Phase II Investigation
Work Plan

Area B: Parcel B3
Tradepoint Atlantic
Sparrows Point, Maryland

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ARM Project 150300M-4

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1.0 INTRODUCTION

1.1. INTRODUCTION

ARM Group Inc. (ARM), on behalf of EnviroAnalytics Group (EAG), has prepared the following Work Plan to complete a Phase II site investigation on a portion of the Tradepoint Atlantic property that has been designated as Area B, Parcel B3 (the Site). Parcel B3 is comprised of approximately 54.3 acres of the approximately 3,100-acre former plant property located as shown on **Figure 1**.

Site characterization of Parcel B3 will be performed in compliance with requirements pursuant to the following:

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

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

Parcel B3 is part of the acreage that was removed (Carveout Area) from inclusion in the Multimedia Consent Decree between Bethlehem Steel Corporation, the United States Environmental Protection Agency (EPA), and the Maryland Department of the Environment (MDE) (effective October 8, 1997) as documented in correspondence received from EPA on September 12, 2014. Based on this agreement, EPA has determined that no further investigation or corrective measures will be required under the terms of the Consent Decree for the Carveout Area. However, the SA reflects that the property within the Carveout Area will remain subject to the EPA's RCRA Corrective Action authorities.

Tradepoint Atlantic has developed an initial master plan that shows potential future development areas across the entire Tradepoint Atlantic property. This master plan is a working document and it is expected to undergo subsequent revisions in the future. Based on this document and additional development information provided by EAG, 100% of the total area within Parcel B3 may ultimately be proposed for development and associated environmental capping as appropriate. The parcel contains several buildings proposed for demolition, including a former

Security Building and Offices, former Information Services Building, and former Administrative Building (now under the authority of Tradepoint Atlantic). The Site also contains the main Tradepoint Atlantic Office and the former Roll Grinding Facility, now occupied by MCM Construction Inc. (MCM), which will remain occupied and may be redeveloped based on future needs of the property.

The Roll Grinding Facility was located to the southwest of the main Tradepoint Atlantic entrance on 7th Street. The specific activities completed within the Roll Grinding Facility are unknown, but the building remains intact. The facility is currently leased by MCM and used as an office space. MCM equipment is also stored in a large warehouse portion of the building. MCM is currently responsible for cleaning and otherwise improving the structure. Prior to its construction, an Environmental Site Assessment (ESA) was completed for the proposed location of the building, yielding a limited amount of analytical data for soil and groundwater in the parcel. There is no evidence that other significant iron and steel work processes were completed within Parcel B3.

The objective of this Phase II Investigation is to identify the presence or absence of any existing hazardous conditions for future tenants or personnel working on the Site. During the Phase II Investigation, a total of 30 soil borings samples and seven (7) soil gas samples will be collected and analyzed to assess the presence or absence of contamination in Parcel B3. Groundwater at the Site has been previously investigated by the separate Area B Groundwater Investigation (conducted in accordance with the approved Phase II Investigation Work Plan: Area B Groundwater Investigation dated and submitted October 6, 2015) and Finishing Mills Groundwater Investigation (conducted in accordance with the approved Phase II Investigation Work Plan: Finishing Mills Groundwater Investigation dated and submitted July 7, 2016). Following the receipt of soil analytical data, a Human Health Screening Level Risk Analysis (SLRA) will be completed to evaluate the potential risk to future workers, and a Phase II Investigation Report will be prepared to summarize the findings.

1.2. SITE BACKGROUND

From the late 1800s until 2012, the production and manufacturing of steel was conducted at Sparrows Point. Iron and steel production operations and processes at Sparrows Point included raw material handling, coke production, sinter production, iron production, steel production, and semi-finished and finished product preparation. In 1970, Sparrows Point was the largest steel facility in the United States, producing hot and cold rolled sheets, coated materials, pipes, plates, and rod and wire. The steel making operations at the facility ceased in fall 2012.

Groundcover at the Site is comprised of approximately 99% natural soils and 1% slag based on the approximate shoreline of the Sparrows Point Peninsula in 1916, as shown on **Figure 2**

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

Parcel B3 was formerly occupied by numerous active buildings, including the main Employee Services and Human Resources Building (now the Tradepoint Atlantic Office), the Administrative Building, the former Information Services Building, the Patapsco and Back Rivers Railroad Office (converted to a Security Building and Offices), and a Training Department (pre-dating the Roll Grinding Facility). A site visit by ARM personnel on November 3, 2016 verified that these buildings are still intact (with the exception of the old Training Department), and several extensive parking areas are present near these structures. A former industrial water supply well (Deep Well No. 10) is present in the parking lot to the west of the Tradepoint Atlantic Office. This well has not been abandoned but is no longer is use.

At the time of the Phase I ESA prepared by Weaver Boos Consultants (May 19, 2014), the main Employee Services and Human Resources Building was vacant and inactive. In October 2015, the Tradepoint Atlantic administrative offices in the former Security Building were relocated into the main Employee Services and Human Resources Building. This building is expected to remain in use, and will not be demolished. The former Roll Grinding Facility is currently occupied by MCM and will also remain in use. The former Security Building and Offices, the former Information Services Building, and the former Administration Building are all proposed for demolition.

1.2.1. Background Environmental Data

The Roll Grinding Facility is located in the central portion of Parcel B3, currently surrounded by open land. Prior to its construction, the building footprint and immediate surrounding areas were characterized by the Roll Grinding Facility Report of Environmental Site Assessment prepared by Whitman, Requardt and Associates, LLP (May 6, 1998).

The purpose of the Roll Grinding Facility Report was to characterize the current conditions at the build site to determine whether it was a suitable location for the structure. As part of the assessment, six soil borings and three monitoring wells were completed in March 1998. Soil boring locations consisted of B-1 through B-7, with the exception of B-4 (cancelled). From among these soil borings, five locations and depth intervals were selected for analytical testing and given unique sample IDs, as follows:

Sample ID	Sample Info
#1A	B-1 (4.0 to 4.5 feet)
#1B	B-1 (7.0 to 7.5 feet)
#2	B-2 (9.5 to 10.0 feet)
#3A	B-3 (4.0 to 4.5 feet)
#3B	B-3 (7.0 to 7.5 feet)

Groundwater monitoring well locations consisted of B-8 through B-10. Groundwater samples were collected from each of the three monitoring wells on April 3, 1998 and sent for analytical testing. The analytical results for the selected soil and groundwater locations are included as **Appendix A** and **Appendix B**, respectively, with applicable Project Action Limit (PAL) exceedances highlighted.

The soil analysis resulted in no detections of pesticides, PCBs, VOCs, or SVOCs. Soil sample #3B (Boring B-3 from 7.0 to 7.5 feet) exceeded the applicable solid PAL for arsenic, but no other soil exceedances were noted. The groundwater analysis resulted in no detections of pesticides, PCBs, cyanide, VOCs, or SVOCs. Groundwater sample B-8 exceeded the applicable aqueous PAL for nickel, but no other groundwater exceedances were evident. **Figure 3** displays the locations of the samples gathered as part of the 1996 Roll Grinding Facility Report. Besides the information contained in the Roll Grinding Facility Report, these is no additional historical data available for the parcel.

Prior to the Area B and Finishing Mills Groundwater Investigations, there were no existing groundwater collection points within Parcel B3. Several new wells and piezometers were installed within and surrounding the parcel and these groundwater locations were sampled during the Area B Groundwater Investigation and Finishing Mills Groundwater Investigation. The results from the recent groundwater sampling events (January 2016 to July 2016) for the locations relevant to Parcel B3 are provided in **Appendix C**. Any aqueous PAL exceedances in the recently obtained groundwater data are highlighted. The appendix also indicates the screened interval, as well as the hydrogeologic zone, for each of the existing wells/piezometers. In accordance with the relevant approved Work Plans (Area B and Finishing Mills Groundwater Investigations), each of the sampling locations included in the groundwater study was checked for non-aqueous phase liquid (NAPL) using an oil-water interface probe prior to sampling. None of the wells or piezometers in the vicinity of Parcel B3 showed evidence of NAPL during the required measurements.

There is no historical soil gas data available from this parcel.

1.3. SAMPLING DESIGN AND RATIONALE

1.3.1. Soil Sampling Targets

Parcel B3 contains a total of 54.3 acres: 32.6 acres without engineered barriers and 21.7 acres with engineered barriers (parking/roads or building slabs). The current engineered barriers were used to define the density requirements for the parcel. In accordance with the relevant sampling density requirements set forth in the Quality Assurance Project Plan (QAPP) Worksheet 17 – Sampling Design and Rationale, a minimum of 22 soil boring locations are required in the areas without engineered barriers, and a minimum of 8 soil boring locations are required in the areas

with engineered barriers. A total of 22 borings have been proposed in areas without engineered barriers and a total of 8 borings have been proposed in areas with engineered barriers**. Figure 4** shows the proposed borings on an aerial image to indicate locations of borings with regard to physical landmarks. This figure acts as a reference map and indicates the boring IDs assigned to each individual location. The soil boring IDs have been abbreviated on all subsequent soil sampling figures. **Figure 5** shows the locations of the borings relative to current engineered barriers within Parcel B3. Sampling locations were selected as follows.

Across the whole Tradepoint Atlantic property, several buildings and facilities may have been historical sources of environmental contamination. These areas were identified as targets for sampling through a careful review of historical documents. The first sampling targets to be identified were Recognized Environmental Conditions (RECs), if they exist, that are located within the Site boundaries as shown on the REC Location Map provided in the Phase I ESA prepared by Weaver Boos Consultants dated May 19, 2014. Weaver Boos completed site visits of Sparrows Point from February 19 through 21, 2014, for the purpose of characterizing current conditions at the former steel plant. All RECs would be targeted with at least three (3) borings. There were no RECs identified at the Site.

A second group of sampling targets was defined, if necessary, based on previous RCRA Facility Assessment (RFA) documentation and a previous visual site inspection (VSI) prepared by A.T. Kearney, Inc. (dated August 1993) provided in the DCC Report. The purpose of the VSI was to identify Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) on the property. SWMUs and AOCs, if present, were identified from the DCC report Figure 3-1. There were no SWMUs or AOCs that were identified at the Site based on this figure, and no additional units were identified from the DCC report Table 3-1. **Figure 6** shows the proposed borings overlain on the DCC figure, which shows the SWMUs, AOCs, and main facility areas within the property boundaries.

Following the identification of all RECs, SWMUs, and AOCs, four (4) sets of historical site drawings were reviewed to identify additional sampling targets. These site drawings included the 5000 Set (Plant Arrangement), the 5100 Set (Plant Index), the 5500 Set (Plant Sewer Lines), and a set of drawings indicating coke oven gas distribution drip leg locations. Sampling target locations were identified if the historical site drawings depicted industrial activities or a specific feature at a location that may have been a source of environmental contamination that impacted the Site. Drip legs are points throughout the distribution system where coke oven gas condensate was removed from the gas pipelines. The condensate from the drip legs was typically discharged to drums, although it is possible some spilled out of the drums and on to the ground. There were no drip legs identified within the parcel boundaries based on this final drawing set. **Figures 7 through 9** show the proposed borings and the parcel boundary overlain on the 5000 Set, 5100 Set, and 5500 Set, respectively. A summary of the specific drawings covering the Site is presented in the table below:

Parcel B3 Historical Site Drawings Details				
Set Name	Typical Features Shown	Drawing Number	Original Date Drawn	Latest Revision Date
Plant Arrangement	Roads, water bodies, building/structure footprints, electric lines, above-ground pipelines (e.g.: steam, nitrogen, etc.)	5023	9/8/1958	3/11/1982
		5028	6/24/1959	3/11/1982
		5029	8/25/1959	3/11/1982
		5035	9/1/1958	3/19/1982
Plant Index	Roads, water bodies, demolished buildings/structures, electric lines, above-ground pipelines	5123	*Unknown*	11/7/2008
		5128	*Unknown*	12/14/2007
		5129	*Unknown*	9/10/2009
		5135	*Unknown*	7/11/2008
Plant Sewer Lines	Same as above plus trenches, sumps, underground piping (includes pipe materials)	5523	*Unknown*	2/24/1982
		5528	*Unknown*	9/10/2008
		5529	8/26/1959	7/14/1992
		5535	*Unknown*	5/28/1976
Drip Legs	Coke Oven Gas Drip Legs Locations	5886B	*Unknown*	Sept. 1988

A list and figure of former PCB-containing transformer equipment was also reviewed for inclusion as additional targets. There were no possible PCB-contaminated equipment areas identified in the parcel based on this information.

The number of proposed borings that targeted a specific feature is directly related to the size and likely historical presence of materials that could have impacted the Site. Careful review of the geospatially referenced figures and review of other historical documents (previously discussed) yielded the proposed boring locations. Based on this criterion, the following sample targets were identified at the Site: Electric Substations, Roll Grinding Facility, Roll Grinding Facility Sanitary Line, and Temporary Stockpile and Laydown Area. One former underground storage tank (UST) was identified from the Closure of Underground Storage Tanks Report prepared by Geraghty & Miller, Inc. (June 1992). This UST was removed on December 6, 1989, and the field sketches indicating the location of the tank are provided in **Appendix D**. The Former #2 Fuel Oil UST was added as an additional sampling target. ARM conducted a site-visit on May 3, 2017 to verify the location of the former UST on the west side of the current Tradepoint Atlantic Office. The location of the former UST was confirmed during the site-visit via the positive identification of landmarks in the vicinity of the former tank, most notably the "vent pipe" identified on the field sketches. A photograph log from the site visit is also included in **Appendix D**, following the field sketches.

When a sampling target was identified, at least two borings were placed at or around its location using GIS software (ArcMap Version 10.3.1). Sample locations were also added to fill in large spatial gaps between proposed borings within the Site and to meet the sample density requirements set forth in the QAPP Worksheet 17 – Sampling Design and Rationale. The full list of sample targets, along with the specific rationale for sampling each target, is given in **Appendix E**.

1.3.2. Groundwater

Groundwater at the Site was investigated as described in the Area B Groundwater Investigation and Finishing Mills Groundwater Investigation Work Plans. The groundwater sample locations from these separate plans are shown on **Figure 10**. Groundwater analytical data has been provided in **Appendix C** for each of the identified wells/piezometers. Based on the coverage specified in the Area B and Finishing Mills Groundwater Investigation Work Plans, no additional groundwater samples are warranted.

1.3.3. Sub-Slab Soil Gas

Sub-slab soil gas investigations of the Tradepoint Atlantic Office (formerly the Employee Services and Human Resources Building) and MCM Building (formerly the Roll Grinding Facility) are necessary to verify that conditions below the buildings do not pose a potentially unacceptable risk to current and future workers occupying the buildings via the vapor intrusion to indoor air risk pathway. The Tradepoint Atlantic Office and MCM Building have areas of approximately 63,300 ft^2 and 35,600 ft^2, respectively. Approximately half of the Tradepoint Atlantic Office (29,000 ft^2) currently has a crawl space installed below the floor slab, and is not proposed for sub-slab soil gas investigation. According to the density requirement given in QAPP Worksheet 17 – Sampling Design and Rationale, three (3) sampling locations are required for the Tradepoint Atlantic Office (excluding the crawl space area) and three (3) sampling locations are required for the MCM Building. Sub-slab soil gas samples have been included in the parcel specific sampling plan, with four (4) locations (B3-031-SG, B3-032-SG, B3-033-SG, and B3-034-SG) targeting the MCM Building and three (3) locations (B3-035-SG, B3-036-SG, and B3-037-SG) targeting the Tradepoint Atlantic Office. **Figures 11 and 12** display the locations of these proposed sub-slab soil gas samples.

2.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

2.1. PROJECT PERSONNEL

The site characterization of Area B Parcel B3 will be conducted by ARM under a contract with EAG. ARM will provide project planning, field sampling and reporting support. The required drilling, Geoprobe® and laboratory services will be contracted directly by EAG. The management, field, and laboratory responsibilities of key project personnel are defined in this section.

The ARM Project Manager, Mr. Eric Magdar is responsible for ensuring that all activities are conducted in accordance with this Work Plan and the contract requirements. Mr. Magdar will provide technical coordination with the MDE, EPA and EAG. The ARM Project Manager is responsible for managing all operations conducted for this project including:

- Ensure all personnel assigned to this project review the technical project plans before initiation of all tasks associated with the project.
- Review of project plans in a timely manner.
- Ensure proper methods and procedures are implemented to collect representative samples.
- Monitor the project budget and schedule and ensure the availability of necessary personnel, equipment, subcontractors, and other necessary services.

The lead ARM Project Scientist, Mr. Nicholas Kurtz, will be responsible for coordinating field activities including the collection, preservation, documentation and shipment of samples. Mr. Kurtz will directly communicate with the ARM Project Manager and Laboratory Project Manager on issues pertaining to sample shipments, schedules, container requirements, and other necessary issues. Mr. Kurtz is also responsible for ensuring the accuracy of sample documentation including the completion of the chain-of-custody (CoC) forms.

Pace Analytical Services, Inc. (PACE) of Greensburg, Pennsylvania will provide the analytical services for this project. The address for the laboratory is as follows:

Pace Analytical
1638 Roseytown Road
Greensburg, PA 15601

During the field activities, the Laboratory Project Manager will coordinate directly with the ARM Project Manager on issues regarding sample shipments, schedules, container requirements, and other field-laboratory logistics. The Laboratory Project Manager will monitor the daily activities of the laboratory, coordinate all production activities, and ensure that work is being

conducted as specified in this document. Ms. Samantha Bayura will be the Laboratory Project Manager for PACE on this project.

2.2. HEALTH AND SAFETY ISSUES

Because of the potential presence of metals, petroleum hydrocarbons and chlorinated hydrocarbons in the soil and groundwater at the Site, the investigation will be conducted under a Health and Safety Plan (HASP) to protect investigation workers from possible exposure to contaminated materials. The HASP to be used during the field investigation of Parcel B3 is included as **Appendix F**.

Based on information provided to ARM, the planned site activities will be conducted under modified Level D personal protection. The requirements of the modified Level D protection are defined in the attached HASP. All field personnel assigned for work at the Site have been trained in accordance with the Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response standard (29 CFR 1910.120) and other applicable OSHA training standards. All field staff will be experienced in hazardous waste site work, use of personal protective equipment (PPE), and emergency response procedures.

3.0 FIELD ACTIVITIES AND PROCEDURES

3.1. UTILITY CLEARANCE

ARM will take appropriate precautions to avoid subsurface utilities and structures during the site investigation. Prior to initiating any subsurface investigations, ARM will attempt to determine the location of utilities in the project area using the Miss Utility system. Additionally, any required state or local permits will be acquired prior to the commencement of site activities.

In addition to the Miss Utility system, EAG will clear each proposed boring with utility personnel currently working on the property. To facilitate this, ARM will locate with a GPS and mark all proposed boring locations in the field. ARM will coordinate the staking of borings in the field with Tradepoint Atlantic utility personnel to avoid conflicts. Historical utility drawings which may be relevant include the 5600 Set (Plant Water Lines) and 5800 Set (Plant Gas Lines).

3.2. SAMPLING PLAN

The purpose of this site characterization is to identify any existing hazardous conditions across the entire Site. A summary of the RECs and other areas that will be investigated, along with the proposed boring identification number and the analyses being performed, has been provided as **Appendix E.**

This Work Plan presents the methods and protocols to be used to complete the site characterization. These methods and procedures follow the MDE-VCP and EPA guidelines. Information regarding the project organization, field activities and sampling methods, sampling equipment, sample handling and management procedures, the laboratory analytical methods and selected laboratory, quality control and quality assurance procedures, investigation-derived waste (IDW) management methods, reporting requirements are described in detail in the QAPP that has been developed to support the investigation and remediation of the Tradepoint Atlantic Site (Quality Assurance Project Plan, ARM Group Inc., April 5, 2016).

The proposed schedule of this investigation is contained in this Work Plan (Section 8.0). All site characterization activities will be conducted under the HASP (**Appendix F**).

3.3. SOIL INVESTIGATION

Soil samples collected from the locations identified on **Figures 4 through 9** will be screened and analyzed in accordance with procedures referenced in the QAPP Worksheet 21 – Field SOPs (Standard Operating Procedures), SOP No. 009 – Sub-Surface Soil Sampling. Regarding soil sampling depth, a shallow sample will be collected from the 0 to 1 foot depth interval, and a deeper sample will be collected from the 4 to 5 foot depth interval. If a concrete slab or slag aggregate occupies the 0 to1 foot bgs sample, the interval may be shifted to the depth of the first

observed soil interval. Soil samples will be analyzed for SVOCs, TAL-Metals, Oil & Grease, TPH-DRO, TPH-GRO, hexavalent chromium, and cyanide. Samples from any depth interval with a sustained Photoionization Detector (PID) reading of greater than 10 ppm will also be analyzed for VOCs. Additionally, the soil sample collected from the shallow interval (0 to 1 foot bgs) will be analyzed for PCBs. If the PID or other field observations indicate contamination to exist at a depth greater than 3 feet bgs but less than 9 feet bgs, and is above the water table, the sample from the deeper 4 to 5 foot interval may be shifted to the depth interval indicated by the PID response. One additional sample will also be collected from the 9 to 10 foot depth interval if groundwater has not been encountered. It should be noted that no soil samples will be collected from a depth that is below the water table.

If the PID reading from the 9 to 10 foot depth interval is less than 10 ppm, all parameters will be held by the laboratory pending the analysis of the 0 to 1 and 4 to 5 foot depth interval samples. If this depth interval exhibits a sustained PID reading of 10 ppm, it will be analyzed for VOCs, SVOCs, TPH-DRO, TPH-GRO, and Oil & Grease. However, the samples for metals and cyanide will be held by the laboratory pending the analysis of the 0 to 1 and 4 to 5 foot depth interval samples. If the analyses from the 4 to 5 foot depth interval show exceedances of PALs for any constituent, the held sample from the 9 to 10 foot depth interval will be analyzed for those constituents that exhibited PAL exceedances in the overlying 4 to 5 foot sample.

After soil sampling has been concluded at a location, down-hole soil sampling equipment will be decontaminated according to procedures referenced in the QAPP Worksheet 21 – Field SOPs, SOP No. 016 – Equipment Decontamination. The decontamination procedures that will be used during the course of this investigation include Decontamination Area (Section 3.1 of the SOP), Decontamination of Sampling Equipment (Section 3.5), Decontamination of Measurement Devices & Monitoring Equipment (Section 3.7), Decontamination of Subsurface Drilling Equipment (Section 3.8), and Document and Record Keeping (Section 5). Analytical methods, sample containers, preservatives, and holding times for the sample analyses are listed in the QAPP Worksheet 19 & 30 – Sample Containers, Preservation, and Holding Times.

3.4. SUB-SLAB SOIL GAS INVESTIGATION

Sub-slab soil gas samples will be collected from temporary monitoring probes installed at each of the locations provided on **Figures 11 and 12** to determine if historical on-site activities have negatively impacted the subsurface beneath the MCM Building or the Tradepoint Atlantic Office and to determine if there is a potentially unacceptable risk associated with the vapor intrusion to indoor air risk pathway. Sub-slab soil gas samples will be collected according to procedures outlined in QAPP Worksheet 21 – Field SOPs, SOP No. 002 – Sub-Slab Soil Gas Sampling. All sub-slab soil gas samples will be analyzed for VOCs. Analytical methods, sample containers, preservatives, and holding times for the sample analyses are listed in the QAPP Worksheet 19 & 30 – Sample Containers, Preservation, and Holding Times.

3.5. NAPL DELINEATION

The MDE will be notified of any initial occurrence of NAPL bearing soils identified in a soil boring within two (2) hours of the field observation. This notification will be provided in email format to appropriate MDE representatives. For the purpose of this notification, NAPL bearing soil is defined as soil containing free oil (i.e., liquid oil which could potentially be drained or otherwise extracted from the soil). If minor indications of NAPL (globules or a sheen) are identified in the soil core, it will be delineated in accordance with the procedures listed below, but the initial 2-hour MDE notification will not be required (unless NAPL bearing soils are identified during the subsequent delineation). Any subsequent observations of NAPL in Phase II or delineation borings within the same areas will not require additional notifications. The accumulation of measureable NAPL in a temporary screening piezometer (see below) will warrant the same 2-hour MDE notification and subsequent delineation. If the evidence of NAPL is limited to a trace detection, the potential impacts will be delineated but the initial 2-hour MDE notification will not be required.

In the event that NAPL and/or sheen is identified in a soil boring, a temporary piezometer will be installed according to the specifications identified in SOP No. 028 – Direct Push Installation and Construction of Temporary Groundwater Sample Collection Points. ARM will immediately check the piezometer for the presence of NAPL using an oil-water interface probe in accordance with methods referenced in the SOP No. 019 – Depth to Groundwater and NAPL Measurements. Each piezometer installed to delineate the presence or absence of NAPL will be checked with an oil-water interface probe immediately after installation, 48 hours after installation, and 30 days after installation. If NAPL is not detected after 30 days of equilibration time, the piezometer will be emptied, removed and discarded, and the borehole will be abandoned in accordance with Maryland abandonment standards as stated in COMAR 26.04.04.34 through 36.

If measureable NAPL or sheen is present in the initial piezometer, ARM will remobilize (following utility clearance) to install and inspect additional soil borings and shallow, temporary piezometers to the north, south, east, and west of the detection point at distances of approximately 25 feet. Delineation piezometers will extend into adjacent parcels (if applicable) but will not be installed off of Tradepoint Atlantic property and will only be installed up to the edge of existing buildings. At each location, continuous core soil samples will be screened with a hand-held PID and inspected for evidence of NAPL, and the additional temporary piezometers will be installed to a final depth determined by ARM personnel.

Each additional piezometer installed to delineate the NAPL will be checked for the presence of product with an oil-water interface probe immediately after installation, 48 hours after installation, and again after a 30 day equilibration period. If NAPL is present within any of the piezometers, additional borings/piezometers will be added as necessary to complete the delineation. Once the MDE has given approval to abandon the additional piezometers, each

piezometer will be emptied, removed and discarded. All boreholes will be abandoned in accordance with Maryland abandonment standards as stated in COMAR 26.04.04.34 through 36. A full report documenting the results of the delineation, including NAPL thickness, will be submitted to the MDE.

3.6. SAMPLE DOCUMENTATION

3.6.1. Sample Numbering

Samples will be numbered in accordance with the QAPP Appendix C – Data Management Plan.

3.6.2. Sample Labels & Chain-of-Custody Forms

Samples will be labeled and recorded on the Chain-of-Custody form in accordance with methods referenced in the QAPP Worksheet 26 & 27 – Sample Handling, Custody and Disposal.

3.7. LABORATORY ANALYSIS

EAG has contracted PACE of Greensburg, Pennsylvania to perform the laboratory analysis for this project. All sample analyses to be performed are listed in **Appendix E**. The samples will be submitted for analysis with a standard turnaround time (approximately 5 work days). The specific list of compounds and analytes that the soil and soil gas samples will be analyzed for, as well as the quantitation limits and project action limits, is provided in Worksheet 15 – Project Action Limits and Laboratory-Specific Detection/Quantitation Limits.

4.0 QUALITY ASSURANCE AND QUALITY CONTROL PROCEDURES

All soil and soil gas samples will be collected using dedicated equipment including new soil core liners, sampling kits, and tubing. Each cooler temperature will be measured and documented by the laboratory upon receipt.

Quality control (QC) samples are collected during field studies for various purposes, among which are to isolate site effects (control samples), to define background conditions (background sample), and to evaluate field/laboratory variability (spikes and blanks, trip blanks, duplicates, etc.).

The following QC samples will be submitted for analysis to support the data validation:

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

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

5.0 MANAGEMENT OF INVESTIGATION-DERIVED WASTE

All investigation derived waste (IDW) procedures will be carried out in accordance with methods referenced in the QAPP Worksheet 21 – Field SOPs, SOP No. 005 – Investigation-Derived Wastes Management.

6.0 DATA VALIDATION

For this Parcel B3 Phase II Investigation, a representative 50% of the complete analytical dataset will undergo data validation. Samples will be selected in groups according to the PACE project number assigned to each set of samples. Each PACE project number will be assigned a sequential number (from 1, 2, 3 … n) in the order received by the lab until all sample groups for the parcel have been received by the lab. The random number function will be used to randomly order the project numbers and project numbers will be selected from top to bottom until 50% or more of the total number of samples in the parcel have been identified for validation.

All data validation procedures will be carried out in accordance with the QAPP Worksheet 34 – Data Verification and Validation Inputs, QAPP Worksheet 35 – Data Verification Procedures, and QAPP Worksheet 36 – Data Validation Procedures.

7.0 REPORTING

Following the receipt of all sampling results and the designated 50% of validated data from Area B: Parcel B3, a Phase II Investigation Report will be prepared that will document the sample collection procedures and supporting rationale, and present and interpret the analytical results. Results will be presented in tabular and graphical formats as appropriate to best summarize the data for future use. The sample results will be compared against the PALs specified in the QAPP (or other direct guidance from the MDE), considering appropriate land use factors and institutional controls, to identify contaminants and exposure pathways of potential concern.

The Phase II Investigation Report will include a SLRA to evaluate potential baseline risks to future workers of the Site prior to any mitigative measures. Compounds that are present at concentrations at or above the USEPA Regional Screening Levels (RSLs) set at a target cancer risk of 1E-6 or target non-cancer Hazard Quotient (HQ) of 0.1 will be identified as constituents of potential concern (COPCs) to be included in the SLRA. The Site will be analyzed as a single exposure unit (EU) based on the size of the parcel and distribution of the proposed soil borings. The existing Tradepoint Atlantic Office and MCM Building, included in the site-wide EU, will each be evaluated by a building occupancy assessment (BOA) to determine if use of the existing buildings might pose any additional unacceptable risks. Exposure point concentrations (EPCs) will be estimated for each COPC dataset (surface, subsurface, and pooled surface/subsurface) in the site-wide EU using ProUCL software. The estimates of potential EPCs for the soil datasets will be compared to the RSLs for the Composite Worker scenario and to site-specific Soil Screening Levels (SSLs) for the Construction Worker scenario (calculated based on the USEPA Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites) to develop Risk Ratios for each COPC relative to a cancer risk of 1E-6 and non-cancer HQ of 1. The risk ratios for individual COPCs will be summed for the carcinogens and non-carcinogens (summed by target organ) to provided screening level estimates of potential cumulative risk to determine if further action is warranted. Lead, PCBs, and TPH/Oil & Grease are subject to special requirements as designated by the agencies: lead results above 10,000 mg/kg are subject to additional delineation (and possible excavation), PCB results above 50 mg/kg are subject to delineation and excavation, and TPH/Oil & Grease results above 6,200 mg/kg should be evaluated for the potential presence and mobility of NAPL in any future development planning. ARM will also present recommendations for any additional site investigation activities if warranted.

8.0 SCHEDULE

The field activities below (including sample analysis and data validation) are planned so that they may be completed within six (6) months of agency approval of this Work Plan. In addition, the investigation report will be submitted to the regulatory authorities within two (2) months of completion of the field activities in accordance with these approximate timeframes:

- the sample collection activities will take approximately three (3) weeks to complete (including mobilization activities) once approval of the Work Plan is received;
- the sample analysis, data validation (≥50%) and review is expected to require an additional eight (8) weeks to complete; and
- the preparation of the investigation report, including an internal Quality Assurance Review cycle, will require another eight (8) weeks.

