<2)	N/A
Dissolved Metals, filtered within 15 minutes of collection	(pH<2)	N/A
Orthophosphorus, filtered within 15 minutes of collection		N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, DOC (field filtered), COD, Phenols	(pH<2)	N/A
TOX, TKN, NH3, Total Phos	(pH<2)	N/A
VOC, BTEX (VOA Vials Rcvd Preserved)	(pH<2)	N/A
Do VOA vials have zero headspace?		N/A
624 VOC (Rcvd at least one unpreserved VOA vial)		N/A
524 VOC (Rcvd with trip blanks)	(pH<2)	N/A

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

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

Samples Inspected/Checklist Completed By: Thomas Wingate Date: 10/18/2017

Thomas Wingate

PM Review and Approval: Amber Confer Date: 10/19/2017

Amber Confer

Analytical Report for

Hillis Carnes Engineering Associates

Certificate of Analysis No.: 18013020

Project Manager: Keith Progin

Project Name : SPT A3-1

Project Location: Sparrows Point, MD

Project ID : 16280B

February 2, 2018

Phase Separation Science, Inc.

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Baltimore, MD 21228
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PHASE SEPARATION SCIENCE, INC.

February 2, 2018

Keith Progin
Hillis Carnes Engineering Associates
10975 Guilford Road, Ste. A
Annapolis Junction, MD 20701

Reference: PSS Work Order(s) No: **18013020**
Project Name: SPT A3-1
Project Location: Sparrows Point, MD
Project ID.: 16280B

Dear Keith Progin :

This report includes the analytical results from the analyses performed on the samples received under the project name referenced above and identified with the Phase Separation Science (PSS) Work Order(s) numbered **18013020**.

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

PSS reserves the right to return any unused samples, extracts or related solutions. Otherwise, the samples are scheduled for disposal, without any further notice, on March 6, 2018, with the exception of air canisters which are cleaned immediately following analysis. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt , the request will be acknowledged by PSS, thus extending the storage period.

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

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

Sincerely,

Dan Prucnal
Laboratory Manager

Sample Summary

Client Name: Hillis Carnes Engineering Associates

Project Name: SPT A3-1

Work Order Number(s): 18013020

Project ID: 16280B

The following samples were received under chain of custody by Phase Separation Science (PSS) on 01/30/2018 at 03:20 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
18013020-001	Exclusion 5	SOIL	01/30/18 13:20

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

Notes:

1. The presence of a common laboratory contaminant such as methylene chloride may be considered a possible laboratory artifact. Where observed, appropriate consideration of data should be taken.
2. Unless otherwise noted in the case narrative, results are reported on a dry weight basis with the exception of pH, flashpoint, moisture, and paint filter test.
3. Drinking water samples collected for the purpose of compliance with SDWA may not be suitable for their intended use unless collected by a certified sampler [COMAR 26.08.05.07.C.2].
4. The analyses of 1,2-dibromo-3-chloropropane (DBCP) and 1,2-dibromoethane (EDB) by EPA 524.2 and calcium, magnesium, sodium and iron by EPA 200.8 are not currently promulgated for use in testing to meet the Safe Drinking Water Act and as such cannot be used for compliance purposes. The listings of the current promulgated methods for testing in compliance with the Safe Drinking Water Act can be found in the 40 CFR part 141.1, for the primary drinking water contaminates, and part 141.3, for the secondary drinking water contaminates.
5. Sample prepared under EPA 3550C with concentrations greater than 20 mg/Kg should employ the microtip extraction procedure if required to meet data quality objectives.
6. The analysis of acrolein by EPA 624 must be analyzed within three days of sampling unless pH is adjusted to 4-5 units [40 CFR part 136.3(e)].
7. Method 180.1, The Determination of Turbidity by Nephelometry, recommends samples over 40 NTU be diluted until the turbidity falls below 40 units. Routine samples over 40 NTU may not be diluted as long as the data quality objectives are not affected.
8. Alkalinity results analyzed by EPA 310.2 that are reported by dilution are estimated and are not in compliance with method requirements.

Standard Flags/Abbreviations:

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

Certifications:

NELAP Certifications: PA 68-03330, VA 460156
State Certifications: MD 179, WV 303
Regulated Soil Permit: P330-12-00268
NSWC USCG Accepted Laboratory
LDBE MWAA LD1997-0041-2015

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ROUTE 40 WEST
BALTIMORE, MD 21228
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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 18013020

Hillis Carnes Engineering Associates, Annapolis Junction, MD

February 2, 2018

Project Name: SPT A3-1
Project Location: Sparrows Point, MD
Project ID: 16280B

Sample ID: Exclusion 5 | **Date/Time Sampled: 01/30/2018 13:20** | **PSS Sample ID: 18013020-001**
Matrix: SOIL | **Date/Time Received: 01/30/2018 15:20** | **% Solids: 90**

Oil and Grease — Analytical Method: EPA 9071 B-Modified

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Oil & Grease, Total Recovered	**110**	mg/kg	56		1	02/01/18	02/01/18 08:53	1067

PP Metals (plus Vanadium & Manganese) — Analytical Method: SW-846 6020 A — Preparation Method: 3050B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Antimony	ND	mg/kg	2.3		1	01/31/18	01/31/18 18:30	1064
Arsenic	**5.9**	mg/kg	0.46		1	01/31/18	01/31/18 18:30	1064
Beryllium	ND	mg/kg	2.3		1	01/31/18	01/31/18 18:30	1064
Cadmium	**31**	mg/kg	2.3		1	01/31/18	01/31/18 18:30	1064
Chromium	**70**	mg/kg	2.3		1	01/31/18	01/31/18 18:30	1064
Copper	**24**	mg/kg	2.3		1	01/31/18	01/31/18 18:30	1064
Lead	**120**	mg/kg	2.3		1	01/31/18	01/31/18 18:30	1064
Manganese	**2,000**	mg/kg	23		10	01/31/18	02/01/18 16:14	1064
Mercury	**0.19**	mg/kg	0.092		1	01/31/18	01/31/18 18:30	1064
Nickel	**9.5**	mg/kg	2.3		1	01/31/18	02/01/18 16:56	1064
Selenium	ND	mg/kg	2.3		1	01/31/18	01/31/18 18:30	1064
Silver	ND	mg/kg	2.3		1	01/31/18	01/31/18 18:30	1064
Thallium	ND	mg/kg	1.8		1	01/31/18	01/31/18 18:30	1064
Vanadium	**64**	mg/kg	2.3		1	01/31/18	01/31/18 18:30	1064
Zinc	**1,700**	mg/kg	92		10	01/31/18	01/31/18 18:46	1064

Total Petroleum Hydrocarbons - DRO — Analytical Method: SW-846 8015 C — Preparation Method: SW3550C

HF - Heavier fuel/oil pattern observed in sample.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
TPH-DRO (Diesel Range Organics)	**49**	mg/kg	11	HF	1	01/31/18	02/01/18 15:13	1045

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

PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 18013020

Hillis Carnes Engineering Associates, Annapolis Junction, MD

February 2, 2018

Project Name: SPT A3-1
Project Location: Sparrows Point, MD
Project ID: 16280B

Sample ID: Exclusion 5 **Date/Time Sampled: 01/30/2018 13:20** **PSS Sample ID: 18013020-001**

Matrix: SOIL **Date/Time Received: 01/30/2018 15:20** **% Solids: 90**

Polychlorinated Biphenyls

Analytical Method: SW-846 8082 A

Preparation Method: SW3550C
Clean up Method: SW846 3665A

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
PCB-1016	ND	mg/kg	0.056		1	01/31/18	02/01/18 11:27	1029
PCB-1221	ND	mg/kg	0.056		1	01/31/18	02/01/18 11:27	1029
PCB-1232	ND	mg/kg	0.056		1	01/31/18	02/01/18 11:27	1029
PCB-1242	ND	mg/kg	0.056		1	01/31/18	02/01/18 11:27	1029
PCB-1248	ND	mg/kg	0.056		1	01/31/18	02/01/18 11:27	1029
PCB-1254	ND	mg/kg	0.056		1	01/31/18	02/01/18 11:27	1029
PCB-1260	ND	mg/kg	0.056		1	01/31/18	02/01/18 11:27	1029

Case Narrative Summary

Client Name: Hillis Carnes Engineering Associates

Project Name: SPT A3-1

Work Order Number(s): 18013020

Project ID: 16280B

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

The analyses of chlorine, pH, dissolved oxygen, temperature and sulfite for drinking water and non-potable samples tested for compliance have a maximum holding time of 15 minutes. As such, all laboratory analyses for these analytes exceed holding times.

Matrix spike and matrix spike duplicate analyses may not be performed due to insufficient sample quantity. In these instances, a laboratory control sample and laboratory control sample duplicate are analyzed unless otherwise noted or specified in the method.

Sample Receipt:

All sample receipt conditions were acceptable.

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

EPA 9071 B-Modified: Oil & Grease, Total Recovered

Analytical Data Package Information Summary

Work Order(s): 18013020
Report Prepared For: Hillis Carnes Engineering Associates, Annapo
Project Name: SPT A3-1
Project Manager: Keith Progin

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
EPA 9071 B-Modified	Exclusion 5	Initial	18013020-001	1067	S	150035	150035	01/30/2018	02/01/2018 08:53	02/01/2018 08:53
	150035-1-BKS	BKS	150035-1-BKS	1067	S	150035	150035	--------	02/01/2018 08:53	02/01/2018 08:53
	150035-1-BLK	BLK	150035-1-BLK	1067	S	150035	150035	--------	02/01/2018 08:53	02/01/2018 08:53
	150035-1-BSD	BSD	150035-1-BSD	1067	S	150035	150035	--------	02/01/2018 08:53	02/01/2018 08:53
	MW-1, S-5, 9'-11' S	MS	18013021-002 S	1067	S	150035	150035	01/25/2018	02/01/2018 08:53	02/01/2018 08:53
	MW-1, S-5, 9'-11' SD	MSD	18013021-002 SD	1067	S	150035	150035	01/25/2018	02/01/2018 08:53	02/01/2018 08:53
SM2540G	Exclusion 5	Initial	18013020-001	1066	S	149994	149994	01/30/2018	01/30/2018 16:09	01/30/2018 16:09
SW-846 6020 A	Exclusion 5	Initial	18013020-001	1064	S	69757	150065	01/30/2018	01/31/2018 10:27	01/31/2018 18:30
	69757-1-BKS	BKS	69757-1-BKS	1064	S	69757	150065	--------	01/31/2018 10:27	01/31/2018 17:44
	69757-1-BLK	BLK	69757-1-BLK	1064	S	69757	150065	--------	01/31/2018 10:27	01/31/2018 17:40
	1-2 S	MS	18012906-001 S	1064	S	69757	150065	01/29/2018	01/31/2018 10:27	01/31/2018 18:15
	1-2 SD	MSD	18012906-001 SD	1064	S	69757	150065	01/29/2018	01/31/2018 10:27	01/31/2018 18:19
	Exclusion 5	Reanalysis	18013020-001	1064	S	69757	150065	01/30/2018	01/31/2018 10:27	01/31/2018 18:46
	Exclusion 5	Reanalysis	18013020-001	1064	S	69757	150080	01/30/2018	01/31/2018 10:27	02/01/2018 16:56
	Exclusion 5	Reanalysis	18013020-001	1064	S	69757	150080	01/30/2018	01/31/2018 10:27	02/01/2018 16:14
SW-846 8015 C	Exclusion 5	Initial	18013020-001	1045	S	69745	150068	01/30/2018	01/31/2018 08:25	02/01/2018 15:13
	69745-1-BKS	BKS	69745-1-BKS	1045	S	69745	150068	--------	01/31/2018 08:25	02/01/2018 11:23
	69745-1-BLK	BLK	69745-1-BLK	1045	S	69745	150068	--------	01/31/2018 08:25	02/01/2018 10:58
	69745-1-BSD	BSD	69745-1-BSD	1045	S	69745	150068	--------	01/31/2018 08:25	02/01/2018 11:47
	D-1 Diesel S	MS	18013022-002 S	1045	S	69745	150068	01/25/2018	01/31/2018 08:25	02/01/2018 11:23
	D-1 Diesel SD	MSD	18013022-002 SD	1045	S	69745	150068	01/25/2018	01/31/2018 08:25	02/01/2018 11:47
SW-846 8082 A	Exclusion 5	Initial	18013020-001	1029	S	69759	150051	01/30/2018	01/31/2018 11:11	02/01/2018 11:27
	69759-1-BKS	BKS	69759-1-BKS	1029	S	69759	150051	--------	01/31/2018 11:11	02/01/2018 09:35
	69759-1-BLK	BLK	69759-1-BLK	1029	S	69759	150051	--------	01/31/2018 11:11	02/01/2018 09:07
	69759-1-BSD	BSD	69759-1-BSD	1029	S	69759	150051	--------	01/31/2018 11:11	02/01/2018 10:03
	Exclusion 5 S	MS	18013020-001 S	1029	S	69759	150051	01/30/2018	01/31/2018 11:11	02/01/2018 10:31
	Exclusion 5 SD	MSD	18013020-001 SD	1029	S	69759	150051	01/30/2018	01/31/2018 11:11	02/01/2018 10:59

PHASE SEPARATION SCIENCE, INC.

QC Summary 18013020

Hillis Carnes Engineering Associates
SPT A3-1

Analytical Method: SW-846 8082 A Prep Method: SW3550C
Seq Number: 150051 Matrix: Soil Date Prep: 01/31/2018
PSS Sample ID: 18013020-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Decachlorobiphenyl	114		61-150	%	02/01/18 11:27
Tetrachloro-m-xylene	67		42-142	%	02/01/18 11:27

Analytical Method: SW-846 8015 C Prep Method: SW3550C
Seq Number: 150068 Matrix: Soil Date Prep: 01/31/2018
PSS Sample ID: 18013020-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
o-Terphenyl	104		34-133	%	02/01/18 15:13

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

PHASE SEPARATION SCIENCE, INC.

QC Summary 18013020

Hillis Carnes Engineering Associates

SPT A3-1

Analytical Method: EPA 9071 B-Modified

Seq Number: 150035 Matrix: Solid

MB Sample Id: 150035-1-BLK LCS Sample Id: 150035-1-BKS LCSD Sample Id: 150035-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Oil & Grease, Total Recovered	<49.94	799	731.1	92	736.3	92	78-114	1	28	mg/kg	02/01/18 08:53	

Analytical Method: SW-846 6020 A

Prep Method: SW3050B

Seq Number: 150065 Matrix: Solid

Date Prep: 01/31/18

MB Sample Id: 69757-1-BLK LCS Sample Id: 69757-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Antimony	<2.270	18.16	19.55	108	80-120	mg/kg	01/31/18 17:44	
Arsenic	<0.4539	18.16	17.60	97	80-120	mg/kg	01/31/18 17:44	
Beryllium	<2.270	18.16	19.17	106	80-120	mg/kg	01/31/18 17:44	
Cadmium	<2.270	18.16	18.02	99	80-120	mg/kg	01/31/18 17:44	
Chromium	<2.270	18.16	17.39	96	80-120	mg/kg	01/31/18 17:44	
Copper	<2.270	18.16	17.77	98	80-120	mg/kg	01/31/18 17:44	
Lead	<2.270	18.16	18.66	103	80-120	mg/kg	01/31/18 17:44	
Manganese	<2.270	18.16	17.08	94	80-120	mg/kg	01/31/18 17:44	
Mercury	<0.09079	0.4539	0.4326	95	80-120	mg/kg	01/31/18 17:44	
Nickel	<2.270	18.16	17.83	98	80-120	mg/kg	01/31/18 17:44	
Selenium	<2.270	18.16	18.67	103	80-120	mg/kg	01/31/18 17:44	
Silver	<2.270	18.16	18.53	102	80-120	mg/kg	01/31/18 17:44	
Thallium	<1.816	18.16	16.21	89	80-120	mg/kg	01/31/18 17:44	
Vanadium	<2.270	18.16	17.26	95	80-120	mg/kg	01/31/18 17:44	
Zinc	<9.079	90.79	86.17	95	80-120	mg/kg	01/31/18 17:44	

Analytical Method: SW-846 8082 A

Prep Method: SW3550C

Seq Number: 150051 Matrix: Solid

Date Prep: 01/31/18

MB Sample Id: 69759-1-BLK LCS Sample Id: 69759-1-BKS LCSD Sample Id: 69759-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
PCB-1016	<0.04946	0.4946	0.3330	67	0.3402	68	60-110	2	25	mg/kg	02/01/18 09:35	
PCB-1260	<0.04946	0.4946	0.3506	71	0.3567	71	60-98	2	25	mg/kg	02/01/18 09:35	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Decachlorobiphenyl	87		87		87		61-150	%	02/01/18 09:35
Tetrachloro-m-xylene	70		71		71		42-142	%	02/01/18 09:35

PHASE SEPARATION SCIENCE, INC.

QC Summary 18013020

Hillis Carnes Engineering Associates

SPT A3-1

Analytical Method: SW-846 8082 A Prep Method: SW3550C

Seq Number: 150051 Matrix: Soil Date Prep: 01/31/18

Parent Sample Id: 18013020-001 MS Sample Id: 18013020-001 S MSD Sample Id: 18013020-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
PCB-1016	<0.05511	0.5511	0.3897	71	0.3830	69	45-130	2	30	mg/kg	02/01/18 10:31	
PCB-1260	<0.05511	0.5511	0.4008	73	0.3968	72	30-125	1	30	mg/kg	02/01/18 10:31	

Surrogate	MS Result	MS Flag	MSD Result	MSD Flag	Limits	Units	Analysis Date
Decachlorobiphenyl	109		100		61-150	%	02/01/18 10:31
Tetrachloro-m-xylene	72		71		42-142	%	02/01/18 10:31

Analytical Method: SW-846 8015 C Prep Method: SW3550C

Seq Number: 150068 Matrix: Solid Date Prep: 01/31/18

MB Sample Id: 69745-1-BLK LCS Sample Id: 69745-1-BKS LCSD Sample Id: 69745-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
TPH-DRO (Diesel Range Organics)	<10.01	33.38	29.29	88	31.82	96	54-123	8	25	mg/kg	02/01/18 11:23	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
o-Terphenyl	98		89		98		34-133	%	02/01/18 11:23

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

PHASE SEPARATION SCIENCE, INC.

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

(1) *CLIENT: Hillis-Carnes *OFFICE LOC. AJ

*PROJECT MGR: Keith Progin *PHONE NO.: (410) 880-4788

EMAIL: Kprogin@hcea.com FAX NO.: ( )

*PROJECT NAME: SPT A3-1 PROJECT NO.: 16280B

SITE LOCATION: Sparrows Point, MD P.O. NO.:

SAMPLER(S): K. Progin DW CERT NO.:

PSS Work Order #: 1801302O PAGE 1 OF 1

Matrix Codes: **SW**=Surface Wtr **DW**=Drinking Wtr **GW**=Ground Wtr **WW**=Waste Wtr **O**=Oil **S**=Soil **L**=Liquid **SOL**=Solid **A**=Air **WI**=Wipe

(2)

LAB NO.	*SAMPLE IDENTIFICATION	*DATE (SAMPLED)	*TIME (SAMPLED)	MATRIX (See Codes)	No. CONTAINERS	SAMPLE TYPE C = COMP G = GRAB	Preservatives Used	Analysis/ Method Required (3) * TPH-DRO	O&G	PCBs	PP 13 Metals	Vanadium	Manganese	REMARKS
	Exclusion 5	1/30/18	1:20pm	Soil	4	C		✓	✓	✓	✓	✓	✓	

(5)

Relinquished By: (1)	Date	Time	Received By:
KHMB	1/30/18	1520	
Relinquished By: (2)	Date	Time	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

(4)

*Requested TAT (One TAT per COC)
☐ 5-Day ☑ 3-Day ☐ 2-Day
☐ Next Day ☐ Emergency ☐ Other

Data Deliverables Required:
COA ☐ QC SUMM ☐ CLP LIKE ☐ OTHER ____

# of Coolers: 1

Custody Seal: ABS

Ice Present: PRES Temp: 1°-2°C

Shipping Carrier: Client

Special Instructions:

DW COMPLIANCE? YES ☐

EDD FORMAT TYPE ____

STATE RESULTS REPORTED TO:
MD ☐ DE ☐ PA ☐ VA ☐ WV ☐ OTHER ____

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

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	18013020	**Received By**	Thomas Wingate
Client Name	Hillis Carnes Engineering Associates	**Date Received**	01/30/2018 03:20:00 PM
Project Name	SPT A3-1	**Delivered By**	Client
Project Number	16280B	**Tracking No**	Not Applicable
Disposal Date	03/06/2018	**Logged In By**	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	2
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No

Documentation

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

Sample Container

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

Total No. of Samples Received 1 Total No. of Containers Received 4

Preservation

Total Metals	(pH<2)	N/A
Dissolved Metals, filtered within 15 minutes of collection	(pH<2)	N/A
Orthophosphorus, filtered within 15 minutes of collection		N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, DOC (field filtered), COD, Phenols	(pH<2)	N/A
TOX, TKN, NH3, Total Phos	(pH<2)	N/A
VOC, BTEX (VOA Vials Rcvd Preserved)	(pH<2)	N/A
Do VOA vials have zero headspace?		N/A
624 VOC (Rcvd at least one unpreserved VOA vial)		N/A
524 VOC (Rcvd with trip blanks)	(pH<2)	N/A

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

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

Samples Inspected/Checklist Completed By: Thomas Wingate Date: 01/30/2018

Thomas Wingate

PM Review and Approval: Amber T Confer Date: 01/31/2018

Amber Confer

Analytical Report for

Hillis Carnes Engineering Associates

Certificate of Analysis No.: 18040507

Project Manager: Keith Progin

Project Name : SPT A3-1

Project Location: A3-1

Project ID : 16280B

April 10, 2018

Phase Separation Science, Inc.

6630 Baltimore National Pike
Baltimore, MD 21228
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PHASE SEPARATION SCIENCE, INC.

April 10, 2018

Keith Progin
Hillis Carnes Engineering Associates
10975 Guilford Road, Ste. A
Annapolis Junction, MD 20701

Reference: PSS Work Order(s) No: **18040507**
Project Name: SPT A3-1
Project Location: A3-1
Project ID.: 16280B

Dear Keith Progin :

This report includes the analytical results from the analyses performed on the samples received under the project name referenced above and identified with the Phase Separation Science (PSS) Work Order(s) numbered **18040507**.

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

PSS reserves the right to return any unused samples, extracts or related solutions. Otherwise, the samples are scheduled for disposal, without any further notice, on May 10, 2018, with the exception of air canisters which are cleaned immediately following analysis. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt , the request will be acknowledged by PSS, thus extending the storage period.

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

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

Sincerely,

Dan Prucnal
Laboratory Manager

Sample Summary

Client Name: Hillis Carnes Engineering Associates

Project Name: SPT A3-1

Work Order Number(s): 18040507

Project ID: 16280B

The following samples were received under chain of custody by Phase Separation Science (PSS) on 04/05/2018 at 11:20 am

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
18040507-001	Exclusion 6	SOIL	04/05/18 10:15
18040507-002	Exclusion 7	SOIL	04/05/18 09:55

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

Notes:

1. The presence of a common laboratory contaminant such as methylene chloride may be considered a possible laboratory artifact. Where observed, appropriate consideration of data should be taken.
2. Unless otherwise noted in the case narrative, results are reported on a dry weight basis with the exception of pH, flashpoint, moisture, and paint filter test.
3. Drinking water samples collected for the purpose of compliance with SDWA may not be suitable for their intended use unless collected by a certified sampler [COMAR 26.08.05.07.C.2].
4. The analyses of 1,2-dibromo-3-chloropropane (DBCP) and 1,2-dibromoethane (EDB) by EPA 524.2 and calcium, magnesium, sodium and iron by EPA 200.8 are not currently promulgated for use in testing to meet the Safe Drinking Water Act and as such cannot be used for compliance purposes. The listings of the current promulgated methods for testing in compliance with the Safe Drinking Water Act can be found in the 40 CFR part 141.1, for the primary drinking water contaminates, and part 141.3, for the secondary drinking water contaminates.
5. Sample prepared under EPA 3550C with concentrations greater than 20 mg/Kg should employ the microtip extraction procedure if required to meet data quality objectives.
6. The analysis of acrolein by EPA 624 must be analyzed within three days of sampling unless pH is adjusted to 4-5 units [40 CFR part 136.3(e)].
7. Method 180.1, The Determination of Turbidity by Nephelometry, recommends samples over 40 NTU be diluted until the turbidity falls below 40 units. Routine samples over 40 NTU may not be diluted as long as the data quality objectives are not affected.
8. Alkalinity results analyzed by EPA 310.2 that are reported by dilution are estimated and are not in compliance with method requirements.

