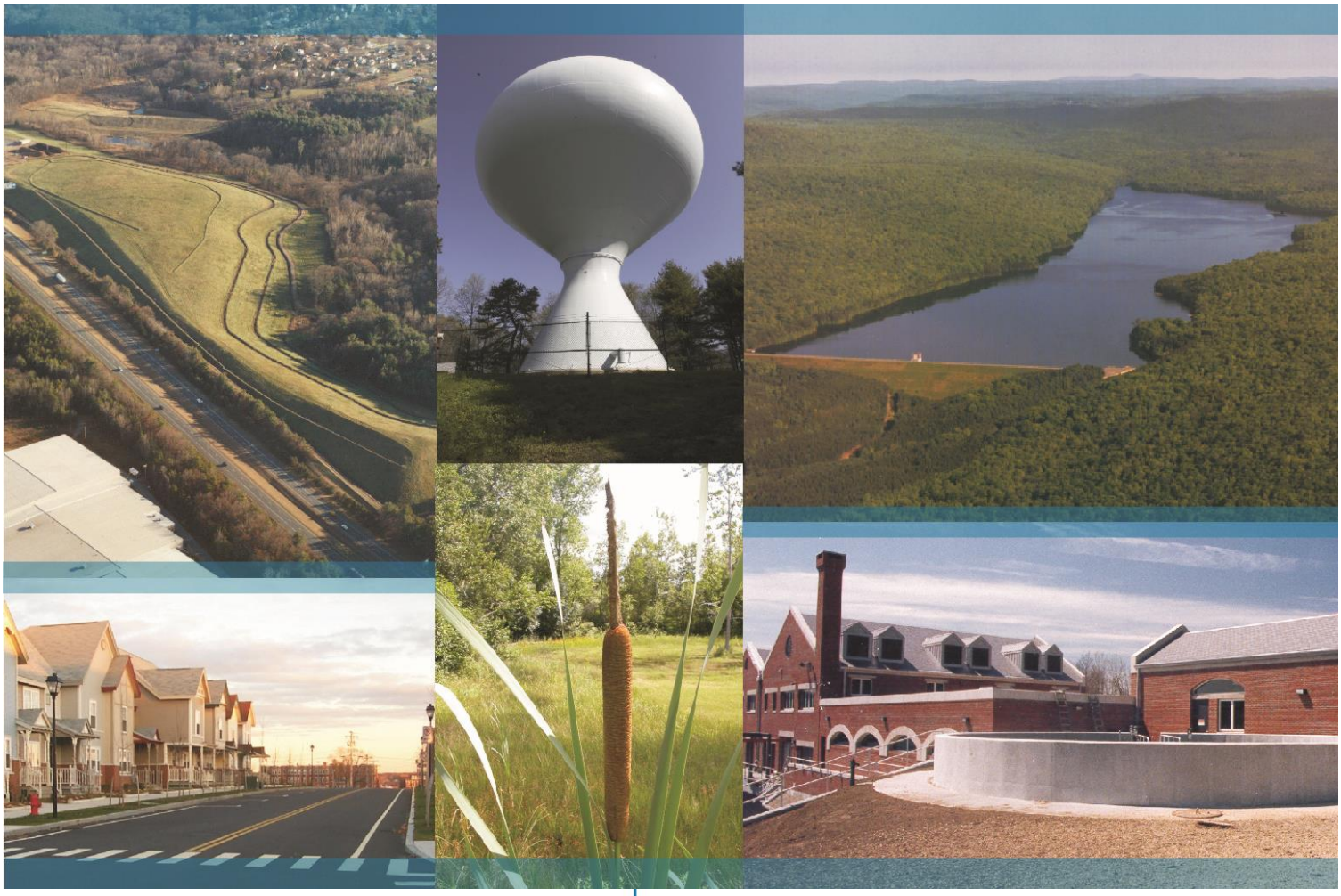

Tighe&Bond

Palmer Cove Park Renovation - Phase 2
Salem, Massachusetts

Soil Management Plan

Prepared For:

