RESPONSE AND DEVELOPMENT WORK PLAN

AREA B: SUB-PARCEL B7-1
TRADEPOINT ATLANTIC
SPARROWS POINT, MARYLAND

Prepared For:

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Revision 2 – July 14, 2022

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1.0 INTRODUCTION

ARM Group LLC (ARM), on behalf of Tradepoint Atlantic, has prepared this Response and Development Work Plan (RADWP) for a portion of the Tradepoint Atlantic property that has been designated as Area B: Sub-Parcel B7-1 (the Site). Tradepoint Atlantic submitted a letter (**Appendix A**) requesting an expedited plan review to achieve construction deadlines for the proposed development on this Site. As shown on **Figure 1**, Sub-Parcel B7-1 consists of approximately 22.0 acres located within Parcel B7 and Parcel B25 of the approximately 3,100-acre former steel plant property. Section 2.0 provides a detailed Site Description and Site History for this portion of the property.

As shown on **Figure 2**, Sub-Parcel B7-1 is slated for development as a Baltimore County Park, including a community building, playground area, sports field, boat dock, and two constructed wetlands. Associated service utilities, car parking, access roads, and interior roads are also proposed. The planned development activities will generally include grading and landscaping; construction of the community building; installation of utilities; and paving of parking areas and roadways. Subsequent site-use will involve maintenance and community recreational activities. Outside of the main development area designated as Sub-Parcel B7-1, temporary construction zones (not intended for permanent occupancy) with a total area of less than 0.5 acre within the Limit of Disturbance (LOD) will be utilized to install the park entrance, limited roadside grading, and subgrade utility connections for the project.

The conduct of any environmental assessment and cleanup activities on the Tradepoint Atlantic property, as well as any associated development, is subject to the requirements outlined in the following agreements:

- Administrative Consent Order (ACO) between Tradepoint Atlantic (formerly Sparrows Point Terminal, LLC) and the Maryland Department of the Environment (MDE), 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 (USEPA), effective November 25, 2014.

Sub-Parcel B7-1 is part of the acreage that was removed (Carveout Area) from inclusion in the Multimedia Consent Decree between Bethlehem Steel Corporation, the USEPA, and the MDE (effective October 8, 1997) as documented in correspondence received from USEPA on September 12, 2014. Based on this agreement, USEPA determined that no further investigation or corrective measures will be required under the terms of the Consent Decree for the Carveout Area. However, the SA reflects that the property within the Carveout Area will remain subject to the USEPA's Resource Conservation and Recovery Act (RCRA) Corrective Action authorities.

An application to enter the full Tradepoint Atlantic property (3,100 acres) into the MDE Voluntary Cleanup Program (MDE-VCP) was submitted to the MDE on June 27, 2014. The property's current and anticipated future use is Tier 3B (Restricted Industrial) on most areas of the property, and plans for the property include demolition and redevelopment over several years. Sub-Parcel B7-1 will be transferred to Baltimore County and developed as a public park with an anticipated future use of Tier 4B (Restricted Public Recreational Area).

In consultation with the MDE, Tradepoint Atlantic affirms that it desires to accelerate the assessment, remediation, and redevelopment of certain sub-parcels within the larger site due to current market conditions. To that end, the MDE and Tradepoint Atlantic agree that the Controlled Hazardous Substance (CHS) Act (Section 7-222 of the Environment Article) and the CHS Response Plan (Code of Maryland Regulations (COMAR) 26.14.02) shall serve as the governing statutory and regulatory authority for completing the development activities on Sub-Parcel B7-1 and complement the statutory requirements of the VCP (Section 7-501 of the Environment Article). Upon submission of a RADWP and completion of any remedial activities for the sub-parcel, the MDE shall issue a No Further Action Letter (NFA) upon a recordation of an Environmental Covenant describing any necessary land use controls for the specific sub-parcel. At such time that all the sub-parcels within the larger parcel have completed remedial activities, Tradepoint Atlantic shall submit to the MDE a request for issuing a Certificate of Completion (COC) as well as all pertinent information concerning completion of remedial activities conducted on the parcel. Once the VCP has completed its review of the submitted information it shall issue a COC for the entire parcel described in Tradepoint Atlantic's VCP application.

Alternatively, Tradepoint Atlantic or other entity may elect to submit an application for a specific sub-parcel and submit it to the VCP for review and acceptance. If the application is received after the cleanup and redevelopment activities described in this RADWP are implemented and a NFA is issued by the MDE pursuant to the CHS Act, the VCP shall prepare a No Further Requirements Determination for the sub-parcel.

If Tradepoint Atlantic or other entity has not carried out cleanup and redevelopment activities described in the RADWP, the cleanup and redevelopment activities may be conducted under the oversight authority of either the VCP or the CHS Act, so long as those activities comport with this RADWP.

This RADWP provides a Site description and history; summary of environmental conditions identified by the Phase I Environmental Site Assessment (ESA); summary of relevant findings and environmental conditions identified by the Parcel B7 Baltimore County Property Transfer Phase II Investigation; a human health Screening Level Risk Assessment (SLRA) conducted for the identified conditions; and any necessary engineering and/or institutional controls to facilitate the planned development and address the impacts and potential human health exposures. These controls include work practices and applicable protocols that are submitted for approval to support

the development and use of the Site. Engineering/institutional controls approved and installed for this RADWP shall be described in closure certification documentation submitted to the MDE demonstrating that exposure pathways on the Site are addressed in a manner that protects public health and the environment.

The remaining acreage of Parcel B7 and Parcel B25 will be addressed in future work associated with completion of the obligations of the ACO and associated VCP requirements. This work will include assessments of risk and, if necessary, RADWPs to address unacceptable risks associated with future land use. As noted above, temporary construction zones with a total area of less than 0.5 acre will be utilized to install the park entrance, roadside grading, and subgrade utility connections for the project outside of the sub-parcel. The temporary work outside of the boundary of the Site is not intended to be the basis for the issuance of a NFA or a COC, although the scope of construction is covered by this RADWP.

2.0 SITE DESCRIPTION AND HISTORY

2.1 SITE DESCRIPTION

The Sub-Parcel B7-1 development project consists of approximately 22.0 acres comprising the northern portions of Parcel B7 and Parcel B25 (**Figure 1**). The Site will be transferred to Baltimore County and developed as a public park with an anticipated future use of Tier 4B (Restricted Public Recreational Area). The proposed development on this sub-parcel will include a community building, playground area, sports field, boat dock, and two constructed wetlands (**Figure 2**). Outside of the main development area designated as Sub-Parcel B7-1, temporary construction zones (not intended for permanent occupancy) with a total area of less than 0.5 acre within the construction LOD will be utilized to install the park entrance, roadside grading, and subgrade utility connections for the project. The Site is not currently occupied. There is no groundwater use on-site or within the surrounding Tradepoint Atlantic property.

The Site can be roughly split into northern and southern sections based on its current condition and proposed future use, as well as the historical uses of the sub-parcel (discussed in Section 2.2). The distinct current conditions and proposed uses for the northern and southern sections of the Site support the establishment of two exposure units (EUs) as more fully described in the SLRA within Section 3.3. Descriptions of the two EUs are provided below:

- EU1: The southern half of the Site includes an historical rail yard that will be demolished during the proposed park development. The railyard is currently vacant with dirt/gravel and slag aggregate at the surface. The historical rail lines and ties have been mostly removed, and the remaining material will be removed prior to construction. Wooded areas border the historical rail yard on all sides except the west, where it is bordered by (and accessible from) Wharf Road. An existing drive provides access to a nearby yacht club to the south of the sub-parcel. The existing drive will be rerouted to accommodate the future Site footprint. The southern portion of the Site will be developed for public recreational use and will include the main planned improvements and amenities including the community building, playground, sports field, parking lots and access drives, constructed wetlands, dock access, etc.
- EU2: The northern half of the Site and eastern shoreline are fully wooded. These wooded areas include existing natural resources such as wetlands, wetland buffers, and critical area easements (CAEs) along the shoreline. The northern half of the Site (and the eastern shoreline) will have no planned improvements or amenities; the natural resources will be retained. This portion of the park is only anticipated to be used sporadically by individuals. Anticipated uses could include walking in the woods for bird/wildlife watching.

Ground surface elevations at the Site range from approximately 0 to 20 feet above mean sea level (amsl). The elevations generally slope downward from the north to south and west to east across

the Site. The rail yard in the southern portion of the Site is relatively flat and is positioned between approximately 10 and 12 feet amsl. The eastern shoreline slopes steeply downward to meet the surface water body of Jones Creek. According to Figure B-2 of the property Stormwater Pollution Prevention Plan (SWPPP) Revision 8 dated April 30, 2020, surface water runoff from the Site is conveyed to the east toward Jones Creek. There are no permitted National Pollutant Discharge Elimination System (NPDES) outfalls located on the Site.

2.2 SITE HISTORY

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

The majority of the Site (both the northern and southern portions) was formerly occupied by a golf course from at least as early as 1938 until 1952. During that time, the Site was clear cut with only a few small stands of trees. Beginning in c. 1957 a railyard was constructed on the southern portion of the Site, while the northern portion of the Site remained unused and gradually became wooded. Besides the operation of the rail yard, no other uses of the Site are apparent. There is no evidence to suspect that significant historical steel production activities were conducted on the Site.

The rail yard in the southern portion of the Site and associated fill/debris piles were identified in the historical Phase I ESA conducted by Weaver Boos dated May 19, 2014. The Phase I ESA findings are detailed in Section 3.1. As noted above, the historical rail yard will be demolished during the proposed park development. More information on the historical condition of the Site can be found in the agency-approved Baltimore County Property Transfer Pre-Development Investigation Work Plan (Revision 0 dated April 15, 2019) as amended by the associated Work Plan Update Letter (dated October 14, 2020).

3.0 ENVIRONMENTAL SITE ASSESSMENT RESULTS

3.1 PHASE I ENVIRONMENTAL SITE ASSESSMENT RESULTS

A Phase I ESA was completed by Weaver Boos Consultants for the entire Sparrows Point property on 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. The Phase I ESA identified particular features across the Tradepoint Atlantic property which presented potential risks to the environment. These Recognized Environmental Conditions (RECs) included buildings and process areas where releases of hazardous substances and/or petroleum products potentially may have occurred. The Phase I ESA also relied upon findings identified during a previous visual site inspection (VSI) conducted in 1991 as part of the RCRA Facility Assessment (RFA) prepared by A.T. Kearney, Inc. dated August 1993, for the purpose of identifying Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) on the property. This VSI is regularly cited in the Description of Current Conditions (DCC) Report prepared by Rust Environment and Infrastructure, dated January 1998 (included with Weaver Boos' Phase I ESA).

Weaver Boos' distinction of a REC or Non-REC was based upon the findings of the DCC Report (which was prepared when the features remained on-site in 1998) or on observations of the general area during their site visit. Weaver Boos made the determination to identify a feature as a REC based on historical information, observations during the site visit, and prior knowledge and experience with similar facilities. The following REC was identified in Sub-Parcel B7-1:

Rail Yard Fill Materials (REC 12B):
During the Phase I ESA site visit conducted by Weaver Boos, several piles of fill soil or debris were observed along the small rail yard located to the north of the two existing yacht clubs (on Parcel B25). Based on a review of aerial photographs, Weaver Boos concluded that fill materials may have been historically placed on the north side of the rail yard. The Phase I ESA stated that the source and contents of the fill materials were unknown as well as their extent into the subsurface and potential impacts to soil and/or groundwater.

Relevant SWMUs and AOCs were also identified as located on Figure 3-1 from the DCC Report. This figure generally shows the SWMUs, AOCs, and main facility areas within the property boundaries. There were no SWMUs or AOCs identified within the Sub-Parcel B7-1 boundary.

3.2 PHASE II INVESTIGATION RESULTS – SUB-PARCEL B7-1

A Phase II Investigation specific to soil and groundwater conditions was performed for the area encompassing Sub-Parcel B7-1 in accordance with the requirements outlined in the ACO as further described in the agency-approved Baltimore County Property Transfer Pre-Development Investigation Work Plan (Revision 0 dated April 15, 2019) and the associated Work Plan Update Letter (dated October 14, 2020). This investigation also relied on data obtained from the combined

Phase II Investigation of Parcel B7 and Parcel B25, which was conducted in accordance with the preceding agency-approved Phase II Investigation Work Plan (dated May 22, 2018). All soil and groundwater samples were collected and analyzed in accordance with agency-approved protocols during the Phase II Investigation, the specific details of which can be reviewed in each Work Plan.

The Phase II Investigation was developed to target specific features which represented a potential release of hazardous substances and/or petroleum products to the environment, including the identified REC 12B, as well as other targets from former operations that could have the potential for environmental contamination. Samples were also collected at site-wide locations to ensure full coverage of the investigation area. The full analytical results and conclusions have been presented in the Parcel B7 Baltimore County Property Transfer Phase II Investigation Report (Revision 0 dated January 28, 2021). This RADWP summarizes the relevant soil and groundwater findings from the Phase II Investigation with respect to the proposed development of Sub-Parcel B7-1.

3.2.1 Phase II Soil Investigation Findings

Based on the scope of development for Sub-Parcel B7-1, all 66 soil samples collected from 19 soil borings included in the Parcel B7 Baltimore County Property Transfer Phase II Investigation Report were included for a representative evaluation of Sub-Parcel B7-1. The 19 boring locations are shown on **Figure 3**, and the samples obtained from these borings provided relevant analytical data for discussion of on-site conditions.

Soil samples collected during the Phase II Investigation were analyzed for the Target Compound List (TCL) semi-volatile organic compounds (SVOCs) and polynuclear aromatic hydrocarbons (PAHs), total petroleum hydrocarbon (TPH) diesel range organics (DRO) and gasoline range organics (GRO), Oil & Grease, Target Analyte List (TAL) metals, hexavalent chromium, and cyanide. Shallow soil samples (0 to 1 foot below ground surface (bgs)) were analyzed for polychlorinated biphenyls (PCBs). Soil samples from the 0 to 1 foot bgs and 1 to 2 foot bgs intervals were analyzed for pesticides. Samples from any depth interval with a sustained photoionization detector (PID) reading above 10 ppm were also analyzed for TCL volatile organic compounds (VOCs). The laboratory Certificates of Analysis (including Chains of Custody) and Data Validation Reports (30% validated soil data) are included as electronic attachments. The Data Validation Reports contain qualifier keys for the flags assigned to individual results in the attached summary tables.

Soil sample results were screened against the Project Action Limits (PALs) established in the property-wide Quality Assurance Project Plan (QAPP) dated April 5, 2016, or based on other direct agency guidance. **Table 1**, **Table 2**, and **Table 3** provide summaries of the detected organic compounds, inorganics, and pesticides in the soil samples collected from the 19 soil borings at the Site. **Figure 4** presents the soil sample results that exceeded the PALs among these soil borings. The PALs for relevant PAHs have been adjusted upward based on revised toxicity data published by the USEPA. PAL exceedances were limited to arsenic and manganese.

No evidence of non-aqueous phase liquid (NAPL) was observed at any soil boring location. Contingency measures to address the presence of NAPL which could be encountered during construction are addressed in subsequent sections of this RADWP.

3.2.2 Visual Slag Fill Delineation Investigation Findings

A visual slag delineation investigation was conducted along the perimeter of the former rail yard in the southern portion of the Site to characterize the horizontal extent of surficial slag fill. The horizontal extents of the slag fill were delineated via the completion of nine soil borings to a depth of 5 feet bgs. Five soil borings were completed at the ostensible edge of the former rail yard. A paired soil boring was completed along a transect at a distance of approximately 50 feet into the wooded area beyond the former rail yard to delineate the presence of slag aggregate. Therefore, five transects were completed along the perimeter of the former rail yard to characterize the horizontal extent of slag fill materials, as shown on **Figure 3**. The Baltimore County Property Transfer Work Plan proposed 10 visual slag delineation soil borings; however, due to a lack of access one boring (T1-2) was unable to be completed.

The visual results are summarized as follows:

Transect ID	Edge of Rail Yard Observed Slag Interval (ft bgs)	50-foot Step Out Boring Observed Slag Interval (ft bgs)
Transect 1	0 to 0.1	NA
Transect 2	(no slag observed)	(no slag observed)
Transect 3	0 to 2.3	(no slag observed)
Transect 4	0 to 4	0 to 1.2
Transect 5	0 to 4.5	2.6 to 2.7 and 4.1 to 4.2

NA indicates that a soil boring was unable to be completed at this location

The visual delineation investigation determined that slag fill material is largely absent in the soil column (above 5 feet bgs) at a distance of approximately 50 feet from the ostensible edge of the former rail yard. Among the soil borings completed directly within the former rail yard (B7-001-SB, B7-002-SB, B7-003-SB, B7-014-SB, B7-015-SB, B7-053-SB, and B7-054-SB), slag aggregate was observed primarily at depths from 0 to 2.5 feet bgs. All four of the manganese PAL exceedances (and the maximum arsenic PAL exceedance) were identified within the shallow soil samples (top 2 feet) collected from the historical rail yard.

3.2.3 Phase II Groundwater Investigation Findings

Groundwater conditions were investigated in accordance with the Baltimore County Property Transfer Pre-Development Investigation Work Plan. During this groundwater investigation, samples were obtained from four temporary groundwater sample collection points (piezometers)

and one groundwater monitoring well (SW-046-MWS) within Sub-Parcel B7-1. A piezometer was originally specified to be installed at B7-032-SB; however, this location could not be installed due to significant access restrictions. B7-065-PZ was installed as a replacement for the originally planned location. The Baltimore County Property Transfer Work Plan proposed an additional sample to be collected from permanent groundwater monitoring well SW-047-MWS. However, during groundwater sampling activities, it was determined that SW-047-MWS had been destroyed (likely during recent construction activities on the highway ramps in the vicinity). Therefore, a groundwater sample could not be collected from SW-047-MWS during the 2020 groundwater sampling event. Groundwater data had previously been collected from SW-047-MWS on December 14, 2015 during the preceding Area B Groundwater Phase II Investigation. The historical data was incorporated into the Phase II Investigation Report and is included in this RADWP to provide characterization data in this portion of the Site.

The six groundwater points which provided relevant analytical data for the proposed development project are shown on **Figure 5**. There is no direct exposure risk for future Composite Workers or Recreators at the Site because there is no use of groundwater on the Tradepoint Atlantic property; however, groundwater may be encountered in the sub-parcel during some construction tasks.

The groundwater samples were analyzed for TCL-VOCs, TCL-SVOCs and PAHs, TPH-DRO/GRO, Oil & Grease, TAL-dissolved metals, dissolved hexavalent chromium, and total cyanide. The groundwater samples collected from the permanent wells were also analyzed for total metals. The historical sample from SW-047-MWS included in this RADWP was also analyzed for PCBs (with no detections). The laboratory Certificates of Analysis (including Chains of Custody) and Data Validation Reports (30% validated groundwater data) are included as electronic attachments. The Data Validation Reports contain qualifier keys for the flags assigned to individual results in the attached summary tables.

The Phase II Investigation groundwater results were screened against the PALs established in the property-wide QAPP dated April 5, 2016, or based on other direct agency guidance. **Table 4** and **Table 5** provide summaries of the detected organic compounds and inorganics in the groundwater samples submitted for laboratory analysis, and **Figure 6** presents the groundwater results that exceeded the PALs. Similar to the evaluation of soil data, the PALs for relevant PAHs have been adjusted upward based on revised toxicity data published by the USEPA. PAL exceedances in the Phase II Investigation groundwater samples collected in the vicinity of the proposed development project consisted of one VOC (chloroform), five PAHs (benz[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, dibenz[a,h]anthrancene, and indeno[1,2,3-c,d]pyrene), TPH-DRO, and eight total and/or dissolved metals (aluminum, beryllium, hexavalent chromium, cobalt, iron, lead, manganese, and thallium).

Each groundwater collection point was also inspected for evidence of NAPL using an oil-water interface probe prior to sampling. None of the groundwater sample collection points relevant for

the proposed development project showed evidence of NAPL during these checks. If groundwater is encountered during development, it will be managed to prevent exposures in accordance with the dewatering requirements outlined in Section 5.2.

3.2.4 Locations of Potential Concern

Groundwater data were screened to determine whether any sample results exceeded the USEPA Vapor Intrusion (VI) TCR (carcinogen) or THQ (non-carcinogen) Screening Levels. None of the individual sample results exceeded the VI TCR or THQ criteria. When the aqueous results were summed by sample location, none of the cumulative VI cancer risks exceeded 1E-5, and none of the cumulative VI non-cancer Hazard Index (HI) values exceeded 1. There are no concerns related to potential VI risks/hazards at the Site. The VI risk evaluation is summarized in **Table 6**.

Other locations of potential concern which are subject to special requirements could include elevated lead, PCBs, or TPH/Oil & Grease in soil. The soil data for Sub-Parcel B7-1 were evaluated to determine the presence of any such locations of potential concern including: lead concentrations above 10,000 mg/kg, PCB concentrations above 50 mg/kg, or TPH/Oil & Grease concentrations above 6,200 mg/kg. There were no soil concentrations of lead, PCBs, or TPH/Oil & Grease above the specified criteria.

Locations with physical evidence of NAPL are also considered to be locations of potential concern with respect to proposed development. No soil borings had visual observations or other physical evidence of NAPL. NAPL was not detected in any piezometers or permanent wells. Overall, no locations of potential concern have been identified.

3.3 Human Health Screening Level Risk Assessment

3.3.1 Analysis Process

A human health Screening Level Risk Assessment (SLRA) has been completed based on the analytical data obtained from the characterization of surface and subsurface soils. The SLRA was conducted to evaluate the existing soil conditions to determine if any response measures are necessary. Because the intended use of this Site is as a public park, risk was evaluated for the Composite Worker, Adult Recreator, Child Recreator, and Construction Worker scenarios.

The SLRA included the following evaluation process:

Identification of Exposure Units (EUs): The SLRA was evaluated using two EUs (EU1 and EU2) with land areas of 12.2 acres and 9.8 acres, respectively. EU1 corresponds with the southern half of the Site and EU2 corresponds with the northern half of the Site. These EUs were defined primarily based on the proposed development plans and uses for these portions of the Site, as discussed in detail in Section 2.1. The southern portion (EU1) will be developed for public recreational use and will include the main planned improvements

and amenities including the community building, playground, sports field, parking lots and access drives, constructed wetlands, dock access, etc. The northern portion (EU2) includes existing natural resources (wetlands, buffers, CAEs) that will be retained; this area will have no planned improvements or amenities but may be used sporadically by individuals for bird/wildlife watching, etc.

The EUs are shown in relation to the proposed development area and the 19 Phase II Investigation soil borings on **Figure 7**. The Construction Worker scenario was evaluated using the same two EUs with slightly larger areas (designated as EU1-EXP and EU2-EXP) with land areas of 12.5 acres and 9.9 acres, respectively, due to the inclusion of the temporary construction zones utilized to install the park entrance, roadside grading, and subgrade utility connections for the project.

Identification of Constituents of Potential Concern (COPCs): For the project-specific SLRA, compounds that were present at concentrations at or above the USEPA's Residential Regional Screening Levels (RSLs) set at a target cancer risk of 1E-6 or target non-cancer Hazard Quotient (HQ) of 0.1 were identified as COPCs to be included in the SLRA. The Residential RSLs were used as a conservatism due to the intended use of this Site as a public park. A COPC screening analysis is provided in **Table 7** to identify all compounds above the relevant screening levels.

The results for antimony were eliminated from the SLRA because this compound was very infrequently detected in the dataset for Sub-Parcel B7-1. Antimony was only detected in 1.7% of the samples analyzed for this compound (1 sample out of 59). If the detection frequency of a COPC is less than 5% in a dataset with a minimum of 20 samples, the COPC can be eliminated from the SLRA assuming the detections are not extremely high (based on agency discretion). A single detection that is extremely high could require delineation rather than elimination. In this case it is reasonable to remove antimony. All remaining COPCs identified in **Table 7** have been retained for the SLRA.

Exposure Point Concentrations (EPCs): The COPC soil datasets for each EU were divided into surface (0 to 2 feet bgs), subsurface (>2 feet bgs), and pooled depths for estimation of potential EPCs. Thus, there are three soil datasets associated with each EU. A statistical analysis was performed for each COPC dataset using the ProUCL software (version 5.0) developed by the USEPA to determine representative reasonable maximum exposure (RME) values for the EPC for each constituent. The RME value is typically the 95% Upper Confidence Limit (UCL) of the mean. For lead, the average concentration was calculated for each depth category (presented in **Table 8**).

Risk Ratios: The surface soil EPCs, subsurface soil EPCs, and pooled soil EPCs were compared to the USEPA RSLs for the Composite Worker, and site-specific Soil Screening Levels (SSLs) for the Adult Recreator, Child Recreator, and Construction Worker. Risk

ratios were calculated for each scenario with respect to a cancer risk of 1E-6 and a non-cancer HQ of 1. The risk ratios for the carcinogens were summed to develop a screening level estimate of the baseline cumulative cancer risk for each scenario. For the Adult Recreator and Child Recreator scenarios, the computed cancer risks are the cumulative risks for both age ranges combined. The risk ratios for the non-carcinogens were segregated and summed by target organ to develop a screening level estimate of the baseline cumulative non-cancer HI for each scenario.

Adult Recreator and Child Recreator SSLs were calculated using the USEPA's online RSL calculator for the Recreator Scenario using the default input assumptions for chronic exposure. Based on the proposed development layout, EU1 was evaluated according to the MDE's high frequency use scenario of 250 days/year (and 8 hours/day), whereas EU2 was evaluated according to the MDE's moderate frequency use scenario of 182 days/year (and 8 hours/day). These use frequencies are supported by the proposed development plans and amenities for EU1 (including the main planned improvements such as the community building, playground, sports field, parking lots and access drives, etc.) and EU2 (no planned improvements but may be used sporadically for bird/wildlife watching, etc.). Construction Worker SSLs were calculated based on equations derived in the USEPA Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites (OSWER 9355.4-24, December 2002). The Construction Worker SSL spreadsheet and USEPA Recreator calculator outputs (for both the high frequency and moderate frequency use scenarios) are provided in **Appendix B**.

For the Construction Worker, site-specific risk-based evaluations were completed for a range of potential exposure frequencies to determine the maximum allowable exposure frequencies for EU1-EXP and EU2-EXP that would result in risk ratios equivalent to a cumulative cancer risk of 1E-5 or HI of 1 for the individual target organs. This analysis indicated that the allowable exposure frequencies before additional worker protections might be needed are 50 days and 250 days for EU1-EXP and EU2-EXP, respectively. The 250-day limit for EU2-EXP represents the default 1-year construction period, indicating there is no unacceptable risk in this EU.

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

Assessment of Lead: The average lead concentrations for surface soils, subsurface soils, and pooled soils for each EU are presented in **Table 8**. The averages were compared to the Composite Worker and Residential RSLs (800 mg/kg and 400 mg/kg, respectively) as

an initial screening. None of the computed average lead concentrations (or any individual lead results) exceeded the Composite Worker or Residential RSLs. The average lead concentrations were additionally evaluated in the Adult Lead Model (ALM) and Integrated Exposure Uptake Biokinetic Model (IEUBK). Since the surface lead concentrations were the highest in each case (57.8 mg/kg and 38.3 mg/kg in EU1 and EU2, respectively) these concentrations were evaluated. The ALM (Version dated 6/21/2009 updated with the 5/17/2017 OLEM Directive) with inputs of 1.8 for the geometric standard deviation and a blood baseline lead level of 0.6 ug/dL generated a soil lead concentration of 1,050 mg/kg, which is the most conservative (i.e., lowest) concentration which would yield a probability of 5% of a blood lead concentration of 5 ug/dL. The average lead concentrations in EU1 and EU2 were significantly below 1,050 mg/kg. The average surface concentrations for EU1 and EU2 were also input into the IEUBK using default exposure assumptions, and the outputs are provided in **Appendix B**. EU1 and EU2 present negligible risk with respect to lead, with computed 0.335% and 0.126% probabilities of a blood lead concentration above 5 ug/dL. Both EUs are identified as requiring no further action for lead.

Assessment of TPH/Oil & Grease: EPCs were not calculated for TPH/Oil & Grease. Instead, the individual results were compared to the PAL set to a HQ of 1 (6,200 mg/kg). No soil samples exceeded the PAL for TPH/Oil & Grease. No physical evidence of NAPL was identified in any soil boring. Contingency measures to address the potential presence of NAPL which could be encountered during construction are addressed in subsequent sections of this RADWP.

Risk Characterization Approach: Generally, if the baseline risk ratio for each non-carcinogenic COPC or cumulative target organ does not exceed 1, and the sum of the risk ratios for the carcinogenic COPCs does not exceed a cumulative cancer risk of 1E-5, then a no further action determination will be recommended. If the baseline estimate of cumulative cancer risk exceeds 1E-5 but is less than or equal to 1E-4, then capping of the EU will be considered to be an acceptable remedy. The efficacy of capping for elevated non-cancer hazard will be evaluated in terms of the magnitude of exceedance and other factors such as bioavailability of the COPC. For the Construction Worker, cumulative cancer risks exceeding 1E-5 (but less than or equal to 1E-4) or HI values exceeding 1 will be mitigated via site-specific health and safety requirements.

The USEPA's acceptable risk range is between 1E-6 and 1E-4. If the sum of the risk ratios for carcinogens exceeds a cumulative cancer risk of 1E-4, further analysis of site conditions will be required including the consideration of toxicity reduction in any proposal for a remedy. The magnitude of any non-carcinogen HI exceedances and bioavailability of the COPC will also dictate further analysis of site conditions including consideration of toxicity reduction in any proposal for a remedy.

Due to the grading activities including cut and fill which will be implemented during development at the Site, the SLRA was evaluated to determine baseline Composite Worker, Adult Recreator, Child Recreator, and Construction Worker exposures to surface, subsurface, and pooled data.

3.3.2 Sub-Parcel B7-1 SLRA Results and Risk Characterization

Soil data were divided into three datasets (surface, subsurface, and pooled) for Sub-Parcel B7-1 to evaluate potential exposure scenarios. Due to the grading activities including cut and fill which will be implemented during development at the Site, each of these potential exposure scenarios is relevant for the Composite Worker, Adult Recreator, Child Recreator, and Construction Worker.

EPCs were calculated for each soil dataset in each EU. ProUCL output tables (with computed UCLs) derived from the data for each COPC in soils are provided as electronic attachments, with computations presented and EPCs calculated for COPCs within each of the datasets. The ProUCL input tables are also included as electronic attachments. The results were evaluated to identify any samples that may require additional assessment or special management based on the risk characterization approach. The calculated EPCs for the surface, subsurface, and pooled soils are provided in **Table 9**. These EPCs were used for all risk scenarios.

As indicated above, the EPCs for lead are the average (i.e., arithmetic mean) values for each dataset. A lead evaluation spreadsheet, providing the computations to determine lead averages for each dataset, is also included as an electronic attachment. The average lead concentrations are presented in **Table 8**. The average surface lead concentrations for EU1 and EU2 were input into the IEUBK using default exposure assumptions (**Appendix B**), and both present negligible risk. Both EUs are identified as requiring no further action for lead.

Composite Worker and Recreator Assessment:

Risk ratios for the estimates of potential EPCs for the Composite Worker, Adult Recreator, and Child Recreator baseline scenarios at the Site are shown in **Table 10** through **Table 18**. The results are summarized as follows:

Worker Scenario	Exposure Unit	Medium	Hazard Index (>1)	Total Cancer Risk
Composite Worker	EU1 (12.2 acres)	Surface Soil	none	4E-6
		Subsurface Soil	none	3E-6
		Pooled Soil	none	3E-6
	EU2 (9.8 acres)	Surface Soil	none	3E-6
		Subsurface Soil	none	3E-6
		Pooled Soil	none	3E-6

Worker Scenario	Exposure Unit	Medium	Hazard Index (>1)	Total Cancer Risk
Adult Recreator	EU1 (12.2 acres)	Surface Soil	none	2E-5
		Subsurface Soil	none	1E-5
		Pooled Soil	none	1E-5
	EU2 (9.8 acres)	Surface Soil	none	1E-5
		Subsurface Soil	none	8E-6
		Pooled Soil	none	9E-6

Worker Scenario	Exposure Unit	Medium	Hazard Index (>1)	Total Cancer Risk
Child Recreator	EU1 (12.2 acres)	Surface Soil	Dermal = 4 Gastro. = 2 Nervous =10	2E-5
		Subsurface Soil	none	1E-5
		Pooled Soil	Dermal = 3 Nervous =10	1E-5
	EU2 (9.8 acres)	Surface Soil	none	1E-5
		Subsurface Soil	none	8E-6
		Pooled Soil	none	9E-6

Based on the risk ratios for Sub-Parcel B7-1, environmental capping of EU1 is an acceptable remedy to be protective of future Composite Workers, Adult Recreators, and Child Recreators for the surface, subsurface, and pooled soils. The carcinogenic risk estimates for the Adult Recreator and Child Recreator scenarios (cumulative for both age ranges combined) exceed 1E-5 in EU1. The dermal system, gastrointestinal system, and nervous system HI values exceed 1 for the Child Recreator scenario in EU1. It should also be noted that the recreator risk calculations utilizing the MDE use scenarios employ very conservative exposure assumptions. This results in somewhat of an over-estimation of risk and hazard. Capping and institutional controls (to maintain the integrity of the cap) will provide adequate protection for these risk-based exceedances in EU1. No capping remedy is required in EU2.

Construction Worker Assessment:

Intrusive activities which could result in potential Construction Worker exposures are expected to be limited primarily to utility installation tasks performed by specific crews. Construction Worker

risks were evaluated for several different exposure scenarios to determine the maximum exposure frequency for each EU that would result in risk ratios equivalent to a cumulative cancer risk of 1E-5 or HI of 1 for any individual target organ. Risk ratios for the Construction Worker scenario using the selected durations (50 and 250 exposure days for EU1-EXP and EU2-EXP, respectively) are shown in **Table 19** through **Table 21**. The spreadsheet used for computation of the site-specific Construction Worker SSLs is included in **Appendix B**. The results are summarized as follows:

Worker Scenario	Exposure Unit	Medium	Hazard Index (>1)	Total Cancer Risk
Construction Worker	EU1-EXP (12.5 acres) (50 exposure days)	Surface Soil	none	1E-7
		Subsurface Soil	none	1E-7
		Pooled Soil	none	1E-7
	EU2-EXP (9.9 acres) (250 exposure days)	Surface Soil	none	6E-7
		Subsurface Soil	none	7E-7
		Pooled Soil	none	6E-7

Using the selected exposure durations for EU1-EXP (50 days) and EU2-EXP (250 days), the carcinogenic risks were all less than 1E-5, and none of the non-carcinogens caused a cumulative HI to exceed 1 for any target organ system. These findings are below the acceptable limits for no further action established by the agencies. This evaluation indicates that additional site-specific health and safety requirements (beyond standard Level D protection) would be required only if these allowable exposure durations were to be exceeded for an individual worker.

The 250-day limit for EU2-EXP represents the default 1-year construction period, indicating there is no unacceptable risk in this EU. Certain activities at the Site have the potential to exceed the allowable duration in EU1-EXP, and Construction Worker risks will be mitigated via site-specific health and safety requirements. Upgraded Personal Protective Equipment (PPE) beyond standard Level D protection will be used for the entire scope of ground intrusive work covered by this RADWP as a protective measure to ensure that there are no unacceptable exposures for Construction Workers during project implementation. The modified Level D PPE requirements which will be applied during this project, including specific PPE details, planning, tracking/supervision, enforcement, and documentation, are outlined in the PPE Standard Operational Procedure (SOP) provided as **Appendix C**.

Institutional controls will be required to be established for the protection of future Construction Workers in the event of any future long-term construction projects which could include intrusive activities. The anticipated institutional controls, including notification requirements, health and safety requirements, and materials management requirements, are specified in Section 5.4.

3.3.3 Evaluation of RCRA Criteria

Results from the SLRA indicate that a capping remedy for EU1 with site-wide institutional controls will be acceptable to mitigate potential risks to Composite Workers, Adult Recreators, and Child Recreators resulting from on-site soil conditions. No capping remedy is required in EU2. Site-specific health and safety controls will be implemented to mitigate Construction Worker risks within the sub-parcel. This includes using modified Level D PPE. The modified Level D PPE requirements will be implemented throughout the project duration in accordance with the PPE SOP provided as **Appendix C**. Institutional controls will also be required to be established for the protection of future Construction Workers in the event of any future long-term construction projects which could include intrusive activities.

The proposed VCP capping remedy with institutional controls was evaluated for consistency with the RCRA Threshold Criteria and Balancing Criteria. The Threshold Criteria assess the overall protection of human health and the environment, as well as achievement of media cleanup objectives and control of sources of releases at the Site. The Balancing Criteria assess long-term effectiveness and permanence; reduction of toxicity, mobility or volume; short-term effectiveness; implementability; cost effectiveness; and community and State acceptance.

Threshold Criteria:

Protect Human Health and the Environment: The assessment against this criterion evaluates how the remedy protects and maintains protection of human health and the environment. This criterion is satisfied when response actions are complete. The purpose of this remedy is to provide a protective barrier between human site users and impacted materials, and to protect the environment by preventing surface water from contacting potentially impacted materials in place. The capping and institutional control remedy would eliminate risk to current and future workers and visitors by preventing exposure to areas of the Site where soil concentrations exceed a cancer risk of 1E-5 or a HI of 1. Groundwater does not present a direct human health hazard since there is no groundwater use on the property. Implementation of the proposed use restrictions will address the residual risk and will also protect future workers and visitors by eliminating or controlling potential exposure pathways, thus, reducing potential intake and contact of soil/groundwater COPCs by human receptors.

Achieve Media Cleanup Objective: The assessment against this criterion describes how the remedy meets the cleanup objective, which is risk reduction, appropriate for the expected current and reasonably anticipated future land use. The objective is to protect current and future workers and visitors from potential exposures to COPCs present in soil or groundwater at levels that may result in risks of adverse health effects. The proposed capping of EU1 and site-wide institutional controls will prevent contact with any soil or groundwater exceeding risk-based screening levels. The control measures included in the

proposed remedy, such as Materials Management Plan requirements and groundwater use restrictions, provide a mechanism to control and reduce potential further releases of contaminants. This is achieved by eliminating the potential for groundwater use and requiring proper planning associated with future intrusive activities.

Control the Source of Releases: In its RCRA Corrective Action proposed remedies, USEPA seeks to eliminate or reduce further releases of hazardous wastes or hazardous constituents that may pose a threat to human health and the environment. Controlling the sources of contamination relates to the ability of the proposed remedy to reduce or eliminate, to the maximum extent practicable, further releases. Sampling results did not indicate localized, discernible source areas associated with the soil conditions at the Site.

Balancing Criteria:

Long-Term Reliability and Effectiveness: The assessment against this criterion evaluates the long-term effectiveness of the remedy in maintaining protection of human health and the environment after the response objectives have been met. The primary focus of this criterion is the extent and effectiveness of the controls that may be required to manage the risk posed by treatment residuals and/or untreated wastes. The proposed capping measures have been proven to be effective in the long-term at similar sites with similar conditions. The capping remedy on EU1 will permanently contain the potentially contaminated media in place. In order for the cap to effectively act as a barrier, regular inspections will be required to determine if erosion or cracks have formed that could expose workers and visitors to contaminated materials.

Institutional controls will be implemented to protect future workers and visitors against inadvertent contact with potentially impacted media. The anticipated institutional controls are specified in Section 5.4. The proposed remedy will maintain protection of human health and the environment over time by controlling exposures to the hazardous constituents potentially remaining in existing on-site media. The long-term effectiveness is high, as use restrictions are readily implementable and easily maintained. Given the historical, heavily industrial uses of the Site and the surrounding area, including the presence of landfills, land and groundwater use restrictions are expected to continue in the long term.

Reduction of Toxicity, Mobility, or Volume of Waste: The assessment against this criterion evaluates the anticipated performance of specific technologies that a remedial action alternative may employ. The capping remedy in EU1 will prevent the spread of contaminants in wind-blown dust or stormwater and will prevent infiltration through the unsaturated zone from carrying contaminants to the groundwater. Thus, the mobility of contaminants will be somewhat reduced by the capping remedy.

Short-term Effectiveness: The assessment against this criterion examines how well the proposed remedy protects human health and the environment during the construction and implementation until response objectives have been met. This criterion also includes an estimate of the time required to achieve protection for either the entire site or individual elements associated with specific site areas or threats. The risks to the Construction Worker during remedy implementation are mitigated by executing the modified Level D PPE requirements outlined in **Appendix C**. The short-term risk to site workers following these upgraded health and safety measures during implementation of the remedy will be low, leading to a high level of short-term effectiveness for protection of future site users and the environment. Short-term effectiveness in protecting on-site workers and the environment will be achieved through establishing appropriate management, construction, health and safety, and security procedures. Proper water management protocols will be implemented to prevent uncontrolled discharge(s) offsite. Security and fences will be used to maintain controlled access during construction.

Implementability: The assessment against this criterion evaluates the technical and administrative feasibility, including the availability of trained and experienced personnel, materials, and equipment. Technical feasibility includes the ability to construct and operate the technology, the reliability of the technology, and the ability to effectively monitor the technology. Administrative feasibility includes the capability of obtaining permits, meeting permit requirements, and coordinating activities of governmental agencies. The proposed capping remedy for EU1 will use readily available, typically acceptable, and proven technologies.

Cost Effectiveness: The assessment against this criterion evaluates the capital costs, annual Operating and Maintenance (O&M) costs, and the net present value (NPV) of this remedy relative to alternatives. The capping remedy remedial costs will be incurred as part of the proposed site development. The estimated costs for implementation are relatively low in both the short term and long term.

State Support / Agency Acceptance: MDE has been involved throughout the Site investigation process. The proposed use restrictions included in the proposed remedy are generally recognized as commonly employed measures for long-term stewardship. Ultimately State/MDE support will be evaluated based on comments received during the public comment period.

A capping remedy for EU1 with site-wide institutional controls will satisfy the RCRA Threshold Criteria and Balancing Criteria and will do so in a manner that ensures reliable implementation and effectiveness.

4.0 PROPOSED SITE DEVELOPMENT PLAN

Sub-Parcel B7-1 is proposed to be developed as a Baltimore County Park facility. The Site encompasses 22.0 acres to be transferred to Baltimore County with an anticipated future use of Tier 4B (Restricted Public Recreational Area). The remainder of Parcel B7 will be addressed in separate development plans in accordance with the requirements of the ACO that will include RADWPs, if necessary. Outside of the main development area, temporary construction zones with a total area of less than 0.5 acre will be utilized to install the park entrance, roadside grading, and subgrade utility connections for the project. The temporary work outside of the boundary of the Site is not intended to be the basis for the issuance of a NFA or a COC, although the scope of construction work is covered by this RADWP.

The Site was evaluated as two EUs (EU1 and EU2) with land areas of 12.2 acres and 9.8 acres, respectively. The EU boundaries were established through a review of historical records and site use, as well as current conditions and proposed future uses for the southern and northern portions of the Site, as discussed in detail in Section 2.1. The EU boundaries ensure that park development features are included in the EU1 parcel capping plan. The southern portion (EU1) will include the main planned improvements and amenities including a community building, playground, sports field, parking lots and access drives, constructed wetlands, dock access, etc. EU1 will be fully capped by surface engineering controls. The northern portion (EU2) includes existing natural resources (wetlands, buffers, CAEs) that will be retained; this area will have no planned improvements or amenities but may be used sporadically by individuals for bird/wildlife watching, etc. No capping remedy is required in EU2.

Certain compounds are present in the soils located near the surface and in the subsurface at concentrations in excess of the PALs (shown on **Figure 4**). Therefore, soil is considered a potential media of concern. Potential risks to workers and visitors associated with impacts to soil and groundwater will be addressed through a remedy consisting of surface engineering controls (capping of EU1) and site-wide institutional controls (deed restrictions).

Construction Workers may contact impacted surface and/or subsurface soil during earth movement activities associated with construction activities, including within the temporary construction zones outside of the main development area. The findings of the Construction Worker SLRA using the selected exposure frequencies for EU1-EXP (50 days) and EU2-EXP (250 days) indicated the estimates of Construction Worker cancer risk were less than 1E-5 and no HI values above 1 were identified for any organ system (the acceptable thresholds for no further action).

The 250-day limit for EU2-EXP represents the default 1-year construction period, indicating there is no unacceptable risk in this EU. Certain activities at the Site have the potential to exceed the allowable duration in EU1-EXP, and Construction Worker risks will be mitigated via site-specific health and safety requirements. Upgraded PPE beyond standard Level D protection will be used

in conjunction with a Health and Safety Plan (HASP) for the entire scope of ground intrusive work covered by this RADWP as a protective measure to ensure that there are no unacceptable exposures for Construction Workers during project implementation. The modified Level D PPE requirements which will be applied during this project, including specific PPE details, planning, tracking/supervision, enforcement, and documentation, are outlined in the PPE SOP provided as **Appendix C**.

A restriction prohibiting the use of groundwater for any purpose at the Site will be included as an institutional control in the NFA and COC issued by the MDE, and a deed restriction prohibiting the use of groundwater will be filed. The groundwater use restriction will protect future workers and visitors from potential direct exposures. Proper water management is required to prevent unacceptable discharges or risks to Construction Workers during development. Work practices and health and safety plans governing groundwater encountered during excavation activities will provide protection for Construction Workers involved with development at the Site.

The overall development plan for the Site is shown on **Figure 2**. Detailed development drawings (provided by Baltimore County) and undercut section drawings (provided by MK Consulting Engineers, LLC) are included as **Appendix D**. The various types of surface engineering controls proposed on EU1 (concrete, asphalt, and landscaping) are summarized on **Figure 8**.

The process of constructing the proposed Baltimore County Park facility will involve the tasks listed below. Documentation for the outlined tasks and procedures will be provided in a Sub-Parcel B7-1 Development Completion Report.

4.1 Response Phase – Well Retention

All temporary groundwater sample collection points (piezometers) within Parcel B7-1 have previously been abandoned in accordance with COMAR 26.04.04.34 through 36. Records of all piezometer abandonments (including abandonment forms) will be included in the Development Completion Report.

As noted in Section 3.2.3, SW-047-MWS was previously destroyed (likely during construction activities on the highway ramps in the vicinity of the Site). The existing permanent groundwater monitoring well SW-046-MWS will be retained for future use. The location of this well is shown on **Figure 9**. To ensure that the location is not damaged/destroyed during construction, the well should be protected using a sonotube, flagging, and/or barriers as needed prior to grading in this area. Following development, SW-046-MWS will be either 1) converted to a flush-mount well with a protective manhole cover, or 2) retained as a stick-up well with protective steel casing. Tradepoint Atlantic will be granted access for the purpose of future groundwater monitoring as may be required.

4.2 DEVELOPMENT PHASE

Property boundaries (including the boundary between EU1 and EU2) will be surveyed and staked prior to development, and maintained in the field during construction. In addition, a silt fence will be installed between the EUs to prevent grading of EU1 material on the uncapped EU2. The staked line and silt fence will also ensure accurate cap placement along the proper boundaries. After cap construction, concrete survey monuments will be installed along the southern property line and along the property line between EU1 and EU2 (as indicated in site plans) to provide a visual reference for future cap inspections and maintenance.

4.2.1 Erosion and Sediment Control Installation

Installation of erosion and sediment controls will be completed in accordance with the requirements of the 2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control prior to any construction at the Site. Any soils which are disturbed during the installation of erosion and sediment controls will be replaced on-site within each respective EU.

4.2.2 Grading and Site Preparation

As indicated on the development plans in **Appendix D**, grading activities including both cut and fill will occur within the Sub-Parcel B7-1 boundary. Any material that is not suitable for compaction will be excavated and replaced with subbase material, although it is not anticipated that poor soils will be encountered. Borrow materials will be obtained from MDE-approved sources and will be documented prior to transport to the Site. Fill sources shall be free of organic material, frozen material, or other deleterious material. Materials approved by the MDE for industrial use may be used as fill on EU1 only, unless otherwise approved. EU1 will be capped by surface engineering controls.

In the case that there is excess material, the spoils will be stockpiled at a suitable location in accordance with the Erosion and Sediment Control Plan. No excess material will leave the Site without prior approval from MDE.

4.2.3 Installation of Structures and Underground Utilities

The community center building, utilities, parking lots, and other infrastructure will be installed as shown on the development plans in **Appendix D**. Excavated soils may be replaced on-site within each respective EU. All utility trenches in EU1 will be backfilled with at least two feet of bedding and backfill approved by the MDE for industrial use (which may include approved utility trench spoils from within EU1). All utility trenches in EU2 will be backfilled with VCP clean fill (sourced from off-site sources and subject to MDE approval) or other material approved by the MDE. The minimum cover above utility pipe shall be based on requirements specific to the utility. Additional protocols for the installation of utilities at the Site are provided in Section 5.1.2. Any water removed will be managed as detailed in Section 5.2.

4.2.4 Floor Slabs and Paving

Much of EU1 will be covered with floor slabs or paving as indicated in the development plans provided in **Appendix D** and summarized on **Figure 8**. Undercut section drawings are also included in **Appendix D**. The paved areas on EU1 will receive a layer of subbase material which will consist of compacted aggregate base approved by the MDE.

Sitewide pavement sections include asphalt paving, reinforced concrete paving, trail paving, concrete sidewalk, and concrete unit pavers. Further information pertaining to the construction of paving sections can be found in the construction detail in **Appendix D**.

- Paving detail for parking areas: total cap thickness of 12 inches (6 inches of asphalt overlying 6 inches of stone base)
- Reinforced concrete paving: total cap thickness of 12 inches (6 inches concrete and 6 inches stone base)
- Asphalt Trail paving: total cap thickness of nine inches (3 inches of asphalt overlying 6 inches of stone base) integrated into the 2-foot landscape cap
- Concrete sidewalk: total cap thickness of nine inches (5 inches of concrete overlying 4 inches of stone base)
- Concrete unit pavers (as part of onsite planters): total cap thickness of approximately nine inches

4.2.5 Landscaping

Much of EU1 will be covered with landscaping caps as indicated in the development plans provided in **Appendix D** and summarized on **Figure 8**. The landscape cap will serve as surface engineering controls and will include a minimum of 24 inches of VCP clean fill, with a geotextile marker fabric between the VCP clean fill and the underlying material. VCP clean fill will be sourced from off-site sources and subject to MDE approval. At the transition between the subject site and neighboring parcels, a buffer will be created by tapering the landscape cap two feet into the neighboring parcel to the surface. The geotextile marker fabric will extend into the transition buffer and follow the tapered zone to the surface.

4.2.6 Playground

The playground on EU1 will be capped by 24 inches of VCP clean fill constituting the cap. VCP clean fill will be sourced from off-site sources and subject to MDE approval. The cap will be further covered by a play surface, likely a pour-in-place rubber product to provide Americans with Disabilities Act (ADA) accessibility. Baltimore County has not yet selected a playground vendor and is not able to definitively state what the final play surface will be at this time. A playground undercut drawing is provided with the development plans in **Appendix D**.

4.2.7 Artificial Turf

The sport field on EU1 will consist of synthetic turf manufactured by FieldTurf® or an approved equally protective product. Typical Turf Field Sections will be bordered by a two-inch by four-inch notched concrete curb. The field will be constructed on undisturbed subgrade, and will include the following layers (from bottom to top):

- 30 mm impervious liner
- Six inches of #57 stone. At specific areas the #57 stone will extend to a greater depth to surround two-inch perforated collector pipes.
- One inch of #8 stone
- One inch of #10 finish stone
- Synthetic turf will be installed as the top layer.

A typical turf field section and undercut drawing are provided with the development plans in **Appendix D**.

4.2.8 Stormwater Management

The proposed stormwater utility layout for the Site is provided on the development plan drawings in **Appendix D**. New stormwater infrastructure will be installed throughout the Site, and will include two constructed submerged gravel wetlands. According to the development plans, the constructed wetlands will be installed with an impermeable PVC liner on all sides and bottom. The liner will be placed between the existing subgrade and varying thickness of overlying clean soil and stone layers above the liner.

Tradepoint Atlantic is working with the MDE Industrial & General Permits Division to renew the property-wide NPDES permit. This Site will not be maintained in the property-wide NPDES permit after property transfer and development. The stormwater management systems for each parcel are reviewed and approved by Baltimore County for each individual development project.

4.2.9 Shoreline

A shoreline rip-rap revetment will be constructed to protect the shoreline and provide the environmental cap. The revetment will consist of geotextile fabric, a 10-inch gravel bedding layer, and a three-foot thick section of Class III riprap. The revetment will be finished by toeing into existing bottom sediments below the mean low water line to ensure slope stability. At the landscape cap transition to the shoreline revetment a layer of geotextile fabric will extend vertically the entire height of the revetment.

5.0 DEVELOPMENT IMPLEMENTATION PROTOCOLS

5.1 DEVELOPMENT PHASE

This plan presents protocols for the handling of soils and fill materials in association with the development of Sub-Parcel B7-1. In particular, this plan highlights the minimum standards for construction practices and managing potentially contaminated materials to reduce potential risks to workers and the environment.

Several exceedances of the PALs were identified in soil samples across the Site (as shown on **Figure 4**). The PALs are set based on USEPA's RSLs for industrial soils, or other direct guidance from the MDE. Because PAL exceedances can present potential risks to human health and the environment at certain concentrations, this plan presents material management and other protocols to be followed during the work to adequately mitigate such potential risks for material remaining on-site during the development phase. There were no locations within the proposed development boundary with soil exceedances of the special management criteria for PCBs (50 mg/kg), lead (10,000 mg/kg), or TPH/Oil & Grease (6,200 mg/kg). NAPL was not identified in any soil boring.

Following completion of the SLRA, the findings of the Construction Worker evaluation using the selected exposure frequencies for EU1-EXP (50 days) and EU2-EXP (250 days) indicated the estimates of Construction Worker cancer risk were less than 1E-5 and no HI values exceeded 1 for any target organ system (the acceptable thresholds for no further action). The 250-day limit for EU2-EXP represents the default 1-year construction period, indicating there is no unacceptable risk in this EU. Certain activities at the Site have the potential to exceed the allowable duration in EU1-EXP, and Construction Worker risks will be mitigated via site-specific health and safety requirements. Upgraded PPE beyond standard Level D protection will be used in conjunction with a HASP for the entire scope of ground intrusive work covered by this RADWP as a protective measure to ensure that there are no unacceptable exposures for Construction Workers during project implementation. The modified Level D PPE requirements which will be applied during this project, including specific PPE details, planning, tracking/supervision, enforcement, and documentation, are outlined in the PPE SOP provided as **Appendix C**.

Based on the characterization of surface and subsurface soils and the associated SLRA findings, surface engineering controls are an acceptable remedy on EU1 to be protective of Composite Workers, Adult Recreators, and Child Recreators who otherwise could potentially contact impacted materials at the Site. The proposed capping sections will meet the required minimum thicknesses for surface engineering controls, which are provided in **Appendix D**. No capping remedy is required in EU2.

5.1.1 Erosion/Sediment Control

Erosion and sediment controls will be installed prior to commencing work in accordance with the 2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control. The erosion and sediment controls will be approved by the MDE. In addition, the following measures will be taken to prevent contaminated soil from exiting the Site:

- Stabilized construction entrance will be placed at site entrance.
- A dry street sweeper will be used as necessary on adjacent roads, and the swept dust will be collected and properly managed.
- Accumulated sediment removed from silt fence, and sediment traps if applicable, shall be periodically removed and returned to the Site.