Standard Flags/Abbreviations:

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

Certifications:

NELAP Certifications: PA 68-03330, VA 460156
State Certifications: MD 179, WV 303
Regulated Soil Permit: P330-12-00268
NSWC USCG Accepted Laboratory
LDBE MWAA LD1997-0041-2015

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 18040507

Hillis Carnes Engineering Associates, Annapolis Junction, MD

April 10, 2018

Project Name: SPT A3-1
Project Location: A3-1
Project ID: 16280B

Sample ID: Exclusion 6 **Date/Time Sampled: 04/05/2018 10:15** **PSS Sample ID: 18040507-001**
Matrix: SOIL **Date/Time Received: 04/05/2018 11:20** **% Solids: 85**

Oil and Grease — Analytical Method: EPA 9071 B-Modified

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Oil & Grease, Total Recovered	**510**	mg/kg	59		1	04/05/18	04/05/18 15:56	1066

PP Metals plus V and Mn — Analytical Method: SW-846 6020 A — Preparation Method: 3050B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Antimony	ND	mg/kg	2.6		1	04/06/18	04/06/18 21:36	1064
Arsenic	**48**	mg/kg	0.51		1	04/06/18	04/06/18 21:36	1064
Beryllium	ND	mg/kg	2.6		1	04/06/18	04/06/18 21:36	1064
Cadmium	**150**	mg/kg	2.6		1	04/06/18	04/06/18 21:36	1064
Chromium	**130**	mg/kg	2.6		1	04/06/18	04/06/18 21:36	1064
Copper	**360**	mg/kg	2.6		1	04/06/18	04/06/18 21:36	1064
Lead	**260**	mg/kg	2.6		1	04/06/18	04/06/18 21:36	1064
Manganese	**2,300**	mg/kg	51		20	04/06/18	04/09/18 15:42	1064
Mercury	**0.45**	mg/kg	0.10		1	04/06/18	04/06/18 21:36	1064
Nickel	**13**	mg/kg	2.6		1	04/06/18	04/06/18 21:36	1064
Selenium	ND	mg/kg	2.6		1	04/06/18	04/06/18 21:36	1064
Silver	ND	mg/kg	2.6		1	04/06/18	04/06/18 21:36	1064
Thallium	ND	mg/kg	2.0		1	04/06/18	04/06/18 21:36	1064
Vanadium	**120**	mg/kg	2.6		1	04/06/18	04/06/18 21:36	1064
Zinc	**8,600**	mg/kg	200		20	04/06/18	04/09/18 15:42	1064

Total Petroleum Hydrocarbons - DRO — Analytical Method: SW-846 8015 C — Preparation Method: SW3550C

DF/HF - No. 2/diesel fuel and heavier fuel/oil patterns observed in sample.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
TPH-DRO (Diesel Range Organics)	**1,800**	mg/kg	590	DF	10	04/05/18	04/10/18 09:57	1059

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
TPH-GRO (Gasoline Range Organics)	ND	ug/kg	120		1	04/05/18	04/05/18 17:40	1035

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 18040507

Hillis Carnes Engineering Associates, Annapolis Junction, MD

April 10, 2018

Project Name: SPT A3-1
Project Location: A3-1
Project ID: 16280B

Sample ID: Exclusion 6 | **Date/Time Sampled: 04/05/2018 10:15** | **PSS Sample ID: 18040507-001**

Matrix: SOIL | **Date/Time Received: 04/05/2018 11:20** | **% Solids: 85**

Polychlorinated Biphenyls

Analytical Method: SW-846 8082 A

Preparation Method: SW3550C
Clean up Method: SW846 3665A

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
PCB-1016	ND	mg/kg	0.060		1	04/05/18	04/06/18 13:14	1014
PCB-1221	ND	mg/kg	0.060		1	04/05/18	04/06/18 13:14	1014
PCB-1232	ND	mg/kg	0.060		1	04/05/18	04/06/18 13:14	1014
PCB-1242	ND	mg/kg	0.060		1	04/05/18	04/06/18 13:14	1014
PCB-1248	ND	mg/kg	0.060		1	04/05/18	04/06/18 13:14	1014
PCB-1254	ND	mg/kg	0.060		1	04/05/18	04/06/18 13:14	1014
PCB-1260	ND	mg/kg	0.060		1	04/05/18	04/06/18 13:14	1014

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 18040507

Hillis Carnes Engineering Associates, Annapolis Junction, MD

April 10, 2018

Project Name: SPT A3-1
Project Location: A3-1
Project ID: 16280B

Sample ID: Exclusion 7 | **Date/Time Sampled: 04/05/2018 09:55** | **PSS Sample ID: 18040507-002**
Matrix: SOIL | **Date/Time Received: 04/05/2018 11:20** | **% Solids: 83**

Oil and Grease — Analytical Method: EPA 9071 B-Modified

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Oil & Grease, Total Recovered	**1,100**	mg/kg	60		1	04/05/18	04/05/18 15:56	1066

PP Metals plus V and Mn — Analytical Method: SW-846 6020 A — Preparation Method: 3050B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Antimony	ND	mg/kg	2.1		1	04/06/18	04/06/18 21:40	1064
Arsenic	**64**	mg/kg	0.41		1	04/06/18	04/06/18 21:40	1064
Beryllium	**2.1**	mg/kg	2.1		1	04/06/18	04/06/18 21:40	1064
Cadmium	**590**	mg/kg	41		20	04/06/18	04/09/18 15:46	1064
Chromium	**250**	mg/kg	2.1		1	04/06/18	04/06/18 21:40	1064
Copper	**710**	mg/kg	41		20	04/06/18	04/09/18 15:46	1064
Lead	**550**	mg/kg	41		20	04/06/18	04/09/18 15:46	1064
Manganese	**5,200**	mg/kg	41		20	04/06/18	04/09/18 15:46	1064
Mercury	**0.73**	mg/kg	0.082		1	04/06/18	04/06/18 21:40	1064
Nickel	**21**	mg/kg	2.1		1	04/06/18	04/06/18 21:40	1064
Selenium	ND	mg/kg	2.1		1	04/06/18	04/06/18 21:40	1064
Silver	**2.3**	mg/kg	2.1		1	04/06/18	04/06/18 21:40	1064
Thallium	ND	mg/kg	1.6		1	04/06/18	04/06/18 21:40	1064
Vanadium	**220**	mg/kg	2.1		1	04/06/18	04/06/18 21:40	1064
Zinc	**12,000**	mg/kg	160		20	04/06/18	04/09/18 15:46	1064

Total Petroleum Hydrocarbons - DRO — Analytical Method: SW-846 8015 C — Preparation Method: SW3550C

DF/HF - No. 2/diesel fuel and heavier fuel/oil patterns observed in sample.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
TPH-DRO (Diesel Range Organics)	**7,900**	mg/kg	480	DF	20	04/05/18	04/10/18 12:01	1059

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
TPH-GRO (Gasoline Range Organics)	ND	ug/kg	120		1	04/05/18	04/05/18 18:11	1035

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 18040507

Hillis Carnes Engineering Associates, Annapolis Junction, MD

April 10, 2018

Project Name: SPT A3-1
Project Location: A3-1
Project ID: 16280B

Sample ID: Exclusion 7 **Date/Time Sampled: 04/05/2018 09:55** **PSS Sample ID: 18040507-002**

Matrix: SOIL **Date/Time Received: 04/05/2018 11:20** **% Solids: 83**

Polychlorinated Biphenyls

Analytical Method: SW-846 8082 A

Preparation Method: SW3550C
Clean up Method: SW846 3665A

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
PCB-1016	ND	mg/kg	0.058		1	04/05/18	04/06/18 13:43	1014
PCB-1221	ND	mg/kg	0.058		1	04/05/18	04/06/18 13:43	1014
PCB-1232	ND	mg/kg	0.058		1	04/05/18	04/06/18 13:43	1014
PCB-1242	ND	mg/kg	0.058		1	04/05/18	04/06/18 13:43	1014
PCB-1248	ND	mg/kg	0.058		1	04/05/18	04/06/18 13:43	1014
PCB-1254	ND	mg/kg	0.058		1	04/05/18	04/06/18 13:43	1014
PCB-1260	ND	mg/kg	0.058		1	04/05/18	04/06/18 13:43	1014

Case Narrative Summary

Client Name: Hillis Carnes Engineering Associates

Project Name: SPT A3-1

Work Order Number(s): 18040507

Project ID: 16280B

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

The analyses of chlorine, pH, dissolved oxygen, temperature and sulfite for drinking water and non-potable samples tested for compliance have a maximum holding time of 15 minutes. As such, all laboratory analyses for these analytes exceed holding times.

Matrix spike and matrix spike duplicate analyses may not be performed due to insufficient sample quantity. In these instances, a laboratory control sample and laboratory control sample duplicate are analyzed unless otherwise noted or specified in the method.

Sample Receipt:

All sample receipt conditions were acceptable.

Analytical:

Total Petroleum Hydrocarbons - DRO

Batch: 152153

Surrogate recoveries affected by sample matrix.

Total Petroleum Hydrocarbons-GRO

Batch: 152057

Surrogate recoveries affected by sample matrix.

Polychlorinated Biphenyls

Batch: 152098

Surrogate recoveries affected by sample matrix.

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

EPA 9071 B-Modified: Oil & Grease, Total Recovered

Analytical Data Package Information Summary

Work Order(s): 18040507
Report Prepared For: Hillis Carnes Engineering Associates, Annapo
Project Name: SPT A3-1
Project Manager: Keith Progin

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
EPA 9071 B-Modified	Exclusion 6	Initial	18040507-001	1066	S	152050	152050	04/05/2018	04/05/2018 15:56	04/05/2018 15:56
	Exclusion 7	Initial	18040507-002	1066	S	152050	152050	04/05/2018	04/05/2018 15:56	04/05/2018 15:56
	152050-1-BKS	BKS	152050-1-BKS	1066	S	152050	152050	--------	04/05/2018 15:56	04/05/2018 15:56
	152050-1-BLK	BLK	152050-1-BLK	1066	S	152050	152050	--------	04/05/2018 15:56	04/05/2018 15:56
	152050-1-BSD	BSD	152050-1-BSD	1066	S	152050	152050	--------	04/05/2018 15:56	04/05/2018 15:56
	Exclusion 6 S	MS	18040507-001 S	1066	S	152050	152050	04/05/2018	04/05/2018 15:56	04/05/2018 15:56
	Exclusion 6 SD	MSD	18040507-001 SD	1066	S	152050	152050	04/05/2018	04/05/2018 15:56	04/05/2018 15:56
SM2540G	Exclusion 6	Initial	18040507-001	1059	S	152040	152040	04/05/2018	04/05/2018 14:42	04/05/2018 14:42
	Exclusion 7	Initial	18040507-002	1059	S	152040	152040	04/05/2018	04/05/2018 14:42	04/05/2018 14:42
SW-846 6020 A	Exclusion 6	Initial	18040507-001	1064	S	70776	152108	04/05/2018	04/06/2018 11:03	04/06/2018 21:36
	Exclusion 7	Initial	18040507-002	1064	S	70776	152108	04/05/2018	04/06/2018 11:03	04/06/2018 21:40
	70776-1-BKS	BKS	70776-1-BKS	1064	S	70776	152108	--------	04/06/2018 11:03	04/06/2018 21:13
	70776-1-BLK	BLK	70776-1-BLK	1064	S	70776	152108	--------	04/06/2018 11:03	04/06/2018 21:09
	CT-1 S	MS	18040506-001 S	1064	S	70776	152108	04/05/2018	04/06/2018 11:03	04/06/2018 21:21
	CT-1 SD	MSD	18040506-001 SD	1064	S	70776	152108	04/05/2018	04/06/2018 11:03	04/06/2018 21:25
	Exclusion 6	Reanalysis	18040507-001	1064	S	70776	152139	04/05/2018	04/06/2018 11:03	04/09/2018 15:42
	Exclusion 7	Reanalysis	18040507-002	1064	S	70776	152139	04/05/2018	04/06/2018 11:03	04/09/2018 15:46
SW-846 8015 C	70745-1-BKS	BKS	70745-1-BKS	1045	S	70745	152048	--------	04/05/2018 08:10	04/05/2018 12:01
	70745-1-BLK	BLK	70745-1-BLK	1045	S	70745	152048	--------	04/05/2018 08:10	04/05/2018 11:37
	70745-1-BSD	BSD	70745-1-BSD	1045	S	70745	152048	--------	04/05/2018 08:10	04/05/2018 12:26
	S2 S	MS	18040429-002 S	1045	S	70745	152049	04/04/2018	04/05/2018 08:10	04/05/2018 12:01
	S2 SD	MSD	18040429-002 SD	1045	S	70745	152049	04/04/2018	04/05/2018 08:10	04/05/2018 12:26
	Exclusion 6	Initial	18040507-001	1059	S	70745	152152	04/05/2018	04/05/2018 08:10	04/10/2018 09:57
	Exclusion 7	Initial	18040507-002	1059	S	70745	152153	04/05/2018	04/05/2018 08:10	04/10/2018 12:01
SW-846 8015C	Exclusion 6	Initial	18040507-001	1035	S	70769	152057	04/05/2018	04/05/2018 12:04	04/05/2018 17:40
	Exclusion 7	Initial	18040507-002	1035	S	70769	152057	04/05/2018	04/05/2018 12:04	04/05/2018 18:11
	70769-2-BKS	BKS	70769-2-BKS	1035	S	70769	152057	--------	04/05/2018 12:04	04/05/2018 15:08

Analytical Data Package Information Summary

Work Order(s): 18040507
Report Prepared For: Hillis Carnes Engineering Associates, Annapo
Project Name: SPT A3-1
Project Manager: Keith Progin

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
SW-846 8015C	70769-2-BLK	BLK	70769-2-BLK	1035	S	70769	152057	--------	04/05/2018 12:04	04/05/2018 13:36
	Oily Debris S	MS	18040419-001 S	1035	S	70769	152057	03/30/2018	04/05/2018 12:04	04/05/2018 19:12
	Oily Debris SD	MSD	18040419-001 SD	1035	S	70769	152057	03/30/2018	04/05/2018 12:04	04/05/2018 19:43
SW-846 8082 A	Exclusion 6	Initial	18040507-001	1014	S	70757	152098	04/05/2018	04/05/2018 11:32	04/06/2018 13:14
	Exclusion 7	Initial	18040507-002	1014	S	70757	152098	04/05/2018	04/05/2018 11:32	04/06/2018 13:43
	70757-1-BKS	BKS	70757-1-BKS	1014	S	70757	152098	--------	04/05/2018 11:32	04/06/2018 09:58
	70757-1-BLK	BLK	70757-1-BLK	1014	S	70757	152098	--------	04/05/2018 11:32	04/06/2018 09:30
	70757-1-BSD	BSD	70757-1-BSD	1014	S	70757	152098	--------	04/05/2018 11:32	04/06/2018 10:26
	Disposal Can #1 S	MS	18040502-003 S	1014	S	70757	152098	04/04/2018	04/05/2018 11:32	04/06/2018 10:54
	Disposal Can #1 SD	MSD	18040502-003 SD	1014	S	70757	152098	04/04/2018	04/05/2018 11:32	04/06/2018 11:22

PHASE SEPARATION SCIENCE, INC.

QC Summary 18040507

Hillis Carnes Engineering Associates
SPT A3-1

Analytical Method: SW-846 8082 A Prep Method: SW3550C
Seq Number: 152098 Matrix: Soil Date Prep: 04/05/2018
PSS Sample ID: 18040507-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Decachlorobiphenyl	380	*	61-150	%	04/06/18 13:14
Tetrachloro-m-xylene	52		42-142	%	04/06/18 13:14

Analytical Method: SW-846 8015 C Prep Method: SW3550C
Seq Number: 152152 Matrix: Soil Date Prep: 04/05/2018
PSS Sample ID: 18040507-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
o-Terphenyl	107		34-133	%	04/10/18 09:57

Analytical Method: SW-846 8015C Prep Method: SW5030
Seq Number: 152057 Matrix: Soil Date Prep: 04/05/2018
PSS Sample ID: 18040507-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
a,a,a-Trifluorotoluene	92		81-105	%	04/05/18 17:40

Analytical Method: SW-846 8082 A Prep Method: SW3550C
Seq Number: 152098 Matrix: Soil Date Prep: 04/05/2018
PSS Sample ID: 18040507-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Decachlorobiphenyl	562	*	61-150	%	04/06/18 13:43
Tetrachloro-m-xylene	52		42-142	%	04/06/18 13:43

Analytical Method: SW-846 8015 C Prep Method: SW3550C
Seq Number: 152153 Matrix: Soil Date Prep: 04/05/2018
PSS Sample ID: 18040507-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
o-Terphenyl	0	*	34-133	%	04/10/18 12:01

PHASE SEPARATION SCIENCE, INC.

QC Summary 18040507

Hillis Carnes Engineering Associates
SPT A3-1

Analytical Method: SW-846 8015C Prep Method: SW5030
Seq Number: 152057 Matrix: Soil Date Prep: 04/05/2018
PSS Sample ID: 18040507-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
a,a,a-Trifluorotoluene	90		81-105	%	04/05/18 18:11

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

PHASE SEPARATION SCIENCE, INC.

QC Summary 18040507

Hillis Carnes Engineering Associates
SPT A3-1

Analytical Method: EPA 9071 B-Modified
Seq Number: 152050 Matrix: Solid
MB Sample Id: 152050-1-BLK LCS Sample Id: 152050-1-BKS LCSD Sample Id: 152050-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Oil & Grease, Total Recovered	<49.97	799.5	773.5	97	768	96	78-114	1	28	mg/kg	04/05/18 15:56	

Analytical Method: EPA 9071 B-Modified
Seq Number: 152050 Matrix: Soil
Parent Sample Id: 18040507-001 MS Sample Id: 18040507-001 S MSD Sample Id: 18040507-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Oil & Grease, Total Recovered	508	941.6	1403	95	1399	95	78-114	0	28	mg/kg	04/05/18 15:56	

Analytical Method: SW-846 6020 A Prep Method: SW3050B
Seq Number: 152108 Matrix: Solid Date Prep: 04/06/18
MB Sample Id: 70776-1-BLK LCS Sample Id: 70776-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Antimony	<2.111	16.89	17.22	102	80-120	mg/kg	04/06/18 21:13	
Arsenic	<0.4223	16.89	16.23	96	80-120	mg/kg	04/06/18 21:13	
Beryllium	<2.111	16.89	16.19	96	80-120	mg/kg	04/06/18 21:13	
Cadmium	<2.111	16.89	16.49	98	80-120	mg/kg	04/06/18 21:13	
Chromium	<2.111	16.89	16.76	99	80-120	mg/kg	04/06/18 21:13	
Copper	<2.111	16.89	17.03	101	80-120	mg/kg	04/06/18 21:13	
Lead	<2.111	16.89	16.50	98	80-120	mg/kg	04/06/18 21:13	
Manganese	<2.111	16.89	16.43	97	80-120	mg/kg	04/06/18 21:13	
Mercury	<0.08446	0.4223	0.4151	98	80-120	mg/kg	04/06/18 21:13	
Nickel	<2.111	16.89	16.76	99	80-120	mg/kg	04/06/18 21:13	
Selenium	<2.111	16.89	16.41	97	80-120	mg/kg	04/06/18 21:13	
Silver	<2.111	16.89	16.21	96	80-120	mg/kg	04/06/18 21:13	
Thallium	<1.689	16.89	14.66	87	80-120	mg/kg	04/06/18 21:13	
Vanadium	<2.111	16.89	16.48	98	80-120	mg/kg	04/06/18 21:13	
Zinc	<8.446	84.46	82.24	97	80-120	mg/kg	04/06/18 21:13	

Analytical Method: SW-846 8082 A Prep Method: SW3550C
Seq Number: 152098 Matrix: Solid Date Prep: 04/05/18
MB Sample Id: 70757-1-BLK LCS Sample Id: 70757-1-BKS LCSD Sample Id: 70757-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
PCB-1016	<0.04975	0.4975	0.4304	87	0.4239	86	60-110	2	25	mg/kg	04/06/18 09:58	
PCB-1260	<0.04975	0.4975	0.4613	93	0.4550	92	60-98	1	25	mg/kg	04/06/18 09:58	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Decachlorobiphenyl	112		114		112		61-150	%	04/06/18 09:58
Tetrachloro-m-xylene	90		96		94		42-142	%	04/06/18 09:58

PHASE SEPARATION SCIENCE, INC.

QC Summary 18040507

Hillis Carnes Engineering Associates

SPT A3-1

Analytical Method: SW-846 8015 C Prep Method: SW3550C

Seq Number: 152048 Matrix: Solid Date Prep: 04/05/18

MB Sample Id: 70745-1-BLK LCS Sample Id: 70745-1-BKS LCSD Sample Id: 70745-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
TPH-DRO (Diesel Range Organics)	<9.987	33.29	28.10	84	29.13	87	54-123	4	25	mg/kg	04/05/18 12:01	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
o-Terphenyl	89		84		88		34-133	%	04/05/18 12:01

Analytical Method: SW-846 8015C Prep Method: SW5030

Seq Number: 152057 Matrix: Solid Date Prep: 04/05/18

MB Sample Id: 70769-2-BLK LCS Sample Id: 70769-2-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
TPH-GRO (Gasoline Range Organics	<100	5000	5530	111	65-139	ug/kg	04/05/18 15:08	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
a,a,a-Trifluorotoluene	88		110	*	81-105	%	04/05/18 15:08

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

PHASE SEPARATION SCIENCE, INC.

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

(1) *CLIENT: Hillis-Carnes (HCEA) *OFFICE LOC. AJ

*PROJECT MGR: Keith Prosin *PHONE NO.: (410) 880-4788

EMAIL: kprosin@hcea.com FAX NO.: ( )

*PROJECT NAME: SPT A3-1 PROJECT NO.: 162803

SITE LOCATION: A3-1 P.O. NO.:

SAMPLER(S): Sean Harkins DW CERT NO.:

PSS Work Order #: 1804057 PAGE 1 OF 1

Matrix Codes: **SW**=Surface Wtr **DW**=Drinking Wtr **GW**=Ground Wtr **WW**=Waste Wtr **O**=Oil **S**=Soil **L**=Liquid **SOL**=Solid **A**=Air **WI**=Wipe

(2)

LAB NO.	*SAMPLE IDENTIFICATION	*DATE (SAMPLED)	*TIME (SAMPLED)	MATRIX (See Codes)	No. CONTAINERS	SAMPLE TYPE (C = COMP, G = GRAB)	Preservatives Used	Analysis/ Method Required (3) * TPH-DRO	TPH-GRO	Oil & Grease	PCBs	PP 13 Metals	Vanadium	Manganese	REMARKS
1	Exclusion 6	4/5/18	10:15am	S	6	C		X	X	X	X	X	X	X	Keep
2	Exclusion 7	4/5/18	9:35am	S	6	C		X	X	X	X	X	X	X	two jars per Sample on HOLD

(5)

Relinquished By: (1)	Date	Time	Received By:
Sean Harkins	4/5/18	1120	
Relinquished By: (2)	Date	Time	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

(4)

*Requested TAT (One TAT per COC)
☐ 5-Day ☒ 3-Day ☐ 2-Day
☐ Next Day ☐ Emergency ☐ Other

Data Deliverables Required:
COA ☐ QC SUMM ☐ CLP LIKE ☐ OTHER ____

# of Coolers: 1
Custody Seal: ABS
Ice Present: PRES Temp: 1°-1°C
Shipping Carrier: Client

Special Instructions:

DW COMPLIANCE? YES ☐ EDD FORMAT TYPE ____

STATE RESULTS REPORTED TO: MD ☐ DE ☐ PA ☐ VA ☐ WV ☐ OTHER ____

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

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	18040507	**Received By**	Thomas Wingate
Client Name	Hillis Carnes Engineering Associates	**Date Received**	04/05/2018 11:20:00 AM
Project Name	SPT A3-1	**Delivered By**	Client
Project Number	16280B	**Tracking No**	Not Applicable
Disposal Date	05/10/2018	**Logged In By**	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

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

Documentation

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

Sample Container

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

Total No. of Samples Received 2 Total No. of Containers Received 12

Preservation

Total Metals	(pH<2)	N/A
Dissolved Metals, filtered within 15 minutes of collection	(pH<2)	N/A
Orthophosphorus, filtered within 15 minutes of collection		N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, DOC (field filtered), COD, Phenols	(pH<2)	N/A
TOX, TKN, NH3, Total Phos	(pH<2)	N/A
VOC, BTEX (VOA Vials Rcvd Preserved)	(pH<2)	N/A
Do VOA vials have zero headspace?		N/A
624 VOC (Rcvd at least one unpreserved VOA vial)		N/A
524 VOC (Rcvd with trip blanks)	(pH<2)	N/A

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

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

Samples Inspected/Checklist Completed By: Thomas Wingate Date: 04/05/2018

Thomas Wingate

PM Review and Approval: Amber L Confer Date: 04/05/2018

Amber Confer

Analytical Report for

Hillis Carnes Engineering Associates

Certificate of Analysis No.: 18041829

Project Manager: Keith Progin

Project Name : A3-1

Project Location: Sparrows Point

Project ID : 16280B

April 23, 2018

Phase Separation Science, Inc.

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PHASE SEPARATION SCIENCE, INC.

April 23, 2018

Keith Progin
Hillis Carnes Engineering Associates
10975 Guilford Road, Ste. A
Annapolis Junction, MD 20701

Reference: PSS Work Order(s) No: **18041829**
Project Name: A3-1
Project Location: Sparrows Point
Project ID.: 16280B

Dear Keith Progin :

This report includes the analytical results from the analyses performed on the samples received under the project name referenced above and identified with the Phase Separation Science (PSS) Work Order(s) numbered **18041829**.

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

PSS reserves the right to return any unused samples, extracts or related solutions. Otherwise, the samples are scheduled for disposal, without any further notice, on May 23, 2018, with the exception of air canisters which are cleaned immediately following analysis. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt , the request will be acknowledged by PSS, thus extending the storage period.

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

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

Sincerely,

Dan Prucnal
Laboratory Manager

Sample Summary

Client Name: Hillis Carnes Engineering Associates

Project Name: A3-1

Work Order Number(s): 18041829

Project ID: 16280B

The following samples were received under chain of custody by Phase Separation Science (PSS) on 04/18/2018 at 04:10 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
18041829-001	Exclusion 8	SOIL	04/18/18 09:30

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

Notes:

1. The presence of a common laboratory contaminant such as methylene chloride may be considered a possible laboratory artifact. Where observed, appropriate consideration of data should be taken.
2. Unless otherwise noted in the case narrative, results are reported on a dry weight basis with the exception of pH, flashpoint, moisture, and paint filter test.
3. Drinking water samples collected for the purpose of compliance with SDWA may not be suitable for their intended use unless collected by a certified sampler [COMAR 26.08.05.07.C.2].
4. The analyses of 1,2-dibromo-3-chloropropane (DBCP) and 1,2-dibromoethane (EDB) by EPA 524.2 and calcium, magnesium, sodium and iron by EPA 200.8 are not currently promulgated for use in testing to meet the Safe Drinking Water Act and as such cannot be used for compliance purposes. The listings of the current promulgated methods for testing in compliance with the Safe Drinking Water Act can be found in the 40 CFR part 141.1, for the primary drinking water contaminates, and part 141.3, for the secondary drinking water contaminates.
5. Sample prepared under EPA 3550C with concentrations greater than 20 mg/Kg should employ the microtip extraction procedure if required to meet data quality objectives.
6. The analysis of acrolein by EPA 624 must be analyzed within three days of sampling unless pH is adjusted to 4-5 units [40 CFR part 136.3(e)].
7. Method 180.1, The Determination of Turbidity by Nephelometry, recommends samples over 40 NTU be diluted until the turbidity falls below 40 units. Routine samples over 40 NTU may not be diluted as long as the data quality objectives are not affected.
8. Alkalinity results analyzed by EPA 310.2 that are reported by dilution are estimated and are not in compliance with method requirements.