FIGURES

ARM Group Inc.
Earth Resource Engineers and Consultants

0 375 750 1,500 Feet

- Site Boundary
- Private Property
- Area A Boundaries
- Area B Boundaries

Tradepoint Atlantic
Area A and Area B Parcels

August 1, 2016

EnviroAnalytics Group	Tradepoint Atlantic
Area A: Project 150298M Area B: Project 150300M	Baltimore County, MD

Figure 1

ARM Group Inc.
Earth Resource Engineers and Consultants

0 375 750 1,500 Feet

Site Boundary
Area A Boundaries
Area B Boundaries
Land
Marsh
Water

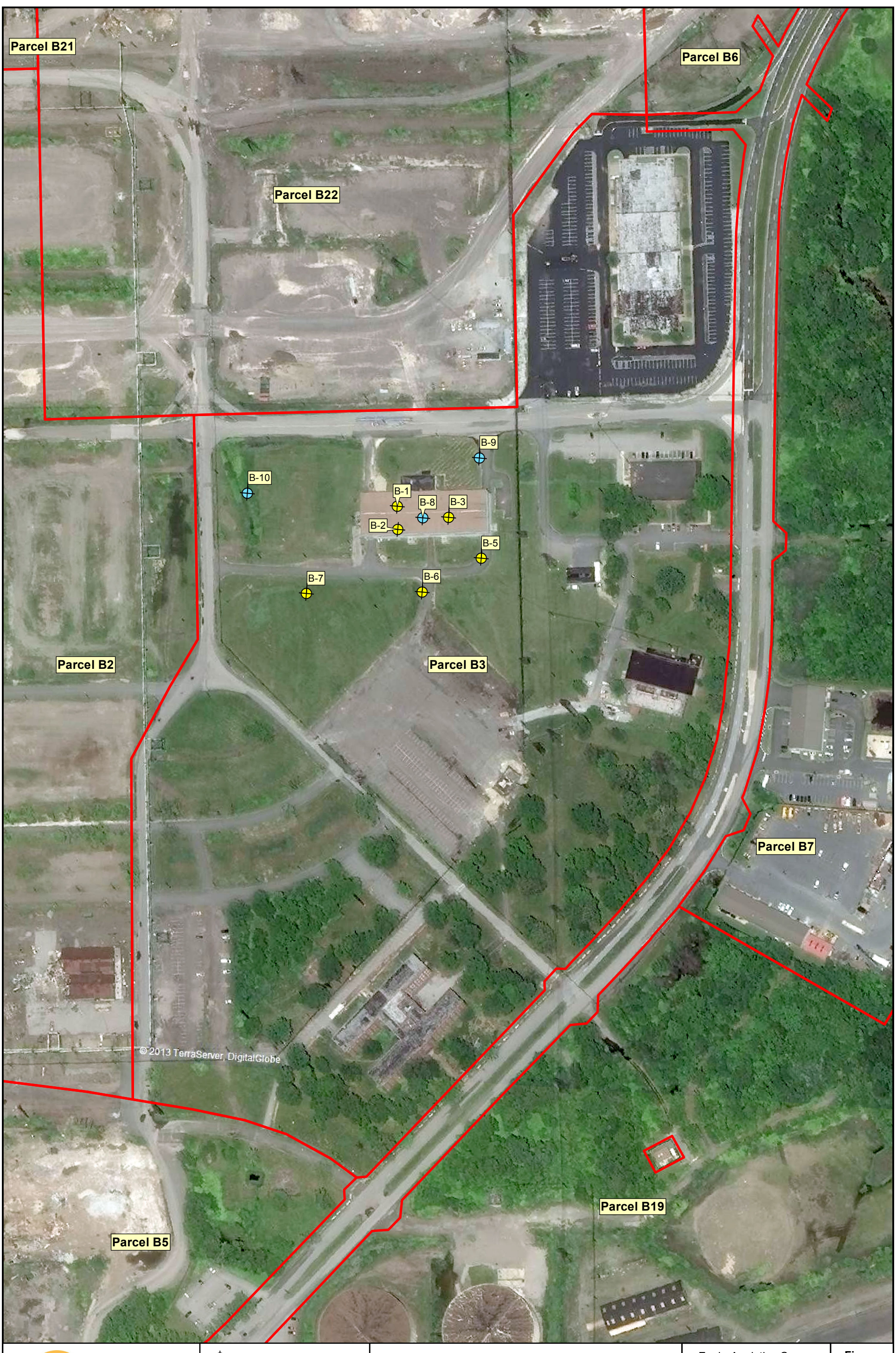
Approximate Shoreline 1916

August 1, 2016

Adapted from Figure 2-5 of the Description of Current Conditions Report prepared by Rust Environmental and Infrastructure, dated January 1998

EnviroAnalytics Group	Tradepoint Atlantic
Area A: Project 150298M Area B: Project 150300M	Baltimore County, MD

Figure 2



ARM Group Inc.
Earth Resource Engineers and Consultants

0 80 160 320 Feet

Monitoring Well
Soil Boring
Parcel Boundary

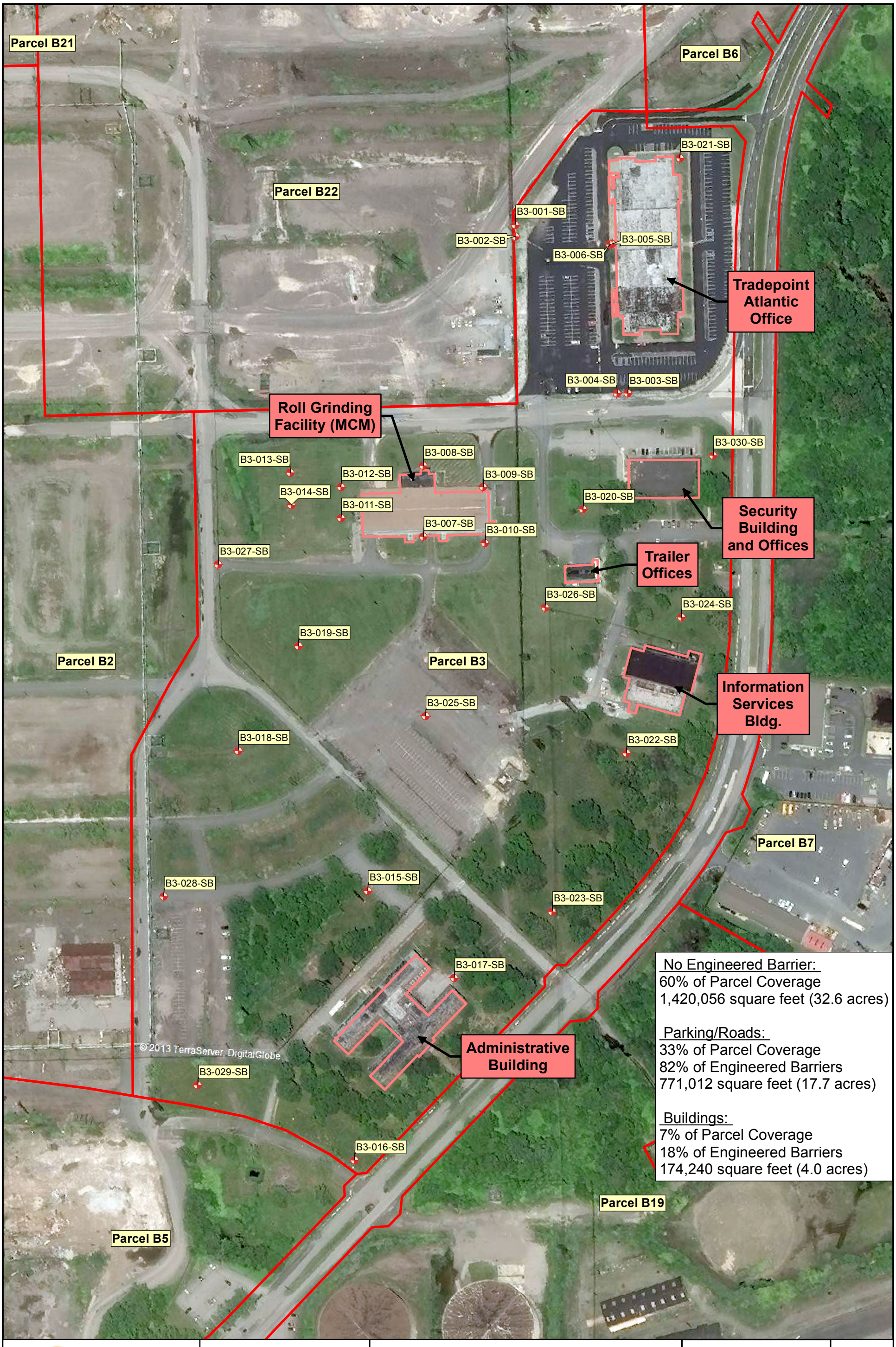
Parcel B3: Roll Grinding Facility
Historical Soil & Groundwater Samples

November 5, 2016

EnviroAnalytics Group
ARM Project 150300M-4

Tradepoint Atlantic
Baltimore County, MD

Figure
3



ARM Group Inc.
Earth Resource Engineers and Consultants

0 80 160 320 Feet

Proposed Boring
Buildings
Parcel Boundary

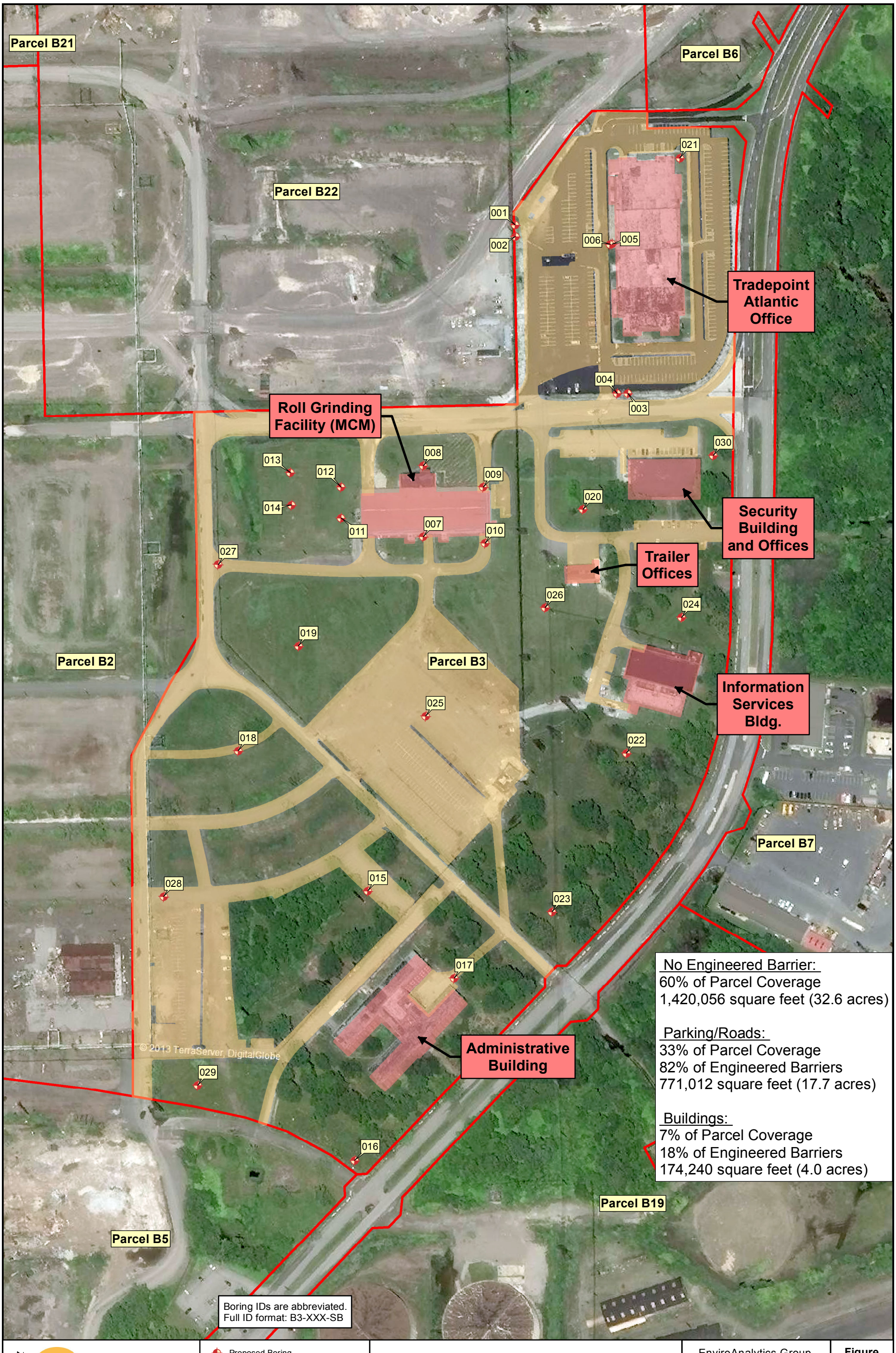
Parcel B3: Proposed Sample Locations
Aerial View

November 5, 2016

EnviroAnalytics Group
ARM Project 150300M-4

Tradepoint Atlantic
Baltimore County, MD

Figure
4



ARM Group Inc.
Earth Resource Engineers and Consultants

0 80 160 320 Feet

Proposed Boring
Buildings
Roads
Parcel Boundary

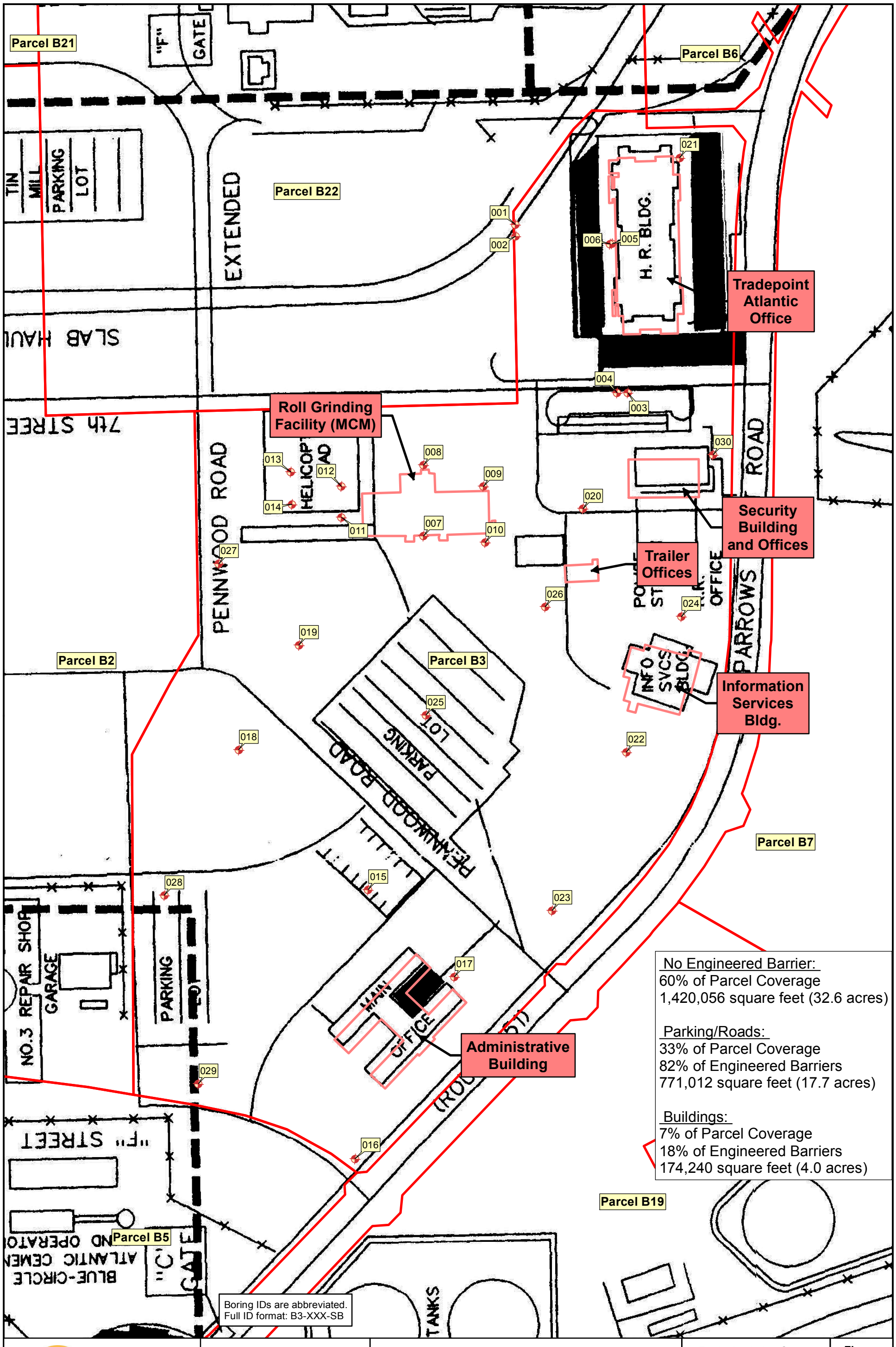
Parcel B3: Proposed Sample Locations Current Engineered Barriers

November 5, 2016

EnviroAnalytics Group
ARM Project 150300M-4

Tradepoint Atlantic
Baltimore County, MD

Figure 5


Parcel B21
Parcel B6
Parcel B22
Parcel B2
Parcel B3
Parcel B7
Parcel B19
Parcel B5
Tradepoint Atlantic Office
Roll Grinding Facility (MCM)
Security Building and Offices
Trailer Offices
Information Services Bldg.
Administrative Building
H. R. BLDG.
TIN MILL PARKING LOT
"F" GATE
EXTENDED
PENNWOOD ROAD
HELICOPTER PAD
PENNWOOD ROAD PARKING LOT
PARROWS ROAD
INFO. SVCS BLDG.
OFFICE
MAIN BLDG.
TANKS
NO.3 REPAIR SHOP
GARAGE
PARKING
001
002
004
003
005
006
021
030
020
008
009
007
010
011
012
013
014
027
026
024
019
025
018
022
028
015
023
017
029
016
No Engineered Barrier:
60% of Parcel Coverage
1,420,056 square feet (32.6 acres)
Parking/Roads:
33% of Parcel Coverage
82% of Engineered Barriers
771,012 square feet (17.7 acres)
Buildings:
7% of Parcel Coverage
18% of Engineered Barriers
174,240 square feet (4.0 acres)
Boring IDs are abbreviated.
Full ID format: B3-XXX-SB
N
ARM Group Inc.
Earth Resource Engineers and Consultants
0 80 160 320
Feet
Proposed Boring
Buildings
Parcel Boundary
Parcel B3: Proposed Sample Locations
Locations of SWMUs, AOCs,
and Facility Areas
November 5, 2016
EnviroAnalytics Group
ARM Project 150300M-4
Tradepoint Atlantic
Baltimore County, MD
Figure
6

Parcel B21

Parcel B6

Parcel B22

001
002
005
006
021

Tradepoint Atlantic Office

004
003

Roll Grinding Facility (MCM)

008
013
012
009
014
011
007
010
030
020

Security Building and Offices

027

Trailer Offices

026
024

019

Parcel B2

Parcel B3

025

Information Services Bldg.

018
022

Parcel B7

028
015
023

017

Administrative Building

029

016

Parcel B19

Parcel B5

Boring IDs are abbreviated.
Full ID format: B3-XXX-SB

No Engineered Barrier:
60% of Parcel Coverage
1,420,056 square feet (32.6 acres)

Parking/Roads:
33% of Parcel Coverage
82% of Engineered Barriers
771,012 square feet (17.7 acres)

Buildings:
7% of Parcel Coverage
18% of Engineered Barriers
174,240 square feet (4.0 acres)

ARM Group Inc.
Earth Resource Engineers and Consultants

0 80 160 320 Feet

Proposed Boring
Buildings
Parcel Boundary

Parcel B3: Proposed Sample Locations
Historical Site Drawings - 5000 Set

November 5, 2016

EnviroAnalytics Group
ARM Project 150300M-4

Tradepoint Atlantic
Baltimore County, MD

Figure 7

Parcel B21

Parcel B6

Parcel B22

Tradepoint Atlantic Office

Roll Grinding Facility (MCM)

Security Building and Offices

Trailer Offices

Information Services Bldg.

Parcel B2

Parcel B3

Parcel B7

Administrative Building

Parcel B5

Parcel B19

001 002 003 004 005 006 007 008 009 010 011 012 013 014 015 016 017 018 019 020 021 022 023 024 025 026 027 028 029 030

Boring IDs are abbreviated.
Full ID format: B3-XXX-SB

No Engineered Barrier:
60% of Parcel Coverage
1,420,056 square feet (32.6 acres)

Parking/Roads:
33% of Parcel Coverage
82% of Engineered Barriers
771,012 square feet (17.7 acres)

Buildings:
7% of Parcel Coverage
18% of Engineered Barriers
174,240 square feet (4.0 acres)

ARM Group Inc.
Earth Resource Engineers and Consultants

0 80 160 320 Feet

Proposed Boring
Buildings
Parcel Boundary

Parcel B3: Proposed Sample Locations
Historical Site Drawings - 5100 Set

November 5, 2016

EnviroAnalytics Group
ARM Project 150300M-4

Tradepoint Atlantic
Baltimore County, MD

Figure 8

Parcel B21

Parcel B6

Parcel B22

001

002

006

005

021

Tradepoint Atlantic Office

004

003

Roll Grinding Facility (MCM)

008

013

012

009

014

011

007

010

030

020

Security Building and Offices

Trailer Offices

027

026

024

019

Parcel B2

Parcel B3

025

Information Services Bldg.

018

022

Parcel B7

028

015

023

017

Administrative Building

029

016

Parcel B5

Parcel B19

No Engineered Barrier:
60% of Parcel Coverage
1,420,056 square feet (32.6 acres)

Parking/Roads:
33% of Parcel Coverage
82% of Engineered Barriers
771,012 square feet (17.7 acres)

Buildings:
7% of Parcel Coverage
18% of Engineered Barriers
174,240 square feet (4.0 acres)

Boring IDs are abbreviated.
Full ID format: B3-XXX-SB

ARM Group Inc.
Earth Resource Engineers and Consultants

0 80 160 320 Feet

Proposed Boring

Buildings

Parcel Boundary

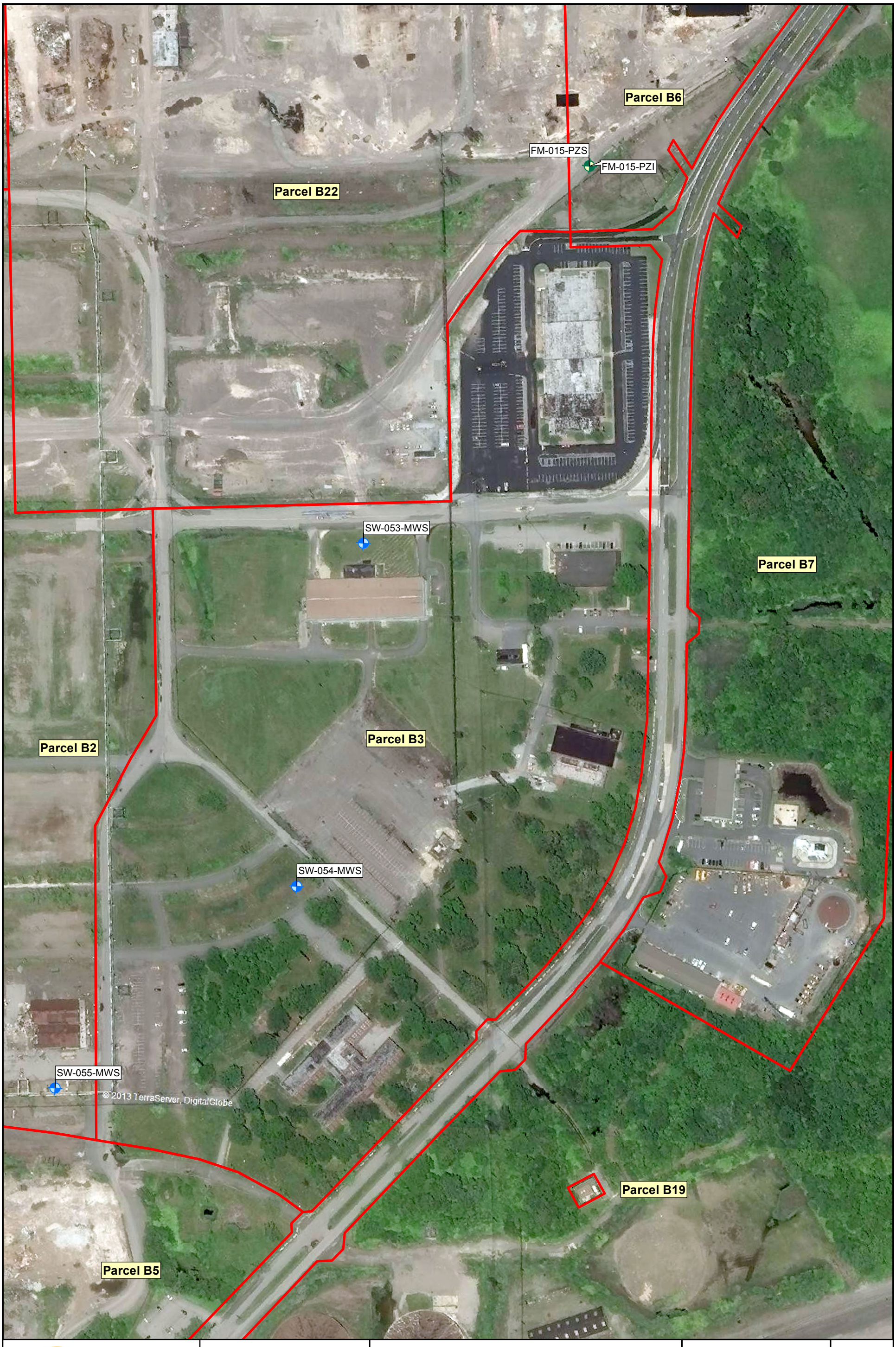
Parcel B3: Proposed Sample Locations
Historical Site Drawings - 5500 Set

November 5, 2016

EnviroAnalytics Group
ARM Project 150300M-4

Tradepoint Atlantic
Baltimore County, MD

Figure
9



ARM Group Inc.
Earth Resource Engineers and Consultants

0 87.5 175 350 Feet

Piezometer
Groundwater Well
Parcel Boundary

Parcel B3: Groundwater Locations
Aerial View
(From Groundwater Investigation Work Plans)
November 5, 2016

EnviroAnalytics Group
ARM Project 150300M-4

Tradepoint Atlantic
Baltimore County, MD

Figure
10

ARM Group Inc.
Earth Resource Engineers and Consultants

0 12.5 25 50 Feet

Sub-Slab Soil Gas

Buildings

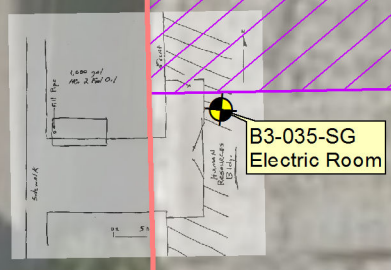
Parcel B3: Proposed Sub-Slab Soil Gas
MCM Building (former Roll Grinding Facility)
Aerial View
May 3, 2017

EnviroAnalytics Group
ARM Project 150300M-4

Tradepoint Atlantic
Baltimore County, MD

Figure
11

Tradepoint Atlantic Office:
Total Area = 63,333 square feet
Crawl Space Area = 29,000 square feet
Remaining Area = 34,333 square feet



B3-035-SG
Electric Room

Parcel B3

Tradepoint Atlantic Office

B3-036-SG
Archive Room

B3-037-SG
EAG Office

ARM Group Inc.
Earth Resource Engineers and Consultants

0 12.5 25 50 Feet

Sub-Slab Soil Gas
Buildings
Crawl Space

Parcel B3: Proposed Sub-Slab Soil Gas
Tradepoint Atlantic Office
Aerial View
May 3, 2017

EnviroAnalytics Group
ARM Project 150300M-4

Tradepoint Atlantic
Baltimore County, MD

Figure
12

APPENDIX A

Parcel B3
Roll Grinding Facility Historical Soil Data
Former Sparrows Point Steel Mill
Sparrows Point, Maryland

Sample ID	Chemical Analyte	Sample Date	Result	Units	Qualifier
1A. B-1, 4.0'-4.5'	Antimony	3/23/1998	9.1	mg/kg	U
1A. B-1, 4.0'-4.5'	Arsenic	3/23/1998	1.6	mg/kg	
1A. B-1, 4.0'-4.5'	Beryllium	3/23/1998	0.91	mg/kg	U
1A. B-1, 4.0'-4.5'	Cadmium	3/23/1998	0.91	mg/kg	U
1A. B-1, 4.0'-4.5'	Chromium	3/23/1998	23	mg/kg	
1A. B-1, 4.0'-4.5'	Selenium	3/23/1998	0.5	mg/kg	U
1A. B-1, 4.0'-4.5'	Silver	3/23/1998	0.91	mg/kg	U
1A. B-1, 4.0'-4.5'	Thallium	3/23/1998	9.1	mg/kg	U
1A. B-1, 4.0'-4.5'	Phenolics	3/23/1998	1	mg/kg	U
1A. B-1, 4.0'-4.5'	Copper	3/23/1998	8.9	mg/kg	
1A. B-1, 4.0'-4.5'	Cyanide (total)	3/23/1998	0.14	mg/kg	
1A. B-1, 4.0'-4.5'	Lead	3/23/1998	20	mg/kg	
1A. B-1, 4.0'-4.5'	Mercury	3/23/1998	0.20	mg/kg	
1A. B-1, 4.0'-4.5'	Nickel	3/23/1998	8.8	mg/kg	
1A. B-1, 4.0'-4.5'	Zinc	3/23/1998	26	mg/kg	
1A. B-1, 4.0'-4.5'	Phenol	3/23/1998	10	mg/L	U
1A. B-1, 4.0'-4.5'	2-Chlorophenol	3/23/1998	1	mg/L	U
1A. B-1, 4.0'-4.5'	N-Nitrosodimethylamine	3/23/1998	10	mg/L	U
1A. B-1, 4.0'-4.5'	Bis (2-chloroethyl) ether	3/23/1998	1	mg/L	U
1A. B-1, 4.0'-4.5'	1,3-Dichlorobenzene	3/23/1998	1	mg/L	U
1A. B-1, 4.0'-4.5'	1,4-Dichlorobenzene	3/23/1998	1	mg/L	U
1A. B-1, 4.0'-4.5'	1,2-Dichlorobenzene	3/23/1998	1	mg/L	U
1A. B-1, 4.0'-4.5'	Bis (2-chloroisopropyl) ether	3/23/1998	10	mg/L	U
1A. B-1, 4.0'-4.5'	N-Nitroso-di-N-propylamine	3/23/1998	2	mg/L	U
1A. B-1, 4.0'-4.5'	Hexachloroethane	3/23/1998	1	mg/L	U
1A. B-1, 4.0'-4.5'	2-Nitrophenol	3/23/1998	2	mg/L	U
1A. B-1, 4.0'-4.5'	2,4-Dimethylphenol	3/23/1998	1	mg/L	U
1A. B-1, 4.0'-4.5'	2,4-Dichlorophenol	3/23/1998	1	mg/L	U
1A. B-1, 4.0'-4.5'	4-Chloro-3-methylphenol	3/23/1998	1	mg/L	U
1A. B-1, 4.0'-4.5'	Nitrobenzene	3/23/1998	2	mg/L	U
1A. B-1, 4.0'-4.5'	Isophorone	3/23/1998	1	mg/L	U
1A. B-1, 4.0'-4.5'	Bis (2-chloroethoxy) methane	3/23/1998	1	mg/L	U
1A. B-1, 4.0'-4.5'	1,2,4-Trichlorobenzene	3/23/1998	1	mg/L	U
1A. B-1, 4.0'-4.5'	Hexachlorobutadiene	3/23/1998	1	mg/L	U
1A. B-1, 4.0'-4.5'	Naphthalene	3/23/1998	1	mg/L	U
1A. B-1, 4.0'-4.5'	2,4,6-Trichlorophenol	3/23/1998	1	mg/L	U
1A. B-1, 4.0'-4.5'	2,4-Dinitrophenol	3/23/1998	10	mg/L	U
1A. B-1, 4.0'-4.5'	4-Nitrophenol	3/23/1998	10	mg/L	U
1A. B-1, 4.0'-4.5'	Hexachlorocyclopentadiene	3/23/1998	10	mg/L	U
1A. B-1, 4.0'-4.5'	2-Chloronaphthalene	3/23/1998	1	mg/L	U
1A. B-1, 4.0'-4.5'	Dimethyl phthalate	3/23/1998	1	mg/L	U
1A. B-1, 4.0'-4.5'	2,6-Dinitrotoluene	3/23/1998	1	mg/L	U

Parcel B3
Roll Grinding Facility Historical Soil Data
Former Sparrows Point Steel Mill
Sparrows Point, Maryland

Sample ID	Chemical Analyte	Sample Date	Result	Units	Qualifier
1A. B-1, 4.0'-4.5'	Acenaphthylene	3/23/1998	1	mg/L	U
1A. B-1, 4.0'-4.5'	Acenaphthene	3/23/1998	1	mg/L	U
1A. B-1, 4.0'-4.5'	2,4-Dinitrotoluene	3/23/1998	1	mg/L	U
1A. B-1, 4.0'-4.5'	Diethyl phthalate	3/23/1998	1	mg/L	U
1A. B-1, 4.0'-4.5'	4-Chlorophenyl phenyl ether	3/23/1998	1	mg/L	U
1A. B-1, 4.0'-4.5'	Fluorene	3/23/1998	1	mg/L	U
1A. B-1, 4.0'-4.5'	4,6-Dinitro-2-methylphenol	3/23/1998	10	mg/L	U
1A. B-1, 4.0'-4.5'	Pentachlorophenol	3/23/1998	10	mg/L	U
1A. B-1, 4.0'-4.5'	N-Nitrosodiphenylamine	3/23/1998	1	mg/L	U
1A. B-1, 4.0'-4.5'	1,2-Diphenylhydrazine	3/23/1998	1	mg/L	U
1A. B-1, 4.0'-4.5'	4-Bromophenyl phenyl ether	3/23/1998	1	mg/L	U
1A. B-1, 4.0'-4.5'	Hexachlorobenzene	3/23/1998	2	mg/L	U
1A. B-1, 4.0'-4.5'	Di-N-butyl phthalate	3/23/1998	1	mg/L	U
1A. B-1, 4.0'-4.5'	Phenanthrene	3/23/1998	1	mg/L	U
1A. B-1, 4.0'-4.5'	Anthracene	3/23/1998	1	mg/L	U
1A. B-1, 4.0'-4.5'	Fluoranthene	3/23/1998	1	mg/L	U
1A. B-1, 4.0'-4.5'	Benzidine	3/23/1998	10	mg/L	U
1A. B-1, 4.0'-4.5'	Pyrene	3/23/1998	1	mg/L	U
1A. B-1, 4.0'-4.5'	Butyl benzyl phthalate	3/23/1998	1	mg/L	U
1A. B-1, 4.0'-4.5'	Bis (2-ethylhexyl) phthalate	3/23/1998	10	mg/L	U
1A. B-1, 4.0'-4.5'	Benzo (a) anthracene	3/23/1998	1	mg/L	U
1A. B-1, 4.0'-4.5'	Chrysene	3/23/1998	1	mg/L	U
1A. B-1, 4.0'-4.5'	3,3'-Dichlorobenzidine	3/23/1998	2	mg/L	U
1A. B-1, 4.0'-4.5'	Di-n-octylphthalate	3/23/1998	1	mg/L	U
1A. B-1, 4.0'-4.5'	Benzo (b) fluoranthene	3/23/1998	1	mg/L	U
1A. B-1, 4.0'-4.5'	Benzo (k) fluoranthene	3/23/1998	1	mg/L	U
1A. B-1, 4.0'-4.5'	Benzo (a) pyrene	3/23/1998	1	mg/L	U
1A. B-1, 4.0'-4.5'	Indeno (123cd) pyrene	3/23/1998	2	mg/L	U
1A. B-1, 4.0'-4.5'	Dibenz (ah) anthracene	3/23/1998	2	mg/L	U
1A. B-1, 4.0'-4.5'	Benzo (ghi) perylene	3/23/1998	2	mg/L	U
1A. B-1, 4.0'-4.5'	Chloromethane	3/23/1998	10	µg/L	U
1A. B-1, 4.0'-4.5'	Bromomethane	3/23/1998	10	µg/L	U
1A. B-1, 4.0'-4.5'	Vinyl chloride	3/23/1998	10	µg/L	U
1A. B-1, 4.0'-4.5'	Chloroethane	3/23/1998	10	µg/L	U
1A. B-1, 4.0'-4.5'	Methylene chloride	3/23/1998	5	µg/L	U
1A. B-1, 4.0'-4.5'	Acrolein	3/23/1998	5	µg/L	U
1A. B-1, 4.0'-4.5'	Acrylonitrile	3/23/1998	5	µg/L	U
1A. B-1, 4.0'-4.5'	Trichlorofluoromethane	3/23/1998	10	µg/L	U
1A. B-1, 4.0'-4.5'	1,1-Dichloroethene	3/23/1998	5	µg/L	U
1A. B-1, 4.0'-4.5'	1,1-Dichloroethane	3/23/1998	5	µg/L	U
1A. B-1, 4.0'-4.5'	Trans-1,2-Dichloroethene	3/23/1998	5	µg/L	U
1A. B-1, 4.0'-4.5'	Chloroform	3/23/1998	5	µg/L	U

Parcel B3
Roll Grinding Facility Historical Soil Data
Former Sparrows Point Steel Mill
Sparrows Point, Maryland