5.1.2 Soil Excavation and Utility Trenching

A pre-excavation meeting shall be held to address proper operating procedures for working on-site and monitoring excavations and utility trenching in potentially contaminated material. This meeting shall include the construction manager and the EP providing oversight on the project. During the meeting, the construction manager and the EP shall review the proposed excavation/trenching locations and any associated utility inverts. The construction manager will be responsible for conveying all relevant information regarding excavation/grading and/or utility work to the workers who will be involved with these activities. The Utility Excavation NAPL Contingency Plan (discussed below) must also be reviewed during the pre-excavation meeting. The HASP and PPE SOP for the project shall also be reviewed and discussed.

The EP will provide oversight of soil excavation/trenching activities as described in Section 5.6. Soil excavation/trenching will occur during various phases of construction. In general, and based on the existing sampling information, all excavated materials are expected to be suitable for replacement on the Site within each respective EU. However, the EP will monitor the soil excavation activities for signs of significantly contaminated material which may not be suitable for reuse (as described below). The EP will also be responsible for monitoring organic vapor concentrations in the worker breathing zone within utility trenches and excavations to determine whether any increased level of health and safety protection is required.

To the extent practical, all excavation activities should be conducted in a manner to minimize double or extra handling of materials. Stockpiles will be kept within the Site footprint, and in a location that is not subjected to concentrated stormwater runoff. Stockpiles shall be managed as necessary to prevent the erosion and off-site migration of stockpiled materials, and in accordance with the applicable provisions of the 2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control. Soil designated for replacement on-site which does not otherwise exhibit evidence of contamination (as determined by the EP) may be managed in large stockpiles (no size restriction) as long as they remain within the erosion and sediment controls.

All utility trenches will be backfilled with bedding and backfill materials approved by the MDE. A general utility cross section is provided as **Appendix D**. Additional preventative measures will be required if evidence of petroleum contamination is encountered, to prevent the discharge to, or migration of, petroleum product along a utility conduit. Contingency measures have been developed to ensure that utilities will be constructed in a manner that will prevent the migration of any encountered NAPL, and that excavated material will be properly managed. The Utility Excavation NAPL Contingency Plan (**Appendix E**) provides protocols to be followed if NAPL is encountered during the construction activities. Preventative measures to inhibit the spread of petroleum product will be conducted in accordance with this plan. NAPL is not anticipated to be encountered during development at the Site.

The EP will monitor all soil excavation and utility trenching activities for signs of potential contamination. In particular, soils will be monitored with a hand-held PID for potential VOCs and will also be visually inspected for the presence of staining, petroleum waste materials, or other indications of significant contamination. If screening of excavated materials by the EP indicates the presence of conditions of potential concern (i.e., sustained PID readings greater than 10 ppm, visual staining, unsuitable waste materials, etc.), such materials shall be segregated for additional sampling and special management.

Excavated material exhibiting evidence of significant contamination (including NAPL) shall be placed in stockpiles (not to exceed 500 cubic yards) on polyethylene sheeting and covered with polyethylene sheeting to minimize potential exposures and erosion when not in use. Materials stockpiled due to evidence of contamination will be sampled in accordance with reuse and/or waste disposal requirements and transported to an appropriate permitted disposal facility. Plans for analysis of segregated soils for any use other than disposal must be submitted to the MDE for approval. The quantities of all materials that require disposal, if any, will be recorded and identified in the Development Completion Report.

5.1.3 Soil Sampling and Disposal

Excavated materials that are determined by the EP to warrant sampling and analysis because of elevated PID readings or other indications of potential contamination shall be sampled and analyzed to determine how the materials should be managed. If excavated and stockpiled, such materials should be covered with a polyethylene tarp to minimize potential exposures and erosion. All stockpiled soil may be considered for use as fill at this Site or on other areas of the property depending on the analytical results. A sampling Work Plan including a description of the material, estimated volume, and sampling parameters will be submitted to the MDE for approval. The resulting analytical data will be submitted to the MDE to determine the suitability of the material for reuse. If the MDE determines that the materials are unsuitable for reuse, the materials will be sampled to determine if they require regulated disposal.

Soil material may be taken to an appropriate non-hazardous landfill (including Greys Landfill) for proper disposal if the concentrations of excavated sampled materials indicate that the materials are not hazardous, but still are not suitable for reuse. Soil material that is determined to be a hazardous waste shall be shipped off-site in accordance with applicable regulations to an appropriate and permitted RCRA disposal facility. The quantities of all materials that require disposal, if any, will be recorded and identified in the Development Completion Report.

5.1.4 Fill

Materials approved by the MDE for industrial use may be used as structural fill on EU1 only, unless otherwise approved. EU1 will be capped by surface engineering controls. No capping remedy is required in EU2. In general, and based on the existing sampling information, all excavated materials are expected to be suitable for replacement on the Site within each respective EU, unless materials are determined by the EP and MDE to be unsuitable for use as outlined in Section 5.1.2 and Section 5.1.3.

All utility trenches in EU1 will be backfilled with bedding and backfill approved by the MDE for industrial use (which may include approved utility trench spoils from within EU1). Any utility backfill which will extend into the cap (i.e., top 2 feet of backfill in landscaped areas) must meet the VCP clean fill requirements, and a geotextile marker fabric will be placed between the VCP clean fill and any underlying material. All utility trenches in EU2 will be backfilled with VCP clean fill or other material approved by the MDE (which may include approved utility trench spoils from within EU2). Materials placed in areas outside of the Site boundary (i.e., within the temporary construction zones outside of Sub-Parcel B7-1) must meet the VCP clean fill requirements or be otherwise approved by the MDE prior to placement. A general utility detail drawing is provided as **Appendix D**. Material imported to the Site will be screened according to MDE guidance for suitability.

5.1.5 Dust Control

General construction operations, including soil excavation and transport, and trenching for utilities will be performed at the Site. These activities are anticipated to be performed in areas of soil impacted with COPCs. Best management practices should be undertaken at the Sparrows Point property as a whole to prevent the generation of dust which could impact other areas of the property outside of the immediate work zone. To limit worker exposure to contaminants borne on dust and windblown particulates, dust monitoring will be performed in the immediate work zone and at the upwind and downwind perimeter of the Site, and dust control measures will be implemented if warranted based on the monitoring results. The action level proposed for the purpose of determining the need for dust suppression techniques (e.g. watering and/or misting) during the development activities at the Site will be 3.0 mg/m^3. The lowest of the site-specific dust action levels, OSHA PELs, and ACGIH TLV was selected as the proposed action level.

The EP will be responsible for the dust monitoring program. Air monitoring will be performed using Met One Instruments, Inc. E-Sampler dust monitors or equivalent real-time air monitoring devices. The EP will set-up dust monitoring equipment at the outset of ground intrusive work or other dust-generating activities, and continuous dust monitoring will be performed during this work. In addition to work area monitoring, a dust monitor will be placed at selected perimeter locations that will correspond to the upwind and downwind boundaries based on the prevailing wind direction predicted for that day. The prevailing wind direction will be assessed during the day, and the positions of the perimeter monitors will be adjusted if there is a substantial shift in the prevailing wind direction.

Once all dust-generating activities are complete (which may occur at a later stage of the project once ground intrusive work has been completed or after the Site has been capped), the dust monitoring program may be discontinued. If additional dust-generating activities commence, additional dust monitoring activities will be performed.

If sustained dust concentrations exceed the action level (3.0 mg/m^3) at any of the monitoring locations as a result of conditions occurring at the Site, operations will be stopped temporarily until dust suppression can be implemented. Operations may be resumed once monitoring indicates that dust concentrations are below the action level. The background dust concentration will be utilized to evaluate whether Site activities are the source of the action level exceedance. The background dust concentration will be based on measurements over a minimum of a 1-hour period at the upwind Site boundary. The upwind data will be used to calculate a time weighted average background dust concentration. As noted above, the locations of the perimeter dust monitors may be adjusted periodically if there is a substantial shift in the prevailing wind direction.

As applicable, air monitoring will be conducted during development implementation activities to assess levels of exposure to Site workers, establish that the work zone designations are valid, and verify that respiratory protection being worn by personnel, if needed, is adequate. Concurrent with the work zone air monitoring, perimeter air monitoring will also be performed at the upwind and downwind Site boundaries to ensure contaminants are not migrating off-site. The concentration measured at the downwind perimeter shall not exceed the action level of 3.0 mg/m^3, unless caused by background dust from upwind of the Site. If exceedances of the action level are identified downwind for more than five minutes, the background dust concentration shall be evaluated to determine whether the action level exceedances are attributable to Site conditions. If on-site activities are the source of the exceedances, dust control measures and additional monitoring will be implemented. The dust suppression measures may include wetting or misting using a hose connected to a water supply or a water truck stationed at the Site.

Dust control measures will be implemented as described above to address dust generated as a result of construction activities conducted at the Site. However, based on the nature of the area and/or ongoing activities surrounding the Site, it is possible that windblown particulates may come from surrounding areas. As discussed above, the dust concentration in the upwind portion of the Site

will be considered when monitoring dust levels in the work area. A pre-construction meeting will be held to discuss the potential of windblown particulates from other activities impacting the air monitoring required for this RADWP. Site contact information will be provided to address the possibility of upwind dust impacts. If sustained dust is observed above the action level (3.0 mg/m^3) and it is believed to originate from off-site (i.e., upwind) sources, this will immediately be reported to TPA and the MDE-VCP team, as well as the MDE Air and Radiation Administration (ARA).

5.2 WATER MANAGEMENT

This plan presents the protocols for handling any groundwater or surface water that needs to be removed to facilitate construction of the proposed Sub-Parcel B7-1 development.

5.2.1 Groundwater PAL Exceedances

Groundwater samples were collected during the preceding Phase II Investigation from four temporary groundwater sample collection points (piezometers) and two permanent monitoring wells within and surrounding the Site. Aqueous PAL exceedances in groundwater in the vicinity of the development LOD included both inorganic and organic compounds. The aqueous PAL exceedances obtained during the Parcel B7 Phase II Investigation are summarized on **Figure 6**.

While the concentrations of PAL exceedances are not deemed to be a significant human health hazard for potential future workers and visitors since there is no on-site groundwater use which could lead to direct exposures, proper water management is required during construction to prevent unacceptable discharges or risks to Construction Workers.

5.2.2 Dewatering

Dewatering may be necessary during the installation of underground utilities and within excavations/trenches. **Figure 10** displays the groundwater elevations underlying the Site for the shallow aquifer zone, based on prior investigation data. Any dewatering shall be done in accordance with all local, state, and federal regulations. Water that collects in excavations/trenches due to intrusion of groundwater, stormwater, and/or dust control waters will be transported to the HCWWTP. The water will be treated and discharged in accordance with NPDES Permit No. 90-DP-0064A; I. Special Conditions; A.4; Effluent Limitations and Monitoring Requirements.

It is the intent that any water that must be removed will be ultimately sent (via pumping or trucking) to the HCWWTP via the TMC, following any pretreatment, if necessary. Water in the TMC feeds into the HCWWTP where it is treated prior to release into Bear Creek. Dewatering fluids will be evaluated and then tested (if required) pursuant to the HCWWTP Constituent Threshold Limits for Dewatering Activities related to Remediation, Development, and Capping Protocol. If the groundwater does not meet the constituent threshold limits specified in the protocol, the

groundwater will be pre-treated. Any water discharged to the TMC will be pumped through a filter bag or equivalent to remove suspended solids prior to discharge.

Note that additional analyses could be required if warranted based on field observations by the EP. The EP will inspect any water that collects in the excavations/trenches. If the water exhibits indications of significant contamination (sheen, odor, discoloration, presence of product), the water may be sampled and analyzed for some or all of the analyses listed below. In such case, the analyses run will be dependent on the suspected source of contamination and local site conditions.

The results of the analyses will be reviewed by the HCWWTP operator to determine if any wastewater treatment system adjustments are necessary. If the results of the analyses are above the threshold levels listed below, the water will be further evaluated to confirm acceptable treatment at the HCWWTP, or will be evaluated to design an appropriate pre-treatment option. Alternatively, the water may be disposed of at an appropriate off-site facility.

Analysis	Threshold Levels
• Total metals by USEPA Method 6020A	1,000 ppm
• PCBs by USEPA Method 8082	>Non-Detect
• SVOCs by USEPA Method 8270C	1 ppm
• VOCs by USEPA Method 8260B	1 ppm
• Oil & Grease by USEPA Method 1664	200 ppm
• TPH-DRO by USEPA Method 8015B	200 ppm
• TPH-GRO by USEPA Method 8015B	200 ppm

Documentation of any water testing, as well as the selected disposal option, will be reported to the MDE in the Development Completion Report. Any permits or permit modifications related to dewatering will be provided to the agencies as addenda to this RADWP.

5.3 HEALTH AND SAFETY

A property-wide HASP has been developed and is provided with this RADWP (as an electronic attachment) to present the minimum requirements for worker health and safety protection for all development projects. All contractors working on the Site must prepare their own HASP that provides a level of protection at least as protective as that provided by the property-wide HASP. Alternately, on-site contractors may elect to adopt the HASP provided.

General health and safety controls (level D protection) are adequate to mitigate potential risk to Construction Workers for a duration of up to 50 days in EU1-EXP and 250 days in EU2-EXP. The 250-day limit for EU2-EXP represents the default 1-year construction period, indicating there is no unacceptable risk in this EU. Certain activities at the Site have the potential to exceed the allowable duration in EU1-EXP. Modified Level D PPE will be used for the entire scope of ground

intrusive work covered by this RADWP as a protective measure to ensure that there are no unacceptable exposures for Construction Workers during project implementation. Health and safety controls outlined in the HASP and PPE SOP will mitigate any potential risk to Construction Workers from contacting impacted soil and groundwater during development. The modified Level D PPE requirements planned for this development project, including specific PPE details, planning, tracking/supervision, enforcement, and documentation, are outlined in the PPE SOP provided as **Appendix C**. The EP will be responsible for monitoring organic vapor concentrations in the worker breathing zone within the utility trenches and excavations to determine whether any increased level of safety protection (including engineering controls and/or PPE) is required.

Prior to commencing work, the contractor must conduct an on-site safety meeting for all personnel. All personnel must be made aware of the HASP and the PPE SOP. Detailed safety information shall be provided to personnel who may be exposed to COPCs. Workers will be responsible for following established safety procedures to prevent contact with potentially contaminated material.

5.4 INSTITUTIONAL CONTROLS (FUTURE LAND USE CONTROLS)

Long-term conditions related to future use of the Site will be placed on the RADWP approval, NFA, and COC. These conditions are anticipated to include the following:

- A restriction prohibiting the use of groundwater for any purpose at the Site and a requirement to characterize, containerize, and properly dispose of groundwater in the event of deep excavations encountering groundwater.
- Notice to the MDE at least 30 days prior to any future soil disturbances that are expected to breach the approved capping remedy (i.e., through the pavement cap or marker fabric in landscaped areas).
- Notice to the USEPA at least 30 days prior to any future soil disturbances that are expected to breach the approved capping remedy, only if the proposed duration of intrusive activity would exceed the allowable exposure duration determined in the SLRA and the contractor will not use the modified Level D PPE specified in the approved SOP.
- Requirement for a HASP in the event of any future excavations at the Site.
- Complete appropriate characterization and disposal of any material excavated/pumped at the Site in accordance with applicable local, state, and federal requirements.
- Implementation of inspection procedures and maintenance of the containment remedies.

The owner/operator will file the above deed restrictions as defined by the MDE-VCP in the NFA and COC.

5.5 POST REMEDIATION REQUIREMENTS

Post remediation requirements will include compliance with the conditions specified in the NFA, COC, and the deed restrictions recorded for the Site. Deed restrictions will be recorded within 30 days after receipt of the final NFA. In addition, the MDE and USEPA will be provided with a written notice of any future excavations (as applicable) in accordance with the requirements given in Section 5.4. Written notice of planned excavation activities will include the proposed date(s) for the excavation, location of the excavation, health and safety protocols (as required), clean fill source (as required), and proposed characterization and disposal requirements. Written notice may consist of email correspondence and/or hard copy correspondence.

Additional requirements will include inspection procedures and maintenance of the containment remedies to minimize degradation which could lead to future exposures. An Operations and Maintenance Plan (O&M Plan) will be submitted for MDE approval. This O&M Plan will include long-term inspection and maintenance requirements for the capped areas of the Site. The owner/operator will perform cap inspections, perform maintenance of the cap, and retain inspection records, as required by the O&M Plan.

5.6 CONSTRUCTION OVERSIGHT

Construction Oversight by an EP will ensure and document that the project is built as designed and appropriate environmental and safety protocols are followed. Upon completion, the EP will certify that the project is constructed in accordance with this RADWP.

The EP will monitor all soil excavation and utility trenching activities for signs of potential contamination that may not have been previously identified. In particular, soils will be monitored with a hand-held PID for potential VOCs, and will also be visually inspected for staining, petroleum waste materials, or other indications of significant contamination. If screening of excavated materials by the EP indicates the presence of conditions of potential concern (i.e., sustained PID readings greater than 10 ppm, visual staining, unsuitable waste materials, etc.), such materials shall be segregated for additional sampling and special management (as described in Section 5.1.2; Soil Excavation and Utility Trenching). The EP will also perform routine periodic breathing zone monitoring and PPE spot checks during ground intrusive activities. The EP will also inspect any water that collects in the excavations/trenches on an as-needed basis to coordinate appropriate sampling prior to disposal (as described in Section 5.2.2; Dewatering).

Daily inspections, as necessary, will be performed during general site grading and cap construction activities to verify that appropriate fill materials are being used (as described in Section 5.1.4; Fill), dust monitoring and control measures are being implemented as appropriate (as described in Section 5.1.5; Dust Control), the requirements of the HASP and the PPE SOP are being enforced as applicable (as described in Section 5.3; Health and Safety), and surface engineering controls are being installed with the appropriate thicknesses (shown on the RADWP attachments). Oversight

by an EP will not be required during construction activities which do not have a significant environmental component, such as above-grade construction.

Records will be developed by the EP to document:

- Compliance with soil screening requirements
- Proper water management, including documentation of any testing and water disposal
- Observations of construction activities during site grading and cap construction
- Proper cap thickness and construction

6.0 PERMITS, NOTIFICATIONS AND CONTINGENCIES

The participant and their contractors will comply with all local, state, and federal laws and regulations by obtaining any necessary approvals and permits to conduct the activities contained herein. Any permits or permit modifications from State or local authorities will be provided as addenda to this RADWP.

A grading permit is required if the proposed grading disturbs over 5,000 square feet of surface area or over 100 cubic yards of earth. A grading permit is required for any grading activities in any watercourse, floodplain, wetland area, buffers (stream and within 100 feet of tidal water), habitat protection areas or forest buffer areas (includes forest conservation areas). Based on the scope of proposed earth disturbance, a grading permit will be required as part of this development project. Erosion and Sediment Control Plans will be submitted to, and approved by, the MDE prior to initiation of land disturbance for development. Wetlands have previously been identified within the project area, so a permit will be required from the MDE Water Resources Administration.

Contingency measures will include the following:

1. The MDE will be notified immediately of any previously undiscovered contamination, previously undiscovered storage tanks and other oil-related issues, and citations from regulatory entities related to health and safety practices.

2. Any significant change to the implementation schedule will be noted in the progress reports to MDE.

3. Modified Level D PPE will be used for the entire scope of ground intrusive work covered by this RADWP as a protective measure to ensure that there are no unacceptable exposures for Construction Workers during project implementation. The modified Level D PPE requirements which will be applied during this project are outlined in the PPE SOP provided as **Appendix C**. If it is not possible to implement the PPE SOP as provided, the agencies will be notified and a RADWP Addendum will be submitted to detail any appropriate mitigative measures.

7.0 IMPLEMENTATION SCHEDULE

Progress reports will be submitted to the MDE on a quarterly basis. Each quarterly progress report will include, at a minimum, a discussion of the following information regarding tasks completed during the specified quarter:

- Development Progress
- Soil Management (imported materials, screening, stockpiling)
- Soil Sampling and Disposal
- Water Management
- Dust Monitoring
- Notable Occurrences (if applicable)
- Additional Associated Work (if applicable)

The proposed implementation schedule is shown below:

Task	Proposed Completion Date
Anticipated RADWP Approval	June 30, 2022

Task	Proposed Completion Date
Installation of Erosion and Sediment Controls	April 2023
Site Preparation/Grading – Building Pad & Parking	May – August 2023
Utility Installations	September – October 2023
Installation of Pavements	November 2023 – January 2024
Installation of Turf Field	January – April 2024
Construction of Building	September 2023 – July 2024
Submittal of Development Completion Report/ Notice of Completion of Remedial Actions*	November 2024
Request for NFA from the MDE	November 2024

Recordation of institutional controls in the land records office of Baltimore County	Within 30 days of receiving the approval of NFA from the MDE
Submit proof of recordation with Baltimore County	Upon receipt from Baltimore County

*Notice of Completion of Remedial Actions will be prepared by Professional Engineer registered in Maryland and submitted with the Development Completion Report to certify that the work is consistent with the requirements of this RADWP and the Site is suitable for occupancy and use.

FIGURES

Tradepoint Atlantic
Area A and Area B Parcels

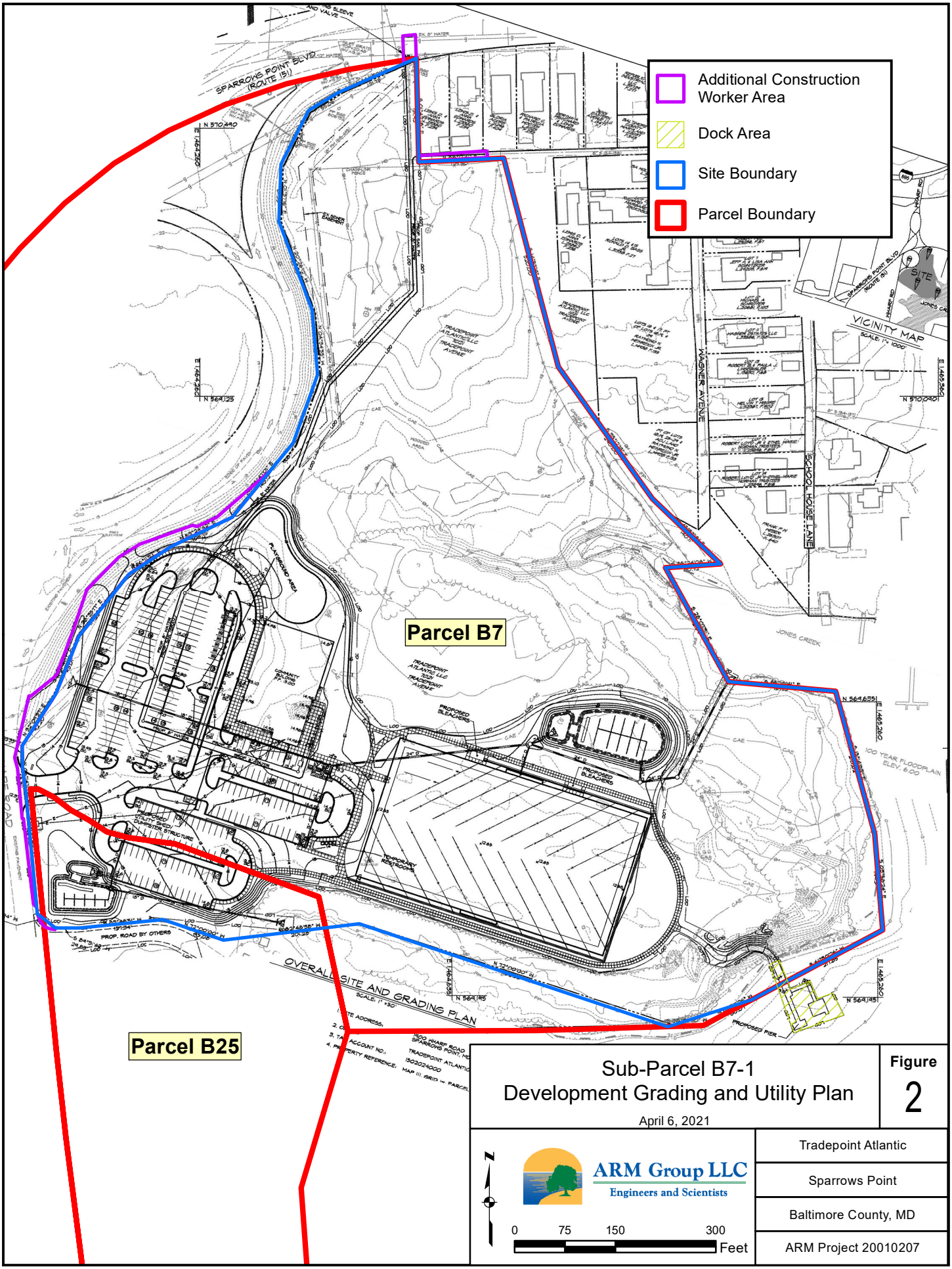
March 24, 2021

Figure
1

ARM Group LLC
Engineers and Scientists

0 500 1,000 2,000
Feet

Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
Area A: Project 200101
Area B: Project 200102
B7-1: Project 20010207



Sub-Parcel B7-1
Development Grading and Utility Plan

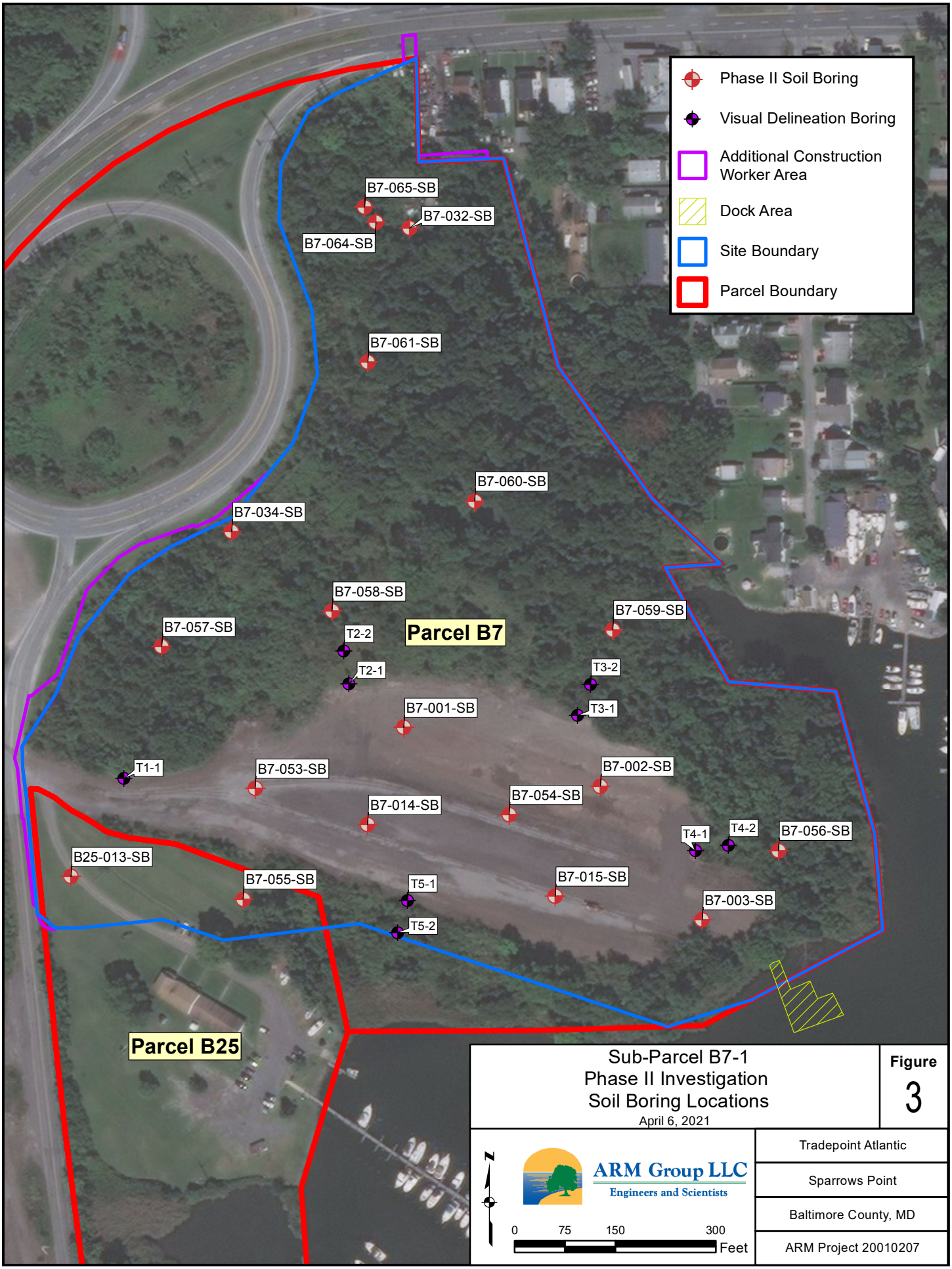
April 6, 2021

Figure 2

ARM Group LLC
Engineers and Scientists

0 75 150 300 Feet

Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 20010207

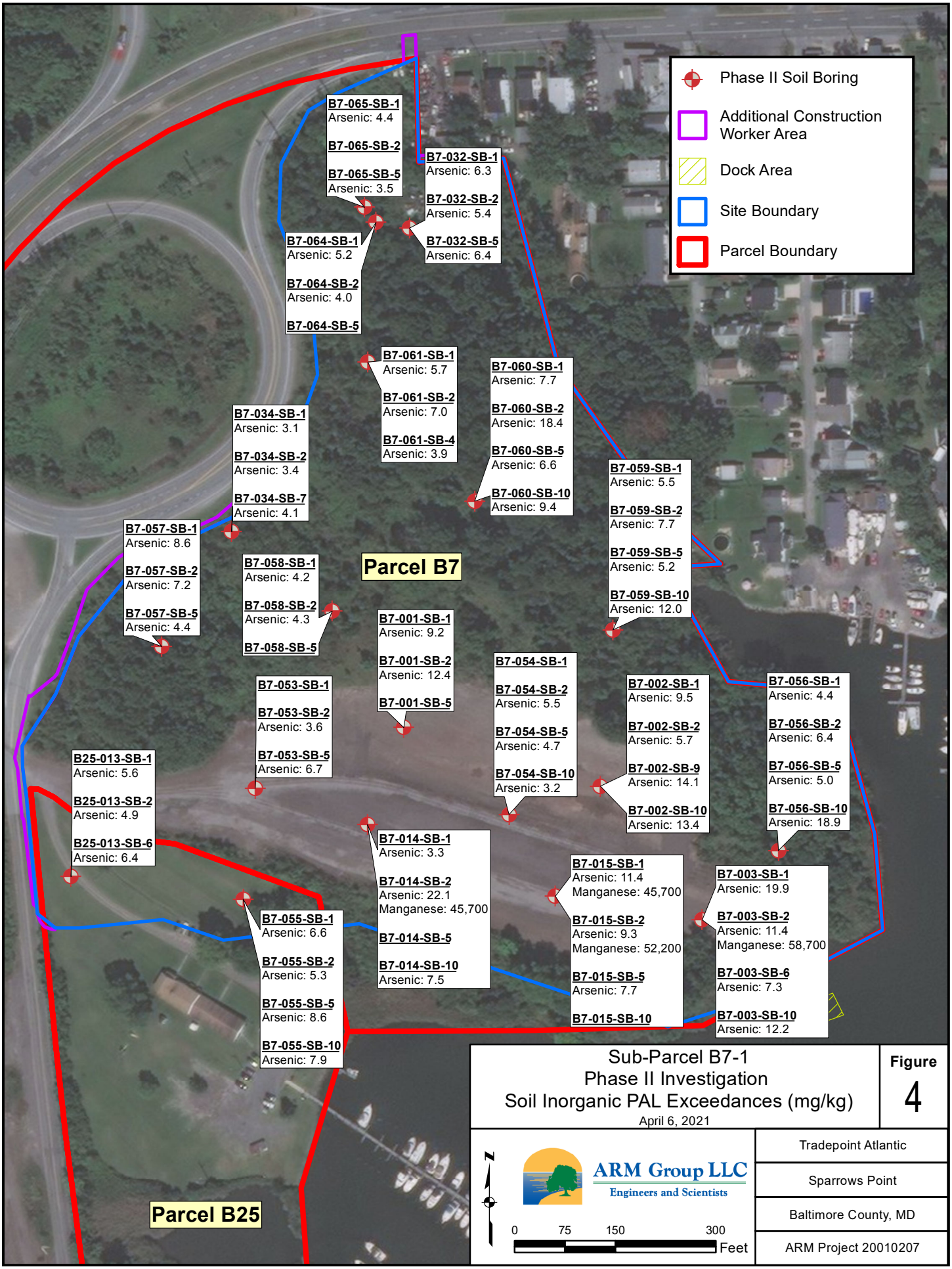


Sub-Parcel B7-1
Phase II Investigation
Soil Boring Locations
April 6, 2021

Figure
3

ARM Group LLC
Engineers and Scientists

Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 20010207

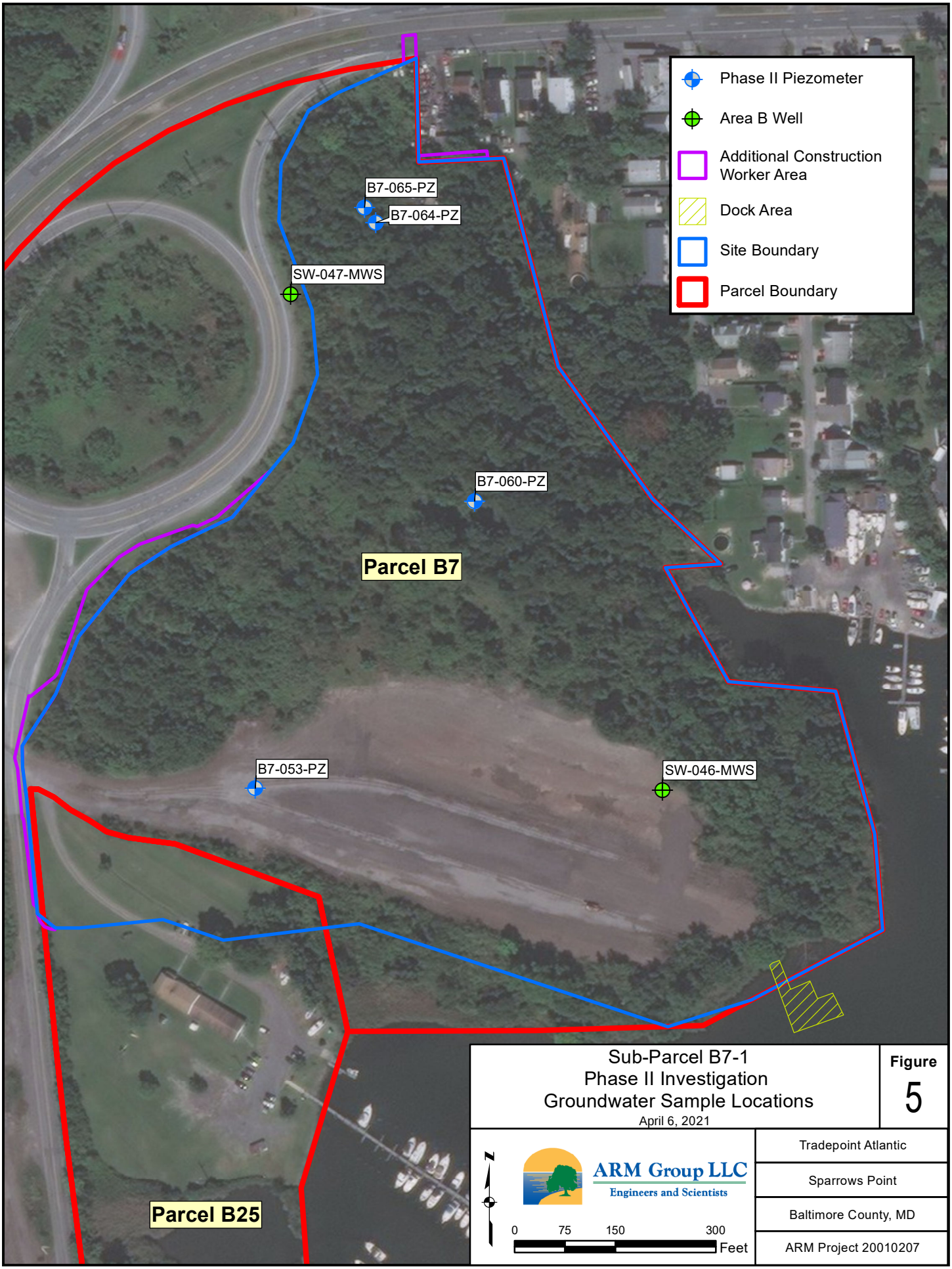


Sub-Parcel B7-1
Phase II Investigation
Soil Inorganic PAL Exceedances (mg/kg)
April 6, 2021

Figure 4

ARM Group LLC
Engineers and Scientists

Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 20010207

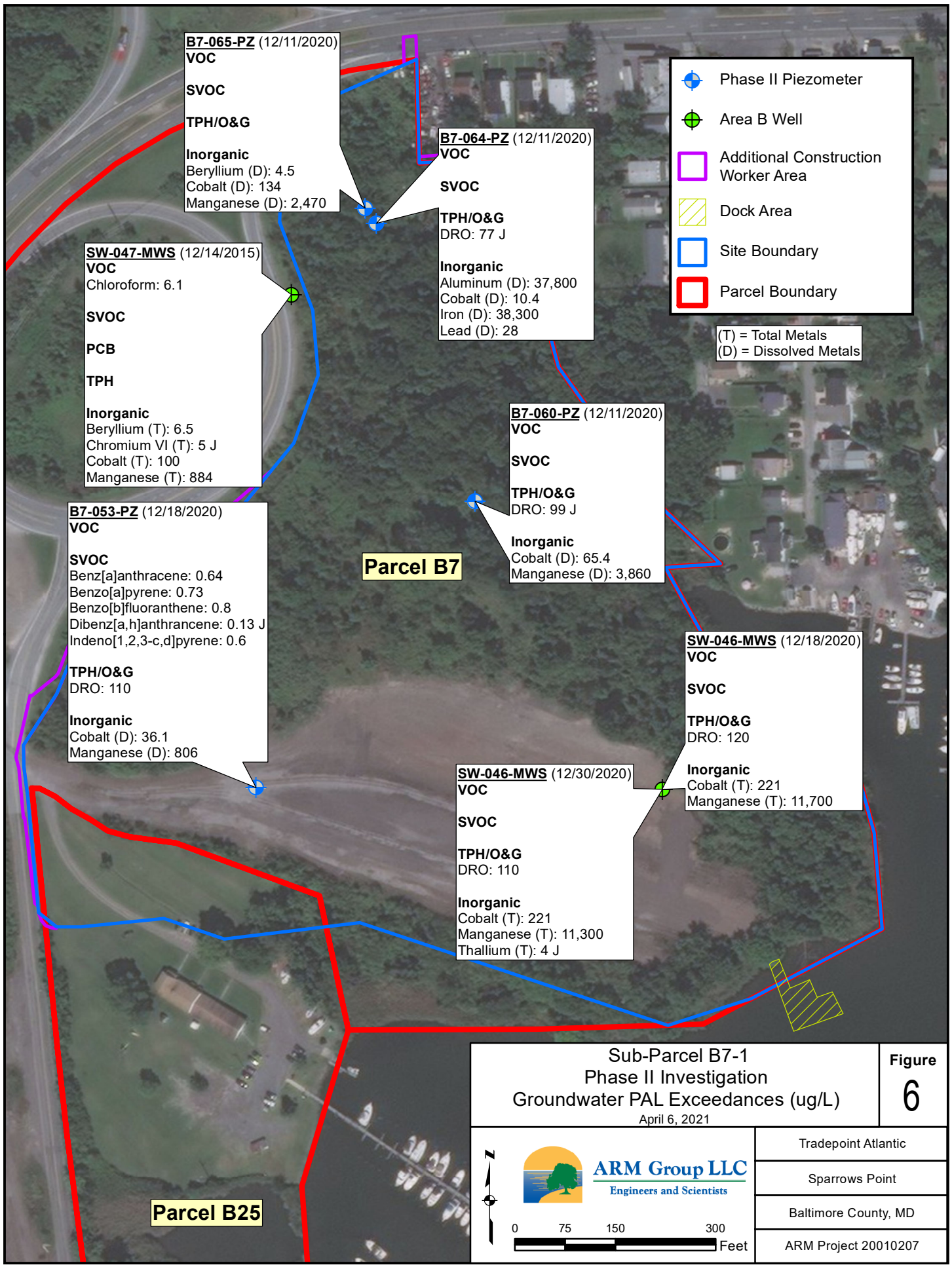


Sub-Parcel B7-1
Phase II Investigation
Groundwater Sample Locations
April 6, 2021

Figure
5

ARM Group LLC
Engineers and Scientists

Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 20010207

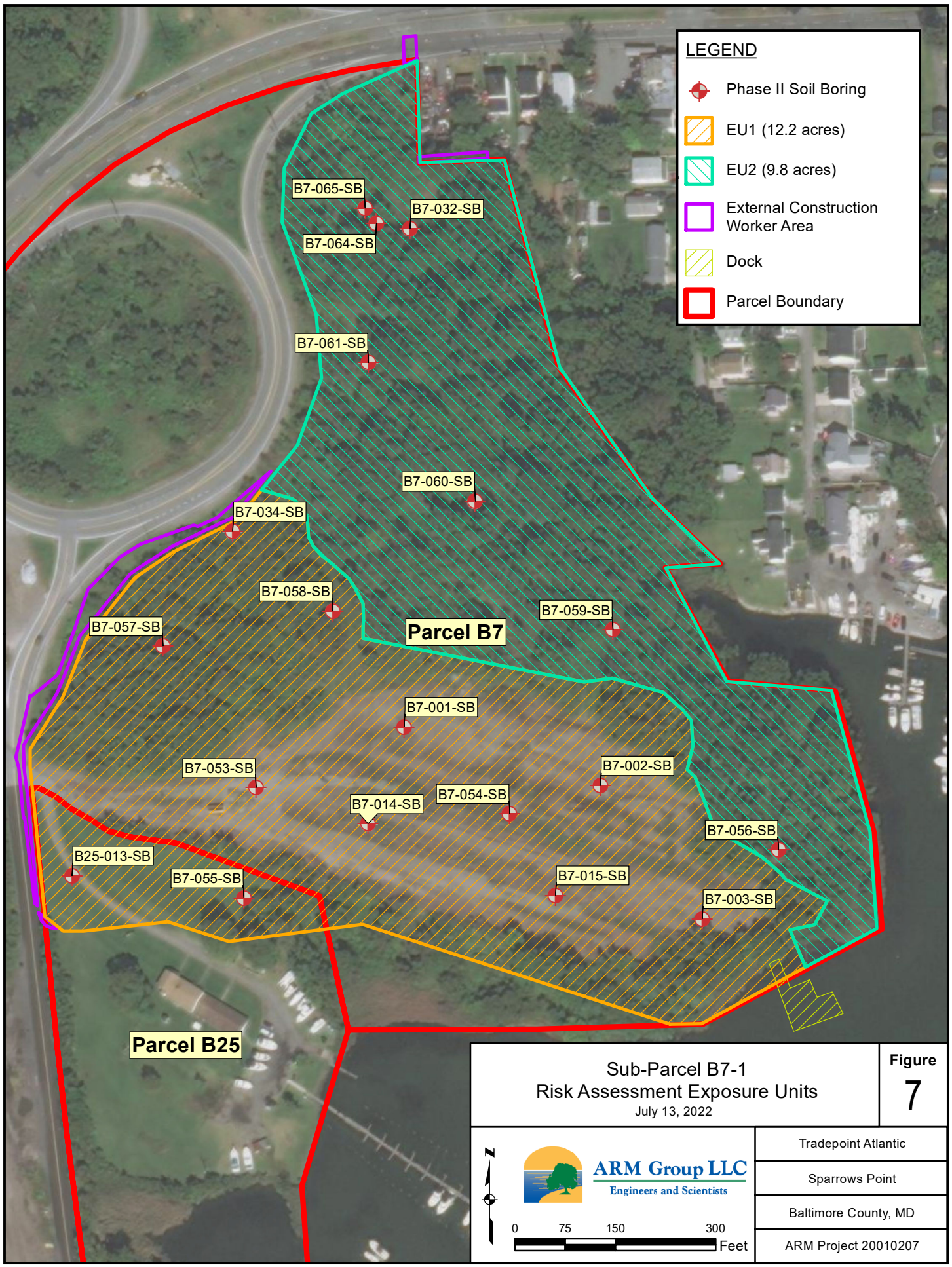


Sub-Parcel B7-1
Phase II Investigation
Groundwater PAL Exceedances (ug/L)
April 6, 2021

Figure 6

ARM Group LLC
Engineers and Scientists

Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 20010207



Sub-Parcel B7-1
Risk Assessment Exposure Units
July 13, 2022

Figure 7

ARM Group LLC
Engineers and Scientists

0 75 150 300 Feet

Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 20010207

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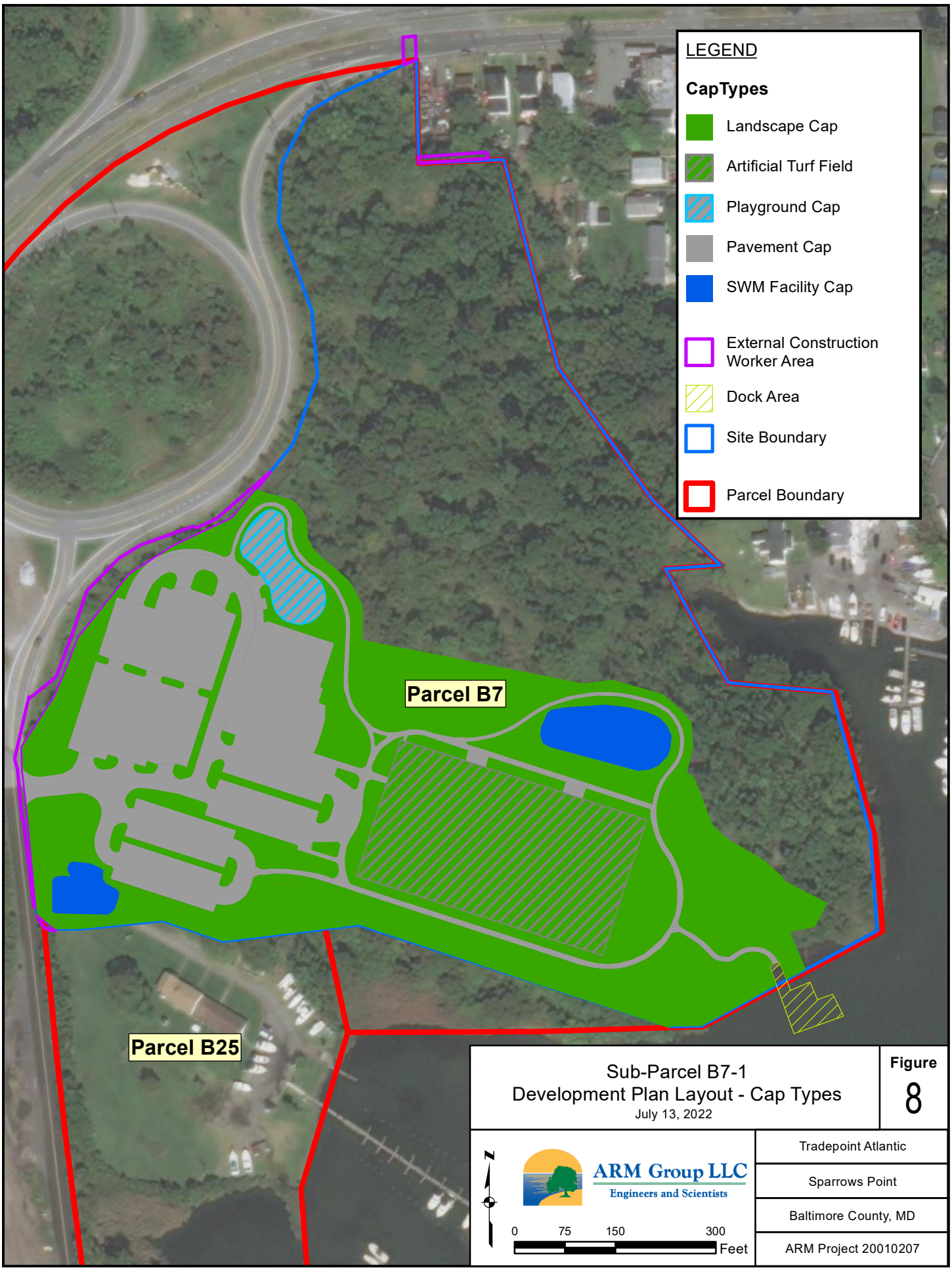


Sub-Parcel B7-1
Development Plan Layout - Cap Types
July 13, 2022

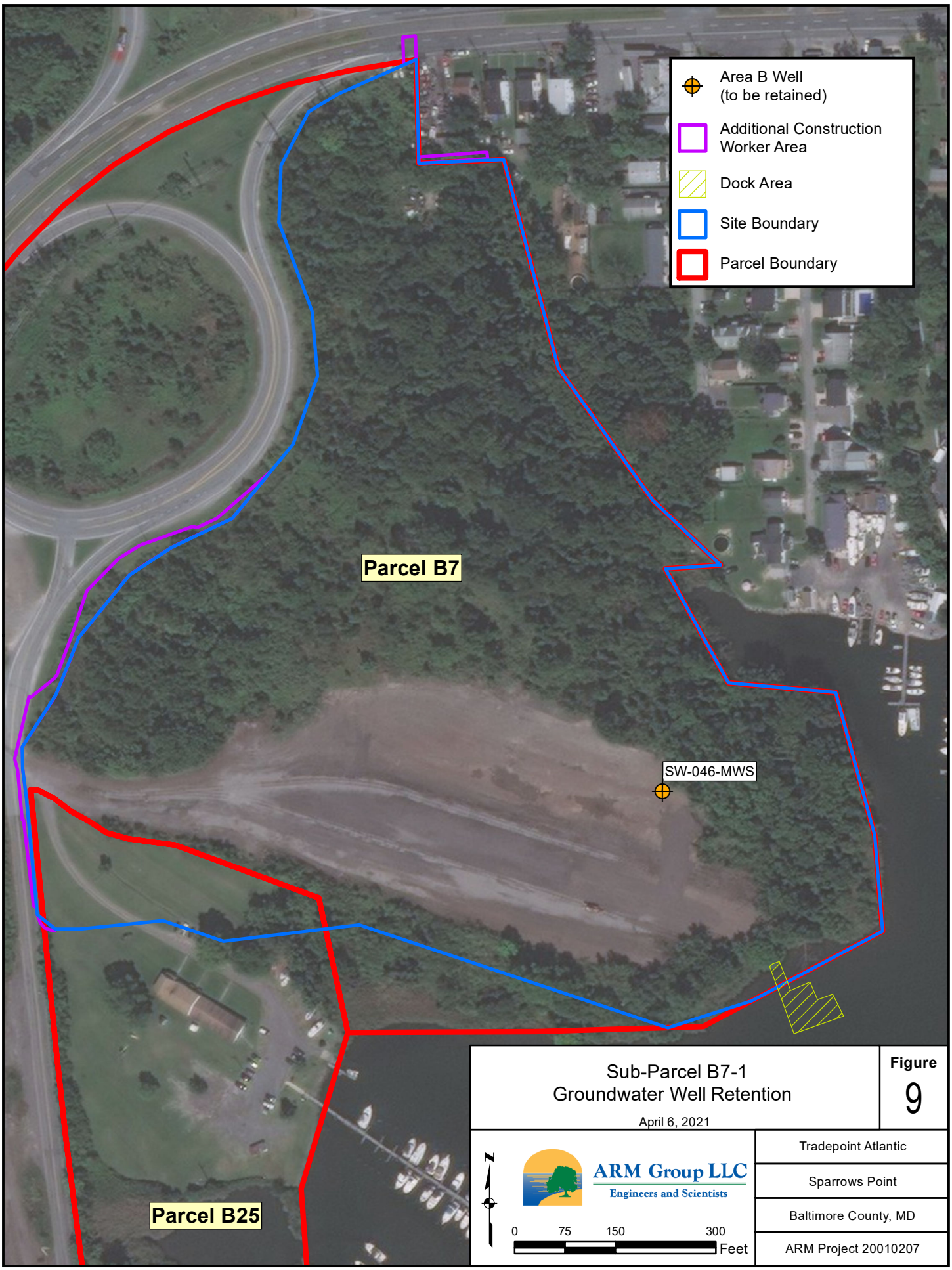
Figure
8

ARM Group LLC
Engineers and Scientists

0 75 150 300
Feet

Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 20010207

P:\EnviroAnalytics Group\160443M EAG_TPA Redevelopment\GIS\Parcel B7-1.mxd



Sub-Parcel B7-1
Groundwater Well Retention

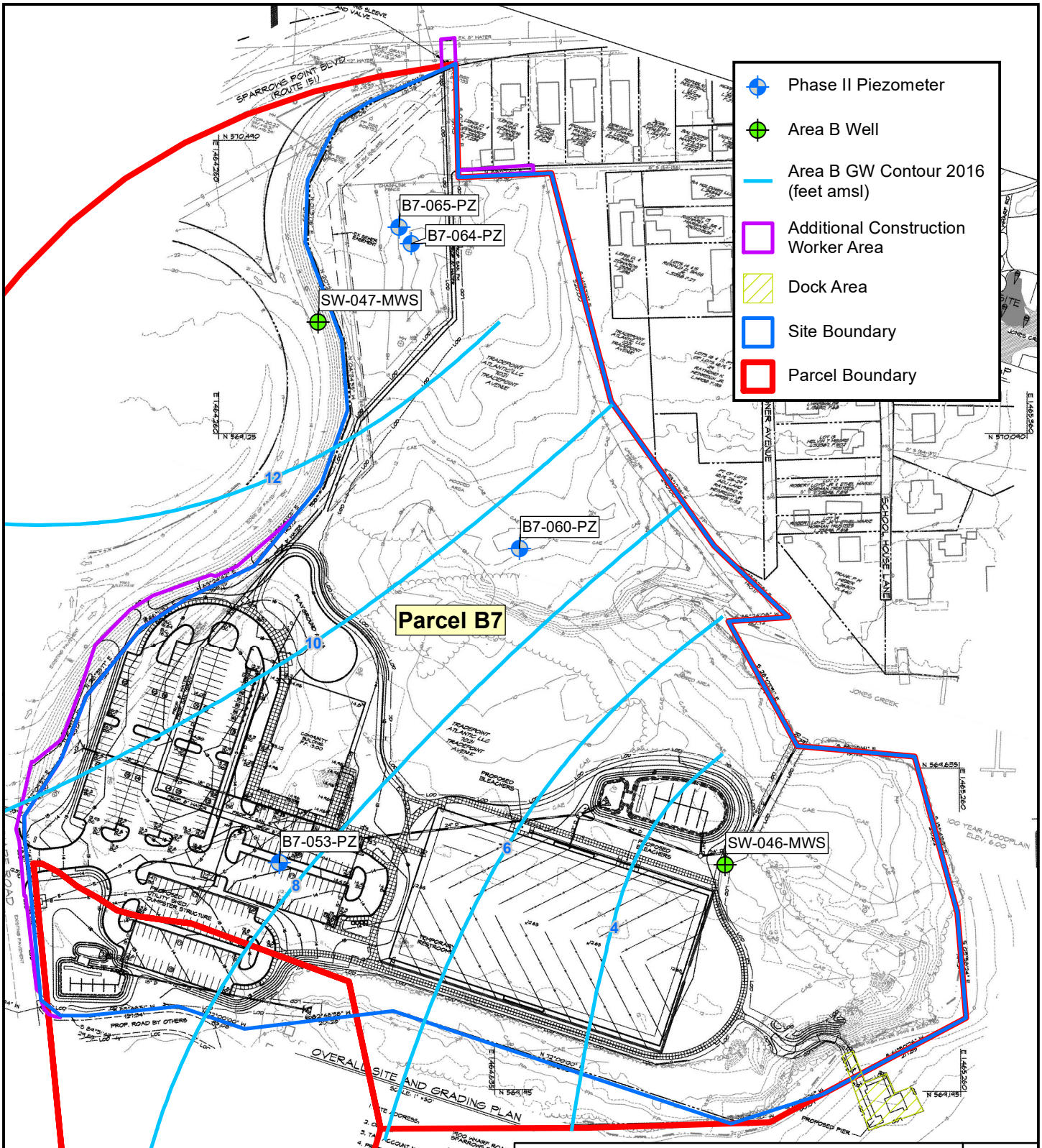
April 6, 2021

Figure
9

ARM Group LLC
Engineers and Scientists

0 75 150 300
Feet

Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 20010207



Sub-Parcel B7-1
Shallow Groundwater Contour Map (ft amsl)
Development Grading and Utility Plan
April 6, 2021