Standard Flags/Abbreviations:

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

Certifications:

NELAP Certifications: PA 68-03330, VA 460156
State Certifications: MD 179, WV 303
Regulated Soil Permit: P330-12-00268
NSWC USCG Accepted Laboratory
LDBE MWAA LD1997-0041-2015

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 18041829

Hillis Carnes Engineering Associates, Annapolis Junction, MD

April 23, 2018

Project Name: A3-1
Project Location: Sparrows Point
Project ID: 16280B

Sample ID: Exclusion 8 **Date/Time Sampled: 04/18/2018 09:30** **PSS Sample ID: 18041829-001**
Matrix: SOIL **Date/Time Received: 04/18/2018 16:10** **% Solids: 85**

Oil and Grease — Analytical Method: EPA 9071 B-Modified

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Oil & Grease, Total Recovered	**990**	mg/kg	59		1	04/20/18	04/20/18 10:09	1066

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Antimony	ND	mg/kg	2.4		1	04/19/18	04/19/18 19:07	1051
Arsenic	**5.6**	mg/kg	0.47		1	04/19/18	04/19/18 19:07	1051
Beryllium	ND	mg/kg	2.4		1	04/19/18	04/19/18 19:07	1051
Cadmium	**10**	mg/kg	2.4		1	04/19/18	04/19/18 19:07	1051
Chromium	**24**	mg/kg	2.4		1	04/19/18	04/19/18 19:07	1051
Copper	**37**	mg/kg	2.4		1	04/19/18	04/19/18 19:07	1051
Lead	**91**	mg/kg	2.4		1	04/19/18	04/19/18 19:07	1051
Manganese	**670**	mg/kg	47		20	04/19/18	04/20/18 14:43	1051
Mercury	**0.30**	mg/kg	0.094		1	04/19/18	04/19/18 19:07	1051
Nickel	**8.1**	mg/kg	2.4		1	04/19/18	04/19/18 19:07	1051
Selenium	ND	mg/kg	2.4		1	04/19/18	04/19/18 19:07	1051
Silver	ND	mg/kg	2.4		1	04/19/18	04/19/18 19:07	1051
Thallium	ND	mg/kg	1.9		1	04/19/18	04/19/18 19:07	1051
Vanadium	**33**	mg/kg	2.4		1	04/19/18	04/19/18 19:07	1051
Zinc	**1,100**	mg/kg	190		20	04/19/18	04/20/18 14:43	1051

Total Petroleum Hydrocarbons - DRO — Analytical Method: SW-846 8015 C — Preparation Method: SW3550C

DF/HF - No. 2/diesel fuel and heavier fuel/oil patterns observed in sample.

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
TPH-DRO (Diesel Range Organics)	**92**	mg/kg	12	DF	1	04/20/18	04/23/18 10:13	1059

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
TPH-GRO (Gasoline Range Organics)	ND	ug/kg	120		1	04/19/18	04/19/18 13:18	1035

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BALTIMORE, MD 21228
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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 18041829

Hillis Carnes Engineering Associates, Annapolis Junction, MD

April 23, 2018

Project Name: A3-1
Project Location: Sparrows Point
Project ID: 16280B

Sample ID: Exclusion 8 **Date/Time Sampled: 04/18/2018 09:30** **PSS Sample ID: 18041829-001**

Matrix: SOIL **Date/Time Received: 04/18/2018 16:10** **% Solids: 85**

Polychlorinated Biphenyls

Analytical Method: SW-846 8082 A

Preparation Method: SW3550C
Clean up Method: SW846 3665A

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
PCB-1016	ND	mg/kg	0.058		1	04/19/18	04/19/18 22:51	1029
PCB-1221	ND	mg/kg	0.058		1	04/19/18	04/19/18 22:51	1029
PCB-1232	ND	mg/kg	0.058		1	04/19/18	04/19/18 22:51	1029
PCB-1242	ND	mg/kg	0.058		1	04/19/18	04/19/18 22:51	1029
PCB-1248	ND	mg/kg	0.058		1	04/19/18	04/19/18 22:51	1029
PCB-1254	ND	mg/kg	0.058		1	04/19/18	04/19/18 22:51	1029
PCB-1260	**0.087**	mg/kg	0.058		1	04/19/18	04/19/18 22:51	1029

Case Narrative Summary

Client Name: Hillis Carnes Engineering Associates

Project Name: A3-1

Work Order Number(s): 18041829

Project ID: 16280B

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

The analyses of chlorine, pH, dissolved oxygen, temperature and sulfite for drinking water and non-potable samples tested for compliance have a maximum holding time of 15 minutes. As such, all laboratory analyses for these analytes exceed holding times.

Matrix spike and matrix spike duplicate analyses may not be performed due to insufficient sample quantity. In these instances, a laboratory control sample and laboratory control sample duplicate are analyzed unless otherwise noted or specified in the method.

Sample Receipt:

All sample receipt conditions were acceptable.

Analytical:

Total Petroleum Hydrocarbons-GRO

Batch: 152467

Surrogate recoveries affected by sample matrix.

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

EPA 9071 B-Modified: Oil & Grease, Total Recovered

Analytical Data Package Information Summary

Work Order(s): 18041829
Report Prepared For: Hillis Carnes Engineering Associates, Annapo
Project Name: A3-1
Project Manager: Keith Progin

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
EPA 9071 B-Modified	Exclusion 8	Initial	18041829-001	1066	S	152493	152493	04/18/2018	04/20/2018 10:09	04/20/2018 10:09
SM2540G	Exclusion 8	Initial	18041829-001	1066	S	152474	152474	04/18/2018	04/19/2018 14:03	04/19/2018 14:03
SW-846 6020 A	Exclusion 8	Initial	18041829-001	1051	S	70969	152502	04/18/2018	04/19/2018 10:51	04/19/2018 19:07
	70969-1-BKS	BKS	70969-1-BKS	1051	S	70969	152502	--------	04/19/2018 10:51	04/19/2018 17:20
	70969-1-BLK	BLK	70969-1-BLK	1051	S	70969	152502	--------	04/19/2018 10:51	04/19/2018 17:16
	PRC-18R,0-4' S	MS	18041729-002 S	1051	S	70969	152502	04/17/2018	04/19/2018 10:51	04/19/2018 17:28
	PRC-18R,0-4' SD	MSD	18041729-002 SD	1051	S	70969	152502	04/17/2018	04/19/2018 10:51	04/19/2018 17:32
	Exclusion 8	Reanalysis	18041829-001	1051	S	70969	152542	04/18/2018	04/19/2018 10:51	04/20/2018 14:43
SW-846 8015 C	70979-1-BKS	BKS	70979-1-BKS	1059	S	70979	152549	--------	04/20/2018 07:58	04/20/2018 16:40
	70979-1-BLK	BLK	70979-1-BLK	1059	S	70979	152549	--------	04/20/2018 07:58	04/20/2018 16:15
	70979-1-BSD	BSD	70979-1-BSD	1059	S	70979	152549	--------	04/20/2018 07:58	04/20/2018 17:05
	W419-05 S	MS	18041924-005 S	1059	S	70979	152551	04/19/2018	04/20/2018 07:58	04/20/2018 16:40
	W419-05 SD	MSD	18041924-005 SD	1059	S	70979	152551	04/19/2018	04/20/2018 07:58	04/20/2018 17:05
	Exclusion 8	Initial	18041829-001	1059	S	70979	152552	04/18/2018	04/20/2018 07:58	04/23/2018 10:13
SW-846 8015C	Exclusion 8	Initial	18041829-001	1035	S	70974	152467	04/18/2018	04/19/2018 09:41	04/19/2018 13:18
	70974-2-BKS	BKS	70974-2-BKS	1035	S	70974	152467	--------	04/19/2018 09:41	04/19/2018 11:46
	70974-2-BLK	BLK	70974-2-BLK	1035	S	70974	152467	--------	04/19/2018 09:41	04/19/2018 11:17
	Holtzman Oil A S	MS	18041832-001 S	1035	S	70974	152467	04/18/2018	04/19/2018 09:41	04/19/2018 18:55
	Holtzman Oil A SD	MSD	18041832-001 SD	1035	S	70974	152467	04/18/2018	04/19/2018 09:41	04/19/2018 19:25
SW-846 8082 A	Exclusion 8	Initial	18041829-001	1029	S	70955	152498	04/18/2018	04/19/2018 08:59	04/19/2018 22:51
	70955-1-BKS	BKS	70955-1-BKS	1029	S	70955	152498	--------	04/19/2018 08:59	04/19/2018 16:19
	70955-1-BLK	BLK	70955-1-BLK	1029	S	70955	152498	--------	04/19/2018 08:59	04/19/2018 15:51
	70955-1-BSD	BSD	70955-1-BSD	1029	S	70955	152498	--------	04/19/2018 08:59	04/19/2018 16:46
	WRC Mg-Lime (April) S	MS	18041819-002 S	1029	S	70955	152498	04/18/2018	04/19/2018 08:59	04/19/2018 17:15
	WRC Mg-Lime (April) SD	MSD	18041819-002 SD	1029	S	70955	152498	04/18/2018	04/19/2018 08:59	04/19/2018 17:43

PHASE SEPARATION SCIENCE, INC.

QC Summary 18041829

Hillis Carnes Engineering Associates

A3-1

Analytical Method: SW-846 8082 A Prep Method: SW3550C

Seq Number: 152498 Matrix: Soil Date Prep: 04/19/2018

PSS Sample ID: 18041829-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Decachlorobiphenyl	82		61-150	%	04/19/18 22:51
Tetrachloro-m-xylene	68		42-142	%	04/19/18 22:51

Analytical Method: SW-846 8015 C Prep Method: SW3550C

Seq Number: 152552 Matrix: Soil Date Prep: 04/20/2018

PSS Sample ID: 18041829-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
o-Terphenyl	85		34-133	%	04/23/18 10:13

Analytical Method: SW-846 8015C Prep Method: SW5030

Seq Number: 152467 Matrix: Soil Date Prep: 04/19/2018

PSS Sample ID: 18041829-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
a,a,a-Trifluorotoluene	100		81-105	%	04/19/18 13:18

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

PHASE SEPARATION SCIENCE, INC.

QC Summary 18041829

Hillis Carnes Engineering Associates

A3-1

Analytical Method: SW-846 6020 A Prep Method: SW3050B

Seq Number: 152502 Matrix: Solid Date Prep: 04/19/18

MB Sample Id: 70969-1-BLK LCS Sample Id: 70969-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Antimony	<1.901	15.21	15.16	100	80-120	mg/kg	04/19/18 17:20	
Arsenic	<0.3802	15.21	15.01	99	80-120	mg/kg	04/19/18 17:20	
Beryllium	<1.901	15.21	14.30	94	80-120	mg/kg	04/19/18 17:20	
Cadmium	<1.901	15.21	14.23	94	80-120	mg/kg	04/19/18 17:20	
Chromium	<1.901	15.21	14.99	99	80-120	mg/kg	04/19/18 17:20	
Copper	<1.901	15.21	15.89	104	80-120	mg/kg	04/19/18 17:20	
Lead	<1.901	15.21	15.23	100	80-120	mg/kg	04/19/18 17:20	
Manganese	<1.901	15.21	14.63	96	80-120	mg/kg	04/19/18 17:20	
Mercury	<0.07604	0.3802	0.3608	95	80-120	mg/kg	04/19/18 17:20	
Nickel	<1.901	15.21	15.31	101	80-120	mg/kg	04/19/18 17:20	
Selenium	<1.901	15.21	15.26	100	80-120	mg/kg	04/19/18 17:20	
Silver	<1.901	15.21	14.91	98	80-120	mg/kg	04/19/18 17:20	
Thallium	<1.521	15.21	13.17	87	80-120	mg/kg	04/19/18 17:20	
Vanadium	<1.901	15.21	14.82	97	80-120	mg/kg	04/19/18 17:20	
Zinc	<7.604	76.04	76.00	100	80-120	mg/kg	04/19/18 17:20	

Analytical Method: SW-846 8082 A Prep Method: SW3550C

Seq Number: 152498 Matrix: Solid Date Prep: 04/19/18

MB Sample Id: 70955-1-BLK LCS Sample Id: 70955-1-BKS LCSD Sample Id: 70955-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
PCB-1016	<0.04975	0.4975	0.4102	82	0.4083	82	60-110	0	25	mg/kg	04/19/18 16:19	
PCB-1260	<0.04975	0.4975	0.4350	87	0.4322	87	60-98	1	25	mg/kg	04/19/18 16:19	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Decachlorobiphenyl	93		95		93		61-150	%	04/19/18 16:19
Tetrachloro-m-xylene	85		91		91		42-142	%	04/19/18 16:19

Analytical Method: SW-846 8015 C Prep Method: SW3550C

Seq Number: 152549 Matrix: Solid Date Prep: 04/20/18

MB Sample Id: 70979-1-BLK LCS Sample Id: 70979-1-BKS LCSD Sample Id: 70979-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
TPH-DRO (Diesel Range Organics)	<9.973	33.24	37.39	112	35.94	109	54-123	4	25	mg/kg	04/20/18 16:40	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
o-Terphenyl	101		112		108		34-133	%	04/20/18 16:40

PHASE SEPARATION SCIENCE, INC.

QC Summary 18041829

Hillis Carnes Engineering Associates

A3-1

Analytical Method: SW-846 8015C Prep Method: SW5030

Seq Number: 152467 Matrix: Solid Date Prep: 04/19/18

MB Sample Id: 70974-2-BLK LCS Sample Id: 70974-2-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
TPH-GRO (Gasoline Range Organics	<100	5000	5568	111	65-139	ug/kg	04/19/18 11:46	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
a,a,a-Trifluorotoluene	100		120	*	81-105	%	04/19/18 11:46

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

PHASE SEPARATION SCIENCE, INC.

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

(1) *CLIENT: Hillis-Carnes *OFFICE LOC. AT

*PROJECT MGR: Kerth Progin *PHONE NO.: (410) 880-4788

EMAIL: kprogin@hcea.com FAX NO.: ( )

*PROJECT NAME: A3-1 PROJECT NO.: 16280B

SITE LOCATION: Sparrows Point P.O. NO.:

SAMPLER(S): DW CERT NO.:

PSS Work Order #: 1804824 PAGE 1 OF 1

Matrix Codes: SW=Surface Wtr DW=Drinking Wtr GW=Ground Wtr WW=Waste Wtr O=Oil S=Soil L=Liquid SOL=Solid A=Air WI=Wipe

(2)

LAB NO.	*SAMPLE IDENTIFICATION	*DATE (SAMPLED)	*TIME (SAMPLED)	MATRIX (See Codes)	No. CONTAINERS	SAMPLE TYPE C = COMP G = GRAB	Preservatives Used	Analysis/ Method Required (3) * TPH-DRO	TPH-GRO	Oil & Grease	PCBs	PP 13 Metals	Vanadium	Manganese					REMARKS
1	Exclusion 8	4/18/18	9:30am	S	4	C		✓	✓	✓	✓	✓	✓	✓					

(5)

	Date	Time	
Relinquished By: (1)	4/18/18	3:00pm	Received By:
Relinquished By: (2)	4/18/18	1610	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

(4)

*Requested TAT (One TAT per COC)
☐ 5-Day ☑ 3-Day ☐ 2-Day
☐ Next Day ☐ Emergency ☐ Other

Data Deliverables Required:
COA ☐ QC SUMM ☐ CLP LIKE ☐ OTHER ____

# of Coolers: 1

Custody Seal: ABS

Ice Present: PRES Temp: 1°-1°C

Shipping Carrier: Client

Special Instructions:

DW COMPLIANCE? YES ☐

EDD FORMAT TYPE ____

STATE RESULTS REPORTED TO:
MD ☐ DE ☐ PA ☐ VA ☐ WV ☐ OTHER ____

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Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	18041829	**Received By**	Thomas Wingate
Client Name	Hillis Carnes Engineering Associates	**Date Received**	04/18/2018 04:10:00 PM
Project Name	A3-1	**Delivered By**	Client
Project Number	16280B	**Tracking No**	Not Applicable
Disposal Date	05/23/2018	**Logged In By**	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

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

Documentation

		Sampler Name	Not Provided
COC agrees with sample labels?	Yes		N/A
Chain of Custody	Yes		

Sample Container

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

Total No. of Samples Received 1 Total No. of Containers Received 4

Preservation

Total Metals	(pH<2)	N/A
Dissolved Metals, filtered within 15 minutes of collection	(pH<2)	N/A
Orthophosphorus, filtered within 15 minutes of collection		N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, DOC (field filtered), COD, Phenols	(pH<2)	N/A
TOX, TKN, NH3, Total Phos	(pH<2)	N/A
VOC, BTEX (VOA Vials Rcvd Preserved)	(pH<2)	N/A
Do VOA vials have zero headspace?		N/A
624 VOC (Rcvd at least one unpreserved VOA vial)		N/A
524 VOC (Rcvd with trip blanks)	(pH<2)	N/A

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

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

Samples Inspected/Checklist Completed By: Thomas Wingate Date: 04/18/2018

Thomas Wingate

PM Review and Approval: Amber L Confer Date: 04/19/2018

Amber Confer

Analytical Report for

Hillis Carnes Engineering Associates

Certificate of Analysis No.: 18050127

Project Manager: Keith Progin

Project Name : A3-1

Project Location: Sparrows Point, MD

Project ID : 18134C

May 4, 2018

Phase Separation Science, Inc.

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PHASE SEPARATION SCIENCE, INC.

May 4, 2018

Keith Progin
Hillis Carnes Engineering Associates
10975 Guilford Road, Ste. A
Annapolis Junction, MD 20701

Reference: PSS Work Order(s) No: **18050127**
Project Name: A3-1
Project Location: Sparrows Point, MD
Project ID.: 18134C

Dear Keith Progin :

This report includes the analytical results from the analyses performed on the samples received under the project name referenced above and identified with the Phase Separation Science (PSS) Work Order(s) numbered **18050127**.

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

PSS reserves the right to return any unused samples, extracts or related solutions. Otherwise, the samples are scheduled for disposal, without any further notice, on June 5, 2018, with the exception of air canisters which are cleaned immediately following analysis. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt , the request will be acknowledged by PSS, thus extending the storage period.

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

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

Sincerely,

Dan Prucnal
Laboratory Manager

Sample Summary

Client Name: Hillis Carnes Engineering Associates

Project Name: A3-1

Work Order Number(s): 18050127

Project ID: 18134C

The following samples were received under chain of custody by Phase Separation Science (PSS) on 05/01/2018 at 03:50 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
18050127-001	Exclusion 6B	SOIL	04/30/18 14:30
18050127-002	Exclusion 7B	SOIL	04/30/18 14:30

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

Notes:

1. The presence of a common laboratory contaminant such as methylene chloride may be considered a possible laboratory artifact. Where observed, appropriate consideration of data should be taken.
2. Unless otherwise noted in the case narrative, results are reported on a dry weight basis with the exception of pH, flashpoint, moisture, and paint filter test.
3. Drinking water samples collected for the purpose of compliance with SDWA may not be suitable for their intended use unless collected by a certified sampler [COMAR 26.08.05.07.C.2].
4. The analyses of 1,2-dibromo-3-chloropropane (DBCP) and 1,2-dibromoethane (EDB) by EPA 524.2 and calcium, magnesium, sodium and iron by EPA 200.8 are not currently promulgated for use in testing to meet the Safe Drinking Water Act and as such cannot be used for compliance purposes. The listings of the current promulgated methods for testing in compliance with the Safe Drinking Water Act can be found in the 40 CFR part 141.1, for the primary drinking water contaminates, and part 141.3, for the secondary drinking water contaminates.
5. Sample prepared under EPA 3550C with concentrations greater than 20 mg/Kg should employ the microtip extraction procedure if required to meet data quality objectives.
6. The analysis of acrolein by EPA 624 must be analyzed within three days of sampling unless pH is adjusted to 4-5 units [40 CFR part 136.3(e)].
7. Method 180.1, The Determination of Turbidity by Nephelometry, recommends samples over 40 NTU be diluted until the turbidity falls below 40 units. Routine samples over 40 NTU may not be diluted as long as the data quality objectives are not affected.
8. Alkalinity results analyzed by EPA 310.2 that are reported by dilution are estimated and are not in compliance with method requirements.

Standard Flags/Abbreviations:

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

Certifications:

NELAP Certifications: PA 68-03330, VA 460156
State Certifications: MD 179, WV 303
Regulated Soil Permit: P330-12-00268
NSWC USCG Accepted Laboratory
LDBE MWAA LD1997-0041-2015

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 18050127

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 4, 2018

Project Name: A3-1
Project Location: Sparrows Point, MD
Project ID: 18134C

Sample ID: Exclusion 6B **Date/Time Sampled: 04/30/2018 14:30** **PSS Sample ID: 18050127-001**
Matrix: SOIL **Date/Time Received: 05/01/2018 15:50**

TCLP Metals — Analytical Method: SW-846 6020 A — Preparation Method: 3010A

	Result	Units	RL	Flag	Dil	TCLP Limit	Prepared	Analyzed	Analyst
Arsenic	ND	mg/L	0.050		1	5	05/02/18	05/03/18 00:12	1064
Barium	ND	mg/L	1.0		1	100	05/02/18	05/03/18 00:12	1064
Cadmium	**0.72**	mg/L	0.050		1	1	05/02/18	05/03/18 00:12	1064
Chromium	ND	mg/L	0.050		1	5	05/02/18	05/03/18 00:12	1064
Lead	**0.054**	mg/L	0.050		1	5	05/02/18	05/03/18 00:12	1064
Mercury	ND	mg/L	0.0020		1	0.2	05/02/18	05/03/18 00:12	1064
Selenium	ND	mg/L	0.050		1	1	05/02/18	05/03/18 00:12	1064
Silver	ND	mg/L	0.050		1	5	05/02/18	05/03/18 00:12	1064

TCLP Organochlorine Pesticides — Analytical Method: SW-846 8081 B — Preparation Method: 3510C

	Result	Units	RL	Flag	Dil	TCLP Limit	Prepared	Analyzed	Analyst
Chlordane	ND	mg/L	0.017		5	0.03	05/02/18	05/03/18 10:50	1029
Endrin	ND	mg/L	0.00067		5	0.02	05/02/18	05/03/18 10:50	1029
Gamma-BHC (Lindane)	ND	mg/L	0.00067		5	0.4	05/02/18	05/03/18 10:50	1029
Heptachlor	ND	mg/L	0.00067		5	0.008	05/02/18	05/03/18 10:50	1029
Methoxychlor	ND	mg/L	0.00067		5	10	05/02/18	05/03/18 10:50	1029
Toxaphene	ND	mg/L	0.017		5	0.5	05/02/18	05/03/18 10:50	1029
Heptachlor epoxide	ND	mg/L	0.00067		5	0.008	05/02/18	05/03/18 10:50	1029

TCLP Chlorinated Herbicides — Analytical Method: SW-846 8151 A — Preparation Method: 8151A

	Result	Units	RL	Flag	Dil	TCLP Limit	Prepared	Analyzed	Analyst
2,4-D	ND	mg/L	0.0094		10	10	05/02/18	05/03/18 14:51	1029
2,4,5-TP (Silvex)	ND	mg/L	0.00095		10	1	05/02/18	05/03/18 14:51	1029

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 18050127

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 4, 2018

Project Name: A3-1
Project Location: Sparrows Point, MD
Project ID: 18134C

Sample ID: Exclusion 6B **Date/Time Sampled: 04/30/2018 14:30** **PSS Sample ID: 18050127-001**
Matrix: SOIL **Date/Time Received: 05/01/2018 15:50**

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

	Result	Units	RL	Flag	Dil	TCLP Limit	Prepared	Analyzed	Analyst
Vinyl Chloride	ND	mg/L	0.10		100	0.2	05/02/18	05/02/18 13:54	1011
1,1-Dichloroethene	ND	mg/L	0.10		100	0.7	05/02/18	05/02/18 13:54	1011
2-Butanone	ND	mg/L	1.0		100	200	05/02/18	05/02/18 13:54	1011
Chloroform	ND	mg/L	0.10		100	6	05/02/18	05/02/18 13:54	1011
Carbon Tetrachloride	ND	mg/L	0.10		100	0.5	05/02/18	05/02/18 13:54	1011
Benzene	ND	mg/L	0.10		100	0.5	05/02/18	05/02/18 13:54	1011
1,2-Dichloroethane	ND	mg/L	0.10		100	0.5	05/02/18	05/02/18 13:54	1011
Trichloroethene	ND	mg/L	0.10		100	0.5	05/02/18	05/02/18 13:54	1011
Tetrachloroethylene	ND	mg/L	0.10		100	0.7	05/02/18	05/02/18 13:54	1011
Chlorobenzene	ND	mg/L	0.10		100	100	05/02/18	05/02/18 13:54	1011
1,4-Dichlorobenzene	ND	mg/L	0.10		100	7.5	05/02/18	05/02/18 13:54	1011

TCLP Semivolatile Organic Compounds — Analytical Method: SW-846 8270 C — Preparation Method: 3510C

	Result	Units	RL	Flag	Dil	TCLP Limit	Prepared	Analyzed	Analyst
2,4-Dinitrotoluene	ND	mg/L	0.010		1	0.13	05/02/18	05/03/18 01:24	1055
Hexachlorobenzene	ND	mg/L	0.010		1	0.13	05/02/18	05/03/18 01:24	1055
Hexachlorobutadiene	ND	mg/L	0.010		1	0.5	05/02/18	05/03/18 01:24	1055
Hexachloroethane	ND	mg/L	0.010		1	3	05/02/18	05/03/18 01:24	1055
2-methylphenol	ND	mg/L	0.010		1	200	05/02/18	05/03/18 01:24	1055
3&4-Methylphenol	ND	mg/L	0.010		1	200	05/02/18	05/03/18 01:24	1055
Nitrobenzene	ND	mg/L	0.010		1	2	05/02/18	05/03/18 01:24	1055
Pentachlorophenol	ND	mg/L	0.010		1	100	05/02/18	05/03/18 01:24	1055
Pyridine	ND	mg/L	0.010		1	5	05/02/18	05/03/18 01:24	1055
2,4,6-Trichlorophenol	ND	mg/L	0.010		1	2	05/02/18	05/03/18 01:24	1055
2,4,5-Trichlorophenol	ND	mg/L	0.010		1	400	05/02/18	05/03/18 01:24	1055

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 18050127

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 4, 2018

Project Name: A3-1
Project Location: Sparrows Point, MD
Project ID: 18134C

Sample ID: Exclusion 7B **Date/Time Sampled: 04/30/2018 14:30** **PSS Sample ID: 18050127-002**
Matrix: SOIL **Date/Time Received: 05/01/2018 15:50**

TCLP Metals — Analytical Method: SW-846 6020 A — Preparation Method: 3010A

	Result	Units	RL	Flag	Dil	TCLP Limit	Prepared	Analyzed	Analyst
Arsenic	ND	mg/L	0.050		1	5	05/02/18	05/03/18 00:16	1064
Barium	ND	mg/L	1.0		1	100	05/02/18	05/03/18 00:16	1064
Cadmium	**0.81**	mg/L	0.050		1	1	05/02/18	05/03/18 00:16	1064
Chromium	ND	mg/L	0.050		1	5	05/02/18	05/03/18 00:16	1064
Lead	ND	mg/L	0.050		1	5	05/02/18	05/03/18 00:16	1064
Mercury	ND	mg/L	0.0020		1	0.2	05/02/18	05/03/18 00:16	1064
Selenium	ND	mg/L	0.050		1	1	05/02/18	05/03/18 00:16	1064
Silver	ND	mg/L	0.050		1	5	05/02/18	05/03/18 00:16	1064