Sample ID	Chemical Analyte	Sample Date	Result	Units	Qualifier
1A. B-1, 4.0'-4.5'	1,2-Dichloroethane	3/23/1998	5	µg/L	U
1A. B-1, 4.0'-4.5'	1,1,1-Trichloroethane	3/23/1998	5	µg/L	U
1A. B-1, 4.0'-4.5'	Carbon tetrachloride	3/23/1998	5	µg/L	U
1A. B-1, 4.0'-4.5'	Bromodichloromethane	3/23/1998	5	µg/L	U
1A. B-1, 4.0'-4.5'	1,2-Dichloropropane	3/23/1998	5	µg/L	U
1A. B-1, 4.0'-4.5'	Cis-1,3-Dichloropropene	3/23/1998	5	µg/L	U
1A. B-1, 4.0'-4.5'	Trichloroethene	3/23/1998	5	µg/L	U
1A. B-1, 4.0'-4.5'	Benzene	3/23/1998	5	µg/L	U
1A. B-1, 4.0'-4.5'	Chlorodibromomethane	3/23/1998	5	µg/L	U
1A. B-1, 4.0'-4.5'	1,1,2-Trichloroethane	3/23/1998	5	µg/L	U
1A. B-1, 4.0'-4.5'	2-Chloroethylvinyl ether	3/23/1998	5	µg/L	U
1A. B-1, 4.0'-4.5'	Bromoform	3/23/1998	5	µg/L	U
1A. B-1, 4.0'-4.5'	1,1,2,2-Tetrachloroethane	3/23/1998	5	µg/L	U
1A. B-1, 4.0'-4.5'	Tetrachloroethene	3/23/1998	5	µg/L	U
1A. B-1, 4.0'-4.5'	Toluene	3/23/1998	5	µg/L	U
1A. B-1, 4.0'-4.5'	Chlorobenzene	3/23/1998	5	µg/L	U
1A. B-1, 4.0'-4.5'	Ethylbenzene	3/23/1998	5	µg/L	U
1A. B-1, 4.0'-4.5'	a-BHC	3/23/1998	0.1	mg/L	U
1A. B-1, 4.0'-4.5'	g-BHC	3/23/1998	0.1	mg/L	U
1A. B-1, 4.0'-4.5'	b-BHC	3/23/1998	0.1	mg/L	U
1A. B-1, 4.0'-4.5'	Heptachlor	3/23/1998	0.1	mg/L	U
1A. B-1, 4.0'-4.5'	d-BHC	3/23/1998	0.1	mg/L	U
1A. B-1, 4.0'-4.5'	Aldrin	3/23/1998	0.1	mg/L	U
1A. B-1, 4.0'-4.5'	Heptachlor Epoxide	3/23/1998	0.1	mg/L	U
1A. B-1, 4.0'-4.5'	Endosulfan	3/23/1998	0.1	mg/L	U
1A. B-1, 4.0'-4.5'	Dieldrin	3/23/1998	0.1	mg/L	U
1A. B-1, 4.0'-4.5'	4,4'-DDE	3/23/1998	0.1	mg/L	U
1A. B-1, 4.0'-4.5'	Endrin	3/23/1998	0.1	mg/L	U
1A. B-1, 4.0'-4.5'	4,4'-DDD	3/23/1998	0.1	mg/L	U
1A. B-1, 4.0'-4.5'	Endosulfan II	3/23/1998	0.1	mg/L	U
1A. B-1, 4.0'-4.5'	4,4'-DDT	3/23/1998	0.1	mg/L	U
1A. B-1, 4.0'-4.5'	Endrin Aldehyde	3/23/1998	0.1	mg/L	U
1A. B-1, 4.0'-4.5'	Endosulfan Sulfate	3/23/1998	0.1	mg/L	U
1A. B-1, 4.0'-4.5'	Chlordane	3/23/1998	1.0	mg/L	U
1A. B-1, 4.0'-4.5'	Toxaphene	3/23/1998	1.0	mg/L	U
1A. B-1, 4.0'-4.5'	Methoxychlor	3/23/1998	2.0	mg/L	U
1A. B-1, 4.0'-4.5'	PCB-1016	3/23/1998	1.0	mg/L	U
1A. B-1, 4.0'-4.5'	PCB-1221	3/23/1998	1.0	mg/L	U
1A. B-1, 4.0'-4.5'	PCB-1232	3/23/1998	1.0	mg/L	U
1A. B-1, 4.0'-4.5'	PCB-1242	3/23/1998	1.0	mg/L	U
1A. B-1, 4.0'-4.5'	PCB-1248	3/23/1998	1.0	mg/L	U
1A. B-1, 4.0'-4.5'	PCB-1254	3/23/1998	1.0	mg/L	U

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Sample ID	Chemical Analyte	Sample Date	Result	Units	Qualifier
1A. B-1, 4.0'-4.5'	PCB-1260	3/23/1998	1.0	mg/L	U
1B. B-1, 7.0'-7.5'	Arsenic	3/23/1998	0.48	mg/kg	
1B. B-1, 7.0'-7.5'	Chromium	3/23/1998	4.1	mg/kg	
1B. B-1, 7.0'-7.5'	Antimony	3/23/1998	8.5	mg/kg	U
1B. B-1, 7.0'-7.5'	Beryllium	3/23/1998	0.85	mg/kg	U
1B. B-1, 7.0'-7.5'	Cadmium	3/23/1998	0.85	mg/kg	U
1B. B-1, 7.0'-7.5'	Copper	3/23/1998	1.9	mg/kg	
1B. B-1, 7.0'-7.5'	Mercury	3/23/1998	0.16	mg/kg	U
1B. B-1, 7.0'-7.5'	Selenium	3/23/1998	0.50	mg/kg	U
1B. B-1, 7.0'-7.5'	Silver	3/23/1998	0.85	mg/kg	U
1B. B-1, 7.0'-7.5'	Thallium	3/23/1998	8.5	mg/kg	U
1B. B-1, 7.0'-7.5'	Cyanide (total)	3/23/1998	0.10	mg/kg	U
1B. B-1, 7.0'-7.5'	Phenolics	3/23/1998	1	mg/kg	U
1B. B-1, 7.0'-7.5'	Lead	3/23/1998	9.2	mg/kg	
1B. B-1, 7.0'-7.5'	Nickel	3/23/1998	2.5	mg/kg	
1B. B-1, 7.0'-7.5'	Zinc	3/23/1998	7.9	mg/kg	
1B. B-1, 7.0'-7.5'	Phenol	3/23/1998	10	mg/L	U
1B. B-1, 7.0'-7.5'	2-Chlorophenol	3/23/1998	1	mg/L	U
1B. B-1, 7.0'-7.5'	N-Nitrosodimethylamine	3/23/1998	10	mg/L	U
1B. B-1, 7.0'-7.5'	Bis (2-chloroethyl) ether	3/23/1998	1	mg/L	U
1B. B-1, 7.0'-7.5'	1,3-Dichlorobenzene	3/23/1998	1	mg/L	U
1B. B-1, 7.0'-7.5'	1,4-Dichlorobenzene	3/23/1998	1	mg/L	U
1B. B-1, 7.0'-7.5'	1,2-Dichlorobenzene	3/23/1998	1	mg/L	U
1B. B-1, 7.0'-7.5'	Bis (2-chloroisopropyl) ether	3/23/1998	10	mg/L	U
1B. B-1, 7.0'-7.5'	N-Nitroso-di-N-propylamine	3/23/1998	2	mg/L	U
1B. B-1, 7.0'-7.5'	Hexachloroethane	3/23/1998	1	mg/L	U
1B. B-1, 7.0'-7.5'	2-Nitrophenol	3/23/1998	2	mg/L	U
1B. B-1, 7.0'-7.5'	2,4-Dimethylphenol	3/23/1998	1	mg/L	U
1B. B-1, 7.0'-7.5'	2,4-Dichlorophenol	3/23/1998	1	mg/L	U
1B. B-1, 7.0'-7.5'	4-Chloro-3-methylphenol	3/23/1998	1	mg/L	U
1B. B-1, 7.0'-7.5'	Nitrobenzene	3/23/1998	2	mg/L	U
1B. B-1, 7.0'-7.5'	Isophorone	3/23/1998	1	mg/L	U
1B. B-1, 7.0'-7.5'	Bis (2-chloroethoxy) methane	3/23/1998	1	mg/L	U
1B. B-1, 7.0'-7.5'	1,2,4-Trichlorobenzene	3/23/1998	1	mg/L	U
1B. B-1, 7.0'-7.5'	Hexachlorobutadiene	3/23/1998	1	mg/L	U
1B. B-1, 7.0'-7.5'	Naphthalene	3/23/1998	1	mg/L	U
1B. B-1, 7.0'-7.5'	2,4,6-Trichlorophenol	3/23/1998	1	mg/L	U
1B. B-1, 7.0'-7.5'	2,4-Dinitrophenol	3/23/1998	10	mg/L	U
1B. B-1, 7.0'-7.5'	4-Nitrophenol	3/23/1998	10	mg/L	U
1B. B-1, 7.0'-7.5'	Hexachlorocyclopentadiene	3/23/1998	10	mg/L	U
1B. B-1, 7.0'-7.5'	2-Chloronaphthalene	3/23/1998	1	mg/L	U
1B. B-1, 7.0'-7.5'	Dimethyl phthalate	3/23/1998	1	mg/L	U

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Sample ID	Chemical Analyte	Sample Date	Result	Units	Qualifier
1B. B-1, 7.0'-7.5'	2,6-Dinitrotoluene	3/23/1998	1	mg/L	U
1B. B-1, 7.0'-7.5'	Acenaphthylene	3/23/1998	1	mg/L	U
1B. B-1, 7.0'-7.5'	Acenaphthene	3/23/1998	1	mg/L	U
1B. B-1, 7.0'-7.5'	2,4-Dinitrotoluene	3/23/1998	1	mg/L	U
1B. B-1, 7.0'-7.5'	Diethyl phthalate	3/23/1998	1	mg/L	U
1B. B-1, 7.0'-7.5'	4-Chlorophenyl phenyl ether	3/23/1998	1	mg/L	U
1B. B-1, 7.0'-7.5'	Fluorene	3/23/1998	1	mg/L	U
1B. B-1, 7.0'-7.5'	4,6-Dinitro-2-methylphenol	3/23/1998	10	mg/L	U
1B. B-1, 7.0'-7.5'	Pentachlorophenol	3/23/1998	10	mg/L	U
1B. B-1, 7.0'-7.5'	N-Nitrosodiphenylamine	3/23/1998	1	mg/L	U
1B. B-1, 7.0'-7.5'	1,2-Diphenylhydrazine	3/23/1998	1	mg/L	U
1B. B-1, 7.0'-7.5'	4-Bromophenyl phenyl ether	3/23/1998	1	mg/L	U
1B. B-1, 7.0'-7.5'	Hexachlorobenzene	3/23/1998	2	mg/L	U
1B. B-1, 7.0'-7.5'	Di-N-butyl phthalate	3/23/1998	1	mg/L	U
1B. B-1, 7.0'-7.5'	Phenanthrene	3/23/1998	1	mg/L	U
1B. B-1, 7.0'-7.5'	Anthracene	3/23/1998	1	mg/L	U
1B. B-1, 7.0'-7.5'	Fluoranthene	3/23/1998	1	mg/L	U
1B. B-1, 7.0'-7.5'	Benzidine	3/23/1998	10	mg/L	U
1B. B-1, 7.0'-7.5'	Pyrene	3/23/1998	1	mg/L	U
1B. B-1, 7.0'-7.5'	Butyl benzyl phthalate	3/23/1998	1	mg/L	U
1B. B-1, 7.0'-7.5'	Bis (2-ethylhexyl) phthalate	3/23/1998	10	mg/L	U
1B. B-1, 7.0'-7.5'	Benzo (a) anthracene	3/23/1998	1	mg/L	U
1B. B-1, 7.0'-7.5'	Chrysene	3/23/1998	1	mg/L	U
1B. B-1, 7.0'-7.5'	3,3'-Dichlorobenzidine	3/23/1998	2	mg/L	U
1B. B-1, 7.0'-7.5'	Di-n-octylphthalate	3/23/1998	1	mg/L	U
1B. B-1, 7.0'-7.5'	Benzo (b) fluoranthene	3/23/1998	1	mg/L	U
1B. B-1, 7.0'-7.5'	Benzo (k) fluoranthene	3/23/1998	1	mg/L	U
1B. B-1, 7.0'-7.5'	Benzo (a) pyrene	3/23/1998	1	mg/L	U
1B. B-1, 7.0'-7.5'	Indeno (123cd) pyrene	3/23/1998	2	mg/L	U
1B. B-1, 7.0'-7.5'	Dibenz (ah) anthracene	3/23/1998	2	mg/L	U
1B. B-1, 7.0'-7.5'	Benzo (ghi) perylene	3/23/1998	2	mg/L	U
1B. B-1, 7.0'-7.5'	Chloromethane	3/23/1998	10	µg/L	U
1B. B-1, 7.0'-7.5'	Bromomethane	3/23/1998	10	µg/L	U
1B. B-1, 7.0'-7.5'	Vinyl chloride	3/23/1998	10	µg/L	U
1B. B-1, 7.0'-7.5'	Chloroethane	3/23/1998	10	µg/L	U
1B. B-1, 7.0'-7.5'	Methylene chloride	3/23/1998	5	µg/L	U
1B. B-1, 7.0'-7.5'	Acrolein	3/23/1998	5	µg/L	U
1B. B-1, 7.0'-7.5'	Acrylonitrile	3/23/1998	5	µg/L	U
1B. B-1, 7.0'-7.5'	Trichlorofluoromethane	3/23/1998	10	µg/L	U
1B. B-1, 7.0'-7.5'	1,1-Dichloroethene	3/23/1998	5	µg/L	U
1B. B-1, 7.0'-7.5'	1,1-Dichloroethane	3/23/1998	5	µg/L	U
1B. B-1, 7.0'-7.5'	Trans-1,2-Dichloroethene	3/23/1998	5	µg/L	U

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Sample ID	Chemical Analyte	Sample Date	Result	Units	Qualifier
1B. B-1, 7.0'-7.5'	Chloroform	3/23/1998	5	µg/L	U
1B. B-1, 7.0'-7.5'	1,2-Dichloroethane	3/23/1998	5	µg/L	U
1B. B-1, 7.0'-7.5'	1,1,1-Trichloroethane	3/23/1998	5	µg/L	U
1B. B-1, 7.0'-7.5'	Carbon tetrachloride	3/23/1998	5	µg/L	U
1B. B-1, 7.0'-7.5'	Bromodichloromethane	3/23/1998	5	µg/L	U
1B. B-1, 7.0'-7.5'	1,2-Dichloropropane	3/23/1998	5	µg/L	U
1B. B-1, 7.0'-7.5'	Cis-1,3-Dichloropropene	3/23/1998	5	µg/L	U
1B. B-1, 7.0'-7.5'	Trichloroethene	3/23/1998	5	µg/L	U
1B. B-1, 7.0'-7.5'	Benzene	3/23/1998	5	µg/L	U
1B. B-1, 7.0'-7.5'	Chlorodibromomethane	3/23/1998	5	µg/L	U
1B. B-1, 7.0'-7.5'	1,1,2-Trichloroethane	3/23/1998	5	µg/L	U
1B. B-1, 7.0'-7.5'	2-Chloroethylvinyl ether	3/23/1998	5	µg/L	U
1B. B-1, 7.0'-7.5'	Bromoform	3/23/1998	5	µg/L	U
1B. B-1, 7.0'-7.5'	1,1,2,2-Tetrachloroethane	3/23/1998	5	µg/L	U
1B. B-1, 7.0'-7.5'	Tetrachloroethene	3/23/1998	5	µg/L	U
1B. B-1, 7.0'-7.5'	Toluene	3/23/1998	5	µg/L	U
1B. B-1, 7.0'-7.5'	Chlorobenzene	3/23/1998	5	µg/L	U
1B. B-1, 7.0'-7.5'	Ethylbenzene	3/23/1998	5	µg/L	U
2. B-2, 9.5'-10.0'	Arsenic	3/24/1998	1.4	mg/kg	
2. B-2, 9.5'-10.0'	Chromium	3/24/1998	19	mg/kg	
2. B-2, 9.5'-10.0'	Copper	3/24/1998	6.1	mg/kg	
2. B-2, 9.5'-10.0'	Antimony	3/24/1998	11	mg/kg	U
2. B-2, 9.5'-10.0'	Beryllium	3/24/1998	1.1	mg/kg	U
2. B-2, 9.5'-10.0'	Cadmium	3/24/1998	1.1	mg/kg	U
2. B-2, 9.5'-10.0'	Selenium	3/24/1998	0.5	mg/kg	U
2. B-2, 9.5'-10.0'	Silver	3/24/1998	1.1	mg/kg	U
2. B-2, 9.5'-10.0'	Thallium	3/24/1998	11	mg/kg	U
2. B-2, 9.5'-10.0'	Lead	3/24/1998	11	mg/kg	
2. B-2, 9.5'-10.0'	Cyanide (total)	3/24/1998	0.11	mg/kg	U
2. B-2, 9.5'-10.0'	Phenolics	3/24/1998	1	mg/kg	U
2. B-2, 9.5'-10.0'	Mercury	3/24/1998	0.31	mg/kg	
2. B-2, 9.5'-10.0'	Nickel	3/24/1998	9.4	mg/kg	
2. B-2, 9.5'-10.0'	Zinc	3/24/1998	29	mg/kg	
2. B-2, 9.5'-10.0'	Phenol	3/24/1998	10	mg/L	U
2. B-2, 9.5'-10.0'	2-Chlorophenol	3/24/1998	1	mg/L	U
2. B-2, 9.5'-10.0'	N-Nitrosodimethylamine	3/24/1998	10	mg/L	U
2. B-2, 9.5'-10.0'	Bis (2-chloroethyl) ether	3/24/1998	1	mg/L	U
2. B-2, 9.5'-10.0'	1,3-Dichlorobenzene	3/24/1998	1	mg/L	U
2. B-2, 9.5'-10.0'	1,4-Dichlorobenzene	3/24/1998	1	mg/L	U
2. B-2, 9.5'-10.0'	1,2-Dichlorobenzene	3/24/1998	1	mg/L	U
2. B-2, 9.5'-10.0'	Bis (2-chloroisopropyl) ether	3/24/1998	10	mg/L	U
2. B-2, 9.5'-10.0'	N-Nitroso-di-N-propylamine	3/24/1998	2	mg/L	U

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Sample ID	Chemical Analyte	Sample Date	Result	Units	Qualifier
2. B-2, 9.5'-10.0'	Hexachloroethane	3/24/1998	1	mg/L	U
2. B-2, 9.5'-10.0'	2-Nitrophenol	3/24/1998	2	mg/L	U
2. B-2, 9.5'-10.0'	2,4-Dimethylphenol	3/24/1998	1	mg/L	U
2. B-2, 9.5'-10.0'	2,4-Dichlorophenol	3/24/1998	1	mg/L	U
2. B-2, 9.5'-10.0'	4-Chloro-3-methylphenol	3/24/1998	1	mg/L	U
2. B-2, 9.5'-10.0'	Nitrobenzene	3/24/1998	2	mg/L	U
2. B-2, 9.5'-10.0'	Isophorone	3/24/1998	1	mg/L	U
2. B-2, 9.5'-10.0'	Bis (2-chloroethoxy) methane	3/24/1998	1	mg/L	U
2. B-2, 9.5'-10.0'	1,2,4-Trichlorobenzene	3/24/1998	1	mg/L	U
2. B-2, 9.5'-10.0'	Hexachlorobutadiene	3/24/1998	1	mg/L	U
2. B-2, 9.5'-10.0'	Naphthalene	3/24/1998	1	mg/L	U
2. B-2, 9.5'-10.0'	2,4,6-Trichlorophenol	3/24/1998	1	mg/L	U
2. B-2, 9.5'-10.0'	2,4-Dinitrophenol	3/24/1998	10	mg/L	U
2. B-2, 9.5'-10.0'	4-Nitrophenol	3/24/1998	10	mg/L	U
2. B-2, 9.5'-10.0'	Hexachlorocyclopentadiene	3/24/1998	10	mg/L	U
2. B-2, 9.5'-10.0'	2-Chloronaphthalene	3/24/1998	1	mg/L	U
2. B-2, 9.5'-10.0'	Dimethyl phthalate	3/24/1998	1	mg/L	U
2. B-2, 9.5'-10.0'	2,6-Dinitrotoluene	3/24/1998	1	mg/L	U
2. B-2, 9.5'-10.0'	Acenaphthylene	3/24/1998	1	mg/L	U
2. B-2, 9.5'-10.0'	Acenaphthene	3/24/1998	1	mg/L	U
2. B-2, 9.5'-10.0'	2,4-Dinitrotoluene	3/24/1998	1	mg/L	U
2. B-2, 9.5'-10.0'	Diethyl phthalate	3/24/1998	1	mg/L	U
2. B-2, 9.5'-10.0'	4-Chlorophenyl phenyl ether	3/24/1998	1	mg/L	U
2. B-2, 9.5'-10.0'	Fluorene	3/24/1998	1	mg/L	U
2. B-2, 9.5'-10.0'	4,6-Dinitro-2-methylphenol	3/24/1998	10	mg/L	U
2. B-2, 9.5'-10.0'	Pentachlorophenol	3/24/1998	10	mg/L	U
2. B-2, 9.5'-10.0'	N-Nitrosodiphenylamine	3/24/1998	1	mg/L	U
2. B-2, 9.5'-10.0'	1,2-Diphenylhydrazine	3/24/1998	1	mg/L	U
2. B-2, 9.5'-10.0'	4-Bromophenyl phenyl ether	3/24/1998	1	mg/L	U
2. B-2, 9.5'-10.0'	Hexachlorobenzene	3/24/1998	2	mg/L	U
2. B-2, 9.5'-10.0'	Di-N-butyl phthalate	3/24/1998	1	mg/L	U
2. B-2, 9.5'-10.0'	Phenanthrene	3/24/1998	1	mg/L	U
2. B-2, 9.5'-10.0'	Anthracene	3/24/1998	1	mg/L	U
2. B-2, 9.5'-10.0'	Fluoranthene	3/24/1998	1	mg/L	U
2. B-2, 9.5'-10.0'	Benzidine	3/24/1998	10	mg/L	U
2. B-2, 9.5'-10.0'	Pyrene	3/24/1998	1	mg/L	U
2. B-2, 9.5'-10.0'	Butyl benzyl phthalate	3/24/1998	1	mg/L	U
2. B-2, 9.5'-10.0'	Bis (2-ethylhexyl) phthalate	3/24/1998	10	mg/L	U
2. B-2, 9.5'-10.0'	Benzo (a) anthracene	3/24/1998	1	mg/L	U
2. B-2, 9.5'-10.0'	Chrysene	3/24/1998	1	mg/L	U
2. B-2, 9.5'-10.0'	3,3'-Dichlorobenzidine	3/24/1998	2	mg/L	U
2. B-2, 9.5'-10.0'	Di-n-octylphthalate	3/24/1998	1	mg/L	U

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Sample ID	Chemical Analyte	Sample Date	Result	Units	Qualifier
2. B-2, 9.5'-10.0'	Benzo (b) fluoranthene	3/24/1998	1	mg/L	U
2. B-2, 9.5'-10.0'	Benzo (k) fluoranthene	3/24/1998	1	mg/L	U
2. B-2, 9.5'-10.0'	Benzo (a) pyrene	3/24/1998	1	mg/L	U
2. B-2, 9.5'-10.0'	Indeno (123cd) pyrene	3/24/1998	2	mg/L	U
2. B-2, 9.5'-10.0'	Dibenz (ah) anthracene	3/24/1998	2	mg/L	U
2. B-2, 9.5'-10.0'	Benzo (ghi) perylene	3/24/1998	2	mg/L	U
2. B-2, 9.5'-10.0'	Chloromethane	3/24/1998	10	µg/L	U
2. B-2, 9.5'-10.0'	Bromomethane	3/24/1998	10	µg/L	U
2. B-2, 9.5'-10.0'	Vinyl chloride	3/24/1998	10	µg/L	U
2. B-2, 9.5'-10.0'	Chloroethane	3/24/1998	10	µg/L	U
2. B-2, 9.5'-10.0'	Methylene chloride	3/24/1998	5	µg/L	U
2. B-2, 9.5'-10.0'	Acrolein	3/24/1998	5	µg/L	U
2. B-2, 9.5'-10.0'	Acrylonitrile	3/24/1998	5	µg/L	U
2. B-2, 9.5'-10.0'	Trichlorofluoromethane	3/24/1998	10	µg/L	U
2. B-2, 9.5'-10.0'	1,1-Dichloroethene	3/24/1998	5	µg/L	U
2. B-2, 9.5'-10.0'	1,1-Dichloroethane	3/24/1998	5	µg/L	U
2. B-2, 9.5'-10.0'	Trans-1,2-Dichloroethene	3/24/1998	5	µg/L	U
2. B-2, 9.5'-10.0'	Chloroform	3/24/1998	5	µg/L	U
2. B-2, 9.5'-10.0'	1,2-Dichloroethane	3/24/1998	5	µg/L	U
2. B-2, 9.5'-10.0'	1,1,1-Trichloroethane	3/24/1998	5	µg/L	U
2. B-2, 9.5'-10.0'	Carbon tetrachloride	3/24/1998	5	µg/L	U
2. B-2, 9.5'-10.0'	Bromodichloromethane	3/24/1998	5	µg/L	U
2. B-2, 9.5'-10.0'	1,2-Dichloropropane	3/24/1998	5	µg/L	U
2. B-2, 9.5'-10.0'	Cis-1,3-Dichloropropene	3/24/1998	5	µg/L	U
2. B-2, 9.5'-10.0'	Trichloroethene	3/24/1998	5	µg/L	U
2. B-2, 9.5'-10.0'	Benzene	3/24/1998	5	µg/L	U
2. B-2, 9.5'-10.0'	Chlorodibromomethane	3/24/1998	5	µg/L	U
2. B-2, 9.5'-10.0'	1,1,2-Trichloroethane	3/24/1998	5	µg/L	U
2. B-2, 9.5'-10.0'	2-Chloroethylvinyl ether	3/24/1998	5	µg/L	U
2. B-2, 9.5'-10.0'	Bromoform	3/24/1998	5	µg/L	U
2. B-2, 9.5'-10.0'	1,1,2,2-Tetrachloroethane	3/24/1998	5	µg/L	U
2. B-2, 9.5'-10.0'	Tetrachloroethene	3/24/1998	5	µg/L	U
2. B-2, 9.5'-10.0'	Toluene	3/24/1998	5	µg/L	U
2. B-2, 9.5'-10.0'	Chlorobenzene	3/24/1998	5	µg/L	U
2. B-2, 9.5'-10.0'	Ethylbenzene	3/24/1998	5	µg/L	U
2. B-2, 9.5'-10.0'	a-BHC	3/24/1998	0.1	mg/L	U
2. B-2, 9.5'-10.0'	g-BHC	3/24/1998	0.1	mg/L	U
2. B-2, 9.5'-10.0'	b-BHC	3/24/1998	0.1	mg/L	U
2. B-2, 9.5'-10.0'	Heptachlor	3/24/1998	0.1	mg/L	U
2. B-2, 9.5'-10.0'	d-BHC	3/24/1998	0.1	mg/L	U
2. B-2, 9.5'-10.0'	Aldrin	3/24/1998	0.1	mg/L	U
2. B-2, 9.5'-10.0'	Heptachlor Epoxide	3/24/1998	0.1	mg/L	U

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Sample ID	Chemical Analyte	Sample Date	Result	Units	Qualifier
2. B-2, 9.5'-10.0'	Endosulfan	3/24/1998	0.1	mg/L	U
2. B-2, 9.5'-10.0'	Dieldrin	3/24/1998	0.1	mg/L	U
2. B-2, 9.5'-10.0'	4,4'-DDE	3/24/1998	0.1	mg/L	U
2. B-2, 9.5'-10.0'	Endrin	3/24/1998	0.1	mg/L	U
2. B-2, 9.5'-10.0'	4,4'-DDD	3/24/1998	0.1	mg/L	U
2. B-2, 9.5'-10.0'	Endosulfan II	3/24/1998	0.1	mg/L	U
2. B-2, 9.5'-10.0'	4,4'-DDT	3/24/1998	0.1	mg/L	U
2. B-2, 9.5'-10.0'	Endrin Aldehyde	3/24/1998	0.1	mg/L	U
2. B-2, 9.5'-10.0'	Endosulfan Sulfate	3/24/1998	0.1	mg/L	U
2. B-2, 9.5'-10.0'	Chlordane	3/24/1998	1.0	mg/L	U
2. B-2, 9.5'-10.0'	Toxaphene	3/24/1998	1.0	mg/L	U
2. B-2, 9.5'-10.0'	Methoxychlor	3/24/1998	2.0	mg/L	U
2. B-2, 9.5'-10.0'	PCB-1016	3/24/1998	1.0	mg/L	U
2. B-2, 9.5'-10.0'	PCB-1221	3/24/1998	1.0	mg/L	U
2. B-2, 9.5'-10.0'	PCB-1232	3/24/1998	1.0	mg/L	U
2. B-2, 9.5'-10.0'	PCB-1242	3/24/1998	1.0	mg/L	U
2. B-2, 9.5'-10.0'	PCB-1248	3/24/1998	1.0	mg/L	U
2. B-2, 9.5'-10.0'	PCB-1254	3/24/1998	1.0	mg/L	U
2. B-2, 9.5'-10.0'	PCB-1260	3/24/1998	1.0	mg/L	U
3A. B-3, 4.0'-4.5'	Arsenic	3/27/1998	1.9	mg/kg	
3A. B-3, 4.0'-4.5'	Chromium	3/27/1998	10	mg/kg	
3A. B-3, 4.0'-4.5'	Copper	3/27/1998	4.2	mg/kg	
3A. B-3, 4.0'-4.5'	Cyanide (total)	3/27/1998	0.13	mg/kg	
3A. B-3, 4.0'-4.5'	Antimony	3/27/1998	8.5	mg/kg	U
3A. B-3, 4.0'-4.5'	Lead	3/27/1998	13	mg/kg	
3A. B-3, 4.0'-4.5'	Beryllium	3/27/1998	0.85	mg/kg	U
3A. B-3, 4.0'-4.5'	Cadmium	3/27/1998	0.85	mg/kg	U
3A. B-3, 4.0'-4.5'	Mercury	3/27/1998	0.33	mg/kg	
3A. B-3, 4.0'-4.5'	Selenium	3/27/1998	0.50	mg/kg	U
3A. B-3, 4.0'-4.5'	Silver	3/27/1998	0.85	mg/kg	U
3A. B-3, 4.0'-4.5'	Thallium	3/27/1998	8.5	mg/kg	U
3A. B-3, 4.0'-4.5'	Phenolics	3/27/1998	1	mg/kg	U
3A. B-3, 4.0'-4.5'	Nickel	3/27/1998	7.1	mg/kg	
3A. B-3, 4.0'-4.5'	Zinc	3/27/1998	13	mg/kg	
3A. B-3, 4.0'-4.5'	Phenol	3/27/1998	10	mg/L	U
3A. B-3, 4.0'-4.5'	2-Chlorophenol	3/27/1998	1	mg/L	U
3A. B-3, 4.0'-4.5'	N-Nitrosodimethylamine	3/27/1998	10	mg/L	U
3A. B-3, 4.0'-4.5'	Bis (2-chloroethyl) ether	3/27/1998	1	mg/L	U
3A. B-3, 4.0'-4.5'	1,3-Dichlorobenzene	3/27/1998	1	mg/L	U
3A. B-3, 4.0'-4.5'	1,4-Dichlorobenzene	3/27/1998	1	mg/L	U
3A. B-3, 4.0'-4.5'	1,2-Dichlorobenzene	3/27/1998	1	mg/L	U
3A. B-3, 4.0'-4.5'	Bis (2-chloroisopropyl) ether	3/27/1998	10	mg/L	U

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Sample ID	Chemical Analyte	Sample Date	Result	Units	Qualifier
3A. B-3, 4.0'-4.5'	N-Nitroso-di-N-propylamine	3/27/1998	2	mg/L	U
3A. B-3, 4.0'-4.5'	Hexachloroethane	3/27/1998	1	mg/L	U
3A. B-3, 4.0'-4.5'	2-Nitrophenol	3/27/1998	2	mg/L	U
3A. B-3, 4.0'-4.5'	2,4-Dimethylphenol	3/27/1998	1	mg/L	U
3A. B-3, 4.0'-4.5'	2,4-Dichlorophenol	3/27/1998	1	mg/L	U
3A. B-3, 4.0'-4.5'	4-Chloro-3-methylphenol	3/27/1998	1	mg/L	U
3A. B-3, 4.0'-4.5'	Nitrobenzene	3/27/1998	2	mg/L	U
3A. B-3, 4.0'-4.5'	Isophorone	3/27/1998	1	mg/L	U
3A. B-3, 4.0'-4.5'	Bis (2-chloroethoxy) methane	3/27/1998	1	mg/L	U
3A. B-3, 4.0'-4.5'	1,2,4-Trichlorobenzene	3/27/1998	1	mg/L	U
3A. B-3, 4.0'-4.5'	Hexachlorobutadiene	3/27/1998	1	mg/L	U
3A. B-3, 4.0'-4.5'	Naphthalene	3/27/1998	1	mg/L	U
3A. B-3, 4.0'-4.5'	2,4,6-Trichlorophenol	3/27/1998	1	mg/L	U
3A. B-3, 4.0'-4.5'	2,4-Dinitrophenol	3/27/1998	10	mg/L	U
3A. B-3, 4.0'-4.5'	4-Nitrophenol	3/27/1998	10	mg/L	U
3A. B-3, 4.0'-4.5'	Hexachlorocyclopentadiene	3/27/1998	10	mg/L	U
3A. B-3, 4.0'-4.5'	2-Chloronaphthalene	3/27/1998	1	mg/L	U
3A. B-3, 4.0'-4.5'	Dimethyl phthalate	3/27/1998	1	mg/L	U
3A. B-3, 4.0'-4.5'	2,6-Dinitrotoluene	3/27/1998	1	mg/L	U
3A. B-3, 4.0'-4.5'	Acenaphthylene	3/27/1998	1	mg/L	U
3A. B-3, 4.0'-4.5'	Acenaphthene	3/27/1998	1	mg/L	U
3A. B-3, 4.0'-4.5'	2,4-Dinitrotoluene	3/27/1998	1	mg/L	U
3A. B-3, 4.0'-4.5'	Diethyl phthalate	3/27/1998	1	mg/L	U
3A. B-3, 4.0'-4.5'	4-Chlorophenyl phenyl ether	3/27/1998	1	mg/L	U
3A. B-3, 4.0'-4.5'	Fluorene	3/27/1998	1	mg/L	U
3A. B-3, 4.0'-4.5'	4,6-Dinitro-2-methylphenol	3/27/1998	10	mg/L	U
3A. B-3, 4.0'-4.5'	Pentachlorophenol	3/27/1998	10	mg/L	U
3A. B-3, 4.0'-4.5'	N-Nitrosodiphenylamine	3/27/1998	1	mg/L	U
3A. B-3, 4.0'-4.5'	1,2-Diphenylhydrazine	3/27/1998	1	mg/L	U
3A. B-3, 4.0'-4.5'	4-Bromophenyl phenyl ether	3/27/1998	1	mg/L	U
3A. B-3, 4.0'-4.5'	Hexachlorobenzene	3/27/1998	2	mg/L	U
3A. B-3, 4.0'-4.5'	Di-N-butyl phthalate	3/27/1998	1	mg/L	U
3A. B-3, 4.0'-4.5'	Phenanthrene	3/27/1998	1	mg/L	U
3A. B-3, 4.0'-4.5'	Anthracene	3/27/1998	1	mg/L	U
3A. B-3, 4.0'-4.5'	Fluoranthene	3/27/1998	1	mg/L	U
3A. B-3, 4.0'-4.5'	Benzidine	3/27/1998	10	mg/L	U
3A. B-3, 4.0'-4.5'	Pyrene	3/27/1998	1	mg/L	U
3A. B-3, 4.0'-4.5'	Butyl benzyl phthalate	3/27/1998	1	mg/L	U
3A. B-3, 4.0'-4.5'	Bis (2-ethylhexyl) phthalate	3/27/1998	10	mg/L	U
3A. B-3, 4.0'-4.5'	Benzo (a) anthracene	3/27/1998	1	mg/L	U
3A. B-3, 4.0'-4.5'	Chrysene	3/27/1998	1	mg/L	U
3A. B-3, 4.0'-4.5'	3,3'-Dichlorobenzidine	3/27/1998	2	mg/L	U