Figure 10

ARM Group LLC
Engineers and Scientists

0 75 150 300 Feet

Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 20010207

TABLES

Table 1 - Sub-Parcel B7-1
Summary of Organics Detected in Soil

Parameter	Units	PAL	B25-013-SB-1* 10/17/2018	B25-013-SB-2* 10/17/2018	B25-013-SB-6* 10/17/2018	B7-001-SB-1* 10/2/2018	B7-001-SB-2* 10/2/2018	B7-001-SB-5* 10/2/2018	B7-002-SB-1* 10/2/2018	B7-002-SB-2* 10/2/2018	B7-002-SB-9* 10/2/2018	B7-003-SB-1* 10/2/2018	B7-003-SB-2* 10/2/2018	B7-003-SB-6* 10/2/2018
Volatile Organic Compounds														
Acetone	mg/kg	670,000	0.013 U	**0.0082 J**	0.0094 U	N/A	**0.21**	N/A	N/A	N/A	0.01 U	0.012 U	0.01 U	**0.022**
Ethylbenzene	mg/kg	25	**0.018**	**0.0018 J**	0.0047 U	N/A	0.0048 U	N/A	N/A	N/A	0.005 U	0.0061 U	0.005 U	0.008 U
Xylenes	mg/kg	2,800	**0.13**	**0.014**	0.014 U	N/A	0.014 U	N/A	N/A	N/A	0.015 U	0.018 U	0.015 U	0.024 U
Semi-Volatile Organic Compounds^														
2-Methylnaphthalene	mg/kg	3,000	**0.0049 J**	0.0078 U	0.0079 U	**0.019**	**0.028**	0.0076 U	**0.046**	0.0073 U	0.0084 U	**0.0092**	**0.06**	**0.028**
Acenaphthene	mg/kg	45,000	0.008 U	0.0078 U	0.0079 U	**0.01**	**0.041**	0.0076 U	**0.031**	0.0073 U	0.0084 U	**0.0041 J**	**0.048**	**0.039**
Acenaphthylene	mg/kg	45,000	**0.0016 J**	0.0078 U	0.0079 U	**0.0063 J**	**0.027**	0.0076 U	**0.0098**	0.0073 U	0.0084 U	**0.014**	**0.49**	**0.053**
Anthracene	mg/kg	230,000	**0.0012 J**	0.0078 U	0.0079 U	**0.014**	**0.13**	0.0076 U	**0.039**	0.0073 U	0.0084 U	**0.013**	**0.66**	**0.13**
Benz[a]anthracene	mg/kg	21	**0.0069 J**	**0.0018 J**	0.0079 U	**0.075**	**0.28**	0.0076 U	**0.22**	0.0073 U	0.0084 U	**0.06**	**2**	**0.24**
Benzaldehyde	mg/kg	120,000	0.078 U	0.077 U	0.077 U	0.072 U	**0.027 J**	0.075 U	0.071 U	0.073 U	0.083 U	0.073 U	0.74 U	0.08 U
Benzo[a]pyrene	mg/kg	2.1	**0.007 J**	**0.0011 J**	0.0079 U	**0.098**	**0.24**	0.0076 U	**0.34**	0.0073 U	0.0084 U	**0.077**	**1.4**	**0.2**
Benzo[b]fluoranthene	mg/kg	21	**0.014**	**0.002 J**	0.0079 U	**0.21**	**0.46**	0.0076 U	**0.49**	0.0073 U	0.0084 U	**0.13**	**2.2**	**0.28**
Benzo[g,h,i]perylene	mg/kg		**0.0052 J**	0.0078 U	0.0079 U	**0.054**	**0.099**	0.0076 U	**0.17**	0.0073 U	0.0084 U	**0.047**	**0.47**	**0.054**
Benzo[k]fluoranthene	mg/kg	210	**0.013**	**0.0019 J**	0.0079 U	**0.19**	**0.14**	0.0076 U	**0.16**	0.0073 U	0.0084 U	**0.05**	**0.89**	**0.12**
bis(2-Ethylhexyl)phthalate	mg/kg	160	0.078 U	0.077 U	0.077 U	**0.03 J**	**0.093**	0.075 U	0.071 U	0.073 U	0.083 U	0.073 U	0.74 U	0.08 U
Caprolactam	mg/kg	400,000	0.2 U	0.19 U	0.19 U	0.18 U	0.19 U	0.19 U	0.18 U	0.18 U	0.21 U	0.18 U	1.9 U	0.2 U
Carbazole	mg/kg		0.078 U	0.077 U	0.077 U	0.072 U	0.075 U	0.075 U	**0.02 J**	0.073 U	0.083 U	0.073 U	0.74 U	0.08 U
Chrysene	mg/kg	2,100	**0.0077 J**	**0.0009 J**	0.0079 U	**0.098**	**0.31**	0.0076 U	**0.25**	0.0073 U	0.0084 U	**0.08**	**1.4**	**0.22**
Dibenz[a,h]anthracene	mg/kg	2.1	0.008 U	0.0078 U	0.0079 U	**0.021**	**0.045**	0.0076 U	**0.068**	0.0073 U	0.0084 U	**0.019**	**0.22**	**0.026**
Di-n-butylphthalate	mg/kg	82,000	0.078 U	0.077 U	0.077 U	0.072 U	**0.031 J**	0.075 U	0.071 U	0.073 U	0.083 U	0.073 U	0.74 U	0.08 U
Di-n-ocytlphthalate	mg/kg	8,200	0.078 U	0.077 U	0.077 U	**0.057 J**	**0.059 J**	**0.056 J**	**0.057 J**	**0.054 J**	**0.062 J**	**0.055 J**	0.74 U	0.08 U
Fluoranthene	mg/kg	30,000	**0.012**	**0.0017 J**	0.0079 U	**0.079**	**0.33**	0.0076 U	**0.22**	0.0073 U	0.0084 U	**0.06**	**4.7**	**0.81**
Fluorene	mg/kg	30,000	0.008 U	0.0078 U	0.0079 U	**0.0036 J**	**0.024**	0.0076 U	**0.01**	0.0073 U	0.0084 U	**0.002 J**	**0.25**	**0.035**
Indeno[1,2,3-c,d]pyrene	mg/kg	21	**0.0045 J**	0.0078 U	0.0079 U	**0.062**	**0.12**	0.0076 U	**0.2**	0.0073 U	0.0084 U	**0.053**	**0.61**	**0.07**
Naphthalene	mg/kg	8.6	**0.0098**	0.0078 U	0.0079 U	**0.022**	**0.017**	0.0076 U	**0.061**	0.0073 U	0.0084 U	**0.024**	**0.22**	**0.062**
Phenanthrene	mg/kg		**0.0063 J**	**0.00086 J**	0.0079 U	**0.065**	**0.26**	**0.0012 J**	**0.15**	0.0073 U	0.0084 U	**0.034**	**2.9**	**0.18**
Pyrene	mg/kg	23,000	**0.01**	**0.0017 J**	0.0079 U	**0.069**	**0.25**	0.0076 U	**0.2**	0.0073 U	0.0084 U	**0.051**	**3.6**	**0.55**
PCBs														
Aroclor 1248	mg/kg	0.94	0.02 U	N/A	N/A	**0.045**	N/A	N/A	**0.027**	N/A	N/A	0.018 U	N/A	N/A
Aroclor 1254	mg/kg	0.97	0.02 U	N/A	N/A	0.019 U	N/A	N/A	0.018 U	N/A	N/A	**0.13**	N/A	N/A
Aroclor 1260	mg/kg	0.99	0.02 U	N/A	N/A	**0.064**	N/A	N/A	**0.058**	N/A	N/A	0.018 U	N/A	N/A
Aroclor 1268	mg/kg		**0.014 J**	N/A	N/A	0.019 U	N/A	N/A	**0.044**	N/A	N/A	**0.032**	N/A	N/A
PCBs (total)	mg/kg	0.97	0.18 U	N/A	N/A	**0.11 J**	N/A	N/A	**0.13 J**	N/A	N/A	**0.16 J**	N/A	N/A
TPH/Oil & Grease														
Diesel Range Organics	mg/kg	6,200	**17.4**	**5.4 J**	7.8 U	**42.9**	**42.8**	7.6 U	**76.8**	7.4 U	8.5 U	**16.4**	**55.6**	**84.6**
Gasoline Range Organics	mg/kg	6,200	**4 J**	11.5 U	9.8 U	13 U	12.2 U	12.5 U	10.8 U	10.1 U	10.7 U	11.9 U	14 U	10.1 U
Oil & Grease	mg/kg	6,200	**770**	**527**	**557**	**184**	**280**	**369**	**288**	**424**	**467**	**248**	**526**	**906**

Detections in bold
Values in red indicate an exceedance of the Project Action Limit (PAL)
N/A indicates that the parameter was not analyzed for this sample
*indicates non-validated data
^PAH compounds were analyzed via SIM

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

Table 1 - Sub-Parcel B7-1
Summary of Organics Detected in Soil

Parameter	Units	PAL	B7-014-SB-1* 10/1/2018	B7-014-SB-2* 10/1/2018	B7-014-SB-5* 10/1/2018	B7-014-SB-10* 10/1/2018	B7-015-SB-1* 10/1/2018	B7-015-SB-2* 10/1/2018	B7-015-SB-5* 10/1/2018	B7-015-SB-10* 10/1/2018	B7-032-SB-1* 12/21/2020	B7-032-SB-2* 12/21/2020	B7-032-SB-5* 12/21/2020	B7-034-SB-1* 10/2/2018
Volatile Organic Compounds														
Acetone	mg/kg	670,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ethylbenzene	mg/kg	25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Xylenes	mg/kg	2,800	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Semi-Volatile Organic Compounds^														
2-Methylnaphthalene	mg/kg	3,000	**0.019**	**0.0023 J**	0.0079 U	0.0085 U	**0.008**	**0.0018 J**	0.008 U	0.0077 U	**0.005 J**	**0.0094**	0.0084 U	**0.0032 J**
Acenaphthene	mg/kg	45,000	**0.0099**	**0.00094 J**	0.0079 U	0.0085 U	**0.0014 J**	0.0075 U	0.008 U	0.0077 U	**0.0013 J**	**0.0022 J**	0.0084 U	**0.0013 J**
Acenaphthylene	mg/kg	45,000	**0.011**	**0.0044 J**	0.0079 U	0.0085 U	**0.019**	**0.0039 J**	0.008 U	0.0077 U	**0.0024 J**	**0.0056 J**	0.0084 U	**0.0066 J**
Anthracene	mg/kg	230,000	**0.017**	**0.004 J**	0.0079 U	0.0085 U	**0.022**	**0.0097**	0.008 U	0.0077 U	**0.0035 J**	**0.0097**	0.0084 U	**0.0087**
Benz[a]anthracene	mg/kg	21	**0.08**	**0.019**	**0.0012 J**	0.0085 U	**0.088**	**0.034**	0.008 U	0.0077 U	**0.019**	**0.043**	0.0084 U	**0.032**
Benzaldehyde	mg/kg	120,000	0.074 U	0.072 U	0.077 U	0.085 U	0.072 U	0.073 U	0.08 U	0.076 U	0.82 U	0.079 U	0.083 U	0.081 U
Benzo[a]pyrene	mg/kg	2.1	**0.11**	**0.019**	0.0079 U	0.0085 U	**0.078**	**0.021**	0.008 U	0.0077 U	**0.024**	**0.047**	0.0084 U	**0.026**
Benzo[b]fluoranthene	mg/kg	21	**0.14**	**0.042**	**0.0012 J**	0.0085 U	**0.14**	**0.039**	0.008 U	0.0077 U	**0.061**	**0.11**	0.0084 U	**0.039**
Benzo[g,h,i]perylene	mg/kg		**0.1**	**0.015**	0.0079 U	0.0085 U	**0.059**	**0.015**	0.008 U	0.0077 U	**0.011**	**0.01**	0.0084 U	**0.0089**
Benzo[k]fluoranthene	mg/kg	210	**0.059**	**0.038**	0.0079 U	0.0085 U	**0.056**	**0.014**	0.008 U	0.0077 U	**0.055**	**0.096**	0.0084 U	**0.016**
bis(2-Ethylhexyl)phthalate	mg/kg	160	0.074 U	0.072 U	0.077 U	0.085 U	0.072 U	0.073 U	0.08 U	0.076 U	**0.23 J**	**0.02 J**	**0.025 J**	0.081 U
Caprolactam	mg/kg	400,000	0.18 U	0.18 U	0.19 U	0.21 U	0.18 U	0.18 U	0.2 U	0.19 U	2 U	0.2 U	**0.028 J**	0.2 U
Carbazole	mg/kg		0.074 U	0.072 U	0.077 U	0.085 U	0.072 U	0.073 U	0.08 U	0.076 U	0.82 U	0.079 U	0.083 U	0.081 U
Chrysene	mg/kg	2,100	**0.097**	**0.021**	0.0079 U	0.0085 U	**0.094**	**0.038**	0.008 U	0.0077 U	**0.026**	**0.051**	0.0084 U	**0.03**
Dibenz[a,h]anthracene	mg/kg	2.1	**0.029**	**0.0039 J**	0.0079 U	0.0085 U	**0.018**	**0.0056 J**	0.008 U	0.0077 U	**0.0036 J**	**0.0044 J**	0.0084 U	**0.0032 J**
Di-n-butylphthalate	mg/kg	82,000	0.074 U	0.072 U	0.077 U	0.085 U	0.072 U	0.073 U	0.08 U	0.076 U	0.82 U	**0.026 J**	**0.048 J**	0.081 U
Di-n-ocytlphthalate	mg/kg	8,200	0.056 B	0.054 B	**0.058 J**	**0.063 J**	**0.055 J**	**0.056 J**	**0.06 J**	**0.057 J**	0.82 U	0.079 U	0.083 U	**0.059 J**
Fluoranthene	mg/kg	30,000	**0.11**	**0.03**	0.0079 U	0.0085 U	**0.14**	**0.049**	0.008 U	0.0077 U	**0.027**	**0.087**	0.0084 U	**0.05**
Fluorene	mg/kg	30,000	**0.0057 J**	**0.00069 J**	0.0079 U	0.0085 U	**0.0025 J**	**0.00084 J**	0.008 U	0.0077 U	**0.0014 J**	**0.0034 J**	0.0084 U	**0.0014 J**
Indeno[1,2,3-c,d]pyrene	mg/kg	21	**0.09**	**0.012**	0.0079 U	0.0085 U	**0.051**	**0.016**	0.008 U	0.0077 U	**0.0094**	**0.011**	0.0084 U	**0.0098**
Naphthalene	mg/kg	8.6	**0.031**	**0.0046 J**	0.0079 U	**0.0081 J**	**0.013**	**0.004 J**	0.008 U	0.0077 U	**0.0067 J**	**0.0066 J**	**0.0029 J**	**0.0032 J**
Phenanthrene	mg/kg		**0.063**	**0.011**	0.0079 U	0.0085 U	**0.041**	**0.027**	0.008 U	0.0077 U	**0.013**	**0.059**	0.0084 U	**0.03**
Pyrene	mg/kg	23,000	**0.091**	**0.026**	0.0079 U	0.0085 U	**0.13**	**0.043**	0.008 U	0.0077 U	**0.027**	**0.079**	0.0084 U	**0.05**
PCBs														
Aroclor 1248	mg/kg	0.94	0.019 U	0.018 U	0.019 U	0.022 U	0.018 U	0.018 U	0.02 U	0.019 U	0.21 U	N/A	N/A	0.02 U
Aroclor 1254	mg/kg	0.97	**0.089**	0.018 U	0.019 U	0.022 U	0.018 U	0.018 U	0.02 U	0.019 U	0.21 U	N/A	N/A	0.02 U
Aroclor 1260	mg/kg	0.99	0.019 U	0.018 U	0.019 U	0.022 U	0.018 U	0.018 U	0.02 U	0.019 U	0.21 U	N/A	N/A	0.02 U
Aroclor 1268	mg/kg		0.019 U	0.018 U	0.019 U	0.022 U	0.018 U	0.018 U	0.02 U	0.019 U	0.21 U	N/A	N/A	0.02 U
PCBs (total)	mg/kg	0.97	**0.089 J**	0.16 U	0.17 U	0.19 U	0.16 U	0.17 U	0.18 U	0.18 U	0.21 U	N/A	N/A	0.18 U
TPH/Oil & Grease														
Diesel Range Organics	mg/kg	6,200	**15.7**	**7.5**	7.9 U	8.5 U	**6.2 J**	**7.5**	8.1 U	7.8 U	**195**	**28.8**	**11.7 J**	**9.8**
Gasoline Range Organics	mg/kg	6,200	13.4 U	12.6 U	10.1 U	11.8 U	16.1 U	11.4 U	9.8 U	9.5 U	15 U	13.4 U	12.4 U	10.6 U
Oil & Grease	mg/kg	6,200	**916**	**325**	**570**	**768**	**279**	**299**	**797**	**493**	**1,090**	**315 J**	500 U	**364**

Detections in bold
Values in red indicate an exceedance of the Project Action Li
N/A indicates that the parameter was not analyzed for this sample
*indicates non-validated data
^PAH compounds were analyzed via SIM

Table 1 - Sub-Parcel B7-1
Summary of Organics Detected in Soil

Parameter	Units	PAL	B7-034-SB-2* 10/2/2018	B7-034-SB-7* 10/2/2018	B7-053-SB-1 12/7/2020	B7-053-SB-2 12/7/2020	B7-053-SB-5 12/7/2020	B7-054-SB-1 12/7/2020	B7-054-SB-2 12/7/2020	B7-054-SB-5 12/7/2020	B7-055-SB-1* 12/8/2020	B7-055-SB-2* 12/8/2020	B7-055-SB-5* 12/8/2020	B7-056-SB-1 12/7/2020	B7-056-SB-2 12/7/2020
Volatile Organic Compounds															
Acetone	mg/kg	670,000	N/A	0.0088 U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ethylbenzene	mg/kg	25	N/A	0.0044 U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Xylenes	mg/kg	2,800	N/A	0.013 U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Semi-Volatile Organic Compounds^															
2-Methylnaphthalene	mg/kg	3,000	**0.0023 J**	0.0077 U	**0.0069 J**	**0.0021 J**	0.0081 U	**0.0016 J**	**0.0029 J**	**0.012**	**0.0023 J**	**0.0018 J**	0.0085 U	**0.024**	**0.0078**
Acenaphthene	mg/kg	45,000	0.0078 U	0.0077 U	**0.007 J**	0.0077 U	0.0081 U	**0.0017 J**	**0.002 J**	**0.0012 J**	0.0083 U	0.0081 U	0.0085 U	**0.0087**	**0.0011 J**
Acenaphthylene	mg/kg	45,000	**0.0049 J**	0.0077 U	**0.0076**	**0.002 J**	0.0081 U	**0.047**	**0.0025 J**	**0.0028 J**	**0.0027 J**	**0.0079 J**	0.0085 U	**0.31**	**0.023**
Anthracene	mg/kg	230,000	**0.0033 J**	0.0077 U	**0.011**	**0.0032 J**	0.0081 U	**0.027**	**0.0046 J**	**0.0031 J**	**0.0016 J**	**0.0021 J**	0.0085 U	**0.098**	**0.011**
Benz[a]anthracene	mg/kg	21	**0.015**	0.0077 U	**0.038**	**0.013**	0.0081 U	**0.073**	**0.018**	**0.011**	**0.01**	**0.0096**	0.0085 U	**0.3**	**0.037**
Benzaldehyde	mg/kg	120,000	0.078 U	0.076 U	0.071 U	0.077 U	0.081 U	0.071 U	0.079 U	0.08 U	0.081 U	0.08 U	0.084 U	0.078 U	1.5 U
Benzo[a]pyrene	mg/kg	2.1	**0.014**	0.0077 U	**0.045**	**0.013**	0.0081 U	**0.088**	**0.018**	**0.012**	**0.013**	**0.02**	0.0085 U	**0.68**	**0.059**
Benzo[b]fluoranthene	mg/kg	21	**0.028**	0.0077 U	**0.081**	**0.026**	0.0081 U	**0.24**	**0.032**	**0.023**	**0.021**	**0.032**	0.0085 U	**1.3**	**0.11**
Benzo[g,h,i]perylene	mg/kg		**0.005 J**	0.0077 U	**0.034**	**0.0092**	0.0081 U	**0.17**	**0.011**	**0.0086**	**0.0096**	**0.026**	0.0085 U	**0.22**	**0.041**
Benzo[k]fluoranthene	mg/kg	210	**0.026**	0.0077 U	**0.08**	**0.026**	0.0081 U	**0.23 J**	**0.032**	**0.023**	**0.021**	**0.032**	0.0085 U	**1.3**	**0.11**
bis(2-Ethylhexyl)phthalate	mg/kg	160	0.078 U	0.076 U	0.035 B	0.041 B	0.037 B	0.028 B	0.041 B	0.038 B	0.081 U	0.08 U	0.084 U	0.032 B	1.5 U
Caprolactam	mg/kg	400,000	0.19 U	0.19 U	0.18 U	0.19 U	0.2 U	0.18 U	0.2 U	0.2 U	0.2 U	0.2 U	0.21 U	0.2 U	3.8 U
Carbazole	mg/kg		0.078 U	0.076 U	0.071 U	0.077 U	0.081 U	0.071 U	0.079 U	0.08 U	0.081 U	0.08 U	0.084 U	0.078 U	1.5 U
Chrysene	mg/kg	2,100	**0.013**	0.0077 U	**0.041**	**0.013**	0.0081 U	**0.11**	**0.019**	**0.013**	**0.011**	**0.011**	0.0085 U	**0.33**	**0.042**
Dibenz[a,h]anthracene	mg/kg	2.1	**0.0017 J**	0.0077 U	**0.0089**	**0.0034 J**	0.0081 U	**0.041**	**0.0041 J**	**0.003 J**	**0.0035 J**	**0.0074 J**	0.0085 U	**0.1**	**0.014**
Di-n-butylphthalate	mg/kg	82,000	0.078 U	0.076 U	0.045 B	0.06 B	0.051 B	0.037 B	0.046 B	0.048 B	**0.042 J**	**0.053 J**	**0.034 J**	0.04 B	1.5 U
Di-n-ocytlphthalate	mg/kg	8,200	**0.058 J**	**0.057 J**	0.071 U	0.077 U	0.081 U	0.071 U	0.079 U	0.08 U	0.081 U	0.08 U	0.084 U	0.078 UJ	1.5 U
Fluoranthene	mg/kg	30,000	**0.023**	0.0077 U	**0.066**	**0.02**	0.0081 U	**0.1**	**0.036**	**0.02**	**0.013**	**0.011**	0.0085 U	**0.48**	**0.086**
Fluorene	mg/kg	30,000	0.0078 U	0.0077 U	**0.0061 J**	**0.0013 J**	0.0081 U	**0.0025 J**	**0.0021 J**	**0.0028 J**	0.0083 U	0.0081 U	0.0085 U	**0.023**	**0.0038 J**
Indeno[1,2,3-c,d]pyrene	mg/kg	21	**0.0053 J**	0.0077 U	**0.031**	**0.0084**	0.0081 U	**0.14**	**0.011**	**0.0079 J**	**0.0084**	**0.022**	0.0085 U	**0.26**	**0.04**
Naphthalene	mg/kg	8.6	**0.0055 J**	0.0077 U	**0.011**	**0.0035 J**	0.0081 U	**0.007 J**	**0.0048 J**	**0.0068 J**	**0.0027 J**	**0.0044 J**	0.0085 U	**0.057**	**0.016**
Phenanthrene	mg/kg		**0.0098**	0.0077 U	**0.029**	**0.0081**	0.0081 U	**0.021**	**0.022**	**0.0088**	**0.0062 J**	**0.005 J**	0.0085 U	**0.19**	**0.031**
Pyrene	mg/kg	23,000	**0.019**	0.0077 U	**0.061**	**0.018**	0.0081 U	**0.13**	**0.033**	**0.019**	**0.013**	**0.0096**	0.0085 U	**0.44**	**0.075**
PCBs															
Aroclor 1248	mg/kg	0.94	N/A	N/A	0.092 U	N/A	N/A	0.089 U	N/A	N/A	0.021 U	N/A	N/A	0.098 U	N/A
Aroclor 1254	mg/kg	0.97	N/A	N/A	0.092 U	N/A	N/A	0.089 U	N/A	N/A	0.021 U	N/A	N/A	0.098 U	N/A
Aroclor 1260	mg/kg	0.99	N/A	N/A	0.092 U	N/A	N/A	0.089 U	N/A	N/A	0.021 U	N/A	N/A	0.098 U	N/A
Aroclor 1268	mg/kg		N/A	N/A	0.092 U	N/A	N/A	0.089 U	N/A	N/A	0.021 U	N/A	N/A	0.098 U	N/A
PCBs (total)	mg/kg	0.97	N/A	N/A	0.092 U	N/A	N/A	0.089 U	N/A	N/A	0.021 U	N/A	N/A	0.098 U	N/A
TPH/Oil & Grease															
Diesel Range Organics	mg/kg	6,200	**5.8 J**	7.9 U	**16.3**	**64.9**	16.4 U	**221**	**20.5**	**49.9**	**12.4 J**	16 U	16.5 U	**60.7**	**44.8**
Gasoline Range Organics	mg/kg	6,200	11.9 U	8.9 U	11.8 U	9.4 U	10.1 U	8.2 U	9.9 U	10.3 U	12.2 U	8.9 U	11.6 U	10 U	9.5 U
Oil & Grease	mg/kg	6,200	**378**	**325**	219 U	**314**	495 U	**189 J**	**224 J**	492 U	500 U	492 U	504 U	**226 J**	464 U

Detections in bold
Values in red indicate an exceedance of the Project Action Li
N/A indicates that the parameter was not analyzed for this sample
*indicates non-validated data
^PAH compounds were analyzed via SIM

Table 1 - Sub-Parcel B7-1
Summary of Organics Detected in Soil

Parameter	Units	PAL	B7-056-SB-5 12/7/2020	B7-057-SB-1* 12/10/2020	B7-057-SB-2* 12/10/2020	B7-057-SB-5* 12/10/2020	B7-058-SB-1 12/7/2020	B7-058-SB-2 12/7/2020	B7-058-SB-5 12/7/2020	B7-059-SB-1 12/7/2020	B7-059-SB-2 12/7/2020	B7-059-SB-5 12/7/2020	B7-060-SB-1* 12/8/2020	B7-060-SB-2* 12/8/2020	B7-060-SB-5* 12/8/2020
Volatile Organic Compounds															
Acetone	mg/kg	670,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ethylbenzene	mg/kg	25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Xylenes	mg/kg	2,800	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Semi-Volatile Organic Compounds^															
2-Methylnaphthalene	mg/kg	3,000	0.0075 U	**0.057**	**0.038**	**0.019**	**0.0027 J**	0.0082 U	0.0078 U	0.008 U	**0.008 J**	0.008 U	**0.079**	**0.037**	**0.0016 J**
Acenaphthene	mg/kg	45,000	0.0075 U	**0.069**	**0.011**	**0.0068 J**	**0.0016 J**	0.0082 U	0.0078 U	0.008 U	**0.0022 J**	0.008 U	**0.032**	**0.041**	0.0077 U
Acenaphthylene	mg/kg	45,000	**0.0021 J**	**0.2**	**0.19**	**0.14**	**0.014**	0.0082 U	0.0078 U	**0.0011 J**	**0.0075 J**	0.008 U	**0.25**	**0.091**	**0.0011 J**
Anthracene	mg/kg	230,000	**0.002 J**	**0.38**	**0.14**	**0.055**	**0.0068 J**	0.0082 U	0.0078 U	**0.00078 J**	**0.017**	0.008 U	**0.17**	**0.14**	**0.0011 J**
Benz[a]anthracene	mg/kg	21	**0.016**	**0.95**	**0.66**	**0.29**	**0.048**	0.0082 U	0.0078 U	**0.0033 J**	**0.038**	0.008 U	**0.78**	**0.48**	**0.008**
Benzaldehyde	mg/kg	120,000	0.074 U	0.077 U	0.087 U	0.079 U	0.078 U	0.08 U	0.078 U	0.079 U	0.092 U	0.08 U	0.85 U	0.84 U	0.076 U
Benzo[a]pyrene	mg/kg	2.1	**0.018**	**0.81**	**0.8**	**0.44**	**0.05**	0.0082 U	0.0078 U	**0.0032 J**	**0.037**	0.008 U	**0.91**	**0.5**	**0.0083**
Benzo[b]fluoranthene	mg/kg	21	**0.029**	**1.5**	**1.5**	**0.77**	**0.096**	0.0082 U	0.0078 U	**0.0057 J**	**0.062**	0.008 U	**1.5**	**0.79**	**0.013**
Benzo[g,h,i]perylene	mg/kg		**0.01**	**0.35**	**0.37**	**0.25**	**0.024**	0.0082 U	0.0078 U	**0.002 J**	**0.016**	0.008 U	**0.58**	**0.26**	**0.0062 J**
Benzo[k]fluoranthene	mg/kg	210	**0.029**	**1.3**	**1.3**	**0.7**	**0.095**	0.0082 U	0.0078 U	**0.0057 J**	**0.062**	0.008 U	**1.5**	**0.79**	**0.013**
bis(2-Ethylhexyl)phthalate	mg/kg	160	0.036 B	0.077 U	0.087 U	0.079 U	0.042 B	0.032 B	0.023 B	0.035 B	0.044 B	0.033 B	0.85 U	0.84 U	0.076 U
Caprolactam	mg/kg	400,000	0.19 U	0.19 U	0.22 U	0.2 U	0.2 U	0.2 U	0.19 U	0.2 U	0.23 U	0.2 U	2.1 U	2.1 U	0.19 U
Carbazole	mg/kg		0.074 U	**0.043 J**	**0.036 J**	0.079 U	0.078 U	0.08 U	0.078 U	0.079 U	0.092 U	0.08 U	0.85 U	**0.2 J**	0.076 U
Chrysene	mg/kg	2,100	**0.015**	**0.88**	**0.67**	**0.32**	**0.061**	0.0082 U	0.0078 U	**0.003 J**	**0.038**	0.008 U	**0.77**	**0.46**	**0.008**
Dibenz[a,h]anthracene	mg/kg	2.1	**0.0031 J**	**0.13**	**0.14**	**0.085**	**0.0097**	0.0082 U	0.0078 U	0.008 U	**0.0072 J**	0.008 U	**0.22**	**0.1**	**0.0018 J**
Di-n-butylphthalate	mg/kg	82,000	0.042 B	**0.043 J**	**0.043 J**	**0.036 J**	0.049 B	0.036 B	0.03 B	0.042 B	0.055 B	0.04 B	0.85 U	0.84 U	**0.045 J**
Di-n-ocytlphthalate	mg/kg	8,200	0.074 U	0.077 U	0.087 U	0.079 U	0.078 UJ	0.08 U	0.078 U	0.079 U	0.092 U	0.08 U	0.85 U	0.84 U	0.076 U
Fluoranthene	mg/kg	30,000	**0.025**	**2.1**	**0.99**	**0.34**	**0.15**	0.0082 U	0.0078 U	**0.0043 J**	**0.072**	0.008 U	**1.3**	**0.9**	**0.013**
Fluorene	mg/kg	30,000	0.0075 U	**0.097**	**0.021**	**0.011**	**0.0058 J**	0.0082 U	0.0078 U	0.008 U	**0.0027 J**	0.008 U	**0.038**	**0.049**	0.0077 U
Indeno[1,2,3-c,d]pyrene	mg/kg	21	**0.0096**	**0.36**	**0.38**	**0.25**	**0.024**	0.0082 U	0.0078 U	**0.002 J**	**0.018**	0.008 U	**0.62**	**0.28**	**0.0053 J**
Naphthalene	mg/kg	8.6	**0.0029 J**	**0.16**	**0.25**	**0.19**	**0.0045 J**	0.0082 U	0.0078 U	**0.0034 J**	**0.038**	0.008 U	**0.64**	**0.18**	**0.0021 J**
Phenanthrene	mg/kg		**0.0064 J**	**1.1**	**0.32**	**0.1**	**0.11**	0.0082 U	0.0078 U	**0.0018 J**	**0.033**	**0.00072 J**	**0.54**	**0.49**	**0.0057 J**
Pyrene	mg/kg	23,000	**0.024**	**1.7**	**0.84**	**0.31**	**0.11**	0.0082 U	0.0078 U	**0.0037 J**	**0.056**	0.008 U	**0.95**	**0.71**	**0.012**
PCBs															
Aroclor 1248	mg/kg	0.94	N/A	0.097 U	N/A	N/A	0.02 U	N/A	N/A	0.02 U	N/A	N/A	0.11 U	N/A	N/A
Aroclor 1254	mg/kg	0.97	N/A	0.097 U	N/A	N/A	0.02 U	N/A	N/A	0.02 U	N/A	N/A	0.11 U	N/A	N/A
Aroclor 1260	mg/kg	0.99	N/A	0.097 U	N/A	N/A	0.02 U	N/A	N/A	0.02 U	N/A	N/A	0.11 U	N/A	N/A
Aroclor 1268	mg/kg		N/A	0.097 U	N/A	N/A	0.02 U	N/A	N/A	0.02 U	N/A	N/A	0.11 U	N/A	N/A
PCBs (total)	mg/kg	0.97	N/A	0.097 U	N/A	N/A	0.02 U	N/A	N/A	0.02 U	N/A	N/A	0.11 U	N/A	N/A
TPH/Oil & Grease															
Diesel Range Organics	mg/kg	6,200	13.2 B	**772**	**54.4**	**30.3**	**19**	12.2 B	10.4 B	**20.3**	**28.2**	10.4 B	**52.7**	**91.8**	**12.9 J**
Gasoline Range Organics	mg/kg	6,200	9 U	11.3 U	13.2 U	11.8 U	10.5 U	10.5 U	9.5 U	10.4 U	11.7 U	10.5 U	12 U	10.6 U	9.1 U
Oil & Grease	mg/kg	6,200	226 U	483 U	534 U	**243 J**	480 U	247 U	235 U	482 U	550 U	243 U	**233 J**	509 U	**140 J**

Detections in bold
Values in red indicate an exceedance of the Project Action Li
N/A indicates that the parameter was not analyzed for this sample
*indicates non-validated data
^PAH compounds were analyzed via SIM

Table 1 - Sub-Parcel B7-1
Summary of Organics Detected in Soil

Parameter	Units	PAL	B7-061-SB-1* 12/10/2020	B7-061-SB-2* 12/10/2020	B7-061-SB-4* 12/10/2020	B7-064-SB-1* 12/10/2020	B7-064-SB-2* 12/10/2020	B7-064-SB-5* 12/10/2020	B7-065-SB-1* 12/10/2020	B7-065-SB-2* 12/10/2020	B7-065-SB-5* 12/10/2020
Volatile Organic Compounds											
Acetone	mg/kg	670,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ethylbenzene	mg/kg	25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Xylenes	mg/kg	2,800	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Semi-Volatile Organic Compounds^											
2-Methylnaphthalene	mg/kg	3,000	0.008 U	0.008 U	0.0079 U	0.0078 U	0.0078 U	0.0079 U	0.008 U	0.0084 U	**0.0022 J**
Acenaphthene	mg/kg	45,000	0.008 U	0.008 U	0.0079 U	**0.0015 J**	0.0078 U	0.0079 U	**0.00075 J**	0.0084 U	**0.0013 J**
Acenaphthylene	mg/kg	45,000	0.008 U	0.008 U	0.0079 U	**0.0022 J**	0.0078 U	0.0079 U	**0.0022 J**	0.0084 U	0.0079 U
Anthracene	mg/kg	230,000	**0.00084 J**	0.008 U	0.0079 U	**0.0027 J**	0.0078 U	0.0079 U	**0.0013 J**	0.0084 U	0.0079 U
Benz[a]anthracene	mg/kg	21	**0.0049 J**	0.008 U	0.0079 U	**0.017**	0.0078 U	0.0079 U	**0.012**	0.0084 U	0.0079 U
Benzaldehyde	mg/kg	120,000	0.079 U	0.08 U	0.079 U	0.078 U	0.077 U	0.078 U	0.08 U	0.083 U	0.078 U
Benzo[a]pyrene	mg/kg	2.1	**0.0043 J**	0.008 U	0.0079 U	**0.019**	0.0078 U	0.0079 U	**0.014**	0.0084 U	0.0079 U
Benzo[b]fluoranthene	mg/kg	21	**0.0051 J**	0.008 U	0.0079 U	**0.031**	0.0078 U	0.0079 U	**0.023**	0.0084 U	0.0079 U
Benzo[g,h,i]perylene	mg/kg		**0.0026 J**	0.008 U	0.0079 U	**0.011**	0.0078 U	0.0079 U	**0.0079 J**	0.0084 U	0.0079 U
Benzo[k]fluoranthene	mg/kg	210	**0.0022 J**	0.008 U	0.0079 U	**0.028**	0.0078 U	0.0079 U	**0.021**	0.0084 U	0.0079 U
bis(2-Ethylhexyl)phthalate	mg/kg	160	0.079 U	0.08 U	0.079 U	0.078 U	0.077 U	0.078 U	0.08 U	0.083 U	0.078 U
Caprolactam	mg/kg	400,000	0.2 U	0.2 U	0.2 U	0.2 U	0.19 U	0.2 U	0.2 U	0.21 U	0.2 U
Carbazole	mg/kg		0.079 U	0.08 U	0.079 U	0.078 U	0.077 U	0.078 U	0.08 U	0.083 U	0.078 U
Chrysene	mg/kg	2,100	**0.0046 J**	0.008 U	0.0079 U	**0.019**	**0.00042 J**	0.0079 U	**0.014**	0.0084 U	0.0079 U
Dibenz[a,h]anthracene	mg/kg	2.1	0.008 U	0.008 U	0.0079 U	**0.0033 J**	0.0078 U	0.0079 U	**0.0026 J**	0.0084 U	0.0079 U
Di-n-butylphthalate	mg/kg	82,000	**0.037 J**	**0.036 J**	**0.032 J**	**0.037 J**	**0.042 J**	**0.048 J**	**0.04 J**	**0.046 J**	**0.039 J**
Di-n-ocytlphthalate	mg/kg	8,200	0.079 U	0.08 U	0.079 U	0.078 U	0.077 U	0.078 U	0.08 U	0.083 U	0.078 U
Fluoranthene	mg/kg	30,000	**0.007 J**	0.008 U	0.0079 U	**0.034**	0.0078 U	0.0079 U	**0.023**	**0.00079 J**	**0.00072 J**
Fluorene	mg/kg	30,000	0.008 U	0.008 U	0.0079 U	0.0078 U	0.0078 U	0.0079 U	0.008 U	0.0084 U	0.0079 U
Indeno[1,2,3-c,d]pyrene	mg/kg	21	**0.0021 J**	0.008 U	0.0079 U	**0.0091**	0.0078 U	0.0079 U	**0.0073 J**	0.0084 U	0.0079 U
Naphthalene	mg/kg	8.6	0.008 U	0.008 U	0.0079 U	**0.0021 J**	0.0078 U	0.0079 U	0.008 U	0.0084 U	**0.0053 J**
Phenanthrene	mg/kg		**0.0039 J**	0.008 U	0.0079 U	**0.018**	0.0078 U	0.0079 U	**0.0093**	0.0084 U	**0.0011 J**
Pyrene	mg/kg	23,000	**0.0072 J**	0.008 U	0.0079 U	**0.031**	0.0078 U	0.0079 U	**0.02**	0.0084 U	0.0079 U
PCBs											
Aroclor 1248	mg/kg	0.94	0.021 U	N/A	N/A	0.02 U	N/A	N/A	0.02 U	N/A	N/A
Aroclor 1254	mg/kg	0.97	0.021 U	N/A	N/A	0.02 U	N/A	N/A	0.02 U	N/A	N/A
Aroclor 1260	mg/kg	0.99	0.021 U	N/A	N/A	0.02 U	N/A	N/A	0.02 U	N/A	N/A
Aroclor 1268	mg/kg		0.021 U	N/A	N/A	0.02 U	N/A	N/A	0.02 U	N/A	N/A
PCBs (total)	mg/kg	0.97	0.021 U	N/A	N/A	0.02 U	N/A	N/A	0.02 U	N/A	N/A
TPH/Oil & Grease											
Diesel Range Organics	mg/kg	6,200	**10.7 J**	16 U	**10 J**	15.3 U	15.4 U	15.4 U	15.6 U	16.9 U	15.4 U
Gasoline Range Organics	mg/kg	6,200	9.5 U	9.1 U	9.5 U	9.4 U	9.3 U	8.6 U	9.9 U	10.8 U	11.1 U
Oil & Grease	mg/kg	6,200	480 U	486 U	479 U	474 U	468 U	476 U	487 U	512 U	476 U

Detections in bold
Values in red indicate an exceedance of the Project Action Li
N/A indicates that the parameter was not analyzed for this sample
*indicates non-validated data
^PAH compounds were analyzed via SIM

Table 2 - Sub-Parcel B7-1
Summary of Inorganics Detected in Soil

Parameter	Units	PAL	B25-013-SB-1* 10/17/2018	B25-013-SB-2* 10/17/2018	B25-013-SB-6* 10/17/2018	B7-001-SB-1* 10/2/2018	B7-001-SB-2* 10/2/2018	B7-001-SB-5* 10/2/2018
Metals								
Aluminum	mg/kg	1,100,000	**11,400**	**16,200**	**18,800**	**5,860**	**6,510**	**4,960**
Antimony	mg/kg	470	2.8 U	2.7 U	2.8 U	2.5 U	2.6 U	2.6 U
Arsenic	mg/kg	3	**5.6**	**4.9**	**6.4**	**9.2**	**12.4**	2.2 U
Barium	mg/kg	220,000	**170**	**43.9**	**46.2**	**63.4**	**174**	**13.2**
Beryllium	mg/kg	2,300	**0.85 J**	**0.65 J**	**0.68 J**	**0.42 J**	**0.27 J**	0.88 U
Cadmium	mg/kg	980	**0.6 J**	1.3 U	1.4 U	1.3 U	**0.76 J**	1.3 U
Chromium	mg/kg	120,000	**120**	**26.1**	**67.3**	**903**	**844**	**5.3**
Chromium VI	mg/kg	6.3	1.2 U	1.2 U	1.2 U	**0.77 J**	1.1 U	1.1 U
Cobalt	mg/kg	350	**6.7**	**6.6**	**6.2**	**5.3**	**6.1**	**2.8 J**
Copper	mg/kg	47,000	**26.2**	**12.6**	**8.3**	**60.5**	**84**	4.4 U
Iron	mg/kg	820,000	**30,600**	**25,900**	**20,000**	**215,000**	**189,000**	**3,670**
Lead	mg/kg	800	**66.7**	**13.2**	**12.1**	**63.5**	**291**	**3.9**
Manganese	mg/kg	26,000	**4,070**	**168**	**99.6**	**22,500**	**20,200**	**39.4**
Mercury	mg/kg	350	**0.078 J**	0.11 U	0.11 U	**0.021 J**	**0.41**	**0.0073 J**
Nickel	mg/kg	22,000	**15.5**	**13.3**	**64.4**	**26.7**	**39.2**	**3.1 J**
Vanadium	mg/kg	5,800	**189**	**36.4**	**39.7**	**2,410**	**471**	**14.2**
Zinc	mg/kg	350,000	**300**	**38.4**	**27**	**142**	**414**	**8.4**
Other								
Cyanide	mg/kg	150	**0.25 J**	1.1 U	1.2 U	**0.45 J**	**1.5**	1.1 U

Detections in bold
Values in red indicate an exceedance of the Project Action Limit (PAL)
N/A indicates that the parameter was not analyzed for this sample
*indicates non-validated data

U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit.
UJ: This analyte was not detected in the sample. The actual quantitation/detection limit may be higher than reported.
J: The positive result reported for this analyte is a quantitative estimate.
J-: The positive result reported for this analyte is a quantitative estimate, but may be biased low.
B: This analyte was not detected substantially above the level of the associated method or field blank.
R: The result for this analyte is unreliable. Additional data is needed to confirm or disprove the presence of this analyte in the sample.

Table 2 - Sub-Parcel B7-1
Summary of Inorganics Detected in Soil

Parameter	Units	PAL	B7-002-SB-1* 10/2/2018	B7-002-SB-2* 10/2/2018	B7-002-SB-9* 10/2/2018	B7-002-SB-10 10/2/2018	B7-003-SB-1* 10/2/2018	B7-003-SB-2* 10/2/2018
Metals								
Aluminum	mg/kg	1,100,000	**8,300**	**14,800**	**21,500**	N/A	**12,100**	**14,200**
Antimony	mg/kg	470	2.4 U	2.6 U	2.8 U	N/A	2.6 U	2.5 U
Arsenic	mg/kg	3	**9.5**	**5.7**	**14.1**	**13.4**	**19.9**	**11.4**
Barium	mg/kg	220,000	**85**	**38.7**	**97.4**	N/A	**142**	**176**
Beryllium	mg/kg	2,300	**0.64 J**	**0.45 J**	**1.7**	N/A	**1.5**	**1.3**
Cadmium	mg/kg	980	1.2 U	1.3 U	1.4 U	N/A	1.3 U	1.3 U
Chromium	mg/kg	120,000	**1,040**	**33.2**	**45.5**	N/A	**379**	**1,270**
Chromium VI	mg/kg	6.3	**0.7 J**	1.1 U	**0.65 J**	N/A	1.1 U	1.1 U
Cobalt	mg/kg	350	**8.3**	**5.8**	**8**	N/A	**32.9**	**9**
Copper	mg/kg	47,000	**292**	**8.3**	**29.4**	N/A	**191**	**133**
Iron	mg/kg	820,000	**223,000**	**21,800**	**53,200**	N/A	**299,000**	**158,000**
Lead	mg/kg	800	**281**	**15.8**	**22.9**	N/A	**79.1**	**32**
Manganese	mg/kg	26,000	**19,500**	**287**	**177**	N/A	**9,650**	**58,700**
Mercury	mg/kg	350	**0.035 J**	**0.019 J**	0.13 U	N/A	**0.028 J**	**0.019 J**
Nickel	mg/kg	22,000	**54.9**	**12.6**	**19.5**	N/A	**97.4**	**73.5**
Vanadium	mg/kg	5,800	**1,790**	**43.1**	**57.5**	N/A	**558**	**4,020**
Zinc	mg/kg	350,000	**180**	**37.8**	**80.3**	N/A	**207**	**68.1**
Other								
Cyanide	mg/kg	150	**0.49 J**	1.1 U	1.3 U	N/A	**0.34 J**	**0.14 J**

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Table 2 - Sub-Parcel B7-1
Summary of Inorganics Detected in Soil

Parameter	Units	PAL	B7-003-SB-6* 10/2/2018	B7-003-SB-10 10/2/2018	B7-014-SB-1* 10/1/2018	B7-014-SB-2* 10/1/2018	B7-014-SB-5* 10/1/2018	B7-014-SB-10* 10/1/2018
Metals								
Aluminum	mg/kg	1,100,000	**19,800**	N/A	**38,700**	**27,100**	**14,000**	**18,400**
Antimony	mg/kg	470	**10.3**	N/A	2.7 U	2.5 U	2.8 U	3.1 U
Arsenic	mg/kg	3	**7.3**	**12.2**	**3.3**	**22.1**	2.3 U	**7.5**
Barium	mg/kg	220,000	**103**	N/A	**422**	**406**	**50.7**	**64.4**
Beryllium	mg/kg	2,300	**0.98**	N/A	**4.2**	**2.4**	**0.58 J**	**1**
Cadmium	mg/kg	980	1.4 U	N/A	1.3 U	1.2 U	1.4 U	1.5 U
Chromium	mg/kg	120,000	**43.9**	N/A	**149**	**2,440**	**20.5**	**37.8**
Chromium VI	mg/kg	6.3	1.2 U	N/A	1.1 U	1.1 U	**0.65 J**	**1.2 J**
Cobalt	mg/kg	350	**16.6**	N/A	**9.9**	4.1 U	**6.5**	**7.8**
Copper	mg/kg	47,000	**27.9**	N/A	**50.6**	**35.8**	**8.1**	**14.5**
Iron	mg/kg	820,000	**27,200**	N/A	**110,000**	**98,200**	**12,900**	**32,400**
Lead	mg/kg	800	**52.1**	N/A	**87.3**	**9.1**	**9.3**	**12**
Manganese	mg/kg	26,000	**773**	N/A	**7,530**	**45,700**	**90.4**	**127**
Mercury	mg/kg	350	**2.6**	N/A	**0.011 J**	**0.0068 J**	0.11 U	0.12 U
Nickel	mg/kg	22,000	**32.9**	N/A	**14**	**5.2 J**	**14.4**	**18.5**
Vanadium	mg/kg	5,800	**48.7**	N/A	**244**	**1,850**	**22.8**	**41.1**
Zinc	mg/kg	350,000	**91.2**	N/A	**83.3**	**54.6**	**36.4**	**55.9**
Other								
Cyanide	mg/kg	150	**0.25 J**	N/A	**0.97**	**0.48 J**	0.95 U	1.3 U

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Table 2 - Sub-Parcel B7-1
Summary of Inorganics Detected in Soil

Parameter	Units	PAL	B7-015-SB-1* 10/1/2018	B7-015-SB-2* 10/1/2018	B7-015-SB-5* 10/1/2018	B7-015-SB-10* 10/1/2018	B7-032-SB-1* 12/21/2020	B7-032-SB-2* 12/21/2020
Metals								
Aluminum	mg/kg	1,100,000	**16,300**	**17,600**	**14,700**	**20,200**	**8,410**	**11,100**
Antimony	mg/kg	470	2.6 U	2.7 U	2.9 U	2.7 U	3.1 U	2.8 U
Arsenic	mg/kg	3	**11.4**	**9.3**	**7.7**	2.2 U	**6.3**	**5.4**
Barium	mg/kg	220,000	**277**	**353**	**87.5**	**62.9**	**61.5**	**78.5**
Beryllium	mg/kg	2,300	**1.3**	**1.9**	**0.69 J**	**0.72 J**	**1.2**	**0.52 J**
Cadmium	mg/kg	980	1.3 U	1.3 U	1.4 U	1.3 U	**1.2 J**	**0.44 J**
Chromium	mg/kg	120,000	**1,950**	**1,670**	**26.1**	**32.7**	**38.6**	**22.6**
Chromium VI	mg/kg	6.3	1.1 U	1.1 U	1.2 U	1.2 U	1.3 U	1.2 U
Cobalt	mg/kg	350	**3.1 J**	**1.6 J**	**9.5**	**10.3**	**8.9**	**5.7**
Copper	mg/kg	47,000	**44.1**	**38.4**	**8.6**	**9**	**36**	**20.4**
Iron	mg/kg	820,000	**138,000**	**124,000**	**23,600**	**15,700**	**26,900**	**14,900**
Lead	mg/kg	800	**30.9**	**22.9**	**11.7**	**10.6**	**107**	**66.4**
Manganese	mg/kg	26,000	**45,700**	**52,200**	**204**	**150**	**322**	**237**
Mercury	mg/kg	350	**0.025 J**	0.11 U	**0.0076 J**	0.12 U	**0.095 J**	**0.11 J**
Nickel	mg/kg	22,000	**12**	**9.2**	**14.1**	**18.5**	**22.9**	**12.6**
Vanadium	mg/kg	5,800	**3,130**	**3,410**	**35.6**	**31.8**	**44.5**	**32.5**
Zinc	mg/kg	350,000	**90.2**	**53.1**	**36.4**	**54.9**	**203**	**165**
Other								
Cyanide	mg/kg	150	**0.26 J**	**0.35 J**	1.1 U	0.93 U	**0.27 J**	**0.18 J**

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Table 2 - Sub-Parcel B7-1
Summary of Inorganics Detected in Soil

Parameter	Units	PAL	B7-032-SB-5* 12/21/2020	B7-034-SB-1* 10/2/2018	B7-034-SB-2* 10/2/2018	B7-034-SB-7* 10/2/2018	B7-053-SB-1 12/7/2020	B7-053-SB-2 12/7/2020	B7-053-SB-5 12/7/2020
Metals									
Aluminum	mg/kg	1,100,000	**21,200**	**20,000**	**15,100**	**16,400**	**31,900**	**13,400**	**16,600**
Antimony	mg/kg	470	2.9 U	2.8 U	2.8 U	2.7 U	2.7 UJ	2.7 UJ	2.9 UJ
Arsenic	mg/kg	3	**6.4**	**3.1**	**3.4**	**4.1**	2.2 UJ	**3.6**	**6.7**
Barium	mg/kg	220,000	**83.5**	**222**	**115**	**67.9**	**350 J**	**61.2 J**	**34.3 J**
Beryllium	mg/kg	2,300	**1**	**1.4**	**0.77 J**	**0.57 J**	**4.8**	**0.5 J**	**0.65 J**
Cadmium	mg/kg	980	1.4 U	**0.48 J**	1.4 U	1.3 U	**0.35 J**	1.4 U	1.4 U
Chromium	mg/kg	120,000	**24.9**	**28**	**30.2**	**20.1**	**22.3 J**	**20.5 J**	**26.7 J**
Chromium VI	mg/kg	6.3	1.2 U	1.2 U	1.2 U	1.2 U	1.1 R	1.2 R	0.79 B
Cobalt	mg/kg	350	**5.4**	**5.2**	**5.7**	**5**	4.4 U	**5.7**	**6.2**
Copper	mg/kg	47,000	**10.4**	**16.8**	**13.7**	**4.4 J**	**3.1 J**	**12.2**	**13.1**
Iron	mg/kg	820,000	**16,300**	**14,400**	**14,600**	**14,100**	**4,480 J**	**17,900 J**	**16,200 J**
Lead	mg/kg	800	**15.7**	**37.1**	**31.7**	**9.7**	**5.8**	**20.9**	**11.4**
Manganese	mg/kg	26,000	**54.4**	**1,650**	**584**	**25.2**	**2,370 J**	**243 J**	**67.9 J**
Mercury	mg/kg	350	0.12 U	**0.14**	**0.91**	0.12 U	0.1 U	**0.14**	**0.022 J**
Nickel	mg/kg	22,000	**14.6**	**21.2**	**19.8**	**11**	**1.6 J**	**12.2**	**13.9**
Vanadium	mg/kg	5,800	**30.5**	**72.1**	**46.3**	**25.1**	**39.9 J**	**32.8 J**	**33.1 J**
Zinc	mg/kg	350,000	**26.3**	**77.2**	**63.9**	**25.8**	**5.9**	**48**	**43.5**
Other									
Cyanide	mg/kg	150	1.3 U	**0.15 J**	1.2 U	1.1 U	**0.37 J**	**0.25 J**	**0.17 J**

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Table 2 - Sub-Parcel B7-1
Summary of Inorganics Detected in Soil