TCLP Organochlorine Pesticides — Analytical Method: SW-846 8081 B — Preparation Method: 3510C

	Result	Units	RL	Flag	Dil	TCLP Limit	Prepared	Analyzed	Analyst
Chlordane	ND	mg/L	0.017		5	0.03	05/02/18	05/03/18 10:50	1029
Endrin	ND	mg/L	0.00067		5	0.02	05/02/18	05/03/18 10:50	1029
Gamma-BHC (Lindane)	ND	mg/L	0.00067		5	0.4	05/02/18	05/03/18 10:50	1029
Heptachlor	ND	mg/L	0.00067		5	0.008	05/02/18	05/03/18 10:50	1029
Methoxychlor	ND	mg/L	0.00067		5	10	05/02/18	05/03/18 10:50	1029
Toxaphene	ND	mg/L	0.017		5	0.5	05/02/18	05/03/18 10:50	1029
Heptachlor epoxide	ND	mg/L	0.00067		5	0.008	05/02/18	05/03/18 10:50	1029

TCLP Chlorinated Herbicides — Analytical Method: SW-846 8151 A — Preparation Method: 8151A

	Result	Units	RL	Flag	Dil	TCLP Limit	Prepared	Analyzed	Analyst
2,4-D	ND	mg/L	0.0094		10	10	05/02/18	05/03/18 14:51	1029
2,4,5-TP (Silvex)	ND	mg/L	0.00095		10	1	05/02/18	05/03/18 14:51	1029

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 18050127

Hillis Carnes Engineering Associates, Annapolis Junction, MD

May 4, 2018

Project Name: A3-1
Project Location: Sparrows Point, MD
Project ID: 18134C

Sample ID: Exclusion 7B **Date/Time Sampled: 04/30/2018 14:30** **PSS Sample ID: 18050127-002**
Matrix: SOIL **Date/Time Received: 05/01/2018 15:50**

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

	Result	Units	RL	Flag	Dil	TCLP Limit	Prepared	Analyzed	Analyst
Vinyl Chloride	ND	mg/L	0.10		100	0.2	05/02/18	05/02/18 14:15	1011
1,1-Dichloroethene	ND	mg/L	0.10		100	0.7	05/02/18	05/02/18 14:15	1011
2-Butanone	ND	mg/L	1.0		100	200	05/02/18	05/02/18 14:15	1011
Chloroform	ND	mg/L	0.10		100	6	05/02/18	05/02/18 14:15	1011
Carbon Tetrachloride	ND	mg/L	0.10		100	0.5	05/02/18	05/02/18 14:15	1011
Benzene	ND	mg/L	0.10		100	0.5	05/02/18	05/02/18 14:15	1011
1,2-Dichloroethane	ND	mg/L	0.10		100	0.5	05/02/18	05/02/18 14:15	1011
Trichloroethene	ND	mg/L	0.10		100	0.5	05/02/18	05/02/18 14:15	1011
Tetrachloroethylene	ND	mg/L	0.10		100	0.7	05/02/18	05/02/18 14:15	1011
Chlorobenzene	ND	mg/L	0.10		100	100	05/02/18	05/02/18 14:15	1011
1,4-Dichlorobenzene	ND	mg/L	0.10		100	7.5	05/02/18	05/02/18 14:15	1011

TCLP Semivolatile Organic Compounds — Analytical Method: SW-846 8270 C — Preparation Method: 3510C

	Result	Units	RL	Flag	Dil	TCLP Limit	Prepared	Analyzed	Analyst
2,4-Dinitrotoluene	ND	mg/L	0.010		1	0.13	05/02/18	05/03/18 00:58	1055
Hexachlorobenzene	ND	mg/L	0.010		1	0.13	05/02/18	05/03/18 00:58	1055
Hexachlorobutadiene	ND	mg/L	0.010		1	0.5	05/02/18	05/03/18 00:58	1055
Hexachloroethane	ND	mg/L	0.010		1	3	05/02/18	05/03/18 00:58	1055
2-methylphenol	ND	mg/L	0.010		1	200	05/02/18	05/03/18 00:58	1055
3&4-Methylphenol	ND	mg/L	0.010		1	200	05/02/18	05/03/18 00:58	1055
Nitrobenzene	ND	mg/L	0.010		1	2	05/02/18	05/03/18 00:58	1055
Pentachlorophenol	ND	mg/L	0.010		1	100	05/02/18	05/03/18 00:58	1055
Pyridine	ND	mg/L	0.010		1	5	05/02/18	05/03/18 00:58	1055
2,4,6-Trichlorophenol	ND	mg/L	0.010		1	2	05/02/18	05/03/18 00:58	1055
2,4,5-Trichlorophenol	ND	mg/L	0.010		1	400	05/02/18	05/03/18 00:58	1055

Case Narrative Summary

Client Name: Hillis Carnes Engineering Associates

Project Name: A3-1

Work Order Number(s): 18050127
Project ID: 18134C

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

The analyses of chlorine, pH, dissolved oxygen, temperature and sulfite for drinking water and non-potable samples tested for compliance have a maximum holding time of 15 minutes. As such, all laboratory analyses for these analytes exceed holding times.

Matrix spike and matrix spike duplicate analyses may not be performed due to insufficient sample quantity. In these instances, a laboratory control sample and laboratory control sample duplicate are analyzed unless otherwise noted or specified in the method.

Unless otherwise noted, surrogate recoveries outside of the acceptance criteria are most often the result of sample matrix interference and/or sample dilution.

Quality control samples that display a high bias will not be narrated when sample target compounds are not detected.

Sample Receipt:

All sample receipt conditions were acceptable.

Analytical:

TCLP Organochlorine Pesticides

Batch: 152873

The recoveries of Endrin and Methoxychlor in closing CCV were 61% and 64% (80-120%) due to sample matrix. All samples were confirmed on second column.

Matrix spike and/or matrix spike duplicate (MS/MSD) exceedances identified; see MS summary form.

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

Analytical Data Package Information Summary

Work Order(s): **18050127**
Report Prepared For: Hillis Carnes Engineering Associates, Annapo
Project Name: A3-1
Project Manager: Keith Progin

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
SW-846 6020 A	Exclusion 6B	Initial	18050127-001	1064	W	71149	152877	04/30/2018	05/02/2018 10:41	05/03/2018 00:12
	Exclusion 7B	Initial	18050127-002	1064	W	71149	152877	04/30/2018	05/02/2018 10:41	05/03/2018 00:16
	71149-1-BKS	BKS	71149-1-BKS	1064	W	71149	152877	--------	05/02/2018 10:41	05/02/2018 23:22
	71149-1-BLK	BLK	71149-1-BLK	1064	W	71149	152877	--------	05/02/2018 10:41	05/02/2018 23:18
	100 yards S	MS	18043012-001 S	1064	W	71149	152877	04/28/2018	05/02/2018 10:41	05/02/2018 23:30
	100 yards SD	MSD	18043012-001 SD	1064	W	71149	152877	04/28/2018	05/02/2018 10:41	05/02/2018 23:34
SW-846 8081 B	Exclusion 6B	Initial	18050127-001	1029	W	71158	152873	04/30/2018	05/02/2018 13:50	05/03/2018 10:50
	Exclusion 7B	Initial	18050127-002	1029	W	71158	152873	04/30/2018	05/02/2018 13:50	05/03/2018 10:50
	71158-1-BKS	BKS	71158-1-BKS	1029	W	71158	152873	--------	05/02/2018 13:50	05/03/2018 10:50
	71158-1-BLK	BLK	71158-1-BLK	1029	W	71158	152873	--------	05/02/2018 13:50	05/03/2018 10:50
	71158-1-BSD	BSD	71158-1-BSD	1029	W	71158	152873	--------	05/02/2018 13:50	05/03/2018 10:50
	Exclusion 6B S	MS	18050127-001 S	1029	W	71158	152873	04/30/2018	05/02/2018 13:50	05/03/2018 10:50
SW-846 8151 A	Exclusion 6B	Initial	18050127-001	1029	W	71165	152903	04/30/2018	05/02/2018 18:10	05/03/2018 14:51
	Exclusion 7B	Initial	18050127-002	1029	W	71165	152903	04/30/2018	05/02/2018 18:10	05/03/2018 14:51
	71165-1-BKS	BKS	71165-1-BKS	1029	W	71165	152903	--------	05/02/2018 18:10	05/03/2018 14:51
	71165-1-BLK	BLK	71165-1-BLK	1029	W	71165	152903	--------	05/02/2018 18:10	05/03/2018 14:51
	71165-1-BSD	BSD	71165-1-BSD	1029	W	71165	152903	--------	05/02/2018 18:10	05/03/2018 14:53
	Exclusion 7B S	MS	18050127-002 S	1029	W	71165	152903	04/30/2018	05/02/2018 18:10	05/03/2018 14:51
SW-846 8260 B	Exclusion 6B	Initial	18050127-001	1011	W	71170	152867	04/30/2018	05/02/2018 07:44	05/02/2018 13:54
	Exclusion 7B	Initial	18050127-002	1011	W	71170	152867	04/30/2018	05/02/2018 07:44	05/02/2018 14:15
	71170-1-BKS	BKS	71170-1-BKS	1011	W	71170	152867	--------	05/02/2018 07:44	05/02/2018 09:24
	71170-1-BLK	BLK	71170-1-BLK	1011	W	71170	152867	--------	05/02/2018 07:44	05/02/2018 10:59
	JDH/10/18/176 S	MS	18042707-001 S	1011	W	71170	152867	04/26/2018	05/02/2018 07:44	05/02/2018 12:02
	JDH/10/18/176 SD	MSD	18042707-001 SD	1011	W	71170	152867	04/26/2018	05/02/2018 07:44	05/02/2018 12:22
SW-846 8270 C	Exclusion 6B	Initial	18050127-001	1055	W	71142	152886	04/30/2018	05/02/2018 09:42	05/03/2018 01:24
	Exclusion 7B	Initial	18050127-002	1055	W	71142	152886	04/30/2018	05/02/2018 09:42	05/03/2018 00:58
	71142-1-BKS	BKS	71142-1-BKS	1055	W	71142	152886	--------	05/02/2018 09:42	05/02/2018 18:55

Analytical Data Package Information Summary

Work Order(s): 18050127
Report Prepared For: Hillis Carnes Engineering Associates, Annapo
Project Name: A3-1
Project Manager: Keith Progin

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
SW-846 8270 C	71142-1-BLK	BLK	71142-1-BLK	1055	W	71142	152886	--------	05/02/2018 09:42	05/02/2018 18:03
	71142-1-BSD	BSD	71142-1-BSD	1055	W	71142	152886	--------	05/02/2018 09:42	05/02/2018 19:21
	JDH/10/18/176 S	MS	18042707-001 S	1055	W	71142	152886	04/26/2018	05/02/2018 09:42	05/02/2018 19:47

PHASE SEPARATION SCIENCE, INC.

QC Summary 18050127

Hillis Carnes Engineering Associates

A3-1

Analytical Method: SW-846 8081 B Prep Method: SW3510C

Seq Number: 152873 Matrix: Soil Date Prep: 05/02/2018

PSS Sample ID: 18050127-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Decachlorobiphenyl	80		43-150	%	05/03/18 10:50
Tetrachloro-m-xylene	104		40-126	%	05/03/18 10:50

Analytical Method: SW-846 8151 A Prep Method: SW8151A_PREP

Seq Number: 152903 Matrix: Soil Date Prep: 05/02/2018

PSS Sample ID: 18050127-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
2,4-Dichlorophenylacetic Acid	82		64-126	%	05/03/18 14:51

Analytical Method: SW-846 8270 C Prep Method: SW3510C

Seq Number: 152886 Matrix: Soil Date Prep: 05/02/2018

PSS Sample ID: 18050127-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
2-Fluorobiphenyl	76		35-107	%	05/03/18 01:24
2-Fluorophenol	74		32-106	%	05/03/18 01:24
Nitrobenzene-d5	74		34-123	%	05/03/18 01:24
Phenol-d6	77		36-111	%	05/03/18 01:24
Terphenyl-D14	69		43-143	%	05/03/18 01:24
2,4,6-Tribromophenol	94		26-122	%	05/03/18 01:24

Analytical Method: SW-846 8260 B Prep Method: SW5030B

Seq Number: 152867 Matrix: Soil Date Prep: 05/02/2018

PSS Sample ID: 18050127-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	101		87-109	%	05/02/18 13:54
Dibromofluoromethane	99		93-111	%	05/02/18 13:54
Toluene-D8	100		91-109	%	05/02/18 13:54

Analytical Method: SW-846 8081 B Prep Method: SW3510C

Seq Number: 152873 Matrix: Soil Date Prep: 05/02/2018

PSS Sample ID: 18050127-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Decachlorobiphenyl	76		43-150	%	05/03/18 10:50
Tetrachloro-m-xylene	106		40-126	%	05/03/18 10:50

PHASE SEPARATION SCIENCE, INC.

QC Summary 18050127

Hillis Carnes Engineering Associates

A3-1

Analytical Method: SW-846 8151 A Prep Method: SW8151A_PREP

Seq Number: 152903 Matrix: Soil Date Prep: 05/02/2018

PSS Sample ID: 18050127-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
2,4-Dichlorophenylacetic Acid	85		64-126	%	05/03/18 14:51

Analytical Method: SW-846 8270 C Prep Method: SW3510C

Seq Number: 152886 Matrix: Soil Date Prep: 05/02/2018

PSS Sample ID: 18050127-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
2-Fluorobiphenyl	75		35-107	%	05/03/18 00:58
2-Fluorophenol	74		32-106	%	05/03/18 00:58
Nitrobenzene-d5	73		34-123	%	05/03/18 00:58
Phenol-d6	77		36-111	%	05/03/18 00:58
Terphenyl-D14	73		43-143	%	05/03/18 00:58
2,4,6-Tribromophenol	91		26-122	%	05/03/18 00:58

Analytical Method: SW-846 8260 B Prep Method: SW5030B

Seq Number: 152867 Matrix: Soil Date Prep: 05/02/2018

PSS Sample ID: 18050127-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	100		87-109	%	05/02/18 14:15
Dibromofluoromethane	99		93-111	%	05/02/18 14:15
Toluene-D8	100		91-109	%	05/02/18 14:15

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

PHASE SEPARATION SCIENCE, INC.

QC Summary 18050127

Hillis Carnes Engineering Associates

A3-1

Analytical Method: SW-846 6020 A Prep Method: SW3010A

Seq Number: 152877 Matrix: Water Date Prep: 05/02/18

MB Sample Id: 71149-1-BLK LCS Sample Id: 71149-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Arsenic	<0.05000	0.4000	0.3732	93	80-120	mg/L	05/02/18 23:22	
Barium	<1.000	2.000	2.056	103	80-120	mg/L	05/02/18 23:22	
Cadmium	<0.05000	0.4000	0.3807	95	80-120	mg/L	05/02/18 23:22	
Chromium	<0.05000	0.4000	0.3800	95	80-120	mg/L	05/02/18 23:22	
Lead	<0.05000	0.4000	0.3980	100	80-120	mg/L	05/02/18 23:22	
Mercury	<0.002000	0.01000	0.009790	98	80-120	mg/L	05/02/18 23:22	
Selenium	<0.05000	0.4000	0.3765	94	80-120	mg/L	05/02/18 23:22	
Silver	<0.05000	0.4000	0.3913	98	80-120	mg/L	05/02/18 23:22	

Analytical Method: SW-846 8081 B Prep Method: SW3510C

Seq Number: 152873 Matrix: Water Date Prep: 05/02/18

MB Sample Id: 71158-1-BLK LCS Sample Id: 71158-1-BKS LCSD Sample Id: 71158-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Endrin	<0.00004	0.0002	0.0001214	61	0.0001331	67	48-132	9	20	mg/L	05/03/18 10:50	
Gamma-BHC (Lindane)	<0.00004	0.0002	0.0002031	102	0.0002033	102	57-120	0	20	mg/L	05/03/18 10:50	
Heptachlor	<0.00004	0.0002	0.0001645	82	0.0001703	85	49-127	3	20	mg/L	05/03/18 10:50	
Methoxychlor	<0.00004	0.0002	0.0001341	67	0.0001596	80	26-156	17	20	mg/L	05/03/18 10:50	
Heptachlor epoxide	<0.00004	0.0002	0.0001845	92	0.0001932	97	62-116	5	20	mg/L	05/03/18 10:50	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Decachlorobiphenyl	117		79		97		43-150	%	05/03/18 10:50
Tetrachloro-m-xylene	122		116		114		40-126	%	05/03/18 10:50

Analytical Method: SW-846 8081 B Prep Method: SW3510C

Seq Number: 152873 Matrix: Soil Date Prep: 05/02/18

Parent Sample Id: 18050127-001 MS Sample Id: 18050127-001 S

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	Limits	Units	Analysis Date	Flag
Endrin	<0.0006667	0.0006667	0	0	50-150	mg/L	05/03/18 10:50	X
Gamma-BHC (Lindane)	<0.0006667	0.0006667	0	0	50-150	mg/L	05/03/18 10:50	X
Heptachlor	<0.0006667	0.0006667	0	0	50-150	mg/L	05/03/18 10:50	X
Methoxychlor	<0.0006667	0.0006667	0	0	50-150	mg/L	05/03/18 10:50	X
Heptachlor epoxide	<0.0006667	0.0006667	0	0	50-150	mg/L	05/03/18 10:50	X

Surrogate	MS Result	MS Flag	Limits	Units	Analysis Date
Decachlorobiphenyl	53		43-150	%	05/03/18 10:50
Tetrachloro-m-xylene	102		40-126	%	05/03/18 10:50

PHASE SEPARATION SCIENCE, INC.

QC Summary 18050127

Hillis Carnes Engineering Associates

A3-1

Analytical Method: SW-846 8151 A Prep Method: SW8151A_PREP

Seq Number: 152903 Matrix: Water Date Prep: 05/02/18

MB Sample Id: 71165-1-BLK LCS Sample Id: 71165-1-BKS LCSD Sample Id: 71165-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
2,4-D	<0.001880	0.005640	0.005705	101	0.006141	109	70-104	7	20	mg/L	05/03/18 14:51	H
2,4,5-TP (Silvex)	<0.00019	0.00057	0.0005672	100	0.0006137	108	59-122	8	20	mg/L	05/03/18 14:51	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
2,4-Dichlorophenylacetic Acid	88		97		102		64-126	%	05/03/18 14:51

Analytical Method: SW-846 8151 A Prep Method: SW8151A_PREP

Seq Number: 152903 Matrix: Soil Date Prep: 05/02/18

Parent Sample Id: 18050127-002 MS Sample Id: 18050127-002 S

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	Limits	Units	Analysis Date	Flag
2,4-D	<0.009400	0.02820	0.02168	77	51-124	mg/L	05/03/18 14:51	
2,4,5-TP (Silvex)	<0.00095	0.002850	0.002470	87	48-124	mg/L	05/03/18 14:51	

Surrogate	MS Result	MS Flag	Limits	Units	Analysis Date
2,4-Dichlorophenylacetic Acid	94		64-126	%	05/03/18 14:51

Analytical Method: SW-846 8270 C Prep Method: SW3510C

Seq Number: 152886 Matrix: Water Date Prep: 05/02/18

MB Sample Id: 71142-1-BLK LCS Sample Id: 71142-1-BKS LCSD Sample Id: 71142-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
2,4-Dinitrotoluene	<0.005000	0.04000	0.03534	88	0.03452	86	70-119	2	20	mg/L	05/02/18 18:55	
Hexachlorobenzene	<0.005000	0.04000	0.03480	87	0.03539	88	76-110	2	20	mg/L	05/02/18 18:55	
Hexachlorobutadiene	<0.005000	0.04000	0.03213	80	0.03294	82	64-113	2	20	mg/L	05/02/18 18:55	
Hexachloroethane	<0.005000	0.04000	0.03252	81	0.03345	84	62-105	3	20	mg/L	05/02/18 18:55	
2-methylphenol	<0.005000	0.04000	0.03386	85	0.03413	85	67-111	1	20	mg/L	05/02/18 18:55	
3&4-Methylphenol	<0.005000	0.04000	0.03505	88	0.03532	88	67-107	1	20	mg/L	05/02/18 18:55	
Nitrobenzene	<0.005000	0.04000	0.03082	77	0.03210	80	60-107	4	20	mg/L	05/02/18 18:55	
Pentachlorophenol	<0.005000	0.04000	0.04126	103	0.03951	99	63-119	4	20	mg/L	05/02/18 18:55	
Pyridine	<0.005000	0.04000	0.02828	71	0.02899	72	47-105	2	20	mg/L	05/02/18 18:55	
2,4,6-Trichlorophenol	<0.005000	0.04000	0.03710	93	0.03787	95	68-118	2	20	mg/L	05/02/18 18:55	
2,4,5-Trichlorophenol	<0.005000	0.04000	0.03870	97	0.03905	98	69-114	1	20	mg/L	05/02/18 18:55	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
2-Fluorobiphenyl	88		81		83		35-107	%	05/02/18 18:55
2-Fluorophenol	95		82		84		32-106	%	05/02/18 18:55
Nitrobenzene-d5	87		77		82		34-123	%	05/02/18 18:55
Phenol-d6	93		85		85		36-111	%	05/02/18 18:55
Terphenyl-D14	72		71		71		43-143	%	05/02/18 18:55
2,4,6-Tribromophenol	97		99		98		26-122	%	05/02/18 18:55

PHASE SEPARATION SCIENCE, INC.

QC Summary 18050127

Hillis Carnes Engineering Associates

A3-1

Analytical Method: SW-846 8260 B Prep Method: SW5030B

Seq Number: 152867 Matrix: Water Date Prep: 05/02/18

MB Sample Id: 71170-1-BLK LCS Sample Id: 71170-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Vinyl Chloride	<0.001000	0.05000	0.05194	104	66-133	mg/L	05/02/18 09:24	
1,1-Dichloroethene	<0.001000	0.05000	0.04949	99	85-123	mg/L	05/02/18 09:24	
2-Butanone	<0.01000	0.05000	0.03378	68	45-136	mg/L	05/02/18 09:24	
Chloroform	<0.001000	0.05000	0.04519	90	76-129	mg/L	05/02/18 09:24	
Carbon Tetrachloride	<0.001000	0.05000	0.04680	94	79-133	mg/L	05/02/18 09:24	
Benzene	<0.001000	0.05000	0.05105	102	87-123	mg/L	05/02/18 09:24	
1,2-Dichloroethane	<0.001000	0.05000	0.04975	100	86-125	mg/L	05/02/18 09:24	
Trichloroethene	<0.001000	0.05000	0.05190	104	87-124	mg/L	05/02/18 09:24	
Tetrachloroethylene	<0.001000	0.05000	0.05374	107	85-131	mg/L	05/02/18 09:24	
Chlorobenzene	<0.001000	0.05000	0.05271	105	87-127	mg/L	05/02/18 09:24	
1,4-Dichlorobenzene	<0.001000	0.05000	0.05199	104	84-129	mg/L	05/02/18 09:24	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	101		96		87-109	%	05/02/18 09:24
Dibromofluoromethane	98		98		93-111	%	05/02/18 09:24
Toluene-D8	100		99		91-109	%	05/02/18 09:24

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

PHASE SEPARATION SCIENCE, INC.

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

(1) *CLIENT: Hillis-Carnes *OFFICE LOC. AJ

*PROJECT MGR: Keith Progin *PHONE NO.: (410) 880-4788

EMAIL: Kprogin@hcea.com FAX NO.: ( )

*PROJECT NAME: A3-1 PROJECT NO.: 18134C

SITE LOCATION: Sparrows Point, MD P.O. NO.: POHCEJ06961

SAMPLER(S): Keith Progin DW CERT NO.:

PSS Work Order #: 1805127 PAGE 1 OF 1

Matrix Codes: **SW**=Surface Wtr **DW**=Drinking Wtr **GW**=Ground Wtr **WW**=Waste Wtr **O**=Oil **S**=Soil **L**=Liquid **SOL**=Solid **A**=Air **WI**=Wipe

(2)

LAB NO.	*SAMPLE IDENTIFICATION	*DATE (SAMPLED)	*TIME (SAMPLED)	MATRIX (See Codes)	No. CONTAINERS	SAMPLE TYPE C = COMP G = GRAB	Preservatives Used	Analysis/ Method Required (3) * Full TCLP (complete package)	REMARKS
1	Exclusion 6B	4/30/18	2:30pm	Soil	5	C		✓	
2	Exclusion 7B	4/30/18	2:35pm	Soil	5	C		✓	

(5)

Relinquished By:	Date	Time	Received By:
(1) KH Mn	5/1/18	2:45pm	
(2)	5/1/18	1550	
(3)			
(4)			

(4)

*Requested TAT (One TAT per COC)
☐ 5-Day ☑ 3-Day ☐ 2-Day
☐ Next Day ☐ Emergency ☐ Other

Data Deliverables Required:
COA ☐ QC SUMM ☐ CLP LIKE ☐ OTHER ____

# of Coolers: 1

Custody Seal: ABS

Ice Present: PRES Temp: 1°-1°C

Shipping Carrier: Client

Special Instructions:

DW COMPLIANCE? YES ☐

EDD FORMAT TYPE ____

STATE RESULTS REPORTED TO:
MD ☐ DE ☐ PA ☐ VA ☐ WV ☐ OTHER ____

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

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	18050127	**Received By**	Thomas Wingate
Client Name	Hillis Carnes Engineering Associates	**Date Received**	05/01/2018 03:50:00 PM
Project Name	A3-1	**Delivered By**	Client
Project Number	18134C	**Tracking No**	Not Applicable
Disposal Date	06/05/2018	**Logged In By**	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

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

Documentation

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

Sample Container

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

Total No. of Samples Received 2 Total No. of Containers Received 10

Preservation

Total Metals	(pH<2)	N/A
Dissolved Metals, filtered within 15 minutes of collection	(pH<2)	N/A
Orthophosphorus, filtered within 15 minutes of collection		N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, DOC (field filtered), COD, Phenols	(pH<2)	N/A
TOX, TKN, NH3, Total Phos	(pH<2)	N/A
VOC, BTEX (VOA Vials Rcvd Preserved)	(pH<2)	N/A
Do VOA vials have zero headspace?		N/A
624 VOC (Rcvd at least one unpreserved VOA vial)		N/A
524 VOC (Rcvd with trip blanks)	(pH<2)	N/A

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

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

Samples Inspected/Checklist Completed By: L Jackson Date: 05/01/2018
Lynn Jackson

PM Review and Approval: Amber T Confer Date: 05/02/2018
Amber Confer

Maryland spectral Services

Analytical Chemistry Services

1500 Caton Center Dr Suite G
Baltimore MD 21227
410-247-7600
www.mdspectral.com
VELAP ID 460040

17 July 2020

Keith Progin
Hillis-Carnes Engineering Associates
10975 Guilford Rd
Annapolis Junction, MD 20701
RE: A3

Enclosed are the results of analyses for samples received by the laboratory on 07/13/20 14:11.