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Sample ID	Chemical Analyte	Sample Date	Result	Units	Qualifier
3A. B-3, 4.0'-4.5'	Di-n-octylphthalate	3/27/1998	1	mg/L	U
3A. B-3, 4.0'-4.5'	Benzo (b) fluoranthene	3/27/1998	1	mg/L	U
3A. B-3, 4.0'-4.5'	Benzo (k) fluoranthene	3/27/1998	1	mg/L	U
3A. B-3, 4.0'-4.5'	Benzo (a) pyrene	3/27/1998	1	mg/L	U
3A. B-3, 4.0'-4.5'	Indeno (123cd) pyrene	3/27/1998	2	mg/L	U
3A. B-3, 4.0'-4.5'	Dibenz (ah) anthracene	3/27/1998	2	mg/L	U
3A. B-3, 4.0'-4.5'	Benzo (ghi) perylene	3/27/1998	2	mg/L	U
3A. B-3, 4.0'-4.5'	Chloromethane	3/27/1998	10	µg/L	U
3A. B-3, 4.0'-4.5'	Bromomethane	3/27/1998	10	µg/L	U
3A. B-3, 4.0'-4.5'	Vinyl chloride	3/27/1998	10	µg/L	U
3A. B-3, 4.0'-4.5'	Chloroethane	3/27/1998	10	µg/L	U
3A. B-3, 4.0'-4.5'	Methylene chloride	3/27/1998	5	µg/L	U
3A. B-3, 4.0'-4.5'	Acrolein	3/27/1998	5	µg/L	U
3A. B-3, 4.0'-4.5'	Acrylonitrile	3/27/1998	5	µg/L	U
3A. B-3, 4.0'-4.5'	Trichlorofluoromethane	3/27/1998	10	µg/L	U
3A. B-3, 4.0'-4.5'	1,1-Dichloroethene	3/27/1998	5	µg/L	U
3A. B-3, 4.0'-4.5'	1,1-Dichloroethane	3/27/1998	5	µg/L	U
3A. B-3, 4.0'-4.5'	Trans-1,2-Dichloroethene	3/27/1998	5	µg/L	U
3A. B-3, 4.0'-4.5'	Chloroform	3/27/1998	5	µg/L	U
3A. B-3, 4.0'-4.5'	1,2-Dichloroethane	3/27/1998	5	µg/L	U
3A. B-3, 4.0'-4.5'	1,1,1-Trichloroethane	3/27/1998	5	µg/L	U
3A. B-3, 4.0'-4.5'	Carbon tetrachloride	3/27/1998	5	µg/L	U
3A. B-3, 4.0'-4.5'	Bromodichloromethane	3/27/1998	5	µg/L	U
3A. B-3, 4.0'-4.5'	1,2-Dichloropropane	3/27/1998	5	µg/L	U
3A. B-3, 4.0'-4.5'	Cis-1,3-Dichloropropene	3/27/1998	5	µg/L	U
3A. B-3, 4.0'-4.5'	Trichloroethene	3/27/1998	5	µg/L	U
3A. B-3, 4.0'-4.5'	Benzene	3/27/1998	5	µg/L	U
3A. B-3, 4.0'-4.5'	Chlorodibromomethane	3/27/1998	5	µg/L	U
3A. B-3, 4.0'-4.5'	1,1,2-Trichloroethane	3/27/1998	5	µg/L	U
3A. B-3, 4.0'-4.5'	2-Chloroethylvinyl ether	3/27/1998	5	µg/L	U
3A. B-3, 4.0'-4.5'	Bromoform	3/27/1998	5	µg/L	U
3A. B-3, 4.0'-4.5'	1,1,2,2-Tetrachloroethane	3/27/1998	5	µg/L	U
3A. B-3, 4.0'-4.5'	Tetrachloroethene	3/27/1998	5	µg/L	U
3A. B-3, 4.0'-4.5'	Toluene	3/27/1998	5	µg/L	U
3A. B-3, 4.0'-4.5'	Chlorobenzene	3/27/1998	5	µg/L	U
3A. B-3, 4.0'-4.5'	Ethylbenzene	3/27/1998	5	µg/L	U
3A. B-3, 4.0'-4.5'	a-BHC	3/27/1998	0.1	mg/L	U
3A. B-3, 4.0'-4.5'	g-BHC	3/27/1998	0.1	mg/L	U
3A. B-3, 4.0'-4.5'	b-BHC	3/27/1998	0.1	mg/L	U
3A. B-3, 4.0'-4.5'	Heptachlor	3/27/1998	0.1	mg/L	U
3A. B-3, 4.0'-4.5'	d-BHC	3/27/1998	0.1	mg/L	U
3A. B-3, 4.0'-4.5'	Aldrin	3/27/1998	0.1	mg/L	U

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Sample ID	Chemical Analyte	Sample Date	Result	Units	Qualifier
3A. B-3, 4.0'-4.5'	Heptachlor Epoxide	3/27/1998	0.1	mg/L	U
3A. B-3, 4.0'-4.5'	Endosulfan	3/27/1998	0.1	mg/L	U
3A. B-3, 4.0'-4.5'	Dieldrin	3/27/1998	0.1	mg/L	U
3A. B-3, 4.0'-4.5'	4,4'-DDE	3/27/1998	0.1	mg/L	U
3A. B-3, 4.0'-4.5'	Endrin	3/27/1998	0.1	mg/L	U
3A. B-3, 4.0'-4.5'	4,4'-DDD	3/27/1998	0.1	mg/L	U
3A. B-3, 4.0'-4.5'	Endosulfan II	3/27/1998	0.1	mg/L	U
3A. B-3, 4.0'-4.5'	4,4'-DDT	3/27/1998	0.1	mg/L	U
3A. B-3, 4.0'-4.5'	Endrin Aldehyde	3/27/1998	0.1	mg/L	U
3A. B-3, 4.0'-4.5'	Endosulfan Sulfate	3/27/1998	0.1	mg/L	U
3A. B-3, 4.0'-4.5'	Chlordane	3/27/1998	1.0	mg/L	U
3A. B-3, 4.0'-4.5'	Toxaphene	3/27/1998	1.0	mg/L	U
3A. B-3, 4.0'-4.5'	Methoxychlor	3/27/1998	2.0	mg/L	U
3A. B-3, 4.0'-4.5'	PCB-1016	3/27/1998	1.0	mg/L	U
3A. B-3, 4.0'-4.5'	PCB-1221	3/27/1998	1.0	mg/L	U
3A. B-3, 4.0'-4.5'	PCB-1232	3/27/1998	1.0	mg/L	U
3A. B-3, 4.0'-4.5'	PCB-1242	3/27/1998	1.0	mg/L	U
3A. B-3, 4.0'-4.5'	PCB-1248	3/27/1998	1.0	mg/L	U
3A. B-3, 4.0'-4.5'	PCB-1254	3/27/1998	1.0	mg/L	U
3A. B-3, 4.0'-4.5'	PCB-1260	3/27/1998	1.0	mg/L	U
3B. B-3, 7.0'-7.5'	Arsenic	3/27/1998	3.4	mg/kg	
3B. B-3, 7.0'-7.5'	Chromium	3/27/1998	14	mg/kg	
3B. B-3, 7.0'-7.5'	Copper	3/27/1998	5.7	mg/kg	
3B. B-3, 7.0'-7.5'	Cyanide (total)	3/27/1998	0.13	mg/kg	
3B. B-3, 7.0'-7.5'	Lead	3/27/1998	14	mg/kg	
3B. B-3, 7.0'-7.5'	Mercury	3/27/1998	0.3	mg/kg	
3B. B-3, 7.0'-7.5'	Antimony	3/27/1998	7.9	mg/kg	U
3B. B-3, 7.0'-7.5'	Beryllium	3/27/1998	0.79	mg/kg	U
3B. B-3, 7.0'-7.5'	Cadmium	3/27/1998	0.79	mg/kg	U
3B. B-3, 7.0'-7.5'	Nickel	3/27/1998	6.1	mg/kg	
3B. B-3, 7.0'-7.5'	Selenium	3/27/1998	0.50	mg/kg	U
3B. B-3, 7.0'-7.5'	Silver	3/27/1998	0.79	mg/kg	U
3B. B-3, 7.0'-7.5'	Thallium	3/27/1998	7.9	mg/kg	U
3B. B-3, 7.0'-7.5'	Zinc	3/27/1998	28	mg/kg	
3B. B-3, 7.0'-7.5'	Phenolics	3/27/1998	1	mg/kg	U
3B. B-3, 7.0'-7.5'	Phenol	3/27/1998	10	mg/L	U
3B. B-3, 7.0'-7.5'	2-Chlorophenol	3/27/1998	1	mg/L	U
3B. B-3, 7.0'-7.5'	N-Nitrosodimethylamine	3/27/1998	10	mg/L	U
3B. B-3, 7.0'-7.5'	Bis (2-chloroethyl) ether	3/27/1998	1	mg/L	U
3B. B-3, 7.0'-7.5'	1,3-Dichlorobenzene	3/27/1998	1	mg/L	U
3B. B-3, 7.0'-7.5'	1,4-Dichlorobenzene	3/27/1998	1	mg/L	U
3B. B-3, 7.0'-7.5'	1,2-Dichlorobenzene	3/27/1998	1	mg/L	U

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Sample ID	Chemical Analyte	Sample Date	Result	Units	Qualifier
3B. B-3, 7.0'-7.5'	Bis (2-chloroisopropyl) ether	3/27/1998	10	mg/L	U
3B. B-3, 7.0'-7.5'	N-Nitroso-di-N-propylamine	3/27/1998	2	mg/L	U
3B. B-3, 7.0'-7.5'	Hexachloroethane	3/27/1998	1	mg/L	U
3B. B-3, 7.0'-7.5'	2-Nitrophenol	3/27/1998	2	mg/L	U
3B. B-3, 7.0'-7.5'	2,4-Dimethylphenol	3/27/1998	1	mg/L	U
3B. B-3, 7.0'-7.5'	2,4-Dichlorophenol	3/27/1998	1	mg/L	U
3B. B-3, 7.0'-7.5'	4-Chloro-3-methylphenol	3/27/1998	1	mg/L	U
3B. B-3, 7.0'-7.5'	Nitrobenzene	3/27/1998	2	mg/L	U
3B. B-3, 7.0'-7.5'	Isophorone	3/27/1998	1	mg/L	U
3B. B-3, 7.0'-7.5'	Bis (2-chloroethoxy) methane	3/27/1998	1	mg/L	U
3B. B-3, 7.0'-7.5'	1,2,4-Trichlorobenzene	3/27/1998	1	mg/L	U
3B. B-3, 7.0'-7.5'	Hexachlorobutadiene	3/27/1998	1	mg/L	U
3B. B-3, 7.0'-7.5'	Naphthalene	3/27/1998	1	mg/L	U
3B. B-3, 7.0'-7.5'	2,4,6-Trichlorophenol	3/27/1998	1	mg/L	U
3B. B-3, 7.0'-7.5'	2,4-Dinitrophenol	3/27/1998	10	mg/L	U
3B. B-3, 7.0'-7.5'	4-Nitrophenol	3/27/1998	10	mg/L	U
3B. B-3, 7.0'-7.5'	Hexachlorocyclopentadiene	3/27/1998	10	mg/L	U
3B. B-3, 7.0'-7.5'	2-Chloronaphthalene	3/27/1998	1	mg/L	U
3B. B-3, 7.0'-7.5'	Dimethyl phthalate	3/27/1998	1	mg/L	U
3B. B-3, 7.0'-7.5'	2,6-Dinitrotoluene	3/27/1998	1	mg/L	U
3B. B-3, 7.0'-7.5'	Acenaphthylene	3/27/1998	1	mg/L	U
3B. B-3, 7.0'-7.5'	Acenaphthene	3/27/1998	1	mg/L	U
3B. B-3, 7.0'-7.5'	2,4-Dinitrotoluene	3/27/1998	1	mg/L	U
3B. B-3, 7.0'-7.5'	Diethyl phthalate	3/27/1998	1	mg/L	U
3B. B-3, 7.0'-7.5'	4-Chlorophenyl phenyl ether	3/27/1998	1	mg/L	U
3B. B-3, 7.0'-7.5'	Fluorene	3/27/1998	1	mg/L	U
3B. B-3, 7.0'-7.5'	4,6-Dinitro-2-methylphenol	3/27/1998	10	mg/L	U
3B. B-3, 7.0'-7.5'	Pentachlorophenol	3/27/1998	10	mg/L	U
3B. B-3, 7.0'-7.5'	N-Nitrosodiphenylamine	3/27/1998	1	mg/L	U
3B. B-3, 7.0'-7.5'	1,2-Diphenylhydrazine	3/27/1998	1	mg/L	U
3B. B-3, 7.0'-7.5'	4-Bromophenyl phenyl ether	3/27/1998	1	mg/L	U
3B. B-3, 7.0'-7.5'	Hexachlorobenzene	3/27/1998	2	mg/L	U
3B. B-3, 7.0'-7.5'	Di-N-butyl phthalate	3/27/1998	1	mg/L	U
3B. B-3, 7.0'-7.5'	Phenanthrene	3/27/1998	1	mg/L	U
3B. B-3, 7.0'-7.5'	Anthracene	3/27/1998	1	mg/L	U
3B. B-3, 7.0'-7.5'	Fluoranthene	3/27/1998	1	mg/L	U
3B. B-3, 7.0'-7.5'	Benzidine	3/27/1998	10	mg/L	U
3B. B-3, 7.0'-7.5'	Pyrene	3/27/1998	1	mg/L	U
3B. B-3, 7.0'-7.5'	Butyl benzyl phthalate	3/27/1998	1	mg/L	U
3B. B-3, 7.0'-7.5'	Bis (2-ethylhexyl) phthalate	3/27/1998	10	mg/L	U
3B. B-3, 7.0'-7.5'	Benzo (a) anthracene	3/27/1998	1	mg/L	U
3B. B-3, 7.0'-7.5'	Chrysene	3/27/1998	1	mg/L	U

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Sample ID	Chemical Analyte	Sample Date	Result	Units	Qualifier
3B. B-3, 7.0'-7.5'	3,3'-Dichlorobenzidine	3/27/1998	2	mg/L	U
3B. B-3, 7.0'-7.5'	Di-n-octylphthalate	3/27/1998	1	mg/L	U
3B. B-3, 7.0'-7.5'	Benzo (b) fluoranthene	3/27/1998	1	mg/L	U
3B. B-3, 7.0'-7.5'	Benzo (k) fluoranthene	3/27/1998	1	mg/L	U
3B. B-3, 7.0'-7.5'	Benzo (a) pyrene	3/27/1998	1	mg/L	U
3B. B-3, 7.0'-7.5'	Indeno (123cd) pyrene	3/27/1998	2	mg/L	U
3B. B-3, 7.0'-7.5'	Dibenz (ah) anthracene	3/27/1998	2	mg/L	U
3B. B-3, 7.0'-7.5'	Benzo (ghi) perylene	3/27/1998	2	mg/L	U
3B. B-3, 7.0'-7.5'	Chloromethane	3/27/1998	10	µg/L	U
3B. B-3, 7.0'-7.5'	Bromomethane	3/27/1998	10	µg/L	U
3B. B-3, 7.0'-7.5'	Vinyl chloride	3/27/1998	10	µg/L	U
3B. B-3, 7.0'-7.5'	Chloroethane	3/27/1998	10	µg/L	U
3B. B-3, 7.0'-7.5'	Methylene chloride	3/27/1998	5	µg/L	U
3B. B-3, 7.0'-7.5'	Acrolein	3/27/1998	5	µg/L	U
3B. B-3, 7.0'-7.5'	Acrylonitrile	3/27/1998	5	µg/L	U
3B. B-3, 7.0'-7.5'	Trichlorofluoromethane	3/27/1998	10	µg/L	U
3B. B-3, 7.0'-7.5'	1,1-Dichloroethene	3/27/1998	5	µg/L	U
3B. B-3, 7.0'-7.5'	1,1-Dichloroethane	3/27/1998	5	µg/L	U
3B. B-3, 7.0'-7.5'	Trans-1,2-Dichloroethene	3/27/1998	5	µg/L	U
3B. B-3, 7.0'-7.5'	Chloroform	3/27/1998	5	µg/L	U
3B. B-3, 7.0'-7.5'	1,2-Dichloroethane	3/27/1998	5	µg/L	U
3B. B-3, 7.0'-7.5'	1,1,1-Trichloroethane	3/27/1998	5	µg/L	U
3B. B-3, 7.0'-7.5'	Carbon tetrachloride	3/27/1998	5	µg/L	U
3B. B-3, 7.0'-7.5'	Bromodichloromethane	3/27/1998	5	µg/L	U
3B. B-3, 7.0'-7.5'	1,2-Dichloropropane	3/27/1998	5	µg/L	U
3B. B-3, 7.0'-7.5'	Cis-1,3-Dichloropropene	3/27/1998	5	µg/L	U
3B. B-3, 7.0'-7.5'	Trichloroethene	3/27/1998	5	µg/L	U
3B. B-3, 7.0'-7.5'	Benzene	3/27/1998	5	µg/L	U
3B. B-3, 7.0'-7.5'	Chlorodibromomethane	3/27/1998	5	µg/L	U
3B. B-3, 7.0'-7.5'	1,1,2-Trichloroethane	3/27/1998	5	µg/L	U
3B. B-3, 7.0'-7.5'	2-Chloroethylvinyl ether	3/27/1998	5	µg/L	U
3B. B-3, 7.0'-7.5'	Bromoform	3/27/1998	5	µg/L	U
3B. B-3, 7.0'-7.5'	1,1,2,2-Tetrachloroethane	3/27/1998	5	µg/L	U
3B. B-3, 7.0'-7.5'	Tetrachloroethene	3/27/1998	5	µg/L	U
3B. B-3, 7.0'-7.5'	Toluene	3/27/1998	5	µg/L	U
3B. B-3, 7.0'-7.5'	Chlorobenzene	3/27/1998	5	µg/L	U
3B. B-3, 7.0'-7.5'	Ethylbenzene	3/27/1998	5	µg/L	U
3B. B-3, 7.0'-7.5'	a-BHC	3/27/1998	0.1	mg/L	U
3B. B-3, 7.0'-7.5'	g-BHC	3/27/1998	0.1	mg/L	U
3B. B-3, 7.0'-7.5'	b-BHC	3/27/1998	0.1	mg/L	U
3B. B-3, 7.0'-7.5'	Heptachlor	3/27/1998	0.1	mg/L	U
3B. B-3, 7.0'-7.5'	d-BHC	3/27/1998	0.1	mg/L	U

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Sample ID	Chemical Analyte	Sample Date	Result	Units	Qualifier
3B. B-3, 7.0'-7.5'	Aldrin	3/27/1998	0.1	mg/L	U
3B. B-3, 7.0'-7.5'	Heptachlor Epoxide	3/27/1998	0.1	mg/L	U
3B. B-3, 7.0'-7.5'	Endosulfan	3/27/1998	0.1	mg/L	U
3B. B-3, 7.0'-7.5'	Dieldrin	3/27/1998	0.1	mg/L	U
3B. B-3, 7.0'-7.5'	4,4'-DDE	3/27/1998	0.1	mg/L	U
3B. B-3, 7.0'-7.5'	Endrin	3/27/1998	0.1	mg/L	U
3B. B-3, 7.0'-7.5'	4,4'-DDD	3/27/1998	0.1	mg/L	U
3B. B-3, 7.0'-7.5'	Endosulfan II	3/27/1998	0.1	mg/L	U
3B. B-3, 7.0'-7.5'	4,4'-DDT	3/27/1998	0.1	mg/L	U
3B. B-3, 7.0'-7.5'	Endrin Aldehyde	3/27/1998	0.1	mg/L	U
3B. B-3, 7.0'-7.5'	Endosulfan Sulfate	3/27/1998	0.1	mg/L	U
3B. B-3, 7.0'-7.5'	Chlordane	3/27/1998	1.0	mg/L	U
3B. B-3, 7.0'-7.5'	Toxaphene	3/27/1998	1.0	mg/L	U
3B. B-3, 7.0'-7.5'	Methoxychlor	3/27/1998	2.0	mg/L	U
3B. B-3, 7.0'-7.5'	PCB-1016	3/27/1998	1.0	mg/L	U
3B. B-3, 7.0'-7.5'	PCB-1221	3/27/1998	1.0	mg/L	U
3B. B-3, 7.0'-7.5'	PCB-1232	3/27/1998	1.0	mg/L	U
3B. B-3, 7.0'-7.5'	PCB-1242	3/27/1998	1.0	mg/L	U
3B. B-3, 7.0'-7.5'	PCB-1248	3/27/1998	1.0	mg/L	U
3B. B-3, 7.0'-7.5'	PCB-1254	3/27/1998	1.0	mg/L	U
3B. B-3, 7.0'-7.5'	PCB-1260	3/27/1998	1.0	mg/L	U
Blank	Phenol	3/31/1998	10	µg/L	U
Blank	2-Chlorophenol	3/31/1998	1	µg/L	U
Blank	N-Nitrosodimethylamine	3/31/1998	10	µg/L	U
Blank	Bis (2-chloroethyl) ether	3/31/1998	1	µg/L	U
Blank	1,3-Dichlorobenzene	3/31/1998	1	µg/L	U
Blank	1,4-Dichlorobenzene	3/31/1998	1	µg/L	U
Blank	1,2-Dichlorobenzene	3/31/1998	1	µg/L	U
Blank	Bis (2-chloroisopropyl) ether	3/31/1998	10	µg/L	U
Blank	N-Nitroso-di-N-propylamine	3/31/1998	2	µg/L	U
Blank	Hexachloroethane	3/31/1998	1	µg/L	U
Blank	2-Nitrophenol	3/31/1998	2	µg/L	U
Blank	2,4-Dimethylphenol	3/31/1998	1	µg/L	U
Blank	2,4-Dichlorophenol	3/31/1998	1	µg/L	U
Blank	4-Chloro-3-methylphenol	3/31/1998	1	µg/L	U
Blank	Nitrobenzene	3/31/1998	2	µg/L	U
Blank	Isophorone	3/31/1998	1	µg/L	U
Blank	Bis (2-chloroethoxy) methane	3/31/1998	1	µg/L	U
Blank	1,2,4-Trichlorobenzene	3/31/1998	1	µg/L	U
Blank	Hexachlorobutadiene	3/31/1998	1	µg/L	U
Blank	Naphthalene	3/31/1998	1	µg/L	U
Blank	2,4,6-Trichlorophenol	3/31/1998	1	µg/L	U

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Sample ID	Chemical Analyte	Sample Date	Result	Units	Qualifier
Blank	2,4-Dinitrophenol	3/31/1998	10	µg/L	U
Blank	4-Nitrophenol	3/31/1998	10	µg/L	U
Blank	Hexachlorocyclopentadiene	3/31/1998	10	µg/L	U
Blank	2-Chloronaphthalene	3/31/1998	1	µg/L	U
Blank	Dimethyl phthalate	3/31/1998	1	µg/L	U
Blank	2,6-Dinitrotoluene	3/31/1998	1	µg/L	U
Blank	Acenaphthylene	3/31/1998	1	µg/L	U
Blank	Acenaphthene	3/31/1998	1	µg/L	U
Blank	2,4-Dinitrotoluene	3/31/1998	1	µg/L	U
Blank	Diethyl phthalate	3/31/1998	1	µg/L	U
Blank	4-Chlorophenyl phenyl ether	3/31/1998	1	µg/L	U
Blank	Fluorene	3/31/1998	1	µg/L	U
Blank	4,6-Dinitro-2-methylphenol	3/31/1998	10	µg/L	U
Blank	Pentachlorophenol	3/31/1998	10	µg/L	U
Blank	N-Nitrosodiphenylamine	3/31/1998	1	µg/L	U
Blank	1,2-Diphenylhydrazine	3/31/1998	1	µg/L	U
Blank	4-Bromophenyl phenyl ether	3/31/1998	1	µg/L	U
Blank	Hexachlorobenzene	3/31/1998	2	µg/L	U
Blank	Di-N-butyl phthalate	3/31/1998	1	µg/L	U
Blank	Phenanthrene	3/31/1998	1	µg/L	U
Blank	Anthracene	3/31/1998	1	µg/L	U
Blank	Fluoranthene	3/31/1998	1	µg/L	U
Blank	Benzidine	3/31/1998	10	µg/L	U
Blank	Pyrene	3/31/1998	1	µg/L	U
Blank	Butyl benzyl phthalate	3/31/1998	1	µg/L	U
Blank	Bis (2-ethylhexyl) phthalate	3/31/1998	10	µg/L	U
Blank	Benzo (a) anthracene	3/31/1998	1	µg/L	U
Blank	Chrysene	3/31/1998	1	µg/L	U
Blank	3,3'-Dichlorobenzidine	3/31/1998	2	µg/L	U
Blank	Di-n-octylphthalate	3/31/1998	1	µg/L	U
Blank	Benzo (b) fluoranthene	3/31/1998	1	µg/L	U
Blank	Benzo (k) fluoranthene	3/31/1998	1	µg/L	U
Blank	Benzo (a) pyrene	3/31/1998	1	µg/L	U
Blank	Indeno (123cd) pyrene	3/31/1998	2	µg/L	U
Blank	Dibenz (ah) anthracene	3/31/1998	2	µg/L	U
Blank	Benzo (ghi) perylene	3/31/1998	2	µg/L	U
Blank	Chloromethane	4/1/1998	10	µg/L	U
Blank	Bromomethane	4/1/1998	10	µg/L	U
Blank	Vinyl chloride	4/1/1998	10	µg/L	U
Blank	Chloroethane	4/1/1998	10	µg/L	U
Blank	Methylene chloride	4/1/1998	5	µg/L	U
Blank	Acrolein	4/1/1998	5	µg/L	U

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Sample ID	Chemical Analyte	Sample Date	Result	Units	Qualifier
Blank	Acrylonitrile	4/1/1998	5	µg/L	U
Blank	Trichlorofluoromethane	4/1/1998	10	µg/L	U
Blank	1,1-Dichloroethene	4/1/1998	5	µg/L	U
Blank	1,1-Dichloroethane	4/1/1998	5	µg/L	U
Blank	Trans-1,2-Dichloroethene	4/1/1998	5	µg/L	U
Blank	Chloroform	4/1/1998	5	µg/L	U
Blank	1,2-Dichloroethane	4/1/1998	5	µg/L	U
Blank	1,1,1-Trichloroethane	4/1/1998	5	µg/L	U
Blank	Carbon tetrachloride	4/1/1998	5	µg/L	U
Blank	Bromodichloromethane	4/1/1998	5	µg/L	U
Blank	1,2-Dichloropropane	4/1/1998	5	µg/L	U
Blank	Cis-1,3-Dichloropropene	4/1/1998	5	µg/L	U
Blank	Trichloroethene	4/1/1998	5	µg/L	U
Blank	Benzene	4/1/1998	5	µg/L	U
Blank	Chlorodibromomethane	4/1/1998	5	µg/L	U
Blank	1,1,2-Trichloroethane	4/1/1998	5	µg/L	U
Blank	2-Chloroethylvinyl ether	4/1/1998	5	µg/L	U
Blank	Bromoform	4/1/1998	5	µg/L	U
Blank	1,1,2,2-Tetrachloroethane	4/1/1998	5	µg/L	U
Blank	Tetrachloroethene	4/1/1998	5	µg/L	U
Blank	Toluene	4/1/1998	5	µg/L	U
Blank	Chlorobenzene	4/1/1998	5	µg/L	U
Blank	Ethylbenzene	4/1/1998	5	µg/L	U
Blank	Phenol	4/13/1998	10	µg/L	U
Blank	2-Chlorophenol	4/13/1998	1	µg/L	U
Blank	N-Nitrosodimethylamine	4/13/1998	10	µg/L	U
Blank	Bis (2-chloroethyl) ether	4/13/1998	1	µg/L	U
Blank	1,3-Dichlorobenzene	4/13/1998	1	µg/L	U
Blank	1,4-Dichlorobenzene	4/13/1998	1	µg/L	U
Blank	1,2-Dichlorobenzene	4/13/1998	1	µg/L	U
Blank	Bis (2-chloroisopropyl) ether	4/13/1998	10	µg/L	U
Blank	N-Nitroso-di-N-propylamine	4/13/1998	2	µg/L	U
Blank	Hexachloroethane	4/13/1998	1	µg/L	U
Blank	2-Nitrophenol	4/13/1998	2	µg/L	U
Blank	2,4-Dimethylphenol	4/13/1998	1	µg/L	U
Blank	2,4-Dichlorophenol	4/13/1998	1	µg/L	U
Blank	4-Chloro-3-methylphenol	4/13/1998	1	µg/L	U
Blank	Nitrobenzene	4/13/1998	2	µg/L	U
Blank	Isophorone	4/13/1998	1	µg/L	U
Blank	Bis (2-chloroethoxy) methane	4/13/1998	1	µg/L	U
Blank	1,2,4-Trichlorobenzene	4/13/1998	1	µg/L	U
Blank	Hexachlorobutadiene	4/13/1998	1	µg/L	U

Parcel B3
Roll Grinding Facility Historical Soil Data
Former Sparrows Point Steel Mill
Sparrows Point, Maryland

Sample ID	Chemical Analyte	Sample Date	Result	Units	Qualifier
Blank	Naphthalene	4/13/1998	1	µg/L	U
Blank	2,4,6-Trichlorophenol	4/13/1998	1	µg/L	U
Blank	2,4-Dinitrophenol	4/13/1998	10	µg/L	U
Blank	4-Nitrophenol	4/13/1998	10	µg/L	U
Blank	Hexachlorocyclopentadiene	4/13/1998	10	µg/L	U
Blank	2-Chloronaphthalene	4/13/1998	1	µg/L	U
Blank	Dimethyl phthalate	4/13/1998	1	µg/L	U
Blank	2,6-Dinitrotoluene	4/13/1998	1	µg/L	U
Blank	Acenaphthylene	4/13/1998	1	µg/L	U
Blank	Acenaphthene	4/13/1998	1	µg/L	U
Blank	2,4-Dinitrotoluene	4/13/1998	1	µg/L	U
Blank	Diethyl phthalate	4/13/1998	1	µg/L	U
Blank	4-Chlorophenyl phenyl ether	4/13/1998	1	µg/L	U
Blank	Fluorene	4/13/1998	1	µg/L	U
Blank	4,6-Dinitro-2-methylphenol	4/13/1998	10	µg/L	U
Blank	Pentachlorophenol	4/13/1998	10	µg/L	U
Blank	N-Nitrosodiphenylamine	4/13/1998	1	µg/L	U
Blank	1,2-Diphenylhydrazine	4/13/1998	1	µg/L	U
Blank	4-Bromophenyl phenyl ether	4/13/1998	1	µg/L	U
Blank	Hexachlorobenzene	4/13/1998	2	µg/L	U
Blank	Di-N-butyl phthalate	4/13/1998	1	µg/L	U
Blank	Phenanthrene	4/13/1998	1	µg/L	U
Blank	Anthracene	4/13/1998	1	µg/L	U
Blank	Fluoranthene	4/13/1998	1	µg/L	U
Blank	Benzidine	4/13/1998	10	µg/L	U
Blank	Pyrene	4/13/1998	1	µg/L	U
Blank	Butyl benzyl phthalate	4/13/1998	1	µg/L	U
Blank	Bis (2-ethylhexyl) phthalate	4/13/1998	10	µg/L	U
Blank	Benzo (a) anthracene	4/13/1998	1	µg/L	U
Blank	Chrysene	4/13/1998	1	µg/L	U
Blank	3,3'-Dichlorobenzidine	4/13/1998	2	µg/L	U
Blank	Di-n-octylphthalate	4/13/1998	1	µg/L	U
Blank	Benzo (b) fluoranthene	4/13/1998	1	µg/L	U
Blank	Benzo (k) fluoranthene	4/13/1998	1	µg/L	U
Blank	Benzo (a) pyrene	4/13/1998	1	µg/L	U
Blank	Indeno (123cd) pyrene	4/13/1998	2	µg/L	U
Blank	Dibenz (ah) anthracene	4/13/1998	2	µg/L	U
Blank	Benzo (ghi) perylene	4/13/1998	2	µg/L	U

Highlight value indicates PAL exceedance

U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit.