Parameter	Units	PAL	B7-054-SB-1 12/7/2020	B7-054-SB-2 12/7/2020	B7-054-SB-5 12/7/2020	B7-054-SB-10* 12/7/2020	B7-055-SB-1* 12/8/2020	B7-055-SB-2* 12/8/2020	B7-055-SB-5* 12/8/2020
Metals									
Aluminum	mg/kg	1,100,000	**15,700**	**12,000**	**15,000**	N/A	**13,600**	**12,400**	**16,900**
Antimony	mg/kg	470	2.5 UJ	3 UJ	3 UJ	N/A	3 U	3 U	3 U
Arsenic	mg/kg	3	2.1 UJ	**5.5**	**4.7**	**3.2**	**6.6**	**5.3**	**8.6**
Barium	mg/kg	220,000	**314 J**	**63.8 J**	**123 J**	N/A	**111**	**71.1**	**38.2**
Beryllium	mg/kg	2,300	**2**	**0.58 J**	**0.6 J**	N/A	**1.1**	**0.64 J**	**0.9 J**
Cadmium	mg/kg	980	**0.54 J**	1.5 U	1.5 U	N/A	**0.38 J**	1.5 U	1.5 U
Chromium	mg/kg	120,000	**445 J**	**19.8 J**	**27.4 J**	N/A	**29**	**23.9**	**30.5**
Chromium VI	mg/kg	6.3	0.8 B	1.2 R	1.2 R	N/A	1.3 U	1.3 U	**1.3**
Cobalt	mg/kg	350	**3.2 J**	**8.4**	**5.3**	N/A	**5.6**	**5.4**	**6.6**
Copper	mg/kg	47,000	**24.2**	**16.3**	**14.2**	N/A	**19**	**14.4**	**15.6**
Iron	mg/kg	820,000	**55,900 J**	**13,200 J**	**16,800 J**	N/A	**21,000**	**16,000**	**36,200**
Lead	mg/kg	800	**30.7**	**42.9**	**10.4**	N/A	**38.5**	**37.1**	**12.3**
Manganese	mg/kg	26,000	**25,900 J**	**195 J**	**84.9 J**	N/A	**1,140**	**261**	**75.1**
Mercury	mg/kg	350	0.11 U	**0.2**	0.12 U	N/A	**0.041 J**	**0.056 J**	0.12 U
Nickel	mg/kg	22,000	**5.3 J**	**14**	**13.1**	N/A	**12.9**	**11.9**	**15.7**
Vanadium	mg/kg	5,800	**1,230 J**	**28 J**	**34.5 J**	N/A	**58.6**	**27.1**	**41.7**
Zinc	mg/kg	350,000	**91.3**	**81.3**	**41.4**	N/A	**153**	**67.9**	**46.8**
Other									
Cyanide	mg/kg	150	**0.38 J**	**0.19 J**	**0.16 J**	N/A	1.1 U	**0.14 J**	1 U

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Summary of Inorganics Detected in Soil

Parameter	Units	PAL	B7-055-SB-10* 12/8/2020	B7-056-SB-1 12/7/2020	B7-056-SB-2 12/7/2020	B7-056-SB-5 12/7/2020	B7-056-SB-10* 12/7/2020	B7-057-SB-1* 12/10/2020
Metals								
Aluminum	mg/kg	1,100,000	N/A	**15,800**	**13,100**	**8,770**	N/A	**14,300**
Antimony	mg/kg	470	N/A	2.7 UJ	2.8 UJ	2.6 UJ	N/A	2.8 U
Arsenic	mg/kg	3	**7.9**	**4.4**	**6.4**	**5**	**18.9**	**8.6**
Barium	mg/kg	220,000	N/A	**99.4 J**	**49.2 J**	**46.6 J**	N/A	**71.4**
Beryllium	mg/kg	2,300	N/A	**0.92**	**0.63 J**	**0.47 J**	N/A	**0.88 J**
Cadmium	mg/kg	980	N/A	**0.36 J**	1.4 U	1.3 U	N/A	**0.52 J**
Chromium	mg/kg	120,000	N/A	**39.6 J**	**33.9 J**	**12.8 J**	N/A	**49.7**
Chromium VI	mg/kg	6.3	N/A	1.2 R	1.2 R	1.1 R	N/A	1.2 U
Cobalt	mg/kg	350	N/A	**5.4**	**4.8**	**5.1**	N/A	**10**
Copper	mg/kg	47,000	N/A	**14.7**	**13.9**	**12.2**	N/A	**41.8**
Iron	mg/kg	820,000	N/A	**18,500 J**	**24,500 J**	**9,650 J**	N/A	**34,000**
Lead	mg/kg	800	N/A	**29.6**	**27.5**	**27.8**	N/A	**74.1**
Manganese	mg/kg	26,000	N/A	**1,120 J**	**263 J**	**78.7 J**	N/A	**719**
Mercury	mg/kg	350	N/A	**0.04 J**	**0.011 J**	**0.52**	N/A	**0.66**
Nickel	mg/kg	22,000	N/A	**12.7**	**13.2**	**10.1**	N/A	**32.6**
Vanadium	mg/kg	5,800	N/A	**72.7 J**	**35.7 J**	**16.1 J**	N/A	**86.2**
Zinc	mg/kg	350,000	N/A	**68.3**	**48.3**	**40.9**	N/A	**191**
Other								
Cyanide	mg/kg	150	N/A	**0.19 J**	1.1 U	**0.13 J**	N/A	**0.31 J**

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Summary of Inorganics Detected in Soil

Parameter	Units	PAL	B7-057-SB-2* 12/10/2020	B7-057-SB-5* 12/10/2020	B7-058-SB-1 12/7/2020	B7-058-SB-2 12/7/2020	B7-058-SB-5 12/7/2020	B7-059-SB-1 12/7/2020	B7-059-SB-2 12/7/2020
Metals									
Aluminum	mg/kg	1,100,000	**22,700**	**16,700**	**13,200**	**13,200**	**8,340**	**7,880**	**17,200**
Antimony	mg/kg	470	3.2 U	2.9 U	2.9 UJ	3.1 UJ	2.8 UJ	3 UJ	3.4 UJ
Arsenic	mg/kg	3	**7.2**	**4.4**	**4.2**	**4.3**	**2.3 J-**	**5.5**	**7.7**
Barium	mg/kg	220,000	**87.7**	**138**	**47.7 J**	**27.6 J**	**18.7 J**	**29.3 J**	**77.1 J**
Beryllium	mg/kg	2,300	**1.4**	**1.2**	**0.44 J**	**0.25 J**	**0.15 J**	**0.3 J**	**0.49 J**
Cadmium	mg/kg	980	**0.48 J**	**0.65 J**	1.4 U	1.5 U	1.4 U	1.5 U	1.7 U
Chromium	mg/kg	120,000	**78.9**	**89.9**	**20.3 J**	**21.3 J**	**8.8 J**	**28.8 J**	**129 J**
Chromium VI	mg/kg	6.3	1.3 U	1.2 U	1.2 R	0.86 B	1.2 R	1.2 R	1.4 R
Cobalt	mg/kg	350	**16.7**	**15.2**	**6**	**3.8 J**	**2.1 J**	**3.9 J**	**8.9**
Copper	mg/kg	47,000	**26.2**	**22.2**	**10.5**	**7.9**	**3.6 J**	**11.4**	**35.5**
Iron	mg/kg	820,000	**37,700**	**25,200**	**16,200 J**	**17,000 J**	**6,920 J**	**24,700 J**	**44,100 J**
Lead	mg/kg	800	**47.7**	**82.3**	**19.1**	**8.2**	**4**	**11.8**	**45.3**
Manganese	mg/kg	26,000	**1,220**	**2,250**	**200 J**	**80.3 J**	**33.4 J**	**174 J**	**222 J**
Mercury	mg/kg	350	**0.092 J**	**0.22**	**0.043 J**	**0.013 J**	0.11 U	**0.016 J**	**0.041 J**
Nickel	mg/kg	22,000	**67.2**	**78.7**	**12.1**	**8.5 J**	**5.8 J**	**19.3**	**40.1**
Vanadium	mg/kg	5,800	**72.1**	**101**	**28.8 J**	**27.1 J**	**12 J**	**36.1 J**	**54.1 J**
Zinc	mg/kg	350,000	**137**	**181**	**62.8**	**21.9**	**15.8**	**32.3**	**73.4**
Other									
Cyanide	mg/kg	150	**0.68 J**	**1.1**	**0.16 J**	**0.17 J**	**0.15 J**	**0.27 J**	**0.22 J**

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Table 2 - Sub-Parcel B7-1
Summary of Inorganics Detected in Soil

Parameter	Units	PAL	B7-059-SB-5 12/7/2020	B7-059-SB-10* 12/7/2020	B7-060-SB-1* 12/8/2020	B7-060-SB-2* 12/8/2020	B7-060-SB-5* 12/8/2020	B7-060-SB-10* 12/8/2020
Metals								
Aluminum	mg/kg	1,100,000	**16,400**	N/A	**13,700**	**18,200**	**11,600**	N/A
Antimony	mg/kg	470	2.9 UJ	N/A	3.2 U	3 U	2.7 U	N/A
Arsenic	mg/kg	3	**5.2**	**12**	**7.7**	**18.4**	**6.6**	**9.4**
Barium	mg/kg	220,000	**43.1 J**	N/A	**86.2**	**153**	**57**	N/A
Beryllium	mg/kg	2,300	**0.5 J**	N/A	**0.96 J**	**1.4**	**0.62 J**	N/A
Cadmium	mg/kg	980	1.4 U	N/A	**0.6 J**	**0.85 J**	1.4 U	N/A
Chromium	mg/kg	120,000	**25.6 J**	N/A	**61.7**	**109**	**18.6**	N/A
Chromium VI	mg/kg	6.3	0.87 B	N/A	1.3 U	1.3 U	1.2 U	N/A
Cobalt	mg/kg	350	**5.4**	N/A	**11.4**	**36.3**	**8.4**	N/A
Copper	mg/kg	47,000	**11.4**	N/A	**48.7**	**560**	**14.1**	N/A
Iron	mg/kg	820,000	**20,600 J**	N/A	**32,000**	**311,000**	**16,000**	N/A
Lead	mg/kg	800	**10.6**	N/A	**103**	**51.2**	**27**	N/A
Manganese	mg/kg	26,000	**89.8 J**	N/A	**1,100**	**1,650**	**187**	N/A
Mercury	mg/kg	350	0.12 U	N/A	**0.69**	**0.15**	**0.061 J**	N/A
Nickel	mg/kg	22,000	**14**	N/A	**40.4**	**99.4**	**12.3**	N/A
Vanadium	mg/kg	5,800	**35.5 J**	N/A	**83.2**	**115**	**27.7**	N/A
Zinc	mg/kg	350,000	**32.8**	N/A	**229**	**123**	**58.8**	N/A
Other								
Cyanide	mg/kg	150	**0.17 J**	N/A	**0.45 J**	**0.32 J**	1.2 U	N/A

Detections in bold
Values in red indicate an exceedance of the Project Action Li
N/A indicates that the parameter was not analyzed for this sampl
*indicates non-validated data

U: This analyte was not detected in the sample. The numeric valu
UJ: This analyte was not detected in the sample. The actual quan
J: The positive result reported for this analyte is a quantitative es
J-: The positive result reported for this analyte is a quantitative e
B: This analyte was not detected substantially above the level of
R: The result for this analyte is unreliable. Additional data is nee

Table 2 - Sub-Parcel B7-1
Summary of Inorganics Detected in Soil

Parameter	Units	PAL	B7-061-SB-1* 12/10/2020	B7-061-SB-2* 12/10/2020	B7-061-SB-4* 12/10/2020	B7-064-SB-1* 12/10/2020	B7-064-SB-2* 12/10/2020	B7-064-SB-5* 12/10/2020
Metals								
Aluminum	mg/kg	1,100,000	**14,300**	**21,200**	**16,000**	**15,600**	**19,300**	**11,900**
Antimony	mg/kg	470	2.9 U	2.8 U	2.8 U	2.8 U	2.7 U	2.9 U
Arsenic	mg/kg	3	**5.7**	**7**	**3.9**	**5.2**	**4**	2.4 U
Barium	mg/kg	220,000	**62.7**	**75.4**	**65.9**	**50.8**	**74.3**	**33.1**
Beryllium	mg/kg	2,300	**0.59 J**	**0.66 J**	**0.51 J**	**0.34 J**	**0.53 J**	**0.28 J**
Cadmium	mg/kg	980	**0.36 J**	1.4 U	1.4 U	1.4 U	1.4 U	1.5 U
Chromium	mg/kg	120,000	**25.7**	**26.3**	**12.5**	**18.6**	**18.7**	**16**
Chromium VI	mg/kg	6.3	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
Cobalt	mg/kg	350	**6.3**	**4.8**	**3 J**	**4.6 J**	**4.2 J**	**2.7 J**
Copper	mg/kg	47,000	**18.5**	**11.6**	**5**	**8.8**	**9.2**	**6.5**
Iron	mg/kg	820,000	**19,600**	**19,300**	**15,800**	**18,200**	**25,800**	**6,650**
Lead	mg/kg	800	**42.2**	**10.7**	**10.8**	**10.9**	**11.5**	**8**
Manganese	mg/kg	26,000	**221**	**51.9**	**19.6**	**71.8**	**28.4**	**22.9**
Mercury	mg/kg	350	0.12 U	0.12 U	0.12 U	**0.018 J**	0.12 U	0.11 U
Nickel	mg/kg	22,000	**13.4**	**12.1**	**8.4 J**	**9.6**	**9.3**	**8.6 J**
Vanadium	mg/kg	5,800	**35.4**	**30.8**	**18.5**	**29.3**	**25.1**	**15.4**
Zinc	mg/kg	350,000	**106**	**23.3**	**15.3**	**35.2**	**26.4**	**21.5**
Other								
Cyanide	mg/kg	150	1 U	**0.14 J**	1.1 U	**0.16 J**	1.1 U	1 U

Detections in bold
Values in red indicate an exceedance of the Project Action Li
N/A indicates that the parameter was not analyzed for this sampl
*indicates non-validated data

U: This analyte was not detected in the sample. The numeric valu
UJ: This analyte was not detected in the sample. The actual quan
J: The positive result reported for this analyte is a quantitative es
J-: The positive result reported for this analyte is a quantitative e
B: This analyte was not detected substantially above the level of
R: The result for this analyte is unreliable. Additional data is nee

Table 2 - Sub-Parcel B7-1
Summary of Inorganics Detected in Soil

Parameter	Units	PAL	B7-065-SB-1* 12/10/2020	B7-065-SB-2* 12/10/2020	B7-065-SB-5* 12/10/2020
Metals					
Aluminum	mg/kg	1,100,000	**14,700**	**24,300**	**11,600**
Antimony	mg/kg	470	2.9 U	3.1 U	2.8 U
Arsenic	mg/kg	3	**4.4**	**2.8**	**3.5**
Barium	mg/kg	220,000	**47.1**	**103**	**45.7**
Beryllium	mg/kg	2,300	**0.31 J**	**0.62 J**	**0.31 J**
Cadmium	mg/kg	980	1.5 U	1.5 U	1.4 U
Chromium	mg/kg	120,000	**17.6**	**24.3**	**11.9**
Chromium VI	mg/kg	6.3	1.2 U	1.3 U	1.2 U
Cobalt	mg/kg	350	**3.6 J**	**4.6 J**	**2.7 J**
Copper	mg/kg	47,000	**8.1**	**8.7**	**7.2**
Iron	mg/kg	820,000	**14,200**	**11,100**	**12,500**
Lead	mg/kg	800	**9.4**	**10.1**	**8.3**
Manganese	mg/kg	26,000	**45.9**	**28.1**	**17.6**
Mercury	mg/kg	350	0.11 U	0.13 U	0.11 U
Nickel	mg/kg	22,000	**9.4 J**	**11.6**	**9.4**
Vanadium	mg/kg	5,800	**25.3**	**21.1**	**13.3**
Zinc	mg/kg	350,000	**29.6**	**30.2**	**17.2**
Other					
Cyanide	mg/kg	150	1.2 U	**0.15 J**	**0.15 J**

Detections in bold
Values in red indicate an exceedance of the Project Action Li
N/A indicates that the parameter was not analyzed for this sampl
*indicates non-validated data

U: This analyte was not detected in the sample. The numeric valu
UJ: This analyte was not detected in the sample. The actual quan
J: The positive result reported for this analyte is a quantitative es
J-: The positive result reported for this analyte is a quantitative es
B: This analyte was not detected substantially above the level of
R: The result for this analyte is unreliable. Additional data is nee

Table 3 - Sub-Parcel B7-1
Summary of Pesticides Detected in Soil

Parameter	Units	PAL	B25-013-SB-1* 10/17/2018	B25-013-SB-2* 10/17/2018	B7-001-SB-1* 10/2/2018	B7-001-SB-2* 10/2/2018	B7-002-SB-1* 10/2/2018	B7-002-SB-2* 10/2/2018	B7-003-SB-1* 10/2/2018
Pesticides									
4,4'-DDE	mg/kg	9.3	0.004 U	0.0039 U	**0.0022 J**	**0.0029 J**	0.0035 U	0.0037 U	**0.0022 J**
4,4'-DDT	mg/kg	8.5	0.004 U	0.0039 U	**0.0038**	**0.0413**	**0.0031 J**	0.0037 U	**0.0096**
Aldrin	mg/kg	0.18	0.002 U	0.002 U	0.0018 U	**0.0015 J**	0.0018 U	0.0018 U	0.0018 U
alpha-BHC	mg/kg	0.36	**0.0028**	0.002 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U	0.0018 U
alpha-Chlordane^	mg/kg	7.7	**0.00037 J**	0.002 U	0.0018 U	**0.00077 J**	0.0018 U	0.0018 U	**0.00051 J**
Dieldrin	mg/kg	0.14	**0.0008 J**	0.0039 U	**0.0027 J**	**0.0155**	**0.0025 J**	0.0037 U	**0.0068**
Endosulfan I[+]	mg/kg	7,000	0.002 U	0.002 U	**0.00065 J**	**0.0019**	0.0018 U	0.0018 U	**0.0014 J**
Endosulfan II[+]	mg/kg	7,000	0.004 U	0.0039 U	**0.0015 J**	**0.0106**	**0.001 J**	0.0037 U	**0.0027 J**
Endosulfan sulfate	mg/kg	4,900	0.004 U	0.0039 U	**0.0016 J**	**0.011**	0.0035 U	0.0037 U	**0.0016 J**
Endrin	mg/kg	250	0.004 U	0.0039 U	0.0036 U	**0.03**	**0.0032 J**	0.0037 U	**0.0056**
Endrin aldehyde	mg/kg		0.004 U	0.0039 U	**0.0021 J**	0.0037 U	**0.0021 J**	0.0037 U	**0.0021 J**
Endrine ketone	mg/kg		**0.0016 J**	0.0039 U	**0.0056**	**0.0263**	**0.0066**	0.0037 U	0.0037 U
gamma-BHC (Lindane)	mg/kg	2.5	0.002 U	0.002 U	0.0018 U	**0.0021**	**0.00082 J**	0.0018 U	**0.0018 J**
gamma-Chlordane^	mg/kg	7.7	0.002 U	0.002 U	0.0018 U	**0.0095**	0.0018 U	0.0018 U	**0.0039**
Heptachlor	mg/kg	0.63	0.002 U	0.002 U	0.0018 U	**0.0012 J**	**0.0005 J**	0.0018 U	**0.00092 J**
Heptachlor epoxide	mg/kg	0.33	0.002 U	0.002 U	0.0018 U	**0.0075**	0.0018 U	0.0018 U	0.0018 U
Methoxychlor	mg/kg	4,100	0.0199 U	0.0196 U	**0.0064 J**	**0.0079 J**	**0.0042 J**	0.0184 U	**0.0031 J**

Detections in bold
Values in red indicate an exceedance of the Project Action Limit (PAL)
*indicates non-validated data
^The USEPA RSL for Chlordane (technical mixture) was used as the PAL for both alpha- and gamma-Chlordane
[+]The USEPA RSL for Endosulfan was used as the PAL for both Endosulfan I and II

U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit.
UJ: This analyte was not detected in the sample. The actual quantitation/detection limit may be higher than reported.
J: The positive result reported for this analyte is a quantitative estimate.

Table 3 - Sub-Parcel B7-1
Summary of Pesticides Detected in Soil

Parameter	Units	PAL	B7-003-SB-2* 10/2/2018	B7-014-SB-1* 10/1/2018	B7-014-SB-2* 10/1/2018	B7-015-SB-1* 10/1/2018	B7-015-SB-2* 10/1/2018	B7-032-SB-1* 12/21/2020	B7-032-SB-2* 12/21/2020
Pesticides									
4,4'-DDE	mg/kg	9.3	**0.0038**	0.0038 U	0.0036 U	0.0036 U	0.0037 U	0.0414 U	0.0199 U
4,4'-DDT	mg/kg	8.5	**0.0054**	**0.0088**	0.0036 U	0.0036 U	0.0037 U	0.0414 U	0.0199 U
Aldrin	mg/kg	0.18	0.0019 U	0.0019 U	0.0018 U	0.0018 U	0.0018 U	0.0207 U	0.0099 U
alpha-BHC	mg/kg	0.36	0.0019 U	0.0019 U	0.0018 U	0.0018 U	0.0018 U	0.0207 U	0.0099 U
alpha-Chlordane^	mg/kg	7.7	**0.0011 J**	0.0019 U	0.0018 U	0.0018 U	0.0018 U	**0.0492**	**0.0029 J**
Dieldrin	mg/kg	0.14	**0.0043**	**0.0045**	0.0036 U	**0.00074 J**	0.0037 U	**0.0157 J**	0.0199 U
Endosulfan I[+]	mg/kg	7,000	0.0019 U	0.0019 U	0.0018 U	0.0018 U	0.0018 U	0.0207 U	0.0099 U
Endosulfan II[+]	mg/kg	7,000	**0.0014 J**	**0.0018 J**	0.0036 U	0.0036 U	0.0037 U	0.0414 U	0.0199 U
Endosulfan sulfate	mg/kg	4,900	**0.0013 J**	0.0038 U	0.0036 U	0.0036 U	0.0037 U	0.0414 U	0.0199 U
Endrin	mg/kg	250	**0.0038**	**0.0035 J**	0.0036 U	0.0036 U	0.0037 U	0.0414 U	0.0199 U
Endrin aldehyde	mg/kg		0.0037 U	0.0038 U	0.0036 U	0.0036 U	0.0037 U	0.0414 U	0.0199 U
Endrine ketone	mg/kg		**0.0047**	0.0038 U	**0.00034 J**	**0.0012 J**	**0.00072 J**	0.0414 U	0.0199 U
gamma-BHC (Lindane)	mg/kg	2.5	**0.0025**	0.0019 U	0.0018 U	0.0018 U	0.0018 U	0.0207 U	0.0099 U
gamma-Chlordane^	mg/kg	7.7	**0.0039**	0.0019 U	0.0018 U	0.0018 U	0.0018 U	**0.0725**	0.0099 U
Heptachlor	mg/kg	0.63	**0.0018 J**	0.0019 U	0.0018 U	0.0018 U	0.0018 U	0.0207 U	0.0099 U
Heptachlor epoxide	mg/kg	0.33	0.0019 U	0.0019 U	0.0018 U	0.0018 U	0.0018 U	**0.0104 J**	0.0099 U
Methoxychlor	mg/kg	4,100	**0.017 J**	0.0189 U	0.0179 U	0.0181 U	0.0185 U	0.207 U	0.0993 U

Detections in bold
Values in red indicate an exceedance of the Proje
*indicates non-validated data
^The USEPA RSL for Chlordane (technical mixture
[+]The USEPA RSL for Endosulfan was used as the P

U: This analyte was not detected in the sample. The
UJ: This analyte was not detected in the sample. Th
J: The positive result reported for this analyte is a qu

Table 3 - Sub-Parcel B7-1
Summary of Pesticides Detected in Soil

Parameter	Units	PAL	B7-034-SB-1* 10/2/2018	B7-034-SB-2* 10/2/2018	B7-053-SB-1 12/7/2020	B7-053-SB-2 12/7/2020	B7-054-SB-1 12/7/2020	B7-054-SB-2 12/7/2020
Pesticides								
4,4'-DDE	mg/kg	9.3	0.004 U	0.004 U	0.0184 U	0.0038 U	0.0177 U	0.0039 U
4,4'-DDT	mg/kg	8.5	0.004 U	0.004 U	0.0184 UJ	0.0038 UJ	0.0177 UJ	0.0039 UJ
Aldrin	mg/kg	0.18	0.002 U	0.002 U	0.0092 U	0.0019 U	0.0089 U	0.002 U
alpha-BHC	mg/kg	0.36	0.002 U	0.002 U	0.0092 U	0.0019 U	0.0089 U	0.002 U
alpha-Chlordane^	mg/kg	7.7	0.002 U	**0.00047 J**	0.0092 U	0.0019 U	0.0089 U	0.002 U
Dieldrin	mg/kg	0.14	0.004 U	0.004 U	0.0184 U	0.0038 U	0.0177 U	0.0039 U
Endosulfan I[+]	mg/kg	7,000	0.002 U	0.002 U	0.0092 U	0.0019 U	0.0089 U	0.002 U
Endosulfan II[+]	mg/kg	7,000	0.004 U	0.004 U	0.0184 U	0.0038 U	0.0177 U	0.0039 U
Endosulfan sulfate	mg/kg	4,900	0.004 U	0.004 U	0.0184 U	0.0038 U	0.0177 U	0.0039 U
Endrin	mg/kg	250	0.004 U	0.004 U	0.0184 U	0.0038 U	0.0177 U	0.0039 U
Endrin aldehyde	mg/kg		0.004 U	0.004 U	0.0184 U	0.0038 U	0.0177 U	0.0039 U
Endrine ketone	mg/kg		0.004 U	**0.00076 J**	0.0184 U	0.0038 U	0.0177 U	0.0039 U
gamma-BHC (Lindane)	mg/kg	2.5	0.002 U	0.002 U	0.0092 U	0.0019 U	0.0089 U	0.002 U
gamma-Chlordane^	mg/kg	7.7	0.002 U	**0.0011 J**	0.0092 U	0.0019 U	0.0089 U	0.002 U
Heptachlor	mg/kg	0.63	0.002 U	0.002 U	0.0092 U	0.0019 U	0.0089 U	0.002 U
Heptachlor epoxide	mg/kg	0.33	0.002 U	0.002 U	0.0092 U	0.0019 U	0.0089 U	0.002 U
Methoxychlor	mg/kg	4,100	0.0202 U	0.02 U	0.0918 UJ	0.0192 UJ	0.0887 UJ	0.0196 UJ

Detections in bold
Values in red indicate an exceedance of the Proje
*indicates non-validated data
^The USEPA RSL for Chlordane (technical mixture
[+]The USEPA RSL for Endosulfan was used as the P

U: This analyte was not detected in the sample. The
UJ: This analyte was not detected in the sample. Th
J: The positive result reported for this analyte is a qu

Table 3 - Sub-Parcel B7-1
Summary of Pesticides Detected in Soil

Parameter	Units	PAL	B7-055-SB-1* 12/8/2020	B7-055-SB-2* 12/8/2020	B7-056-SB-1 12/7/2020	B7-056-SB-2 12/7/2020	B7-057-SB-1* 12/10/2020	B7-057-SB-2* 12/10/2020
Pesticides								
4,4'-DDE	mg/kg	9.3	0.0041 U	0.02 U	0.0196 U	0.019 U	0.0194 U	**0.0028 J**
4,4'-DDT	mg/kg	8.5	0.0041 U	0.02 U	0.0196 UJ	0.019 UJ	0.0194 U	0.0216 U
Aldrin	mg/kg	0.18	0.0021 U	0.01 U	0.0098 U	0.0095 U	0.0097 U	0.0108 U
alpha-BHC	mg/kg	0.36	0.0021 U	0.01 U	0.0098 U	0.0095 U	0.0097 U	0.0108 U
alpha-Chlordane^	mg/kg	7.7	0.0021 U	0.01 U	0.0098 U	0.0095 U	0.0097 U	0.0108 U
Dieldrin	mg/kg	0.14	0.0041 U	0.02 U	0.0196 U	0.019 U	0.0194 U	0.0216 U
Endosulfan I[+]	mg/kg	7,000	0.0021 U	0.01 U	0.0098 U	0.0095 U	0.0097 U	0.0108 U
Endosulfan II[+]	mg/kg	7,000	0.0041 U	0.02 U	0.0196 U	0.019 U	0.0194 U	0.0216 U
Endosulfan sulfate	mg/kg	4,900	0.0041 U	0.02 U	0.0196 U	0.019 U	0.0194 U	0.0216 U
Endrin	mg/kg	250	0.0041 U	0.02 U	0.0196 U	0.019 U	0.0194 U	0.0216 U
Endrin aldehyde	mg/kg		0.0041 U	0.02 U	0.0196 U	0.019 U	0.0194 U	0.0216 U
Endrine ketone	mg/kg		0.0041 U	0.02 U	0.0196 U	0.019 U	0.0194 U	0.0216 U
gamma-BHC (Lindane)	mg/kg	2.5	0.0021 U	0.01 U	0.0098 U	0.0095 U	0.0097 U	0.0108 U
gamma-Chlordane^	mg/kg	7.7	0.0021 U	0.01 U	0.0098 U	0.0095 U	0.0097 U	0.0108 U
Heptachlor	mg/kg	0.63	0.0021 U	0.01 U	0.0098 U	0.0095 U	0.0097 U	0.0108 U
Heptachlor epoxide	mg/kg	0.33	0.0021 U	0.01 U	0.0098 U	0.0095 U	0.0097 U	0.0108 U
Methoxychlor	mg/kg	4,100	0.0205 U	0.0998 U	0.0979 UJ	0.0952 UJ	0.097 U	0.108 U

Detections in bold
Values in red indicate an exceedance of the Proje
*indicates non-validated data
^The USEPA RSL for Chlordane (technical mixture
[+]The USEPA RSL for Endosulfan was used as the P

U: This analyte was not detected in the sample. The
UJ: This analyte was not detected in the sample. Th
J: The positive result reported for this analyte is a qu

Table 3 - Sub-Parcel B7-1
Summary of Pesticides Detected in Soil

Parameter	Units	PAL	B7-058-SB-1 12/7/2020	B7-058-SB-2 12/7/2020	B7-059-SB-1 12/7/2020	B7-059-SB-2 12/7/2020	B7-060-SB-1* 12/8/2020	B7-060-SB-2* 12/8/2020
Pesticides								
4,4'-DDE	mg/kg	9.3	0.0039 U	0.0041 U	0.004 U	0.0045 U	0.0429 U	0.021 U
4,4'-DDT	mg/kg	8.5	0.0039 UJ	0.0041 UJ	0.004 UJ	0.0045 UJ	0.0429 U	0.021 U
Aldrin	mg/kg	0.18	0.002 U	0.002 U	0.002 U	0.0022 U	0.0214 U	0.0105 U
alpha-BHC	mg/kg	0.36	0.002 U	0.002 U	0.002 U	0.0022 U	0.0214 U	0.0105 U
alpha-Chlordane^	mg/kg	7.7	0.002 U	0.002 U	0.002 U	0.0022 U	0.0214 U	0.0105 U
Dieldrin	mg/kg	0.14	0.0039 U	0.0041 U	0.004 U	0.0045 U	0.0429 U	0.021 U
Endosulfan I[+]	mg/kg	7,000	0.002 U	0.002 U	0.002 U	0.0022 U	0.0214 U	0.0105 U
Endosulfan II[+]	mg/kg	7,000	0.0039 U	0.0041 U	0.004 U	0.0045 U	0.0429 U	0.021 U
Endosulfan sulfate	mg/kg	4,900	0.0039 U	0.0041 U	0.004 U	0.0045 U	0.0429 U	0.021 U
Endrin	mg/kg	250	0.0039 U	0.0041 U	0.004 U	0.0045 U	0.0429 U	0.021 U
Endrin aldehyde	mg/kg		0.0039 U	**0.026**	0.004 U	0.0045 U	0.0429 U	0.021 U
Endrine ketone	mg/kg		0.0039 U	0.0041 U	0.004 U	0.0045 U	0.0429 U	0.021 U
gamma-BHC (Lindane)	mg/kg	2.5	0.002 U	0.002 U	0.002 U	0.0022 U	0.0214 U	0.0105 U
gamma-Chlordane^	mg/kg	7.7	0.002 U	0.002 U	0.002 U	0.0022 U	0.0214 U	0.0105 U
Heptachlor	mg/kg	0.63	0.002 U	0.002 U	0.002 U	0.0022 U	0.0214 U	0.0105 U
Heptachlor epoxide	mg/kg	0.33	0.002 U	0.002 U	0.002 U	0.0022 U	0.0214 U	0.0105 U
Methoxychlor	mg/kg	4,100	0.0196 UJ	0.0204 UJ	0.0202 UJ	0.0225 UJ	0.214 U	0.105 U

Detections in bold
Values in red indicate an exceedance of the Proje
*indicates non-validated data
^The USEPA RSL for Chlordane (technical mixture
[+]The USEPA RSL for Endosulfan was used as the P

U: This analyte was not detected in the sample. The
UJ: This analyte was not detected in the sample. Th
J: The positive result reported for this analyte is a qu

Table 3 - Sub-Parcel B7-1
Summary of Pesticides Detected in Soil

Parameter	Units	PAL	B7-061-SB-1* 12/10/2020	B7-061-SB-2* 12/10/2020	B7-064-SB-1* 12/10/2020	B7-064-SB-2* 12/10/2020	B7-065-SB-1* 12/10/2020	B7-065-SB-2* 12/10/2020
Pesticides								
4,4'-DDE	mg/kg	9.3	0.0039 U	0.004 U	0.0039 U	0.0039 U	0.004 U	0.0042 U
4,4'-DDT	mg/kg	8.5	0.0039 U	0.004 U	0.0039 U	0.0039 U	0.004 U	0.0042 U
Aldrin	mg/kg	0.18	0.0019 U	0.002 U	0.002 U	0.0019 U	0.002 U	0.0021 U
alpha-BHC	mg/kg	0.36	0.0019 U	0.002 U	0.002 U	0.0019 U	0.002 U	0.0021 U
alpha-Chlordane^	mg/kg	7.7	0.0019 U	0.002 U	0.002 U	0.0019 U	0.002 U	0.0021 U
Dieldrin	mg/kg	0.14	0.0039 U	0.004 U	0.0039 U	0.0039 U	0.004 U	0.0042 U
Endosulfan I[+]	mg/kg	7,000	0.0019 U	0.002 U	0.002 U	0.0019 U	0.002 U	0.0021 U
Endosulfan II[+]	mg/kg	7,000	0.0039 U	0.004 U	0.0039 U	0.0039 U	0.004 U	0.0042 U
Endosulfan sulfate	mg/kg	4,900	0.0039 U	0.004 U	0.0039 U	0.0039 U	0.004 U	0.0042 U
Endrin	mg/kg	250	0.0039 U	0.004 U	0.0039 U	0.0039 U	0.004 U	0.0042 U
Endrin aldehyde	mg/kg		0.0039 U	0.004 U	0.0039 U	0.0039 U	0.004 U	0.0042 U
Endrine ketone	mg/kg		0.0039 U	0.004 U	0.0039 U	0.0039 U	0.004 U	0.0042 U
gamma-BHC (Lindane)	mg/kg	2.5	0.0019 U	0.002 U	0.002 U	0.0019 U	0.002 U	0.0021 U
gamma-Chlordane^	mg/kg	7.7	0.0019 U	0.002 U	0.002 U	0.0019 U	0.002 U	0.0021 U
Heptachlor	mg/kg	0.63	0.0019 U	0.002 U	0.002 U	0.0019 U	0.002 U	0.0021 U
Heptachlor epoxide	mg/kg	0.33	0.0019 U	0.002 U	0.002 U	0.0019 U	0.002 U	0.0021 U
Methoxychlor	mg/kg	4,100	0.0195 U	0.02 U	0.0196 U	0.0194 U	0.0198 U	0.0209 U

Detections in bold
Values in red indicate an exceedance of the Proje
*indicates non-validated data
^The USEPA RSL for Chlordane (technical mixture
[+]The USEPA RSL for Endosulfan was used as the P

U: This analyte was not detected in the sample. The
UJ: This analyte was not detected in the sample. Th
J: The positive result reported for this analyte is a qu

Table 4 - Sub-Parcel B7-1
Summary of Organics Detected in Groundwater

Parameter	Units	PAL	B7-053-PZ* 12/18/2020	B7-060-PZ 12/11/2020	B7-064-PZ 12/11/2020	B7-065-PZ 12/11/2020	SW-046-MWS* 12/18/2020	SW-046-MWS* 12/30/2020	SW-047-MWS 12/14/2015
Volatile Organic Compounds									
1,2-Dichloroethene (Total)	µg/L	70	2 U	2 U	2 U	2 U	2 U	2 U	**0.58 J**
Acetone	µg/L	14,000	**12.3**	10 U	10 U	10 U	10 U	10 U	10 UJ
Chloroform	µg/L	0.22	1 U	1 U	1 U	1 U	1 U	1 U	**6.1**
cis-1,2-Dichloroethene	µg/L	70	1 U	1 U	1 U	1 U	1 U	1 U	**0.58 J**
Methyl tert-butyl ether (MTBE)	µg/L	14	1 U	**0.68 J**	1 U	1 U	**10.4**	**9.7**	1 U
Semi-Volatile Organic Compounds^									
1,4-Dioxane	µg/L	0.46	0.5 U	0.098 U	0.1 U	**0.016 J**	**0.033 J**	**0.049 J**	0.1 U
2-Methylnaphthalene	µg/L	36	**0.091 J**	0.098 U	**0.01 J**	0.098 U	0.095 U	0.094 U	0.1 U
Acenaphthene	µg/L	530	**0.11 J**	0.098 U	0.1 U	0.098 U	0.095 U	0.094 U	0.1 U
Anthracene	µg/L	1,800	**0.34 J**	0.098 U	0.1 U	0.098 U	0.095 U	0.094 U	0.1 U
Benz[a]anthracene	µg/L	0.03	**0.64**	**0.02 J**	0.1 U	0.098 U	0.095 U	0.094 U	0.1 U
Benzo[a]pyrene	µg/L	0.2	**0.73**	**0.023 J**	0.1 U	0.098 U	0.095 U	0.094 U	0.1 U
Benzo[b]fluoranthene	µg/L	0.25	**0.8**	**0.023 J**	0.1 U	0.098 U	0.095 U	0.094 U	0.1 U
Benzo[g,h,i]perylene	µg/L		**0.56**	**0.021 J**	0.1 U	0.098 U	0.095 U	0.094 U	0.1 U
Benzo[k]fluoranthene	µg/L	2.5	**0.69**	**0.024 J**	0.1 U	0.098 U	0.095 U	0.094 U	0.1 U
Chrysene	µg/L	25	**0.84**	**0.024 J**	0.1 U	0.098 U	0.095 U	0.094 U	0.1 U
Dibenz[a,h]anthracene	µg/L	0.025	**0.13 J**	0.069 U	0.07 U	0.068 U	0.066 U	0.066 U	0.1 U
Diethylphthalate	µg/L	15,000	15 U	2.9 U	**1.7 J**	2.9 U	2.8 U	2.8 U	1 U
Dimethylphthalate	µg/L		15 U	2.9 U	**0.42 J**	2.9 U	2.8 U	2.8 U	N/A
Di-n-butylphthalate	µg/L	900	15 U	2.9 U	**0.54 J**	**0.44 J**	2.8 U	2.8 U	1 U
Fluoranthene	µg/L	800	**1.4**	**0.041 J**	0.1 U	**0.011 J**	0.095 U	0.094 U	0.1 U
Fluorene	µg/L	290	**0.086 J**	0.098 U	0.1 U	0.098 U	0.095 U	0.094 U	0.1 U
Indeno[1,2,3-c,d]pyrene	µg/L	0.25	**0.6**	**0.022 J**	0.1 U	0.098 U	0.095 U	0.094 U	0.1 U
Phenanthrene	µg/L		**0.63**	**0.027 J**	**0.015 J**	**0.013 J**	0.095 U	0.094 U	0.1 U
Pyrene	µg/L	120	**1.2**	**0.034 J**	0.1 U	0.098 U	0.095 U	0.094 U	0.1 U
TPH/Oil & Grease									
Diesel Range Organics	µg/L	47	**110**	**99 J**	**77 J**	100 UJ	**120**	**110**	65 B

Detections in bold
Values in red indicate an exceedance of the Project Action Limit (PAL)
N/A indicates that the parameter was not analyzed for this sample
*indicates non-validated data
^PAH compounds and 1,4-dioxane (2020) were analyzed via SIM.

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

Table 5 - Sub-Parcel B7-1
Summary of Inorganics Detected in Groundwater

Parameter	Units	PAL	B7-053-PZ* 12/18/2020	B7-060-PZ 12/11/2020	B7-064-PZ 12/11/2020	B7-065-PZ 12/11/2020	SW-046-MWS* 12/18/2020	SW-046-MWS* 12/30/2020	SW-047-MWS 12/14/2015
Metals									
Aluminum	µg/L	20,000	N/A	N/A	N/A	N/A	**126**	**154**	**2,810**
Barium	µg/L	2,000	N/A	N/A	N/A	N/A	**22.5**	**20.1**	**44.3**
Beryllium	µg/L	4	N/A	N/A	N/A	N/A	**0.49 J**	**0.59 J**	**6.5**
Cadmium	µg/L	5	N/A	N/A	N/A	N/A	**1.3 J**	**1 J**	**1.5 J**
Chromium	µg/L	100	N/A	N/A	N/A	N/A	**1.4 J**	**1.6 J**	**1.6 J**
Chromium VI	µg/L	0.035	N/A	N/A	N/A	N/A	N/A	N/A	**5 J**
Cobalt	µg/L	6	N/A	N/A	N/A	N/A	**221**	**221**	**100**
Copper	µg/L	1,300	N/A	N/A	N/A	N/A	5 U	5 U	**7.9**
Iron	µg/L	14,000	N/A	N/A	N/A	N/A	**6,680**	**6,720**	83.2 B
Manganese	µg/L	430	N/A	N/A	N/A	N/A	**11,700**	**11,300**	**884**
Mercury	µg/L	2	N/A	N/A	N/A	N/A	0.2 U	0.2 U	**0.03 J**
Nickel	µg/L	390	N/A	N/A	N/A	N/A	**89.6**	**85.3**	**99.4 J**
Thallium	µg/L	2	N/A	N/A	N/A	N/A	10 U	**4 J**	10 U
Vanadium	µg/L	86	N/A	N/A	N/A	N/A	5 U	**0.82 J**	1 B
Zinc	µg/L	6,000	N/A	N/A	N/A	N/A	**133**	**128**	**130**
Dissolved Metals									
Aluminum, Dissolved	µg/L	20,000	**224**	**180**	**37,800**	**3,280**	**109**	**110**	**2,860**
Arsenic, Dissolved	µg/L	10	**3.6 J**	5 U	**7**	5 U	5 U	5 U	**4.5 J**
Barium, Dissolved	µg/L	2,000	**34.6**	**13.6**	**154**	**48**	**22.8**	**20.5**	**42.9**
Beryllium, Dissolved	µg/L	4	**0.68 J**	**0.31 J**	**1.2**	**4.5**	**0.4 J**	**0.23 J**	**6.6**
Cadmium, Dissolved	µg/L	5	2 B	**1.1 J**	**0.68 J**	**1.7 J**	1.2 B	**1 J**	1.4 B
Chromium, Dissolved	µg/L	100	**1.1 J**	**1.1 J**	**58.6**	**2 J**	**1.5 J**	**1.5 J**	0.98 B
Cobalt, Dissolved	µg/L	6	**36.1**	**65.4**	**10.4**	**134**	**219**	**228**	**105**
Copper, Dissolved	µg/L	1,300	5 U	5 U	**26.9**	**10**	5 U	5 U	**7.8**
Iron, Dissolved	µg/L	14,000	**1,070**	**2,650**	**38,300**	**465**	**6,410**	**6,330**	30.4 B
Lead, Dissolved	µg/L	15	5 U	5 U	**28**	**7.7**	5 U	5 U	5 U
Manganese, Dissolved	µg/L	430	**806**	**3,860**	**241**	**2,470**	**11,700**	**11,700**	**850 J**
Nickel, Dissolved	µg/L	390	**48.3**	**64.4**	**33.2**	**104**	**91.2**	**87.4**	**106 J**
Vanadium, Dissolved	µg/L	86	**9**	5 U	**60.3**	5 U	5 U	**0.58 J**	0.81 B
Zinc, Dissolved	µg/L	6,000	**69.6**	**50.9**	**86.2**	**144**	**135**	**131**	**134 J**
Other									
Cyanide	µg/L	200	10 U	**11**	10 U	10 U	**7.4 J**	**7.9 J**	10 U

Detections in bold
Values in red indicate an exceedance of the Project Action Limit (PAL)
N/A inidicates that the parameter was not analyzed for this sample
*indicates non-validated data

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 or field blank.

Table 6 - Sub-Parcel B7-1
Cumulative Vapor Intrusion Criteria Comparison

				B7-053-PZ 12/18/2020		B7-060-PZ 12/11/2020		B7-064-PZ 12/11/2020		B7-065-PZ 12/11/2020	
Parameter	Type	Organ Systems	VI Screening Criteria	Conc. (ug/L)	Risk/ Hazard	Conc. (ug/L)	Risk/ Hazard	Conc. (ug/L)	Risk/ Hazard	Conc. (ug/L)	Risk/ Hazard
Cancer Risk											
1,4-Dioxane	SVOC		130,000	0.5 U	0	0.098 U	0	0.1 U	0	0.016 J	1.2E-12
Naphthalene	SVOC		200	0.5 U	0	0.098 U	0	0.1 U	0	0.098 U	0
Chloroform	VOC		36	1 U	0	1 U	0	1 U	0	1 U	0
Methyl tert-butyl ether (MTBE)	VOC		20,000	1 U	0	0.68 J	3.4E-10	1 U	0	1 U	0
Cumulative Vapor Intrusion Risk =					0		3E-10		0		1E-12
Non-Cancer Hazard											
Cumulative Vapor Intrusion Non-Cancer Hazard =					0		0		0		0

				SW-046-MWS 12/18/2020		SW-046-MWS 12/30/2020		SW-047-MWS 12/14/2015	
Parameter	Type	Organ Systems	VI Screening Criteria	Conc. (ug/L)	Risk/ Hazard	Conc. (ug/L)	Risk/ Hazard	Conc. (ug/L)	Risk/ Hazard
Cancer Risk									
1,4-Dioxane	SVOC		130,000	0.033 J	2.5E-12	0.049 J	3.8E-12	0.1 U	0
Naphthalene	SVOC		200	0.095 U	0	0.094 U	0	0.045 B	0
Chloroform	VOC		36	1 U	0	1 U	0	6.1	1.7E-06
Methyl tert-butyl ether (MTBE)	VOC		20,000	10.4	5.2E-09	9.7	4.9E-09	1 U	0
Cumulative Vapor Intrusion Risk =					5E-09		5E-09		2E-06
Non-Cancer Hazard									
Cumulative Vapor Intrusion Non-Cancer Hazard =					0		0		0

Highlighted values indicate an exceedance of the cumulative vapor intrusion criteria:
TCR>1E-05
THI>1
Conc. = Concentration

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

Table 7 - Sub-Parcel B7-1
COPC Screening Analysis

Parameter	CAS#	Location of Max Result	Max Detection (mg/kg)	Final Flag	Min Detection (mg/kg)	Average Detection (mg/kg)	Total Samples	Frequency of Detection (%)	Cancer TR=1E-06 (mg/kg)	Non-Cancer HQ=0.1 (mg/kg)	COPC?
2-Methylnaphthalene	91-57-6	B7-060-SB-1	0.079		0.0016	0.02	59	55.93		24	no
4,4'-DDE	72-55-9	B7-003-SB-2	0.0038		0.0022	0.003	38	13.16	2	2.3	no
4,4'-DDT	50-29-3	B7-001-SB-2	0.0413		0.0031	0.01	38	15.79	1.9	3.7	no
Acenaphthene	83-32-9	B7-057-SB-1	0.069		0.00075	0.01	59	47.46		360	no
Acenaphthylene	208-96-8	B7-003-SB-2	0.49		0.0011	0.05	59	61.02			no
Acetone	67-64-1	B7-001-SB-2	0.21		0.0082	0.08	9	33.33		6,100	no
Aldrin	309-00-2	B7-001-SB-2	0.0015	J	0.0015	0.002	38	2.63	0.039	0.23	no
alpha-BHC	319-84-6	B25-013-SB-1	0.0028		0.0028	0.003	38	2.63	0.086	51	no
alpha-Chlordane[#]	5103-71-9	B7-032-SB-1	0.0492		0.00037	0.008	38	18.42	1.7	3.5	no
Aluminum	7429-90-5	B7-014-SB-1	38,700		4,960	15,612	59	100.00		7,700	YES (NC)
Anthracene	120-12-7	B7-003-SB-2	0.66		0.00078	0.06	59	62.71		1,800	no
Antimony	7440-36-0	B7-003-SB-6	10.3		10.3	10.3	59	1.69		3.1	YES (NC)
Aroclor 1248	12672-29-6	B7-001-SB-1	0.045		0.027	0.04	25	8.00	0.23		no
Aroclor 1254	11097-69-1	B7-003-SB-1	0.13		0.089	0.11	25	8.00	0.24	0.12	YES (NC)
Aroclor 1260	11096-82-5	B7-001-SB-1	0.064		0.058	0.06	25	8.00	0.24		no
Arsenic	7440-38-2	B7-014-SB-2	22.1		2.3	7.48	66	90.91	0.68	3.5	YES (C/NC)
Barium	7440-39-3	B7-014-SB-1	422		13.2	106	59	100.00		1,500	no
Benz[a]anthracene	56-55-3	B7-003-SB-2	2		0.0012	0.18	59	66.10	1.1		YES (C)
Benzaldehyde	100-52-7	B7-001-SB-2	0.027	J	0.027	0.03	59	1.69	170	780	no
Benzo[a]pyrene	50-32-8	B7-003-SB-2	1.4		0.0011	0.19	59	64.41	0.11	1.8	YES (C)
Benzo[b]fluoranthene	205-99-2	B7-003-SB-2	2.2		0.0012	0.32	59	66.10	1.1		YES (C)
Benzo[g,h,i]perylene	191-24-2	B7-060-SB-1	0.58		0.002	0.10	59	62.71			no
Benzo[k]fluoranthene	207-08-9	B7-060-SB-1	1.5		0.0019	0.25	59	64.41	11		no
Beryllium	7440-41-7	B7-053-SB-1	4.8		0.15	0.93	59	98.31	1,600	16	no
bis(2-Ethylhexyl)phthalate	117-81-7	B7-032-SB-1	0.23	J	0.02	0.08	59	8.47	39	130	no
Cadmium	7440-43-9	B7-032-SB-1	1.2	J	0.35	0.57	59	25.42	2,100	7.1	no
Caprolactam	105-60-2	B7-032-SB-5	0.028	J	0.028	0.03	59	1.69		3,100	no
Carbazole	86-74-8	B7-060-SB-2	0.2	J	0.02	0.07	59	6.78			no
Chromium (salts)	7440-47-3	B7-014-SB-2	2,440		5.3	217	59	100.00		12,000	no
Chromium VI	18540-29-9	B7-055-SB-5	1.3		0.65	0.88	48	12.50	0.3	23	YES (C)

Table 7 - Sub-Parcel B7-1
COPC Screening Analysis

Parameter	CAS#	Location of Max Result	Max Detection (mg/kg)	Final Flag	Min Detection (mg/kg)	Average Detection (mg/kg)	Total Samples	Frequency of Detection (%)	Cancer TR=1E-06 (mg/kg)	Non-Cancer HQ=0.1 (mg/kg)	COPC?
Chrysene	218-01-9	B7-003-SB-2	1.4		0.00042	0.17	59	66.10	110		no
Cobalt	7440-48-4	B7-060-SB-2	36.3		1.6	7.46	59	96.61	420	2.3	YES (NC)
Copper	7440-50-8	B7-060-SB-2	560		3.1	38.5	59	98.31		310	YES (NC)
Cyanide (calcium cyanide)	57-12-5	B7-001-SB-2	1.5		0.13	0.33	59	64.41		7.8	no
Dibenz[a,h]anthracene	53-70-3	B7-060-SB-1 & B7-003-SB-2	0.22		0.0017	0.04	59	57.63	0.11		YES (C)
Dieldrin	60-57-1	B7-032-SB-1	0.0157	J	0.00074	0.006	38	23.68	0.034	0.32	no
Di-n-butylphthalate	84-74-2	B7-055-SB-2	0.053	J	0.026	0.04	59	32.20		630	no
Di-n-ocytlphthalate	117-84-0	B7-014-SB-10	0.063	J	0.054	0.06	59	27.12		63	no
Endosulfan I[+]	959-98-8	B7-001-SB-2	0.0019		0.00065	0.001	38	7.89		47	no
Endosulfan II[+]	33213-65-9	B7-001-SB-2	0.0106		0.001	0.003	38	15.79		47	no
Endosulfan sulfate	1031-07-8	B7-001-SB-2	0.011		0.0013	0.004	38	10.53		38	no
Endrin	72-20-8	B7-001-SB-2	0.03		0.0032	0.009	38	13.16		1.9	no
Endrin aldehyde	7421-93-4	B7-058-SB-2	0.026		0.0021	0.008	38	10.53			no
Endrine ketone	53494-70-5	B7-001-SB-2	0.0263		0.00034	0.005	38	23.68			no
Ethylbenzene	100-41-4	B25-013-SB-1	0.018		0.0018	0.01	9	22.22	5.8	340	no
Fluoranthene	206-44-0	B7-003-SB-2	4.7		0.00072	0.34	59	67.80		240	no
Fluorene	86-73-7	B7-003-SB-2	0.25		0.00069	0.02	59	45.76		240	no
gamma-BHC (Lindane)	58-89-9	B7-003-SB-2	0.0025		0.00082	0.002	38	10.53	0.57	2.1	no
gamma-Chlordane[#]	5103-74-2	B7-032-SB-1	0.0725		0.0011	0.02	38	13.16	1.7	3.5	no
Heptachlor	76-44-8	B7-003-SB-2	0.0018	J	0.0005	0.001	38	10.53	0.13	3.9	no
Heptachlor epoxide	1024-57-3	B7-032-SB-1	0.0104	J	0.0075	0.009	38	5.26	0.07	0.10	no
Indeno[1,2,3-c,d]pyrene	193-39-5	B7-060-SB-1	0.62		0.002	0.10	59	62.71	1.1		no
Iron	7439-89-6	B7-060-SB-2	311,000		3,670	49,174	59	100.00		5,500	YES (NC)
Lead^	7439-92-1	B7-001-SB-2	291		3.9	38.9	59	100.00		400	no
Manganese	7439-96-5	B7-003-SB-2	58,700		17.6	5,610	59	100.00		180	YES (NC)
Mercury (salts)	7439-97-6	B7-003-SB-6	2.6		0.0068	0.21	59	61.02		2.3	YES (NC)
Methoxychlor	72-43-5	B7-003-SB-2	0.017	J	0.0031	0.008	38	13.16		32	no
Naphthalene	91-20-3	B7-060-SB-1	0.64		0.0021	0.06	59	64.41	2	13	no
Nickel	7440-02-0	B7-060-SB-2	99.4		1.6	22.4	59	100.00	15,000	150	no

Table 7 - Sub-Parcel B7-1
COPC Screening Analysis

Parameter	CAS#	Location of Max Result	Max Detection (mg/kg)	Final Flag	Min Detection (mg/kg)	Average Detection (mg/kg)	Total Samples	Frequency of Detection (%)	Cancer TR=1E-06 (mg/kg)	Non-Cancer HQ=0.1 (mg/kg)	COPC?
PCBs (total)*	1336-36-3	B7-003-SB-1	0.16	J	0.089	0.12	25	16.00	0.23		no
Phenanthrene	85-01-8	B7-003-SB-2	2.9		0.00072	0.17	59	69.49			no
Pyrene	129-00-0	B7-003-SB-2	3.6		0.0017	0.28	59	64.41		180	no
Vanadium	7440-62-2	B7-003-SB-2	4,020		12	360	59	100.00		39	YES (NC)
Xylenes	1330-20-7	B25-013-SB-1	0.13		0.014	0.07	9	22.22		58	no
Zinc	7440-66-6	B7-001-SB-2	414		5.9	81.7	59	100.00		2,300	no

J: The positive result reported for this analyte is a quantitative estimate.