Maryland Spectral Services, Inc. is a TNI 2009 Standard accredited laboratory and as such, all analyses performed at Maryland Spectral Services included in this report are 2009 TNI certified except as indicated at the end of this report. Please visit our website at www.mdspectral.com for a complete listing of our TNI 2009 Standard accreditations.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Will Brewington
President

Maryland spectral Services

Analytical Chemistry Services

1500 Caton Center Dr Suite G
Baltimore MD 21227
410-247-7600
www.mdspectral.com

Analytical Results

Project: A3

Project Number: 16280D
Project Manager: Keith Progin

Reported:
07/17/20 09:14

Client Sample ID	Alternate Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
EZFEP-1		0071308-01	Soil	07/13/20 13:00	07/13/20 14:11

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Will Brewington, President

All analyses performed at Maryland Spectral Services included in the report are TNI certified except as indicated at the end of the report.

Maryland spectral Services

Analytical Chemistry Services

1500 Caton Center Dr Suite G
Baltimore MD 21227
410-247-7600
www.mdspectral.com

Analytical Results

Project: A3

Project Number: 16280D
Project Manager: Keith Progin

Reported:
07/17/20 09:14

EZFEP-1

0071308-01 (Soil)
Sample Date: 07/13/20

Analyte	Result	Notes	Units	Reporting Limit (MRL)	Detection Limit (LOD)	Dilution	Prepared	Analyzed	Analyst
PERCENT SOLIDS BY ASTM D2216-05 Prepared by Percent Solids									
Percent Solids	**93**		%			1	07/14/20	07/15/20 09:56	MH
TOTAL METALS ANALYSIS BY EPA 3050B/6020A Prepared by 3050B-Metals Digestion									
Cadmium	**11.3**		mg/kg dry	0.269	0.269	1	07/13/20	07/14/20 12:30	KD
TCLP RCRA8 Metals by EPA 1311/3010A/6020A (ICP-MS) Prepared by 3010A-Metals Digestion(TCLP)									
Arsenic	ND		mg/L	0.500	0.500	1	07/15/20	07/16/20 15:01	KD
Barium	ND		mg/L	0.500	0.500	1	07/15/20	07/16/20 15:01	KD
Cadmium	ND		mg/L	0.500	0.500	1	07/15/20	07/16/20 15:01	KD
Chromium	ND		mg/L	0.500	0.500	1	07/15/20	07/16/20 15:01	KD
Lead	ND		mg/L	0.500	0.500	1	07/15/20	07/16/20 15:01	KD
Mercury	ND		mg/L	0.0100	0.0100	1	07/15/20	07/16/20 15:01	KD
Selenium	ND		mg/L	0.500	0.500	1	07/15/20	07/16/20 15:01	KD
Silver	ND		mg/L	0.500	0.500	1	07/15/20	07/16/20 15:01	KD

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Will Brewington, President

All analyses performed at Maryland Spectral Services included in the report are TNI certified except as indicated at the end of the report.

1500 Caton Center Dr Suite G
Baltimore MD 21227
410-247-7600
www.mdspectral.com

Analytical Results

Project: A3

Project Number: 16280D
Project Manager: Keith Progin

Reported:
07/17/20 09:14

Maryland Spectral Services does not maintain certification for the following analytical parameters:

Maryland Spectral Services

Matrix , Method , Analyte

Soil | 6020 (RCRA8 TCLP) | Arsenic
Soil | 6020 (RCRA8 TCLP) | Barium
Soil | 6020 (RCRA8 TCLP) | Cadmium
Soil | 6020 (RCRA8 TCLP) | Chromium
Soil | 6020 (RCRA8 TCLP) | Lead
Soil | 6020 (RCRA8 TCLP) | Mercury
Soil | 6020 (RCRA8 TCLP) | Selenium
Soil | 6020 (RCRA8 TCLP) | Silver

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Will Brewington, President

All analyses performed at Maryland Spectral Services included in the report are TNI certified except as indicated at the end of the report.

Analytical Results

1500 Caton Center Dr Suite G
Baltimore MD 21227
410-247-7600
www.mdspectral.com

Project: A3

Project Number: 16280D

Project Manager: Keith Progin

Reported:
07/17/20 09:14

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
%-Solids	Percent Solids is a supportive test and as such does not require accreditation

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Will Brewington, President

All analyses performed at Maryland Spectral Services included in the report are TNI certified except as indicated at the end of the report.

CHAIN-OF-CUSTODY RECORD

Maryland Spectral Services, Inc.
1500 Caton Center Drive, Suite G
Baltimore, MD 21227
410-247-7600 • Fax 410-247-7602
reporting@mdspectral.com

Matrix Codes: NW (non-potable water), DW (drinking water)

Company Name:	Project Manager:
Hillis Carnes (HCEA	Keith Progin KProgin@HCEA.com
Project Name:	**Project ID:**
A3	16280D
Sampler(s):	**P.O. Number:**
Benjamin Jones	

Field Sample ID	Date	Time	DW	Water	Soil	Other	No. of Containers	TCLP Metals	Total Cadmium								Preservative	Field Notes	MSS Lab ID
E2FEP-1	7/13/20	1:00 pm			✓		2	✓	✓										0071308-01

Analysis Requested

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
(Printed) Benjamin Jones	7/13/20	(Printed)	(Printed)		(Printed)
Relinquished by: (Signature)	Date/Time	Received by Lab: (Signature)			
(Printed)	7/13/20 14:11	(Printed) Rachel Horne			

Turn Around Time:
- ☐ Normal (7 day)
- ☑ 5 day
- ☐ 4 day
- ☐ 3 day
- ☐ Rush (2 day)
- ☐ Next Day
- ☐ Other: _____
- ☐ Specific Due Date: _____

Lab Use:
Temp: 3.4 °C
- ☑ Received on Ice
- ☐ Received same day

Delivery Method:
- ☐ Courier
- Client
- UPS
- FedEx
- USPS
- Other: _____

Special Instructions/QC Requirements & Comments:

Sample Disposal:
- ☐ Return to Client
- ☐ Disposal by lab
- ☐ Archive for _____ days

Maryland spectral Services

Analytical Chemistry Services

1500 Caton Center Dr Suite G
Baltimore MD 21227
410-247-7600
www.mdspectral.com
VELAP ID 460040

14 September 2020

Keith Progin
Hillis-Carnes Engineering Associates
10975 Guilford Rd
Annapolis Junction, MD 20701
RE: A3-1 Addition

Enclosed are the results of analyses for samples received by the laboratory on 09/10/20 12:26.

Maryland Spectral Services, Inc. is a TNI 2009 Standard accredited laboratory and as such, all analyses performed at Maryland Spectral Services included in this report are 2009 TNI certified except as indicated at the end of this report. Please visit our website at www.mdspectral.com for a complete listing of our TNI 2009 Standard accreditations.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Will Brewington
President

Maryland spectral Services

Analytical Chemistry Services

1500 Caton Center Dr Suite G
Baltimore MD 21227
410-247-7600
www.mdspectral.com

Analytical Results

Project: A3-1 Addition

Project Number: 162800
Project Manager: Keith Progin

Reported:
09/14/20 14:05

Client Sample ID	Alternate Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
EZSB-2		0091012-01	Soil	09/10/20 10:49	09/10/20 12:26
EZSB-2A		0091012-02	Soil	09/10/20 10:45	09/10/20 12:26

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Will Brewington, President

All analyses performed at Maryland Spectral Services included in the report are TNI certified except as indicated at the end of the report.

Maryland spectral Services

Analytical Chemistry Services

1500 Caton Center Dr Suite G
Baltimore MD 21227
410-247-7600
www.mdspectral.com

Analytical Results

Project: A3-1 Addition

Project Number: 162800
Project Manager: Keith Progin

Reported:
09/14/20 14:05

EZSB-2

0091012-01 (Soil)
Sample Date: 09/10/20

Analyte	Result	Notes	Units	Reporting Limit (MRL)	Detection Limit (LOD)	Dilution	Prepared	Analyzed	Analyst
PERCENT SOLIDS BY ASTM D2216-05 Prepared by Percent Solids									
Percent Solids	**90**		%			1	09/11/20	09/14/20 09:40	MH
POLYCHLORINATED BIPHENYLS BY EPA 8082A (GC/ECD) Prepared by 3540-GC(Soxhlet) ClPestPCB									
Aroclor-1016	ND		ug/kg dry	92.2	92.2	1	09/10/20	09/11/20 19:10	SJA
Aroclor-1221	ND		ug/kg dry	189	189	1	09/10/20	09/11/20 19:10	SJA
Aroclor-1232	ND		ug/kg dry	92.2	92.2	1	09/10/20	09/11/20 19:10	SJA
Aroclor-1242	ND		ug/kg dry	92.2	92.2	1	09/10/20	09/11/20 19:10	SJA
Aroclor-1248	ND		ug/kg dry	92.2	92.2	1	09/10/20	09/11/20 19:10	SJA
Aroclor-1254	ND		ug/kg dry	92.2	92.2	1	09/10/20	09/11/20 19:10	SJA
Aroclor-1260	ND		ug/kg dry	92.2	92.2	1	09/10/20	09/11/20 19:10	SJA
Aroclor-1262	ND		ug/kg dry	92.2	92.2	1	09/10/20	09/11/20 19:10	SJA
Aroclor-1268	ND		ug/kg dry	92.2	92.2	1	09/10/20	09/11/20 19:10	SJA
Surrogate: Tetrachloro-m-xylene			*40-150*	*82 %*	*09/10/20*		*09/11/20 19:10*		
Surrogate: Decachlorobiphenyl			*40-150*	*90 %*	*09/10/20*		*09/11/20 19:10*		
TOTAL METALS ANALYSIS BY EPA 6020B Prepared by 3050B-Metals Digestion									
Manganese	**4420**		mg/kg dry	13.9	13.9	50	09/10/20	09/11/20 13:22	KD

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Will Brewington, President

All analyses performed at Maryland Spectral Services included in the report are TNI certified except as indicated at the end of the report.

Maryland spectral Services

Analytical Chemistry Services

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Baltimore MD 21227
410-247-7600
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Analytical Results

Project: A3-1 Addition

Project Number: 162800
Project Manager: Keith Progin

Reported:
09/14/20 14:05

EZSB-2A

0091012-02 (Soil)
Sample Date: 09/10/20

Analyte	Result	Notes	Units	Reporting Limit (MRL)	Detection Limit (LOD)	Dilution	Prepared	Analyzed	Analyst
GASOLINE RANGE ORGANICS BY EPA 5030/8015C Prepared by 5030-GC									
Gasoline-Range Organics	ND		mg/kg dry	0.11	0.11	1	09/11/20	09/11/20 01:11	CMK
Surrogate: a,a,a-Trifluorotoluene [2C]			*85-115*	*101 %*	*09/11/20*		*09/11/20 01:11*		
DIESEL RANGE ORGANICS BY EPA 3540/8015C Prepared by 3540-GC(Soxhlet)									
Diesel-Range Organics (C10-C28)	**66.6**		mg/kg dry	17.8	17.8	2	09/10/20	09/11/20 14:43	SJA
Surrogate: o-Terphenyl			*70-130*	*91 %*	*09/10/20*		*09/11/20 14:43*		
PERCENT SOLIDS BY ASTM D2216-05 Prepared by Percent Solids									
Percent Solids	**90**		%			1	09/11/20	09/14/20 09:40	MH

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Will Brewington, President

All analyses performed at Maryland Spectral Services included in the report are TNI certified except as indicated at the end of the report.

Analytical Results

1500 Caton Center Dr Suite G
Baltimore MD 21227
410-247-7600
www.mdspectral.com

Project: A3-1 Addition

Project Number: 162800
Project Manager: Keith Progin

Reported:
09/14/20 14:05

Maryland Spectral Services does not maintain certification for the following analytical parameters:

Maryland Spectral Services

Matrix , Method , Analyte

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Will Brewington, President

All analyses performed at Maryland Spectral Services included in the report are TNI certified except as indicated at the end of the report.

Analytical Results

1500 Caton Center Dr Suite G
Baltimore MD 21227
410-247-7600
www.mdspectral.com

Project: A3-1 Addition

Project Number: 162800
Project Manager: Keith Progin

Reported:
09/14/20 14:05

Notes and Definitions

QM-4X	The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
%-Solids	Percent Solids is a supportive test and as such does not require accreditation

Will Brewington, President

All analyses performed at Maryland Spectral Services included in the report are TNI certified except as indicated at the end of the report.

CHAIN-OF-CUSTODY RECORD

Maryland Spectral Services, Inc.
1500 Caton Center Drive, Suite G
Baltimore, MD 21227
410–247–7600 • Fax 410–247–7602
reporting@mdspectral.com

Matrix Codes: NW (non-potable water), DW (drinking water)

Company Name: Hillis Carnes (HCEA)	Project Manager: Keith Progin Korogin@hcea.com
Project Name: A3-1 Addition	Project ID: 16280D
Sampler(s): Benjamin Jones	P.O. Number:

Analysis Requested

Field Sample ID	Date	Time	DW	Water	Soil	Other	No. of Containers	Manganese	PCBs	TPH-DRO	TPH-GRO	Preservative	Field Notes	MSS Lab ID
EZSB-2	9/10/20	10:49 am			✓		2	✓	✓					0091012-01
EZSB-2A	9/10/20	10:45 am			✓		1			✓	✓			-02

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
[signature] (Printed) Benjamin Jones	9/10/20	(Printed)	(Printed)		(Printed)
Relinquished by: (Signature) (Printed)	9/10/20 12:26	Received by Lab: (Signature) [signature] (Printed) Rachel Horner			

Turn Around Time:
- ☐ Normal (7 day)
- ☐ 5 day
- ☐ 4 day
- ☒ 3 day
- ☐ Rush (2 day)
- ☐ Next Day
- ☐ Other: ______
- ☐ Specific Due Date: ______

Lab Use:
Temp: 5.3 °C
- ☑ Received on Ice
- ☑ Received same day

Delivery Method:
- ☐ Courier
- ☐ Client
- ☐ UPS
- ☐ FedEx
- ☐ USPS
- ☐ Other: ______

Special Instructions/QC Requirements & Comments:

Sample Disposal:
- ☐ Return to Client
- ☐ Disposal by lab
- ☐ Archive for ______ days

MSS-F001-004

APPENDIX M

INDEPENDENCE EXCAVATING, INC.

~~EXTRA~~ WORK FORM

Nº 50992

DATE: FRI OCT 20, 2017 **JOB#:** 171829

JOB NAME: SPARROWS POINT A-3

WEATHER: SUNNY 79° DRY

WORK TITLE DESCRIPTION: LOADS TO LAND FILL

COMPANY & REPRESENTATIVE

COMPANY TO BE INVOICED: _____

AUTHORIZING WORK: _____

PAY ITEM #: _____

WORKERS CLASS	EMPLOYEE NAME	REG. HOURS	O.T. HOURS	EQUIP HOURS	EQUIPMENT NAME	EQUIP. #	REG. HOURS	O.T. HOURS	EQUIP. HOURS	EQUIPMENT NAME	EQUIP. #

SUPPORT SERVICES: (Hrs. & Task)

Field Engineering: _____
Pick-up Truck: _____
One-Ton Truck: _____
Pitman Boom Truck: _____
Carry All: _____
Mechanics Service: _____
Broom Truck: _____
Water Truck: _____
_____

JOB SUPPLIES: (Quantity)

2" or 4" Brick: _____ ea.
Portland Cement: _____ bags
Wood Products: _____ ea.
Barrier Wall: _____ ea.
Barricades: _____ ea.
Construction Fence: _____ lf.
Road Plates: _____ ea.
Trench box: _____ ea.
_____

SMALL TOOLS: (Check items used)

Instruments: _____
Saws or Pumps: _____
Tampers: _____
(Plate, Jump Jack, Diesel Plate
Air Compressor): _____
Ram-X: _____
Gator Buggy: _____
Light Plant: _____
_____

DUMP FEE	# OF TRUCKS	QTY PER LOAD	TOTAL QTY	SUBCONTRACTORS	HRS	WORK
Import of Clean Fill						
Disposal of Clean Fill						
Disposal of Construction Debris:						

MATERIAL TYPE	SUPPLIER	QUANTITY	TICKET # (or attached copies)
1. UNSUITABLE MATERIAL FROM THE			
2. EXCLUSION ZONE.			
3.			
4.			

COMMENTS: WE HAULED 10 LOADS OF MATERIAL FROM A-3 EXCLUSION ZONE TO LAND FILL AS DIRECTED BY MARK

~~20~~ 10 LOADS AT 23 CY PER LOAD TOTAL ~~460 CY~~ 230 CY

Superintendent Signature: _____ Customer Signature: _____

PINK: Project Manager YELLOW: Customer GREEN: I.X. Super (signed) BLUE: I.X. Office (unsigned) GOLD: I.X. Super (unsigned)

INDEPENDENCE EXCAVATING, INC.
EXTRA WORK FORM

Nº 52249

DATE: Mon. Oct 30, 2017 **JOB#:** _____

JOB NAME: Sparrows Point A-3

WEATHER: cloudy windy wet 68°

WORK TITLE DESCRIPTION: Loads to Landfill

COMPANY & REPRESENTATIVE

COMPANY TO BE INVOICED: _____

AUTHORIZING WORK: _____

PAY ITEM #: _____

WORKERS CLASS	EMPLOYEE NAME	REG. HOURS	O.T. HOURS	EQUIP HOURS	EQUIPMENT NAME	EQUIP. #	REG. HOURS	O.T. HOURS	EQUIP. HOURS	EQUIPMENT NAME	EQUIP. #

SUPPORT SERVICES: (Hrs. & Task)

Field Engineering: _____
Pick-up Truck: _____
One-Ton Truck: _____
Pitman Boom Truck: _____
Carry All: _____
Mechanics Service: _____
Broom Truck: _____
Water Truck: _____
_____

JOB SUPPLIES: (Quantity)

2" or 4" Brick: _____ ea.
Portland Cement: _____ bags
Wood Products: _____ ea.
Barrier Wall: _____ ea.
Barricades: _____ ea.
Construction Fence: _____ lf.
Road Plates: _____ ea.
Trench box: _____ ea.
_____

SMALL TOOLS: (Check items used)

Instruments: _____
Saws or Pumps: _____
Tampers: _____
(Plate, Jump Jack, Diesel Plate
Air Compressor): _____
Ram-X: _____
Gator Buggy: _____
Light Plant: _____
_____

DUMP FEE	# OF TRUCKS	QTY PER LOAD	TOTAL QTY	SUBCONTRACTORS	HRS	WORK
Import of Clean Fill						
Disposal of Clean Fill						
Disposal of Construction Debris:						

MATERIAL TYPE	SUPPLIER	QUANTITY	TICKET # (or attached copies)
1. Unsuitable Material From The			
2. Exclusion Zone.			
3.			
4.			

COMMENTS: We hauled 51 loads of Material From A-3 Exclusion Zone To The Landfill As Directed by Mark

51 Loads at 23 cy Per load Total 1,173 cy.

Superintendent Signature: B J Brewer Customer Signature: _____

PINK: Project Manager YELLOW: Customer GREEN: I.X. Super (signed) BLUE: I.X. Office (unsigned) GOLD: I.X. Super (unsigned)

INDEPENDENCE EXCAVATING, INC.
EXTRA WORK FORM

Nº 51001

DATE: 10-31-17 JOB#: 171829 JOB NAME: Terminal A-3

WEATHER: Clear WORK TITLE DESCRIPTION: Loads to Landfill

COMPANY & REPRESENTATIVE COMPANY TO BE INVOICED:

AUTHORIZING WORK: PAY ITEM #:

WORKERS CLASS	EMPLOYEE NAME	REG. HOURS	O.T. HOURS	EQUIP HOURS	EQUIPMENT NAME	EQUIP. #	REG. HOURS	O.T. HOURS	EQUIP. HOURS	EQUIPMENT NAME	EQUIP. #

SUPPORT SERVICES: (Hrs. & Task)
Field Engineering:
Pick-up Truck:
One-Ton Truck:
Pitman Boom Truck:
Carry All:
Mechanics Service:
Broom Truck:
Water Truck:

JOB SUPPLIES: (Quantity)
2" or 4" Brick: ea.
Portland Cement: bags
Wood Products: ea.
Barrier Wall: ea.
Barricades: ea.
Construction Fence: lf.
Road Plates: ea.
Trench box: ea.

SMALL TOOLS: (Check items used)
Instruments:
Saws or Pumps:
Tampers:
(Plate, Jump Jack, Diesel Plate
Air Compressor):
Ram-X:
Gator Buggy:
Light Plant:

DUMP FEE	# OF TRUCKS	QTY PER LOAD	TOTAL QTY	SUBCONTRACTORS	HRS	WORK
Import of Clean Fill						
Disposal of Clean Fill						
Disposal of Construction Debris:						

MATERIAL TYPE	SUPPLIER	QUANTITY	TICKET # (or attached copies)
1. Unsuitable Material from			
2. the Exclusion Zone			
3.			
4.			

COMMENTS: Today we hauled 6 loads of material from the A-3 Exclusion Zone to the landfill.

6 loads @ 23 Cy per load. Total for today is 138 Cy.

Superintendent Signature: BJ Brewer Customer Signature:

PINK: Project Manager YELLOW: Customer GREEN: I.X. Super (signed) BLUE: I.X. Office (unsigned) GOLD: I.X. Super (unsigned)

INDEPENDENCE EXCAVATING, INC.
EXTRA WORK FORM

№ 52233

DATE: Nov. 20, 2017 JOB#: 171829 JOB NAME: Sparrows Point A-3

WEATHER: Sunny windy 49° WORK TITLE DESCRIPTION: Exclusion Zone MATERIAL

COMPANY & REPRESENTATIVE COMPANY TO BE INVOICED: _____

AUTHORIZING WORK: _____ PAY ITEM #: _____

WORKERS CLASS	EMPLOYEE NAME	REG. HOURS	O.T. HOURS	EQUIP HOURS	EQUIPMENT NAME	EQUIP. #	REG. HOURS	O.T. HOURS	EQUIP. HOURS	EQUIPMENT NAME	EQUIP. #

SUPPORT SERVICES: (Hrs. & Task)
Field Engineering: _____
Pick-up Truck: _____
One-Ton Truck: _____
Pitman Boom Truck: _____
Carry All: _____
Mechanics Service: _____
Broom Truck: _____
Water Truck: _____

JOB SUPPLIES: (Quantity)
2" or 4" Brick: _____ ea.
Portland Cement: _____ bags
Wood Products: _____ ea.
Barrier Wall: _____ ea.
Barricades: _____ ea.
Construction Fence: _____ lf.
Road Plates: _____ ea.
Trench box: _____ ea.

SMALL TOOLS: (Check items used)
Instruments: _____
Saws or Pumps: _____
Tampers: _____
(Plate, Jump Jack, Diesel Plate
Air Compressor): _____
Ram-X: _____
Gator Buggy: _____
Light Plant: _____

DUMP FEE	# OF TRUCKS	QTY PER LOAD	TOTAL QTY	SUBCONTRACTORS	HRS	WORK
Import of Clean Fill						
Disposal of Clean Fill						
Disposal of Construction Debris:	3	23 cy	1,058 cy			

MATERIAL TYPE	SUPPLIER	QUANTITY	TICKET # (or attached copies)
1.			
2.			
3.			
4.			

COMMENTS: Hauling MATERIAL From The Exclusion AREA TO The LANDfill completed clean up of All STOCK Piled MATERIAL.
TOTAL LOADS Today 46 LOADS 23 cy per load. TOTAL Today 1,058 cy

Superintendent Signature: BJ Brenat Customer Signature: _____

PINK: Project Manager YELLOW: Customer GREEN: I.X. Super (signed) BLUE: I.X. Office (unsigned) GOLD: I.X. Super (unsigned)

TRUCK TIME REQUEST FORM

240713

Employee # _____ Hired ID # _____

Date: 5-24-18 Name of Trucking Co.: LAURA LUCKERT

Day of Week: THURSDAY Driver: ACE

Lunch: (Circle One) Yes (No) Truck #: 6166

Truck Type: (Circle One) Single Axle Tag Axle Tand. Axle (Tri. Axle) Tractor Trailer

Start Mileage: _____ Stop Mileage: _____

Start Time: 7AM Stop Time: _____

Item #	Job #	Material Hauled	Arrive Plant	Ticket Number	Tons	Leave Plant	Plant Time Min.	Delay Code Plant	Arrive Job	Leave Job	Delay Code Job	Plant ID
9912	3619	DIRT		ONSITE					7AM			

6 HL

1. Hold for Job (Weather)
2. Hold for Job (End of Day)
3. Plant Delay (Other)
4. Hold for Job (Equipment or Job Problems)

NOTES

DIRT LOADS
HHHH 1

Hourly Ticket

Material	Material	Material
Job # 3619	Job #	Job #
Start Time 7AM	Start Time	Start Time
Stop Time 12:30	Stop Time	Stop Time
Travel Time 1 HOUR	Travel Time	Travel Time
Signature Job Foreman	Signature Job Foreman	Signature Job Foreman

Form 1010

MPI OFFICE

TRUCK TIME REQUEST FORM

240748

Employee # _____ Hired ID # _____

Date: 5-24-18 Name of Trucking Co.: Lapaloobert

Day of Week: Thurs Driver: Terry

Lunch: (Circle One) Yes No Truck #: 6173

Truck Type: (Circle One) Single Axle Tag Axle Tand. Axle Tri. Axle Tractor Trailer

Start Mileage: _____ Stop Mileage: _____

Start Time: 7:00 Stop Time: _____

Item #	Job #	Material Hauled	Arrive Plant	Ticket Number	Tons	Leave Plant	Plant Time Min.	Delay Code Plant	Arrive Job	Leave Job	Delay Code Job	Plant ID
9917	3619	Dirt							7:00			

1. Hold for Job (Weather)
2. Hold for Job (End of Day)
3. Plant Delay (Other)
4. Hold for Job (Equipment or Job Problems)

NOTES

* ON SITE * 10 Loads
Dirt Across Road

Hourly Ticket

Material Coal Dust, Dirt	Material	Material
Job # 3619	Job #	Job #
Start Time 7:00	Start Time	Start Time
Stop Time 12:30	Stop Time	Stop Time
Travel Time 1 hr	Travel Time	Travel Time
Signature Job Foreman	Signature Job Foreman	Signature Job Foreman

Form 1010

MPI OFFICE

TRUCK TIME REQUEST FORM

240768

Employee # _____ Hired ID # _____

Date: 5/24/16 Name of Trucking Co.: LUCKEY

Day of Week: TUE Driver: JOE

Lunch: (Circle One) Yes (No) Truck #: 6163

Truck Type: (Circle One) Single Axle Tag Axle Tand. Axle (Tri. Axle) Tractor Trailer

Start Mileage: 555426 Stop Mileage: _____

Start Time: 7:00 Stop Time: _____

Item #	Job #	Material Hauled	Arrive Plant	Ticket Number	Tons	Leave Plant	Plant Time Min.	Delay Code Plant	Arrive Job	Leave Job	Delay Code Job	Plant ID
9912	3619	DIRT							7:00			

64

1. Hold for Job (Weather)
2. Hold for Job (End of Day)
3. Plant Delay (Other)
4. Hold for Job (Equipment or Job Problems)

NOTES

DIRT
IIII IIII I

Hourly Ticket

Material DIRT	Material	Material
Job # 3619	Job #	Job #
Start Time 7:00	Start Time	Start Time
Stop Time 12:30	Stop Time	Stop Time
Travel Time 1	Travel Time	Travel Time
Signature Job Foreman	Signature Job Foreman	Signature Job Foreman

Form 1010

MPI OFFICE

APPENDIX N

Analytical Report for

Hillis Carnes Engineering Associates

Certificate of Analysis No.: 18040506

Project Manager: Keith Progin

Project Name : SPT A3-1

Project Location: A3-1

Project ID : 16280B

April 11, 2018

Phase Separation Science, Inc.