APPENDIX B

Parcel B3
Roll Grinding Facility Historical Groundwater Data
Former Sparrows Point Steel Mill
Sparrows Point, Maryland

Sample ID	Chemical Analyte	Sample Date	Result	Units	Qualifier
B-10	Chloromethane	4/3/1998	10	µg/L	U
B-10	Bromomethane	4/3/1998	10	µg/L	U
B-10	Vinyl chloride	4/3/1998	10	µg/L	U
B-10	Chloroethane	4/3/1998	10	µg/L	U
B-10	Methylene chloride	4/3/1998	5	µg/L	U
B-10	Acrolein	4/3/1998	5	µg/L	U
B-10	Acrylonitrile	4/3/1998	5	µg/L	U
B-10	Trichlorofluoromethane	4/3/1998	10	µg/L	U
B-10	1,1-Dichloroethene	4/3/1998	5	µg/L	U
B-10	1,1-Dichloroethane	4/3/1998	5	µg/L	U
B-10	Trans-1,2-Dichloroethene	4/3/1998	5	µg/L	U
B-10	Chloroform	4/3/1998	5	µg/L	U
B-10	1,2-Dichloroethane	4/3/1998	5	µg/L	U
B-10	1,1,1-Trichloroethane	4/3/1998	5	µg/L	U
B-10	Carbon tetrachloride	4/3/1998	5	µg/L	U
B-10	Bromodichloromethane	4/3/1998	5	µg/L	U
B-10	1,2-Dichloropropane	4/3/1998	5	µg/L	U
B-10	Cis-1,3-Dichloropropene	4/3/1998	5	µg/L	U
B-10	Trichloroethene	4/3/1998	5	µg/L	U
B-10	Benzene	4/3/1998	5	µg/L	U
B-10	Chlorodibromomethane	4/3/1998	5	µg/L	U
B-10	1,1,2-Trichloroethane	4/3/1998	5	µg/L	U
B-10	2-Chloroethylvinyl ether	4/3/1998	5	µg/L	U
B-10	Bromoform	4/3/1998	5	µg/L	U
B-10	1,1,2,2-Tetrachloroethane	4/3/1998	5	µg/L	U
B-10	Tetrachloroethene	4/3/1998	5	µg/L	U
B-10	Toluene	4/3/1998	5	µg/L	U
B-10	Chlorobenzene	4/3/1998	5	µg/L	U
B-10	Ethylbenzene	4/3/1998	5	µg/L	U
B-10	Phenol	4/3/1998	10	µg/L	U
B-10	2-Chlorophenol	4/3/1998	1	µg/L	U
B-10	N-Nitrosodimethylamine	4/3/1998	10	µg/L	U
B-10	Bis (2-chloroethyl) ether	4/3/1998	1	µg/L	U
B-10	1,3-Dichlorobenzene	4/3/1998	1	µg/L	U
B-10	1,4-Dichlorobenzene	4/3/1998	1	µg/L	U
B-10	1,2-Dichlorobenzene	4/3/1998	1	µg/L	U
B-10	Bis (2-chloroisopropyl) ether	4/3/1998	10	µg/L	U
B-10	N-Nitroso-di-N-propylamine	4/3/1998	2	µg/L	U
B-10	Hexachloroethane	4/3/1998	1	µg/L	U
B-10	2-Nitrophenol	4/3/1998	2	µg/L	U
B-10	2,4-Dimethylphenol	4/3/1998	1	µg/L	U

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Sample ID	Chemical Analyte	Sample Date	Result	Units	Qualifier
B-10	2,4-Dichlorophenol	4/3/1998	1	µg/L	U
B-10	4-Chloro-3-methylphenol	4/3/1998	1	µg/L	U
B-10	Nitrobenzene	4/3/1998	2	µg/L	U
B-10	Isophorone	4/3/1998	1	µg/L	U
B-10	Bis (2-chloroethoxy) methane	4/3/1998	1	µg/L	U
B-10	1,2,4-Trichlorobenzene	4/3/1998	1	µg/L	U
B-10	Hexachlorobutadiene	4/3/1998	1	µg/L	U
B-10	Naphthalene	4/3/1998	1	µg/L	U
B-10	2,4,6-Trichlorophenol	4/3/1998	1	µg/L	U
B-10	2,4-Dinitrophenol	4/3/1998	10	µg/L	U
B-10	4-Nitrophenol	4/3/1998	10	µg/L	U
B-10	Hexachlorocyclopentadiene	4/3/1998	10	µg/L	U
B-10	2-Chloronaphthalene	4/3/1998	1	µg/L	U
B-10	Dimethyl phthalate	4/3/1998	1	µg/L	U
B-10	2,6-Dinitrotoluene	4/3/1998	1	µg/L	U
B-10	Acenaphthylene	4/3/1998	1	µg/L	U
B-10	Acenaphthene	4/3/1998	1	µg/L	U
B-10	2,4-Dinitrotoluene	4/3/1998	1	µg/L	U
B-10	Diethyl phthalate	4/3/1998	1	µg/L	U
B-10	4-Chlorophenyl phenyl ether	4/3/1998	1	µg/L	U
B-10	Fluorene	4/3/1998	1	µg/L	U
B-10	4,6-Dinitro-2-methylphenol	4/3/1998	10	µg/L	U
B-10	Pentachlorophenol	4/3/1998	10	µg/L	U
B-10	N-Nitrosodiphenylamine	4/3/1998	1	µg/L	U
B-10	1,2-Diphenylhydrazine	4/3/1998	1	µg/L	U
B-10	4-Bromophenyl phenyl ether	4/3/1998	1	µg/L	U
B-10	Hexachlorobenzene	4/3/1998	2	µg/L	U
B-10	Di-N-butyl phthalate	4/3/1998	1	µg/L	U
B-10	Phenanthrene	4/3/1998	1	µg/L	U
B-10	Anthracene	4/3/1998	1	µg/L	U
B-10	Fluoranthene	4/3/1998	1	µg/L	U
B-10	Benzidine	4/3/1998	10	µg/L	U
B-10	Pyrene	4/3/1998	1	µg/L	U
B-10	Butyl benzyl phthalate	4/3/1998	1	µg/L	U
B-10	Bis (2-ethylhexyl) phthalate	4/3/1998	10	µg/L	U
B-10	Benzo (a) anthracene	4/3/1998	1	µg/L	U
B-10	Chrysene	4/3/1998	1	µg/L	U
B-10	3,3'-Dichlorobenzidine	4/3/1998	2	µg/L	U
B-10	Di-n-octylphthalate	4/3/1998	1	µg/L	U
B-10	Benzo (b) fluoranthene	4/3/1998	1	µg/L	U
B-10	Benzo (k) fluoranthene	4/3/1998	1	µg/L	U

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B-10	Benzo (a) pyrene	4/3/1998	1	µg/L	U
B-10	Indeno (123cd) pyrene	4/3/1998	2	µg/L	U
B-10	Dibenz (ah) anthracene	4/3/1998	2	µg/L	U
B-10	Benzo (ghi) perylene	4/3/1998	2	µg/L	U
B-10	a-BHC	4/3/1998	0.05	µg/L	U
B-10	g-BHC	4/3/1998	0.05	µg/L	U
B-10	b-BHC	4/3/1998	0.05	µg/L	U
B-10	Heptachlor	4/3/1998	0.05	µg/L	U
B-10	d-BHC	4/3/1998	0.05	µg/L	U
B-10	Aldrin	4/3/1998	0.05	µg/L	U
B-10	Heptachlor Epoxide	4/3/1998	0.05	µg/L	U
B-10	Endosulfan	4/3/1998	0.05	µg/L	U
B-10	Dieldrin	4/3/1998	0.05	µg/L	U
B-10	4,4'-DDE	4/3/1998	0.05	µg/L	U
B-10	Endrin	4/3/1998	0.05	µg/L	U
B-10	4,4'-DDD	4/3/1998	0.05	µg/L	U
B-10	Endosulfan II	4/3/1998	0.05	µg/L	U
B-10	4,4'-DDT	4/3/1998	0.05	µg/L	U
B-10	Endrin Aldehyde	4/3/1998	0.05	µg/L	U
B-10	Endosulfan Sulfate	4/3/1998	0.05	µg/L	U
B-10	Chlordane	4/3/1998	0.5	µg/L	U
B-10	Toxaphene	4/3/1998	1.0	µg/L	U
B-10	Methoxychlor	4/3/1998	0.05	µg/L	U
B-10	PCB-1016	4/3/1998	1.0	µg/L	U
B-10	PCB-1221	4/3/1998	1.0	µg/L	U
B-10	PCB-1232	4/3/1998	1.0	µg/L	U
B-10	PCB-1242	4/3/1998	1.0	µg/L	U
B-10	PCB-1248	4/3/1998	1.0	µg/L	U
B-10	PCB-1254	4/3/1998	1.0	µg/L	U
B-10	PCB-1260	4/3/1998	1.0	µg/L	U
B-10	Antimony	4/3/1998	0.10	mg/L	U
B-10	Arsenic	4/3/1998	0.005	mg/L	U
B-10	Beryllium	4/3/1998	0.01	mg/L	U
B-10	Cadmium	4/3/1998	0.01	mg/L	U
B-10	Chromium	4/3/1998	0.01	mg/L	U
B-10	Copper	4/3/1998	0.01	mg/L	U
B-10	Lead	4/3/1998	0.10	mg/L	U
B-10	Mercury	4/3/1998	0.0005	mg/L	U
B-10	Nickel	4/3/1998	0.14	mg/L	
B-10	Selenium	4/3/1998	0.005	mg/L	U
B-10	Silver	4/3/1998	0.01	mg/L	U

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B-10	Thallium	4/3/1998	0.10	mg/L	U
B-10	Zinc	4/3/1998	0.19	mg/L	
B-10	Cyanide (total)	4/3/1998	0.005	mg/L	U
B-10	Phenolics	4/3/1998	0.01	mg/L	U
B-8	Chloromethane	4/3/1998	10	µg/L	U
B-8	Bromomethane	4/3/1998	10	µg/L	U
B-8	Vinyl chloride	4/3/1998	10	µg/L	U
B-8	Chloroethane	4/3/1998	10	µg/L	U
B-8	Methylene chloride	4/3/1998	5	µg/L	U
B-8	Acrolein	4/3/1998	5	µg/L	U
B-8	Acrylonitrile	4/3/1998	5	µg/L	U
B-8	Trichlorofluoromethane	4/3/1998	10	µg/L	U
B-8	1,1-Dichloroethene	4/3/1998	5	µg/L	U
B-8	1,1-Dichloroethane	4/3/1998	5	µg/L	U
B-8	Trans-1,2-Dichloroethene	4/3/1998	5	µg/L	U
B-8	Chloroform	4/3/1998	5	µg/L	U
B-8	1,2-Dichloroethane	4/3/1998	5	µg/L	U
B-8	1,1,1-Trichloroethane	4/3/1998	5	µg/L	U
B-8	Carbon tetrachloride	4/3/1998	5	µg/L	U
B-8	Bromodichloromethane	4/3/1998	5	µg/L	U
B-8	1,2-Dichloropropane	4/3/1998	5	µg/L	U
B-8	Cis-1,3-Dichloropropene	4/3/1998	5	µg/L	U
B-8	Trichloroethene	4/3/1998	5	µg/L	U
B-8	Benzene	4/3/1998	5	µg/L	U
B-8	Chlorodibromomethane	4/3/1998	5	µg/L	U
B-8	1,1,2-Trichloroethane	4/3/1998	5	µg/L	U
B-8	2-Chloroethylvinyl ether	4/3/1998	5	µg/L	U
B-8	Bromoform	4/3/1998	5	µg/L	U
B-8	1,1,2,2-Tetrachloroethane	4/3/1998	5	µg/L	U
B-8	Tetrachloroethene	4/3/1998	5	µg/L	U
B-8	Toluene	4/3/1998	5	µg/L	U
B-8	Chlorobenzene	4/3/1998	5	µg/L	U
B-8	Ethylbenzene	4/3/1998	5	µg/L	U
B-8	Phenol	4/3/1998	10	µg/L	U
B-8	2-Chlorophenol	4/3/1998	1	µg/L	U
B-8	N-Nitrosodimethylamine	4/3/1998	10	µg/L	U
B-8	Bis (2-chloroethyl) ether	4/3/1998	1	µg/L	U
B-8	1,3-Dichlorobenzene	4/3/1998	1	µg/L	U
B-8	1,4-Dichlorobenzene	4/3/1998	1	µg/L	U
B-8	1,2-Dichlorobenzene	4/3/1998	1	µg/L	U
B-8	Bis (2-chloroisopropyl) ether	4/3/1998	10	µg/L	U

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B-8	N-Nitroso-di-N-propylamine	4/3/1998	2	µg/L	U
B-8	Hexachloroethane	4/3/1998	1	µg/L	U
B-8	2-Nitrophenol	4/3/1998	2	µg/L	U
B-8	2,4-Dimethylphenol	4/3/1998	1	µg/L	U
B-8	2,4-Dichlorophenol	4/3/1998	1	µg/L	U
B-8	4-Chloro-3-methylphenol	4/3/1998	1	µg/L	U
B-8	Nitrobenzene	4/3/1998	2	µg/L	U
B-8	Isophorone	4/3/1998	1	µg/L	U
B-8	Bis (2-chloroethoxy) methane	4/3/1998	1	µg/L	U
B-8	1,2,4-Trichlorobenzene	4/3/1998	1	µg/L	U
B-8	Hexachlorobutadiene	4/3/1998	1	µg/L	U
B-8	Naphthalene	4/3/1998	1	µg/L	U
B-8	2,4,6-Trichlorophenol	4/3/1998	1	µg/L	U
B-8	2,4-Dinitrophenol	4/3/1998	10	µg/L	U
B-8	4-Nitrophenol	4/3/1998	10	µg/L	U
B-8	Hexachlorocyclopentadiene	4/3/1998	10	µg/L	U
B-8	2-Chloronaphthalene	4/3/1998	1	µg/L	U
B-8	Dimethyl phthalate	4/3/1998	1	µg/L	U
B-8	2,6-Dinitrotoluene	4/3/1998	1	µg/L	U
B-8	Acenaphthylene	4/3/1998	1	µg/L	U
B-8	Acenaphthene	4/3/1998	1	µg/L	U
B-8	2,4-Dinitrotoluene	4/3/1998	1	µg/L	U
B-8	Diethyl phthalate	4/3/1998	1	µg/L	U
B-8	4-Chlorophenyl phenyl ether	4/3/1998	1	µg/L	U
B-8	Fluorene	4/3/1998	1	µg/L	U
B-8	4,6-Dinitro-2-methylphenol	4/3/1998	10	µg/L	U
B-8	Pentachlorophenol	4/3/1998	10	µg/L	U
B-8	N-Nitrosodiphenylamine	4/3/1998	1	µg/L	U
B-8	1,2-Diphenylhydrazine	4/3/1998	1	µg/L	U
B-8	4-Bromophenyl phenyl ether	4/3/1998	1	µg/L	U
B-8	Hexachlorobenzene	4/3/1998	2	µg/L	U
B-8	Di-N-butyl phthalate	4/3/1998	1	µg/L	U
B-8	Phenanthrene	4/3/1998	1	µg/L	U
B-8	Anthracene	4/3/1998	1	µg/L	U
B-8	Fluoranthene	4/3/1998	1	µg/L	U
B-8	Benzidine	4/3/1998	10	µg/L	U
B-8	Pyrene	4/3/1998	1	µg/L	U
B-8	Butyl benzyl phthalate	4/3/1998	1	µg/L	U
B-8	Bis (2-ethylhexyl) phthalate	4/3/1998	10	µg/L	U
B-8	Benzo (a) anthracene	4/3/1998	1	µg/L	U
B-8	Chrysene	4/3/1998	1	µg/L	U

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B-8	3,3'-Dichlorobenzidine	4/3/1998	2	µg/L	U
B-8	Di-n-octylphthalate	4/3/1998	1	µg/L	U
B-8	Benzo (b) fluoranthene	4/3/1998	1	µg/L	U
B-8	Benzo (k) fluoranthene	4/3/1998	1	µg/L	U
B-8	Benzo (a) pyrene	4/3/1998	1	µg/L	U
B-8	Indeno (123cd) pyrene	4/3/1998	2	µg/L	U
B-8	Dibenz (ah) anthracene	4/3/1998	2	µg/L	U
B-8	Benzo (ghi) perylene	4/3/1998	2	µg/L	U
B-8	a-BHC	4/3/1998	0.05	µg/L	U
B-8	g-BHC	4/3/1998	0.05	µg/L	U
B-8	b-BHC	4/3/1998	0.05	µg/L	U
B-8	Heptachlor	4/3/1998	0.05	µg/L	U
B-8	d-BHC	4/3/1998	0.05	µg/L	U
B-8	Aldrin	4/3/1998	0.05	µg/L	U
B-8	Heptachlor Epoxide	4/3/1998	0.05	µg/L	U
B-8	Endosulfan	4/3/1998	0.05	µg/L	U
B-8	Dieldrin	4/3/1998	0.05	µg/L	U
B-8	4,4'-DDE	4/3/1998	0.05	µg/L	U
B-8	Endrin	4/3/1998	0.05	µg/L	U
B-8	4,4'-DDD	4/3/1998	0.05	µg/L	U
B-8	Endosulfan II	4/3/1998	0.05	µg/L	U
B-8	4,4'-DDT	4/3/1998	0.05	µg/L	U
B-8	Endrin Aldehyde	4/3/1998	0.05	µg/L	U
B-8	Endosulfan Sulfate	4/3/1998	0.05	µg/L	U
B-8	Chlordane	4/3/1998	0.5	µg/L	U
B-8	Toxaphene	4/3/1998	1.0	µg/L	U
B-8	Methoxychlor	4/3/1998	0.05	µg/L	U
B-8	PCB-1016	4/3/1998	1.0	µg/L	U
B-8	PCB-1221	4/3/1998	1.0	µg/L	U
B-8	PCB-1232	4/3/1998	1.0	µg/L	U
B-8	PCB-1242	4/3/1998	1.0	µg/L	U
B-8	PCB-1248	4/3/1998	1.0	µg/L	U
B-8	PCB-1254	4/3/1998	1.0	µg/L	U
B-8	PCB-1260	4/3/1998	1.0	µg/L	U
B-8	Antimony	4/3/1998	0.10	mg/L	U
B-8	Arsenic	4/3/1998	0.005	mg/L	U
B-8	Beryllium	4/3/1998	0.01	mg/L	U
B-8	Cadmium	4/3/1998	0.01	mg/L	U
B-8	Chromium	4/3/1998	0.01	mg/L	U
B-8	Copper	4/3/1998	0.01	mg/L	U
B-8	Lead	4/3/1998	0.10	mg/L	U

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Sample ID	Chemical Analyte	Sample Date	Result	Units	Qualifier
B-8	Mercury	4/3/1998	0.0005	mg/L	U
B-8	Nickel	4/3/1998	0.40	mg/L	
B-8	Selenium	4/3/1998	0.005	mg/L	U
B-8	Silver	4/3/1998	0.01	mg/L	U
B-8	Thallium	4/3/1998	0.10	mg/L	U
B-8	Zinc	4/3/1998	0.58	mg/L	
B-8	Cyanide (total)	4/3/1998	0.005	mg/L	U
B-8	Phenolics	4/3/1998	0.01	mg/L	U
B-9	Chloromethane	4/3/1998	10	µg/L	U
B-9	Bromomethane	4/3/1998	10	µg/L	U
B-9	Vinyl chloride	4/3/1998	10	µg/L	U
B-9	Chloroethane	4/3/1998	10	µg/L	U
B-9	Methylene chloride	4/3/1998	5	µg/L	U
B-9	Acrolein	4/3/1998	5	µg/L	U
B-9	Acrylonitrile	4/3/1998	5	µg/L	U
B-9	Trichlorofluoromethane	4/3/1998	10	µg/L	U
B-9	1,1-Dichloroethene	4/3/1998	5	µg/L	U
B-9	1,1-Dichloroethane	4/3/1998	5	µg/L	U
B-9	Trans-1,2-Dichloroethene	4/3/1998	5	µg/L	U
B-9	Chloroform	4/3/1998	5	µg/L	U
B-9	1,2-Dichloroethane	4/3/1998	5	µg/L	U
B-9	1,1,1-Trichloroethane	4/3/1998	5	µg/L	U
B-9	Carbon tetrachloride	4/3/1998	5	µg/L	U
B-9	Bromodichloromethane	4/3/1998	5	µg/L	U
B-9	1,2-Dichloropropane	4/3/1998	5	µg/L	U
B-9	Cis-1,3-Dichloropropene	4/3/1998	5	µg/L	U
B-9	Trichloroethene	4/3/1998	5	µg/L	U
B-9	Benzene	4/3/1998	5	µg/L	U
B-9	Chlorodibromomethane	4/3/1998	5	µg/L	U
B-9	1,1,2-Trichloroethane	4/3/1998	5	µg/L	U
B-9	2-Chloroethylvinyl ether	4/3/1998	5	µg/L	U
B-9	Bromoform	4/3/1998	5	µg/L	U
B-9	1,1,2,2-Tetrachloroethane	4/3/1998	5	µg/L	U
B-9	Tetrachloroethene	4/3/1998	5	µg/L	U
B-9	Toluene	4/3/1998	5	µg/L	U
B-9	Chlorobenzene	4/3/1998	5	µg/L	U
B-9	Ethylbenzene	4/3/1998	5	µg/L	U
B-9	a-BHC	4/3/1998	0.05	µg/L	U
B-9	g-BHC	4/3/1998	0.05	µg/L	U
B-9	b-BHC	4/3/1998	0.05	µg/L	U
B-9	Heptachlor	4/3/1998	0.05	µg/L	U

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Sample ID	Chemical Analyte	Sample Date	Result	Units	Qualifier
B-9	d-BHC	4/3/1998	0.05	µg/L	U
B-9	Aldrin	4/3/1998	0.05	µg/L	U
B-9	Heptachlor Epoxide	4/3/1998	0.05	µg/L	U
B-9	Endosulfan	4/3/1998	0.05	µg/L	U
B-9	Dieldrin	4/3/1998	0.05	µg/L	U
B-9	4,4'-DDE	4/3/1998	0.05	µg/L	U
B-9	Endrin	4/3/1998	0.05	µg/L	U
B-9	4,4'-DDD	4/3/1998	0.05	µg/L	U
B-9	Endosulfan II	4/3/1998	0.05	µg/L	U
B-9	4,4'-DDT	4/3/1998	0.05	µg/L	U
B-9	Endrin Aldehyde	4/3/1998	0.05	µg/L	U
B-9	Endosulfan Sulfate	4/3/1998	0.05	µg/L	U
B-9	Chlordane	4/3/1998	0.5	µg/L	U
B-9	Toxaphene	4/3/1998	1.0	µg/L	U
B-9	Methoxychlor	4/3/1998	0.05	µg/L	U
B-9	PCB-1016	4/3/1998	1.0	µg/L	U
B-9	PCB-1221	4/3/1998	1.0	µg/L	U
B-9	PCB-1232	4/3/1998	1.0	µg/L	U
B-9	PCB-1242	4/3/1998	1.0	µg/L	U
B-9	PCB-1248	4/3/1998	1.0	µg/L	U
B-9	PCB-1254	4/3/1998	1.0	µg/L	U
B-9	PCB-1260	4/3/1998	1.0	µg/L	U
B-9	Antimony	4/3/1998	0.10	mg/L	U
B-9	Arsenic	4/3/1998	0.005	mg/L	U
B-9	Beryllium	4/3/1998	0.01	mg/L	U
B-9	Cadmium	4/3/1998	0.01	mg/L	U
B-9	Chromium	4/3/1998	0.01	mg/L	U
B-9	Copper	4/3/1998	0.01	mg/L	
B-9	Lead	4/3/1998	0.10	mg/L	U
B-9	Mercury	4/3/1998	0.0005	mg/L	U
B-9	Nickel	4/3/1998	0.24	mg/L	
B-9	Selenium	4/3/1998	0.005	mg/L	U
B-9	Silver	4/3/1998	0.01	mg/L	U
B-9	Thallium	4/3/1998	0.10	mg/L	U
B-9	Zinc	4/3/1998	0.17	mg/L	
B-9	Cyanide (total)	4/3/1998	0.005	mg/L	U
B-9	Phenolics	4/3/1998	0.01	mg/L	U
Blank	Chloromethane	4/3/1998	10	µg/L	U
Blank	Bromomethane	4/3/1998	10	µg/L	U
Blank	Vinyl chloride	4/3/1998	10	µg/L	U
Blank	Chloroethane	4/3/1998	10	µg/L	U

Parcel B3
Roll Grinding Facility Historical Groundwater Data
Former Sparrows Point Steel Mill
Sparrows Point, Maryland

Sample ID	Chemical Analyte	Sample Date	Result	Units	Qualifier
Blank	Methylene chloride	4/3/1998	5	µg/L	U
Blank	Acrolein	4/3/1998	5	µg/L	U
Blank	Acrylonitrile	4/3/1998	5	µg/L	U
Blank	Trichlorofluoromethane	4/3/1998	10	µg/L	U
Blank	1,1-Dichloroethene	4/3/1998	5	µg/L	U
Blank	1,1-Dichloroethane	4/3/1998	5	µg/L	U
Blank	Trans-1,2-Dichloroethene	4/3/1998	5	µg/L	U
Blank	Chloroform	4/3/1998	5	µg/L	U
Blank	1,2-Dichloroethane	4/3/1998	5	µg/L	U
Blank	1,1,1-Trichloroethane	4/3/1998	5	µg/L	U
Blank	Carbon tetrachloride	4/3/1998	5	µg/L	U
Blank	Bromodichloromethane	4/3/1998	5	µg/L	U
Blank	1,2-Dichloropropane	4/3/1998	5	µg/L	U
Blank	Cis-1,3-Dichloropropene	4/3/1998	5	µg/L	U
Blank	Trichloroethene	4/3/1998	5	µg/L	U
Blank	Benzene	4/3/1998	5	µg/L	U
Blank	Chlorodibromomethane	4/3/1998	5	µg/L	U
Blank	1,1,2-Trichloroethane	4/3/1998	5	µg/L	U
Blank	2-Chloroethylvinyl ether	4/3/1998	5	µg/L	U
Blank	Bromoform	4/3/1998	5	µg/L	U
Blank	1,1,2,2-Tetrachloroethane	4/3/1998	5	µg/L	U
Blank	Tetrachloroethene	4/3/1998	5	µg/L	U
Blank	Toluene	4/3/1998	5	µg/L	U
Blank	Chlorobenzene	4/3/1998	5	µg/L	U
Blank	Ethylbenzene	4/3/1998	5	µg/L	U
TB040298 Trip Blank	Chloromethane	4/3/1998	10	µg/L	U
TB040298 Trip Blank	Bromomethane	4/3/1998	10	µg/L	U
TB040298 Trip Blank	Vinyl chloride	4/3/1998	10	µg/L	U
TB040298 Trip Blank	Chloroethane	4/3/1998	10	µg/L	U
TB040298 Trip Blank	Methylene chloride	4/3/1998	5	µg/L	U
TB040298 Trip Blank	Acrolein	4/3/1998	5	µg/L	U
TB040298 Trip Blank	Acrylonitrile	4/3/1998	5	µg/L	U
TB040298 Trip Blank	Trichlorofluoromethane	4/3/1998	10	µg/L	U
TB040298 Trip Blank	1,1-Dichloroethene	4/3/1998	5	µg/L	U
TB040298 Trip Blank	1,1-Dichloroethane	4/3/1998	5	µg/L	U
TB040298 Trip Blank	Trans-1,2-Dichloroethene	4/3/1998	5	µg/L	U
TB040298 Trip Blank	Chloroform	4/3/1998	5	µg/L	U
TB040298 Trip Blank	1,2-Dichloroethane	4/3/1998	5	µg/L	U
TB040298 Trip Blank	1,1,1-Trichloroethane	4/3/1998	5	µg/L	U
TB040298 Trip Blank	Carbon tetrachloride	4/3/1998	5	µg/L	U
TB040298 Trip Blank	Bromodichloromethane	4/3/1998	5	µg/L	U

Parcel B3
Roll Grinding Facility Historical Groundwater Data
Former Sparrows Point Steel Mill
Sparrows Point, Maryland

Sample ID	Chemical Analyte	Sample Date	Result	Units	Qualifier
TB040298 Trip Blank	1,2-Dichloropropane	4/3/1998	5	µg/L	U
TB040298 Trip Blank	Cis-1,3-Dichloropropene	4/3/1998	5	µg/L	U
TB040298 Trip Blank	Trichloroethene	4/3/1998	5	µg/L	U
TB040298 Trip Blank	Benzene	4/3/1998	5	µg/L	U
TB040298 Trip Blank	Chlorodibromomethane	4/3/1998	5	µg/L	U
TB040298 Trip Blank	1,1,2-Trichloroethane	4/3/1998	5	µg/L	U
TB040298 Trip Blank	2-Chloroethylvinyl ether	4/3/1998	5	µg/L	U
TB040298 Trip Blank	Bromoform	4/3/1998	5	µg/L	U
TB040298 Trip Blank	1,1,2,2-Tetrachloroethane	4/3/1998	5	µg/L	U
TB040298 Trip Blank	Tetrachloroethene	4/3/1998	5	µg/L	U
TB040298 Trip Blank	Toluene	4/3/1998	5	µg/L	U
TB040298 Trip Blank	Chlorobenzene	4/3/1998	5	µg/L	U
TB040298 Trip Blank	Ethylbenzene	4/3/1998	5	µg/L	U

Highlight value indicates PAL exceedance
U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit.

APPENDIX C

Area B and Finishing Mills Groundwater
Parcel B3
Tradepoint Atlantic
Sparrows Point, Maryland

Parameter	Units	PAL	SW-053-MWS Shallow Screen: 3.9-13.9	SW-054-MWS Shallow Screen: 9.5-19.5	SW-055-MWS Shallow Screen: 2.9-12.9	FM-015-PZS* Shallow Screen: 2.0-15.0	FM-015-PZI Intermediate Screen: 64.0-69.0
Volatile Organic Compounds							
Acetone	µg/L	14,000	10 U	10 U	10 U	**47.1**	10 U
Benzene	µg/L	5	1 U	1 U	**7.7**	1 U	1 U
Chloroform	µg/L	0.22	1 U	1 U	1 U	1 U	**0.96 J**
Cyclohexane	µg/L	13,000	10 U	10 U	**7.9 J**	10 U	10 U
Ethylbenzene	µg/L	700	1 U	1 U	**20.3**	1 U	1 U
Isopropylbenzene	µg/L	450	1 U	1 U	**2.3**	1 U	1 U
Methyl tert-butyl ether (MTBE)	µg/L	14	1 U	1 U	**1.4**	1 U	1 U
Toluene	µg/L	1,000	1 U	1 U	**29.8**	1 U	1 U
Xylenes	µg/L	10,000	3 U	3 U	**79.6**	3 U	3 U
Semi-Volatile Organic Compounds							
1,4-Dioxane	µg/L	0.46	0.1 U	0.1 U	0.1 U	0.1 U	**0.36**
2-Methylnaphthalene	µg/L	36	0.1 U	0.1 U	**0.83**	**0.074 J**	0.1 U
Acenaphthene	µg/L	530	0.1 U	0.1 U	**0.06 J**	0.1 U	0.1 U
Acetophenone	µg/L	1,900	1 U	1 U	**0.71 J**	**0.31 J**	1 U
Anthracene	µg/L	1,800	0.1 U	0.1 U	**0.049 J**	**0.088 J**	0.1 U
Benzo[a]anthracene	µg/L	0.012	0.1 U	0.1 U	0.1 U	**0.024 J**	0.1 U
bis(2-Ethylhexyl)phthalate	µg/L	6	1 U	1 U	1 U	**0.21 J**	1 U
Carbazole	µg/L		1 U	1 U	1 U	**0.32 J**	1 U
Chrysene	µg/L	3.4	0.1 U	0.1 U	0.1 U	**0.011 J**	0.1 U
Fluoranthene	µg/L	800	0.1 U	0.1 U	**0.025 J**	**0.49**	0.1 U
Fluorene	µg/L	290	0.1 U	0.1 U	**0.052 J**	0.1 U	0.1 U
Naphthalene	µg/L	0.17	0.1 U	**0.018 B**	**2.8**	**0.3 B**	**0.044 B**
Pentachlorophenol	µg/L	1	2.5 U	2.5 U	**1 J**	2.6 U	2.6 U
Phenanthrene	µg/L		0.1 U	0.1 U	**0.087 J**	**0.89**	**0.029 J**
Phenol	µg/L	5,800	1 U	1 U	**0.36 J**	1 U	1 U
Pyrene	µg/L	120	0.1 U	0.1 U	**0.034 J**	**0.33**	0.1 U
TPH/Oil and Grease							
Diesel Range Organics	µg/L	47	**56.8 J**	103 UJ	**700 J**	**57.8 J**	**161 J**
Gasoline Range Organics	µg/L	47	200 U	200 U	**545**	200 U	200 U
Metal (Total)							
Aluminum	µg/L	20,000	**248**	**621**	**2,320**	N/A	N/A
Arsenic	µg/L	10	5 U	5 U	**7.5**	N/A	N/A
Barium	µg/L	2,000	**17.3**	**25.9**	**19.8**	N/A	N/A
Beryllium	µg/L	4	**2**	**2.4**	1 U	N/A	N/A
Cadmium	µg/L	5	**0.66 J**	3 U	3 U	N/A	N/A
Chromium	µg/L	100	5 U	5 U	**0.98 J**	N/A	N/A
Chromium VI	µg/L	0.035	10 U	10 U	10 U	**25**[+]	10 U
Cobalt	µg/L	6	**77.7**	**27.1**	5 U	N/A	N/A
Iron	µg/L	14,000	**5,040**	**4,530**	**107**	N/A	N/A
Manganese	µg/L	430	**1,620**	**928**	**3.1 B**	N/A	N/A
Nickel	µg/L	390	**120**	**48**	**2.3 J**	N/A	N/A
Selenium	µg/L	50	8 U	**5.1 B**	**5.5 J**	N/A	N/A
Thallium	µg/L	2	**4.3 B**	10 U	**4.9 B**	N/A	N/A
Vanadium	µg/L	86	5 U	5 U	**15.6**	N/A	N/A
Zinc	µg/L	6,000	**127**	**91**	**2.9 B**	N/A	N/A
Metal (Dissolved)							
Aluminum, Dissolved	µg/L	20,000	**172**	**515**	**2,200**	**80.8**	**35.8 J**
Arsenic, Dissolved	µg/L	10	5 U	5 U	**5.9**	5 U	**3.4 J**
Barium, Dissolved	µg/L	2,000	**16.7**	**22.6**	**18.5**	**132**	**35.3**
Beryllium, Dissolved	µg/L	4	**1.8**	**2.2**	1 U	1 U	1 U
Cadmium, Dissolved	µg/L	5	**0.62 B**	**0.63 B**	3 U	3 U	3 U
Chromium VI, Dissolved	µg/L	0.035	N/A	N/A	N/A	**62**	N/A
Chromium, Dissolved	µg/L	100	**1.4 B**	**1.2 B**	5 U	**35.1**	**1.6 J**
Cobalt, Dissolved	µg/L	6	**85.6**	**25.5**	5 U	5 U	5 U
Copper, Dissolved	µg/L	1,300	**1.5 B**	**3.5 B**	5 U	**2.1 J**	5 U
Iron, Dissolved	µg/L	14,000	**4,900**	**3,600**	70 U	70 U	**23,600**
Manganese, Dissolved	µg/L	430	**1,870**	**848**	5 U	5 U	**1,180**
Nickel, Dissolved	µg/L	390	**128**	**46.3**	**2.8 B**	10 U	**0.63 B**
Selenium, Dissolved	µg/L	50	8 U	8 U	**6.2 B**	**4.1 J**	8 U
Silver, Dissolved	µg/L	94	**0.81 B**	6 U	6 U	6 U	6 U
Thallium, Dissolved	µg/L	2	10 U	10 U	**3.7 B**	10 U	10 U
Vanadium, Dissolved	µg/L	86	5 U	5 U	**15.2**	**0.61 J**	**1.8 J**
Zinc, Dissolved	µg/L	6,000	**135**	**87.3**	10 U	**0.69 JB**	10 U
Other							
Cyanide	µg/L	200	10 U	10 U	**4 J**	10 U	10 U

Bold indicates deteciton
U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit.
J: The positive result reported for this analyte is a quantitative estimate.
B: This analyte was not detected substantially above the level of the associated method blank/preparation or field blank.
UJ: This analyte was not detected in the sample. The actual quantitation/detection limit may be higher than reported.
N/A: This parameter was not analyzed for this sample.
*Indicates nonvalidated data.
Values in red indicate a detection exceedance of the Project Action Limit (PAL).
[+]Resampled on 7/15/16 for Hexavalent Chromium (Dissolved) using the 7196 method and produced a detection of 62 ug/L.