COPC = Constituent of Potential Concern
TR = Target Risk
HQ = Hazard Quotient

C = Compound was identified as a cancer COPC
NC = Compound was identified as a non-cancer COPC

*PCBs (total) include the sum of all detected aroclor mixtures, including those without RSLs (e.g. Aroclor 1262, Aroclor 1268) which are not displayed.
^Lead is assessed separately through the ALM and IEUBK models.
[+]The USEPA Screening Levels for Endosulfan were used for both Endosulfan I and II
[#]The USEPA Screening Levels for Chlordane (technical mixture) were used for both alpha- and gamma-Chlordane

Table 8 - Sub-Parcel B7-1
Assessment of Lead

Exposure Unit	Surface/Sub-Surface	Arithmetic Mean (mg/kg)
EU1 & EU1-EXP (11.4 ac. & 11.7 ac.)	Surface	57.8
	Sub-Surface	18.9
	Pooled	43.4
EU2 & EU2-EXP (10.4 ac. & 10.5 ac.)	Surface	38.3
	Sub-Surface	15.5
	Pooled	30.7

Table 9 - Sub-Parcel B7-1
Soil Exposure Point Concentrations

	EU1 & EU1-EXP (11.4 ac. & 11.7 ac.)					
	EPCs - Surface Soils		**EPCs - Sub-Surface Soils**		**EPCs - Pooled Soils**	
Parameter	EPC Type	EPC (mg/kg)	EPC Type	EPC (mg/kg)	EPC Type	EPC (mg/kg)
Aluminum	95% Student's-t UCL	18,746	95% Student's-t UCL	18,015	95% Adjusted Gamma UCL	18,011
Arsenic	95% KM (t) UCL	9.33	95% KM (t) UCL	8.07	95% KM (t) UCL	8.28
Chromium VI	Maximum Value	**0.77**	95% KM (t) UCL	0.88	95% KM (t) UCL	0.79
Cobalt	KM H-UCL	9.42	95% Student's-t UCL	9.67	KM H-UCL	9.02
Copper	95% Adjusted Gamma UCL	75.6	95% KM (t) UCL	17.0	KM H-UCL	49.4
Iron	95% Chebyshev (Mean, Sd) UCL	153,756	95% Student's-t UCL	27,786	95% Chebyshev (Mean, Sd) UCL	109,025
Manganese	95% Adjusted Gamma UCL	26,733	95% Chebyshev (Mean, Sd) UCL	989	97.5% Chebyshev (Mean, Sd) UCL	24,970
Mercury	Gamma Adjusted KM-UCL	0.27	95% KM Bootstrap t UCL	10.9	95% KM (Chebyshev) UCL	0.48
Vanadium	95% Chebyshev (Mean, Sd) UCL	1,938	95% Adjusted Gamma UCL	52.2	95% Chebyshev (Mean, Sd) UCL	1,284
Aroclor 1254	Maximum Value	**0.13**	NA	NA	Maximum Value	**0.13**
Benz[a]anthracene	95% KM (Chebyshev) UCL	0.60	95% KM (t) UCL	0.09	95% KM (Chebyshev) UCL	0.40
Benzo[a]pyrene	95% KM (Chebyshev) UCL	0.49	Maximum Value	**0.44**	Gamma Adjusted KM-UCL	0.27
Benzo[b]fluoranthene	95% KM (Chebyshev) UCL	0.83	95% KM (t) UCL	0.19	Gamma Adjusted KM-UCL	0.46
Dibenz[a,h]anthracene	Gamma Adjusted KM-UCL	0.07	Maximum Value	**0.09**	Gamma Adjusted KM-UCL	0.05

Bold indicates maximum value used as the EPC
NA = No Detections

Table 9 - Sub-Parcel B7-1
Soil Exposure Point Concentrations

	EU2 & EU2-EXP (10.4 ac. & 10.5 ac.)					
	EPCs - Surface Soils		**EPCs - Sub-Surface Soils**		**EPCs - Pooled Soils**	
Parameter	EPC Type	EPC (mg/kg)	EPC Type	EPC (mg/kg)	EPC Type	EPC (mg/kg)
Aluminum	95% Student's-t UCL	17,511	95% Student's-t UCL	16,994	95% Student's-t UCL	16,526
Arsenic	95% Adjusted Gamma UCL	8.44	95% KM (t) UCL	10.2	KM H-UCL	8.26
Chromium VI	NA	NA	NA	NA	NA	NA
Cobalt	95% H-UCL	11.1	95% Student's-t UCL	6.19	95% Chebyshev (Mean, Sd) UCL	13.7
Copper	95% Chebyshev (Mean, Sd) UCL	227	95% Student's-t UCL	12.0	95% Chebyshev (Mean, Sd) UCL	155
Iron	95% Chebyshev (Mean, Sd) UCL	133,518	95% Student's-t UCL	17,364	95% Chebyshev (Mean, Sd) UCL	94,448
Manganese	95% Adjusted Gamma UCL	823	95% Student's-t UCL	112	95% Adjusted Gamma UCL	505
Mercury	95% KM Bootstrap t UCL	0.35	Maximum Value	**0.52**	Gamma Adjusted KM-UCL	0.23
Vanadium	95% Adjusted Gamma UCL	61.6	95% Student's-t UCL	28.8	95% Adjusted Gamma UCL	48.4
Aroclor 1254	NA	NA	NA	NA	NA	NA
Benz[a]anthracene	99% KM (Chebyshev) UCL	0.76	Maximum Value	**0.02**	95% KM (Chebyshev) UCL	0.28
Benzo[a]pyrene	99% KM (Chebyshev) UCL	0.97	Maximum Value	**0.02**	95% KM (Chebyshev) UCL	0.36
Benzo[b]fluoranthene	Gamma Adjusted KM-UCL	0.92	Maximum Value	**0.03**	95% KM (Chebyshev) UCL	0.62
Dibenz[a,h]anthracene	Gamma Adjusted KM-UCL	0.12	Maximum Value	**0.003**	95% KM (Chebyshev) UCL	0.08

Bold indicates maximum value used as the EPC
NA = No Detections

Table 10 - Sub-Parcel B7-1
Surface Soils
Composite Worker Risk Ratios

Parameter	Target Organs	EU1 (12.2 ac.)					EU2 (9.8 ac.)				
			Composite Worker					Composite Worker			
			RSLs (mg/kg)		Risk Ratios			RSLs (mg/kg)		Risk Ratios	
		EPC (mg/kg)	Cancer	Non-Cancer	Risk	HQ	EPC (mg/kg)	Cancer	Non-Cancer	Risk	HQ
Aluminum	**Nervous**	18,746		1,100,000		0.02	17,511		1,100,000		0.02
Arsenic	**Cardiovascular; Dermal**	9.33	3.00	480	3.1E-06	0.02	8.44	3.00	480	2.8E-06	0.02
Chromium VI	**Respiratory**	**0.77**	6.30	3,500	1.2E-07	0.0002	NA	6.30	3,500		
Cobalt	**Thyroid**	9.42	1,900	350	5.0E-09	0.03	11.1	1,900	350	5.8E-09	0.03
Copper	**Gastrointestinal**	75.6		47,000		0.002	227		47,000		0.005
Iron	**Gastrointestinal**	153,756		820,000		0.2	133,518		820,000		0.2
Manganese	**Nervous**	26,733		26,000		1	823		26,000		0.03
Mercury	**Nervous**	0.27		350		0.0008	0.35		350		0.001
Vanadium	**Dermal**	1,938		5,800		0.3	61.6		5,800		0.01
Aroclor 1254	**Dermal; Immune; Ocular**	**0.13**	0.97	15.0	1.3E-07	0.009	NA	0.97	15.0		
Benz[a]anthracene		0.60	21.0		2.9E-08		0.76	21.0		3.6E-08	
Benzo[a]pyrene	**Developmental**	0.49	2.10	220	2.3E-07	0.002	0.97	2.10	220	4.6E-07	0.004
Benzo[b]fluoranthene		0.83	21.0		4.0E-08		0.92	21.0		4.4E-08	
Dibenz[a,h]anthracene		0.07	2.10		3.3E-08		0.12	2.10		5.7E-08	
					4E-06	↓				**3E-06**	↓

Bold indicates maximum value used as the EPC
NA = No Detections
RSLs were obtained from the EPA Regional Screening Level Calculator for Composite Worker using default assumptions.

Total HI	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Respiratory	0
	Gastrointestinal	0
	Nervous	1
	Immune	0
	Occular	0
	Developmental	0

Total HI	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Respiratory	0
	Gastrointestinal	0
	Nervous	0
	Immune	0
	Occular	0
	Developmental	0

Table 11 - Sub-Parcel B7-1
Subsurface Soils
Composite Worker Risk Ratios

Parameter	Target Organs	EU1 (12.2 ac.)					EU2 (9.8 ac.)				
			Composite Worker					Composite Worker			
			RSLs (mg/kg)		Risk Ratios			RSLs (mg/kg)		Risk Ratios	
		EPC (mg/kg)	Cancer	Non-Cancer	Risk	HQ	EPC (mg/kg)	Cancer	Non-Cancer	Risk	HQ
Aluminum	**Nervous**	18,015		1,100,000		0.02	16,994		1,100,000		0.02
Arsenic	**Cardiovascular; Dermal**	8.07	3.00	480	2.7E-06	0.02	10.2	3.00	480	3.4E-06	0.02
Chromium VI	**Respiratory**	0.88	6.30	3,500	1.4E-07	0.0003	NA	6.30	3,500		
Cobalt	**Thyroid**	9.67	1,900	350	5.1E-09	0.03	6.19	1,900	350	3.3E-09	0.02
Copper	**Gastrointestinal**	17.0		47,000		0.0004	12.0		47,000		0.0003
Iron	**Gastrointestinal**	27,786		820,000		0.03	17,364		820,000		0.02
Manganese	**Nervous**	989		26,000		0.04	112		26,000		0.004
Mercury	**Nervous**	10.9		350		0.03	**0.52**		350		0.001
Vanadium	**Dermal**	52.2		5,800		0.009	28.8		5,800		0.005
Aroclor 1254	**Dermal; Immune; Ocular**	NA	0.97	15.0			NA	0.97	15.0		
Benz[a]anthracene		0.09	21.0		4.3E-09		**0.02**	21.0		9.5E-10	
Benzo[a]pyrene	**Developmental**	**0.44**	2.10	220	2.1E-07	0.002	**0.02**	2.10	220	9.5E-09	0.00009
Benzo[b]fluoranthene		0.19	21.0		9.0E-09		**0.03**	21.0		1.4E-09	
Dibenz[a,h]anthracene		**0.09**	2.10		4.3E-08		**0.003**	2.10		1.4E-09	
					3E-06	↓				**3E-06**	↓

Bold indicates maximum value used as the EPC
NA = No Detections
RSLs were obtained from the EPA Regional Screening Level Calculator for Composite Worker using default assumptions.

Total HI	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Respiratory	0
	Gastrointestinal	0
	Nervous	0
	Immune	0
	Occular	0
	Developmental	0

Total HI	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Respiratory	0
	Gastrointestinal	0
	Nervous	0
	Immune	0
	Occular	0
	Developmental	0

Table 12 - Sub-Parcel B7-1
Pooled Soils
Composite Worker Risk Ratios

Parameter	Target Organs	EU1 (12.2 ac.)					EU2 (9.8 ac.)				
			Composite Worker					Composite Worker			
			RSLs (mg/kg)		Risk Ratios			RSLs (mg/kg)		Risk Ratios	
		EPC (mg/kg)	Cancer	Non-Cancer	Risk	HQ	EPC (mg/kg)	Cancer	Non-Cancer	Risk	HQ
Aluminum	**Nervous**	18,011		1,100,000		0.02	16,526		1,100,000		0.02
Arsenic	**Cardiovascular; Dermal**	8.28	3.00	480	2.8E-06	0.02	8.26	3.00	480	2.8E-06	0.02
Chromium VI	**Respiratory**	0.79	6.30	3,500	1.3E-07	0.0002	NA	6.30	3,500		
Cobalt	**Thyroid**	9.02	1,900	350	4.7E-09	0.03	13.7	1,900	350	7.2E-09	0.04
Copper	**Gastrointestinal**	49.4		47,000		0.001	155		47,000		0.003
Iron	**Gastrointestinal**	109,025		820,000		0.1	94,448		820,000		0.1
Manganese	**Nervous**	24,970		26,000		1	505		26,000		0.02
Mercury	**Nervous**	0.48		350		0.001	0.23		350		0.0007
Vanadium	**Dermal**	1,284		5,800		0.2	48.4		5,800		0.008
Aroclor 1254	**Dermal; Immune; Ocular**	**0.13**	0.97	15.0	1.3E-07	0.009	NA	0.97	15.0		
Benz[a]anthracene		0.40	21.0		1.9E-08		0.28	21.0		1.3E-08	
Benzo[a]pyrene	**Developmental**	0.27	2.10	220	1.3E-07	0.001	0.36	2.10	220	1.7E-07	0.002
Benzo[b]fluoranthene		0.46	21.0		2.2E-08		0.62	21.0		3.0E-08	
Dibenz[a,h]anthracene		0.05	2.10		2.4E-08		0.08	2.10		3.8E-08	
					3E-06	↓				**3E-06**	↓

Bold indicates maximum value used as the EPC
NA = No Detections
RSLs were obtained from the EPA Regional Screening Level Calculator for Composite Worker using default assumptions.

Total HI	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Respiratory	0
	Gastrointestinal	0
	Nervous	1
	Immune	0
	Occular	0
	Developmental	0

Total HI	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Respiratory	0
	Gastrointestinal	0
	Nervous	0
	Immune	0
	Occular	0
	Developmental	0

Table 13 - Sub-Parcel B7-1
Surface Soils
Adult Recreator Risk Ratios

Parameter	Target Organs	EU1 (12.2 ac.)					EU2 (9.8 ac.)				
			Adult Recreator - High Frequency					Adult Recreator - Moderate Frequency			
			SSLs (mg/kg)		Risk Ratios			SSLs (mg/kg)		Risk Ratios	
		EPC (mg/kg)	Cancer	Non-Cancer	Risk	HQ	EPC (mg/kg)	Cancer	Non-Cancer	Risk	HQ
Aluminum	**Nervous**	18,746		1,120,000		0.02	17,511		1,540,000		0.01
Arsenic	**Cardiovascular; Dermal**	9.33	0.948	480	9.8E-06	0.02	8.44	1.30	659	6.5E-06	0.01
Chromium VI	**Respiratory**	**0.77**	0.426	3,480	1.8E-06	0.0002	NA	0.585	4,790		
Cobalt	**Thyroid**	9.42	1,780	347	5.3E-09	0.03	11.1	2,450	477	4.5E-09	0.02
Copper	**Gastrointestinal**	75.6		46,700		0.002	227		64,200		0.004
Iron	**Gastrointestinal**	153,756		818,000		0.2	133,518		1,120,000		0.1
Manganese	**Nervous**	26,733		25,600		1	823		35,200		0.02
Mercury	**Nervous**	0.27		350		0.0008	0.35		481		0.0007
Vanadium	**Dermal**	1,938		5,830		0.3	61.6		8,010		0.008
Aroclor 1254	**Dermal; Immune; Ocular**	**0.13**	0.342	14.7	3.8E-07	0.009	NA	0.470	20.2		
Benz[a]anthracene		0.60	1.60		3.8E-07		0.76	2.20		3.5E-07	
Benzo[a]pyrene	**Developmental**	0.49	0.161	222	3.0E-06	0.002	0.97	0.221	305	4.4E-06	0.003
Benzo[b]fluoranthene		0.83	1.61		5.2E-07		0.92	2.21		4.2E-07	
Dibenz[a,h]anthracene		0.07	0.161		4.3E-07		0.12	0.221		5.4E-07	
					2E-05	↓				**1E-05**	↓

Bold indicates maximum value used as the EPC
NA = No Detections
SSLs were obtained from the EPA Regional Screening Level Calculator for Recreator Scenario using default assumptions and the following inputs:

High Frequency	*Moderate Frequency*
Chronic exposure	Chronic exposure
EF (day/yr) = 250	EF (day/yr) = 182
ET (hr/day) = 8	ET (hr/day) = 8

Total HI	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Respiratory	0
	Gastrointestinal	0
	Nervous	1
	Immune	0
	Occular	0
	Developmental	0

Total HI	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Respiratory	0
	Gastrointestinal	0
	Nervous	0
	Immune	0
	Occular	0
	Developmental	0

Table 14 - Sub-Parcel B7-1
Subsurface Soils
Adult Recreator Risk Ratios

Parameter	Target Organs	EU1 (12.2 ac.)					EU2 (9.8 ac.)				
			Adult Recreator - High Frequency					Adult Recreator - Moderate Frequency			
			SSLs (mg/kg)		Risk Ratios			SSLs (mg/kg)		Risk Ratios	
		EPC (mg/kg)	Cancer	Non-Cancer	Risk	HQ	EPC (mg/kg)	Cancer	Non-Cancer	Risk	HQ
Aluminum	**Nervous**	18,015		1,120,000		0.02	16,994		1,540,000		0.01
Arsenic	**Cardiovascular; Dermal**	8.07	0.948	480	8.5E-06	0.02	10.2	1.30	659	7.8E-06	0.02
Chromium VI	**Respiratory**	0.88	0.426	3,480	2.1E-06	0.0003	NA	0.585	4,790		
Cobalt	**Thyroid**	9.67	1,780	347	5.4E-09	0.03	6.19	2,450	477	2.5E-09	0.01
Copper	**Gastrointestinal**	17.0		46,700		0.0004	12.0		64,200		0.0002
Iron	**Gastrointestinal**	27,786		818,000		0.03	17,364		1,120,000		0.02
Manganese	**Nervous**	989		25,600		0.04	112		35,200		0.003
Mercury	**Nervous**	10.9		350		0.03	**0.52**		481		0.001
Vanadium	**Dermal**	52.2		5,830		0.009	28.8		8,010		0.004
Aroclor 1254	**Dermal; Immune; Ocular**	NA	0.342	14.7			NA	0.470	20.2		
Benz[a]anthracene		0.09	1.60		5.6E-08		**0.02**	2.20		9.1E-09	
Benzo[a]pyrene	**Developmental**	**0.44**	0.161	222	2.7E-06	0.002	**0.02**	0.221	305	9.0E-08	0.00007
Benzo[b]fluoranthene		0.19	1.61		1.2E-07		**0.03**	2.21		1.4E-08	
Dibenz[a,h]anthracene		**0.09**	0.161		5.6E-07		**0.003**	0.221		1.4E-08	
					1E-05	↓				**8E-06**	↓

Bold indicates maximum value used as the EPC
NA = No Detections
SSLs were obtained from the EPA Regional Screening Level Calculator for Recreator Scenario using default assumptions and the following inputs:

High Frequency	*Moderate Frequency*
Chronic exposure	Chronic exposure
EF (day/yr) = 250	EF (day/yr) = 182
ET (hr/day) = 8	ET (hr/day) = 8

Total HI	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Respiratory	0
	Gastrointestinal	0
	Nervous	0
	Immune	0
	Occular	0
	Developmental	0

Total HI	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Respiratory	0
	Gastrointestinal	0
	Nervous	0
	Immune	0
	Occular	0
	Developmental	0

Table 15 - Sub-Parcel B7-1
Pooled Soils
Adult Recreator Risk Ratios

Parameter	Target Organs	EU1 (12.2 ac.)					EU2 (9.8 ac.)				
			Adult Recreator - High Frequency					Adult Recreator - Moderate Frequency			
			SSLs (mg/kg)		Risk Ratios			SSLs (mg/kg)		Risk Ratios	
		EPC (mg/kg)	Cancer	Non-Cancer	Risk	HQ	EPC (mg/kg)	Cancer	Non-Cancer	Risk	HQ
Aluminum	**Nervous**	18,011		1,120,000		0.02	16,526		1,540,000		0.01
Arsenic	**Cardiovascular; Dermal**	8.28	0.948	480	8.7E-06	0.02	8.26	1.30	659	6.4E-06	0.01
Chromium VI	**Respiratory**	0.79	0.426	3,480	1.9E-06	0.0002	NA	0.585	4,790		
Cobalt	**Thyroid**	9.02	1,780	347	5.1E-09	0.03	13.7	2,450	477	5.6E-09	0.03
Copper	**Gastrointestinal**	49.4		46,700		0.001	155		64,200		0.002
Iron	**Gastrointestinal**	109,025		818,000		0.1	94,448		1,120,000		0.08
Manganese	**Nervous**	24,970		25,600		1	505		35,200		0.01
Mercury	**Nervous**	0.48		350		0.001	0.23		481		0.0005
Vanadium	**Dermal**	1,284		5,830		0.2	48.4		8,010		0.006
Aroclor 1254	**Dermal; Immune; Ocular**	**0.13**	0.342	14.7	3.8E-07	0.009	NA	0.470	20.2		
Benz[a]anthracene		0.40	1.60		2.5E-07		0.28	2.20		1.3E-07	
Benzo[a]pyrene	**Developmental**	0.27	0.161	222	1.7E-06	0.001	0.36	0.221	305	1.6E-06	0.001
Benzo[b]fluoranthene		0.46	1.61		2.9E-07		0.62	2.21		2.8E-07	
Dibenz[a,h]anthracene		0.05	0.161		3.1E-07		0.08	0.221		3.6E-07	
					1E-05	↓				**9E-06**	↓

Bold indicates maximum value used as the EPC
NA = No Detections
SSLs were obtained from the EPA Regional Screening Level Calculator for Recreator Scenario using default assumptions and the following inputs:

High Frequency	*Moderate Frequency*
Chronic exposure	Chronic exposure
EF (day/yr) = 250	EF (day/yr) = 182
ET (hr/day) = 8	ET (hr/day) = 8

Total HI	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Respiratory	0
	Gastrointestinal	0
	Nervous	1
	Immune	0
	Occular	0
	Developmental	0

Total HI	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Respiratory	0
	Gastrointestinal	0
	Nervous	0
	Immune	0
	Occular	0
	Developmental	0

Table 16 - Sub-Parcel B7-1
Surface Soils
Child Recreator Risk Ratios

Parameter	Target Organs	EU1 (12.2 ac.)					EU2 (9.8 ac.)				
			Child Recreator - High Frequency					Child Recreator - Moderate Frequency			
			SSLs (mg/kg)		Risk Ratios			SSLs (mg/kg)		Risk Ratios	
		EPC (mg/kg)	Cancer	Non-Cancer	Risk	HQ	EPC (mg/kg)	Cancer	Non-Cancer	Risk	HQ
Aluminum	**Nervous**	18,746		109,000		0.2	17,511		150,000		0.1
Arsenic	**Cardiovascular; Dermal**	9.33	0.948	48.9	9.8E-06	0.2	8.44	1.30	67.2	6.5E-06	0.1
Chromium VI	**Respiratory**	**0.77**	0.426	328	1.8E-06	0.002	NA	0.585	451		
Cobalt	**Thyroid**	9.42	1,780	32.8	5.3E-09	0.3	11.1	2,450	45.1	4.5E-09	0.2
Copper	**Gastrointestinal**	75.6		4,380		0.02	227		6,020		0.04
Iron	**Gastrointestinal**	153,756		76,700		2	133,518		105,000		1
Manganese	**Nervous**	26,733		2,610		10	823		3,580		0.2
Mercury	**Nervous**	0.27		32.8		0.008	0.35		45.1		0.008
Vanadium	**Dermal**	1,938		551		4	61.6		757		0.08
Aroclor 1254	**Dermal; Immune; Ocular**	**0.13**	0.342	1.64	3.8E-07	0.08	NA	0.470	2.26		
Benz[a]anthracene		0.60	1.60		3.8E-07		0.76	2.20		3.5E-07	
Benzo[a]pyrene	**Developmental**	0.49	0.161	25.1	3.0E-06	0.02	0.97	0.221	34.4	4.4E-06	0.03
Benzo[b]fluoranthene		0.83	1.61		5.2E-07		0.92	2.21		4.2E-07	
Dibenz[a,h]anthracene		0.07	0.161		4.3E-07		0.12	0.221		5.4E-07	
					2E-05	↓				**1E-05**	↓

Bold indicates maximum value used as the EPC
NA = No Detections
SSLs were obtained from the EPA Regional Screening Level Calculator for Recreator Scenario using default assumptions and the following inputs:

High Frequency	*Moderate Frequency*
Chronic exposure	Chronic exposure
EF (day/yr) = 250	EF (day/yr) = 182
ET (hr/day) = 8	ET (hr/day) = 8

Total HI	Cardiovascular	0
	Dermal	4
	Thyroid	0
	Respiratory	0
	Gastrointestinal	2
	Nervous	10
	Immune	0
	Occular	0
	Developmental	0

Total HI	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Respiratory	0
	Gastrointestinal	1
	Nervous	0
	Immune	0
	Occular	0
	Developmental	0

Table 17 - Sub-Parcel B7-1
Subsurface Soils
Child Recreator Risk Ratios

Parameter	Target Organs	EU1 (12.2 ac.)					EU2 (9.8 ac.)				
			Child Recreator - High Frequency					Child Recreator - Moderate Frequency			
			SSLs (mg/kg)		Risk Ratios			SSLs (mg/kg)		Risk Ratios	
		EPC (mg/kg)	Cancer	Non-Cancer	Risk	HQ	EPC (mg/kg)	Cancer	Non-Cancer	Risk	HQ
Aluminum	**Nervous**	18,015		109,000		0.2	16,994		150,000		0.1
Arsenic	**Cardiovascular; Dermal**	8.07	0.948	48.9	8.5E-06	0.2	10.2	1.30	67.2	7.8E-06	0.2
Chromium VI	**Respiratory**	0.88	0.426	328	2.1E-06	0.003	NA	0.585	451		
Cobalt	**Thyroid**	9.67	1,780	32.8	5.4E-09	0.3	6.19	2,450	45.1	2.5E-09	0.1
Copper	**Gastrointestinal**	17.0		4,380		0.004	12.0		6,020		0.002
Iron	**Gastrointestinal**	27,786		76,700		0.4	17,364		105,000		0.2
Manganese	**Nervous**	989		2,610		0.4	112		3,580		0.03
Mercury	**Nervous**	10.9		32.8		0.3	**0.52**		45.1		0.01
Vanadium	**Dermal**	52.2		551		0.09	28.8		757		0.04
Aroclor 1254	**Dermal; Immune; Ocular**	NA	0.342	1.64			NA	0.470	2.26		
Benz[a]anthracene		0.09	1.60		5.6E-08		**0.02**	2.20		9.1E-09	
Benzo[a]pyrene	**Developmental**	**0.44**	0.161	25.1	2.7E-06	0.02	**0.02**	0.221	34.4	9.0E-08	0.0006
Benzo[b]fluoranthene		0.19	1.61		1.2E-07		**0.03**	2.21		1.4E-08	
Dibenz[a,h]anthracene		**0.09**	0.161		5.6E-07		**0.003**	0.221		1.4E-08	
					1E-05	↓				**8E-06**	↓

Bold indicates maximum value used as the EPC
NA = No Detections
SSLs were obtained from the EPA Regional Screening Level Calculator for Recreator Scenario using default assumptions and the following inputs:

High Frequency	*Moderate Frequency*
Chronic exposure	Chronic exposure
EF (day/yr) = 250	EF (day/yr) = 182
ET (hr/day) = 8	ET (hr/day) = 8

Total HI	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Respiratory	0
	Gastrointestinal	0
	Nervous	1
	Immune	0
	Occular	0
	Developmental	0

Total HI	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Respiratory	0
	Gastrointestinal	0
	Nervous	0
	Immune	0
	Occular	0
	Developmental	0

Table 18 - Sub-Parcel B7-1
Pooled Soils
Child Recreator Risk Ratios

Parameter	Target Organs	EU1 (12.2 ac.)					EU2 (9.8 ac.)				
			Child Recreator - High Frequency					Child Recreator - Moderate Frequency			
			SSLs (mg/kg)		Risk Ratios			SSLs (mg/kg)		Risk Ratios	
		EPC (mg/kg)	Cancer	Non-Cancer	Risk	HQ	EPC (mg/kg)	Cancer	Non-Cancer	Risk	HQ
Aluminum	**Nervous**	18,011		109,000		0.2	16,526		150,000		0.1
Arsenic	**Cardiovascular; Dermal**	8.28	0.948	48.9	8.7E-06	0.2	8.26	1.30	67.2	6.4E-06	0.1
Chromium VI	**Respiratory**	0.79	0.426	328	1.9E-06	0.002	NA	0.585	451		
Cobalt	**Thyroid**	9.02	1,780	32.8	5.1E-09	0.3	13.7	2,450	45.1	5.6E-09	0.3
Copper	**Gastrointestinal**	49.4		4,380		0.01	155		6,020		0.03
Iron	**Gastrointestinal**	109,025		76,700		1	94,448		105,000		0.9
Manganese	**Nervous**	24,970		2,610		10	505		3,580		0.1
Mercury	**Nervous**	0.48		32.8		0.01	0.23		45.1		0.005
Vanadium	**Dermal**	1,284		551		2	48.4		757		0.06
Aroclor 1254	**Dermal; Immune; Ocular**	**0.13**	0.342	1.64	3.8E-07	0.08	NA	0.470	2.26		
Benz[a]anthracene		0.40	1.60		2.5E-07		0.28	2.20		1.3E-07	
Benzo[a]pyrene	**Developmental**	0.27	0.161	25.1	1.7E-06	0.01	0.36	0.221	34.4	1.6E-06	0.01
Benzo[b]fluoranthene		0.46	1.61		2.9E-07		0.62	2.21		2.8E-07	
Dibenz[a,h]anthracene		0.05	0.161		3.1E-07		0.08	0.221		3.6E-07	
					1E-05	↓				**9E-06**	↓

Bold indicates maximum value used as the EPC
NA = No Detections
SSLs were obtained from the EPA Regional Screening Level Calculator for Recreator Scenario using default assumptions and the following inputs:

High Frequency	*Moderate Frequency*
Chronic exposure	Chronic exposure
EF (day/yr) = 250	EF (day/yr) = 182
ET (hr/day) = 8	ET (hr/day) = 8

Total HI	Cardiovascular	0
	Dermal	3
	Thyroid	0
	Respiratory	0
	Gastrointestinal	1
	Nervous	10
	Immune	0
	Occular	0
	Developmental	0

Total HI	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Respiratory	0
	Gastrointestinal	1
	Nervous	0
	Immune	0
	Occular	0
	Developmental	0

Table 19 - Sub-Parcel B7-1
Surface Soils
Construction Worker Risk Ratios

Parameter	Target Organs	50 Day - EU1-EXP (12.5 ac.)					250 Day - EU2-EXP (9.9 ac.)				
			Construction Worker					Construction Worker			
			SSLs (mg/kg)		Risk Ratios			SSLs (mg/kg)		Risk Ratios	
		EPC (mg/kg)	Cancer	Non-Cancer	Risk	HQ	EPC (mg/kg)	Cancer	Non-Cancer	Risk	HQ
Aluminum	**Nervous**	18,746		1,455,305		0.01	17,511		286,692		0.06
Arsenic	**Cardiovascular; Dermal**	9.33	75.6	478.90	1.2E-07	0.02	8.44	15.1	95.62	5.6E-07	0.09
Chromium VI	**Respiratory**	**0.77**	105	3,994	7.3E-09	0.0002	NA	20.9	798		
Cobalt	**Thyroid**	9.42	14,798	4,540	6.4E-10	0.002	11.1	2,691	897.24	4.1E-09	0.01
Copper	**Gastrointestinal**	75.6		17,182		0.004	227		3,436		0.07
Iron	**Gastrointestinal**	153,756		1,202,707		0.1	133,518		240,541		0.6
Manganese	**Nervous**	26,733		19,337		1	823		3,791		0.2
Mercury	**Nervous**	0.27		2,467		0.0001	0.35		493		0.0007
Vanadium	**Dermal**	1,938		7,876		0.2	61.6		1,569		0.04
Aroclor 1254	**Dermal; Immune; Ocular**	**0.13**	25.3	37.4	5.1E-09	0.003	NA	6.65	7.48		
Benz[a]anthracene		0.60	690		8.7E-10		0.76	158		4.8E-09	
Benzo[a]pyrene	**Developmental**	0.49	84.5	25.9	5.8E-09	0.02	0.97	17.4	10.93496	5.6E-08	0.09
Benzo[b]fluoranthene		0.83	840		9.9E-10		0.92	174		5.3E-09	
Dibenz[a,h]anthracene		0.07	87.1		8.0E-10		0.12	17.6		6.8E-09	
					1E-07	↓				**6E-07**	↓

Bold indicates maximum value used as the EPC
NA = No Detections
SSLs calculated using equations in 2002 EPA Supplemental Guidance
Guidance Equation Input Assumptions:
5 cars/day (2 tons/car)
5 trucks/day (20 tons/truck)
3 meter source depth thickness

Total HI	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Respiratory	0
	Gastrointestinal	0
	Nervous	1
	Immune	0
	Occular	0
	Developmental	0

Total HI	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Respiratory	0
	Gastrointestinal	1
	Nervous	0
	Immune	0
	Occular	0
	Developmental	0

Table 20 - Sub-Parcel B7-1
Subsurface Soils
Construction Worker Risk Ratios

Parameter	Target Organs	50 Day - EU1-EXP (12.5 ac.)					250 Day - EU2-EXP (9.9 ac.)				
			Construction Worker					Construction Worker			
			SSLs (mg/kg)		Risk Ratios			SSLs (mg/kg)		Risk Ratios	
		EPC (mg/kg)	Cancer	Non-Cancer	Risk	HQ	EPC (mg/kg)	Cancer	Non-Cancer	Risk	HQ
Aluminum	**Nervous**	18,015		1,455,305		0.01	16,994		286,692		0.06
Arsenic	**Cardiovascular; Dermal**	8.07	75.6	478.90	1.1E-07	0.02	10.2	15.1	95.62	6.7E-07	0.1
Chromium VI	**Respiratory**	0.88	105	3,994	8.4E-09	0.0002	NA	20.9	798		
Cobalt	**Thyroid**	9.67	14,798	4,540	6.5E-10	0.002	6.19	2,691	897.24	2.3E-09	0.007
Copper	**Gastrointestinal**	17.0		17,182		0.001	12.0		3,436		0.003
Iron	**Gastrointestinal**	27,786		1,202,707		0.02	17,364		240,541		0.07
Manganese	**Nervous**	989		19,337		0.05	112		3,791		0.03
Mercury	**Nervous**	10.9		2,467		0.004	**0.52**		493		0.001
Vanadium	**Dermal**	52.2		7,876		0.007	28.8		1,569		0.02
Aroclor 1254	**Dermal; Immune; Ocular**	NA	25.3	37.4			NA	6.65	7.48		
Benz[a]anthracene		0.09	690		1.3E-10		**0.02**	158		1.3E-10	
Benzo[a]pyrene	**Developmental**	**0.44**	84.5	25.9	5.2E-09	0.02	**0.02**	17.4	10.93496	1.1E-09	0.002
Benzo[b]fluoranthene		0.19	840		2.3E-10		**0.03**	174		1.7E-10	
Dibenz[a,h]anthracene		**0.09**	87.1		1.0E-09		**0.003**	17.6		1.7E-10	
					1E-07	↓				**7E-07**	↓

Bold indicates maximum value used as the EPC
NA = No Detections
SSLs calculated using equations in 2002 EPA Supplemental Guidance
Guidance Equation Input Assumptions:
5 cars/day (2 tons/car)
5 trucks/day (20 tons/truck)
3 meter source depth thickness

Total HI	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Respiratory	0
	Gastrointestinal	0
	Nervous	0
	Immune	0
	Occular	0
	Developmental	0

Total HI	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Respiratory	0
	Gastrointestinal	0
	Nervous	0
	Immune	0
	Occular	0
	Developmental	0

Table 21 - Sub-Parcel B7-1
Pooled Soils
Construction Worker Risk Ratios

Parameter	Target Organs	50 Day - EU1-EXP (12.5 ac.)					250 Day - EU2-EXP (9.9 ac.)				
			Construction Worker					Construction Worker			
			SSLs (mg/kg)		Risk Ratios			SSLs (mg/kg)		Risk Ratios	
		EPC (mg/kg)	Cancer	Non-Cancer	Risk	HQ	EPC (mg/kg)	Cancer	Non-Cancer	Risk	HQ
Aluminum	**Nervous**	18,011		1,455,305		0.01	16,526		286,692		0.06
Arsenic	**Cardiovascular; Dermal**	8.28	75.6	478.90	1.1E-07	0.02	8.26	15.1	95.62	5.5E-07	0.09
Chromium VI	**Respiratory**	0.79	105	3,994	7.5E-09	0.0002	NA	20.9	798		
Cobalt	**Thyroid**	9.02	14,798	4,540	6.1E-10	0.002	13.7	2,691	897.24	5.1E-09	0.02
Copper	**Gastrointestinal**	49.4		17,182		0.003	155		3,436		0.05
Iron	**Gastrointestinal**	109,025		1,202,707		0.09	94,448		240,541		0.4
Manganese	**Nervous**	24,970		19,337		1	505		3,791		0.1
Mercury	**Nervous**	0.48		2,467		0.0002	0.23		493		0.0005
Vanadium	**Dermal**	1,284		7,876		0.2	48.4		1,569		0.03
Aroclor 1254	**Dermal; Immune; Ocular**	**0.13**	25.3	37.4	5.1E-09	0.003	NA	6.65	7.48		
Benz[a]anthracene		0.40	690		5.8E-10		0.28	158		1.8E-09	
Benzo[a]pyrene	**Developmental**	0.27	84.5	25.9	3.2E-09	0.01	0.36	17.4	10.93496	2.1E-08	0.03
Benzo[b]fluoranthene		0.46	840		5.5E-10		0.62	174		3.6E-09	
Dibenz[a,h]anthracene		0.05	87.1		5.7E-10		0.08	17.6		4.5E-09	
					1E-07	↓				**6E-07**	↓

Bold indicates maximum value used as the EPC
NA = No Detections
SSLs calculated using equations in 2002 EPA Supplemental Guidance
Guidance Equation Input Assumptions:
5 cars/day (2 tons/car)
5 trucks/day (20 tons/truck)
3 meter source depth thickness

Total HI	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Respiratory	0
	Gastrointestinal	0
	Nervous	1
	Immune	0
	Occular	0
	Developmental	0

Total HI	Cardiovascular	0
	Dermal	0
	Thyroid	0
	Respiratory	0
	Gastrointestinal	0
	Nervous	0
	Immune	0
	Occular	0
	Developmental	0

APPENDIX A

TRADEPOINT
ATLANTIC
1600 Sparrows Point Boulevard
Baltimore, Maryland 21219

March 29, 2021

Maryland Department of Environment
1800 Washington Boulevard
Baltimore MD, 21230
Attention: Ms. Barbara Brown

Subject: **Request to Enter Temporary CHS Review**
Tradepoint Atlantic Parcel B7-1; County Parcel

Dear Ms. Brown:

The conduct of any environmental assessment and cleanup activities on the Tradepoint Atlantic property, as well as any associated development, is subject to the requirements outlined in the following agreements:

- 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).

On September 11, 2014, Tradepoint Atlantic submitted an application to the Maryland Department of the Environment's (Department) Voluntary Cleanup Program (VCP).

In consultation with the Department, Tradepoint Atlantic affirms that it desires to accelerate the assessment, remediation, and redevelopment of certain sub-parcels within the larger site due to current market conditions. To that end, the Department and Tradepoint Atlantic agree that the Controlled Hazardous Substance (CHS) Act (Section 7-222 of the Environment Article) and the CHS Response Plan (COMAR 26.14.02) shall serve as the governing statutory and regulatory authority for completing the development activities on Sub-Parcel B7-1 and complement the statutory requirements of the Voluntary Cleanup Program (Section 7-501 of the Environment Article). Upon submission of a Site Response and Development Work Plan and completion of the remedial activities for the sub-parcel, the Department shall issue a "No Further Action" letter upon a recordation of an environmental covenant describing any necessary land use controls for the specific sub-parcel. At such time that all the sub-parcels within the larger parcel have completed remedial activities, Tradepoint Atlantic shall submit to the Department a request for issuing a Certificate of Completion (COC) as well as all pertinent information concerning completion of remedial activities conducted on the parcel. Once the VCP has completed its review of the

TRADEPOINT
ATLANTIC
1600 Sparrows Point Boulevard
Baltimore, Maryland 21219

submitted information it shall issue a COC for the entire parcel described in Tradepoint Atlantic's VCP application.

Alternatively, Tradepoint Atlantic, or other entity may elect to submit an application for a specific sub-parcel and submit it to the VCP for review and acceptance. If the application is received after the cleanup and redevelopment activities described in this work plan are implemented and a No Further Action letter is issued by the Department pursuant to the CHS Act, the VCP shall prepare a No Further Requirements Determination for the sub-parcel.

If Tradepoint Atlantic or other entity has not carried out cleanup and redevelopment activities described in the work plan, the cleanup and redevelopment activities may be conducted under the oversight authority of either the VCP or the CHS Act, so long as those activities comport with this work plan.

Engineering and institutional controls approved as part of this Site Response and Development Work Plan shall be described in documentation submitted to the Department demonstrating that the exposure pathways on the sub-parcel are addressed in a manner that protects public health and the environment. This information shall support Tradepoint Atlantic's request for the issuance of a COC for the larger parcel.

Please do not hesitate to contact Tradepoint Atlantic for further information.

Thank you,

Peter Haid

Vice President Environmental
TRADEPOINT ATLANTIC
1600 Sparrows Point Boulevard
Baltimore, Maryland 21219
T 443.649.5055 C 732.841.7935
phaid@tradepointatlantic.com

APPENDIX B

Construction Worker Soil Screening Levels
Maximum Allowable Work Day Exposure
Calculation Spreadsheet - Sub-Parcel B7-1

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

Construction Worker Soil Screening Levels
Maximum Allowable Work Day Exposure
Calculation Spreadsheet - Sub-Parcel B7-1

Area of site (ac)	Ac	12.5
Overall duration of construction (wk/yr)	EW	10
Exposure frequency (day/yr)	EF	**50**
Cars per day	Ca	5
Tons per car	CaT	2
Trucks per day	Tru	5
Tons per truck	TrT	20
Mean vehicle weight (tons)	w	**11**
Derivation of dispersion factor - particulate emission factor (g/m2-s per kg/m3)	Q/Csr	**14.9**
Overall duration of traffic (s)	Tt	**1,440,000**
Surface area (m2)	AR	**50,586**
Length (m)	LR	**225**
Distance traveled (km)	ΣVKT	**112**
Particulate emission factor (m3/kg)	PEFsc	**86,875,519**
Derivation of dispersion factor - volatilization (g/m2-s per kg/m3)	Q/Csa	**8.12**
Total time of construction (s)	Tcv	**1,440,000**

(EU1-EXP)

Input
Calculation

Chemical	Toxicity Criteria Source	^Ingestion SF $(mg/kg\text{-}day)^{-1}$	^Inhalation Unit Risk $(ug/m^3)^{-1}$	^Subchronic RfD (mg/kg-day)	^Subchronic RfC (mg/m^3)	^GIABS	Dermally Adjusted RfD (mg/kg-day)	^ABS	^RBA	*Dia	*Diw	*Henry's Law Constant (unitless)	*Kd	*Koc	DA	Volatilization Factor - Unlimited Reservoir (m^3/kg)	Carcinogenic Ingestion/ Dermal SL (SLing/der)	Carcinogenic Inhalation SL (SLinh)	Carcinogenic SL (mg/kg)	Non-Carcinogenic Ingestion/ Dermal SL (SLing/der)	Non-Carcinogenic Inhalation SL (SLinh)	Non-Carcinogenic SL (mg/kg)
Aluminum	A/P	-	-	1.00E+00	5.00E-03	1	1.00E+00	**0.01**	1			-	1.50E+03							1,718,152	9,512,869	1,455,305
Arsenic, Inorganic	I/C	1.50E+00	4.30E-03	3.00E-04	1.50E-05	1	3.00E-04	0.03	0.6			-	2.90E+01				75.8	30,972	75.6	487	28,539	479
Chromium(VI)	A/C/I	5.00E-01	8.40E-02	5.00E-03	3.00E-04	0.025	1.25E-04	**0.01**	1			-	1.90E+01				113	1,585	105	4,022	570,772	3,994
Cobalt	P	-	9.00E-03	3.00E-03	2.00E-05	1	3.00E-03	**0.01**	1			-	4.50E+01					14,798	14,798	5,154	38,051	4,540
Copper	A	-	-	1.00E-02	-	1	1.00E-02	**0.01**	1			-	3.50E+01							17,182		17,182
Iron	P	-	-	7.00E-01	-	1	7.00E-01	**0.01**	1			-	2.50E+01							1,202,707		1,202,707
Manganese (Non-diet)	I	-	-	2.40E-02	5.00E-05	0.04	9.60E-04	**0.01**	1			-	6.50E+01							24,270	95,129	19,337
Mercuric Chloride (and other salts)	I	-	-	2.00E-03	3.00E-04	0.07	1.40E-04	**0.01**	1			-								2,478	570,772	2,467
Vanadium and Compounds	A	-	-	1.00E-02	1.00E-04	0.026	2.60E-04	**0.01**	1			-	1.00E+03							8,216	190,257	7,876
Aroclor 1254	A/I	2.00E+00	5.71E-04	3.00E-05	-	1	3.00E-05	0.14	1	2.40E-02	6.10E-06	1.16E-02	7.80E+02	1.30E+05	1.91E-08	2.25E+4	43.6	60.4	25.3	37.4		37.4
Benz[a]anthracene	I	1.00E-01	6.00E-05	-	-	1		0.13	1	2.60E-02	6.70E-06	4.91E-04	1.08E+03	1.80E+05	6.71E-10	1.20E+5	891	3,063	690			
Benzo[a]pyrene	I	1.00E+00	6.00E-04	3.00E-04	2.00E-06	1	3.00E-04	0.13	1	4.80E-02	5.60E-06	1.87E-05	3.54E+03	5.90E+05	2.37E-11	6.39E+5	89.1	1,622	84.5	382	27.8	25.9
Benzo[b]fluoranthene	I	1.00E-01	6.00E-05	-	-	1		0.13	1	4.80E-02	5.60E-06	2.69E-05	3.60E+03	6.00E+05	2.91E-11	5.76E+5	891	14,630	840			
Dibenz[a,h]anthracene	I	1.00E+00	6.00E-04	-	-	1		0.13	1	4.50E-02	5.20E-06	5.76E-06	1.14E+04	1.90E+06	4.13E-12	1.53E+6	89.1	3,843	87.1			

*chemical specific parameters found in Chemical Specific Parameters Spreadsheet at https://www.epa.gov/risk/regional-screening-levels-rsls
^chemical specific parameters found in Unpaved Road Traffic calculator at https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search
I: chemical specific parameters found in the IRIS at https://www.epa.gov/iris
C: chemical specific parameters found in Cal EPA at https://www.dtsc.ca.gov/AssessingRisk
A: chemical specific parameters found in Agency for Toxic Substances and Disease Registry Minimal Risk Levels (MRLs) at https://www.atsdr.cdc.gov/mrls/pdfs/atsdr_mrls.pdf
P: chemical specific parameters found in the Database of EPA PPRTVs at https://hhpprtv.ornl.gov/quickview/pprtv.php

Construction Worker Soil Screening Levels
Maximum Allowable Work Day Exposure
Calculation Spreadsheet - Sub-Parcel B7-1

Area of site (ac)	Ac	9.9
Overall duration of construction (wk/yr)	EW	50
Exposure frequency (day/yr)	EF	**250**
Cars per day	Ca	5
Tons per car	CaT	2
Trucks per day	Tru	5
Tons per truck	TrT	20
Mean vehicle weight (tons)	w	**11**
Derivation of dispersion factor - particulate emission factor (g/m2-s per kg/m3)	Q/Csr	**15.3**
Overall duration of traffic (s)	Tt	**7,200,000**
Surface area (m2)	AR	**40,064**
Length (m)	LR	**200**
Distance traveled (km)	ΣVKT	**500**
Particulate emission factor (m3/kg)	PEFsc	**79,005,159**
Derivation of dispersion factor - volatilization (g/m2-s per kg/m3)	Q/Csa	**8.43**
Total time of construction (s)	Tcv	**7,200,000**

(EU2-EXP)

Input
Calculation

Chemical	Toxicity Criteria Source	^Ingestion SF $(mg/kg\text{-}day)^{-1}$	^Inhalation Unit Risk $(ug/m^3)^{-1}$	^Subchronic RfD (mg/kg-day)	^Subchronic RfC (mg/m^3)	^GIABS	Dermally Adjusted RfD (mg/kg-day)	^ABS	^RBA	*Dia	*Diw	*Henry's Law Constant (unitless)	*Kd	*Koc	DA	Volatilization Factor - Unlimited Reservoir (m^3/kg)	Carcinogenic Ingestion/ Dermal SL (SLing/der)	Carcinogenic Inhalation SL (SLinh)	Carcinogenic SL (mg/kg)	Non-Carcinogenic Ingestion/ Dermal SL (SLing/der)	Non-Carcinogenic Inhalation SL (SLinh)	Non-Carcinogenic SL (mg/kg)
Aluminum	A/P	-	-	1.00E+00	5.00E-03	1	1.00E+00	**0.01**	1			-	1.50E+03							343,630	1,730,213	286,692
Arsenic, Inorganic	I/C	1.50E+00	4.30E-03	3.00E-04	1.50E-05	1	3.00E-04	0.03	0.6			-	2.90E+01				15.2	5,633	15.1	97	5,191	96
Chromium(VI)	A/C/I	5.00E-01	8.40E-02	5.00E-03	3.00E-04	0.025	1.25E-04	**0.01**	1			-	1.90E+01				23	288	21	804	103,813	798
Cobalt	P	-	9.00E-03	3.00E-03	2.00E-05	1	3.00E-03	**0.01**	1			-	4.50E+01					2,691	2,691	1,031	6,921	897
Copper	A	-	-	1.00E-02	-	1	1.00E-02	**0.01**	1			-	3.50E+01							3,436		3,436
Iron	P	-	-	7.00E-01	-	1	7.00E-01	**0.01**	1			-	2.50E+01							240,541		240,541
Manganese (Non-diet)	I	-	-	2.40E-02	5.00E-05	0.04	9.60E-04	**0.01**	1			-	6.50E+01							4,854	17,302	3,791
Mercuric Chloride (and other salts)	I	-	-	2.00E-03	3.00E-04	0.07	1.40E-04	**0.01**	1			-								496	103,813	493
Vanadium and Compounds	A	-	-	1.00E-02	1.00E-04	0.026	2.60E-04	**0.01**	1			-	1.00E+03							1,643	34,604	1,569
Aroclor 1254	A/I	2.00E+00	5.71E-04	3.00E-05	-	1	3.00E-05	0.14	1	2.40E-02	6.10E-06	1.16E-02	7.80E+02	1.30E+05	1.91E-08	5.23E+4	8.7	28.0	6.7	7.5		7.5
Benz[a]anthracene	I	1.00E-01	6.00E-05	-	-	1		0.13	1	2.60E-02	6.70E-06	4.91E-04	1.08E+03	1.80E+05	6.71E-10	2.79E+5	178	1,419	158			
Benzo[a]pyrene	I	1.00E+00	6.00E-04	3.00E-04	2.00E-06	1	3.00E-04	0.13	1	4.80E-02	5.60E-06	1.87E-05	3.54E+03	5.90E+05	2.37E-11	1.48E+6	17.8	744	17.4	76	12.8	10.9
Benzo[b]fluoranthene	I	1.00E-01	6.00E-05	-	-	1		0.13	1	4.80E-02	5.60E-06	2.69E-05	3.60E+03	6.00E+05	2.91E-11	1.34E+6	178	6,723	174			
Dibenz[a,h]anthracene	I	1.00E+00	6.00E-04	-	-	1		0.13	1	4.50E-02	5.20E-06	5.76E-06	1.14E+04	1.90E+06	4.13E-12	3.55E+6	17.8	1,737	17.6			

*chemical specific parameters found in Chemical Specific Parameters Spreadsheet at https://www.epa.gov/risk/regional-screening-levels-rsls
^chemical specific parameters found in Unpaved Road Traffic calculator at https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search
I: chemical specific parameters found in the IRIS at https://www.epa.gov/iris
C: chemical specific parameters found in Cal EPA at https://www.dtsc.ca.gov/AssessingRisk
A: chemical specific parameters found in Agency for Toxic Substances and Disease Registry Minimal Risk Levels (MRLs) at https://www.atsdr.cdc.gov/mrls/pdfs/atsdr_mrls.pdf
P: chemical specific parameters found in the Database of EPA PPRTVs at https://hhpprtv.ornl.gov/quickview/pprtv.php

Site-specific
Recreator Soil Inputs

Variable	Recreator Soil Default Value	Form-input Value
A (PEF Dispersion Constant)	16.2302	16.2302
A (VF Dispersion Constant)	11.911	11.911
A (VF Dispersion Constant - mass limit)	11.911	11.911
B (PEF Dispersion Constant)	18.7762	18.7762
B (VF Dispersion Constant)	18.4385	18.4385
B (VF Dispersion Constant - mass limit)	18.4385	18.4385
City (PEF Climate Zone) Selection	Default	Default
City (VF Climate Zone) Selection	Default	Default
C (PEF Dispersion Constant)	216.108	216.108
C (VF Dispersion Constant)	209.7845	209.7845
C (VF Dispersion Constant - mass limit)	209.7845	209.7845
foc (fraction organic carbon in soil) g/g	0.006	0.006
F(x) (function dependent on U_m/U_t) unitless	0.194	0.194
n (total soil porosity) L_{pore}/L_{soil}	0.43396	0.43396
p_h (dry soil bulk density) g/cm ^{3}	1.5	1.5
p_h (dry soil bulk density - mass limit) g/cm ^{3}	1.5	1.5
PEF (particulate emission factor) m ^{3}/kg	1359344438	1359344438
p_s (soil particle density) g/cm ^{3}	2.65	2.65
Q/C_{wind} (g/m^2-s per kg/m^3)	93.77	93.77
Q/C_{vol} (g/m^2-s per kg/m^3)	68.18	68.18
Q/C_{vol} (g/m^2-s per kg/m^3 - mass limit)	68.18	68.18
A_s (PEF acres)	0.5	0.5
A_s (VF acres)	0.5	0.5
A_s (VF mass-limit acres)	0.5	0.5
AF_{0-2} (skin adherence factor) mg/cm ^{2}	0.2	0.2
AF_{2-6} (skin adherence factor) mg/cm ^{2}	0.2	0.2
AF_{6-16} (skin adherence factor) mg/cm ^{2}	0.07	0.07
AF_{16-30} (skin adherence factor) mg/cm ^{2}	0.07	0.07
AF_{rec-a} (skin adherence factor - adult) mg/cm ^{2}	0.07	0.07
AF_{rec-c} (skin adherence factor - child) mg/cm ^{2}	0.2	0.2
AT_{rec} (averaging time)	365	365

Output generated 12APR2021:10:53:26

Site-specific
Recreator Soil Inputs

Variable	Recreator Soil Default Value	Form-input Value
BW_{0-2} (body weight) kg	15	15
BW_{2-6} (body weight) kg	15	15
BW_{6-16} (body weight) kg	80	80
BW_{16-30} (body weight) kg	80	80
BW_{rec-a} (body weight - adult) kg	80	80
BW_{rec-c} (body weight - child) kg	15	15
$DFS_{rec-adj}$ (age-adjusted soil dermal factor) mg/kg	.	73850
$DFSM_{rec-adj}$ (mutagenic age-adjusted soil dermal factor) mg/kg	.	305900
ED_{rec} (exposure duration - recreator) years	26	26
ED_{0-2} (exposure duration) year	2	2
ED_{2-6} (exposure duration) year	4	4
ED_{6-16} (exposure duration) year	10	10
ED_{16-30} (exposure duration) year	10	10
ED_{rec-c} (exposure duration - child) years	6	6
EF_{rec} (exposure frequency) days/year	.	250
EF_{0-2} (exposure frequency) days/year	.	250
EF_{2-6} (exposure frequency) days/year	.	250
EF_{6-16} (exposure frequency) days/year	.	250
EF_{16-30} (exposure frequency) days/year	.	250
EF_{rec-a} (exposure frequency - adult) days/year	.	250
EF_{rec-c} (exposure frequency - child) days/year	.	250
ET_{rec} (exposure time - recreator) hours/day	.	8
ET_{0-2} (exposure time) hours/day	.	8
ET_{2-6} (exposure time) hours/day	.	8
ET_{6-16} (exposure time) hours/day	.	8
ET_{16-30} (exposure time) hours/day	.	8
ET_{rec-a} (adult exposure time) hours/day	.	8
ET_{rec-c} (child exposure time) hours/day	.	8
THQ (target hazard quotient) unitless	0.1	0.1
$IFS_{rec-adj}$ (age-adjusted soil ingestion factor) mg/kg	.	26250
$IFSM_{rec-adj}$ (mutagenic age-adjusted soil ingestion factor) mg/kg	.	119166.667

Output generated 12APR2021:10:53:26

Site-specific
Recreator Soil Inputs

Variable	Recreator Soil Default Value	Form-input Value
IRS_{0-2} (soil intake rate) mg/day	200	200
IRS_{2-6} (soil intake rate) mg/day	200	200
IRS_{6-16} (soil intake rate) mg/day	100	100
IRS_{16-30} (soil intake rate) mg/day	100	100
IRS_{rec-a} (soil intake rate - adult) mg/day	100	100
IRS_{rec-c} (soil intake rate - child) mg/day	200	200
LT (lifetime - recreator) years	70	70
SA_{0-2} (skin surface area) cm ^{2}/day	2373	2373
SA_{2-6} (skin surface area) cm ^{2}/day	2373	2373
SA_{6-16} (skin surface area) cm ^{2}/day	6032	6032
SA_{16-30} (skin surface area) cm ^{2}/day	6032	6032
SA_{rec-a} (skin surface area - adult) cm ^{2}/day	6032	6032
SA_{rec-c} (skin surface area - child) cm ^{2}/day	2373	2373
TR (target risk) unitless	1.0E-06	1.0E-06
T_w (groundwater temperature) Celsius	25	25
$Theta_a$ (air-filled soil porosity) L_{air}/L_{soil}	0.28396	0.28396
$Theta_w$ (water-filled soil porosity) L_{water}/L_{soil}	0.15	0.15
T (exposure interval) s	819936000	819936000
T (exposure interval) yr	26	26
U_m (mean annual wind speed) m/s	4.69	4.69
U_t (equivalent threshold value)	11.32	11.32
V (fraction of vegetative cover) unitless	0.5	0.5

Site-specific

Recreator Regional Screening Levels (RSL) for Soil

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; ca = cancer; nc = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; max = ceiling limit exceeded; sat = Csat exceeded.