6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

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PHASE SEPARATION SCIENCE, INC.

April 11, 2018

Keith Progin
Hillis Carnes Engineering Associates
10975 Guilford Road, Ste. A
Annapolis Junction, MD 20701

Reference: PSS Work Order(s) No: **18040506**
Project Name: SPT A3-1
Project Location: A3-1
Project ID.: 16280B

Dear Keith Progin :

This report includes the analytical results from the analyses performed on the samples received under the project name referenced above and identified with the Phase Separation Science (PSS) Work Order(s) numbered **18040506**.

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

PSS reserves the right to return any unused samples, extracts or related solutions. Otherwise, the samples are scheduled for disposal, without any further notice, on May 10, 2018, with the exception of air canisters which are cleaned immediately following analysis. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt , the request will be acknowledged by PSS, thus extending the storage period.

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

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

Sincerely,

Cathy Thompson
QA Officer

Sample Summary

Client Name: Hillis Carnes Engineering Associates

Project Name: SPT A3-1

Work Order Number(s): 18040506

Project ID: 16280B

The following samples were received under chain of custody by Phase Separation Science (PSS) on 04/05/2018 at 11:20 am

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
18040506-001	CT-1	SOIL	04/05/18 10:32

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

Notes:

1. The presence of a common laboratory contaminant such as methylene chloride may be considered a possible laboratory artifact. Where observed, appropriate consideration of data should be taken.
2. Unless otherwise noted in the case narrative, results are reported on a dry weight basis with the exception of pH, flashpoint, moisture, and paint filter test.
3. Drinking water samples collected for the purpose of compliance with SDWA may not be suitable for their intended use unless collected by a certified sampler [COMAR 26.08.05.07.C.2].
4. The analyses of 1,2-dibromo-3-chloropropane (DBCP) and 1,2-dibromoethane (EDB) by EPA 524.2 and calcium, magnesium, sodium and iron by EPA 200.8 are not currently promulgated for use in testing to meet the Safe Drinking Water Act and as such cannot be used for compliance purposes. The listings of the current promulgated methods for testing in compliance with the Safe Drinking Water Act can be found in the 40 CFR part 141.1, for the primary drinking water contaminates, and part 141.3, for the secondary drinking water contaminates.
5. Sample prepared under EPA 3550C with concentrations greater than 20 mg/Kg should employ the microtip extraction procedure if required to meet data quality objectives.
6. The analysis of acrolein by EPA 624 must be analyzed within three days of sampling unless pH is adjusted to 4-5 units [40 CFR part 136.3(e)].
7. Method 180.1, The Determination of Turbidity by Nephelometry, recommends samples over 40 NTU be diluted until the turbidity falls below 40 units. Routine samples over 40 NTU may not be diluted as long as the data quality objectives are not affected.
8. Alkalinity results analyzed by EPA 310.2 that are reported by dilution are estimated and are not in compliance with method requirements.

Standard Flags/Abbreviations:

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

Certifications:

NELAP Certifications: PA 68-03330, VA 460156
State Certifications: MD 179, WV 303
Regulated Soil Permit: P330-12-00268
NSWC USCG Accepted Laboratory
LDBE MWAA LD1997-0041-2015

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 18040506

Hillis Carnes Engineering Associates, Annapolis Junction, MD

April 11, 2018

Project Name: SPT A3-1
Project Location: A3-1
Project ID: 16280B

Sample ID: CT-1 **Date/Time Sampled: 04/05/2018 10:32** **PSS Sample ID: 18040506-001**
Matrix: SOIL **Date/Time Received: 04/05/2018 11:20** **% Solids: 80**

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

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Aluminum	**13,000**	mg/kg	460		10	04/06/18	04/06/18 22:30	1064
Antimony	ND	mg/kg	6.2		1	04/06/18	04/10/18 19:56	1064
Arsenic	**50**	mg/kg	1.2		1	04/06/18	04/10/18 19:56	1064
Barium	**240**	mg/kg	2.3		1	04/06/18	04/06/18 21:17	1064
Beryllium	ND	mg/kg	2.3		1	04/06/18	04/06/18 21:17	1064
Cadmium	**720**	mg/kg	23		10	04/06/18	04/06/18 22:30	1064
Calcium	**97,000**	mg/kg	4,600		100	04/06/18	04/10/18 15:41	1064
Chromium	**290**	mg/kg	2.3		1	04/06/18	04/06/18 21:17	1064
Cobalt	**7.4**	mg/kg	2.3		1	04/06/18	04/06/18 21:17	1064
Copper	**530**	mg/kg	23		10	04/06/18	04/06/18 22:30	1064
Iron	**77,000**	mg/kg	4,600		100	04/06/18	04/10/18 15:41	1064
Lead	**530**	mg/kg	23		10	04/06/18	04/06/18 22:30	1064
Magnesium	**15,000**	mg/kg	460		10	04/06/18	04/06/18 22:30	1064
Manganese	**7,900**	mg/kg	230		100	04/06/18	04/10/18 15:41	1064
Mercury	**1.2**	mg/kg	0.25		1	04/06/18	04/10/18 19:56	1064
Nickel	**34**	mg/kg	6.2		1	04/06/18	04/10/18 19:56	1064
Potassium	**740**	mg/kg	120		1	04/06/18	04/10/18 19:56	1064
Selenium	ND	mg/kg	6.2		1	04/06/18	04/10/18 19:56	1064
Silver	**4.4**	mg/kg	2.3		1	04/06/18	04/06/18 21:17	1064
Sodium	**230**	mg/kg	120		1	04/06/18	04/10/18 19:56	1064
Thallium	ND	mg/kg	1.9		1	04/06/18	04/06/18 21:17	1064
Vanadium	**250**	mg/kg	2.3		1	04/06/18	04/06/18 21:17	1064
Zinc	**16,000**	mg/kg	930		100	04/06/18	04/10/18 15:41	1064

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 18040506

Hillis Carnes Engineering Associates, Annapolis Junction, MD

April 11, 2018

Project Name: SPT A3-1
Project Location: A3-1
Project ID: 16280B

Sample ID: CT-1 **Date/Time Sampled: 04/05/2018 10:32** **PSS Sample ID: 18040506-001**

Matrix: SOIL **Date/Time Received: 04/05/2018 11:20** **% Solids: 80**

Polychlorinated Biphenyls

Analytical Method: SW-846 8082 A

Preparation Method: SW3550C
Clean up Method: SW846 3665A

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
PCB-1016	ND	mg/kg	0.065		1	04/05/18	04/06/18 12:46	1014
PCB-1221	ND	mg/kg	0.065		1	04/05/18	04/06/18 12:46	1014
PCB-1232	ND	mg/kg	0.065		1	04/05/18	04/06/18 12:46	1014
PCB-1242	ND	mg/kg	0.065		1	04/05/18	04/06/18 12:46	1014
PCB-1248	ND	mg/kg	0.065		1	04/05/18	04/06/18 12:46	1014
PCB-1254	ND	mg/kg	0.065		1	04/05/18	04/06/18 12:46	1014
PCB-1260	ND	mg/kg	0.065		1	04/05/18	04/06/18 12:46	1014

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 18040506

Hillis Carnes Engineering Associates, Annapolis Junction, MD

April 11, 2018

Project Name: SPT A3-1
Project Location: A3-1
Project ID: 16280B

Sample ID: CT-1 **Date/Time Sampled: 04/05/2018 10:32** **PSS Sample ID: 18040506-001**
Matrix: SOIL **Date/Time Received: 04/05/2018 11:20**

TCLP Metals — Analytical Method: SW-846 6020 A — Preparation Method: 3010A

	Result	Units	RL	Flag	Dil	TCLP Limit	Prepared	Analyzed	Analyst
Arsenic	ND	mg/L	0.050		1	5	04/06/18	04/07/18 00:48	1064
Barium	ND	mg/L	1.0		1	100	04/06/18	04/07/18 00:48	1064
Cadmium	**0.32**	mg/L	0.050		1	1	04/06/18	04/07/18 00:48	1064
Chromium	ND	mg/L	0.050		1	5	04/06/18	04/07/18 00:48	1064
Lead	ND	mg/L	0.050		1	5	04/06/18	04/07/18 00:48	1064
Mercury	ND	mg/L	0.0020		1	0.2	04/06/18	04/07/18 00:48	1064
Selenium	ND	mg/L	0.050		1	1	04/06/18	04/07/18 00:48	1064
Silver	ND	mg/L	0.050		1	5	04/06/18	04/07/18 00:48	1064

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

	Result	Units	RL	Flag	Dil	TCLP Limit	Prepared	Analyzed	Analyst
Vinyl Chloride	ND	mg/L	0.10		100	0.2	04/06/18	04/06/18 15:14	1011
1,1-Dichloroethene	ND	mg/L	0.10		100	0.7	04/06/18	04/06/18 15:14	1011
2-Butanone	ND	mg/L	1.0		100	200	04/06/18	04/06/18 15:14	1011
Chloroform	ND	mg/L	0.10		100	6	04/06/18	04/06/18 15:14	1011
Carbon Tetrachloride	ND	mg/L	0.10		100	0.5	04/06/18	04/06/18 15:14	1011
Benzene	ND	mg/L	0.10		100	0.5	04/06/18	04/06/18 15:14	1011
1,2-Dichloroethane	ND	mg/L	0.10		100	0.5	04/06/18	04/06/18 15:14	1011
Trichloroethene	ND	mg/L	0.10		100	0.5	04/06/18	04/06/18 15:14	1011
Tetrachloroethylene	ND	mg/L	0.10		100	0.7	04/06/18	04/06/18 15:14	1011
Chlorobenzene	ND	mg/L	0.10		100	100	04/06/18	04/06/18 15:14	1011
1,4-Dichlorobenzene	ND	mg/L	0.10		100	7.5	04/06/18	04/06/18 15:14	1011

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 18040506

Hillis Carnes Engineering Associates, Annapolis Junction, MD

April 11, 2018

Project Name: SPT A3-1
Project Location: A3-1
Project ID: 16280B

Sample ID: CT-1 **Date/Time Sampled: 04/05/2018 10:32** **PSS Sample ID: 18040506-001**
Matrix: SOIL **Date/Time Received: 04/05/2018 11:20**

TCLP Semivolatile Organic Compounds — Analytical Method: SW-846 8270 C — Preparation Method: 3510C

	Result	Units	RL	Flag	Dil	TCLP Limit	Prepared	Analyzed	Analyst
2,4-Dinitrotoluene	ND	mg/L	0.010		1	0.13	04/06/18	04/06/18 20:56	1055
Hexachlorobenzene	ND	mg/L	0.010		1	0.13	04/06/18	04/06/18 20:56	1055
Hexachlorobutadiene	ND	mg/L	0.010		1	0.5	04/06/18	04/06/18 20:56	1055
Hexachloroethane	ND	mg/L	0.010		1	3	04/06/18	04/06/18 20:56	1055
2-methylphenol	ND	mg/L	0.010		1	200	04/06/18	04/06/18 20:56	1055
3&4-Methylphenol	ND	mg/L	0.010		1	200	04/06/18	04/06/18 20:56	1055
Nitrobenzene	ND	mg/L	0.010		1	2	04/06/18	04/06/18 20:56	1055
Pentachlorophenol	ND	mg/L	0.010		1	100	04/06/18	04/06/18 20:56	1055
Pyridine	ND	mg/L	0.010		1	5	04/06/18	04/06/18 20:56	1055
2,4,6-Trichlorophenol	ND	mg/L	0.010		1	2	04/06/18	04/06/18 20:56	1055
2,4,5-Trichlorophenol	ND	mg/L	0.010		1	400	04/06/18	04/06/18 20:56	1055

Case Narrative Summary

Client Name: Hillis Carnes Engineering Associates

Project Name: SPT A3-1

Work Order Number(s): 18040506
Project ID: 16280B

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

The analyses of chlorine, pH, dissolved oxygen, temperature and sulfite for drinking water and non-potable samples tested for compliance have a maximum holding time of 15 minutes. As such, all laboratory analyses for these analytes exceed holding times.

Matrix spike and matrix spike duplicate analyses may not be performed due to insufficient sample quantity. In these instances, a laboratory control sample and laboratory control sample duplicate are analyzed unless otherwise noted or specified in the method.

Sample Receipt:

All sample receipt conditions were acceptable.

Analytical:

TAL Metals

Batch: 152108

Matrix spike and/or matrix spike duplicate (MS/MSD) exceedances identified; see MS summary form.
The concentration of the following analyte(s) in the reference sample was greater than four times the matrix spike concentration : aluminum, barium, cadmium, calcium, chromium, copper, iron, lead, magnesium, manganese, vanadium, zinc

Total Metals

Batch: 152179

Matrix spike and/or matrix spike duplicate (MS/MSD) exceedances identified; see MS summary form.
The concentration of the following analyte(s) in the reference sample was greater than four times the matrix spike concentration : aluminum, iron, magnesium, manganese, potassium

Polychlorinated Biphenyls

Batch: 152098

Surrogate recoveries affected by sample matrix.

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

Analytical Data Package Information Summary

Work Order(s): 18040506
Report Prepared For: Hillis Carnes Engineering Associates, Annapo
Project Name: SPT A3-1
Project Manager: Keith Progin

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
SM2540G	CT-1	Initial	18040506-001	1059	S	152040	152040	04/05/2018	04/05/2018 14:42	04/05/2018 14:42
SW-846 6020 A	CT-1	Initial	18040506-001	1064	S	70776	152108	04/05/2018	04/06/2018 11:03	04/06/2018 21:17
	70776-1-BKS	BKS	70776-1-BKS	1064	S	70776	152108	--------	04/06/2018 11:03	04/06/2018 21:13
	70776-1-BLK	BLK	70776-1-BLK	1064	S	70776	152108	--------	04/06/2018 11:03	04/06/2018 21:09
	CT-1 S	MS	18040506-001 S	1064	S	70776	152108	04/05/2018	04/06/2018 11:03	04/06/2018 21:21
	CT-1 S	Reanalysis	18040506-001 S	1064	S	70776	152108	04/05/2018	04/06/2018 11:03	04/06/2018 21:21
	CT-1 SD	MSD	18040506-001 SD	1064	S	70776	152108	04/05/2018	04/06/2018 11:03	04/06/2018 21:25
	CT-1 SD	Reanalysis	18040506-001 SD	1064	S	70776	152108	04/05/2018	04/06/2018 11:03	04/06/2018 21:25
	CT-1	Reanalysis	18040506-001	1064	S	70776	152108	04/05/2018	04/06/2018 11:03	04/06/2018 22:30
	CT-1	Reanalysis	18040506-001	1064	S	70776	152176	04/05/2018	04/06/2018 11:03	04/10/2018 15:41
	70812-1-BKS	BKS	70812-1-BKS	1064	S	70812	152179	--------	04/10/2018 10:45	04/10/2018 17:37
	70812-1-BLK	BLK	70812-1-BLK	1064	S	70812	152179	--------	04/10/2018 10:45	04/10/2018 17:33
	CT-1 DL S	MS	18040506-001 S	1064	S	70812	152179	04/05/2018	04/10/2018 10:45	04/10/2018 20:00
	CT-1 DL S	Reanalysis	18040506-001 S	1064	S	70812	152179	04/05/2018	04/10/2018 10:45	04/10/2018 20:00
	PRC-19R, 32-38' S	MS	18040608-002 S	1064	S	70812	152179	04/05/2018	04/10/2018 10:45	04/10/2018 18:00
	CT-1 DL SD	MSD	18040506-001 SD	1064	S	70812	152179	04/05/2018	04/10/2018 10:45	04/10/2018 20:04
	CT-1 DL SD	Reanalysis	18040506-001 SD	1064	S	70812	152179	04/05/2018	04/10/2018 10:45	04/10/2018 20:04
	PRC-19R, 32-38' SD	MSD	18040608-002 SD	1064	S	70812	152179	04/05/2018	04/10/2018 10:45	04/10/2018 18:04
	CT-1	Reanalysis	18040506-001	1064	S	70776	152179	04/05/2018	04/06/2018 11:03	04/10/2018 19:56
SW-846 6020 A	CT-1	Initial	18040506-001	1064	W	70785	152106	04/05/2018	04/06/2018 15:39	04/07/2018 00:48
	70785-1-BKS	BKS	70785-1-BKS	1064	W	70785	152106	--------	04/06/2018 15:39	04/06/2018 23:16
	70785-1-BLK	BLK	70785-1-BLK	1064	W	70785	152106	--------	04/06/2018 15:39	04/06/2018 23:12
	S-1 S	MS	18040411-001 S	1064	W	70785	152106	04/03/2018	04/06/2018 15:39	04/06/2018 23:24
	S-1 SD	MSD	18040411-001 SD	1064	W	70785	152106	04/03/2018	04/06/2018 15:39	04/06/2018 23:28
SW-846 8082 A	CT-1	Initial	18040506-001	1014	S	70757	152098	04/05/2018	04/05/2018 11:32	04/06/2018 12:46
	70757-1-BKS	BKS	70757-1-BKS	1014	S	70757	152098	--------	04/05/2018 11:32	04/06/2018 09:58
	70757-1-BLK	BLK	70757-1-BLK	1014	S	70757	152098	--------	04/05/2018 11:32	04/06/2018 09:30
	70757-1-BSD	BSD	70757-1-BSD	1014	S	70757	152098	--------	04/05/2018 11:32	04/06/2018 10:26

Analytical Data Package Information Summary

Work Order(s): 18040506
Report Prepared For: Hillis Carnes Engineering Associates, Annapo
Project Name: SPT A3-1
Project Manager: Keith Progin

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
SW-846 8082 A	Disposal Can #1 S	MS	18040502-003 S	1014	S	70757	152098	04/04/2018	04/05/2018 11:32	04/06/2018 10:54
	Disposal Can #1 SD	MSD	18040502-003 SD	1014	S	70757	152098	04/04/2018	04/05/2018 11:32	04/06/2018 11:22
SW-846 8260 B	CT-1	Initial	18040506-001	1011	W	70790	152101	04/05/2018	04/06/2018 08:12	04/06/2018 15:14
	70790-1-BKS	BKS	70790-1-BKS	1011	W	70790	152101	--------	04/06/2018 08:12	04/06/2018 10:50
	70790-1-BLK	BLK	70790-1-BLK	1011	W	70790	152101	--------	04/06/2018 08:12	04/06/2018 14:53
	CT-1 S	MS	18040506-001 S	1011	W	70790	152101	04/05/2018	04/06/2018 08:12	04/06/2018 15:35
	CT-1 SD	MSD	18040506-001 SD	1011	W	70790	152101	04/05/2018	04/06/2018 08:12	04/06/2018 15:56
SW-846 8270 C	CT-1	Initial	18040506-001	1055	W	70766	152119	04/05/2018	04/06/2018 08:44	04/06/2018 20:56
	70766-1-BKS	BKS	70766-1-BKS	1055	W	70766	152119	--------	04/06/2018 08:44	04/06/2018 16:07
	70766-1-BLK	BLK	70766-1-BLK	1055	W	70766	152119	--------	04/06/2018 08:44	04/07/2018 16:51
	70766-1-BSD	BSD	70766-1-BSD	1055	W	70766	152119	--------	04/06/2018 08:44	04/06/2018 16:36
	18-LF-02-Comp-040218 S	MS	18040407-002 S	1055	W	70766	152119	04/02/2018	04/06/2018 08:44	04/06/2018 17:34

PHASE SEPARATION SCIENCE, INC.

QC Summary 18040506

Hillis Carnes Engineering Associates
SPT A3-1

Analytical Method: SW-846 8082 A Prep Method: SW3550C
Seq Number: 152098 Matrix: Soil Date Prep: 04/05/2018
PSS Sample ID: 18040506-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Decachlorobiphenyl	663	*	61-150	%	04/06/18 12:46
Tetrachloro-m-xylene	110		42-142	%	04/06/18 12:46

Analytical Method: SW-846 8270 C Prep Method: SW3510C
Seq Number: 152119 Matrix: Soil Date Prep: 04/06/2018
PSS Sample ID: 18040506-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
2-Fluorobiphenyl	81		35-107	%	04/06/18 20:56
2-Fluorophenol	76		32-106	%	04/06/18 20:56
Nitrobenzene-d5	98		34-123	%	04/06/18 20:56
Phenol-d6	84		36-111	%	04/06/18 20:56
Terphenyl-D14	79		43-143	%	04/06/18 20:56
2,4,6-Tribromophenol	83		26-122	%	04/06/18 20:56

Analytical Method: SW-846 8260 B Prep Method: SW5030B
Seq Number: 152101 Matrix: Soil Date Prep: 04/06/2018
PSS Sample ID: 18040506-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	103		87-109	%	04/06/18 15:14
Dibromofluoromethane	100		93-111	%	04/06/18 15:14
Toluene-D8	100		91-109	%	04/06/18 15:14

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

PHASE SEPARATION SCIENCE, INC.

QC Summary 18040506

Hillis Carnes Engineering Associates

SPT A3-1

Analytical Method: SW-846 6020 A Prep Method: SW3050B

Seq Number: 152108 Matrix: Solid Date Prep: 04/06/18

MB Sample Id: 70776-1-BLK LCS Sample Id: 70776-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Aluminum	<42.23	84.46	86.59	103	80-120	mg/kg	04/06/18 21:13	
Antimony	<2.111	16.89	17.22	102	80-120	mg/kg	04/06/18 21:13	
Arsenic	<0.4223	16.89	16.23	96	80-120	mg/kg	04/06/18 21:13	
Barium	<2.111	16.89	15.80	94	80-120	mg/kg	04/06/18 21:13	
Beryllium	<2.111	16.89	16.19	96	80-120	mg/kg	04/06/18 21:13	
Cadmium	<2.111	16.89	16.49	98	80-120	mg/kg	04/06/18 21:13	
Calcium	<42.23	168.9	172.2	102	80-120	mg/kg	04/06/18 21:13	
Chromium	<2.111	16.89	16.76	99	80-120	mg/kg	04/06/18 21:13	
Cobalt	<2.111	16.89	16.28	96	80-120	mg/kg	04/06/18 21:13	
Copper	<2.111	16.89	17.03	101	80-120	mg/kg	04/06/18 21:13	
Iron	<42.23	168.9	173.4	103	80-120	mg/kg	04/06/18 21:13	
Lead	<2.111	16.89	16.50	98	80-120	mg/kg	04/06/18 21:13	
Magnesium	<42.23	168.9	170.7	101	80-120	mg/kg	04/06/18 21:13	
Manganese	<2.111	16.89	16.43	97	80-120	mg/kg	04/06/18 21:13	
Mercury	<0.08446	0.4223	0.4151	98	80-120	mg/kg	04/06/18 21:13	
Nickel	<2.111	16.89	16.76	99	80-120	mg/kg	04/06/18 21:13	
Potassium	<42.23	168.9	179.1	106	80-120	mg/kg	04/06/18 21:13	
Selenium	<2.111	16.89	16.41	97	80-120	mg/kg	04/06/18 21:13	
Silver	<2.111	16.89	16.21	96	80-120	mg/kg	04/06/18 21:13	
Sodium	<42.23	168.9	180.6	107	80-120	mg/kg	04/06/18 21:13	
Thallium	<1.689	16.89	14.66	87	80-120	mg/kg	04/06/18 21:13	
Vanadium	<2.111	16.89	16.48	98	80-120	mg/kg	04/06/18 21:13	
Zinc	<8.446	84.46	82.24	97	80-120	mg/kg	04/06/18 21:13	

Analytical Method: SW-846 6020 A Prep Method: SW3010A

Seq Number: 152106 Matrix: Water Date Prep: 04/06/18

MB Sample Id: 70785-1-BLK LCS Sample Id: 70785-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Arsenic	<0.05000	0.4000	0.3770	94	80-120	mg/L	04/06/18 23:16	
Barium	<1.000	2.000	1.843	92	80-120	mg/L	04/06/18 23:16	
Cadmium	<0.05000	0.4000	0.3908	98	80-120	mg/L	04/06/18 23:16	
Chromium	<0.05000	0.4000	0.3892	97	80-120	mg/L	04/06/18 23:16	
Lead	<0.05000	0.4000	0.3601	90	80-120	mg/L	04/06/18 23:16	
Mercury	<0.002000	0.01000	0.009150	92	80-120	mg/L	04/06/18 23:16	
Selenium	<0.05000	0.4000	0.3788	95	80-120	mg/L	04/06/18 23:16	
Silver	<0.05000	0.4000	0.3656	91	80-120	mg/L	04/06/18 23:16	

PHASE SEPARATION SCIENCE, INC.