APPENDIX D

GERAGHTY & MILLER, INC.
Ground-Water Consultants

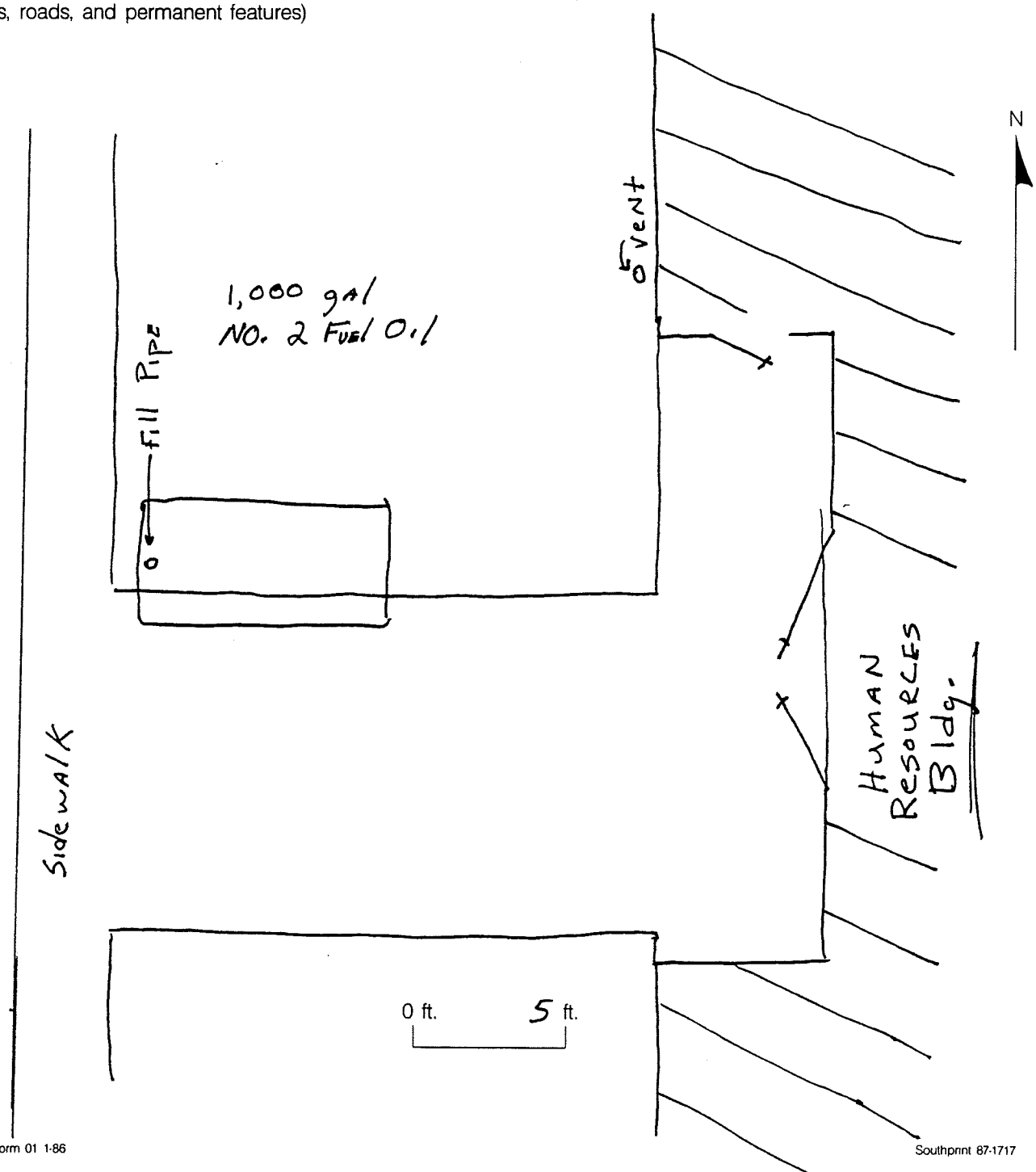
LOCATION SKETCH

Well(s) HR Project/No. MD075 Page 1 of 1

Site Location Beth. Steel Human Resources Bldg- TD340

Observer Johnson

(Locate all wells, borings, etc. with reference to three permanent reference points; tape all distances; clearly label all wells, roads, and permanent features)



LOCATION SKETCH

Project/No.: MD075

Page 1 of 4

Site Location: Beth. Steel

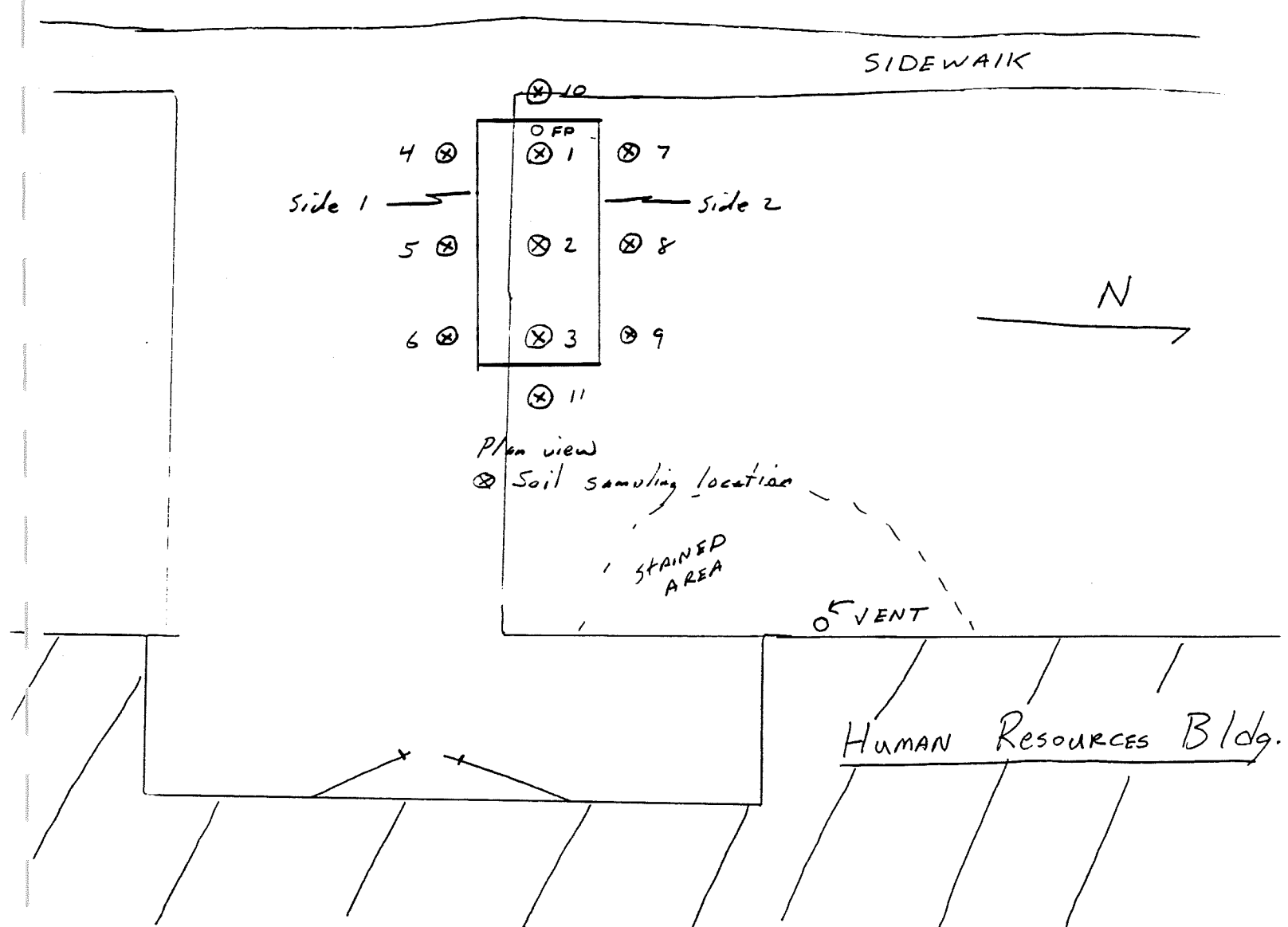
Date: 12/6

Tank I.D. No: Human Resources Bldg. - TD-340

Inspector: Johnson

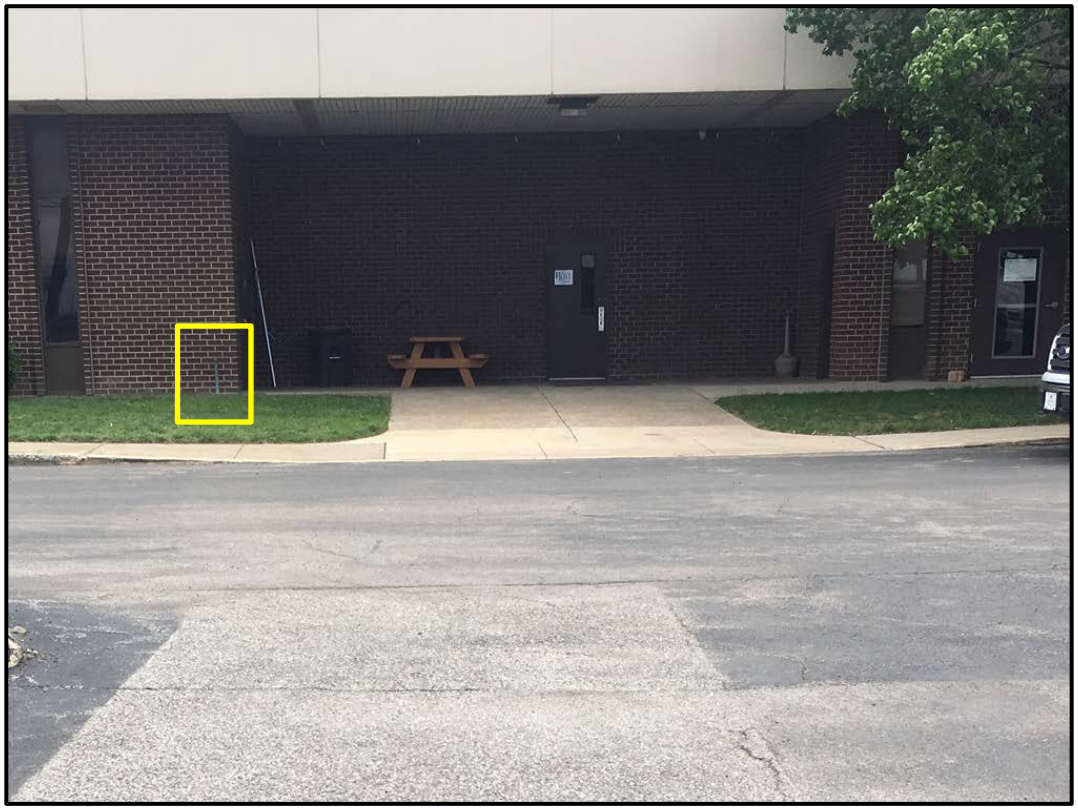
Soil sampling locations are as indicated. Sampling location #1 is located near the tank fill pipe. Locate north arrow and identify three permanent landmarks. Locate the UST with respect to these landmarks.

Tank width: 4'
Tank length: 8'



Former Underground Storage Tank Photograph Log
Former Human Resources Building (Area B: Parcel B3)
Sparrows Point, Maryland

050317-1: “Vent pipe” (highlighted) and area of former Human Resources Building UST (near roadway), facing northwest.



050317-2: Location of former Human Resources Building UST, facing east. Reference “vent pipe” is highlighted.

APPENDIX E

Parcel B3 Sampling Plan Summary
Table 1: Soil Boring
Former Sparrows Point Steel Mill
Sparrows Point, Maryland

Source Area Description	REC & Finding/ SWMU/AOC	Figure or Drawing of Reference	RATIONALE	Number of Locations	Sample Locations	Boring Depth	Sample Depth	Analytical Parameters: Soil Samples
Electric Substations (2)		Drawing 5035	Investigate potential impacts related to electric substations (potential leaks or releases).	4	B3-001 through B3-004	Total depth of 20 feet or groundwater.	0-1', 4-5', 9-10' bgs. 4-5' interval may be adjusted in the field based on observations or field screening.	VOC*, SVOC, Metals, DRO/GRO, O&G, PCBs (0-1')
Former #2 Fuel UST (1000 gallons)		UST Closure Report (hand sketch)	Investigate potential impacts related to the former #2 Fuel UST (1000 gallons) removed on December 6, 1989 (potential leaks or releases).	2	B3-005 and B3-006	Total depth of 20 feet or groundwater.	0-1', 4-5', 9-10' bgs. 4-5' interval may be adjusted in the field based on observations or field screening.	VOC*, SVOC, Metals, DRO/GRO, O&G, PCBs (0-1')
Roll Grinding Facility		Drawing 5535	Investigate potential impacts related to the Roll Grinding Facility (potential leaks or releases).	4	B3-007 through B3-010	Total depth of 20 feet or groundwater.	0-1', 4-5', 9-10' bgs. 4-5' interval may be adjusted in the field based on observations or field screening.	VOC*, SVOC, Metals, DRO/GRO, O&G, PCBs (0-1')
Roll Grinding Facility Sanitary Line		Drawing 5535	Investigate potential impacts related to the sanitary line, in particular cornered segments, leading from the Roll Grinding Facility (potential leaks or releases).	2	B3-011 and B3-012	Total depth of 20 feet or groundwater.	0-1', 4-5', 9-10' bgs. 4-5' interval may be adjusted in the field based on observations or field screening.	VOC*, SVOC, Metals, DRO/GRO, O&G, PCBs (0-1')
Temporary Stockpile and Laydown Area		Drawing 5535	Investigate potential impacts related to the temporary stockpile and laydown area (potential leaks or releases).	2	B3-013 and B3-014	Total depth of 20 feet or groundwater.	0-1', 4-5', 9-10' bgs. 4-5' interval may be adjusted in the field based on observations or field screening.	VOC*, SVOC, Metals, DRO/GRO, O&G, PCBs (0-1')
Parcel B3 Coverage			Investigate potential impacts related to unknown historical activities, and characterize soil in areas not previously sampled.	16	B3-015 through B3-030	Total depth of 20 feet or groundwater.	0-1', 4-5', 9-10' bgs. 4-5' interval may be adjusted in the field based on observations or field screening.	VOC*, SVOC, Metals, DRO/GRO, O&G, PCBs (0-1')
			Total:	30				

Soil Borings Sampling Density Requirements (from **Worksheet 17 - Sampling Design and Rationale**)
No Engineered Barrier (16-40 acres): 1 boring per 1.5 acres with no less than 15.
Engineered Barrier (16-40 acres): 1 boring per 3 acres with no less than 7.
No Engineered Barrier (32.6 acres) = **22 Borings Required, 22 Proposed**
Engineered Barrier (21.7 acres) = **8 Borings Required, 8 Proposed**
Parking/Roads (17.7 acres)
Buildings (4.0 acres)

VOC - Volatile Organic Compounds (Target Compound List)
SVOCs - Semivolatile Organic Compounds (Target Compound List)
Metals - (Target Analyte List plus Hexavalent Chromium and Cyanide)
DRO/GRO - Diesel Range Organics/Gasoline Range Organics
O&G - Oil and Grease
*VOCs are only collected if the PID reading exceeds 10 ppm
bgs - Below Ground Surface

Parcel B3 Sampling Plan Summary
Table 2: Sub-Slab Soil Gas
Former Sparrows Point Steel Mill
Sparrows Point, Maryland

Source Area/ Description	REC & Finding/ SWMU/ AOC	Figure or Drawing of Reference	RATIONALE	Number of Locations	Sample Locations	Boring Depth	Sample Depth	Analytical Parameters: Near-Slab Soil Gas
MCM Building (formerly Roll Grinding Facility)	N/A	Aerial View	Investigate potential impacts related to any historical activities which may have occurred within or adjacent to the MCM Building (potential leaks or releases).	4	B3-031 through B3-034	6 inches below bottom of concrete slab	6 inches below bottom of concrete slab	VOCs
Tradepoint Atlantic Office (formerly Employee Services and Human Resource Building)	N/A	Aerial View	Investigate potential impacts related to any historical activities which may have occurred within or adjacent to the Tradepoint Atlantic Office (potential leaks or releases).	3	B3-035 through B3-037	6 inches below bottom of concrete slab	6 inches below bottom of concrete slab	VOCs
			Total	7				

Soil Gas Sampling Density Requirements (from **Worksheet 17 - Sampling Design and Rationale**)

Soil Gas: 1 sample collected per 20,000 ft^2, with a minimum of 3 per building

Tradepoint Atlantic Office Investigation Area (34,333 ft^2) = **3 samples required, 3 proposed**

Total Floor Area = 63,333 ft^2

Crawl Space Area (north) = 29,000 ft^2

Remaining Floor Area (south) = 34,333 ft^2

MCM Building (35,565 ft^2) = **3 samples required, 4 proposed**

APPENDIX F

HEALTH AND SAFETY PLAN

SPARROWS POINT TERMINAL
SPARROWS POINT, MARYLAND

Prepared by:

EnviroAnalytics Group

Environmental Engineers

January 2015

TABLE OF CONTENTS

ATTACHMENTS

1.0 INTRODUCTION

1.1 Background

The Sparrows Point Terminal site has historically been a steel making facility. It is located in Baltimore County, Maryland in the southeast corner of the Baltimore metropolitan area (approximately 9 miles from the downtown area), on the Sparrows Point Peninsula in the Chesapeake Bay watershed. The facility occupies the entire peninsula and is bounded to the west by Bear Creek; to the south by Patapsco River; and to the east by Jones Creek, Old Road Bay and residential areas of the City of Edgemere. The facility is bounded to the north by the Sparrows Point Country Club. The site is approximately 3,100 acres in size.

Pennsylvania Steel built the furnace at Sparrows Point in 1887 and the first iron was cast in 1889. Bethlehem Steel Corporation (BSC) purchased the facility in 1916 and enlarged it by building additional and plating facilities. BSC filed for bankruptcy in 2001. A series of entities has owned the site between then and now: the International Steel Group (ISG), Mittal Steel, ISG Sparrows Point, LLC, Severstal Sparrows Holding LLC, which was renamed to Severstal Sparrows Point, LLC, RG Steel Sparrows Point, LLC, and then a joint venture to Sparrows Point LLC (SP) and HRE Sparrows Point LLC. Most recently, in 2014, the property and assets were sold to Sparrows Point Terminal LLC (SPT). Environmental liability was retained by SP and work is currently being conducted by EnviroAnalytics Group, LLC (EAG) on behalf of SP.

- In addition to the current environmental investigation and remediation being conducted onsite by EAG and their consultants, there are other entities conducting work on the facility. Demolition of the remaining structures is currently ongoing at the site, and those contractors are being managed by SPT.
- The purpose of this document is to provide an overall health and safety plan (HASP) for EAG personnel and EAG directed contractors who are engaging in environmental investigation and remediation activities onsite. EAG directed contractors will also be expected to have their own Health and Safety Program, and they may opt to draft their own site specific HASP, provided it meets the requirements in this HASP.

1.2 Historic Operations

Steel manufacturing involves handling vast amounts of raw material including coke, iron ore, limestone and scrap steel, as well as recovering byproducts and managing waste materials. The operations listed below either were or are currently performed at the Sparrows Point Facility.

- Iron and steel production
- Coal chemical recovery system
- Other byproducts recovery systems
- Wastewater treatment systems
- Solid waste management
- Air pollution control

A number of site-specific environmental and hydrogeologic investigations have been prepared for the Sparrows Point facility. For the purposes of this HASP, information was obtained from the "Special Study Area Release Site Characterization" completed in 2001 by CH2MHill, as well as additional documents submitted since that time. There are five separate Special Study Areas as put forth in the Consent Decree:

- Humphrey Impoundment,
- Tin Mill Canal/Finishing Mills Areas,
- Coke Oven Area,
- Coke Point Landfill, and
- Greys Landfill.

Contaminated soils and groundwater may be present at the site. This plan was prepared based on an assessment of hazards expected to be present and a review of data from the previous site investigations and groundwater sampling events.

During the current investigations and remedial efforts, all related work will be performed in accordance with the requirements of this HASP and Occupational Safety and Health Administration (OSHA) regulations as defined in 29 Code of Federal Regulations (CFR) 1910.120 and 1926.65.

2.0 PURPOSE, SCOPE AND ORGANIZATION

This section describes the purpose, scope and organization of this HASP and the health and safety responsibilities of EAG, their employees, and their subcontractors involved in the field investigation and remediation activities at the Sparrows Point facility.

2.1 Scope

Field investigation and remediation activities for this project may include, but are not limited to:

- Groundwater sampling and monitoring,
- Groundwater and remediation well installation,
- Groundwater and remediation well repairs,
- Groundwater and remediation well closure and abandonment,
- Surface water sampling,
- Sediment sampling,
- Soil boring and subsurface soil sampling,
- Soil excavations for remedial purposes,
- Installation and operation of remediation systems for soil, soil vapor, and groundwater,
- Decommissioning and closure of remediation systems,
- Soil excavations for remedial purposes,
- Insitu soil mixing/soil stabilization,
- Exsitu soil mixing/soil stabilization,
- Dredging operations along Tin Mill Canal,
- Insitu chemical and/or biological injections, and
- Recovery of non-aqueous phase liquids (NAPL)

When EAG personnel are providing oversight of subcontractors, they will attend the safety and health briefings held by the contractor. EAG personnel will follow the requirements of this HASP, as well as any potentially more stringent requirements of the contractor's health and safety plan.

When EAG personnel are conducting tasks on their own, with or without subcontractors, they will follow the requirements of this HASP. EAG contractors, such as drillers, will also be required to follow the requirements of this HASP, as well as any more stringent requirements of the contractor's health and safety plan.

All EAG field personnel, including subcontractors to EAG, will be required to read and understand this HASP and agree to implement its provisions. All site personnel will sign the Acknowledgement Form included in **Attachment A** stating that they have read, understood, and agree to abide by the guidelines and requirements set forth in this plan.

2.2 Organization of Document

This HASP includes health and safety procedures for all generally anticipated project field activities. This plan also meets the OSHA requirements contained in the CFR, specifically 29 CFR 1910.120 and 29 CFR 1926, by including the following items:

- A description of staff organization, qualifications and responsibilities (Section 2.3),
- Hazard analysis (Section 3.0),
- Health hazard information (Section 4.0),
- Personal protective equipment (PPE), including available first aid, emergency, and safety equipment (Section 5.0),
- Employee and subcontractor training and standard safety procedures (section 6.0),
- Exposure monitoring plan (Section 7.0),
- Medical surveillance (Section 8.0),
- Site control measures and decontamination procedures for personnel and equipment (Section 9.0),
- Emergency response and contingency procedures (section 10.0), and
- Material Safety Data Sheets (MSDSs) for chemicals used on-site (**Attachment B**).

2.3 EAG Health and Safety Personnel

Personnel responsible for implementing this HASP include:

EAG Contacts for Sparrows Point Project Work	
VP Remediation, Russ Becker	(314) 686-5611
Senior Project Manager, James Calenda	(314) 620-3056
Senior Project Engineer, Elizabeth Schlaeger	(314) 307-1732
Josh Burke – Field Operations Manager	(314) 686-5623
Project Field Team Members, Jeff Wilson and Bill Trentzsch	(314) 620-3135, (314) 686-5598

3.0 HAZARD ANALYSIS

This section outlines the potential hazards related to the field activities listed in Section 2.1.

3.1 Hazard Analysis

The field activities planned for this project pose potential health and safety hazards for field team members. This section describes the hazards associated with the above-listed field activities. Detailed chemical, physical, and biological hazards information is provided in Section 4.0 (Health Hazard Information).

Hazards to which employees and subcontractors may be exposed to as a result of the above-listed activities include potential chemical exposures, lacerations, excessive noise, thermal stress, lifting of excessive weight or bulk, hand tools and heavy equipment, drilling and slips, trips and falls.

3.1.1 Chemical Hazards

Potential exposures to chemicals in the soil or groundwater include the possibility of dermal exposure (contact and/or absorption), inhalation of chemical contamination that may be encountered during sampling or during equipment decontamination activities, or ingestion of contaminants if good personal hygiene practices are not followed.

Benzene, naphthalene, and various metals are the major contaminants that have been identified in groundwater during previous investigations at the site In addition, light NAPL (LNAPL – benzene, in particular) and dense NAPL (DNAPL – naphthalene, in particular) have also been identified or are heavily suspected in various locations in the Coke Oven Area. Dissolved metals the chemicals of concern primarily located in the area of Tin Mill Canal and the Rod and Wire Mill Area. Treatment chemicals, such as sulfuric acid, are currently being used in remediation systems. All appropriate MSDS sheets will be reviewed that apply to the investigation or remedial tasks being conducted. MSDS sheets are located in **Attachment B**. It should be noted that this is a dynamic document: should any additional chemicals be introduced or discovered, the MSDS sheets will be added to **Attachment B**, as necessary.

3.1.2 Physical Hazards

The potential physical hazards associated with field activities include:

- Excessive lifting
- Slips, trips, and falls
- Working at heights
- Exposure to extreme outside temperatures and weather
- Equipment hazards
- Drilling Hazards
- Noise
- Dust and fumes
- Injury from tools, equipment, rotating parts
- Electrical hazards
- Buried and overhead hazards
- Work over water
- Driving to, from, and around the site (including working in trafficked areas)

Additional hazards may be encountered based on the various task at hand. It will be the responsibility of the site manager, with the help of field staff, to identify and address any additional hazards on a "per task or job" basis. A Job Safety Analyses (JSA) may need to be conducted prior to the start of various tasks. Safety meetings will be conducted with all staff in attendance, before the start of any new task or when any significant personnel or other changes (such as a swift change in weather, for example) occur. Updated information relating to physical hazards will be presented during these meetings in an effort to familiarize the crew with potential hazards, discuss new situations, and determine how the associated risks can be reduced. Further, good housekeeping practices will be enforced to preclude other risks resulting from clutter and inattention to detail. In addition, internal field audits will be randomly conducted to ensure adherence to all procedures are being followed.

3.1.3 Biological Hazards

Biological hazards that may be encountered when conducting field activities include the following:

- Poisonous snakes and spiders
- Ticks and tick-borne diseases
- Stinging insects such as chiggers, bees, wasps, etc.
- Various viruses and diseases spread via animal to human contact such as West Nile virus or rabies
- Various viruses and diseases spread via human to human contact such as colds or the flu
- Dermal contact with poison ivy, oak, and/or sumac
- Bloodborne pathogens when administering first aid

First aid kits will be available on-site. It is crucial to note that any site personnel who has significant allergies should communicate that information to the field team they are working with, along with the location of their auto-injector pen (such as an Epi-Pen) for use in case of going into anaphylactic shock from something that would cause such a reaction (like a bee sting, for example). Personnel who suffer from such allergies are responsible for providing their own auto-injector devices as those are typically prescription based as well as specific to their particular allergy.

4.0 HEALTH HAZARD INFORMATION

This section provides chemical hazard information for those potentially hazardous materials expected to be present at the facility. Potential physical and biological hazards are also discussed in this section.

4.1 Chemical Hazards

Exposure to chemicals through inhalation, ingestion, or skin contact may result in health hazards to field workers. Hazards associated with exposure will be evaluated using OSHA Permissible Exposure Limits (PELs) and the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs). Each of these values are 8-hour, time-weighted averaged (TWAs) above which an employee cannot be exposed. EAG may also use the National Institute of Occupational Safety and Health (NIOSH) Recommended Exposure Limits (RELs) where applicable. Although the OSHA PELs are the only exposure limits enforceable by law, the most stringent of exposure limits will be used as the EAG-enforced exposure criteria during field activities.

The following is a summary of the potential hazards created by the compounds that may be encountered during field activities. Data from sampling of groundwater wells was reviewed to identify potential contaminants at the site. Contaminants of concern may include benzene, toluene, ethylbenzene and xylenes (BTEX), polycyclic aromatic hydrocarbons (PAHs), phenols, metals and water treatment chemicals. Table 4-1 contains chemical information and exposure limits for various chemicals that may be expected to be present in the investigation and remediation efforts. During the recovery of NAPL, the major contaminants of concern are benzene and naphthalene. It is possible that carbon monoxide may also be encountered from the use of various internal combustion engines (vehicular or otherwise); however, it is anticipated that since any such engine will be used outdoors, it is not expected that concentrations of concern will accumulate. With the use of any such engine, the engine should be positioned such that site personnel are upwind of the engine exhaust.

If any chemicals are brought on-site, MSDS must be made available and added to **Attachment B**. Personnel must be trained in the hazards and use of chemicals.

Table 4-1
Chemical Contaminants of Potential Concern

Chemical Name Synonyms (trade name)	Exposure Limits	Characteristics	Route of Exposure	Symptoms of Exposure
Benzene	PEL: 1PPM REL: 0.1 CA TLV: 0.5PPM STEL: 1PPM (NIOSH) Skin: YES	Colorless to light-yellow liquid with aromatic odor. LEL: 1.2% UEL: 7.8% VP: 75mm FI.P: 12°F	INH ABS ING CON	Irritation of eyes, skin, nose, respiratory system, giddiness, headache, nausea, fatigue, anorexia, dermatitis, bone marrow depression
Ethylbenzene	PEL: 100PPM REL: 100PPM TLV: 100PPM STEL: 125PPM IDLH: 800PPM Skin: NO	Colorless liquid with an aromatic odor. LEL: 0.85 UEL: 6.7% IP: 8.76EV VP: 7mm FI.P: 55°F	INH ING CON	Irritation of eyes, skin, mucous membranes; headache; dermatitis
1,1 dichloroethane	PEL: 100PPM REL: 100PPM TLV: 100PPM STEL: NA IDLH: 3000PPM Skin: NO	Colorless, oily liquid with a chloroform-like odor. LEL: 6.2% UEL: 16% IP: 11.05EV Vp: 64mm FI.P: 56°F	INH ING CON	Irritation of eyes, CNS depression, liver, kidney, lung damage
Phenol	PEL: 5PPM REL: 5PPM, 15.6PPM (C) TLV: 5PPM STEL: NA IDLH 250PPM Skin: YES	Colorless to light pink crystalline solid with a sweet, acrid odor. LEL: 1.8% UEL: 5.9% IP: 8.12EV Vp: 0.08mm FI.P: 175°F	INH ING CON ABS	Irritated eyes, nose, throat, anorexia, weakness, muscular ache, pain, dark urine, cyanosis, liver, kidney damage, skin burns, dermatitis, tremor, convulsions, twitch
Naphthalene	PEL: 10PPM REL: 10PPM TLV: 10PPM STEL: 15PPM IDLH: 250PPM Skin: YES	Colorless to brown solid with an odor of mothballs LEL: 0.9% UEL: 5.9% IP: 8.12EV Vp: 0.08mm FI.P: 174°F	INH ABS ING CON	Irritation of eyes, headache, confusion, excitement, malaise, nausea, vomiting, abdominal pain, irritated bladder, profuse sweating, jaundice, hematuria, renal shutdown, dermatitis, optical neuritis, corneal damage
Toluene	PEL: 200PPM, 300PPM (C) REL: 100PPM TLV: 20PPM STEL: 150PPM IDLH: 500PPM Skin: YES	Colorless liquid with a sweet, pungent benzene-like odor. LEL: 1.1% UEL: 7.1% IP: 8.82EV VP: 21MM FI.P: 40°F	INH ABS ING CON	Irritation of eyes, nose, fatigue, weakness, confusion, euphoria, dizziness, headache, dilated pupils, lacrimation, nervousness, muscle fatigue, insomnia, dermatitis, liver, kidney damage
Xylenes	PEL: 100PPM REL: 100PPM TLV: 100PPM STEL: 150PPM IDLH: 900PPM Skin: NO	Colorless liquid with an aromatic odor. LEL: 0.9% UEL: 6.7% IP: 8.40EV VP: 5MM FI.P: 88°F	INH ABS ING CON	Irritated eyes, nose, respiratory system, headache, fatigue, dizziness, confusion, malaise, drowsiness, incoherence, staggering gait, corneal vacuolization, anorexia, nausea, vomiting, abdominal pain, dermatitis

Chemical Name Synonyms (trade name)	Exposure Limits	Characteristics	Route of Exposure	Symptoms of Exposure
Styrene	PEL: 100PPM, 200PPM (C) REL: 50PPM TLV: 20PPM STEL: 40PPM IDLH: 700PPM Skin: NO	Colorless to yellow, oily liquid with a sweet, floral odor. LEL: 0.9% UEL: 6.8% IP: 8.40eV VP: 5MM FI.P: 88°F	INH ABS ING CON	Irritated eyes, nose, respiratory system, headache, fatigue, dizziness, confusion, malaise, drowsiness, weakness, narcosis, dermatitis
Chlorodiphenyl (54% chlorine) (11097-69-1)	PEL: 0.5mg/m³ REL: 0.001mg/m³ TLV: 0.5mg/m³ STEL: N/A IDLH: 5mg/m³(CA) Skin: YES	Colorless to pale yellow viscous liquid with a mild hydrocarbon odor. LEL: NA UEL: NA IP: UNKNOWN VP: 0.00006MM FI.P: NA	INH ABS ING CON	Irritated eyes, chloracne, liver damage, reproductive effects (carcinogen)
Polynuclear aromatic hydrocarbons (PAHs) (coal tar pitch volatiles) (65996-93-2)	PEL: 0.2mg/m³ REL: 0.1mg/m³ TLV: 0.2 mg/m³ STEL: N/A IDLH: 80mg/m³(CA) Skin: NO	The pitch of coal tar is black or dark brown amorphous residue that remains after the redistillation process. LEL: N/A UEL: N/A IP: VARIES VP: VARIES FI.P: VARIES	INH CON	Direct contact or exposure to vapors may be irritating to the eyes. Direct contact can be highly irritating to the skin and produce dermatitis. Exposure to vapors may cause nausea and vomiting. A potential human carcinogen.
Arsenic (inorganic)	PEL: 0.01mg/m³ REL: NONE TLV: 0.5 mg/m³ STEL: N/A IDLH: 5mg/m³ (CA) Skin: NO	Silver-gray or tin-white brittle odorless solid. Air odor threshold: N/D.	INH ABS CON ING	Symptoms include ulceration of nasal septum, gastrointestinal disturbances, respiratory irritation and peripheral neuropathy. Potential occupational carcinogen.
Barium	PEL: 0.5mg/m³ REL: 0.5mg/m³ TLV: 0.5mg/m³ STEL: N/A IDLH: 50mg/m³ Skin: NO	White, odorless solid. Air odor threshold: N/D.	INH ING CON	Irritated eyes, skin, upper respiratory system, skin burns, gastroenteritis, muscle spasm, slow pulse, cardiac arrhythmia
Cadmium (elemental)	PEL: 0.005mg/m³ REL: CA TLV: 0.01mg/m³ STEL: N/A IDLH: 9mg/m³ (CA) Skin: NO	Silver-white, blue-tinged lustrous, odorless solid. Air odor threshold: N/D.	INH ING	Symptoms include pulmonary edema, cough, tight chest, head pain, chills, muscle aches, vomiting and diarrhea. Potential occupational carcinogen.
Chromium (Metal)	PEL: 1.0mg/m³ REL: 0.5mg/m³ TLV: 0.5mg/m³ STEL: N/A IDLH: 250mg/m³ Skin: NO	Blue-white to steel-gray lustrous, brittle, hard odorless solid. Air odor threshold: N/D.	INH ING CON	Symptoms may include irritated eyes and skin, lung fibrosis.
Chromium (Chromium III inorganic compounds)	PEL: 0.5mg/m³ REL: 0.5mg/m³ TLV: 0.5mg/m³ STEL: N/A IDLH: 25mg/m³ Skin: NO	Varies depending on specific compound.	INH ING CON	Irritation of eyes, sensitivity dermatitis