Chemical	CAS Number	Mutagen?	Volatile?	Chemical Type	SF_o $(mg/kg\text{-}day)^{-1}$	SF_o Ref	IUR $(ug/m^3)^{-1}$	IUR Ref	RfD (mg/kg-day)	RfD Ref	RfC (mg/m^3)	RfC Ref
Aluminum	7429-90-5	No	No	Inorganics	-		-		1.00E+00	P	5.00E-03	P
Aroclor 1254	11097-69-1	No	Yes	Organics	2.00E+00	G	5.71E-04	G	2.00E-05	I	-	
Arsenic, Inorganic	7440-38-2	No	No	Inorganics	1.50E+00	I	4.30E-03	I	3.00E-04	I	1.50E-05	C
Benz[a]anthracene	56-55-3	Yes	Yes	Organics	1.00E-01	E	6.00E-05	E	-		-	
Benzo[a]pyrene	50-32-8	Yes	No	Organics	1.00E+00	I	6.00E-04	I	3.00E-04	I	2.00E-06	I
Benzo[b]fluoranthene	205-99-2	Yes	No	Organics	1.00E-01	E	6.00E-05	E	-		-	
Chromium(VI)	18540-29-9	Yes	No	Inorganics	5.00E-01	C	8.40E-02	G	3.00E-03	I	1.00E-04	I
Cobalt	7440-48-4	No	No	Inorganics	-		9.00E-03	P	3.00E-04	P	6.00E-06	P
Copper	7440-50-8	No	No	Inorganics	-		-		4.00E-02	H	-	
Dibenz[a,h]anthracene	53-70-3	Yes	No	Organics	1.00E+00	E	6.00E-04	E	-		-	
Iron	7439-89-6	No	No	Inorganics	-		-		7.00E-01	P	-	
Manganese (Non-diet)	7439-96-5	No	No	Inorganics	-		-		2.40E-02	G	5.00E-05	I
Mercuric Chloride	7487-94-7	No	No	Inorganics	-		-		3.00E-04	I	3.00E-04	G
Vanadium and Compounds	7440-62-2	No	No	Inorganics	-		-		5.04E-03	G	1.00E-04	A

Site-specific

Recreator Regional Screening Levels (RSL) for Soil

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GIABS	ABS	RBA	Soil Saturation Concentration (mg/kg)	S (mg/L)	K_{oc} \ (cm^3/g)	K_d \ (cm^3/g)	HLC (atm-m^3/mole)	Henry's Law Constant Used in Calcs (unitless)	H` and HLC Ref	Normal Boiling Point BP (K)	BP Ref
1	-	1	-	-	-	1.50E+03	-	-		2792.15	CRC89
1	0.14	1	-	4.30E-02	1.31E+05	7.83E+02	2.83E-04	1.16E-02	PHYSPROP	651.36	EPI
1	0.03	0.6	-	-	-	2.90E+01	-	-		888.15	PHYSPROP
1	0.13	1	-	9.40E-03	1.77E+05	1.06E+03	1.20E-05	4.91E-04	PHYSPROP	710.75	PHYSPROP
1	0.13	1	-	1.62E-03	5.87E+05	-	4.57E-07	1.87E-05	PHYSPROP	768.15	PHYSPROP
1	0.13	1	-	1.50E-03	5.99E+05	-	6.57E-07	2.69E-05	PHYSPROP	715.9	EPI
0.025	-	1	-	1.69E+06	-	1.90E+01	-	-		-	
1	-	1	-	-	-	4.50E+01	-	-		3200.15	CRC89
1	-	1	-	-	-	3.50E+01	-	-		2868.15	PHYSPROP
1	0.13	1	-	2.49E-03	1.91E+06	-	1.41E-07	5.76E-06	EPI	797.15	PHYSPROP
1	-	1	-	-	-	2.50E+01	-	-		3273.15	PERRY
0.04	-	1	-	-	-	6.50E+01	-	-		2368.15	PHYSPROP
0.07	-	1	-	6.90E+04	-	-	-	-		577.15	CRC89
0.026	-	1	-	-	-	1.00E+03	-	-		3680.15	CRC89

Recreator Regional Screening Levels (RSL) for Soil

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; ca = cancer; nc = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; max = ceiling limit exceeded; sat = Csat exceeded.

Critical Temperature TC (K)	TC Ref	Chemical Type	D_{ia} (cm^2/s)	D_{iw} (cm^2/s)	D_A (cm^2/s)	Particulate Emission Factor (m^3/kg)	Volatilization Factor (m^3/kg)	Ingestion SL TR=1E-06 (mg/kg)	Dermal SL TR=1E-06 (mg/kg)	Inhalation SL TR=1E-06 (mg/kg)
6700	CRC89	INORGANIC	-	-	-	1.36E+09	-	-	-	-
957.225	Approx. from Tcrit=1.5xTBoil	PCB	2.37E-02	6.10E-06	1.87E-08	1.36E+09	8.43E+05	4.87E-01	1.24E+00	1.74E+01
1673	CRC89	INORGANIC	-	-	-	1.36E+09	-	1.08E+00	7.69E+00	3.73E+03
979	YAWS	PAH	2.61E-02	6.75E-06	6.83E-10	1.36E+09	4.41E+06	2.14E+00	6.42E+00	3.12E+02
969.27	EPA 2001 Fact Sheet	PAH	2.55E-02	6.58E-06	-	1.36E+09	-	2.14E-01	6.42E-01	9.65E+03
969.27	EPA 2001 Fact Sheet	PAH	2.50E-02	6.43E-06	-	1.36E+09	-	2.14E+00	6.42E+00	9.65E+04
-		INORGANIC	-	-	-	1.36E+09	-	4.29E-01	-	6.89E+01
7398.48	YAWS	INORGANIC	-	-	-	1.36E+09	-	-	-	1.78E+03
5123	YAWS	INORGANIC	-	-	-	1.36E+09	-	-	-	-
990.41	EPA 2001 Fact Sheet	PAH	2.36E-02	6.02E-06	-	1.36E+09	-	2.14E-01	6.42E-01	9.65E+03
9340	CRC89	INORGANIC	-	-	-	1.36E+09	-	-	-	-
4325	CRC89	INORGANIC	-	-	-	1.36E+09	-	-	-	-
973	CRC89	INORGANIC	-	-	-	1.36E+09	-	-	-	-
11325	YAWS	INORGANIC	-	-	-	1.36E+09	-	-	-	-

Site-specific

Recreator Regional Screening Levels (RSL) for Soil

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; ca = cancer; nc = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; max = ceiling limit exceeded; sat = Csat exceeded.

Carcinogenic SL TR=1E-06 (mg/kg)	Ingestion SL Child THQ=0.1 (mg/kg)	Dermal SL Child THQ=0.1 (mg/kg)	Inhalation SL Child THQ=0.1 (mg/kg)	Noncarcinogenic SL Child THI=0.1 (mg/kg)	Ingestion SL Adult THQ=0.1 (mg/kg)	Dermal SL Adult THQ=0.1 (mg/kg)	Inhalation SL Adult THQ=0.1 (mg/kg)	Noncarcinogenic SL Adult THI=0.1 (mg/kg)	Screening Level (mg/kg)
-	1.10E+04	-	2.98E+06	1.09E+04	1.17E+05	-	2.98E+06	1.12E+05	1.09E+04 nc
3.42E-01	2.19E-01	6.59E-01	-	1.64E-01	2.34E+00	3.95E+00	-	1.47E+00	1.64E-01 nc
9.48E-01	5.48E+00	4.61E+01	8.93E+03	4.89E+00	5.84E+01	2.77E+02	8.93E+03	4.80E+01	9.48E-01 ca
1.60E+00	-	-	-	-	-	-	-	-	1.60E+00 ca
1.61E-01	3.29E+00	1.06E+01	1.19E+03	2.51E+00	3.50E+01	6.38E+01	1.19E+03	2.22E+01	1.61E-01 ca
1.61E+00	-	-	-	-	-	-	-	-	1.61E+00 ca
4.26E-01	3.29E+01	-	5.95E+04	3.28E+01	3.50E+02	-	5.95E+04	3.48E+02	4.26E-01 ca
1.78E+03	3.29E+00	-	3.57E+03	3.28E+00	3.50E+01	-	3.57E+03	3.47E+01	3.28E+00 nc
-	4.38E+02	-	-	4.38E+02	4.67E+03	-	-	4.67E+03	4.38E+02 nc
1.61E-01	-	-	-	-	-	-	-	-	1.61E-01 ca
-	7.67E+03	-	-	7.67E+03	8.18E+04	-	-	8.18E+04	7.67E+03 nc
-	2.63E+02	-	2.98E+04	2.61E+02	2.80E+03	-	2.98E+04	2.56E+03	2.61E+02 nc
-	3.29E+00	-	1.79E+05	3.28E+00	3.50E+01	-	1.79E+05	3.50E+01	3.28E+00 nc
-	5.52E+01	-	5.95E+04	5.51E+01	5.89E+02	-	5.95E+04	5.83E+02	5.51E+01 nc

Site-specific
Recreator Soil Inputs

Variable	Recreator Soil Default Value	Form-input Value
A (PEF Dispersion Constant)	16.2302	16.2302
A (VF Dispersion Constant)	11.911	11.911
A (VF Dispersion Constant - mass limit)	11.911	11.911
B (PEF Dispersion Constant)	18.7762	18.7762
B (VF Dispersion Constant)	18.4385	18.4385
B (VF Dispersion Constant - mass limit)	18.4385	18.4385
City (PEF Climate Zone) Selection	Default	Default
City (VF Climate Zone) Selection	Default	Default
C (PEF Dispersion Constant)	216.108	216.108
C (VF Dispersion Constant)	209.7845	209.7845
C (VF Dispersion Constant - mass limit)	209.7845	209.7845
foc (fraction organic carbon in soil) g/g	0.006	0.006
F(x) (function dependent on U_m/U_t) unitless	0.194	0.194
n (total soil porosity) L_{pore}/L_{soil}	0.43396	0.43396
p_h (dry soil bulk density) g/cm ^{3}	1.5	1.5
p_h (dry soil bulk density - mass limit) g/cm ^{3}	1.5	1.5
PEF (particulate emission factor) m ^{3}/kg	1359344438	1359344438
p_s (soil particle density) g/cm ^{3}	2.65	2.65
Q/C_{wind} (g/m^2-s per kg/m^3)	93.77	93.77
Q/C_{vol} (g/m^2-s per kg/m^3)	68.18	68.18
Q/C_{vol} (g/m^2-s per kg/m^3 - mass limit)	68.18	68.18
A_s (PEF acres)	0.5	0.5
A_s (VF acres)	0.5	0.5
A_s (VF mass-limit acres)	0.5	0.5
AF_{0-2} (skin adherence factor) mg/cm ^{2}	0.2	0.2
AF_{2-6} (skin adherence factor) mg/cm ^{2}	0.2	0.2
AF_{6-16} (skin adherence factor) mg/cm ^{2}	0.07	0.07
AF_{16-30} (skin adherence factor) mg/cm ^{2}	0.07	0.07
AF_{rec-a} (skin adherence factor - adult) mg/cm ^{2}	0.07	0.07
AF_{rec-c} (skin adherence factor - child) mg/cm ^{2}	0.2	0.2
AT_{rec} (averaging time)	365	365

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Site-specific
Recreator Soil Inputs

Variable	Recreator Soil Default Value	Form-input Value
BW_{0-2} (body weight) kg	15	15
BW_{2-6} (body weight) kg	15	15
BW_{6-16} (body weight) kg	80	80
BW_{16-30} (body weight) kg	80	80
BW_{rec-a} (body weight - adult) kg	80	80
BW_{rec-c} (body weight - child) kg	15	15
$DFS_{rec-adj}$ (age-adjusted soil dermal factor) mg/kg	.	53762.8
$DFSM_{rec-adj}$ (mutagenic age-adjusted soil dermal factor) mg/kg	.	222695.2
ED_{rec} (exposure duration - recreator) years	26	26
ED_{0-2} (exposure duration) year	2	2
ED_{2-6} (exposure duration) year	4	4
ED_{6-16} (exposure duration) year	10	10
ED_{16-30} (exposure duration) year	10	10
ED_{rec-c} (exposure duration - child) years	6	6
EF_{rec} (exposure frequency) days/year	.	182
EF_{0-2} (exposure frequency) days/year	.	182
EF_{2-6} (exposure frequency) days/year	.	182
EF_{6-16} (exposure frequency) days/year	.	182
EF_{16-30} (exposure frequency) days/year	.	182
EF_{rec-a} (exposure frequency - adult) days/year	.	182
EF_{rec-c} (exposure frequency - child) days/year	.	182
ET_{rec} (exposure time - recreator) hours/day	.	8
ET_{0-2} (exposure time) hours/day	.	8
ET_{2-6} (exposure time) hours/day	.	8
ET_{6-16} (exposure time) hours/day	.	8
ET_{16-30} (exposure time) hours/day	.	8
ET_{rec-a} (adult exposure time) hours/day	.	8
ET_{rec-c} (child exposure time) hours/day	.	8
THQ (target hazard quotient) unitless	0.1	0.1
$IFS_{rec-adj}$ (age-adjusted soil ingestion factor) mg/kg	.	19110
$IFSM_{rec-adj}$ (mutagenic age-adjusted soil ingestion factor) mg/kg	.	86753.333

Site-specific
Recreator Soil Inputs

Variable	Recreator Soil Default Value	Form-input Value
IRS_{0-2} (soil intake rate) mg/day	200	200
IRS_{2-6} (soil intake rate) mg/day	200	200
IRS_{6-16} (soil intake rate) mg/day	100	100
IRS_{16-30} (soil intake rate) mg/day	100	100
IRS_{rec-a} (soil intake rate - adult) mg/day	100	100
IRS_{rec-c} (soil intake rate - child) mg/day	200	200
LT (lifetime - recreator) years	70	70
SA_{0-2} (skin surface area) cm^2/day	2373	2373
SA_{2-6} (skin surface area) cm^2/day	2373	2373
SA_{6-16} (skin surface area) cm^2/day	6032	6032
SA_{16-30} (skin surface area) cm^2/day	6032	6032
SA_{rec-a} (skin surface area - adult) cm^2/day	6032	6032
SA_{rec-c} (skin surface area - child) cm^2/day	2373	2373
TR (target risk) unitless	1.0E-06	1.0E-06
T_w (groundwater temperature) Celsius	25	25
$Theta_a$ (air-filled soil porosity) L_{air}/L_{soil}	0.28396	0.28396
$Theta_w$ (water-filled soil porosity) L_{water}/L_{soil}	0.15	0.15
T (exposure interval) s	819936000	819936000
T (exposure interval) yr	26	26
U_m (mean annual wind speed) m/s	4.69	4.69
U_t (equivalent threshold value)	11.32	11.32
V (fraction of vegetative cover) unitless	0.5	0.5

Site-specific

Recreator Regional Screening Levels (RSL) for Soil

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Chemical	CAS Number	Mutagen?	Volatile?	Chemical Type	SF_o $(mg/kg\text{-}day)^{-1}$	SF_o Ref	IUR $(ug/m^3)^{-1}$	IUR Ref	RfD (mg/kg-day)	RfD Ref	RfC (mg/m^3)	RfC Ref	GIABS	ABS
Aluminum	7429-90-5	No	No	Inorganics	-		-		1.00E+00	U	5.00E-03	U	1	-
Aroclor 1254	11097-69-1	No	Yes	Organics	2.00E+00	U	5.71E-04	U	2.00E-05	U	-		1	0.14
Arsenic, Inorganic	7440-38-2	No	No	Inorganics	1.50E+00	U	4.30E-03	U	3.00E-04	U	1.50E-05	U	1	0.03
Benz[a]anthracene	56-55-3	Yes	Yes	Organics	1.00E-01	U	6.00E-05	U	-		-		1	0.13
Benzo[a]pyrene	50-32-8	Yes	No	Organics	1.00E+00	U	6.00E-04	U	3.00E-04	U	2.00E-06	U	1	0.13
Benzo[b]fluoranthene	205-99-2	Yes	No	Organics	1.00E-01	U	6.00E-05	U	-		-		1	0.13
Chromium(VI)	18540-29-9	Yes	No	Inorganics	5.00E-01	U	8.40E-02	U	3.00E-03	U	1.00E-04	U	0.025	-
Cobalt	7440-48-4	No	No	Inorganics	-		9.00E-03	U	3.00E-04	U	6.00E-06	U	1	-
Copper	7440-50-8	No	No	Inorganics	-		-		4.00E-02	U	-		1	-
Dibenz[a,h]anthracene	53-70-3	Yes	No	Organics	1.00E+00	U	6.00E-04	U	-		-		1	0.13
Iron	7439-89-6	No	No	Inorganics	-		-		7.00E-01	U	-		1	-
Manganese (Non-diet)	7439-96-5	No	No	Inorganics	-		-		2.40E-02	U	5.00E-05	U	0.04	-
Mercuric Chloride	7487-94-7	No	No	Inorganics	-		-		3.00E-04	U	3.00E-04	U	0.07	-
Vanadium and Compounds	7440-62-2	No	No	Inorganics	-		-		5.04E-03	U	1.00E-04	U	0.026	-

Site-specific

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RBA	Soil Saturation Concentration (mg/kg)	S (mg/L)	K_{oc} \ (cm^3/g)	K_d \ (cm^3/g)	HLC (atm-m^3/mole)	Henry's Law Constant Used in Calcs (unitless)	H` and HLC Ref	Normal Boiling Point BP (K)	BP Ref	Critical Temperature TC (K)	TC Ref	Chemical Type	D_{ia} \ (cm^2/s)
1	-	-	-	1.50E+03	-	-		2793.15	U	6700	U	INORGANIC	-
1	-	4.30E-02	1.30E+05	7.80E+02	2.83E-04	1.16E-02	U	651.15	U	957	U	PCB	2.37E-02
0.6	-	-	-	2.90E+01	-	-		888.15	U	1670	U	INORGANIC	-
1	-	9.40E-03	1.77E+05	1.06E+03	1.20E-05	4.91E-04	U	711.15	U	979	U	PAH	2.61E-02
1	-	1.62E-03	5.87E+05	-	4.57E-07	1.87E-05	U	768.15	U	969	U	PAH	2.55E-02
1	-	1.50E-03	5.99E+05	-	6.57E-07	2.69E-05	U	716.15	U	969	U	PAH	2.50E-02
1	-	1.69E+06	-	1.90E+01	-	-		-		-		INORGANIC	-
1	-	-	-	4.50E+01	-	-		3203.15	U	7400	U	INORGANIC	-
1	-	-	-	3.50E+01	-	-		2873.15	U	5120	U	INORGANIC	-
1	-	2.49E-03	1.91E+06	-	1.41E-07	5.76E-06	U	797.15	U	990	U	PAH	2.36E-02
1	-	-	-	2.50E+01	-	-		3273.15	U	9340	U	INORGANIC	-
1	-	-	-	6.50E+01	-	-		2373.15	U	4320	U	INORGANIC	-
1	-	6.90E+04	-	-	-	-		577.15	U	973	U	INORGANIC	-
1	-	-	-	1.00E+03	-	-		3683.15	U	11300	U	INORGANIC	-

Site-specific

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D_{iw} \ (cm^2/s)	D_A \ (cm^2/s)	Particulate Emission Factor (m^3/kg)	Volatilization Factor (m^3/kg)	Ingestion SL TR=1E-06 (mg/kg)	Dermal SL TR=1E-06 (mg/kg)	Inhalation SL TR=1E-06 (mg/kg)	Carcinogenic SL TR=1E-06 (mg/kg)	Ingestion SL Child THQ=0.1 (mg/kg)	Dermal SL Child THQ=0.1 (mg/kg)	Inhalation SL Child THQ=0.1 (mg/kg)	Noncarcinogenic SL Child THI=0.1 (mg/kg)
-	-	1.36E+09	-	-	-	-	-	1.50E+04	-	4.09E+06	1.50E+04
6.10E-06	1.88E-08	1.36E+09	8.42E+05	6.68E-01	1.70E+00	2.39E+01	4.70E-01	3.01E-01	9.05E-01	-	2.26E-01
-	-	1.36E+09	-	1.49E+00	1.06E+01	5.12E+03	1.30E+00	7.52E+00	6.34E+01	1.23E+04	6.72E+00
6.75E-06	6.83E-10	1.36E+09	4.41E+06	2.95E+00	8.83E+00	4.29E+02	2.20E+00	-	-	-	-
6.58E-06	-	1.36E+09	-	2.95E-01	8.83E-01	1.33E+04	2.21E-01	4.51E+00	1.46E+01	1.64E+03	3.44E+00
6.43E-06	-	1.36E+09	-	2.95E+00	8.83E+00	1.33E+05	2.21E+00	-	-	-	-
-	-	1.36E+09	-	5.89E-01	-	9.47E+01	5.85E-01	4.51E+01	-	8.18E+04	4.51E+01
-	-	1.36E+09	-	-	-	2.45E+03	2.45E+03	4.51E+00	-	4.91E+03	4.51E+00
-	-	1.36E+09	-	-	-	-	-	6.02E+02	-	-	6.02E+02
6.02E-06	-	1.36E+09	-	2.95E-01	8.83E-01	1.33E+04	2.21E-01	-	-	-	-
-	-	1.36E+09	-	-	-	-	-	1.05E+04	-	-	1.05E+04
-	-	1.36E+09	-	-	-	-	-	3.61E+02	-	4.09E+04	3.58E+02
-	-	1.36E+09	-	-	-	-	-	4.51E+00	-	2.45E+05	4.51E+00
-	-	1.36E+09	-	-	-	-	-	7.58E+01	-	8.18E+04	7.57E+01

Site-specific

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Ingestion SL Adult THQ=0.1 (mg/kg)	Dermal SL Adult THQ=0.1 (mg/kg)	Inhalation SL Adult THQ=0.1 (mg/kg)	Noncarcinogenic SL Adult THI=0.1 (mg/kg)	Screening Level (mg/kg)
1.60E+05	-	4.09E+06	1.54E+05	1.50E+04 nc
3.21E+00	5.43E+00	-	2.02E+00	2.26E-01 nc
8.02E+01	3.80E+02	1.23E+04	6.59E+01	1.30E+00 ca
-	-	-	-	2.20E+00 ca
4.81E+01	8.77E+01	1.64E+03	3.05E+01	2.21E-01 ca
-	-	-	-	2.21E+00 ca
4.81E+02	-	8.18E+04	4.79E+02	5.85E-01 ca
4.81E+01	-	4.91E+03	4.77E+01	4.51E+00 nc
6.42E+03	-	-	6.42E+03	6.02E+02 nc
-	-	-	-	2.21E-01 ca
1.12E+05	-	-	1.12E+05	1.05E+04 nc
3.85E+03	-	4.09E+04	3.52E+03	3.58E+02 nc
4.81E+01	-	2.45E+05	4.81E+01	4.51E+00 nc
8.09E+02	-	8.18E+04	8.01E+02	7.57E+01 nc

LEAD MODEL FOR WINDOWS Version 1.1

EU1 - Surface

==========

Model Version: 1.1 Build11
User Name:
Date:
Site Name:
Operable Unit:
Run Mode: Research

==========

****** Air ******

Indoor Air Pb Concentration: 30.000 percent of outdoor.
Other Air Parameters:

Age	Time Outdoors (hours)	Ventilation Rate (m^3/day)	Lung Absorption (%)	Outdoor Air Pb Conc (µg Pb/m^3)
.5-1	1.000	2.000	32.000	0.100
1-2	2.000	3.000	32.000	0.100
2-3	3.000	5.000	32.000	0.100
3-4	4.000	5.000	32.000	0.100
4-5	4.000	5.000	32.000	0.100
5-6	4.000	7.000	32.000	0.100
6-7	4.000	7.000	32.000	0.100

****** Diet ******

Age	Diet Intake(µg/day)
.5-1	2.260
1-2	1.960
2-3	2.130
3-4	2.040
4-5	1.950
5-6	2.050
6-7	2.220

****** Drinking Water ******

Water Consumption:

Age	Water (L/day)
.5-1	0.200
1-2	0.500
2-3	0.520
3-4	0.530
4-5	0.550
5-6	0.580
6-7	0.590

Drinking Water Concentration: 4.000 µg Pb/L

****** Soil & Dust ******

Multiple Source Analysis Used
Average multiple source concentration: 50.460 µg/g

Mass fraction of outdoor soil to indoor dust conversion factor: 0.700
Outdoor airborne lead to indoor household dust lead concentration: 100.000
Use alternate indoor dust Pb sources? No

EU1 - Surface

Age	Soil (µg Pb/g)	House Dust (µg Pb/g)
.5-1	57.800	50.460
1-2	57.800	50.460
2-3	57.800	50.460
3-4	57.800	50.460
4-5	57.800	50.460
5-6	57.800	50.460
6-7	57.800	50.460

****** Alternate Intake ******

Age	Alternate (µg Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

****** Maternal Contribution: Infant Model ******

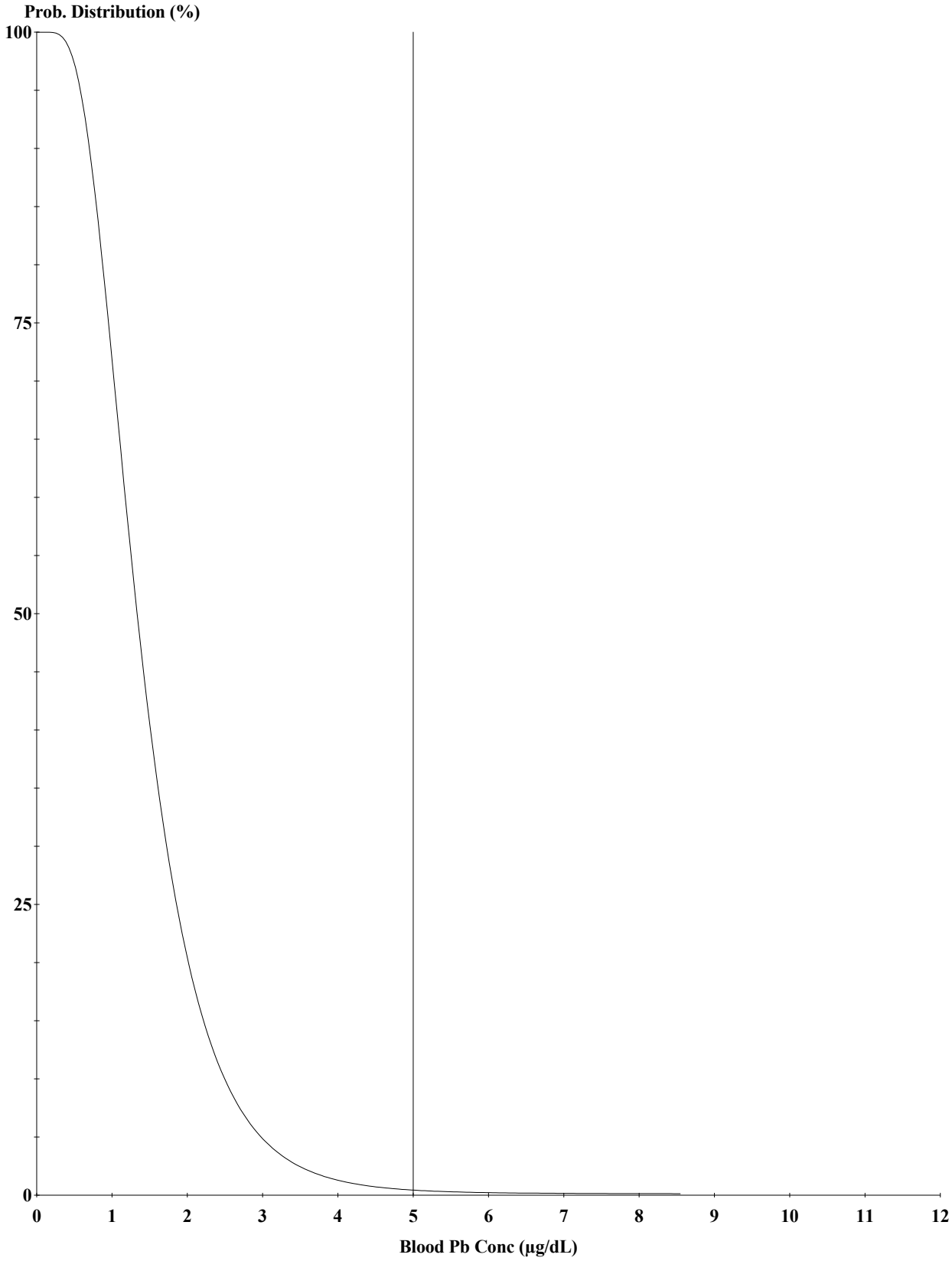
Maternal Blood Concentration: 1.000 µg Pb/dL

****
CALCULATED BLOOD LEAD AND LEAD UPTAKES:
****

Year	Air (µg/day)	Diet (µg/day)	Alternate (µg/day)	Water (µg/day)
.5-1	0.021	1.095	0.000	0.387
1-2	0.034	0.946	0.000	0.966
2-3	0.062	1.033	0.000	1.009
3-4	0.067	0.994	0.000	1.033
4-5	0.067	0.956	0.000	1.079
5-6	0.093	1.007	0.000	1.140
6-7	0.093	1.092	0.000	1.161

Year	Soil+Dust (µg/day)	Total (µg/day)	Blood (µg/dL)
.5-1	1.328	2.831	1.6
1-2	2.103	4.049	1.7
2-3	2.112	4.215	1.6
3-4	2.121	4.214	1.5
4-5	1.581	3.683	1.3
5-6	1.427	3.668	1.1
6-7	1.349	3.696	1.1

EU1 - Surface



Cutoff = 5.000 µg/dl
Geo Mean = 1.398
GSD = 1.600
% Above = 0.335

Age Range = 0 to 84 months

Run Mode = Research

LEAD MODEL FOR WINDOWS Version 1.1

EU2 - Surface

==========

Model Version: 1.1 Build11
User Name:
Date:
Site Name:
Operable Unit:
Run Mode: Research

==========

****** Air ******

Indoor Air Pb Concentration: 30.000 percent of outdoor.
Other Air Parameters:

Age	Time Outdoors (hours)	Ventilation Rate (m^3/day)	Lung Absorption (%)	Outdoor Air Pb Conc (µg Pb/m^3)
.5-1	1.000	2.000	32.000	0.100
1-2	2.000	3.000	32.000	0.100
2-3	3.000	5.000	32.000	0.100
3-4	4.000	5.000	32.000	0.100
4-5	4.000	5.000	32.000	0.100
5-6	4.000	7.000	32.000	0.100
6-7	4.000	7.000	32.000	0.100

****** Diet ******

Age	Diet Intake(µg/day)
.5-1	2.260
1-2	1.960
2-3	2.130
3-4	2.040
4-5	1.950
5-6	2.050
6-7	2.220

****** Drinking Water ******

Water Consumption:

Age	Water (L/day)
.5-1	0.200
1-2	0.500
2-3	0.520
3-4	0.530
4-5	0.550
5-6	0.580
6-7	0.590

Drinking Water Concentration: 4.000 µg Pb/L

****** Soil & Dust ******

Multiple Source Analysis Used
Average multiple source concentration: 36.810 µg/g

Mass fraction of outdoor soil to indoor dust conversion factor: 0.700
Outdoor airborne lead to indoor household dust lead concentration: 100.000
Use alternate indoor dust Pb sources? No

EU2 - Surface

Age	Soil (µg Pb/g)	House Dust (µg Pb/g)
.5-1	38.300	36.810
1-2	38.300	36.810
2-3	38.300	36.810
3-4	38.300	36.810
4-5	38.300	36.810
5-6	38.300	36.810
6-7	38.300	36.810

****** Alternate Intake ******

Age	Alternate (µg Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

****** Maternal Contribution: Infant Model ******

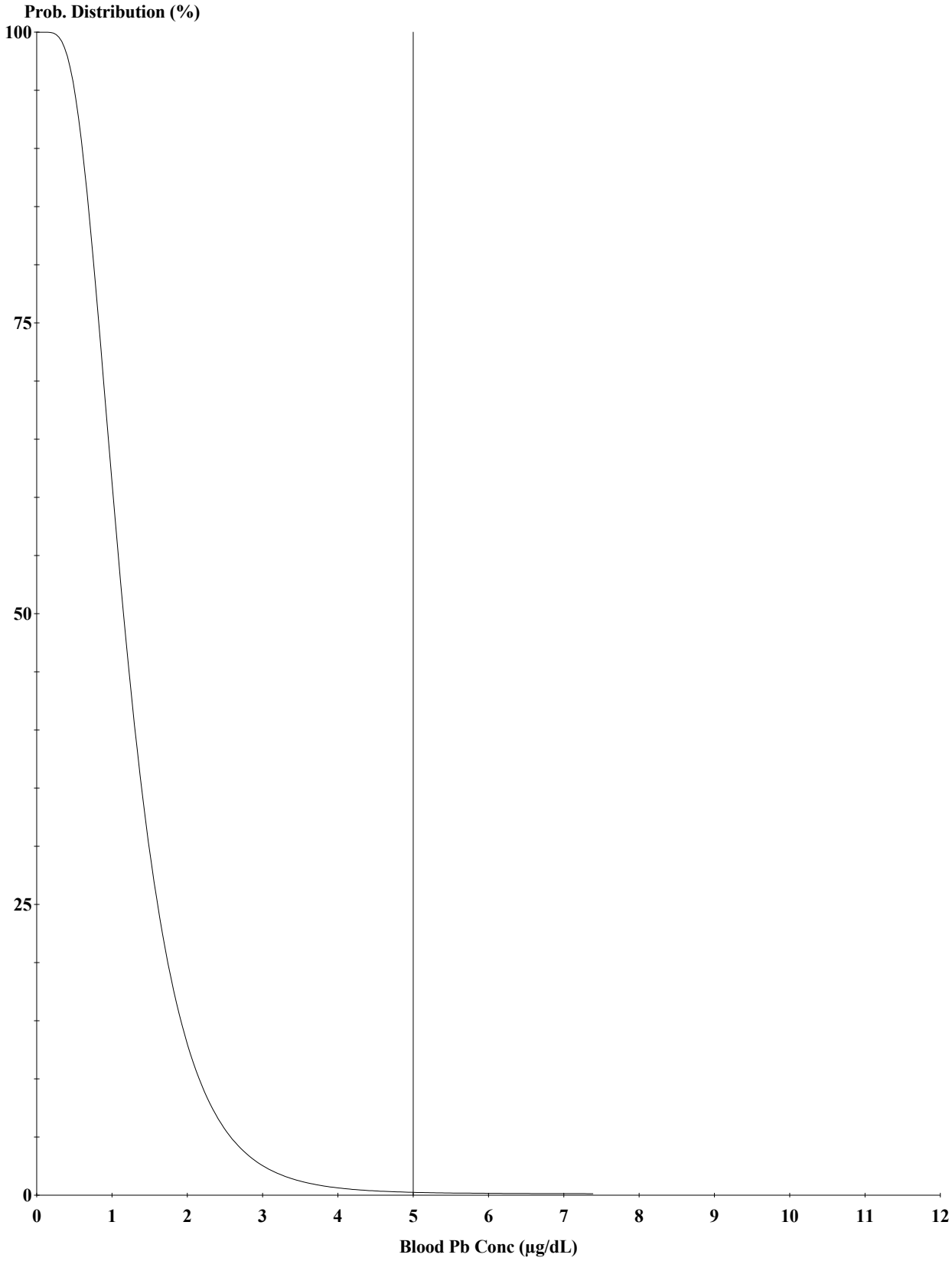
Maternal Blood Concentration: 1.000 µg Pb/dL

****
CALCULATED BLOOD LEAD AND LEAD UPTAKES:
****

Year	Air (µg/day)	Diet (µg/day)	Alternate (µg/day)	Water (µg/day)
.5-1	0.021	1.100	0.000	0.389
1-2	0.034	0.951	0.000	0.971
2-3	0.062	1.038	0.000	1.013
3-4	0.067	0.998	0.000	1.037
4-5	0.067	0.958	0.000	1.081
5-6	0.093	1.010	0.000	1.143
6-7	0.093	1.094	0.000	1.163

Year	Soil+Dust (µg/day)	Total (µg/day)	Blood (µg/dL)
.5-1	0.930	2.440	1.3
1-2	1.474	3.431	1.4
2-3	1.479	3.592	1.3
3-4	1.485	3.586	1.3
4-5	1.105	3.212	1.1
5-6	0.997	3.242	1.0
6-7	0.942	3.293	0.9

EU2 - Surface



Cutoff = 5.000 µg/dl
Geo Mean = 1.208
GSD = 1.600
% Above = 0.126

Age Range = 0 to 84 months

Run Mode = Research

APPENDIX C

Sparrows Point Development - PPE Standard Operational Procedure, Revision 3

Planning, Tracking/Supervision, Enforcement, and Documentation

Planning

- Response and Development Work Plan (RDWP) for each individual redevelopment sub-parcel identifies and documents site conditions.
- RDWP is reviewed and approved by regulators.
- Contractor HASP to address site-specific conditions and PPE requirements:
    - Contractor H&S professional to sign-off on PPE requirements for site workers;
    - Job Safety Analysis (JSA) to be performed for ground intrusive work.
- Project Environmental Professional (EP) assigned to each construction project – monitors project during environmentally sensitive project phases and is available to construction contractor on an as needed basis. EP responsibilities include the following:
    - Dust monitoring
    - Routine ground intrusive breathing space air monitoring
    - Soil tracking
    - Water handling oversight
    - Ground intrusive work observation
    - Notification for unexpected conditions
- Pre-construction meeting identifies EP roles and responsibilities and reviews site conditions.
- Contractor to perform job-site HazCom. HazCom to be addressed in Contractor HASP and include:
    - PPE requirements,
    - Exposure time limits,
    - Identification of chemicals of concern and potential effects of over-exposure (adverse reactions),
    - Methods and routes of potential exposure.
- All personnel that will be performing ground intrusive work within impacted soils shall sign-off on HazCom.
- If, based on a thorough review of Site conditions, it is expected that construction workers will have the potential to encounter materials considered hazardous waste under RCRA or DOT regulations, HAZWOPER-trained personnel will be utilized.

Tracking/Supervision

- Contractor to record any day that there is ground intrusive work and confirm that proper PPE is being worn.
- EP will note ground intrusive work on daily work sheets and perform at least one spot check per day.
- EP will log on daily work sheets PPE compliance for all intrusive work areas at least once per day.

- EP to take example photos of Exclusion Zones/Contamination Reduction Zones periodically.

Work Zones Delineation

- Exclusion Zone – The Exclusion Zones will include the areas proposed for excavation or with active trenches, excavations, or ground intrusive work, at a minimum. Personnel working within the exclusion zone will be required to wear Modified Level D PPE as described in this SOP. EP to take example photos of Exclusion Zones/Contamination Reduction Zones periodically. The Exclusion Zones will be identified each work day.
- Contamination Reduction Zone – This work zone is located outside of the exclusion zone, but inside of the limits of development (LOD). The Contamination Reduction Zone will be located adjacent to the Exclusion Zone, and all personal decontamination including removal of all disposable PPE/removal of soil from boots will be completed in the Contamination Reduction Zone.

Documentation

- Contractor HASP and HazCom.
- Contractor ground intrusive tracking record.
- HASP and HazCom sign-in sheets.
- EP pre-con memos.
- EP daily work sheets.
- Records documenting intrusive work and proper PPE use to be provided in completion report.

Enforcement

- Non-compliance of PPE requirements will result in disciplinary action up to and including prohibition from working on Sparrows Point.

Unknown and/or Unexpected Conditions

If unknown and/or unexpected conditions are encountered during the project that the EP determines to have a reasonable potential to significantly impact construction worker health and safety, the following will be initiated:

1. Job stoppage,
2. TPA and MDE notification,
3. Re-assessment of conditions.

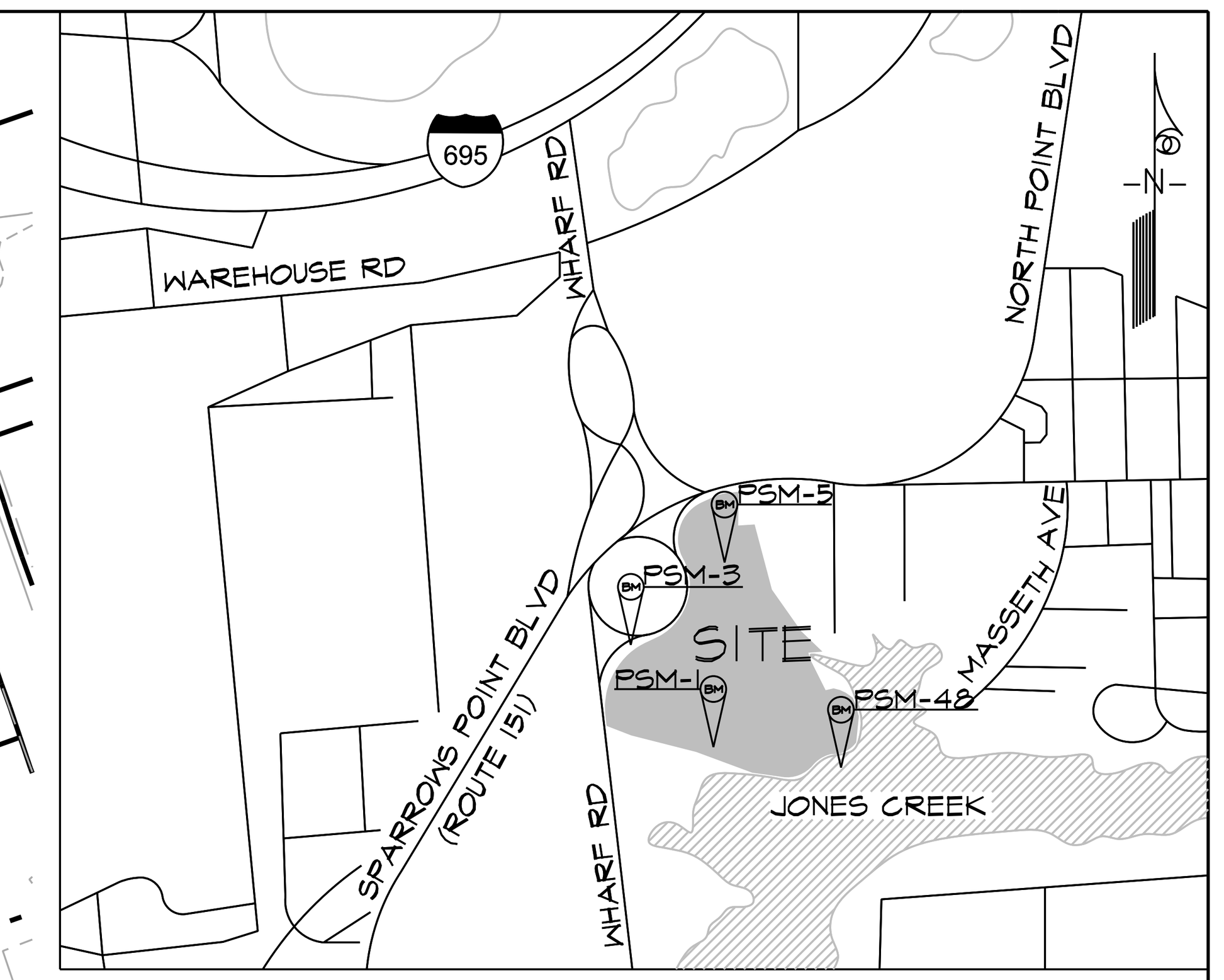
Work will not continue until EP has cleared the area. If hazardous waste is identified, a HAZWOPER contractor will be brought in to address. The approved contingency plan will be implemented, where appropriate.

Modified Level D PPE

Modified Level D PPE will include, at a minimum, overalls such as polyethylene-coated Tyvek or clean washable cloth overalls, latex (or similar) disposable gloves (when working in wet/chemical surroundings) or work gloves, steel-toe/steel-shank high ankle work boots with taped chemical-protective over-boots (as necessary), dust mask, hard hat, safety glasses with

side shields, and hearing protection (as necessary). If chemical-protective over-boots create increased slip/trip/fall hazardous, then standard leather or rubber work boots could be used, but visible soils from the sides and bottoms of the boots must be removed upon exiting the Exclusion Zone.

APPENDIX D



VICINITY MAP

SCALE: 1"= 1000'

GENERAL NOTES

1. THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" (1-800-257-7777) AT LEAST FIVE (5) WORKING DAYS PRIOR TO STARTING ANY WORK.
2. EXISTING UTILITY INFORMATION SHOWN HEREON IS BASED ON THE BEST AVAILABLE INFORMATION, WHICH INCLUDES A FIELD SURVEY CONDUCTED BY PRECISION MAPPING AND SURVEYING, DURING JUNE, 2019. AS-BUILT WATER, WASTEWATER AND STORM DRAIN PLANS FROM BALTIMORE COUNTY DEPARTMENT OF PUBLIC WORKS AND BALTIMORE GAS AND ELECTRIC COMPANY PLANS.
3. OBSTRUCTIONS SHOWN ON THIS DRAWING ARE FOR THE CONVENIENCE OF THE CONTRACTOR ONLY. MK CONSULTING ENGINEERS, LLC. DOES NOT WARRANT OR GUARANTEE THE CORRECTNESS OR THE COMPLETENESS OF THE INFORMATION GIVEN. THE CONTRACTOR MUST VERIFY ALL SUCH INFORMATION TO HIS OWN SATISFACTION. IN THE EVENT THAT INFORMATION IS IN CONFLICT WITH INFORMATION OUTLINED, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT PRIOR TO STARTING ANY WORK.
4. TOPOGRAPHIC INFORMATION SHOWN HEREON IS BASED ON AVAILABLE AS-BUILT PLANS PROVIDED BY TRADE POINT ATLANTIC ,LLC AND BALTIMORE COUNTY DPW, A SUPPLEMENTAL SURVEY CONDUCTED BY PRECISION MAPPING AND SURVEYING DURING JUNE, 2019 , AND A BATHYMETRIC SURVEY DURING JULY 2020.
5. REMOVAL OF ANY SIDEWALK AND/OR CURB AND GUTTER SHALL BE TO THE NEAREST JOINT. NO PATCHING SHALL BE PERMITTED.
6. ADJUST TOP OF CURB GRADES TO PROVIDE SMOOTH TRANSITION.
7. SAWCUT EXISTING PAVING AS NEEDED TO INSTALL NEW CONSTRUCTION.
8. STRIP & RESURFACE EXISTING PAVING AS NEEDED TO PROVIDE SMOOTH TRANSITION TO EX. SURFACE.
9. IT SHALL BE DISTINCTLY UNDERSTOOD THAT FAILURE TO MENTION SPECIFICALLY ANY WORK WHICH WOULD NORMALLY BE REQUIRED TO COMPLETE THIS PROJECT SHALL NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY TO COMPLETE SUCH WORK.
10. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE ENGINEER OF ANY DEVIATION FROM THIS PLAN PRIOR TO ANY CHANGE BEING MADE. ANY DEVIATION FROM THIS PLAN WITHOUT WRITTEN AUTHORIZATION FROM THE ENGINEER WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.
11. SHOULD THE CONTRACTOR DISCOVER DISCREPENCIES BETWEEN THE PLANS AND FIELD CONDITIONS, THE ENGINEER IS TO BE NOTIFIED IMMEDIATELY TO RESOLVE THE SITUATION. SHOULD THE CONTRACTOR MAKE FIELD CORRECTIONS OR ADJUSTMENTS WITHOUT NOTIFYING THE ENGINEER, THEN THE CONTRACTOR ASSUMES ALL RESPONSIBILITY FOR THOSE CHANGES.
12. THE CONTRACTOR SHALL NOTE THAT IN CASE OF ANY DISCREPANCY BETWEEN THE SCALED AND FIGURED DIMENSIONS SHOWN ON THESE PLANS, THE FIGURED DIMENSIONS SHALL GOVERN.
13. PRIOR TO BEGINNING CONSTRUCTION, THE CONTRACTOR SHALL VERIFY ALL TIE-IN ELEVATIONS.
14. STRUCTURAL FILL IN BUILDING AREAS SHALL BE PLACED IN HORIZONTAL, EIGHT-INCH MAXIMUM LOOSE LIFTS AND COMPACTED TO AT LEAST 92 PERCENT OF THE MAXIMUM DRY DENSITY PER AASHTO T-180, STANDARD PROCTOR. STRUCTURAL FILL PLACED IN PAVEMENT AREAS SHALL BE PLACED IN HORIZONTAL, EIGHT-INCH MAXIMUM LOOSE LIFTS AND COMPACTED TO 95 PERCENT OF THE MAXIMUM DRY DENSITY PER AASHTO T-180, STANDARD PROCTOR. SEE THE PROJECT SPECIFICATIONS FOR ADDITIONAL INFORMATION.
15. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE PROTECTION OF THE SUB-GRADE UNTIL IT RECEIVES FINAL SURFACE TREATMENT AND SHALL MAINTAIN THE SUB-GRADE AS SUITABLE AND ACCEPTABLE TO THE OWNER OR OWNER'S REPRESENTATIVE AT ALL TIMES. HE SHALL BE COMPLETELY RESPONSIBLE FOR THE RESTORATION OR REPLACEMENT OF THE SUB-GRADE DUE TO MOISTURE DAMAGE, CONSTRUCTION TRAFFIC, OR ANY OTHER CAUSE. REPAIR OR REPLACEMENT OF THE SUB-GRADE SHALL BE PERFORMED AT NO ADDITIONAL COST TO THE OWNER.
16. ALL CONSTRUCTION SHALL BE COMPLETED IN ACCORDANCE WITH THE LATEST BALTIMORE COUNTY STANDARD DETAILS AND SPECIFICATIONS AND ALL REVISIONS THERETO, UNLESS OTHERWISE NOTED.
17. CONTRACTOR SHALL ADJUST ALL FRAMES, GRATES AND COVERS OF ALL EXISTING UTILITIES WITHIN THE LIMITS OF THE CONTRACT TO THE PROPOSED GRADES, AS REQUIRED.
18. THE CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE TO SWALES AND/ OR STORM DRAIN SYSTEMS AT ALL TIMES.
19. PAVING REPAIR SHALL BE IN ACCORDANCE WITH BALTIMORE COUNTY STANDARD DETAIL R-38.
20. ALL NEW CONCRETE SHALL BE SHA MIX NO. 3, 3,500 PSI (MIN.) AT 28 DAYS.
21. CONSTRUCTION OF THE PROPOSED ON-SITE UTILITIES WILL BE IN ACCORDANCE WITH THE BALTIMORE COUNTY PLUMBING CODE AND BY A CONTRACTOR PRE-QUALIFIED BY BALTIMORE COUNTY.
22. CONTRACTOR SHALL COORDINATE THE LOCATION OF THE UNDERGROUND ELECTRIC SERVICE WITH THE BALTIMORE GAS & ELECTRIC COMPANY. SEE ELECTRICAL PLANS FOR DETAILS.
23. SANITARY SEWER LINES OUTSIDE OF THE BUILDING WILL BE PVC CLASS SDR 26.
24. ALL WATER PIPING, TUBING, FITTINGS AND JOINING METHODS SHALL BE ACCORDING TO THE FOLLOWING APPLICATIONS:

    4 INCHES (DN 100) TO 8 INCHES (DN 200): CLASS 'D' OR CLASS 250, DUCTILE IRON PIPE, DUCTILE IRON COMPACT FITTINGS, AND MECHANICAL JOINTS WITH RETAINER GLANDS
25. ALL ON SITE FIRE HYDRANTS ARE TO BE PAINTED RED AND FIRE HYDRANTS STREAMER NOZZLE TO FACE DRIVE AISLES.
26. THE CONTRACTOR IS RESPONSIBLE FOR PERFORMING ALL WORK SHOWN ON THESE DRAWINGS UNLESS OTHERWISE NOTED.
27. PRIOR TO BEGINNING ANY UTILITY CONSTRUCTION THE CONTRACTOR SHALL VERIFY THAT ALL EXISTING UTILITIES WILL TIE IN WITH PROPOSED UTILITIES AS SHOWN.
28. ALL VALVES SHALL BE IN STANDARD CONCRETE VAULTS IN ACCORDANCE WITH BALTIMORE COUNTY STANDARD DETAILS.
29. SEE STRUCTURAL AND ARCHITECTURAL PLANS FOR SIZE AND LOCATIONS OF TURNED DOWN SLABS AT EXTERIOR DOORS.
30. ALL PUBLIC WORK IDENTIFIED ON THESE PLANS IS SUBJECT TO A BALTIMORE COUNTY UTILITY AGREEMENT AND SHALL BE PERFORMED BY A BALTIMORE COUNTY PREQUALIFIED CONTRACTOR HAVING PREQUALIFICATIONS A1, A2, B, F1, F2, F3 AND E.
31. ALL WORK IDENTIFIED AS PUBLIC AND PRIVATE ON THESE PLANS SHALL BE COMPLETED BY THE CONTRACTOR.
32. THE AREAS BETWEEN THE SIGHT LINE AND THE CURB LINE MUST BE CLEARED, GRADED AND KEPT FREE OF ANY OBSTRUCTIONS.
33. SEE SHEET C2.02 FOR LEGEND AND SITE DATA.
34. THE PROPOSED GRADING SHWON ON THIS PLAN MEETS THE REQUIREMENTS SET FORTH BY BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY AND COMPLIES WITH ARTICLE 33, TITLE 5 OF THE BALTIMORE COUNTY CODE. HOWEVER, DUE TO BUILDING TYPES AND LAYOUT, SOME FIELD ADJUSTMENTS MAY BE REQUIRED. ALL CHANGES MUST COMPLY WITH THE ABOVE MENTIONED REQUIREMENTS.
35. ALL SWALES HAVE BEEN DESIGNED BY THE ENGINEER TO CONVEY RUNOFF ACCORDING TO BALTIMORE COUNTY DEPARTMENT OF PUBLIC WORKS DESIGN STANDARDS.
36. THERE SHALL BE NO CLEARING, GRADING, CONSTRUCTION OR DISTURBANCE OF VEGETATION IN THE CRITICAL AREA EASEMENT OR OTHER FOREST RETENTION AREAS, EXCEPT AS PERMITTED BY THE BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY.
37. STORMWATER MANAGEMENT HAS BEEN ADDRESSED BY ENVIRONMENTAL SITE DESIGN.