QC Summary 18040506

Hillis Carnes Engineering Associates

SPT A3-1

Analytical Method: SW-846 6020 A Prep Method: SW3050B

Seq Number: 152179 Matrix: Solid Date Prep: 04/10/18

MB Sample Id: 70812-1-BLK LCS Sample Id: 70812-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Aluminum	<39.40	78.80	74.37	94	80-120	mg/kg	04/10/18 17:37	
Antimony	<1.970	15.76	15.52	98	80-120	mg/kg	04/10/18 17:37	
Arsenic	<0.3940	15.76	18.01	114	80-120	mg/kg	04/10/18 17:37	
Barium	<1.970	15.76	15.27	97	80-120	mg/kg	04/10/18 17:37	
Beryllium	<1.970	15.76	15.13	96	80-120	mg/kg	04/10/18 17:37	
Cadmium	<1.970	15.76	16.89	107	80-120	mg/kg	04/10/18 17:37	
Calcium	<39.40	157.6	149.7	95	80-120	mg/kg	04/10/18 17:37	
Chromium	<1.970	15.76	18.34	116	80-120	mg/kg	04/10/18 17:37	
Cobalt	<1.970	15.76	15.57	99	80-120	mg/kg	04/10/18 17:37	
Copper	<1.970	15.76	18.30	116	80-120	mg/kg	04/10/18 17:37	
Iron	<39.40	157.6	154.9	98	80-120	mg/kg	04/10/18 17:37	
Lead	<1.970	15.76	15.27	97	80-120	mg/kg	04/10/18 17:37	
Magnesium	<39.40	157.6	177.6	113	80-120	mg/kg	04/10/18 17:37	
Manganese	<1.970	15.76	15.69	100	80-120	mg/kg	04/10/18 17:37	
Mercury	<0.07880	0.3940	0.3896	99	80-120	mg/kg	04/10/18 17:37	
Nickel	<1.970	15.76	18.40	117	80-120	mg/kg	04/10/18 17:37	
Potassium	<39.40	157.6	189.4	120	80-120	mg/kg	04/10/18 17:37	
Selenium	<1.970	15.76	15.23	97	80-120	mg/kg	04/10/18 17:37	
Silver	<1.970	15.76	15.09	96	80-120	mg/kg	04/10/18 17:37	
Sodium	<39.40	157.6	181.1	115	80-120	mg/kg	04/10/18 17:37	
Thallium	<1.576	15.76	13.75	87	80-120	mg/kg	04/10/18 17:37	
Vanadium	<1.970	15.76	18.02	114	80-120	mg/kg	04/10/18 17:37	
Zinc	<7.880	78.80	88.57	112	80-120	mg/kg	04/10/18 17:37	

PHASE SEPARATION SCIENCE, INC.

QC Summary 18040506

Hillis Carnes Engineering Associates

SPT A3-1

Analytical Method: SW-846 6020 A Prep Method: SW3050B

Seq Number: 152108 Matrix: Soil Date Prep: 04/06/18

Parent Sample Id: 18040506-001 MS Sample Id: 18040506-001 S MSD Sample Id: 18040506-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Aluminum	12910	117.6	14850	1650	20700	6869	75-125	33	30	mg/kg	04/06/18 21:21	XF
Antimony	16.90	23.52	25.28	36	27.22	46	75-125	7	30	mg/kg	04/06/18 21:21	EX
Arsenic	54.35	23.52	77.56	99	104.3	220	75-125	29	30	mg/kg	04/06/18 21:21	EX
Barium	243.1	23.52	311.8	292	558	1389	75-125	57	30	mg/kg	04/06/18 21:21	XF
Beryllium	<2.940	23.52	21.16	90	23.10	102	75-125	9	30	mg/kg	04/06/18 21:21	
Cadmium	720.6	23.52	1205	2060	923.8	896	75-125	26	30	mg/kg	04/06/18 21:21	X
Calcium	45860	235.2	26960	0	46860	441	75-125	54	30	mg/kg	04/06/18 21:21	XF
Chromium	293.7	23.52	244.9	0	202.7	0	75-125	19	30	mg/kg	04/06/18 21:21	X
Cobalt	7.392	23.52	29.45	94	29.49	97	75-125	0	30	mg/kg	04/06/18 21:21	
Copper	544.5	23.52	486.7	0	555.3	48	75-125	13	30	mg/kg	04/06/18 21:21	X
Iron	56690	235.2	29250	0	34780	0	75-125	17	30	mg/kg	04/06/18 21:21	X
Lead	516.5	23.52	461.2	0	552.3	158	75-125	18	30	mg/kg	04/06/18 21:21	X
Magnesium	15280	235.2	12950	0	23740	3732	75-125	59	30	mg/kg	04/06/18 21:21	XF
Manganese	6742	23.52	4033	0	5944	0	75-125	38	30	mg/kg	04/06/18 21:21	XF
Mercury	0.9831	0.5880	5.006	684	1.279	52	75-125	119	30	mg/kg	04/06/18 21:21	EXF
Nickel	33.03	23.52	84.24	218	46.40	59	75-125	58	30	mg/kg	04/06/18 21:21	EXF
Potassium	791.3	235.2	1430	272	1672	388	75-125	16	30	mg/kg	04/06/18 21:21	EX
Selenium	<2.940	23.52	13.61	58	15.41	68	75-125	12	30	mg/kg	04/06/18 21:21	EX
Silver	4.419	23.52	26.06	92	27.85	103	75-125	7	30	mg/kg	04/06/18 21:21	
Sodium	375.2	235.2	793.3	178	1304	410	75-125	49	30	mg/kg	04/06/18 21:21	EXF
Thallium	<2.352	23.52	18.41	78	19.74	87	75-125	7	20	mg/kg	04/06/18 21:21	
Vanadium	245.9	23.52	293.2	201	306	265	75-125	4	30	mg/kg	04/06/18 21:21	X
Zinc	14030	117.6	15400	1165	17850	3369	75-125	15	30	mg/kg	04/06/18 21:21	X

PHASE SEPARATION SCIENCE, INC.

QC Summary 18040506

Hillis Carnes Engineering Associates

SPT A3-1

Analytical Method: SW-846 6020 A Prep Method: SW3050B

Seq Number: 152179 Matrix: Soil Date Prep: 04/10/18

Parent Sample Id: 18040506-001 MS Sample Id: 18040506-001 S MSD Sample Id: 18040506-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Aluminum	<113.1	226.2	9920	4385	12040	5137	75-125	19	30	mg/kg	04/10/18 20:00	
Antimony	<5.654	45.23	46.91	104	50.15	107	75-125	7	30	mg/kg	04/10/18 20:00	
Arsenic	<1.131	45.23	70.75	156	72.58	155	75-125	3	30	mg/kg	04/10/18 20:00	
Barium	<5.654	45.23	278.3	615	331.6	707	75-125	17	30	mg/kg	04/10/18 20:00	
Beryllium	<5.654	45.23	28.25	62	30.76	66	75-125	9	30	mg/kg	04/10/18 20:00	
Cadmium	<5.654	45.23	1027	2271	1002	2137	75-125	2	30	mg/kg	04/10/18 20:00	
Calcium	<113.1	452.3	30930	6838	31650	6750	75-125	2	30	mg/kg	04/10/18 20:00	
Chromium	<5.654	45.23	155.6	344	179.3	382	75-125	14	30	mg/kg	04/10/18 20:00	
Cobalt	<5.654	45.23	33.09	73	42.80	91	75-125	26	30	mg/kg	04/10/18 20:00	
Copper	<5.654	45.23	550.6	1217	583.6	1245	75-125	6	30	mg/kg	04/10/18 20:00	
Iron	<113.1	452.3	37410	8271	94520	20158	75-125	87	30	mg/kg	04/10/18 20:00	F
Lead	<5.654	45.23	541.1	1196	618.6	1319	75-125	13	30	mg/kg	04/10/18 20:00	
Magnesium	<113.1	452.3	7953	1758	9934	2119	75-125	22	30	mg/kg	04/10/18 20:00	
Manganese	<5.654	45.23	4350	9618	3615	7710	75-125	18	30	mg/kg	04/10/18 20:00	
Mercury	<0.2262	1.131	2.152	190	2.378	203	75-125	10	30	mg/kg	04/10/18 20:00	
Nickel	<5.654	45.23	45.29	100	55.31	118	75-125	20	30	mg/kg	04/10/18 20:00	
Potassium	<113.1	452.3	953.4	211	1432	305	75-125	40	30	mg/kg	04/10/18 20:00	F
Selenium	<5.654	45.23	30.68	68	35.35	75	75-125	14	30	mg/kg	04/10/18 20:00	
Silver	<5.654	45.23	46.56	103	48.96	104	75-125	5	30	mg/kg	04/10/18 20:00	
Sodium	1464	452.3	509.5	0	691	0	75-125	30	30	mg/kg	04/10/18 20:00	
Thallium	<4.523	45.23	38.68	86	40.43	86	75-125	4	20	mg/kg	04/10/18 20:00	
Vanadium	<5.654	45.23	243.7	539	309.5	660	75-125	24	30	mg/kg	04/10/18 20:00	
Zinc	<22.62	226.2	10200	4509	13910	5934	75-125	31	30	mg/kg	04/10/18 20:00	F

Analytical Method: SW-846 8082 A Prep Method: SW3550C

Seq Number: 152098 Matrix: Solid Date Prep: 04/05/18

MB Sample Id: 70757-1-BLK LCS Sample Id: 70757-1-BKS LCSD Sample Id: 70757-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
PCB-1016	<0.04975	0.4975	0.4304	87	0.4239	86	60-110	2	25	mg/kg	04/06/18 09:58	
PCB-1260	<0.04975	0.4975	0.4613	93	0.4550	92	60-98	1	25	mg/kg	04/06/18 09:58	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Decachlorobiphenyl	112		114		112		61-150	%	04/06/18 09:58
Tetrachloro-m-xylene	90		96		94		42-142	%	04/06/18 09:58

PHASE SEPARATION SCIENCE, INC.

QC Summary 18040506

Hillis Carnes Engineering Associates

SPT A3-1

Analytical Method: SW-846 8270 C Prep Method: SW3510C

Seq Number: 152119 Matrix: Water Date Prep: 04/06/18

MB Sample Id: 70766-1-BLK LCS Sample Id: 70766-1-BKS LCSD Sample Id: 70766-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
2,4-Dinitrotoluene	<0.005000	0.04000	0.03643	91	0.03601	90	70-119	1	20	mg/L	04/06/18 16:07	
Hexachlorobenzene	<0.005000	0.04000	0.03906	98	0.03851	96	76-110	1	20	mg/L	04/06/18 16:07	
Hexachlorobutadiene	<0.005000	0.04000	0.03282	82	0.03220	81	64-113	2	20	mg/L	04/06/18 16:07	
Hexachloroethane	<0.005000	0.04000	0.03233	81	0.03213	80	62-105	1	20	mg/L	04/06/18 16:07	
2-methylphenol	<0.005000	0.04000	0.03941	99	0.03832	96	67-111	3	20	mg/L	04/06/18 16:07	
3&4-Methylphenol	<0.005000	0.04000	0.03827	96	0.03827	96	67-107	0	20	mg/L	04/06/18 16:07	
Nitrobenzene	<0.005000	0.04000	0.03705	93	0.03651	91	60-107	1	20	mg/L	04/06/18 16:07	
Pentachlorophenol	<0.005000	0.04000	0.04269	107	0.04187	105	63-119	2	20	mg/L	04/06/18 16:07	
Pyridine	<0.005000	0.04000	0.03402	85	0.03241	81	47-105	5	20	mg/L	04/06/18 16:07	
2,4,6-Trichlorophenol	<0.005000	0.04000	0.04308	108	0.04044	101	68-118	6	20	mg/L	04/06/18 16:07	
2,4,5-Trichlorophenol	<0.005000	0.04000	0.04020	101	0.04016	100	69-114	0	20	mg/L	04/06/18 16:07	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
2-Fluorobiphenyl	87		83		89		35-107	%	04/06/18 16:07
2-Fluorophenol	82		81		84		32-106	%	04/06/18 16:07
Nitrobenzene-d5	92		86		93		34-123	%	04/06/18 16:07
Phenol-d6	89		88		93		36-111	%	04/06/18 16:07
Terphenyl-D14	86		84		86		43-143	%	04/06/18 16:07
2,4,6-Tribromophenol	86		88		94		26-122	%	04/06/18 16:07

Analytical Method: SW-846 8260 B Prep Method: SW5030B

Seq Number: 152101 Matrix: Water Date Prep: 04/06/18

MB Sample Id: 70790-1-BLK LCS Sample Id: 70790-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Vinyl Chloride	<0.001000	0.05000	0.05102	102	66-133	mg/L	04/06/18 10:50	
1,1-Dichloroethene	<0.001000	0.05000	0.05210	104	85-123	mg/L	04/06/18 10:50	
2-Butanone	<0.01000	0.05000	0.03437	69	45-136	mg/L	04/06/18 10:50	
Chloroform	<0.001000	0.05000	0.04523	90	76-129	mg/L	04/06/18 10:50	
Carbon Tetrachloride	<0.001000	0.05000	0.04583	92	79-133	mg/L	04/06/18 10:50	
Benzene	<0.001000	0.05000	0.05112	102	87-123	mg/L	04/06/18 10:50	
1,2-Dichloroethane	<0.001000	0.05000	0.05052	101	86-125	mg/L	04/06/18 10:50	
Trichloroethene	<0.001000	0.05000	0.05110	102	87-124	mg/L	04/06/18 10:50	
Tetrachloroethylene	<0.001000	0.05000	0.05214	104	85-131	mg/L	04/06/18 10:50	
Chlorobenzene	<0.001000	0.05000	0.05113	102	87-127	mg/L	04/06/18 10:50	
1,4-Dichlorobenzene	<0.001000	0.05000	0.05041	101	84-129	mg/L	04/06/18 10:50	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	102		96		87-109	%	04/06/18 10:50
Dibromofluoromethane	101		100		93-111	%	04/06/18 10:50
Toluene-D8	100		100		91-109	%	04/06/18 10:50

PHASE SEPARATION SCIENCE, INC.

QC Summary 18040506

Hillis Carnes Engineering Associates

SPT A3-1

Analytical Method: SW-846 8260 B Prep Method: SW5030B

Seq Number: 152101 Matrix: Soil Date Prep: 04/06/18

Parent Sample Id: 18040506-001 MS Sample Id: 18040506-001 S MSD Sample Id: 18040506-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Vinyl Chloride	<0.1000	5.000	5.307	106	5.140	103	79-128	3	25	mg/L	04/06/18 15:35	
1,1-Dichloroethene	<0.1000	5.000	5.388	108	5.175	104	74-142	4	25	mg/L	04/06/18 15:35	
2-Butanone	<1.000	5.000	4.351	87	4.787	96	68-127	10	25	mg/L	04/06/18 15:35	
Chloroform	<0.1000	5.000	4.689	94	4.512	90	81-134	4	25	mg/L	04/06/18 15:35	
Carbon Tetrachloride	<0.1000	5.000	4.727	95	4.557	91	76-144	4	25	mg/L	04/06/18 15:35	
Benzene	<0.1000	5.000	5.273	105	5.130	103	77-143	3	25	mg/L	04/06/18 15:35	
1,2-Dichloroethane	<0.1000	5.000	5.242	105	5.069	101	81-139	3	25	mg/L	04/06/18 15:35	
Trichloroethene	<0.1000	5.000	5.241	105	5.040	101	73-148	4	25	mg/L	04/06/18 15:35	
Tetrachloroethylene	<0.1000	5.000	5.217	104	5.068	101	55-166	3	25	mg/L	04/06/18 15:35	
Chlorobenzene	<0.1000	5.000	5.201	104	5.088	102	73-150	2	25	mg/L	04/06/18 15:35	
1,4-Dichlorobenzene	<0.1000	5.000	4.922	98	4.847	97	64-150	2	25	mg/L	04/06/18 15:35	

Surrogate	MS Result	MS Flag	MSD Result	MSD Flag	Limits	Units	Analysis Date
4-Bromofluorobenzene	95		95		87-109	%	04/06/18 15:35
Dibromofluoromethane	100		100		93-111	%	04/06/18 15:35
Toluene-D8	100		100		91-109	%	04/06/18 15:35

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

PHASE SEPARATION SCIENCE, INC.

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

(1) *CLIENT: Hillis-Carnes (HCEA) *OFFICE LOC. AJ
*PROJECT MGR: Keith Prosin *PHONE NO.: (410) 880-4788
EMAIL: kprosin@hcea.com FAX NO.: ( )
*PROJECT NAME: SPT A3-1 PROJECT NO.: 162803
SITE LOCATION: A3-1 P.O. NO.: POHCI106805
SAMPLER(S): Sean Hankins DW CERT NO.:

PSS Work Order #: 18040506 PAGE 1 OF 1

Matrix Codes: SW=Surface Wtr DW=Drinking Wtr GW=Ground Wtr WW=Waste Wtr O=Oil S=Soil L=Liquid SOL=Solid A=Air WI=Wipe

(2)

LAB NO.	*SAMPLE IDENTIFICATION	*DATE (SAMPLED)	*TIME (SAMPLED)	MATRIX (See Codes)	No. CONTAINERS	SAMPLE TYPE C = COMP G = GRAB	Preservatives Used	Analysis/ Method Required (3) * TCLP Metals	TCLP VOCs	TCLP SVOCs	TAL Metals	PCBs	REMARKS
1	CT-1	4/5/18	10:32am	S	4	C		X	X	X	X	X	Priority

(5)

Relinquished By: (1)	Date	Time	Received By:
	4/5/18	1120	
Relinquished By: (2)	Date	Time	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

(4)

*Requested TAT (One TAT per COC)
☐ 5-Day ☒ 3-Day ☐ 2-Day
☐ Next Day ☐ Emergency ☐ Other

Data Deliverables Required:
COA ☐ QC SUMM ☐ CLP LIKE ☐ OTHER ____

# of Coolers: 1
Custody Seal: ABS
Ice Present: PRES Temp: 1°-1°C
Shipping Carrier: Client

Special Instructions:

DW COMPLIANCE? YES ☐
EDD FORMAT TYPE ____
STATE RESULTS REPORTED TO: MD ☐ DE ☐ PA ☐ VA ☐ WV ☐ OTHER ____

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

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	18040506	**Received By**	Thomas Wingate
Client Name	Hillis Carnes Engineering Associates	**Date Received**	04/05/2018 11:20:00 AM
Project Name	SPT A3-1	**Delivered By**	Client
Project Number	16280B	**Tracking No**	Not Applicable
Disposal Date	05/10/2018	**Logged In By**	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

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

Documentation

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

Sample Container

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

Total No. of Samples Received 1 Total No. of Containers Received 4

Preservation

Total Metals	(pH<2)	N/A
Dissolved Metals, filtered within 15 minutes of collection	(pH<2)	N/A
Orthophosphorus, filtered within 15 minutes of collection		N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, DOC (field filtered), COD, Phenols	(pH<2)	N/A
TOX, TKN, NH3, Total Phos	(pH<2)	N/A
VOC, BTEX (VOA Vials Rcvd Preserved)	(pH<2)	N/A
Do VOA vials have zero headspace?		N/A
624 VOC (Rcvd at least one unpreserved VOA vial)		N/A
524 VOC (Rcvd with trip blanks)	(pH<2)	N/A

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

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

Samples Inspected/Checklist Completed By: Thomas Wingate Date: 04/05/2018

Thomas Wingate

PM Review and Approval: Amber L Confer Date: 04/05/2018

Amber Confer

GRAY & SON, INC.

EXTRA WORK REPORT

(For cost plus contracts only)

3619

JOB NO. 9912 TITLE ARCO Cust DATE 5-3-18

JOB DESCRIPTION Haul out A 3

LABOR: (list no. used)

____	FOREMAN	____ HRS. EACH
____	OPERATOR	____ HRS. EACH
3	LABORERS	2 HRS. EACH
1	LABORER	6 HRS. EACH

DUMP FEE: NO. LOADS _____

DUMP SITE _____

MATERIAL USED: (list amount)

_____ TONS STONE _____

MISC. 190 YDS to GRAYS Landfill

EQUIPMENT USED:

TYPE	IDENTIFICATION NO.	HRS. EACH	EQUIPMENT MOVES
P/U truck	VC 133		
963 CDR	Ct 454	4	1
Dump truck	VM 735	6	
"	VM 745	6	
Back Hoe	BH 327	2	

DOES THIS COMPLETE THE EXTRA WORK? YES _____ NO _____

MSimms _____ FOREMAN _____ FOR OWNER

Ticket No. 16460

APPENDIX O

N080N
TECHNICAL DATA SHEET
NONWOVEN GEOTEXTILE

N080N is a polypropylene, needle punched nonwoven geotextile for use in drainage and separation applications. It has been stabilized to resist degradation due to ultraviolet exposure and is resistant to commonly encountered mildew, insects and soil chemicals, and is non-biodegradable.

SPECIFICATIONS:

The N080N polypropylene nonwoven fabric will utilize the following characteristics:

PROPERTY	TEST METHOD	MIN. AVG. ROLL VALUE
Grab Tensile Strength[1]	ASTM D4632	205 lbs
Grab Tensile Elongation	ASTM D4632	50%
CBR Puncture	ASTM D6241	525 lbs
Trapezoid Tear Strength	ASTM D4533	80 lbs
UV Resistance @ 500 hrs	ASTMD4355	70%
Apparent Opening Size (AOS)	ASTM D4751	80 US Sieve
Permittivity (sec^{-1})	ASTM D4491	1.4 (sec^{-1})
Flow Rate	ASTM D4491	90 gpm/ft^2

Values quoted above are the result of multiple tests conducted at an independent testing facility. N080N meets or exceeds values listed.
[1] Values apply to both machine and cross-machine directions

PACKAGING:

Roll Width	12.5 ft.	15 ft.
Roll Length	360 ft.	300 ft.
Roll Area	500 yd^2	500 yd^2

NTPEP "ACF Environmental is certified and successfully complies with AASHTO's NTPEP Geotextiles Technical Committee Work Plan"

9 2015

APPENDIX P

EnviroAnalytics Group

July 18, 2018

Ms. Barbara Brown
Project Coordinator
Maryland Department of the Environment
1800 Washington Boulevard
Baltimore, MD 21230

Re: Northern Access Road Construction & Landscape Capping Implementation
Area A: Sub-Parcel A3-1
Tradepoint Atlantic
Sparrows Point, MD 21219

Dear Ms. Brown:

This letter provides updates to the Maryland Department of the Environment (MDE) and United States Environmental Protection Agency (USEPA) regarding the ongoing development of Sub-Parcel A3-1 (the Site). The position of Sub-Parcel A3-1 within the greater Tradepoint Atlantic property is provided on **Figure 1**. Parcel A3 comprises approximately 64 acres of the approximately 3,100-acre former steel mill property, and is the location of the former Rod & Wire Mill. A Response and Development Work Plan (RADWP) for the 54 acres that were designated as Sub-Parcel A3-1 has already been submitted to, and approved, by the MDE and USEPA. The final version of the RADWP (Revision 3 dated April 24, 2017; updated June 5, 2017) was approved for implementation by the MDE on April 28, 2017, and final approval was received from the USEPA on June 20, 2017. The objectives of this letter are to 1) provide clarification that the northern access road connecting Sub-Parcel A3-1 to Bethlehem Boulevard is being implemented as shown on a revised set of development drawings included in the approved RADWP; and 2) to notify the agencies that EAG (instead of Tradepoint Atlantic) will be implementing the landscape capping remedy in the northern portion of the Site.

TPA will be constructing an access road from the northern portion of the Site which will connect to Bethlehem Boulevard. Due to late-term revisions in the development plans provided by Tradepoint Atlantic in March 2017, the final RADWP was submitted with two versions of the development plans within *Appendix E*. The more recent version of the development plans (dated March 2017) displayed the access road, while the older development plans (dated November 2016) did not. For convenience, the March 2017 development plan sheet C2.0 is provided with this letter as **Attachment 1**. Tradepoint Atlantic recently provided a redline drawing (**Attachment 2**) which shows the current edge of pavement and the development plan for the access road. The proposed road cross section (**Attachment 3**) shows the full thickness of

pavement and subbase that will be placed over the existing soil. The proposed cross section meets the requirements set in the approved RADWP, which specified a total of 8 inches of capping (with 4 inches of subbase and 4 inches of asphalt).

EAG, rather than Tradepoint Atlantic, will be implementing the required landscape capping remedy in the northern portion of Sub-Parcel A3-1 in the vicinity of the former East Pond and Northwest Pond (identified in the RADWP), and an existing active substation. EAG has elected to implement the capping remedy in this area and carry out all of the specific requirements for installation as described in the approved RADWP. The proposed extent of the EAG landscape capping remedy consists of 5.1 acres located in the northern portion of the Site, as pictured in **Figure 2**. The RADWP concluded and specified that a capping remedy was required to be implemented for the entire 54 acres of Sub-Parcel A3-1; therefore, the cap will be constructed in accordance with all of the requirements given in the RADWP. This landscaping area will be covered by the same Development Completion Report as the remainder of Sub-Parcel A3-1.

Fill materials used in the landscape capping remedy must meet the MDE's industrial clean fill requirements. If materials stockpiled on the Tradepoint Atlantic property will be used as a component of the capping remedy, these materials will be subject to testing protocols that meet the MDE's requirements as specified in email correspondence received on June 27, 2018. One 10-point composite sample will be required for every 2,000 cubic yards of material. Each composite sample will be tested for full metals, semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), and total petroleum hydrocarbons (TPH) diesel range organics (DRO), to ensure that the material can be certified as clean. The MDE will review and approve all sampling results prior to the use of the proposed material at the Site.

At this time, EAG is requesting agency approval to proceed with the proposed northern access road and landscape capping remedy. If you have any questions, or if we can provide any additional information at this time, please do not hesitate to contact me.