Chemical Name Synonyms (trade name)	Exposure Limits	Characteristics	Route of Exposure	Symptoms of Exposure
Copper	PEL: 1mg/m³ REL: 1mg/m³ TLV: 1mg/m³ STEL: N/A IDLH: 100mg/m³ Skin: NO	Reddish, lustrous, malleable, odorless solid	INH ING CON	Irritation of eyes, nose, pharynx, nasal septum perforations, metallic taste, dermatitis
Lead (Elemental & Inorganic as Pb)	PEL: 0.05mg/m³ REL0.1mg/m³ TLV: 0.05mg/m³ STEL: N/A IDLH: 100mg/m³ Skin: NO	A heavy, ductile soft gray solid. Air odor threshold: N/D.	INH ING CON	Accumulative poison may cause weakness, insomnia, facial pallor, anorexia, malnutrition, constipation, abdominal pain, anemia, gingival lead line, paralysis of wrists and ankles, hypertension and kidney disease.
Nickel	PEL: 1mg/m³ REL: 0.015mg/m³ (Ca) TLV: 0.1mg/m³ STEL: N/A IDLH: 10mg/m³ Skin: NO	Lustrous, silvery, odorless solid. Air odor threshold: N/A VP: 0mm	INH CON ING	Sensitivity dermatitis, allergic asthma, pneumonitis
Vanadium pentoxide dust	PEL: 0.5mg/m³ (C) REL: 0.05mg/m³ (C) TLV: 0.05mg/m³ STEL: N/A IDLH: 35mg/m³ Skin: NO	Yellow-orange powder or dark gray, odorless flakes dispersed in air. VP: 0mm	INH ING CON	Irritated eyes, skin, throat, green tongue, metallic taste, eczema, cough, fine rales, wheezing, bronchitis
Zinc oxide	PEL: 5mg/m³ REL: 5mg/m³ TLV: 2mg/m³ STEL: 10mg/m³ IDLH: 500mg/m³ Skin: NO	White, lustrous solid	INH	Metal fume fever, chills, muscular ache, nausea, fever, dry throat, cough, weakness, metallic taste, headache, blurred vision, low back pain, vomiting, fatigue, malaise
Sulfuric Acid (water treatment chemical)	PEL: 1mg/m³ TLV: 0.2mg/m³ Skin: YES	Oily, colorless to slightly yellow, clear to turbid liquid	IHN ABS ING CON	Can cause irritation or corrosive burns to the upper respiratory system, lung irritation, pulmonary edema, burns to mouth throat and stomach, erode teeth, skin lesions
Antiscale (water treatment chemical)	PEL: 1mg/m³ TLV: 0.2mg/m³ Skin: YES	Liquid, colorless, clear	IHN ABS ING CON	May cause severe skin burns and eye damage, can cause cancer, fatal if inhaled, may damage organs through prolonged exposure
Antifoam (water treatment chemical)	N/E	Liquid emulsion, white, opaque	IHN ABS ING CON	May be harmful to skin, if inhaled and if swallowed
Gases				
Carbon Monoxide	PEL: 50PPM REL: 35PPM TLV: 25PPM STEL: 200PPM (C) IDLH: 1200PPM Skin: NO	Colorless, odorless gas LEL: 12.5% UEL: 74% IP: 14.01eV VP: >35atm FI.P: N/A	INH	Headache, rapid breathing, nausea, tiredness, dizziness, confusion

NOTES:

OSHA PEL	Occupational Safety and Health administration Final Rule Limits, Permissible Exposure Limit for an eight=hour, time-weighted average
ACGIH TLV	American Conference of Governmental Industrial Hygienists, Threshold Limit Value for eight-hour, time-weighted average
STEL	Short-term Exposure Limit for a 15-minute, time-weighted average
NIOSH IDLH	National Institute for Occupational Safety and Health, Immediately Dangerous to Life or Health concentration
PPM	Part of vapor or gas per millions parts of air by volume at 25°Celsius and 760mm Hg mg/m³ (milligram of substance per cubic meter of air)
CA	NIOSH has identified numerous chemicals that it recommends to be treated as potential or confirmed human carcinogens.
(C)	The (ceiling) concentration that should not be exceed during any part of the working exposure.
Skin	Refers to the potential contribution to the overall exposure by the cutaneous (absorption) route, including mucous membranes and eye, either by airborne or more particularly by direct contact with the substance.
UEL	Upper Explosive Limit – the highest concentration of a material in air that produces an explosion in fire or ignites when it contacts an ignition source.
LEL	Lower Explosive Limit – the lowest concentration of the material in air that can be detonated by spark, shock, fire, etc.
INH	Inhalation
ABS	Skin absorption
ING	Ingestion
CON	Skin and/or eye contact

4.2 Physical Hazards

Field employees and subcontractors may be exposed to a number of physical hazards during this project. Physical hazards that may be encountered include the following:

- Heat and cold stress
- Lifting hazards
- Slips, trips and falls
- Working around heavy equipment
- Drilling hazards
- Noise
- Use of hand and power tools
- Buried hazards
- Electrical hazards
- Underground and overhead utilities
- Working over water
- Travel to and from site

4.2.1 Heat Stress

Local weather conditions may produce an environment that will require restricted work schedules in order to protect employees from heat stress. The Project Manager or the Field Lead Team Member will observe workers for any potential symptoms of heat stress. Adaptation of work schedules and training on recognition of heat stress conditions should help prevent heat-related illnesses from occurring. Heat stress controls will be stated at 70°F for personnel in protective clothing and at 90°F for personnel in regular work clothing. Heat stress prevention controls include:

- Allow workers to become acclimatized to heat (three to six days)
- Provide rest breaks in a shaded or air-conditioned break area
- Provide sun screen to prevent sun burn
- Provide drinking water and electrolyte-replenishing fluids
- Keep ice readily available to rapidly cool field team members

The following Heat Stress Index should be used as a guide to evaluate heat stress situations. If the Heat Stress exceeds 105 degrees Fahrenheit, contact the project manager prior to conducting work for detailed guidance.

Heat Stress Index

Temp. °F	Relative Humidity								
	10%	20%	30%	40%	50%	60%	70%	80%	90%
105	98	104	110	120	132				
102	97	101	108	117	125				
100	95	99	105	110	120	132			
98	93	97	101	106	110	125			
96	91	95	98	104	108	120	128		
94	89	93	95	100	105	111	122		
92	87	90	92	96	100	106	114	122	
90	85	88	90	92	96	100	106	114	122
88	82	86	87	89	93	95	100	106	115
86	80	84	85	87	90	92	96	100	109
84	78	81	83	85	86	89	91	95	99
82	77	79	80	81	84	86	89	91	95
80	75	77	78	79	81	83	85	86	89
78	72	75	77	78	79	80	81	83	85
76	70	72	75	76	77	77	77	78	79
74	68	70	73	74	75	75	75	76	77

NOTES: Add 10° F when protective clothing is being used; Add 10° F when in direct sunlight

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HSI Temp	Category	Injury Threat
Above 130° F	Extreme Danger	No work unless emergency exists. Contact Cardno ATC RSC and Corporate Risk Management Department prior to proceeding. Heat cramps or exhaustion likely, heat stroke possible if exposure is prolonged and there is physical activity.
105° to 130° F	Danger	Contact RSC prior to proceeding. Requires strict adherence to ACGIH Heat Stress Guidelines, including use of on-site WBGT equipment. Heat cramps or exhaustion likely, heat stroke possible if exposure is prolonged and there is physical activity.
90° to 105° F	Extreme Caution	Heat cramps or exhaustion likely, heat stroke possible if exposure is prolonged and there is physical activity.
80° to 90° F	Caution	Heat cramps or exhaustion likely, heat stroke possible if exposure is prolonged and there is physical activity.
Below 80° F	Normal Range	Typical conditions for time of year. Little or no danger under normal circumstances. As always, anticipate problems and work safely.

4.2.2 Cold Stress

Frostbite and hypothermia are two types of cold injury that personnel must be protected against during the performance of field duties. The objective is to prevent the deep body temperature from falling below 96.8° F and to prevent cold injury to body extremities. Two factors influence the development of a cold injury the ambient temperature, and wind velocity. Reduced body temperature will very likely result in reduced mental alertness, reduction in rational decision making, and/or loss of consciousness with the threat of death.

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Use appropriate cold weather clothing when temperatures are at or below 40° F as exposed skin surfaces must be protected. These protective items can include facemask, hand wear, and foot wear. Workers handling evaporative solvents during cold stress conditions will take special precautions to avoid soaking gloves and clothing because of the added danger of prolonged skin contact and evaporative cooling. Personnel will wear protective clothing appropriate for the level of cold and planned physical activity. The objective is to protect all parts of the body, with emphasis on the hands and feet. Eye protection against glare and ultraviolet light should be worn in snowy and icy conditions.

The work rate should not be so great as to cause heavy sweating that could result in wet clothing. If heavy work must be done, opportunities for rest breaks will be provided where workers have the opportunity to change into dry clothing. Conversely, plan work activities to minimize time spent sitting or standing still. Rest breaks should be taken in a warm, dry area. Windbreaks can also be used to shield the work area from the cooling effects of wind.

If extreme cold-related weather conditions occur, EAG field personnel and subcontractors will take the following precautions:

- Wear adequate insulated clothing when the air temperature drops below 40°F
- Reduce work periods in extreme conditions to allow adequate rest periods in a warm area
- Change clothes when work clothes become wet
- Avoid caffeine (which has diuretic and circulatory effects)

4.2.3 Lifting Hazards

Field personnel may be exposed to injury caused by lifting heavy objects and various pieces large or unwieldy pieces of equipment. All field team members will be trained in the proper methods for lifting heavy and/or large equipment and are cautioned against lifting objects that are too heavy or too big for one person. Proper lifting techniques include the following:

- Keep feet approximately shoulder width apart
- Bend at the knees
- Tighten abdominal muscles
- Lift with the legs
- Keep the load close to the body
- Keep the back upright
- Use the buddy system for larger or heavy pieces of equipment

All drums will be staged using an approved drum dolly or other appropriate equipment. Proper care will be taken in the use of this equipment. Healthy employees with no medical restrictions may lift and carry a maximum of 50 pounds using proper lifting and carrying techniques. This recommended weight limit may be reduced depending on physical and workplace factors.

4.2.4 Slips, Trips and Falls

The most common hazards that will be encountered during field activities will be slips, trips and falls. Field team members are trained to use common sense to avoid these hazards such as using work boots/safety shoes with nonskid soles. When working on slippery surfaces, tasks will be planned to decrease the risk of slipping via avoiding the slippery areas, if possible, or utilizing engineering controls. Engineering controls may involve the placement of supplemental material such as boards, gravel, or ice melt should be utilized to mitigate slippery conditions. Other engineering controls may involve the use of footgear traction control devices. Employees and subcontractors will avoid slippery surfaces, use engineering controls as appropriate, not hurry, and maintain good housekeeping.

4.2.5 Buried Hazards

Whenever the ground is penetrated, the potential for contacting buried hazards exists. During the planning/mobilization phase, prior to drilling or other excavation activities, EAG personnel and/or their contractors will establish the location of underground utility lines (gas, electrical, telephone, fiber optic cable, etc.) and/or substructures or other potential buried hazardous items. This may be conducted by review of historic utility and substructure maps, private utility locates, ground penetrating radar, or other technologies. If there is any evidence of utilities or subsurface objects/structures, drilling or excavation activities may be offset. If activities cannot be offset, measures will be taken to remove, disconnect, and/or protect the utilities and/or subsurface structures and/or objects. Every reasonable effort will be made to clear the area of intrusive work prior to fieldwork being started.

4.2.6 Electrical Hazards

It may be possible that overhead power lines will be in proximate locations during drilling or excavation activities. At least a 20 foot clearance must be maintained from overhead power lines. No equipment such as drill rigs or dump trucks can be moved while masts or buckets are in the upright position. Field personnel and subcontractors performing electrical work are required to be appropriately trained to work on the electrical systems in question prior to start of work. Authorization from project management personnel is required prior to any electrical work or work near overhead power lines. . When using extension cords, all field workers will ensure that they are in good working condition, are correctly rated for use, and do not contain abrasions such that bare wires could be exposed to the environment. Extension cords will not be used in wet areas without plugging the extension cord into a ground fault circuit interrupter (GFCI). GFCIs will detect a short circuit and cut power.

4.2.7 Heavy Equipment Operations

Heavy equipment must be operated in a safe manner and be properly maintained such that operators and ground personnel are protected.

Requirements for Operators

- Only qualified, trained, and authorized operators are allowed to operate equipment
- Seat belts will be used at all times in all equipment and trucks
- Operators will stop work whenever ground personnel or other equipment enter their work area; work will resume only when the area has been cleared
- No personnel may ride on equipment other than the Authorized Operator
- No personnel may be carried or lifted in the buckets or working "arms" of the equipment
- Spotters will be used when ground personnel are in the vicinity of heavy equipment work areas and/or when an operator is backing equipment near other structures or congested area

Requirements for Ground Personnel

- All ground personnel must wear orange protective vests in work areas with any operating heavy equipment
- Ground personnel will stay outside of the swing zone or work area of any operating equipment
- Ground personnel may only enter the swing or work area of any operating equipment when:
  -They have attracted the operators attention and made eye contact
  -The operator has idled the equipment down and grounded all extensions
  -The operator gives the ground personnel permission to approach
- Ground personnel shall never walk or position themselves between any fixed object and running equipment or between two running pieces of equipment

Equipment

- Maintain operations manuals at the site for each piece of equipment that is present and in use
- Ensure operators are familiar with the manual for the equipment and operate the equipment within the parameters of the manual
- Ensure all equipment is provided with roll-over protection systems
- Verify that seatbelts are present and functional in all equipment
- Prohibit the use of equipment that has cab glass which is broken or missing
- Ensure that backup alarms are functional on all trucks and equipment
- Require all extensions such as buckets, blades, forks, etc. to be grounded when not in use
- Require brakes to be set and wheels chocked (when applicable) when not in use

Daily inspections of equipment are required using a Daily Heavy Equipment Safety Checklist. Equipment deemed to be unsafe as a result of daily inspection will not be used until required repairs or maintenance occurs. During maintenance/repair, ensure that motors are turned off, all extensions are grounded or securely blocked, controls are in a neutral position, and the brakes are set.

4.2.8 Drilling and Excavation Safety

Prior to any intrusive work, as previously mentioned, the location of underground utilities, such as sewer, telephone, gas, water and electric lines must be determined and plainly staked. Necessary arrangements must be made with the utility company or owner for the protection, removal or relocation of the underground utilities. In such circumstances, excavation will be done in a manner that

does not endanger the field personnel engaged in the work or the underground utility. Utilities left in place will be protected by barricading, shoring, suspension or other measures, as necessary.

The use of unsafe or defective equipment is not permitted. Equipment must be inspected regularly. If found to be defective, equipment must be immediately removed from use and either repaired or replaced prior to resuming work with that equipment. Field personnel will be familiar with the location of first-aid kits and fire extinguishers. Telephone numbers for emergency assistance must be prominently posted and kept current.

Good housekeeping conditions will be observed in and around the work areas. Suitable storage places will be provided for all materials and supplies. Pipe, drill rods, etc. must be securely stacked on solid, level sills. Work surfaces, platforms, stairways, walkways, scaffolding, and access ways will be kept free of obstructions. All debris will be collected and stored in piles or containers for removal and disposal.

The area of the site to undergo intrusive activity must be walked over with the drillers and/or heavy equipment operators to identify all work locations, as well as making sure all marked utilities are seen by those doing the intrusive work.

Drilling Specific Concerns:

In areas where utilities have been identified or may be suspected, pre-drilling clearance such hand-augering, hand excavation (with shovels or post-hole diggers), or air-knifing to a depth of at least 5' below ground surface (BGS) may be required. The Project Manager will provide guidance in those instances on what has been determined as an acceptable means of clearing drilling locations. It should be noted that if the soil lithology changes to gravel within those 5 feet, that may be an indication of a utility trench and extreme caution should be taken OR the drilling location should be offset 5 horizontal feet from the original location. Should 3 consecutive attempts be made without success to offset a particular drilling location, the field personnel should stop and contact the Project Manager for further instruction.

Special precaution must be taken when using a drill rig on a site within the vicinity of electrical power lines and other overhead utilities. Electricity can shock, burn and cause death. When overhead electrical power lines exist at or near a drilling site, all wires will be considered dangerous.

A check will be made for sagging power lines before a site is entered. Power lines will not be lifted to gain entrance. The appropriate utility company will be contacted and a request will be made that it lift or raise cut off power to the lines.

The area around the drill rig will be inspected before the drill rig mast (derrick) is raised at a site in the vicinity of power lines. The minimum distance from any point on the drill rig to the nearest power line will be determined when the mast is raised or is being raised. The mast will not be raised and the drill rig will not be operated if this distance is less than 20 feet, because hoist lines and overhead power lines can be moved toward each other by the wind.

Before the mast is raised, personnel will be cleared from the immediate area, with the exception of the operator and a helper, when necessary. A check will be made to ensure safe clearance from energized power lines or equipment (minimum 20-foot clearance). Unsecured equipment must be removed from the mast and cables, mud lines and catline ropes must be adequately secured to the mast before raising. After it is raised, the mast must be secured to the rig in an upright position with steel pins.

Excavation Specific Concerns:

For excavation work, entry into an excavated area or trench will only be allowed when:

- Shoring, sloping, and spoil pile placement is in conformance with 29 CFR 1926 Subpart P, and
- Personal protection and monitoring, as detailed in this HASP, has been implemented.

All excavation contractors are required to provide an OSHA trained and certified Competent Person. Daily inspections of excavations, the adjacent areas, and protective systems shall be made by the Competent Person for evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection shall be conducted by the Competent Person prior to the start of work and as needed throughout each shift. Inspections shall also be made after every rainstorm or other hazard increasing occurrence. All inspections made by the Competent Person should be recorded in the field log book. No personnel shall perform work in a trench or excavation that contains accumulated water (any accumulated water will need to be either pumped out until the trench/excavation is dry, or the accumulated water is allowed to disperse naturally). Each employee in an excavation shall be protected from cave-ins by an adequate protective system except when excavations are made entirely in stable rock or the excavation is less than 5 feet in depth and examination by the Competent Person provides no indication of a potential cave-in. Protective systems consist of sloping or benching, use of trench boxes or other shielding mechanisms, or the use of a shoring system in accordance with the regulations.

When mobile equipment is operated adjacent to an excavation and the operators/drivers do not have a clear and direct view of the edge of the excavation, a warning system such as barricades, hand or mechanical signals, or spotters are required.

Adequate protection shall be provided to protect employees from loose rock or soil that could pose a hazard to personnel in the excavation. All temporary spoil piles shall be kept at least 2 feet away from the edge of the excavation. Spoil piles should be placed to channel rainwater or other run-off water away from the excavation.

All excavations deeper than 4 feet deep and which have the potential to have a hazardous atmosphere or oxygen deficient atmospheres (less than 19.5% oxygen) must be tested to ensure safe working conditions, prior to entry.

4.2.9 Use of Hand Tools and Portable Power Tools

Hand tools will be kept in good repair and used only for their designed purposes. Proper protective eyewear will be worn when using hand tools and portable power tools. Unguarded sharp-edged or

pointed tools will not be carried in field personnel's pockets. The use of tools with mushroomed heads, split or defective handles, worn parts, or other defects will not be permitted. Inspect all tools prior to start-up or use to identify any defects. Tools that have become unsafe will be reconditioned before reissue or they will be discarded and replaced. Throwing or dropping of tools from one level to another will not be permitted; rather, containers and hand lines will be used for transporting tools from one level to another if working at heights.

Non-sparking tools will be used in atmospheres where sources of ignition may cause fire or explosion. Electric-powered shop and hand tools will be of the double-insulated, shockproof type, or they will be effectively grounded. Power tools will be operated only by designated personnel who are familiar and trained with their use. When not in use, tools will not be left on scaffolds, ladders or overhead working surfaces.

4.2.10 Noise

Exposure to high levels of noise may occur when working near drill rigs or other heavy equipment. Also, depending upon where the work is being performed, local equipment (e.g., airports, factory machines, etc.) may produce high levels of noise. A good indication of the need for hearing protection is when verbal communication is difficult at a distance of 2-3 feet. Personnel will be provided with ear plugs and/or earmuffs when exposed to noise levels in excess of the 8-hour Permissible Exposure Limit (PEL) of 90 decibels.

4.2.11 Work Zone Traffic Control

Personnel will exercise caution when working near areas of vehicular traffic. Work zones will be identified by the use of delineators (traffic cones, flags, vehicles, DOT approved devices, temporary or permanent fencing, and/or safety barrier tape). Personnel will wear reflective vests when working in these areas. Depending on frequency, proximity, and nature of traffic, a flag person may also be utilized.

4.2.12 Work Over Water

If personnel will be working near, above or immediately adjacent to or within 6 feet of water that is 3 feet or more deep or where water presents a drowning hazard (e.g., fast-moving stream, water body with a soft bottom), employees are required to a U.S. Coast Guard (USCG) approved personal flotation device (PFD). All PFDs must have reflective tape on them to facilitate visibility. Employees must inspect PFDs daily before use for defects. Do no use defective PFDs.

4.2.13 Vehicle Use

Personnel must use caution when driving to, from, and across the site, paying special attention to other site traffic, as well as weather and road conditions. Heavy equipment should be transported during non-rush hour traffic.

4.3 Biological Hazards

Site activities on this Site may expose workers to other hazards such as poisonous plants, insects, animals, and indigenous pathogens. Protective clothing and respiratory protection equipment, and being capable of identifying poisonous plants, animals, and insects, can greatly reduce the chances of exposure. Thoroughly washing any exposed body parts, clothing, and equipment will also protect against infections. Avoiding contact with biological hazards is the best way to prevent potential adverse health effects. Recognition of potential hazards is essential. When avoidance is impractical or impossible, PPE, personal hygiene, good general health and awareness must be used to prevent adverse effects. If working in wooded/grassy areas, use appropriate insect repellants (containing DEET and/or Permethrin) and apply them per the manufacturers' directions. The following is a list of biological hazards that may be encountered while performing field activities at the project site and surrounding areas:

BIOLOGICAL HAZARD and LOCATION	CONTROL MEASURES
Snakes typically are found in underbrush and tall grassy areas.	If you encounter a snake, stay calm and look around; there may be other snakes. Turn around and walk away on the same path you used to approach the area. If a person is bitten by a snake, wash and immobilize the injured area, keeping it lower than the heart if possible. Seek medical attention immediately. **DO NOT** apply ice, cut the wound or apply a tourniquet. Carry the victim or have him/her walk slowly if the victim must be moved. Try to identify the snake: note color, size, patterns and markings.
Poison ivy, poison oak and poison sumac typically are found in brush or wooded areas. They are more commonly found in moist areas or along the edges of wooded areas.	Become familiar with the identity of these plants. Wear protective clothing that covers exposed skin and clothes. Avoid contact with plants and the outside of protective clothing. If skin contacts a plant, wash the area with soap and water immediately. If the reaction is severe or worsens, seek medical attention.
Exposure to **bloodborne pathogens** may occur when rendering first aid or CPR, or when coming into contact with medical or other potentially infectious material or when coming into contact with landfill waste or waste streams containing such infectious material.	Training is required before a task involving potential exposure is performed. Exposure controls and personal protective equipment (PPE) area required. Hepatitis B vaccination must be offered before the person participates in a task where exposure is a possibility.
Bees, spiders and other stinging insects may be encountered almost anywhere and may present a serious hazard particularly to people who are allergic.	Watch for and avoid nests. Keep exposed skin to a minimum. Carry a kit if you have had allergic reactions in the past and inform the Project Manager and/or the buddy. If a stinger is present, remove it carefully with tweezers. Watch for allergic reaction; seek medical attention if a reaction develops.
Ticks typically are in wooded areas, bushes, tall grass and brush. Ticks are black, black and red or brown and can be up to one-quarter inch in size.	Avoid tick areas. Wear tightly woven, light-colored clothing with pants tucked into boots or socks. Spray outside of clothing with insect repellent containing permethrin. Check yourself for ticks often. If bitten, carefully remove tick with tweezers. Report the bit to the Project Manager. Look for symptoms of Lyme

	disease that include a rash that looks like a bulls eye and chills, fever, headache, fatigue, stiff neck or bone pain. If symptoms appear, seek medical attention.

5.0 PERSONAL PROTECTIVE EQUIPMENT

PPE ensembles are used to protect employees and subcontractors from potential contamination hazards while conducting project field activities. Level D is expected to be used for most activities at the site. The following subsections describe the PPE requirements for the field activities.

5.1 Level D Protection

When the atmosphere contains no known hazards and work functions preclude splashes, immersions or the potential for unexpected inhalation of or contact with hazardous levels of any chemicals, Level D protection may be used. Level D does not provide respiratory protection and only provides minimal dermal protection. The Level D ensemble consists of the following:

- Work clothes that may consist of a short or long-sleeved cotton shirt and cotton pants, cotton overalls, or disposal overalls such as Tyvek™
- Steel-toe/steel-shank work boots
- Safety glasses with side shields
- Hearing protection, as necessary
- Hand protection, as appropriate
- Hard hat when working around overhead equipment such as a drilling rig
- Reflective vests when working around heavy equipment or near roadways
- Body harness and life vests when working on or within 6 feet of bulkheads, at heights, or in 3 feet or more of standing water (such as in Tin Mill Canal)

5.2 Modified Level D Protection

This is the level of protection that may be needed for material handling, sampling operations, and operation of remediation equipment when splash hazards are present. Modified Level D protection consists of the following:

- Disposable overalls such as polyethylene-coated Tyvek™
- Latex, vinyl, or nitrite inner gloves when handling liquids/fluids
- Nitrile outer gloves (taped to outer suit)
- Chemical-protective over-boots (taped to outer suit)
- Steel-toe/steel-shank, high-ankle work boots
- Hard hat with face shield
- Safety glasses with side shields or goggles
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- Hearing protection, as necessary

5.3 Level C Protection

Level C protection will be used when site action levels are exceeded and respiratory protection is required. The Level C ensemble consists of Modified Level D with the following modifications:

- Half or full-face air-purifying respirator (APR) equipped with appropriate cartridges/filters
- Chemical resistant clothing such as poly-coated Tyvek™
- Inner and outer nitrile gloves
- Chemical-resistant safety boots or boot covers to go over safety boots

Upgrading or downgrading the level of protection used by EAG employees and subcontractors is a decision made by EAG based on the air monitoring protocols presented in Section 7.0 for respiratory protection, the potential for inhalation exposure to toxic chemicals, and the need for dermal protection during the activity.

5.4 First Aid, Emergency and Safety Equipment

The following first aid, emergency and safety equipment will be maintained onsite at the work area:

- A portable eye wash
- Appropriate ABC-type fire extinguishers (minimum of 10 pounds; remediation systems to house individual 20 pound extinguishers) carried in every vehicle used during field operations
- Industrial first-aid kit (one 16-unit that complies with American National Standards Institute (ANSI) Z308A for every 25 persons or less)
- Bloodborne pathogen precaution kit with CPR mouth shield
- Instant cold packs
- Soap or waterless hand cleaner and towels
- American Red Cross First Aid and CPR Instruction Manuals

6.0 PERSONNEL TRAINING AND STANDARD SAFETY PROCEDURES

Employees must have received, at the time of project assignment, a minimum of 40 hours of initial OSHA health and safety training for hazardous waste site operations. Personnel who have not met the requirements for the initial training will not be allowed in the Exclusion Zone (EZ) or Contamination Reduction Zone (CRZ) of any active work area. A copy of each subcontractor site worker's 40-hour training certificate must be sent to the Project Manager for review prior to the start of the site work.

The 8-hour refresher training course must be taken at a minimum of once per year. At the time of the job assignment, all site workers must have received 8 hours of refresher training within the past year. This course is required of all field personnel to maintain their qualifications for hazardous waste site work. A copy of each subcontractor site worker's most recent 8-hour refresher training certificate must be sent to the Project Manager for review prior to the start of the site work.

A site-specific safety orientation will be conducted by EAG for all EAG employees and subcontractors engaged in fieldwork.

6.1 Onsite Safety, Health and Emergency Response Training

The OSHA 1910.120 standard requires that site safety and health training be provided by a trained, experienced supervisor. "Trained" is defined to mean an individual that has satisfactorily completed the OSHA 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) course and 8-hour site supervisor training. Training will be offered at the time of the initial task assignment and/or whenever new chemicals are introduced into the workplace. Training will include all applicable regulatory requirements, location of the program, inventory and MSDSs, chemicals used and their hazards (chemical, physical, and health), how to detect the presence or release of chemicals, safe work practices and methods employees can take to protect themselves from hazards, how to read MSDSs and site or project specific information on hazard warnings and labels in use at that location. All training will be documented and training certificates will be kept in the employee's permanent training file. All applicable training will also require annual refreshers.

EAG qualified personnel must also provide safety meetings.

6.2 Standard Safety Procedures

This section describes the standard safety procedures that EAG requires all onsite personnel to follow during site activities.

6.2.1 General Safety Work Practices

All onsite employees and subcontractors will observe the following general safety work practices:

- Health and safety tailgate briefings will occur to introduce new activities, any new safety issues, and emergency egress routes for work areas; any significant change (added personnel, change in scope, or change in field conditions) will trigger a second (or more) tailgate meeting to address whatever change occurred
- No food, drink, or tobacco products will be allowed in the Exclusion and Contamination Reduction Zones
- Loose clothing, hair, and/or jewelry will not be permitted around moving or rotating equipment
- The "buddy system" will be implemented as necessary whereby a pair of co-workers watches out for each other while in proximity of potential physical work hazards
- Good housekeeping of all work areas will be maintained on an ongoing basis

6.2.2 Hand Safety

This standard is intended to protect employees from activities that may expose them to injury. This standard provides information on recognizing those conditions that require personal protective equipment (PPE) or specific work practices to reduce the risk of hand injury.

Appropriate gloves must be worn when persons work with materials or equipment that presents the potential for hand injury due to sharp edges, corrosives, flammable and irritating materials, extreme temperatures, splinters, etc.

<u>Guidelines for Working With and Around Equipment (Hand Tools, Portable Powered Equipment)</u>:

- Employees should be trained in the use of all tools.
- Keep hand and power tools in good repair and use them only for the task for which they were designed.

- Inspect tools before use and remove damaged or defective tools from service.
- Operate tools in accordance with manufacturer's instructions.
- Do not remove or bypass a guarding device for any reason.
- Keep surfaces and handles clean and free of excess oil to prevent slipping.
- Wear proper PPE, including gloves, as necessary.
- Do not carry sharp tools in pockets.
- Clean tools and return to the toolbox or storage area upon completion of a job.
- Before applying pressure, ensure that wrenches have a good bite.
- Brace yourself by placing your body in the proper position so you will not fall if the tool slips.
- Make sure hands and fingers have sufficient clearance in the event the tool slips.
- Always pull on a wrench, never push.
- When working with tools overhead, place tools in a holding receptacle when not in use.
- Do not throw tools from place to place or from person to person, or drop tools from heights.
- Inspect all tools prior to start-up or use to identify any defects.
- Powered hand tools should not be capable of being locked in the ON position.
- Require that all power-fastening devices be equipped with a safety interlock capable of activation only when in contact with the work surface.
- Do not allow loose clothing, long hair, loose jewelry, rings, and chains to be worn while working with power tools.
- Do not use cheater pipes.
- Make provisions to prevent machines from restarting through proper lockout/tagout.

<u>Guidelines for using Cutting Tools:</u>

- Always use the specific tool for the task. Tubing cutters, snips, self- retracting knives, concealed blade cutters, and related tools are task specific and minimize the risk of hand injury. For more information about cutting tools, see Supplemental Information A.
- Fixed open-blade knives (FOBK) are prohibited from use. Examples of fixed open-blade knives include pocket knives, multitools, hunting knives, and standard utility knives.
- When utilizing cutting tools, personnel will observe the following precautions to the fullest extent possible:
- Use the correct tool and correct size tool for the job.
- Cut in a direction away from yourself and not toward other workers in the area.
- Maintain the noncutting hand and arm toward the body and out of the direction of the cutting tool if it were to slip out of the material being cut.
- Ensure that the tool is sharp and clean; dirty and dull tools typically cause poor cuts and more hazard than a sharp, clean cutting tool.
- Store these tools correctly with covers in place or blades retracted, as provided by the manufacturer.
- On tasks where cutting may be very frequent or last all day (e.g., liner samples), consider Kevlar® gloves in the PPE evaluation for the project.
- Do not remove guards on paper cutters.

6.2.3 Respiratory Protection

Based on air monitoring, an upgrade to Level C protection may be indicated. Half or full-face APRs will be utilized for protection against organic vapors and particulates. All employees required to wear respirators will be need to be medically cleared, in writing to do so by a qualified Occupational Physician.

All respirator users must be trained before they are assigned a respirator, annually thereafter, whenever a new hazard or job is introduces and whenever employees fail to demonstrate proper use or knowledge. Training will include, at a minimum:

- Why the respirator is necessary and what conditions can make the respirator ineffective.
- What limitation and capabilities of the respirators area.
- How to inspect, put on and remove and check the seals of the respirator.
- What respirator maintenance and storage procedures are.
- How to recognize medicals signs and symptoms that may limit or prevent effective use of the respirator.
- The engineering and administrative controls being used and the need for respirators.
- The hazards and consequences of improper respirator use.
- How to recognize and handle emergency situations.

Training will be documented and training certificated will be kept in the employee's permanent training file.

6.2.4 Personal Hygiene Practices

The field team must pay strict attention to sanitation and personal hygiene requirements to avoid personal contamination. The following instructions will be discussed and must be followed:

- During field activities, never put anything in the mouth, including fingers
- All employees must wash their hands, forearms, face, and neck before eating drinking, smoking or using the restroom
- Smoking is prohibited except in designated areas outside the work zone
- At the end of the day, all employees will shower upon returning home or to their hotel

6.2.5 Electrical Safety

All extension cords used onsite must be heavy-duty variety and must be properly grounded. All temporary circuitry must incorporate the use of GFCI devices. Refer to electrical safety in Section 4.2.6, Electrical Hazards.