GRAPHIC SCALE

50 0 25 50 100

(IN FEET)
1" inch = 50'

OWNER

TRADEPOINT ATLANTIC LLC
1600 SPARROWS POINT BLVD
BALTIMORE, MD 21219
PHONE: 410-709-1286

SITE AND GRADING PLAN

SCALE: 1" =50'

CRITICAL AREA MANAGEMENT PLAN NOTE:

REFER TO THE APPROVED CRITICAL AREA MANAGEMENT PLAN FOR THIS PROJECT IN REGARDS TO ALL FOREST PROTECTION AND PRESERVATION MEASURES, INCLUDING THE LOCATION OF ALL CONSERVATION AREAS.

BENCHMARK DATA

ALL SURVEY DATA CONTAINED HEREON ARE REFERENCED TO THE REFERENCED TO THE MARYLAND COORDINATE SYSTEM (NAV83/2011) EPOCH 2010 & NAVD88 FOR VERTICAL. AS DERIVED FROM THE FOLLOWING CONTROL STATIONS:

POINT#	NORTHING	EASTING	ELEV.	DESCRIPTION
PSM-1	569,397.29284	1,464,515.29075	12.03'	IRON REBAR & CAP
PSM-3	569,877.84075	1,464,126.63364	16.63'	PK NAIL
PSM-5	570,264.86984	1,464,567.71304	17.03'	IRON REBAR & CAP
PSM-48	569,300.45813	1,465,115.31775	14.61'	IRON REBAR & CAP

OWNER'S/DEVELOPER'S CERTIFICATION-GRADING:

I/WE CERTIFY THAT ALL GRADING ON THIS SITE WILL BE DONE IN ACCORDANCE WITH THE CURRENT GRADING REQUIREMENTS AS SET FORTH BY THE BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY AND WITH THE REQUIREMENTS SPECIFIED IN ARTICLE 33, TITLE 5 OF THE BALTIMORE COUNTY CODE.

SIGNATURE OWNER/DEVELOPER DATE

BILL SHERD — CHIEF OF FACILITIES
PRINT NAME — TITLE

BALTIMORE COUNTY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
AND SUSTAINABILITY

APPROVED FOR GRADING

DATE

STORMWATER MANAGEMENT REQUIRED

DWG. FILENAME: 17-000

SEAL

DATE :

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.
LICENSE NO. 25058 EXPIRATION DATE: 11-17-22

CIVIL ENGINEER
MARIANNE CRAMPTON, PE
PRINCIPAL
MK CONSULTING ENGINEERS
3300 CLIPPER MILL ROAD, SUITE 201
BALTIMORE, MD 21211
(P) 667-309-6193
Mcrampton@mkceng.com

DGN BY: NM
DWN BY: SG
CHKD BY: SM

AS-BUILT / REVISION	BY	DATE	P.W.A. NO.	KEY SHEET	POSITION SHT
90% CDs		07/23/21	-	-	-
			R.O.W NO.	ANW	25SE29
			-	-	-

DRAWING SCALE
PLAN SCALE:
PROFILE SCALE: -

APPROVED BY: DIRECTOR
DATE:

BUREAU OF ENGINEERING AND CONSTRUCTION
REVIEWED BY:
DATE REVIEWED:

HIGHWAYS	STRUCTURES	STORM DRAINS	SEWER	WATER	FIELD ENGINEER

PROPERTY MANAGEMENT
APPROVED BY: CHIEF
DATE:

BALTIMORE COUNTY OFFICE OF BUDGET AND FINANCE, PROPERTY MANAGEMENT

SUBDIVISION:

SPARROWS POINT PARK
OVERALL SITE AND GRADING PLAN
1900 WHARF ROAD
SPARROWS POINT, MD 21219
TRADEPOINT ATLANTIC, PARCEL 3B

COUNCILMANIC DIST. NO. : 7
ELECTION DIST. NO.: 15c7

BALTIMORE COUNTY MARYLAND

SHEET DESIGNATION	CONTRACT NUMBER
CIVIL ENGINEER	21004PO0
	JOB ORDER NUMBER
	241-212-0307-0809
	SHEET 6 of 150
	DRAWING NUMBER
	C2.00
	FILE NO.: 19011

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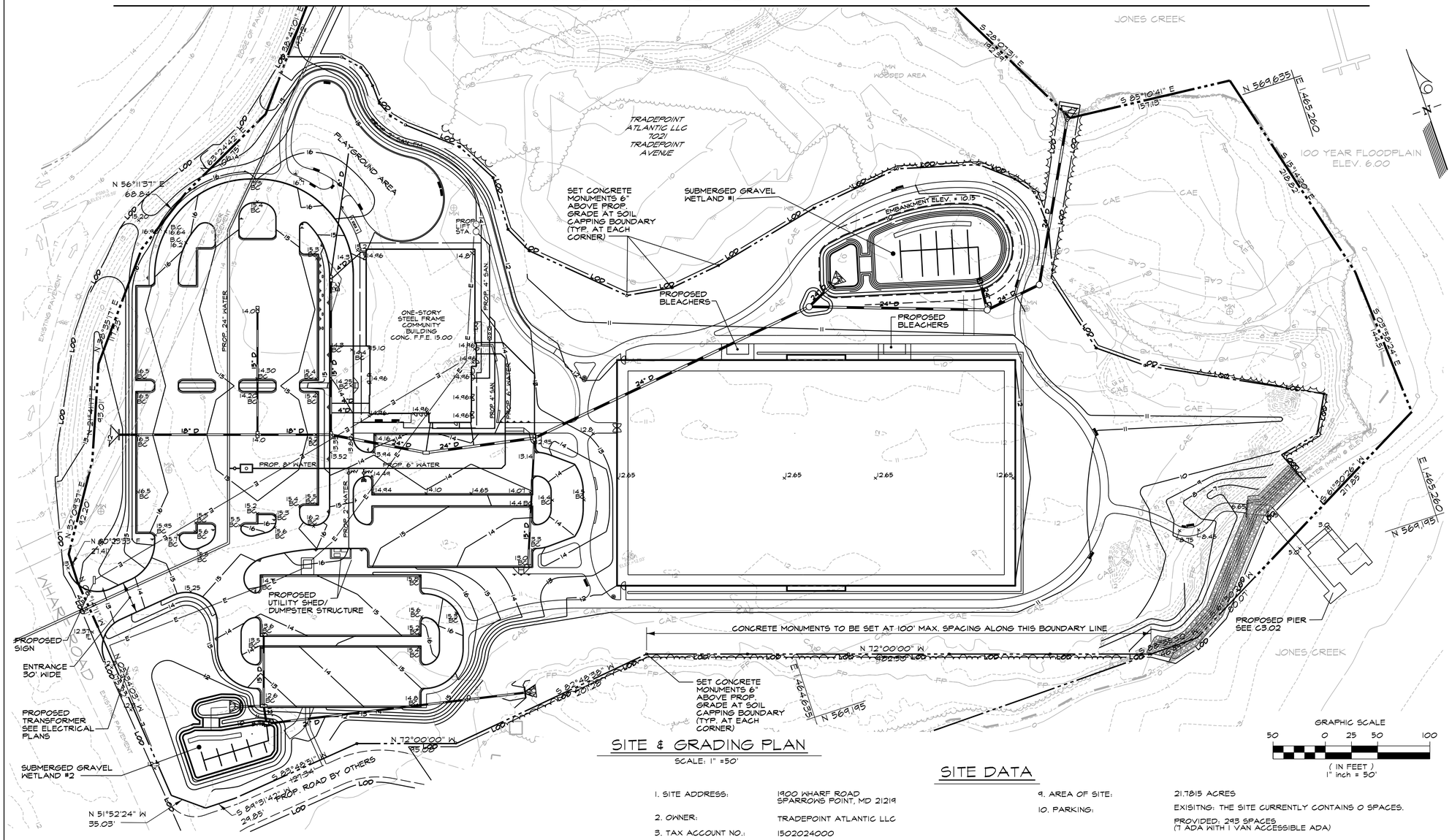
PRELIMINARY - NOT FOR CONSTRUCTION

MATCH LINE SEE SHEET C2.00



LEGEND

- RIGHT-OF-WAY LINE
- PROPERTY LINE
- EASEMENT LINE
- MEAN HIGH WATER
- LOD — LIMIT OF DISTURBANCE
- CAE — CRITICAL AREA EASEMENT
- FP — 100 YEAR FLOODPLAIN
- EX. WETLAND AREA
- EX. WETLAND BUFFER
- EX. STREAM CENTERLINE
- EX. CURB AND GUTTER
- EX. CHAIN LINK FENCE
- 10 — EX. INDEX CONTOUR
- 8 — EX. INTERMEDIATE CONTOUR
- EX. TREE LINE
- g — EX. GAS
- e — EX. ELECTRIC
- EX. 8" WATER — EX. WATER
- to — EX. COMMUNICATIONS
- 15" RCP — EX. STORM DRAIN
- 8" S — EX. SANITARY SEWER
- MH — EX. STORM DRAIN MANHOLE
- SMH — EX. SANITARY MANHOLE
- FH — EX. FIRE HYDRANT
- WV — EX. WATER VALVE
- EX. STREET LIGHT
- EX. UTILITY POLE
- MW — MONITORING WELL
- PROP. CONCRETE CURB & GUTTER
- 105 — PROP. INDEX CONTOUR
- 104 — PROP. INTERMEDIATE CONTOUR
- PROP. SIDEWALK
- PROP 8" WATER — PROP. WATERLINE
- PROP 4" SAN FM — PROP. SEWER
- UD — PROP. UNDERDRAIN
- E — PROP. ELECTRIC SERVICE
- 12" D — PROP. STORM DRAIN
- PROP. MANHOLE
- PROP. INLET
- PROP. FIRE HYDRANT
- PROP. CONCRETE SIDEWALK
- LOD — LIMIT OF DISTURBANCE
- LOW — LIMIT OF WORK

SITE & GRADING PLAN

SCALE: 1" =50'

GRAPHIC SCALE
50 0 25 50 100
(IN FEET)
1" inch = 50'

SITE DATA

1. SITE ADDRESS:	1900 WHARF ROAD SPARROWS POINT, MD 21219	
2. OWNER:	TRADEPOINT ATLANTIC LLC	
3. TAX ACCOUNT NO.:	1502024000	
4. PROPERTY REFERENCE:	MAP 111, GRID 14, PARCEL 318	
5. TAX ASSESSMENT DIST.:	15	
6. LIBER / FOLIO:	N/A	
7. ZONING: EXISTING USE: PROPOSED USE:	BMM (BUSINESS MARITIME MARINA) VACANT RAIL YARD PUBLIC PARK / RECREATION CENTER	
8. SETBACKS:	FRONT	REAR	SIDE	CORNER STREET SIDE	MAX BUILDING HEIGHT
REQUIRED:	15'	NA	30'	10'	40'
PROVIDED:	(SEE SITE PLAN C2.01)				
9. AREA OF SITE:	21.7815 ACRES				
10. PARKING:	EXISITNG: THE SITE CURRENTLY CONTAINS 0 SPACES. PROVIDED: 293 SPACES (7 ADA WITH 1 VAN ACCESSIBLE ADA)				
11. FLOODPLAIN INFO.:	THE SITE LIES WITHIN A 100 YEAR FLOODPLAIN. 100 YEAR FLOODPLAIN ELEVATION = 6.00 FEMA MAP# 24001C0555D MAY 5, 2014				
12. WATERSHED:	THE SITE LIES WITHIN THE BALTIMORE HARBOR WATERSHED				
13. ELECTION DISTRICT:	15				
14. COUNCILMANIC DISTRICT:	7				
15. KEY SHEET:	ANW				
16. POSITION SHEET:	25NE29				

NOTES:

1. THE PROPOSED GRADING SHOWN ON THIS PLAN MEETS THE REQUIREMENTS SET FORTH BY BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY AND COMPLIES WITH ARTICLE 33, TITLE 5 OF THE BALTIMORE COUNTY CODE. HOWEVER, DUE TO BUILDING TYPES AND LAYOUT, SOME FIELD ADJUSTMENTS MAY BE REQUIRED. ALL CHANGES MUST COMPLY WITH THE ABOVE MENTIONED REQUIREMENTS.
2. ALL SWALES HAVE BEEN DESIGNED BY THE ENGINEER TO CONVEY RUNOFF ACCORDING TO BALTIMORE COUNTY DEPARTMENT OF PUBLIC WORKS DESIGN STANDARDS.
3. THERE SHALL BE NO CLEARING, GRADING, CONSTRUCTION OR DISTURBANCE OF VEGETATION IN THE CRITICAL AREA EASEMENT, EXCEPT AS PERMITTED BY THE BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY.
4. STORMWATER MANAGEMENT HAS BEEN ADDRESSED THROUGH ENVIRONMENTAL SITE DESIGN.
5. SEE SHEET C2.00 FOR GENERAL NOTES.
6. REFER TO RDWP FOR INSTALLATION OR REMOVAL OF PLAYGROUND.

SITE ANALYSIS

TOTAL DISTURBED AREA = 462,792 SQ. FT. OR 10.62 AC.

OWNER

TRADEPOINT ATLANTIC LLC
1600 SPARROWS POINT BLVD
BALTIMORE, MD 21219
PHONE: 410-709-1286

DWG FILENAME: 17x400

8/18/2020 4:02:03 PM

SEAL

DATE:

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND
LICENSE NO. 25058 EXPIRATION DATE: 11-17-22

CIVIL ENGINEER
MARIANNE CRAMPTON, PE
PRINCIPAL
MK CONSULTING ENGINEERS
1000 CLIPPER MILL ROAD, SUITE 101
BALTIMORE, MD 21211
(P) 667-808-6180
Mcrampton@mkeng.com

DGN BY: NM
DWN BY: SG
CHKD BY: SM

AS-BUILT / REVISION	BY	DATE	P.W.A. NO.
90% CDs		07/23/21	-
			R.O.W. NO.
			-

KEY SHEET	POSITION SHT	DRAWING SCALE
ANW	25SE29	PLAN SCALE:
		PROFILE SCALE:

BUREAU OF ENGINEERING AND CONSTRUCTION	HIGHWAYS	STRUCTURES	STORM DRAINS	SEWER	WATER	FIELD ENGINEER
REVIEWED BY:						
DATE REVIEWED:						

APPROVED BY: _____ DIRECTOR
DATE: _____

PROPERTY MANAGEMENT
APPROVED BY: _____ CHIEF
DATE: _____

SUBDIVISION:

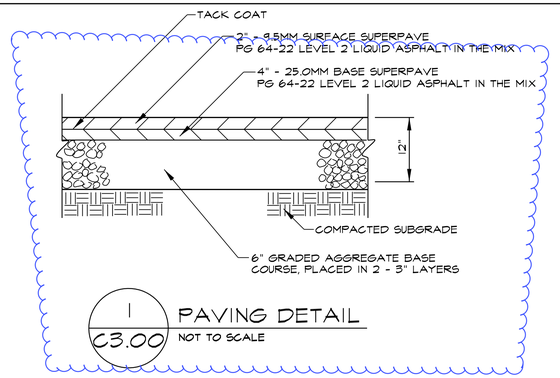
BALTIMORE COUNTY OFFICE OF BUDGET AND FINANCE, PROPERTY MANAGEMENT

SPARROWS POINT PARK
OVERALL SITE AND GRADING PLAN
1900 WHARF ROAD
SPARROWS POINT, MD 21219
TRADEPOINT ATLANTIC, PARCEL 3B

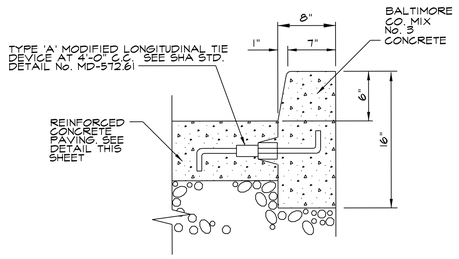
COUNCILMANIC DIST. NO. : 7
ELECTION DIST. NO.: 15C7

SHEET DESIGNATION	CONTRACT NUMBER
CIVIL ENGINEER	21004PO0
	JOB ORDER NUMBER
	241-212-0307-0809
	SHEET 7 of 150
	DRAWING NUMBER
	C2.01
	FILE NO.: 19011

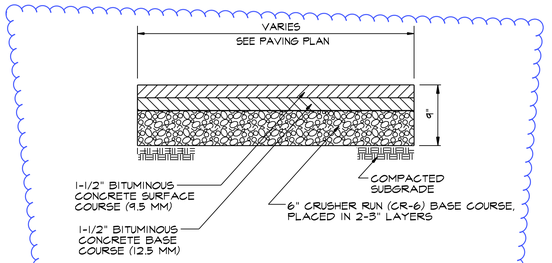
PRELIMINARY - NOT FOR CONSTRUCTION



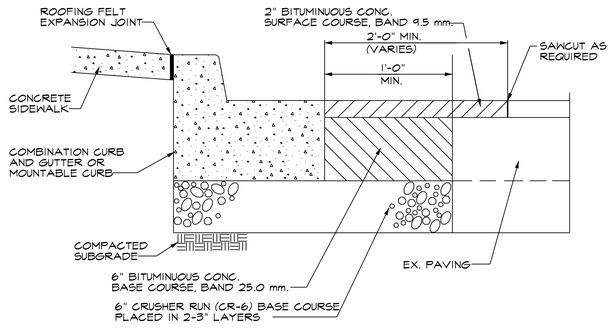
1 C3.00 **PAVING DETAIL**
NOT TO SCALE



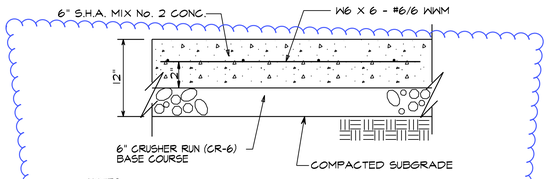
4 C3.00 **TYPE 'A' CURB**
NOT TO SCALE



3 C3.00 **TRAIL PAVING**
NOT TO SCALE

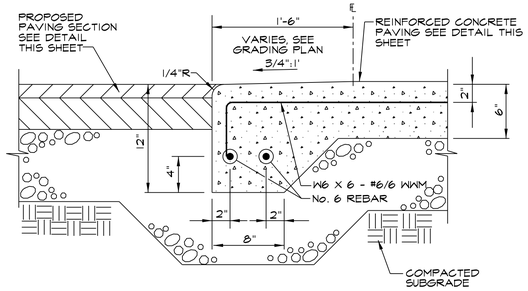


TYPE I

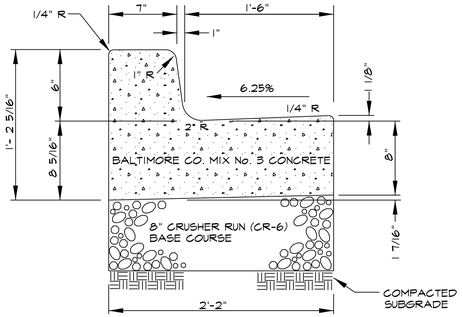


NOTES:
1. EXPANSION JOINTS SHALL BE AT THE LOCATIONS SHOWN ON THE PLANS.
2. MINIMUM 28 DAY COMPRESSION STRENGTH 4000psi.

2 C3.00 **REINFORCED CONCRETE PAVING**
NOT TO SCALE

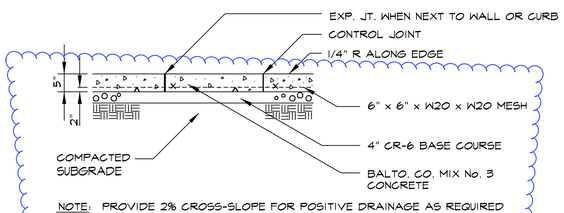


6 C3.00 **TIE IN FOR HEAVY DUTY AND REINFORCED CONCRETE PAVING**
NOT TO SCALE



STANDARD

TYPE II



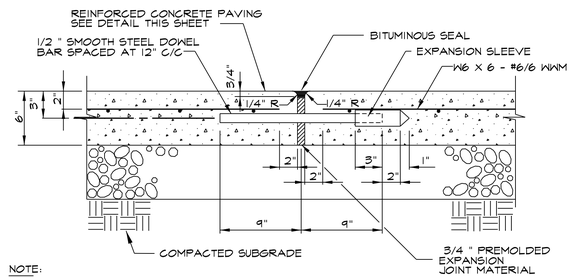
PROFILE

NOTE: PROVIDE 2% CROSS-SLOPE FOR POSITIVE DRAINAGE AS REQUIRED

SECTION

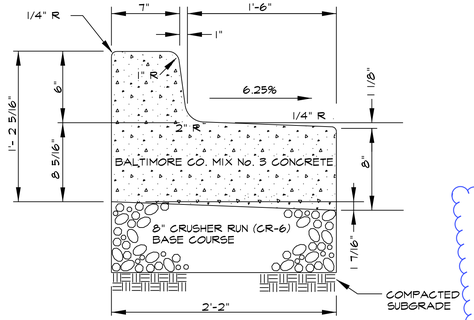
NOTES:
1. PROVIDE EXPANSION JOINTS 40' C.C. MAX. AND SCORE JOINTS 5' C.C. (UNLESS OTHERWISE NOTED). EXPANSION JOINTS SHALL BE 1/2" PREMOLDED BITUMINOUS JOINT MATERIAL IN ACCORDANCE WITH BALTIMORE COUNTY SPECIFICATION.
2. WHEN SIDEWALK ABUTS CURB, SIDEWALK SHALL BE 1/4" ABOVE CURB WITH 1/2" PREMOLDED BITUMINOUS JOINT MATERIAL.
3. SEE BALTIMORE COUNTY STANDARD DETAIL R-19 FOR ADDITIONAL INFORMATION.
4. EXPANSION JOINTS SHALL BE SEALED PER THE PROJECT SPECIFICATIONS.

5 C3.00 **CONCRETE SIDEWALK**
NOT TO SCALE



NOTE:
1. SMOOTH DOWELS SHALL BE PAINTED WITH APPROVED RED LEAD BEFORE DELIVERY AND FREE END SHALL BE GREASED BEFORE INSTALLATION.
2. SEE MARYLAND STATE HIGHWAY ADMINISTRATION STANDARD DETAIL No. MD 572.92.

7 C3.00 **TIE IN AT EXPANSION JOINT**
NOT TO SCALE

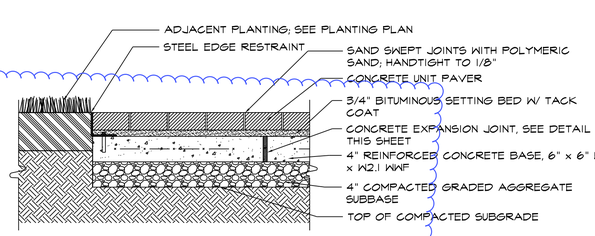


REVERSED

NOTES:
1. PROVIDE EXPANSION JOINTS EVERY 20' (MAX.).
2. PROVIDE CONTROL JOINTS EVERY 10' (MAX.). JOINTS ARE TO ALIGN WITH THE PROPOSED SIDEWALK JOINTS (TYPICAL).
3. SEE CONCRETE SIDEWALK DETAIL THIS SHEET REGARDING SCORING OF SIDEWALK.
4. SEE BALTIMORE COUNTY STANDARD DETAIL R-21 FOR ADDITIONAL INFORMATION.

8 C3.00 **CONCRETE CURB AND GUTTER**
NOT TO SCALE

9 C3.00 **PAVING TIE-IN DETAIL**
NOT TO SCALE



NOTES:
1. PROVIDE EXPANSION JOINT IN CONCRETE BASE OF THE UNIT PAVERS @ 20' O.C. MAX.
2. EXPANSION JOINT TO GO THROUGH CONCRETE BASE ONLY.
3. CONTRACTOR TO SUBMIT SAMPLES, PRODUCT DATA, AND TESTING INFORMATION FOR CONCRETE UNIT PAVER CONSTRUCTION.

10 C3.00 **CONCRETE UNIT PAVER DETAIL**
NOT TO SCALE

DWG. FILENAME: 17-000

SEAL

DATE:

PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND
LICENSE NO. 25038 EXPIRATION DATE: 11-17-22

CIVIL ENGINEER
MARIANNE CRAMPTON, PE
PRINCIPAL
MK CONSULTING ENGINEERS
1000 CLIPPER MILL ROAD, SUITE 201
BALTIMORE, MD 21211
(T) 667-000-0101
Mcrampton@mkcreng.com

DGN BY: NM
DWN BY: SG
CHKD BY: SM

AS-BUILT / REVISION	BY	DATE
90% CD		07/13/21

P.W.A. NO. -
R.O.W NO. -

KEY SHEET	POSITION SHT
-	-
ANW	25SE29
-	-
-	-

DRAWING SCALE
PLAN SCALE: 1"=
PROFILE SCALE: 1"=

APPROVED BY: DIRECTOR
DATE:

BUREAU OF ENGINEERING AND CONSTRUCTION		HIGHWAYS	STRUCTURES	STORM DRAINS	SEWER	WATER	FIELD ENGINEER
REVIEWED BY:							
DATE REVIEWED:							

PROPERTY MANAGEMENT
APPROVED BY: CHIEF
DATE:

SUBDIVISION:

BALTIMORE COUNTY OFFICE OF BUDGET AND FINANCE, PROPERTY MANAGEMENT

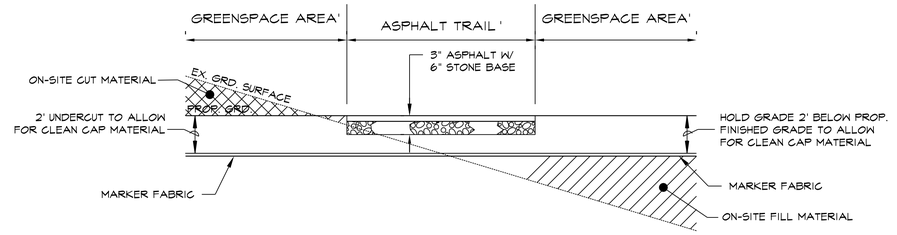
SPARROWS POINT PARK
SITE DETAILS
1900 WHARF ROAD
SPARROWS POINT, MD 21219
TRADEPOINT ATLANTIC, PARCEL 3B

COUNCILMANIC DIST. NO. : 7
ELECTION DIST. NO.: 15c7

SHEET DESIGNATION	CONTRACT NUMBER
CIVIL ENGINEER	21004P00
JOB ORDER NUMBER	241-212-0307-0809
SHEET 8 of 150	
DRAWING NUMBER	C3.00
FILE NO.: 17-000	

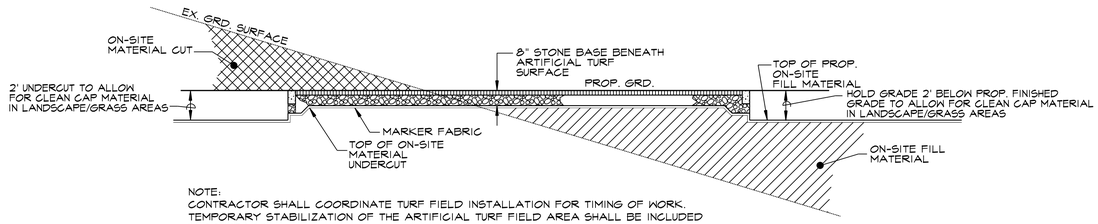
8/18/2020 4:02:03 PM

PRELIMINARY - NOT FOR CONSTRUCTION



1 C3.03 TYPICAL SECTION THRU ASPHALT TRAIL

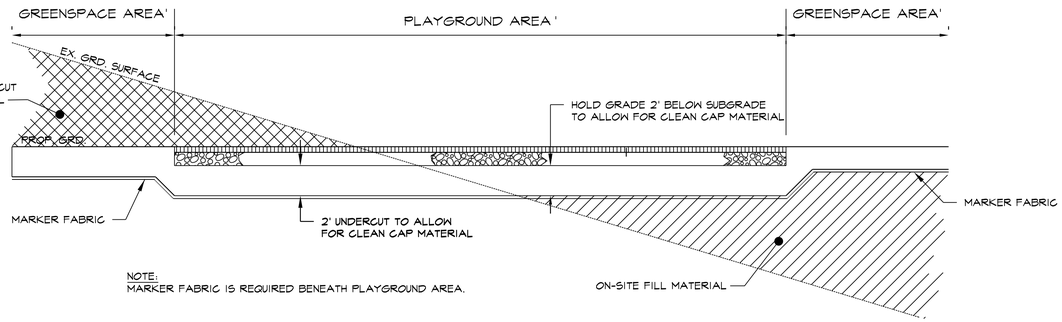
NOT TO SCALE



NOTE:
CONTRACTOR SHALL COORDINATE TURF FIELD INSTALLATION FOR TIMING OF WORK. TEMPORARY STABILIZATION OF THE ARTIFICIAL TURF FIELD AREA SHALL BE INCLUDED IN CONTRACT.

3 C3.03 TYPICAL SECTION THRU TURF FIELD

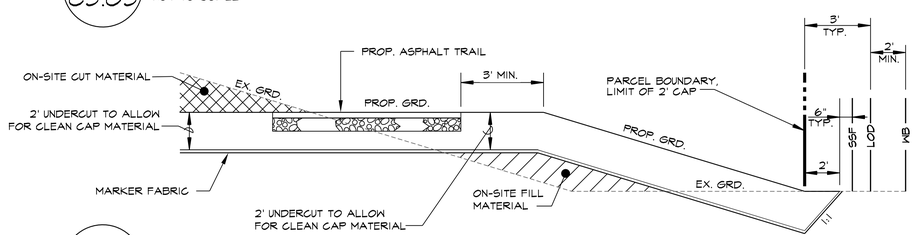
NOT TO SCALE



NOTE:
MARKER FABRIC IS REQUIRED BENEATH PLAYGROUND AREA.

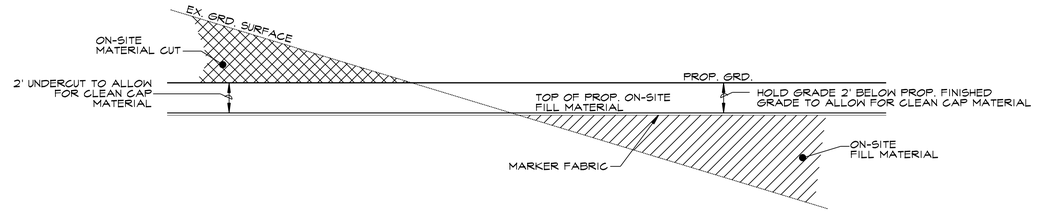
5 C3.03 TYPICAL SECTION THRU PLAYGROUND AREAS

NOT TO SCALE



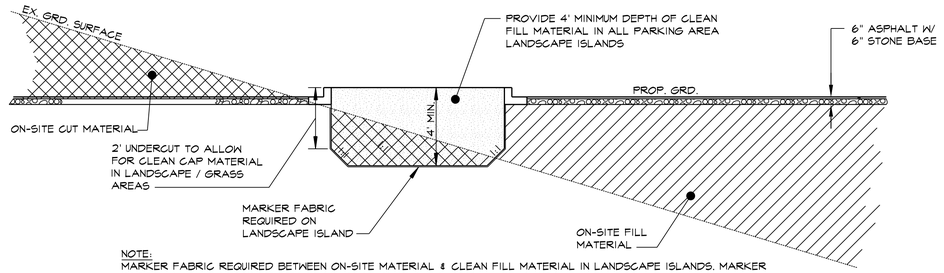
7 C3.03 TYPICAL SECTION AT OUTER CAPPING EDGE

NOT TO SCALE



2 C3.03 TYPICAL SECTION THRU GREENSPACE AREAS

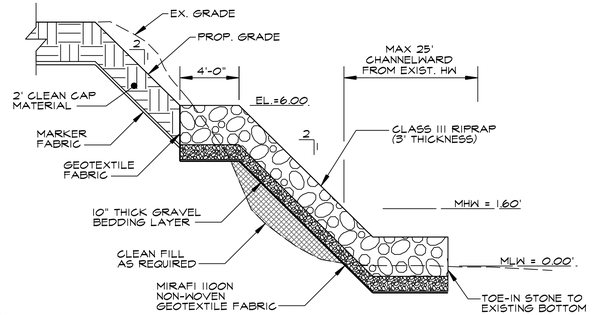
NOT TO SCALE



NOTE:
MARKER FABRIC REQUIRED BETWEEN ON-SITE MATERIAL & CLEAN FILL MATERIAL IN LANDSCAPE ISLANDS. MARKER FABRIC IS NOT REQUIRED BENEATH PAVEMENT,SIDEWALKS OR BUILDING SLABS.

4 C3.03 TYPICAL SECTION THRU PARKING AREAS

NOT TO SCALE



6 C3.03 TYPICAL SECTION OF REVETMENT AT SHORELINE

NOT TO SCALE

GEOTEXTILE MARKER FABRIC SPECIFICATIONS

THE GEOTEXTILE MARKER FABRIC SHALL BE A NONWOVEN PERVIOUS SHEET OF POLYPROPYLENE MATERIAL. ADD STABILIZERS AND/OR INHIBITORS TO THE BASE MATERIAL, AS NEEDED, TO MAKE THE FILAMENTS RESISTANT TO DETERIORATION BY ULTRAVIOLET LIGHT, OXIDATION AND HEAT EXPOSURE. REGRIND MATERIAL WHICH CONSISTS OF EDGE TRIMMINGS AND OTHER SCRAPS THAT HAVE NEVER REACHED THE CONSUMER, MAY BE USED TO PRODUCE THE GEOTEXTILE. POST-CONSUMER RECYCLED MATERIAL MAY BE USED. GEOTEXTILE SHALL BE FORMED INTO A NETWORK SUCH THAT THE FILAMENTS OR YARNS RETAIN DIMENSIONAL STABILITY RELATIVE TO EACH OTHER, INCLUDING THE EDGES. GEOTEXTILES SHALL MEET THE REQUIREMENTS SPECIFIED IN TABLE I. WHERE APPLICABLE, TABLE I PROPERTY VALUES REPRESENT THE MINIMUM AVERAGE ROLL VALUES IN THE WEAKEST PRINCIPAL DIRECTION. VALUES FOR APPARENT OPENING SIZE (AOS) REPRESENT MAXIMUM AVERAGE ROLL VALUES.

TABLE I

MECHANICAL PROPERTIES	TEST METHOD	UNIT	MINIMUM AVERAGE ROLL VALUE	
			MD	CD
GRAB TENSILE STRENGTH	ASTM D4632	lbs (N)	120 (534)	120 (534)
GRAB TENSILE ELONGATION	ASTM D4632	%	50	50
TRAPEZOID TEAR STRENGTH	ASTM D4533	lbs (N)	50 (223)	50 (223)
CBR PUNCTURE STRENGTH	ASTM D6241	lbs (N)	310 (1380)	
			MAXIMUM OPENING SIZE	
APPARENT OPENING SIZE (AOS)	ASTM D4751	U.S. SIEVE (mm)	70 (0.212)	
			MINIMUM ROLL VALUE	
PERMITTIVITY	ASTM D4491	sec^{-1}	1.74	
FLOW RATE	ASTM D4491	$gal/min/ft^2$ ($l/min/m^2$)	135 (5500)	
			MINIMUM TEST VAULE	
UV RESISTANCE (AT 500 HOURS)	ASTM D4355	% STRENGTH RETAINED	70	

DWG FILENAME: 17-000

SEAL

DATE:

PROFESSIONAL CERTIFICATION

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LICENSE NO. 25038 EXPIRATION DATE: 11-17-22

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PRINCIPAL
MK CONSULTING ENGINEERS
1000 CLIPPER MILL ROAD, SUITE 201
BALTIMORE, MD 21211
(T) 667-000-0101
Mcrampton@mkcreng.com

DGN BY: NM
DWN BY: SG
CHKD BY: SM

AS-BUILT / REVISION	BY	DATE	P.W.A. NO.	KEY SHEET	POSITION SHT	DRAWING SCALE
90% CDs		07/22/21	-	-	-	PLAN SCALE:
			R.O.W NO.	ANW	23SE29	PROFILE SCALE:
			-	-	-	

BUREAU OF ENGINEERING AND CONSTRUCTION		HIGHWAYS	STRUCTURES	STORM DRAINS	SEWER	WATER	FIELD ENGINEER
REVIEWED BY:							
DATE REVIEWED:							

APPROVED BY: _____ DIRECTOR
DATE: _____

PROPERTY MANAGEMENT
APPROVED BY: _____ CHIEF
DATE: _____

BALTIMORE COUNTY OFFICE OF BUDGET AND FINANCE, PROPERTY MANAGEMENT

SPARROWS POINT PARK
EARTHWORK SECTIONS
1900 WHARF ROAD
SPARROWS POINT, MD 21219
TRADEPOINT ATLANTIC, PARCEL 3B

SUBDIVISION:

COUNCILMANIC DIST. NO. : 7
ELECTION DIST. NO.: 15c7

SHEET DESIGNATION	CONTRACT NUMBER
CIVIL ENGINEER	21004P00
	JOB ORDER NUMBER
	241-212-0307-0809
	SHEET 9 of 150
	DRAWING NUMBER
	C3.03
	FILE NO.: 19011

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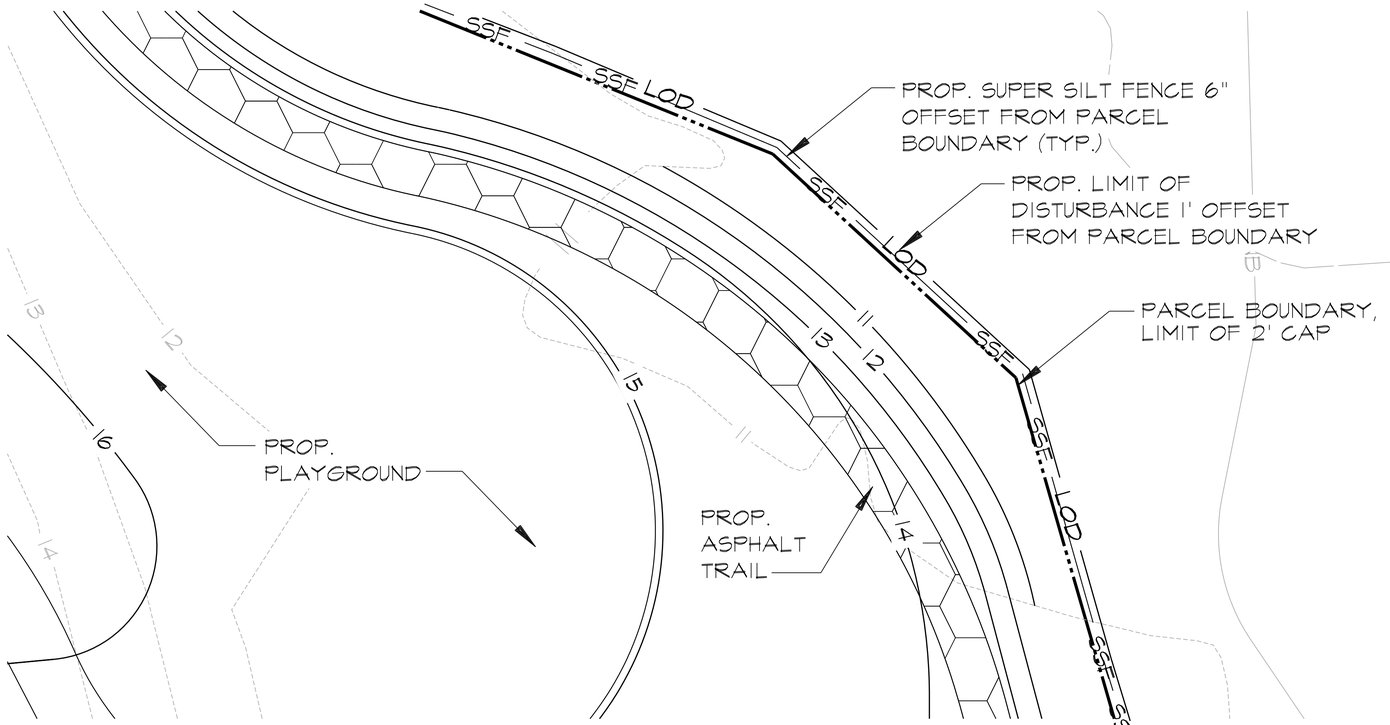
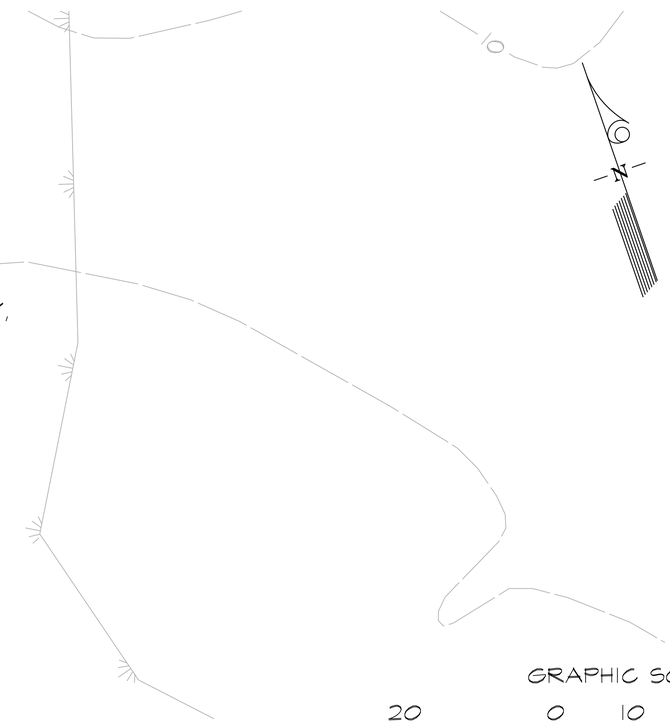
PRELIMINARY - NOT FOR CONSTRUCTION



LOD OFFSET EXHIBIT

SCALE: 1" =10'

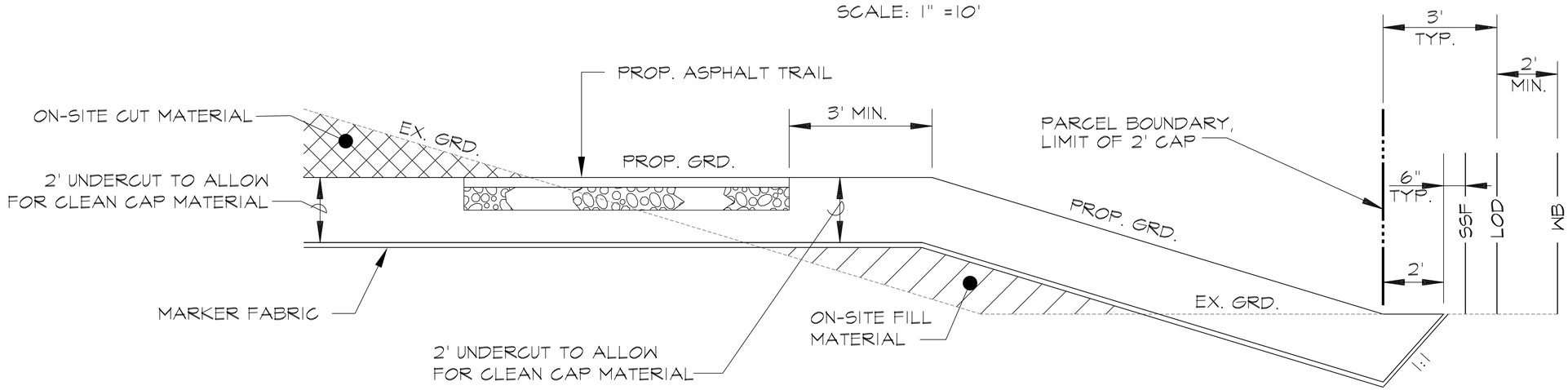


GRAPHIC SCALE

20 0 10 20 40

(IN FEET)

1" inch = 20'



SECTION AT OUTER CAPPING EDGE

SCALE: NOT TO SCALE

LOD OFFSET EXHIBIT
AT
SPARROWS POINT PARK

mk Consulting Engineers, LLC
Whitehall Mill
3300 Clipper Mill Road, Suite 201
Baltimore, MD 21211
Phone: 667-309-6193

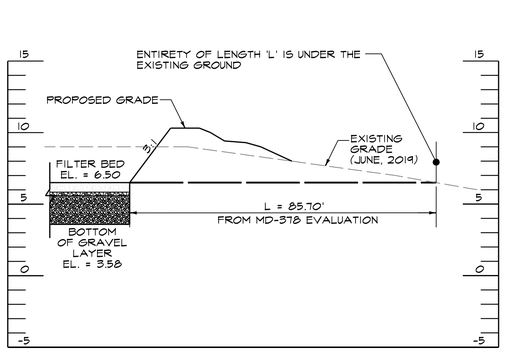
PLOTTED: 2/9/2022
BY:
FILE:G:\2019\19021-1 Sparrows Point - Revision 3\Drawings\Exhibits\LOD SSF Offset Exhibit\LOD SSF Offset Exhibit.dgn

FILTRATION PRACTICES CONSTRUCTION INSPECTION CHECKLIST (SUBMERGED GRAVEL WETLAND FACILITY #1)

PHASE	DATE	INITIALS	REMARKS - DESCRIPTION OF ACTION TAKEN
1. EXCAVATION A. SIZE AND LOCATION B. SIDE SLOPE STABILITY C. SOIL PERMEABILITY D. GROUNDWATER / BEDROCK E. SETBACKS PER DESIGN MANUAL			
2. FILTER FABRIC A. FABRIC SPECIFICATIONS B. SIDES AND TOP (INFILTRATION) C. SIDES, TOP, BOTTOM (ATTENUATION)			
3. AGGREGATE MATERIAL A. TYPE (# CRUSHED, GRAVEL) B. SIZE C. PLACEMENT			
4. OBSERVATION WELL / ROOF LEADERS A. ROOF LEADERS B. SURCHARGE PIPE(S) C. PIPE SIZE AND TYPE D. MINIMUM COVER (1 FOOT)			
5. SURFACE LAYER A. AGGREGATE SURFACE B. VEGETATIVE SURFACE C. PAVED SURFACE			
6. INLET STRUCTURE A. INVERTS AND ELEVATIONS B. RECEIVES DESIGNED DRAINAGE AREA			

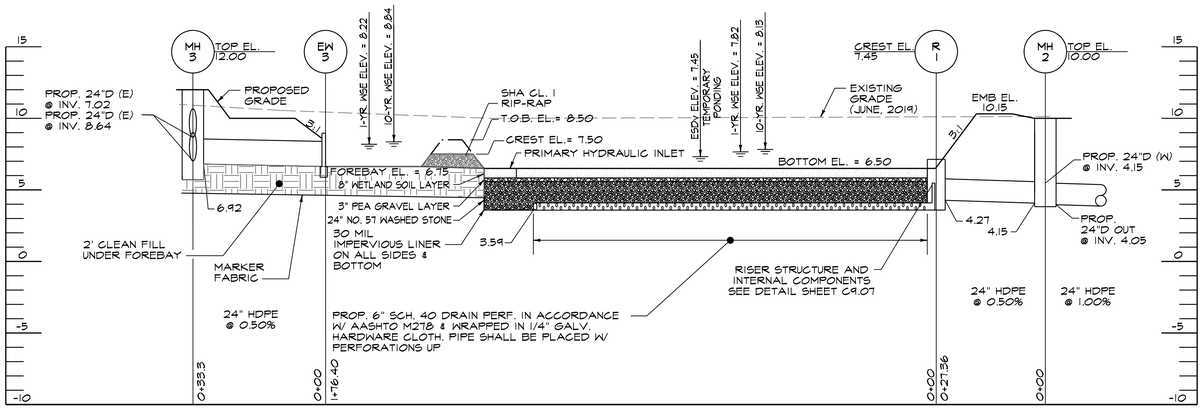
I HEREBY CERTIFY THAT I PERSONALLY REVIEWED OR A PERSON UNDER MY DIRECT SUPERVISION PROVIDED THE INFOMATION REPORTED ON THIS CHECKLIST AND TO THE BEST OF MY KNOWLEDGE DO HEREBY INSURE THAT THE SUBMITAL IS COMPLETE AND ACCURATE.