Sincerely,

James Calenda

James Calenda
Senior Project Manager

cc: Ruth Prince

FIGURES

Site Boundary
Parcel Boundaries
Development Boundary
Private Property

Parcel A9
Parcel A5
Parcel A13
Parcel A7
Parcel A14
Parcel A11
Parcel A8
Parcel A12
Parcel A15
Parcel A2
Parcel A17
Parcel A18
Parcel A16
Parcel A6
A3-1
Parcel A4
Parcel A1
Parcel A10
Parcel A3
Parcel B6
Parcel B8
Parcel B14
Parcel B22
Parcel B16
Parcel B21
Parcel B24
Parcel B15
Parcel B23
Parcel B25
Parcel B7
Parcel B1
Parcel B2
Parcel B3
Parcel B17
Parcel B19
Parcel B4
Parcel B5
Parcel B9
Parcel B18
Parcel B10
Parcel B13
Parcel B20
Parcel B11
Parcel B12

Tradepoint Atlantic
Area A and Area B Parcels

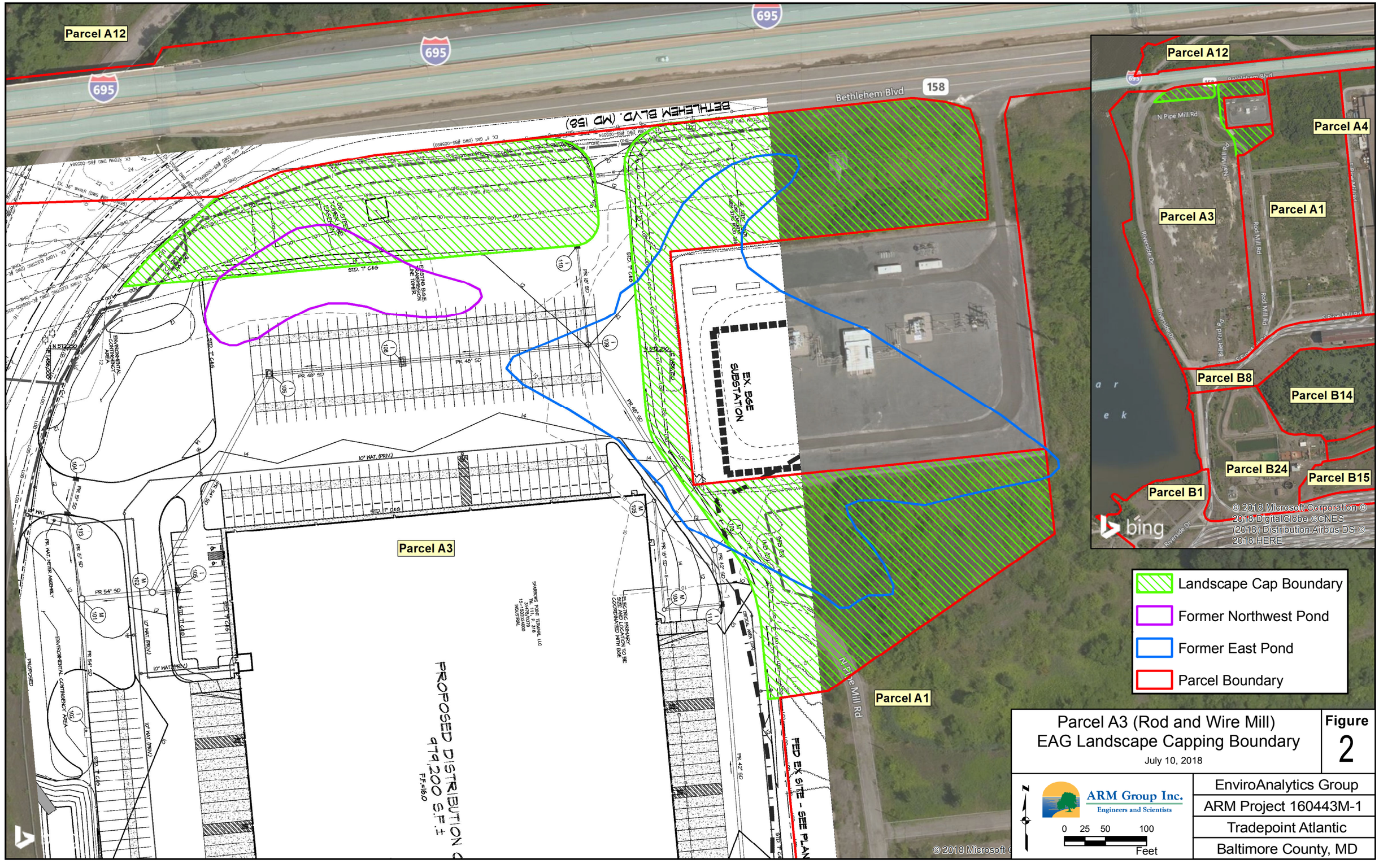
July 9, 2018

Figure 1

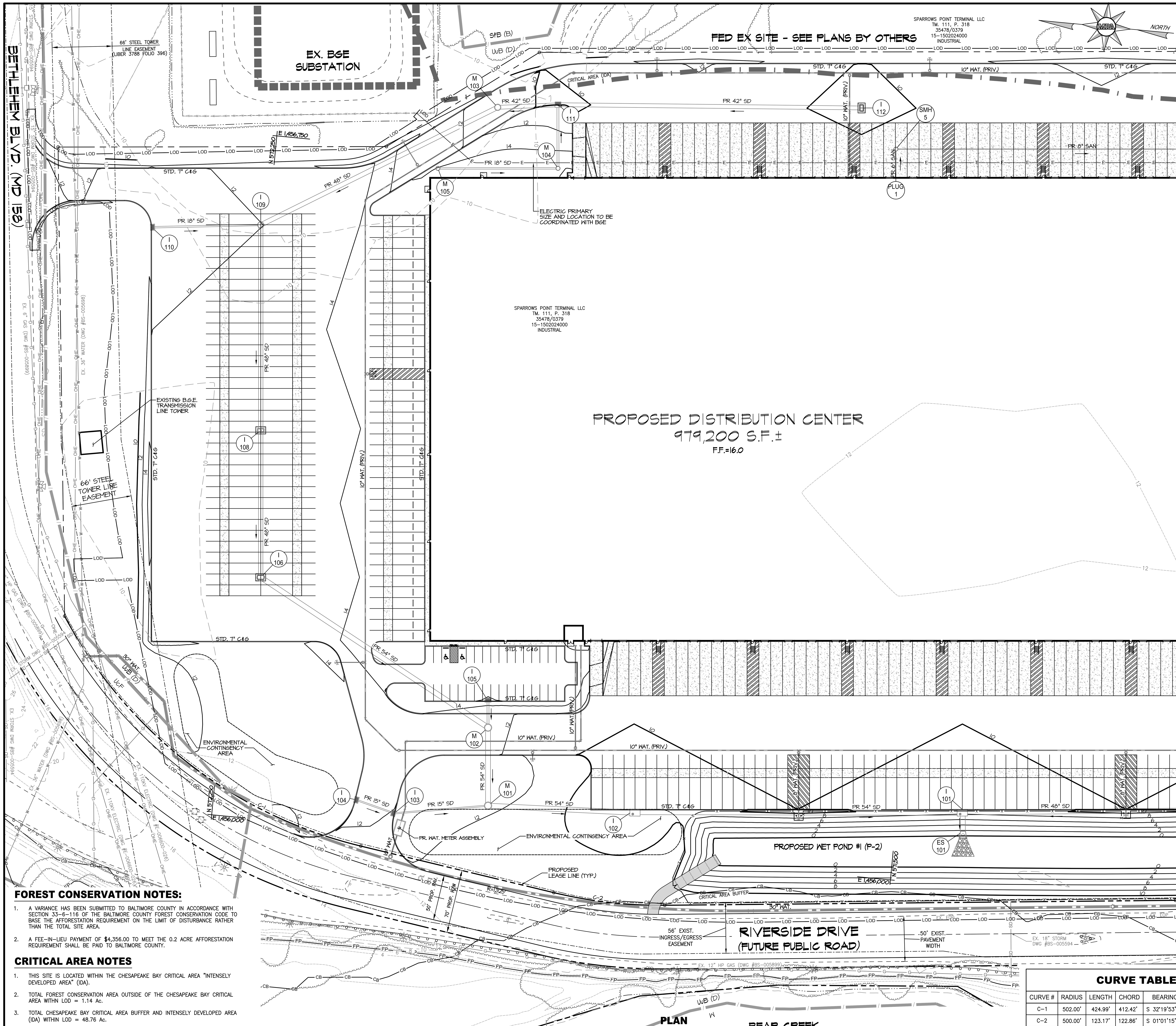
ARM Group Inc.
Engineers and Scientists

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

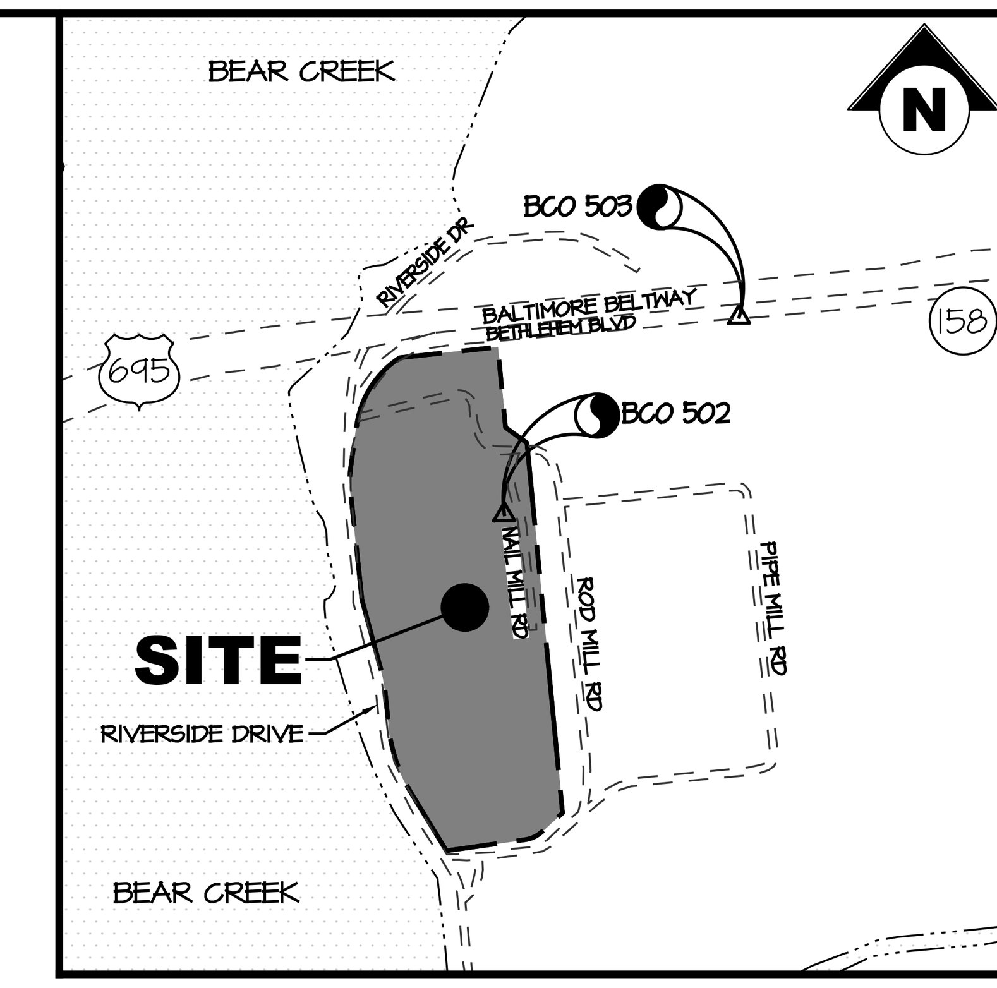

Parcel A12
695
Bethlehem Blvd
158
BETHLEHEM BLVD. (MD 158)
EX. BGE SUBSTATION
EXISTING B.G.E. TRANSMISSION LINE TOWER
Parcel A3
PROPOSED DISTRIBUTION C
979,200 S.F.±
F.F.=16.0
FED EX SITE - SEE PLAN
N Pipe Mill Rd
Parcel A1
Parcel A4
Parcel B8
Parcel B14
Parcel B24
Parcel B15
Parcel B1
Riverside Dr
Rod Mill Rd
Nail Mill Rd
Billet Yard Rd
© 2018 Microsoft Corporation © 2018 DigitalGlobe ©CNES (2018) Distribution Airbus DS © 2018 HERE
bing
Landscape Cap Boundary
Former Northwest Pond
Former East Pond
Parcel Boundary
Parcel A3 (Rod and Wire Mill)
EAG Landscape Capping Boundary
July 10, 2018
Figure
2
ARM Group Inc.
Engineers and Scientists
0 25 50 100
Feet
EnviroAnalytics Group
ARM Project 160443M-1
Tradepoint Atlantic
Baltimore County, MD

Attachment 1



PLAN

SCALE: 1" = 50'



VICINITY MAP

SCALE: 1" = 1000'

BENCHMARKS

BCO 502 – PIN & CAP
ELEV. 11.73
WEST SIDE NAIL MILL ROAD
N 571,617.57
E 1,456,749.20

BCO 503 – PIN & CAP
ELEV. 14.83
SOUTH SIDE 695
N 572,645.36
E 1,457,970.96

GENERAL NOTES:

1. THE PROPOSED GRADING SHOWN ON THIS PLAN MEETS THE REQUIREMENTS SET FORTH BY THE BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY AND COMPLIES WITH ARTICLE 33, TITLE 5 OF THE BALTIMORE COUNTY CODE. HOWEVER, DUE TO BUILDING TYPES AND LAYOUT, SOME FIELD ADJUSTMENTS MAY BE REQUIRED. ALL CHANGES MUST COMPLY WITH THE ABOVE MENTIONED REQUIREMENTS.
2. ALL SWALES HAVE BEEN DESIGNED BY THE ENGINEER TO CONVEY RUNOFF ACCORDING TO BALTIMORE COUNTY DEPARTMENT OF PUBLIC WORKS DESIGN STANDARDS.
3. THERE SHALL BE NO CLEARING, GRADING, CONSTRUCTION OR DISTURBANCE OF VEGETATION IN THE CRITICAL AREA BUFFER, EXCEPT AS PERMITTED BY THE BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY.
4. STORMWATER MANAGEMENT HAS BEEN ADDRESSED THROUGH ENVIRONMENTAL SITE DESIGN TO THE MAXIMUM EXTENT PRACTICAL.
5. ALL WORK WITHIN THE STATE RIGHT–OF–WAY SHALL BE IN ACCORDANCE WITH SHA ACCESS PERMIT NO. 00APBA000–XX AND SHA UTILITY PERMIT NO. TO BE ISSUED AT START OF CONSTRUCTION.
6. THE PROPOSED FIRST FLOOR WILL BE CONCRETE SLAB AND PROPOSED WALLS WILL BE CONCRETE BLOCK.

NOTE

THE CORRECTNESS OR COMPLETENESS OF EXISTING INFORMATION SHOWN ON THE DRAWINGS IS NOT WARRANTED OR GUARANTEED. THE CONTRACTOR SHALL VERIFY THE LOCATION OF UTILITIES AND UNDERGROUND FACILITIES, BY TEST PITS OR OTHER METHODS APPROVED BY THE OWNER'S REPRESENTATIVE, AS REQUIRED TO VERIFY EXACT LOCATIONS AND DEPTHS WITHIN THE LIMIT OF DISTURBANCE. ALL DISCREPANCIES BETWEEN INFORMATION SHOWN ON THE DRAWINGS AND THAT VERIFIED IN THE FIELD SHALL BE REPORTED TO THE OWNER'S REPRESENTATIVE PRIOR TO BEGINNING WORK.

CONCRETE NOTE:

THE CONTRACTOR SHALL VERIFY CONCRETE FORM PLACEMENT TO ASSURE COMPLIANCE WITH CURRENT LOCAL AND STATE ADA AS WELL AS BUILDING CODES. ADA INSPECTION SHALL BE REQUIRED PRIOR TO POURING CONCRETE. THE CONTRACTOR ACCEPTS RESPONSIBILITY FOR MEETING ALL APPLICABLE HANDICAP SLOPE AND DISTANCE REQUIREMENTS AS WELL AS OTHER REQUIREMENTS AS STATED IN THE APPLICABLE CODES.

ANY DISCREPANCIES FOUND SHOULD BE BROUGHT TO THE SITE ENGINEER'S ATTENTION BEFORE ANY CONCRETE IS PLACED.

GRADING OWNER'S/DEVELOPER'S CERTIFICATION

I/WE CERTIFY THAT ALL GRADING ON THIS SITE WILL BE DONE IN ACCORDANCE WITH THE CURRENT GRADING REQUIREMENTS AS SET FORTH BY THE BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY AND WITH THE REQUIREMENTS SPECIFIED IN ARTICLE 33, TITLE 5 OF THE BALTIMORE COUNTY CODE.

SIGNATURE OF OWNER/DEVELOPER　　TITLE　　DATE

PRINT NAME

BALTIMORE COUNTY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
AND SUSTAINABILITY

APPROVED FOR GRADING

DATE

STORMWATER MANAGEMENT REQUIRED

GRADING PERMIT #X000000
SWM PERMIT # X000000
DRC # 071916D
L.O.D. = 2,173,400 S.F. (49.90 AC.)

FOREST CONSERVATION NOTES:

1. A VARIANCE HAS BEEN SUBMITTED TO BALTIMORE COUNTY IN ACCORDANCE WITH SECTION 33–6–116 OF THE BALTIMORE COUNTY FOREST CONSERVATION CODE TO BASE THE AFFORESTATION REQUIREMENT ON THE LIMIT OF DISTURBANCE RATHER THAN THE TOTAL SITE AREA.
2. A FEE–IN–LIEU PAYMENT OF $4,356.00 TO MEET THE 0.2 ACRE AFFORESTATION REQUIREMENT SHALL BE PAID TO BALTIMORE COUNTY.

CRITICAL AREA NOTES

1. THIS SITE IS LOCATED WITHIN THE CHESAPEAKE BAY CRITICAL AREA "INTENSELY DEVELOPED AREA" (IDA).
2. TOTAL FOREST CONSERVATION AREA OUTSIDE OF THE CHESAPEAKE BAY CRITICAL AREA WITHN LOD = 1.14 Ac.
3. TOTAL CHESAPEAKE BAY CRITICAL AREA BUFFER AND INTENSELY DEVELOPED AREA (IDA) WITHIN LOD = 48.76 Ac.

CURVE TABLE

CURVE #	RADIUS	LENGTH	CHORD	BEARING	DELTA	TANGENT
C–1	502.00'	424.99'	412.42'	S 32°19'53" W	048°30'	226.17'
C–2	500.00'	123.17'	122.86'	S 01°01'15" W	014°07'	61.90'

0'　25'　50'　100'
SCALE: 1"=50'

CONSULTING ENGINEERS

ARCHITECT: GMA ARCHITECTS
900-North Rock Hill Road
St. Louis, MI 63119
(P) 314-822-5197 (F) 314-963-0714

STRUCTURAL: McNEALY ENGINEERING INC.
11457 Olde Cabin Road, Suite 350
St. Louis, MO 63141
(P) 314-997-7310

MECHANICAL:

ELECTRICAL: AEDIFICA CASE ENGINEERING
796 MERUS COURT
FENTON, MO 63206
(P) 636-349-1600

PLUMBING: AEDIFICA CASE ENGINEERING
796 MERUS COURT
FENTON, MO 63206
(P) 636-349-1600

FIRE PROTECTION:

CONTRACTOR
ARCO MURRAY DESIGN BUILD
3110 WOODCREEK DRIVE
DOWNERS GROVE, IL 60515
(P) 331-251-2726 (F) 331-251-2701
WWW.ARCOMURRAY.COM

CIVIL
MRA
MORRIS & RITCHIE ASSOCIATES, INC.
1220-C East Joppa Road, Suite 505
Towson, MD 21286
(P) 410-821-1690

NEW WAREHOUSE / DISTRIBUTION CENTER

A3 SPECULATIVE BUILDING

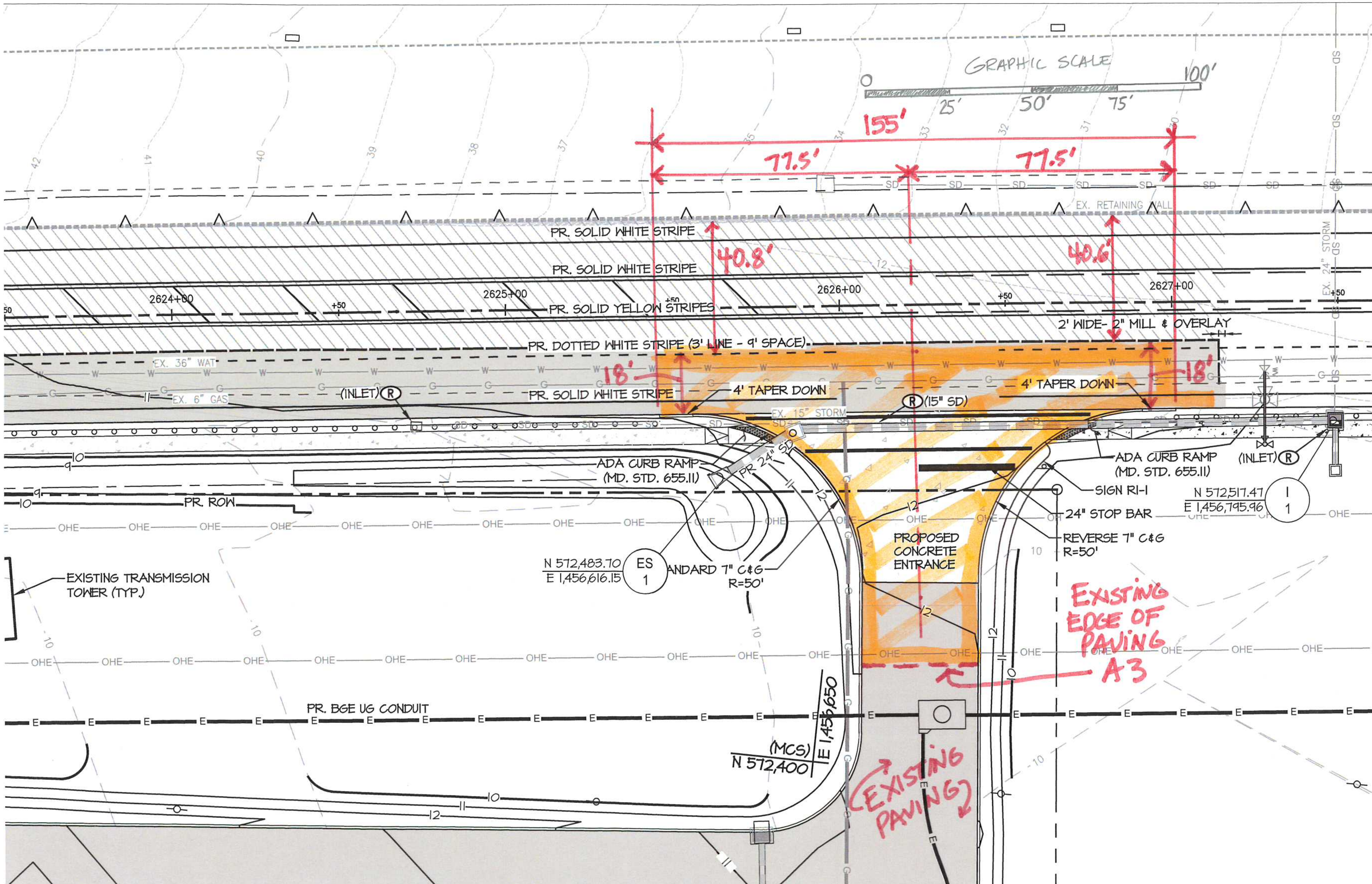
SPARROWS POINT, MD 21219

JOB NO : 19287x01
PA :
DATE : 03.17.2017

REVISIONS △

SHEET NUMBER
C2.0
FINAL GRADING PLAN

Attachment 2



A3

NOTE:
INCREASE OF IMPERVIOUS AREA (THIS SHEET) = 10,454 SQ. FT.±

NOTE:

CONTRACTOR TO CONTACT ENGINEER AT TIME OF CONSTRUCTION TO OBTAIN PR GRADES & VERIFY CUT SHEET INFORMATION

NOTE:

BETHLEHEM BOULEVARD (MD 158) IS A URBAN MAJOR COLLECTOR ROAD, THE POSTED SPEED LIMIT IS 40 MPH.

E&SC NOTE:

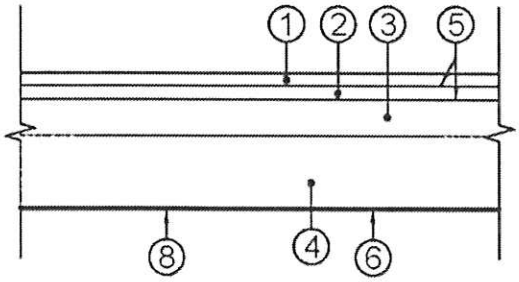
PLEASE REFER TO THE APPROVED EROSION & SEDIMENT CONTROL PLANS FOR SEQUENCE OF CONSTRUCTION AND SEDIMENT CONTROL MEASURES FOR TH CONSTRUCTION OF BETHLEHEM BOULEVARD (MD 158).

SWM NOTE:

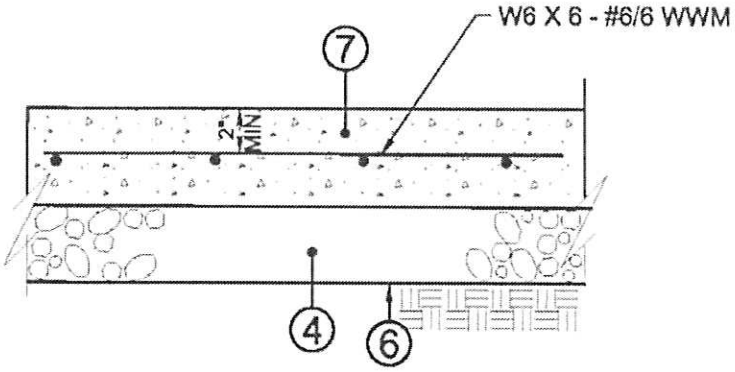
PLEASE REFER TO THE APPROVED STORMWATER MANAGEMENT PLANS FOR SEQUENCE OF CONSTRUCTION AND DESIGN CRITERIA OF SWM FACILITIES WITHIN MDSHA RIGHT-OF-WAY.

30 0 30

Attachment 3



PAVEMENT SECTION - ENTRANCE ROAD
NOT TO SCALE



CONCRETE PAVEMENT SECTION - NEW ENTRANCE
NOT TO SCALE

(1) 2" SURFACE COURSE, 12.5MM PG 64-22 LEVEL 2

(2) 2" INTERMEDIATE COURSE, 12.5MM PG 64-22 LEVEL 2

(3) 6" BASE COURSE, 19.0MM PG 64-22 LEVEL 2 PLACED IN 2-3" LAYERS

(4) 12" UNTREATED GRADED AGGREGATE BASE

(5) TACK COAT

(6) LIMIT OF CLASS I EXCAVATION AND TOP OF SUBGRADE

(7) 8" SHA MIX NO. 9 CONCRETE

(8) GEOTEXTILE FABRIC

APPENDIX Q

Development Photograph Log
Parcel A3 Landscape Capping Area
Sparrows Point, Maryland

032020-1: Placing geotextile marker fabric over the portion of the site south of the substation following the completion of rough grading.

032320-1: Placing and grading clean fill material.

042020-1: Grading stakes used to measure clean fill depth.

042020-2: Cutting in the northwestern section of the capping area to approximately 18” below the initial grade.

042320-1: Placing clean fill material in the northwestern capping area.

042320-2: 6” concrete collar placed around an electrical manhole in the northwestern capping area.

050420-1: Cutting material around the footprint of the large electrical tower in the northwestern capping area.

Photo 12: Geotextile marker fabric and #57 stone placed around the footprint of the electrical tower.

050520-1: Grounding cables exposed just below the surface while cutting around the electrical tower in the northern capping area. Cables were replaced by BGE contractors prior to filling in the area.

060420-1: Cutting around the three monopole towers in the northern capping area.

060920-1: Seeding and stabilization in place following the completion of filling and grading in the south of the substation.

060920-2: Cutting around the electrical manhole and a monopole electrical tower north of the substation.

061920-1: Area west of the substation excavated around a monopole electrical tower and a monitoring well pair.

071320-1: New drainage swale stretching from the northwest corner of the substation to a stormwater inlet adjacent to Bethlehem Boulevard.