6.2.6 Fire Safety

All flammable liquids will be used only for their intended purpose and stored and handled only in approved containers. Portable containers must be the approved red safety containers equipped with flame arresters and self-closing lids. All transfers of flammable liquids must be made with the containers grounded or bonded. Also, gasoline containers will be clearly labeled and storage areas (if

applicable) will be posted with "No Smoking" signs. Fire extinguishers will be stalled in all areas that contain flammable liquids.

6.2.7 Illumination

All work is planned for daylight hours. No special requirements are anticipated. However, should any work take place outdoors after daylight hours, suitable lighting will be required. In addition, suitable lighting is to be provided in each remediation system building or enclosure.

6.2.8 Sanitation

Potable water and toilet facilities will be provided in compliance with the OSHA 1926.51 standard. Any container used to distribute drinking water shall be clearly marked and not used for any other purpose. Single drinking cups will be supplied, both a sanitary container for the unused cups and a receptacle for disposed of the used cups will also be provided. Port-a-johns will be provided since there are no sanitary sewers on the job site.

7.0 EXPOSURE MONITORING PLAN

This section describes air and personnel monitoring protocols, sampling methods, and instrumentation to be used, as well as the methods and frequency of sampling instrument calibration and action levels for potential work site hazards. When engaged in air monitoring, EAG personnel and subcontractors must use the forms to record air monitoring data and air monitoring instrument calibration records. All monitoring records/forms are to be maintained in the project file by the EAG Project Manager.

7.1 Air Monitoring

The surveillance program is established to detect changes in the ambient air at the work site and to ensure the continuing safety of the work zones and adequacy of the level of worker protection. During field activities, the designated field team member will monitor the work site for combustible gas concentrations and organic vapors. Calibration of all monitoring equipment will be performed in accordance with the manufacturers' procedures by trained EAG employees and subcontractors. The Project Manager, Project Field Team Leader or representative will be notified immediately of any contaminant levels that could trigger an upgrade in PPE or cause a suspension of site activities.

- One or more of the following direct-reading instruments may be used to aid in this determination. Photoionization Detectors (PID) and Flame Ionization Detectors (FID) will measure non-specific organic gases and vapors. Combustible Gas Indicators (CGI) will detect explosive atmospheres. Oxygen (O2) meters will detect fluctuations in oxygen concentrations. These instruments should be calibrated or bump tested daily and whenever the readings may be erratic. All readings should be recorded in the field log books.

Air monitoring results obtained from the breathing zone during field activities will be recorded in field log books. All such records will also include the location, date/time, weather conditions, person monitored, background concentration, and identification of specific contaminant whenever possible. Air monitoring information will be utilized to evaluate personnel exposure and assess the appropriateness of PPE for Site conditions.

7.1.1 Combustible Gas and Oxygen Deficiency/Excess Monitoring

Explosive gas concentrations are not expected to exceed 10% of the lower explosive level (LEL). Should the need be indicated for monitoring, action guidance for the CGI/O2 meter responses is contained in **Table 7-1**.

Table 7-1

CGI/Oxygen Meter Action Levels	
Meter Response	**Action**
CGI response 0%-10% LEL	Continue normal operations
CGI initial response >10% and <20% LEL	Eliminate all sources of ignition from the work area; temporarily retreat from work area for 15-30 minutes and then monitor area again
CGI response after 15-30 minute retreat >10% and <20% LEL	Retreat from work area; notify Project Manager
CGI response >20%	Discontinue operations; retreat from work area
Oxygen level <19.5%	Retreat from work area; notify Project Manager
Oxygen level >23.5%	Retreat from work area; notify Project Manager

7.1.2 Organic Vapor Concentrations

Real-time monitoring for organic vapor concentrations in the breathing zone and down hole will be conducted during field operations (installation of groundwater monitoring and groundwater sampling by EAG and EAG subcontractor personnel) with a PID equipped with a 10.2- or 11.7-electron volt (eV) probe. The PID will be taken into the field and operated during site activities where contaminated soil and/or groundwater may be present. Air monitoring will be conducted during well installation and when a well is opened for groundwater measurements. Measurements will be made at the well head and personnel breathing zones where activities are being performed. The instrument will be calibrated using ultra-high purity air and isobutylene vapor of known concentration before and after use each day. Air calibration measurements will be documented in writing and kept in the project file. Action guidance for PID responses is contained in **Table 7-2**.

Table 7-2

Action Levels for General Site Work	
Meter Response in Breathing Zone (minimum of 3 minutes)	**Action Required**
<5ppm above background	Use Level D PPE
>5ppm above background	Level C PPE, including half or full-face APR with organic vapor cartridges/P100 filters
>50ppm above background	Stop work
Action Levels for Handling NAPL	
Meter Response in Breathing Zone (minimum of 3 minutes)	**Action Required**
<1ppm above background	Use Modified Level D PPE
>1ppm to <10ppm	Level C PPE, including half or full-face APR with organic vapor cartridges
>10ppm above background	Immediately withdraw; monitoring will continue until action levels will allow safe re-entry

If air concentrations of organic vapors are greater than 5 ppm above background in the breathing zone for a 3-minute period, personnel will stop work, retreat from site, and allow time (at least 15 minutes) for vapors to dissipate. If monitoring indicates that concentrations still exceed 5 ppm, workers will upgrade to Level C PPE. If monitoring indicates that concentrations exceed 50 ppm, work will be stopped until site conditions can be re-evaluated.

These action levels are based on the assumption that the major component of free product being recovered will be benzene or naphthalene.

Work involving NAPL recovery from monitoring wells will be conducted in Level C PPE. This level may be downgraded based on air monitoring data and actual field conditions. Downgrading of PPE must be approved by the PM and HSE staff. If ventilation is conducted, additional air monitoring will be performed to the resumption of work to determine the level of PPE required.

7.2 Physical Conditions Monitoring

Site workers will be monitored by the Project Manager for signs of weather-related symptoms from exposure to excessive heat or cold.

Whenever the air temperature exceeds 70°F for personnel wearing chemical protective clothing or 90°F for personnel wearing regular work clothes, the Project Manager will assess conditions that may cause heat stress in site workers.

8.0 MEDICAL SURVEILLANCE

This section discusses the medical surveillance program, how the results are reviewed by a physician and how participation is documented.

8.1 Medical Surveillance Program

All personnel who will be performing any task where potential exposure to hazardous material exists will undergo medical surveillance as outlined in OSHA 29 CFR 1910.120(f). All personnel performing tasks in the Exclusion Zone or Contamination Reduction Zone will be required to have passed the EAG medical surveillance examination (or equivalent), performed by a licensed Occupational Physician. The Project Manager will verify that all EAG and subcontractor personnel meet applicable OSHA medical surveillance requirements.

Applicable field employees will undergo an annual comprehensive medical examination, including a comprehensive health history, blood chemistry with complete blood count and differential, urinalysis, medical history, required chest x-rays, audiogram, pulmonary function testing, testing for heavy metals (as needed), and a physician's interpretation of each employee's medical surveillance examination, including the ability of the employee to wear a respirator. A comprehensive medical examination will be performed if an employee develops signs or symptoms indicating possible overexposure to hazardous substances and/or heat or cold stress.

8.2 Physician Review

All medical surveillance and examination results are reviewed by a licensed physician who is certified in Occupational Medicine by the American Board of Preventive Medicine. EAG employee participation in the medical surveillance program is a part of their permanent medical record maintained in the employee's home office. A copy of the current medical clearance signed by the occupational health physician for all EAG employees must be maintained at the home office.

9.0 SITE CONTROL MEASURES AND DECONTAMINATION

To provide for the protection of public health and safety and minimize the possibility of transferring hazardous substances from the site, contamination control procedures are required. These procedures consist of site control measures (which entail the delineation of work zones, communications, and site security) and decontamination procedures (which are necessary for both personnel and equipment). Contaminants that may be uncovered during sampling operations must not be transferred outside the work zone unless properly containerized, and must be removed from clothing, personnel, and equipment prior to relocation from that zone. This section discusses site control measures and decontamination procedures to be used during the collection of samples, the installation of soil borings and/or groundwater monitoring/remediation wells, excavations, and other intrusive work where contact with impacted soils and groundwater could occur by EAG and/or EAG subcontractor personnel.

9.1 Site Control Measures

Site control can be achieved by effectively delineating the work zone, providing appropriate communication, and establishing site security.

9.1.1 Work Zone Delineation

To minimize the transfer of hazardous substances from the site and to ensure proper protection of employees and subcontractors, work zones will be established by the Field Project Team Leader. Applicable site work and the associated requirement for work zones will be determined by the Project Manager. The work area will be divided into an Exclusion Zone (EZ), a Contamination Reduction Zone (CRZ), and a Support Zone (SZ). A typical work zone delineation setup is shown as **Figure 9-1**, below.

Exclusion Zone (EZ)

Contamination does or could exist in this zone. Only properly authorized and trained individuals (refer to Section 6.0) wearing appropriate PPE will be allowed to enter and work in this zone. All people entering the EZ must wear, at a minimum, Level D protection. An entry and exit point for personnel and equipment will be established at the periphery of the EZ (between the EZ and the CRZ) to regulate the flow of personnel and equipment.

Contamination Reduction Zone (CRZ)

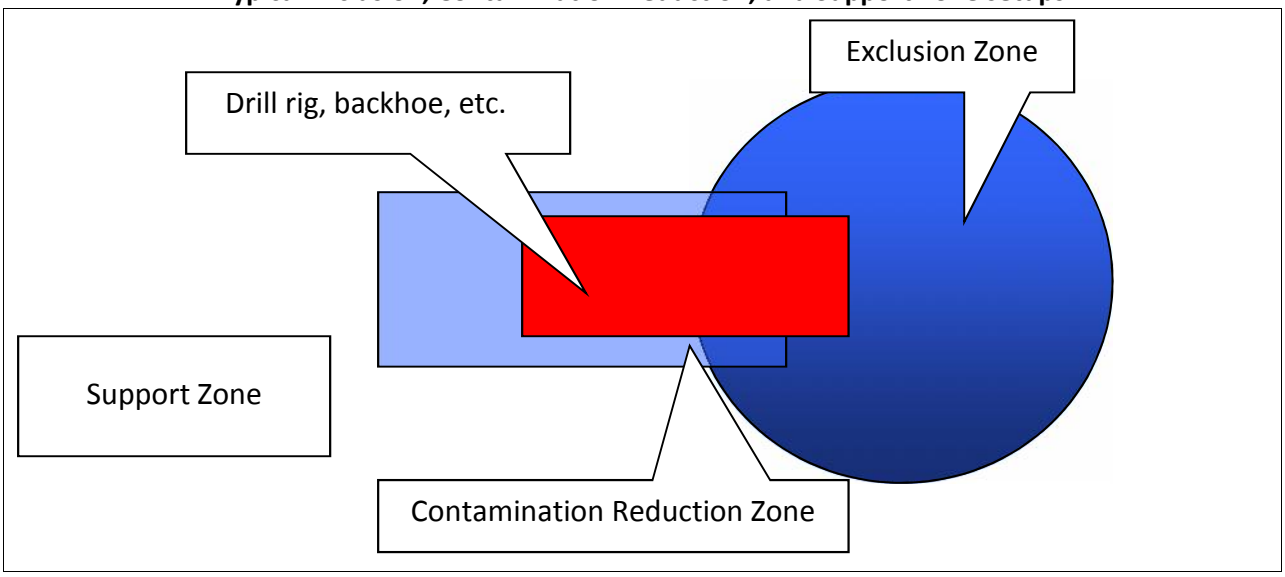
Between the EZ and the SZ will be the CRZ, which will provide a transition between the potentially contaminated EZ and the clean SZ. The CRZ (located upwind of the EZ, if possible) will be a corridor leading from the EZ and will serve as a buffer to further reduce the probability of the SZ becoming contaminated. Exit from the EZ will only be allowed through this CRZ. The CRZ will provide additional assurance that the physical transfer of contaminating substances on people, equipment, and/or in the air will be limited through a combination of decontamination and zone restrictions. Within this zone, employees and subcontractors may perform personal decontamination (e.g., face and hand washing), and certain PPE and small equipment decontamination. Buckets or wash basins for boot

washing and equipment decontamination will be stationed on a sheet of plastic (a minimum of 8 feet by 8 feet), the boundaries of which will constitute the CRZ.

Support Zone (SZ)

The Support Zone will be considered a non-contaminated area. The location of support facilities in the SZ will be upwind of the EZ (where possible) and readily accessible to the nearest road. The field office/support facilities, equipment vehicles, a first aid station and a visitors/personnel entry and exit log for the work site will be located in this zone. Potentially contaminated personal clothing, equipment and samples are not permitted in this zone unless properly containerized.

Figure 9-1
Typical Exclusion, Contamination Reduction, and Support Zone setups



9.1.2 Communications

A loud and clear form of communication should be made available for Site personnel entering the work zones. Site communication may be in the form of hand signals, voice, or other communication devices. All forms of communication should be understood by all workers on the Site prior to starting work. Offsite communications may be conducted with mobile phones or walkie-talkies only if the atmosphere has been deemed non-explosive, and the person using the mobile device is in the SZ while placing the call, or inside the cab of a stationary vehicle.

9.1.3 Site Security

The Sparrows Point facility is not open to the public, and there is a strictly monitored main entrance with a security guard on duty at all times who only allows authorized personnel onto the Site. This limited access to the facility should eliminate the need for many requirements for specific site security except those needed to maintain work zone integrity, such as visible barriers around open excavations or EZs and CRZs. No site visitors will be allowed to travel unescorted by EAG or subcontractor personnel around the facility.

Once site visitors arrive at their intended work zone, they must check in with the Field Team Lead. If visitors are authorized to enter the CRZ and/or the EZ, they must have completed OSHA 1910.120 medical surveillance and training requirements (refer to Section 8.0 and Section 6.0). Visitors must wear

appropriate PPE before they will be allowed to enter the CRZ and/or the EZ. They must also be taken through this HASP during a brief tail-gate meeting and sign the Acknowledgement page in the back prior to engaging in any activities inside the CRZ or the EZ. All site visitors must follow the same site control measures and decontamination procedures as EAG personnel and subcontractors. The Project Manager must also be informed of each visitor's name, purpose for their visit, time of entry (and exit), location of tasks they wish to perform, whether they completed their intended task(s), and any other relevant information pertaining to their visit.

9.2 Decontamination Procedures

Decontamination of employees, subcontractors, and equipment leaving the EZ will be performed to minimize human exposure to hazardous substances and to minimize the spread of contamination to surrounding areas. The purpose of the CRZ is to provide a location to perform limited personnel decontamination and certain PPE and small equipment decontamination.

9.2.1 Personnel Decontamination

Persons leaving the EZ must pass through the CRZ and follow decontamination procedures before entering the SZ. Hand tools and other sampling equipment used in the EZ and reusable PPE (boots, safety glasses, etc.) will be appropriately cleaned prior to removal from the site each day. The step-by-step sequence for personnel decontamination is as follows:

- Remove boot covers (if used) at the boot washing station and place them in the disposal container provided
- Wash outer gloves and chemical resistant boots (if used) at the boot washing station
- Remove wrist tape (if used) and outer gloves and place them in the disposal container provided
- Remove ankle tape (if used) and disposable coveralls (if used) and place them in the disposal container provided
- Remove respirators (if used) and place each in designated locations in the CRZ
- Remove inner gloves and discard in the disposal container provided
- Wash hands and face and proceed to the SZ

Respirators must be fully decontaminated after each use by the personnel who previously wore them. All project employees and subcontractors are required to take a thorough soap and water shower in their home or motel room at the end of each workday. If monitoring or a general exposure assessment indicates that an employee has become contaminated, the employee or subcontractor will notify the EAG Project Manager and the Field Team Lead as soon as the contaminated state has been discovered.

9.2.2 Equipment Decontamination

All equipment leaving the EZ must be decontaminated either within the CRZ or at the central decontamination area. Small equipment, such as hand tools, will be thoroughly decontaminated within the CRZ before being placed in the SZ. The field tools may be scrubbed visually clean using a detergent solution (Alconox/Liquinox) with water and a stiff, long-bristled scrub brush. Following the solution scrubbing, the tools may be rinsed with distilled water or isopropyl alcohol. Any vehicle working in an EZ will be decontaminated before leaving the site. The vehicle will be cleaned by sweeping excess soil and debris off the wheels. A high-pressure sprayer will then be used to wash the wheels, if necessary.

Each piece of equipment will be inspected after cleaning for any soil remaining on the tires or elsewhere. All vehicles will be cleaned to the satisfaction of the Field Team Lead or a designated assistant prior to entering the SZ or leaving the site. Employees or subcontractors performing decontamination shall wear the appropriate level of PPE (refer to Section 5.0).

9.2.3 Waste Management

The Project Manager and the Field Team Leads will be responsible for overseeing the containerization and disposal of any field derived wastes. Contaminated or suspected contaminated field derived wastes shall be disposed of in accordance with all local, state, and/or federal regulations. Field derived wastes include decontamination rinse waters and other related decontamination generated wastes.

Soils and groundwater expected to be encountered during any sampling or intrusive work not to be contaminated, based on existing data, may be discharged to the ground surface in the immediate vicinity of the monitoring well. However, any known or suspected to be contaminated soil (in small quantities) or groundwater will be containerized for future removal, likely in 55-gallon drums or other approved storage vessels. Depending on the suspected contaminants, the recovered groundwater may be sent through one of the onsite groundwater treatment units. However, the treatment unit must be designed to address the contaminants of concern in the groundwater being treated. Otherwise, the liquid must be staged onsite for eventual offsite disposal at an approved facility.

Impacted soil, if in drums, will be staged in an area designated by the Project Manager or Field Team Lead for eventual disposal. For large excavations, where excavated soil is stockpiled, it may be necessary to place soils on plastic and cover with plastic to prevent any potential leachable runoff. The Project Manager and/or Field Team Lead will provide the proper guidance necessary for handling bulk soil piles.

Any NAPL recovered via remediation systems or manual recovery efforts will be properly containerized and either disposed of offsite as a recyclable material, if possible, or as a hazardous waste. The receiving facility must be an approved facility.

10.0 EMERGENCY RESPONSE AND CONTINGENCY PROCEDURES

The objective of emergency response and contingency procedures is to ensure that effective actions are implemented in a timely manner to minimize or control the effects of adverse events (e.g., potential chemical exposures, personal injuries, fires/explosions, and spills/releases). The following subsections describe the basic emergency responses required should an emergency take place during field investigation or remedial effort activities.

10.1 Emergency Phone Numbers

Emergency telephone numbers are listed in **Table 10-1**.

Table 10-1
Emergency Telephone Numbers and Agencies

Agency	Telephone Number
Security (Sparrows Point facility)	(410) 388-7761
Ambulance	911
Fire	911
Occupational Health Clinic	(410) 633-3600
Hospital	(410) 550-0100 (general) (410) 550-0350 (emergency)
National Response Center	(800) 424-8802
Poison Control Center - Maryland	(800) 222-1222
EAG Main Contact	
VP Remediation, Russ Becker	(314) 686-5611
Project Manager, James Calenda	(314) 620-3056

10.2 Injury/Illness Treatment

In the event of illness or injury, the following steps will be taken:

- Evaluate the extent of injuries or seriousness of illness.
- When employees require urgent medical attention, call for emergency assistance. First aid should be administered while awaiting an ambulance or paramedics. All emergency medical treatment, other than first aid, will be administered by the local paramedics. **Table 10-1** lists site emergency telephone numbers. In all cases, critical injuries must be immediately referred for professional medical attention.
- For a non-critical injury/illness, first aid will be administered by onsite personnel. Anyone sustaining a non-critical injury/illness who continues to work will be monitored by the Field Team Lead for any signs of worsening condition, if it is deemed that the person can return to work by the Team Lead and Project Manager. Injured personnel who later suffer any worsening change in status are to immediately notify the Team Lead or the Project Manager.

10.3 Occupational Health Clinic and Hospital Information

Occupational Health Clinic

The Concentra Medical Center, located at 1833 Portal Street, Baltimore, MD, is the closest occupational health clinic, just over 6 miles away. A map to the clinic in included as **Figure 10-1**. The clinic should be used for non-emergency injuries and illnesses.

Directions:
From Sparrow's Point Road, turn left onto Wharf Road;
Turn left onto MD-158 W/Bethlehem Blvd. (0.4 mile);
Turn right onto MD-157 N/Peninsula Expy. (2.7 miles);
Turn slight left onto Merritt Ave. (0.1 mile);
Merritt Ave. becomes Sollers Point Rd. (0.3 mile);
Turn left to stay on Sollers Point Rd (0.6 mile);
Turn left onto Williams Ave. (0.2 mile);
Turn right onto Dundalk Ave. (<0.1 miles);
Turn left onto Chandlery St. (0.1 mile);
Turn left onto Portal St.

Figure 10-1: Health Clinic (Non-Emergency) Map

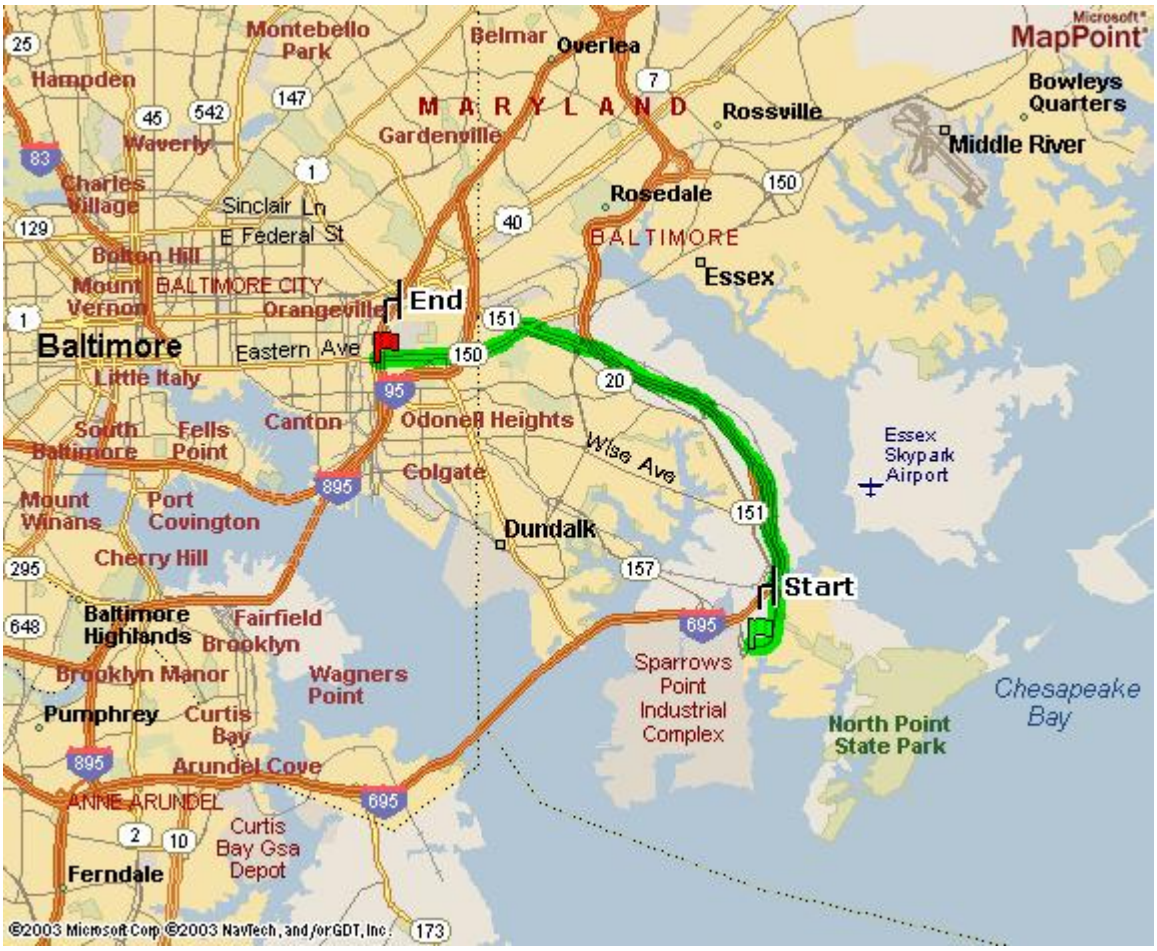
Hospital

The Johns Hopkins Bayview Hospital is the closest emergency facility, just over 9 miles away. The hospital is located at 4940 Eastern Avenue in Baltimore, MD. **Figure 10-2** is a map to this hospital. Maps are also included in **Attachment E**.

Directions:

From the Sparrows Point Industrial Complex, go north on Route 151 for approximately one mile.
Take ramp (right) onto I-695 towards I-695/Essex.
At exit 40, take ramp (right) onto Route 151/North Point Boulevard North/MD 150;
Take ramp (right) onto Route 150 (Eastern Avenue).
Continue on Eastern Avenue to hospital on right.

Figure 10-2: Hospital Map



Prior to the start of field activities, the Project Field Team Leader will call to verify the telephone numbers and directions for the clinic and hospital, and then distribute location maps and the emergency telephone list to workers and vehicles.

10.4 Accident and Emergency Medical Response

All field team members will be aware of the location of a first aid kit kept onsite. All vehicles used to transport injured persons to an offsite medical facility will be provided with directions and a map to the medical facility.

If treatment beyond first aid is required, emergency response personnel will be contacted for assistance and transport. Before beginning site activities, the Project Field Team Leader will ensure that each field team member knows where the nearest emergency medical facilities are and how to get there. The closest hospital will be used in cases of life-threatening emergencies at the direction of the Project Field Team Leader. The telephone numbers of the local emergency services will be available in the SZ, and the Project Field Team Leader will brief the field team on the procedures for calling for help in an emergency.

Site personnel will inform the Project Manager of any medications, allergies, or other medical information that may be applicable for their medical treatment. The Project Manager will supply this information to emergency response personnel, and will accompany the victim to the hospital, if possible.

10.4.1 Chemical Exposure

In case of accidental overexposure to a hazardous material (groundwater, soil, and/or off-gas materials), guidelines shown in **Table 10-2** will be used.

Table 10-2
Chemical Exposure Guidelines

Type of Overexposure	First Aid Guidelines
Skin Contact	Skin: Wash/rinse the affected area thoroughly with copious amounts of soap and water.
	Eyes: Eyes should be rinsed for at least 15 minutes following chemical contamination.
	Contact emergency response personnel if required, or transport victim to the hospital.
Inhalation	Move the victim to fresh air.
	Contact emergency response personnel if required, or transport victim to the hospital.
Ingestion	Contact Poison Control Center.
	Contact emergency response personnel, or transport victim to the hospital.

10.4.2 Decontamination During a Medical Emergency

For minor medical problems or injuries, regular decontamination procedures will be followed. If emergency, life-saving first aid and/or medical treatment are required, regular decontamination procedures may need to be abbreviated or omitted:

- Do not attempt to wash or rinse an unresponsive victim unless the victim has been contaminated with an extremely toxic or corrosive chemical that may cause injury or loss of life to emergency response personnel.
- Outer garments can be removed if it does not cause a delay, interfere with treatment, or aggravate the problem.

- PPE can be cut away and respiratory protective equipment must always be removed.
- If contaminated clothing cannot be safely removed, then the victim should be wrapped in a blanket or plastic sheeting to prevent contamination to the inside of the ambulance and/or emergency response personnel.

The Project Manager or Field Team Lead will advise the medical staff as to the type of contamination possibly involved.

10.4.3 Small or Incipient Fire

A small fire is defined as a fire that can be extinguished with an available 20 pound type ABC fire extinguisher. An incipient fire is a fire that is small because it has just started. In the event of a small or incipient fire, the following minimum actions will be taken:

- Evacuate nearby personnel from the area, if possible, to an upwind location or to an area not affected by smoke or hazardous decomposition products if an upwind location is not feasible.
- Attempt to extinguish fire using portable fire extinguisher or by smothering.
- Contact emergency response personnel, as needed, for any injuries or exposures to hazardous decomposition products, or if fire cannot be put out.
- After the fire has been extinguished, or emergency response personnel have been contacted, notify the following project personnel:

  The Project Manager

10.4.4 Large Fire or Explosion

An explosion, large fire or a small fire which cannot be extinguished is beyond the first line capabilities of EAG personnel. Professional emergency response personnel would be needed to provide emergency assistance for these types of incidents. In the event of a large fire, explosion or a small fire that cannot be extinguished, the following minimum actions will be taken:

- Evacuate all personnel from the site, if possible, to an upwind location, or to an area not affected by smoke or hazardous decomposition products if an upwind location is not feasible
- Perform a quick role call to account for all site personnel
- Contact the fire department
- Contact emergency response personnel, as needed, for any injuries or exposures to hazardous decomposition products
- After emergency response personnel have been contacted, notify the following project personnel:

  The Project Manager

10.4.5 Adverse Weather Conditions

In the event of adverse weather conditions, the Project Manager will determine if work can continue without sacrificing the health and safety of site personnel. Threatening weather conditions will be monitored by the Project Manager and possibly the Team Lead via radio, television, internet, and/ or calls to the National Weather Service. Some of the conditions to be considered include:

- Potential for heat or cold stress
- Limited visibility

- Electrical storms
- Treacherous weather-related working conditions (i.e., heavy rainfall, icy conditions causing slippery footing hazards, etc.).

10.4.6 First Aid for Heat Stress/Cold Stress

First aid treatment for **heat cramps** includes shade, rest and fluid replacement. If available, the individual should drink electrolyte replacement fluids (e.g., Gatorade, Squincher or 10-K). The individual should recover within half an hour.

First aid treatment for **heat exhaustion** includes cooling the victim, elevating the feet and fluid replacement. If the individual has not recovered within half an hour, then transport the victim to the hospital for medical attention.

Heat stroke is a medical emergency, requiring the immediate cooling of the victim and transport to the hospital for medical treatment immediately.

First aid treatment for **frost nip** and **frostbite** includes covering the affected area with warmth and retreating to a warm area. If the individual has not recovered within half an hour, then transport the victim to the hospital for medical attention.

Frozen tissue is a medical emergency and the victim must receive medical attention immediately. Contact emergency response personnel immediately or transport the victim to the hospital.

First aid treatment of **mild hypothermia** includes using heat to raise the individual's body temperature. Heat may be applied to the victim in the form of heat packs, hot water bottles and blankets. If the individual has not recovered within half an hour, then transport the victim to the hospital for medical attention.

Severe hypothermia is a medical emergency and the victim must be transported to the hospital immediately. First aid treatment for severe hypothermia includes handling the victim very gently; rough handling may set off of an irregular heartbeat. ***DO NOT*** attempt to re-warm the severely hypothermic victim; re-warming may cause the development of an irregular heartbeat.

10.4.7 Snake Bites

If bitten, lower the extremity below the heart to reduce the poison's dissemination through the body. Remain calm, try to keep the heart rate reduced and seek medical attention immediately. Do not cut the wound or attempt to suck out the venom. Note any physical features (e.g., shape of head and color or pattern on body) of the snake.

10.4.8 Animal Bites

All bites should be treated as contaminated soft tissue injuries. Bites should be washed immediately with large amounts of soap and water. If soap is not available, flush the wound with water. The severity and onset of any infection is dependent upon the number of organisms (viruses or bacteria) introduced into the wound. Washing saliva out of the wound immediately will reduce the number of bacteria or viruses that can enter the tissue. Medical attention must be sought if rabies is suspected or the individual has not had a recent tetanus booster.

10.4.9 Insect Bites and Stings

Emergency care for insect bites and stings depends on the individual's reaction. To treat a sting that results in a minor reaction, remove the stinger by gently scraping it off the skin. Do not try to grasp the sac or stinger, because this forces the remaining venom into the skin. Once the stinger has been removed, clean the wound and surrounding area. Apply cold packs to slow the absorption of the venom and reduce pain and swelling. The treatment for a severe reaction to insect stings includes the following:

- Confirm with the victim whether they are highly allergic to the insect that stung them
    - If victim has gone into anaphylactic shock, retrieve their epi pen or other auto-injector and administer per the directions as hastily as possible
- Assuming the victim remains conscious, ask them to refrain from moving around, and to lie down
- Immobilize the injured area immediately
- If an extremity is involved, remove any rings or watch
- Keep the affected part low, below the level of the heart
- Apply cold compresses to the affected area
- If possible, try to identify the type of insect that inflicted the sting
- Transport the victim to a medical facility immediately, continuing supportive measures en route.

All employees and subcontractors must report severe reactions to insect stings prior to the beginning of work to both the Project Manager and Field Team Lead.

10.4.10 Poisonous Plants

Decontamination: Wash the skin immediately after contact with the plant. Proper washing may not be practical in the middle of the woods, but a product such as Technu or a small wash-up kit with prepackaged, alcohol-based cleansing tissues can be effective. Employees and subcontractors should not forget to wash contaminated clothing and clean up contaminated equipment prior to re-use.

Treatment: Options are as follows:

- Home treatment: Calamine lotion and an oatmeal bath (one cup to a tub full of water) can help relieve itching. To prevent secondary skin infection, scratching is not helpful and the fingernails should be cut to avoid damage to the skin. Over-the-counter hydrocortisone cream can decrease inflammation and itching; however, the label should be read and the cream used according to directions.
- When to see the doctor: Severe cases may require further treatment. A physician should be seen if the rash appears infected, is on the face or other sensitive body areas, or is too extensive to be easily treated at home.

10.4.11 Ticks

To remove an attached tick:

- Use fine-tipped tweezers or a "tick tool" to grasp the tick at the surface of the skin
- If tweezers are not available, use a tissue to protect the fingers (exposure to the tick's body fluid may lead to transmission of disease)
- With a steady motion, pull the tick straight out

Disinfect the bite site and the tweezers. Wash your hands thoroughly with soap and water. Save the tick if you can by placing it in a Ziploc bag in the freezer; this may help with diagnosis in the future.

If flu-like symptoms such as fatigue, headache, neck-stiffness or jaw discomfort begin following a tick bite, seek medical attention.

APPENDICES

EnviroAnalytics Group

Environmental Engineers

ATTACHMENT A

COMPLIANCE AGREEMENT

EAG HEALTH AND SAFETY PLAN

ACKNOWLEDGEMENT FORM

I, _____, have read (or had read to me), EAG's health and safety plan.
(Print Name)

I understand my responsibilities as they are defined in this plan and will abide by these rules and procedures, as well as any regulations or otherwise governing safety. When in doubt concerning safe job performance, I will speak to my immediate supervisor and/or Project Manager.

I understand EAG reserves the right to change or amend the HASP at any time.

I understand any violation to the plan policies or procedures will be cause for disciplinary action up to and including termination.

_____ _____

Employee Signature Date

_____ _____

EAG Supervisor/Project Manager Signature Date

ATTACHMENT B

Material Safety Data Sheets (MSDSs)