PROFESSIONAL ENGINEER SIGNATURE AND DATE



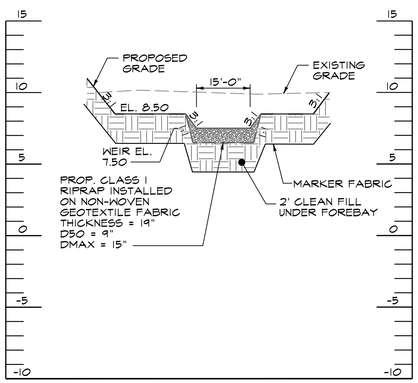
EMBANKMENT SECTION 'C-C'

SCALE: HORIZ. 1" =20'
VERT. 1" = 5'



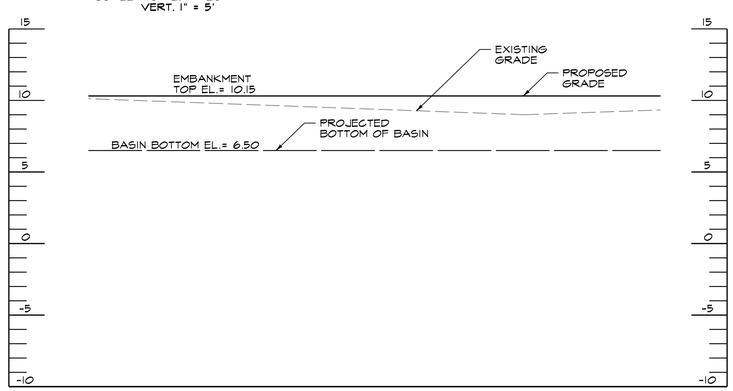
SECTION 'A-A'

SCALE: HORIZ. 1" =20'
VERT. 1" = 5'



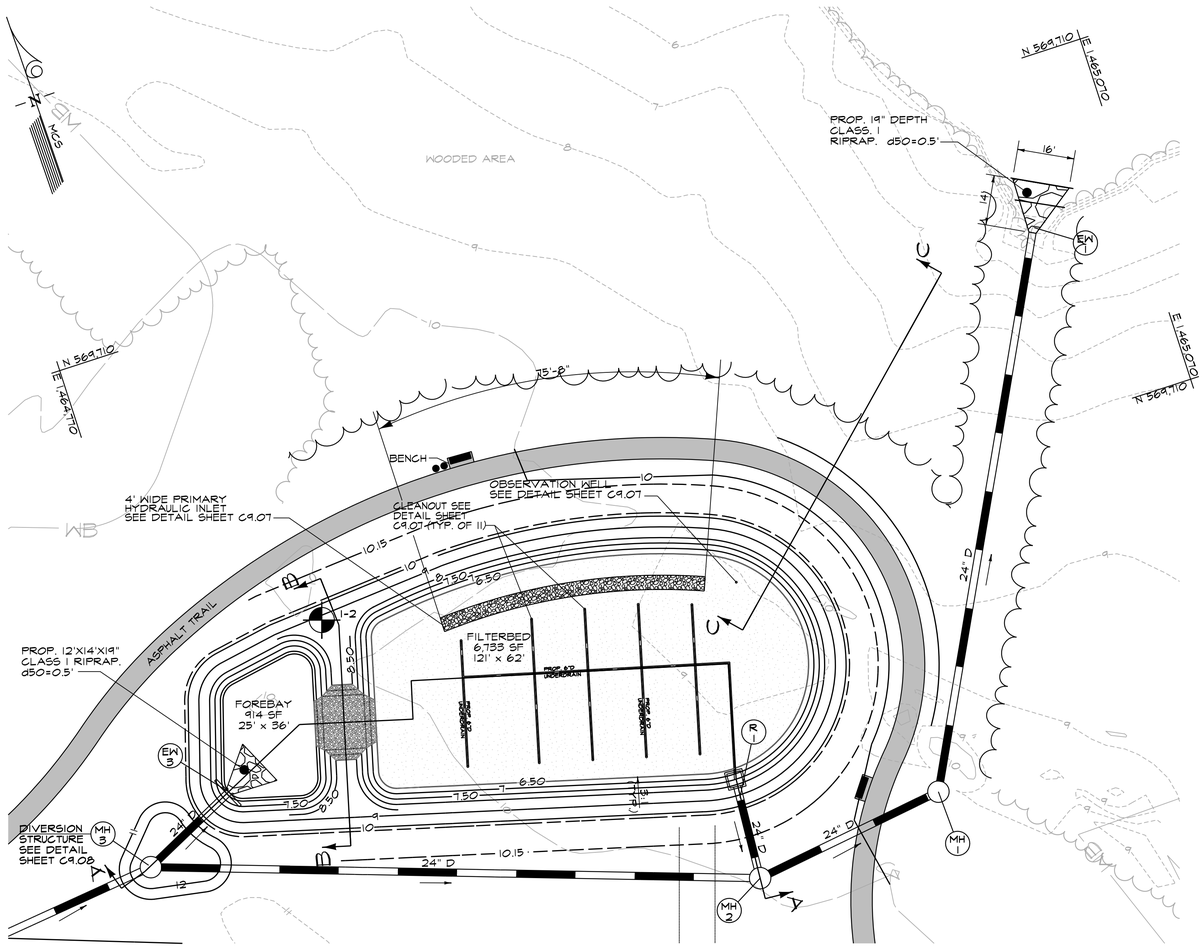
SECTION THRU WEIR (FOREBAY TO SGW B-B)

SCALE: HORIZ. 1" =20'
VERT. 1" = 5'



EMBANKMENT PROFILE

SCALE: HORIZ. 1" =20'
VERT. 1" = 5'



SUBMERGED GRAVEL WETLAND FACILITY #1

SCALE: 1" =20'

GRAPHIC SCALE
20 0 10 20 40
(IN FEET)
1" inch = 20'

LEGEND

175 EX. INDEX CONTOUR	PROP. CONCRETE WALK
174 EX. INTERMEDIATE CONTOUR	PROP. CONCRETE CURB & GUTTER
RIGHT-OF-WAY LINE	105 PROP. INDEX CONTOUR
EASEMENT LINE	104 PROP. INTERMEDIATE CONTOUR
EX. CURB AND GUTTER	12" D PROP. STORM DRAIN
EX. 12"D EX. STORM DRAIN	PROP. MANHOLE
EX. 8" SAN. EX. SANITARY SEWER	PROP. INLET
EX. 16"W EX. WATER	HSG (B) / HSG (C) SOILS LINE
EX. TREE LINE	LOD LIMIT OF DISTURBANCE
MEAN HIGH WATER	SWM-1 SWM SOIL BORING LOCATIONS
EX. WETLAND AREA	
WB EX. WETLAND BUFFER	
CAE CRITICAL AREA EASEMENT	

APPROVED: _____ Chief
STORMWATER ENGINEERING
BALTO. CO. DEPT. OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY

17-0009

DWG. FILENAME:

SWM-06

SEAL	PROFESSIONAL CERTIFICATION	AS-BUILT / REVISION	BY	DATE	P.W.A. NO.	KEY SHEET	POSITION SHT	DRAWING SCALE
DATE:	I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 25638 EXPIRATION DATE: 11-17-22	90% CDs		07/23/21	-	-	-	PLAN SCALE:
					R.O.W NO.	ANW	23SE29	PROFILE SCALE:
					-	-	-	

CIVIL ENGINEER	DGN BY: NM	BUREAU OF ENGINEERING AND CONSTRUCTION		HIGHWAYS	STRUCTURES	STORM DRAINS	SEWER	WATER	FIELD ENGINEER
MARIANNE CRAMPTON, PE PRINCIPAL MK CONSULTING ENGINEERS 1000 CLIPPER MILL ROAD, SUITE 201 BALTIMORE, MD 21211 (P) 667-1000-0100 Mcrampton@mkceng.com	DWN BY: SG	REVIEWED BY:							
	CHKD BY: SM	DATE REVIEWED:							

APPROVED BY: _____ DIRECTOR
DATE: _____

PROPERTY MANAGEMENT
APPROVED BY: _____ CHIEF
DATE: _____

SUBDIVISION:

BALTIMORE COUNTY OFFICE OF BUDGET AND FINANCE, PROPERTY MANAGEMENT

SPARROWS POINT PARK
SUBMERGED GRAVEL WETLANDS FACILITY #1
1900 WHARF ROAD
SPARROWS POINT, MD 21219
TRADEPOINT ATLANTIC, PARCEL 3B

COUNCILMANIC DIST. NO. : 7
ELECTION DIST. NO.: 15c7

SHEET DESIGNATION	CONTRACT NUMBER
CIVIL ENGINEER	21004PO0
JOB ORDER NUMBER	241-212-0307-0809
SHEET	65 of 150
DRAWING NUMBER	C9.05
FILE NO.: 19011	REV. 1

8/18/2020 4:02:03 PM

PRELIMINARY - NOT FOR CONSTRUCTION

FILTRATION PRACTICES CONSTRUCTION INSPECTION CHECKLIST (SUBMERGED GRAVEL WETLAND FACILITY #2)

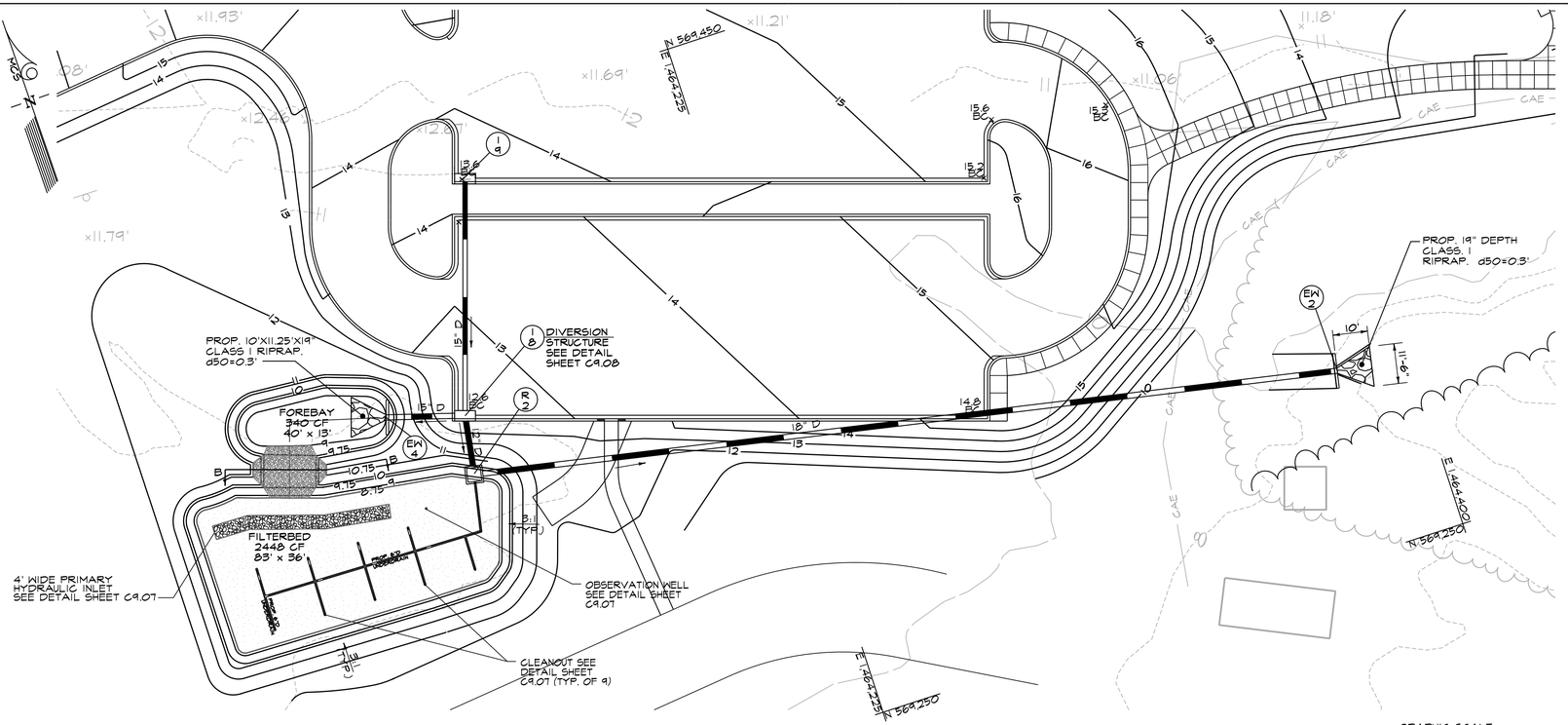
PHASE	DATE	INITIALS	REMARKS - DESCRIPTION OF ACTION TAKEN
1. EXCAVATION A. SIZE AND LOCATION B. SIDE SLOPE STABILITY C. SOIL PERMEABILITY D. GROUNDWATER / BEDROCK E. SETBACKS PER DESIGN MANUAL			
2. FILTER FABRIC A. FABRIC SPECIFICATIONS B. SIDES AND TOP (INFILTRATION) C. SIDES, TOP, BOTTOM (ATTENUATION)			
3. AGGREGATE MATERIAL A. TYPE (# CRUSHED, GRAVEL) B. SIZE C. PLACEMENT			
4. OBSERVATION WELL / ROOF LEADERS A. ROOF LEADERS B. SURCHARGE PIPE(S) C. PIPE SIZE AND TYPE D. MINIMUM COVER (1 FOOT)			
5. SURFACE LAYER A. AGGREGATE SURFACE B. VEGETATIVE SURFACE C. PAVED SURFACE			
6. INLET STRUCTURE A. INVERTS AND ELEVATIONS B. RECEIVES DESIGNED DRAINAGE AREA			

I HEREBY CERTIFY THAT I PERSONALLY REVIEWED OR A PERSON UNDER MY DIRECT SUPERVISION PROVIDED THE INFOMATION REPORTED ON THIS CHECKLIST AND TO THE BEST OF MY KNOWLEDGE DO HEREBY INSURE THAT THE SUBMITAL IS COMPLETE AND ACCURATE.

PROFESSIONAL ENGINEER SIGNATURE AND DATE

LEGEND

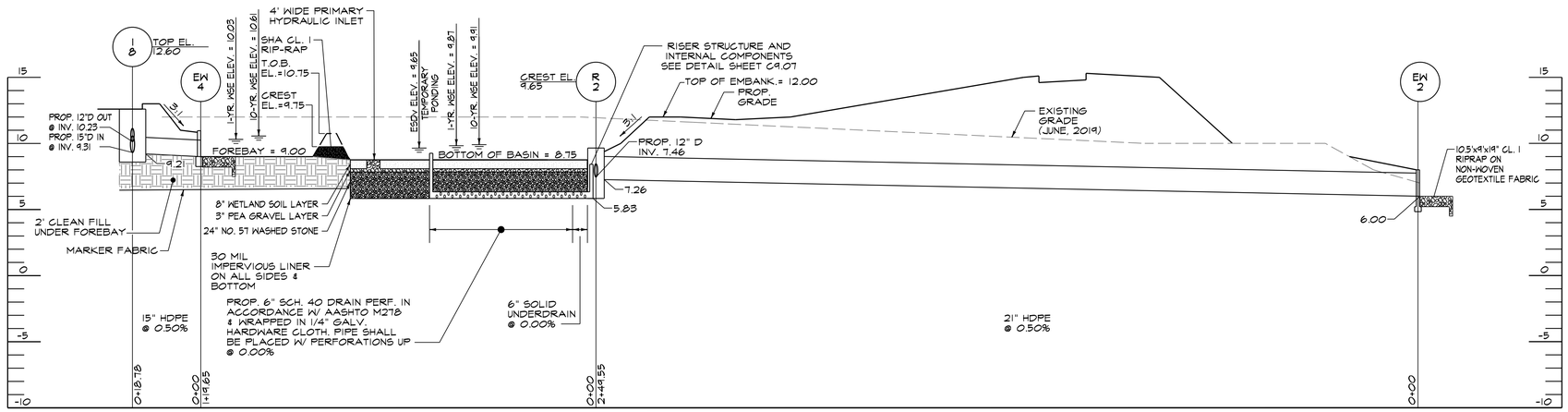
- EX. INDEX CONTOUR
- EX. INTERMEDIATE CONTOUR
- RIGHT-OF-WAY LINE
- EASEMENT LINE
- EX. CURB AND GUTTER
- EX. STORM DRAIN (EX. 12"D)
- EX. SANITARY SEWER (EX. 8" SAN.)
- EX. WATER (EX. 16"W)
- EX. TREE LINE
- MEAN HIGH WATER
- CRITICAL AREA EASEMENT (CAE)
- EX. WETLAND AREA
- EX. WETLAND BUFFER (WB)
- PROP. CONCRETE WALK
- PROP. CONCRETE CURB & GUTTER
- PROP. INDEX CONTOUR
- PROP. INTERMEDIATE CONTOUR
- PROP. STORM DRAIN (12" D)
- PROP. MANHOLE
- PROP. INLET
- SOILS LINE (HSG (B) / HSG (C))
- LIMIT OF DISTURBANCE (LOD)



SUBMERGED GRAVEL WETLAND FACILITY #2

SCALE: 1" =20'

GRAPHIC SCALE
20 0 10 20 40
(IN FEET)
1" inch = 20'



SECTION 'A-A'

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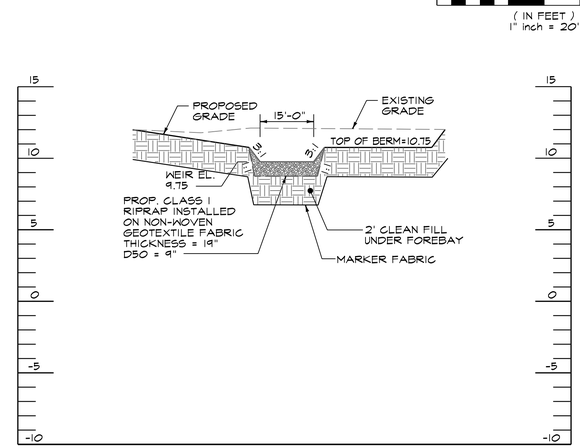
VERT. 1" = 5'



SECTION THRU WEIR (FOREBAY TO SGW B-B)

SCALE: HORIZ. 1" =20'
VERT. 1" = 5'

OWNER

TRADEPOINT ATLANTIC LLC
1600 SPARROWS POINT BLVD
BALTIMORE, MD 21219
PHONE: 410-709-1286

APPROVED: _____ Chief
STORMWATER ENGINEERING
BALTO. CO. DEPT. OF
ENVIRONMENTAL PROTECTION
AND SUSTAINABILITY

SWM-07

SEAL

DATE

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND
LICENSE NO. 25038 EXPIRATION DATE: 11-17-22

CIVIL ENGINEER _____
MARIANNE CRAMPTON, PE
PRINCIPAL
MK CONSULTING ENGINEERS
1000 CLIPPER MILL ROAD, SUITE 201
BALTIMORE, MD 21211
(T) 667-2000-01581
Mcrampton@mkcoeng.com

DGN BY: NM
DWN BY: SG
CHKD BY: SM

AS-BUILT / REVISION: 90% CDs

BY | DATE: 07/22/21

P.W.A. NO. - | R.O.W NO. - -

KEY SHEET - ANW - -

POSITION SHT - 23SE29 - -

DRAWING SCALE
PLAN SCALE: _____
PROFILE SCALE: _____

APPROVED BY: _____ DIRECTOR
DATE: _____

BUREAU OF ENGINEERING AND CONSTRUCTION		HIGHWAYS	STRUCTURES	STORM DRAINS	SEWER	WATER	FIELD ENGINEER
REVIEWED BY:							
DATE REVIEWED:							

PROPERTY MANAGEMENT
APPROVED BY: _____ CHIEF
DATE: _____

SUBDIVISION:

BALTIMORE COUNTY OFFICE OF BUDGET AND FINANCE, PROPERTY MANAGEMENT

SPARROWS POINT PARK
SUBMERGED GRAVEL WETLANDS FACILITY #2
1900 WHARF ROAD
SPARROWS POINT, MD 21219
TRADEPOINT ATLANTIC, PARCEL 3B

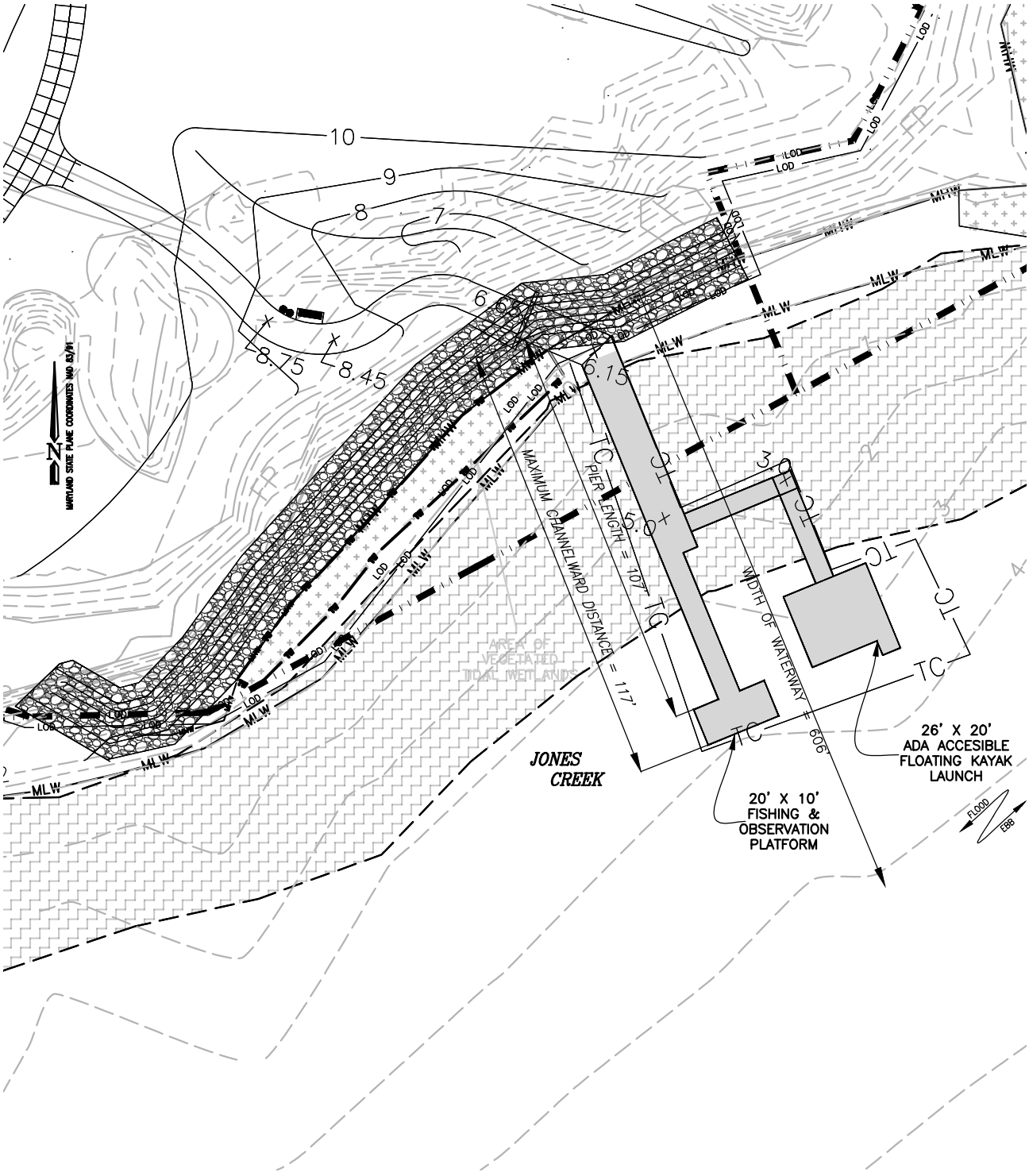
COUNCILMANIC DIST. NO. : 7
ELECTION DIST. NO.: 15c7

SHEET DESIGNATION	CONTRACT NUMBER
CIVIL ENGINEER	21004P00
	JOB ORDER NUMBER
	241-212-0307-0809
	SHEET 66 of 150
	DRAWING NUMBER
	C9.06
	FILE NO.: 19011

DWG FILENAME: 17-000

8/18/2020 4:02:03 PM

PRELIMINARY - NOT FOR CONSTRUCTION



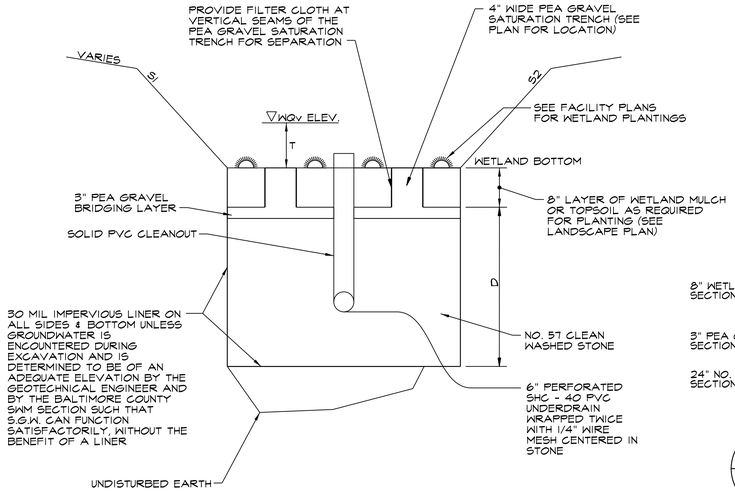
MDE TRACKING #202160358

MDE PERMIT# 21–NT–0281, 21–GL–0376

PATH: C:\Users\kevin\OneDrive\Holly Oak LLC\19-12 TPA BC Park\DWG\JPA\JPA-EXH9A.dwg

HOLLY OAK CONSULTING, LLC
303 SYCAMORE RD
SEVERNA PARK, MD 21146
TELEPHONE (443) 906–3419
EMAIL: info@hollyoakconsulting.com

SCALE: 1"=40'	SHORELINE IMPROVEMENT OVERALL PLAN
DATE: 3/29/2021	**SPARROWS POINT RECREATIONAL FACILITY**
DRAWN BY: KCH	TRADE POINT ATLANTIC – LOT 3B
DESIGNED BY: OTHERS	WHARF ROAD SPARROWS POINT, MD 21219
CHECKED BY: KCH	TM:11 GRD:12 PARCEL:318 BALTIMORE COUNTY, MARYLAND
SHEET 9 OF 12	



MINIMUM SPECIFICATIONS FOR IMPERMEABLE LINER

ASTM-D-4833 (30 MIL THICKNESS)
ASTM-D-412 (TENSILE STRENGTH 1,100 LB. ELONGATION 200%)
ASTM-D-624 (TEAR RESISTANCE = 150 LB/IN)
ASTM-D-471 (WATER ABSORPTION +8 TO -2% MASS)

MINIMUM SPECIFICATIONS FOR CLAY SOIL LINER

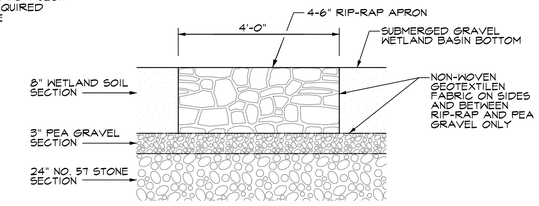
IN LIEU OF AN IMPERMEABLE LINER A 6 TO 12" THICK CLAY SOIL LINER MAY BE USED (AS DETERMINED BY THE GEOTECHNICAL ENGINEER). THE CLAY LINER MUST HAVE AT LEAST 15% PASSING THE #200 SIEVE AND A MAXIMUM PERMEABILITY OF 0.00001 CM/SEC.

THE MAXIMUM REQUIRED DENSITY SHALL NOT BE LESS THAN 95% OF MAXIMUM DRY DENSITY WITH A MOISTURE CONTENT WITHIN ±2% OF THE OPTIMUM. AREAS ON WHICH THE CLAY LINER WILL BE PLACED SHALL BE SCARIFIED PRIOR TO LINER PLACEMENT. FILL MATERIALS SHALL BE PLACED IN MAXIMUM 8 INCH THICK (BEFORE COMPACTION) LAYERS WHICH ARE TO BE CONTINUOUS OVER THE ENTIRE LENGTH OF FILL. EACH LAYER OF FILL SHALL BE COMPACTED AS NECESSARY TO OBTAIN THAT DENSITY, AND IS TO BE CERTIFIED BY THE ENGINEER AT THE TIME OF CONSTRUCTION. ALL COMPACTION IS TO BE DETERMINED BY AASHTO METHOD T-99 (STANDARD PROCTOR).

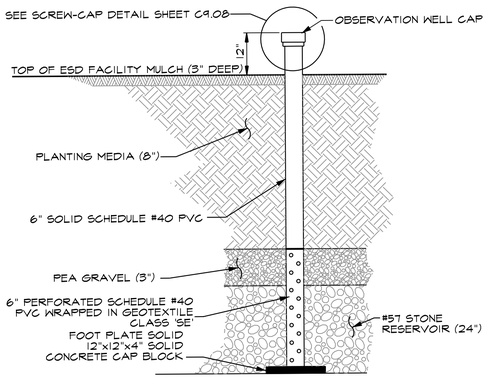
SPECIAL CARE SHALL BE TAKEN TO ENSURE A WATER TIGHT SEAL AROUND ALL STORM DRAINS AND STRUCTURES THAT PASS THROUGH THE CLAY LINER.

FACILITY #	D	S1	S2
S.G.W. # 1	2'-11"	3:1	3:1
S.G.W. # 2	2'-11"	3:1	3:1

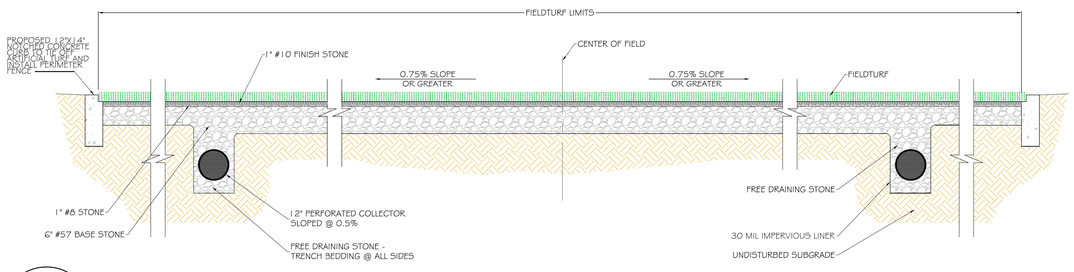
1 C9.07 — SUBMERGED GRAVEL WETLAND TYPICAL SECTION
NOT TO SCALE



2 C9.07 — PRIMARY HYDRAULIC INLET DETAIL
NOT TO SCALE

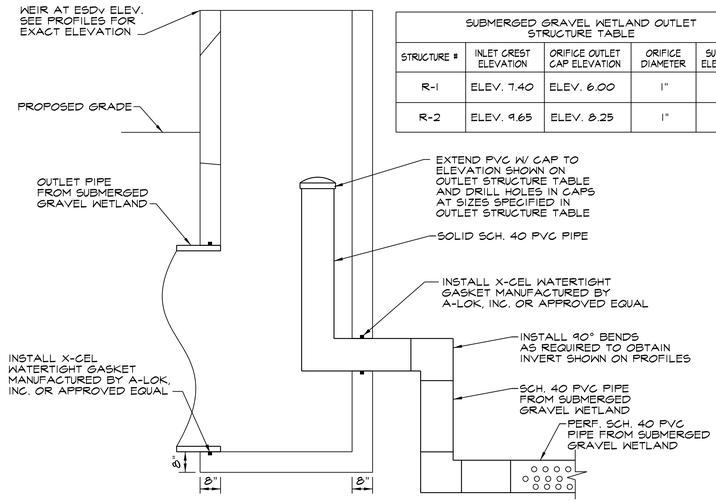


3 C9.07 — SWM OBSERVATION WELL DETAIL
NOT TO SCALE



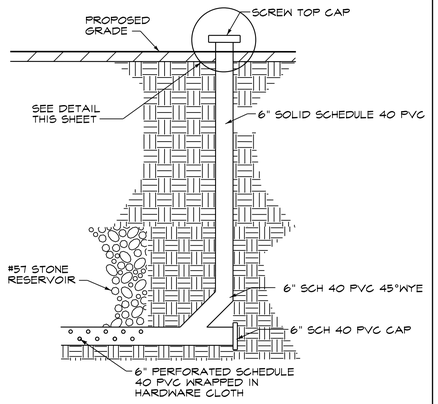
MANUFACTURED BY FIELDTURF OR APPROVED EQUAL

5 C9.07 — TYPICAL TURF FIELD SECTION
NOT TO SCALE

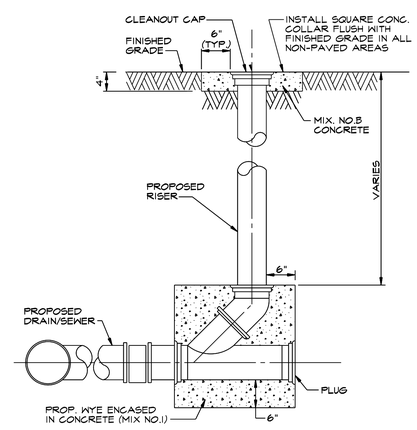


SUBMERGED GRAVEL WETLAND OUTLET STRUCTURE TABLE				
STRUCTURE #	INLET CREST ELEVATION	ORIFICE OUTLET CAP ELEVATION	ORIFICE DIAMETER	SURFACE ELEVATION
R-1	ELEV. 7.40	ELEV. 6.00	1"	8.50
R-2	ELEV. 9.65	ELEV. 8.25	1"	8.75

4 C9.07 — SUBMERGED GRAVEL WETLAND OUTLET STRUCTURE
NOT TO SCALE



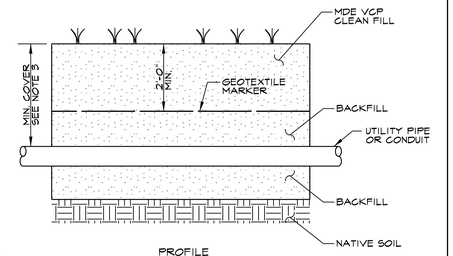
6 C9.07 — SWM FACILITY CLEANOUT DETAIL
NOT TO SCALE



7 C9.07 — CLEANOUT DETAIL
NOT TO SCALE

NOTES:

1. ALL PIPES OR CONDUIT SHALL BE LEAK-PROOF AND WATERTIGHT. ALL JOINTS SHALL BE SEALED OR GASKETED.
2. ALL PIPES SHALL BE PROPERLY PLACED AND BEDDED TO PREVENT MISALIGNMENT OR LEAKAGE. PIPE BEDDING SHALL BE INSTALLED IN SUCH A MANNER AS TO MINIMIZE THE POTENTIAL FOR ACCUMULATION OF WATER AND CONCENTRATED INFILTRATION.
3. MINIMUM COVER ABOVE UTILITY SHALL BE BASED ON SPECIFIC UTILITY REQUIREMENTS.
4. TRENCHES SHALL BE BACKFILLED WITH BEDDING AND MATERIALS APPROVED BY MDE.
5. FOR ANY UTILITY SEGMENT WHICH GOES THROUGH AN AREA WHICH IS DESIGNATED TO RECEIVED A LANDSCAPED CAP, THE UPPER 2 FEET OF BACKFILL MUST MEET THE REQUIREMENTS OF MDE VCP CLEAN FILL FOR THIS LAND USE. IN THIS CASE THE MDE VCP CLEAN FILL WILL BE UNDERLAIN BY A GEOTEXTILE MARKER FABRIC. UTILITY SEGMENTS WHICH GO THROUGH AREAS WHICH DO NOT REQUIRE CAPPING OR ARE DESIGNATED TO RECEIVE A PAVED CAP WILL BE BACKFILLED WITH MATERIALS APPROVED BY MDE FOR THIS USE.



8 C9.07 — TYPICAL UTILITY TRENCH SECTION
NOT TO SCALE

OWNER

TRADEPOINT ATLANTIC LLC
1600 SPARROWS POINT BLVD
BALTIMORE, MD 21219
PHONE: 410-709-1286

APPROVED:_____ Chief
STORMWATER ENGINEERING
BALTO. CO. DEPT. OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY

DWG. FILENAME: 17-0000

SEAL

DATE:

PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.
LICENSE NO. 25658 EXPIRATION DATE: 11-17-22

CIVIL ENGINEER
MARIANNE CRAMPTON, PE
PRINCIPAL
MK CONSULTING ENGINEERS
1000 CLIPPER MILL ROAD, SUITE 201
BALTIMORE, MD 21211
(P) 667-309-0180
Mcrampton@mkceng.com

DGN BY: NM
DWN BY: SG
CHKD BY: SM

AS-BUILT / REVISION	BY	DATE	P.W.A. NO.	KEY SHEET	POSITION SHT	DRAWING SCALE
90% CDs		07/23/21	-	-	-	PLAN SCALE:
			R.O.W NO.	ANW	23SE23	PROFILE SCALE:
			-	-	-	

BUREAU OF ENGINEERING AND CONSTRUCTION — REVIEWED BY: — DATE REVIEWED:
HIGHWAYS | STRUCTURES | STORM DRAINS | SEWER | WATER | FIELD ENGINEER

APPROVED BY: _____ DIRECTOR
DATE:
PROPERTY MANAGEMENT
APPROVED BY: _____ CHIEF
DATE:

BALTIMORE COUNTY OFFICE OF BUDGET AND FINANCE, PROPERTY MANAGEMENT

SPARROWS POINT PARK
STORMWATER MANAGEMENT DETAILS
1900 WHARF ROAD
SPARROWS POINT, MD 21219
TRADEPOINT ATLANTIC, PARCEL 3B

SUBDIVISION:

COUNCILMANIC DIST. NO. : 7
ELECTION DIST. NO.: 15c7

SWM-08

SHEET DESIGNATION	CONTRACT NUMBER
CIVIL ENGINEER	21004PO0
	JOB ORDER NUMBER
	241-212-0307-0809
	SHEET 22 of 150
	DRAWING NUMBER
	C9.07
	FILE NO.: 19011

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PRELIMINARY - NOT FOR CONSTRUCTION

APPENDIX E

Utility Excavation NAPL Contingency Plan

Revision 4 – June 19, 2017

Introduction:

Proposed underground utilities and excavations necessary for the redevelopment of the Tradepoint Atlantic property may encounter areas of petroleum and/or Oil & Grease contamination in soil. The assessment of total petroleum hydrocarbons (TPH) diesel range organics (DRO), gasoline range organics (GRO), Oil & Grease, and/or non-aqueous phase liquid (NAPL) completed as part of each Phase II Investigation includes the following:

- Each soil boring with evidence of NAPL (i.e., containing a sheen or free oil in the soil core), whether located near utilities or not, is investigated via the installation of a piezometer to assess mobility to groundwater. If measureable NAPL is present in the initial piezometer, additional soil borings and shallow temporary piezometers are installed surrounding the initial detection to delineate the impacts. Each piezometer installed to delineate the presence or absence of NAPL is checked with an oil-water interface probe immediately after installation, 48 hours after installation, and at least 30 days after installation.
- TPH-DRO/GRO and Oil & Grease data, once received, are assessed in their magnitude and location respective to subsurface utilities, stormwater conveyances, and surface waters.
- Locations that exhibit elevated detections of TPH/Oil & Grease or evidence of NAPL, that are within reasonable proximity (i.e. 25 feet) to subsurface utilities or stormwater conveyances and/or within reasonable proximity (i.e. 100 feet) to surface waters, are identified for further delineation and selective removal (if warranted).

Any NAPL identified in soil borings or piezometers during the Phase II Investigation would be noted on relevant logs and identified in Response and Development Work Plans for construction planning purposes. Despite these planning efforts, unidentified pockets of contamination (including NAPL) may still be encountered during construction. This contingency plan provides the procedures to be utilized during construction work to properly address response and construction techniques if any materials impacted with NAPL are encountered.

Objectives:

The purpose of this plan is to describe procedures to be followed in the event that NAPL is encountered in utility trenches or other excavations during development of the Tradepoint Atlantic property. The specific objectives of this plan and the procedures outlined herein are:

1. To ensure identification and proper management of Oil & Grease and petroleum-contaminated soils.
2. To ensure proper worker protection for working in areas of Oil & Grease and petroleum contamination.
3. To ensure that the installation of new utilities does not create new preferential flow paths for the migration of free-phase hydrocarbons (Oil & Grease, TPH-DRO/GRO, etc.) or soil vapors.

Identification of Oil & Grease and Petroleum Contaminated Soil:

An Environmental Professional (EP) will be on-site to determine if soils show evidence of the presence of Oil & Grease or TPH present as NAPL during installation of utility trenches or other excavation activities completed during development. Oil & Grease or petroleum-contaminated soils can be identified by the presence of free oil, oil staining, a petroleum odor, or any combination of these conditions. Free oil (NAPL) is liquid oil which could potentially be drained or otherwise extracted from the soil, and is the focus of this contingency plan, although severe staining accompanied by odors should be addressed via the same contingency measures provided herein (based on the judgement of the EP). The appearance of oil staining is not always consistent, but varies depending on the nature of the oil, the soil type, and the age of the release. Staining associated with old petroleum contamination often has a greenish hue, but may also be brown or black. The olfactory sense is the most sensitive instrument for identifying petroleum contamination in the field. Therefore, a petroleum odor may be noted although there is no visible sign of oil or staining. In some instances, decaying organic matter can produce an odor similar to petroleum, but this is rare.

If NAPL is encountered during construction, the extent of impacts shall be delineated by excavating trenches or installing four soil borings (two in each direction) perpendicular to the utility alignment or excavation to examine the soil for physical evidence of NAPL. Perpendicular transects will be investigated every 50 feet along the section of the utility trench or excavation where there is physical evidence of NAPL. Each transect will extend to a distance of 10 feet from the edge of the utility trench or excavation. This represents the maximum distance which would require mandatory excavation to mitigate potential migration risks (see below).

NAPL delineation will be guided primarily by screening observations from the perpendicular borings or trenches, and samples will be collected to test for extractable Oil & Grease or petroleum-contaminated soil using the Oil Sticks™ test kit. This test kit provides a determination of whether hydrocarbons are present in soil and extractable (i.e. could mobilize as a NAPL). Oil Sticks™ change from a pale blue to a deep blue color when they come in contact with free product. This instantaneous change in color occurs even when miniscule amounts of product come in contact with the strip. The sensitivity of Oil Sticks™ to determine the presence/absence of oil is reported by the manufacturer to be about 1,000 to 2,000 mg/kg. The

field test is performed by placing approximately 3 tablespoons of soil in a clean sample cup and adding enough water to cover the sample. After stirring the sample and waiting ~1 minute, the Oil Sticks™ test strip should be swished through the water, making sure to touch the strip to the sides of the cup where product may collect at the interface (meniscus) between the cup, water, and air. If the strip turns deep blue, or deep blue spots appear, oil or hydrocarbon is present. However, the MDE has observed that the Oil Sticks™ method may produce inconsistent results. Therefore, documentation of all screening methods is necessary during boring/trenching work. This documentation shall include an accurate record of visual and olfactory screening, along with a narrative with photographs. Field screening will be aided by photoionization detector (PID) results, and Oil Sticks™ samples should be biased to target elevated PID readings, if any. The agencies have requested that all soil samples prepared for the Oil Sticks™ field test be photographed for evidence of sheen/residue on the cup sides. Detailed records are required to be submitted with the project-specific Completion Report.

If petroleum or Oil & Grease impacts are identified in Site soils based on use of the Oil Sticks™ test kit or other field screening methods, disposal requirements will be determined using the quantitative PetroFLAG™ hydrocarbon analysis system or fixed laboratory analysis (see following section). The PetroFLAG™ hydrocarbon analysis system is a broad spectrum field test kit suitable for TPH contamination regardless of the source or state of degradation (Dexsil Corporation). PetroFLAG™ field test kits do not distinguish between aromatic and aliphatic hydrocarbons, but quantify all fuels, oils, and greases as TPH. Dilutions can be used to determine concentrations of TPH/Oil & Grease above the normal calibration range. Dexsil notes that positive results for TPH may occur if naturally occurring waxes and oils, such as vegetable oils, are present in the sample. Additional detail regarding the procedure for the PetroFLAG™ kit is given in **Attachment 1**.

Soil Excavation, Staging, Sampling and Disposal:

The EP will monitor all utility trenching and excavation activities for signs of potential contamination. In particular, soils will be monitored with a hand-held PID for potential VOCs, and will also be visually inspected for the presence of staining, petroleum waste materials, or other indications of NAPL contamination that may be different than what was already characterized. Excavated material that is visibly stained or that exhibits a sustained PID reading of greater than 10 ppm will be segregated and containerized or placed in a stockpile on polyethylene or impervious surface until the material can be analyzed using the PetroFLAG™ test kit to characterize the material for appropriate disposal. If a PetroFLAG™ test kit is not available to the contractor, or if the contractor prefers to use fixed laboratory analysis, samples may be characterized via submittal to a laboratory for TPH/Oil & Grease analysis. However, any excavated material containing NAPL (i.e., containing free oil) cannot be characterized for waste disposal using the PetroFLAG™ test kit and must instead be characterized via fixed laboratory analysis, as described in the final paragraph of this section. In addition, any hydrocarbon contaminated soil discovered during construction activities that was not previously

characterized must also be analyzed for PCBs prior to removal and transport to an appropriate disposal facility. If excavated and stockpiled, such materials will be covered with a plastic tarp so that the entire stockpile is encapsulated, and anchored to prevent the elements from affecting the integrity of the containment. The MDE will be notified if such materials are encountered during utility work.

Soil exhibiting physical evidence of NAPL contamination or elevated TPH/Oil & Grease with detections in the low percentage range, which is located within 10 feet of a proposed new utility or subsurface structure (i.e., foundation, sump, electrical vault, underground tank, etc.), will be excavated and segregated for disposal at the on-site nonhazardous landfill (Greys Landfill) or an off-site facility pending the completion of any required PCB analytical testing. Impacted soil which is located greater than 10 feet away from the proposed utility or subsurface structure may be left in place and undisturbed. The extent of the excavation will be determined in the field following visual/olfactory screening supplemented by the PID and Oil Sticks™ test kit, but soil disposal requirements will be determined with the PetroFLAG™ test kit (since the Oil Sticks™ method is not quantitative) or via fixed laboratory analysis for TPH/Oil & Grease (if preferred by the contractor or if the PetroFLAG™ test kit is unavailable to the contractor).

Any recovered NAPL will be collected for off-site disposal. As required by the appropriate and MDE approved facility, samples impacted by NAPL (i.e., containing free oil) will be collected for profiling/waste characterization and submitted to a fixed laboratory, as mentioned above, for the following analyses: metals, VOCs, TPH-DRO/GRO, and/or additional analysis required by the selected disposal facility. Upon receipt of any additional characterization analytical results, the MDE will be notified of the proposed disposal facility. Non-impacted material with no evidence of NAPL (i.e. soils that may contain measureable concentrations of TPH/Oil & Grease but below percentage levels) may be placed on the Site in areas to be paved or capped as long as all other requirements specified in the Response and Development Work Plan (or similar governing document) are met.

Initial Reporting:

If evidence of NAPL in soil or groundwater is encountered during excavation, it will be reported to the MDE within two hours. Information regarding the location and characteristics of any NAPL contaminated soil will be documented as follows:

- Location (exact stationing);
- Extent of contamination (horizontally and vertically – prepare a sketch including dimensions);
- Relative degree of contamination (i.e. free oil with strong odor vs. staining); and
- Visual documentation (take photographs and complete a photograph log)

Utility Installations in Impacted Areas:

Underground piping or conduits installed through areas of Oil & Grease or petroleum contamination shall be leak proof and water tight. All joints will be adequately sealed or gasketed, and pipes or conduits will be properly bedded and placed to prevent leakage. All trench backfill will meet the MDE definition of clean fill, or otherwise be approved by the MDE. Pipe bedding will be installed to minimize the potential for accumulation of water and concentrated infiltration. This can be achieved by using a relatively small amount of low-permeability pipe bedding; open-graded stone will be avoided or only used in thicknesses of 6 inches or less. Bedding must be properly placed and compacted below the haunches of the pipe. Clay, flowable fill, or concrete plugs will be placed every 100 feet across any permeable bedding to minimize the preferential flow and concentration of water along the bedding of such utilities.

If required, each trench plug will be constructed with a 2-foot-thick clay plug or 1-foot-thick flowable fill or concrete plug, perpendicular to the pipe, which extends at least 1 foot in all directions beyond the permeable pipe bedding. The plug acts as an anti-seep collar, and will extend above the top of the pipe. Installation of each trench plug will follow the completion of the trench excavation, installation of granular pipe bedding (because dense-graded aggregate or soil or other pipe bedding is difficult to properly compact below the haunches of the pipe), and seating of the pipe. The trench plug will then be installed by digging out a 1-foot trench below and around the pipe corridor, and placing clay, flowable fill, or concrete to construct the plug. A specification drawing for installation of the trench plug has been provided as **Figure 1**.

Attachment 1 - PetroFLAG™ Procedure

PetroFLAG™ field test kits use a proprietary turbidimetric reaction to determine the TPH concentration of solvent extracted samples (USEPA). Calibration standards provided with the unit are used to perform a two-point calibration for the PetroFLAG™. A blank and a 1,000 ppm standard are run by the analyzer unit to create an internal calibration curve.

Analysis of a soil sample is performed using three simple steps: extraction, filtration, and analysis. The PetroFLAG™ analysis is performed as follows:

- Place a 10 gram soil sample in a test tube.
- Add extraction solvent to the tube.
- Shake the tube intermittently for four minutes.
- Filter the extract into a vial that contains development solution
- Allow the solution to react for 10 minutes.

The filtration step is important because the PetroFLAG™ analyzer measures the turbidity or "optical density" of the final solution. Approximately 25 samples can be analyzed per hour. The vial of developed solution is placed in the meter, and the instrument produces a quantitative reading that reveals the concentration of hydrocarbons in the soil sample. The PetroFLAG™ method quantifies all fuels, oils, and greases as TPH between 15 and 2000 ppm (Dexsil Corporation). A 10x dilution of the filtered extraction solvent will be completed to allow for quantification of soil concentrations in excess of 10,000 ppm. The specially designed PetroFLAG™ analyzer allows the user to select, in the field, the response factor that is appropriate for the suspected contaminant at each site. Vegetable-based oils have been shown to exhibit a response factor of 18% (EPA Method 9074). Using the selected response factor, the analyzer compensates for the relative response of each analyte and displays the correct concentration in parts per million (ppm).

References:

U.S. Environmental Protection Agency (EPA). Contaminated Site Clean-up Information (Clu-IN): Test Kits. Office of Superfund Remediation and Technology Innovation. http://www.clu-in.net/characterization/technologies/color.cfm

Dexsil Corporation. 2016. PetroFLAG Analyzer System (PF-MTR-01). http://www.dexsil.com/products/detail.php?product_id=23

EPA SW-846 Method Number 9074 - Turbidimetric Screening Procedure for Total Recoverable Hydrocarbons in Soil

GENERAL NOTES:

1. ALL PIPES OR CONDUIT PASSING THROUGH AREAS OF PETROLEUM CONTAMINATION SHALL BE LEAK-PROOF AND WATERTIGHT. ALL JOINTS SHALL BE SEALED OR GASKETED.

2. ALL PIPES SHALL BE PROPERLY PLACED AND BEDDED TO PREVENT MISALIGNMENT OR LEAKAGE. PIPE BEDDING SHALL BE INSTALLED IN SUCH A MANNER AS TO MINIMIZE THE POTENTIAL FOR ACCUMULATION OF WATER AND CONCENTRATED INFILTRATION.

3. ANTI-SEEP COLLARS FROM THE PIPE MANUFACTURER, THAT ARE PRODUCED SPECIFICALLY FOR THE PURPOSE OF PREVENTING SEEPAGE AROUND THE PIPE, ARE ACCEPTABLE IF INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, AND ONLY WITH PRIOR APPROVAL BY TPA.

4. MINIMUM COVER ABOVE UTILITY SHALL BE BASED ON SPECIFIC UTILITY REQUIREMENTS.

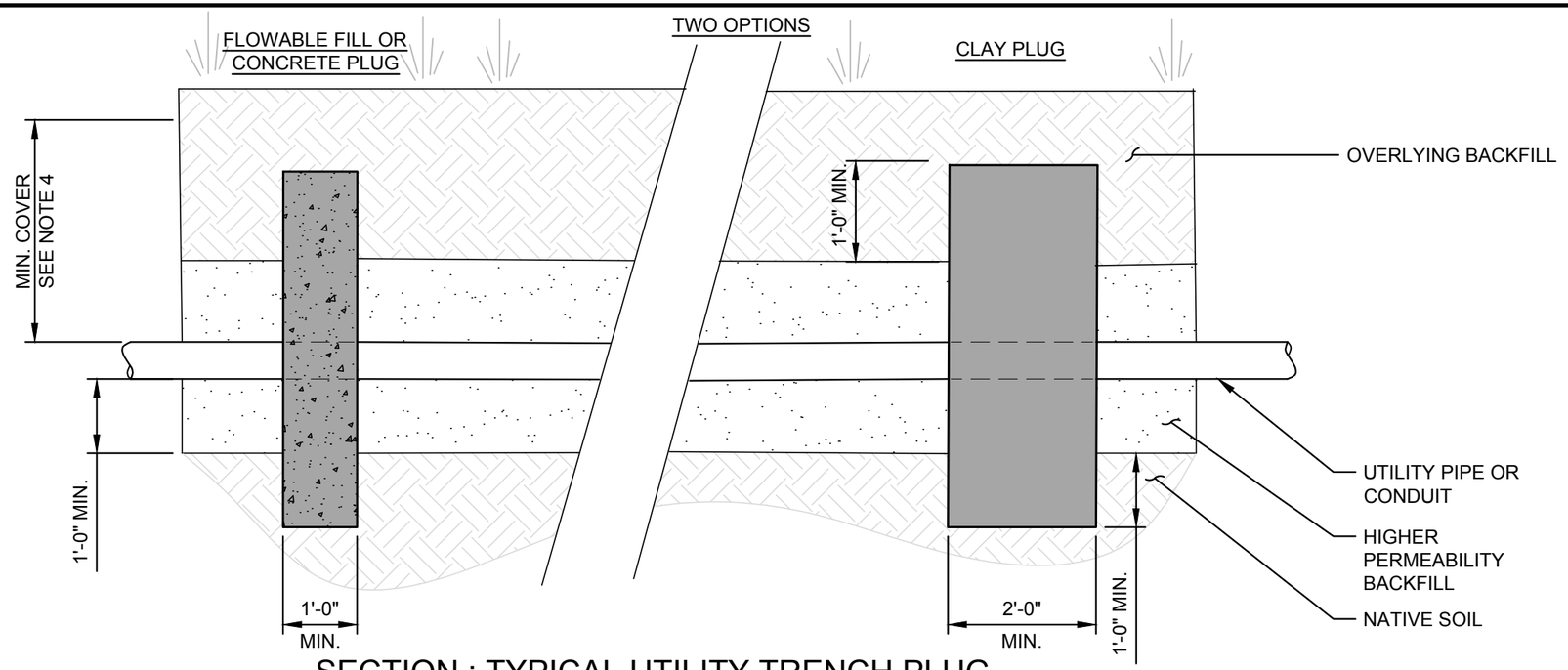
5. TRENCHES SHALL BE BACKFILLED WITH BEDDING AND MATERIALS APPROVED BY MDE.

6. FOR ADDITIONAL REQUIREMENTS, INCLUDING THE USE OF MDE VCP CLEAN FILL FOR INDUSTRIAL LAND USE AND INSTALLATION OF GEOTEXTILE MARKER FABRIC, REFER TO NOTE 5 ON THE TYPICAL UTILITY CROSS SECTIONS.

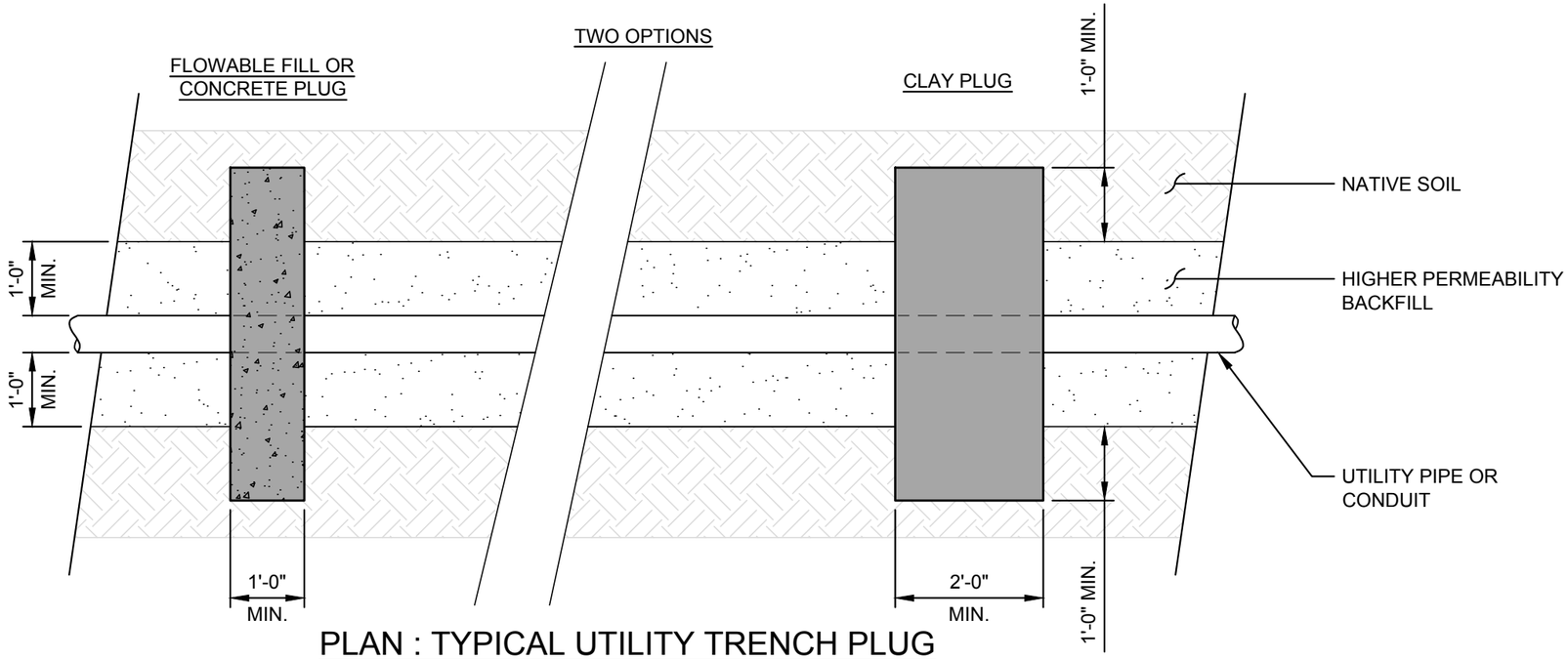
7. ALL UTILITIES INSTALLED THROUGH AREAS CONTAINING NAPL OR ELEVATED CHEMICAL IMPACTS WITH THE POTENTIAL TO TRANSMIT VAPORS ALONG PREFERENTIAL FLOW PATHWAYS SHALL BE EITHER 1) BACKFILLED WITH LOW PERMEABILITY BACKFILL MATERIAL (LESS THAN OR EQUAL TO THE PERMEABILITY OF THE EXISTING SUBGRADE), OR 2) INSTALLED WITH TRENCH PLUGS ALONG THE ALIGNMENT IN ACCORDANCE WITH THE DETAILS SHOWN ON THIS PLAN AND THE FOLLOWING NOTES:

   A.) UTILITY TRENCH PLUGS SHALL BE INSTALLED AT 100-FOOT (MAX.) INTERVALS THROUGH ALL AREAS OF NAPL CONTAMINATION.

   B.) UTILITY TRENCH PLUGS SHALL EXTEND A MINIMUM OF 1-FOOT IN ALL DIRECTIONS BEYOND ANY HIGHER PERMEABILITY BACKFILL MATERIALS (I.E., MATERIALS EXCEEDING THE PERMEABILITY OF THE EXISTING SUBGRADE).



SECTION : TYPICAL UTILITY TRENCH PLUG



PLAN : TYPICAL UTILITY TRENCH PLUG

ARM Group LLC
Engineers and Scientists

UTILITY TRENCH PLUG
Sparrows Point Site
Tradepoint Atlantic

September 2020	Figure
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