City of Salem / Crowley Cottrell Landscape Architecture

July 2023

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Section 1
Introduction

On behalf of City of Salem, Tighe & Bond has prepared this Soil Management Plan ("SMP") to summarize procedures for the handling and disposal, as warranted, of contaminated soil during the scheduled "Palmer Cove Park Renovation - Phase 2" project at the park property listed at 30 Leavitt Street in Salem, Massachusetts (the "site"). A Soil Management Plan (Figure 1) and a Soil Management Plan – Northern Portion (Figure 2) are provided in Appendix A for reference. This SMP also references Crowley Cottrell Landscape Architecture, LLC's ("Crowley Cottrell") *Palmer Cove Park Renovation - Phase 2* project plan set (dated July 2023).

The Licensed Site Professional ("LSP") for this SMP and other related environmental deliverables reviewed herein is Todd Kirton (LSP #2365) of Tighe & Bond.

This SMP does not serve as or replace any project specifications, but rather it serves as supplemental document to be attached to the project bid package being prepared by Crowley Cottrell on behalf of the City of Salem.

1.1 Site Background

During initial due diligence investigations conducted at the site in 2018 by Tighe & Bond, metals and polycyclic aromatic hydrocarbons ("PAHs") were detected above applicable reportable concentrations in site soil, triggering a 120-day reporting condition in accordance with the Massachusetts Contingency Plan ("MCP;" 310 CMR 40.0000) regulations. The Massachusetts Department of Environmental Protection ("MassDEP") was notified of this release condition on July 20, 2018, and MassDEP subsequently assigned RTN 3-35086 to the site.

Historical records research indicate that the site was land under water that was part of Palmer Cover pre-1900, and that filling of this area under Chapter 91 licenses began circa 1899. Filling of the site under Chapter 91 licenses ended in the early 1930s. The contamination present in soil is attributed to the poor-quality fill material used at the site.

Between 2018 and 2023, Tighe & Bond has completed several investigations across the site to delineate impacts to site soil and groundwater, as further reviewed herein.

As part of an earlier "Phase 1" park renovation project in 2021, a new community garden area was constructed on the west/southwestern portion of the site, a new waterfront walkway was constructed above the existing sloped stone seawall situated along the eastern boundary of the site, new walkways and tree plantings were constructed across portions of the site, and other ancillary improvements were made. These activities generated excess soil that required proper off-site disposal, as reviewed herein.

A new tide gate manhole was installed on the southeastern portion of the site in March 2023. These activities generated excess soil that also required proper off-site disposal, as reviewed herein.

1.2 Requirement for Soil Management Plan

Since Palmer Cove Park is an open "release site" under the MCP regulations, site soil must be managed in accordance with the MCP during this upcoming Phase 2 park renovation project, as further described herein. Under separate cover, Tighe & Bond is also submitting a Release Abatement Measure ("RAM") Plan to MassDEP in accordance with the MCP for this project, which is the basis for this SMP.

Section 2
Summary of Previous Subsurface Investigations

In summary, the subsurface investigations and other sampling events that Tighe & Bond previously completed at the site have included the following:

- Advancement of 30 soil borings labeled as B-1 through B-13, B-4A, B-9A and B-11A, and B-301 through B-314.
- Test pit explorations at 10 locations labeled as TP1 through TP-10.
- Hand borings at 33 locations labeled as HB-1 through HB-5, HB-101 through HB-122, and HB-401 through HB-406.
- Installation of three groundwater monitoring wells labeled as MW-4, MW-9 and MW-11.
- Submittal of approximately 107 soil samples from site investigations for laboratory analysis. [Note: Groundwater samples were also collected from the site's monitoring wells, but those activities and laboratory results are not included in this SMP, since dewatering is not anticipated during these park renovation activities.]

The approximate locations where subsurface investigations were conducted are depicted on Figures in Appendix A. A further description of the subsurface investigations is provided below in Section 2.1 through 2.3. A summary of the laboratory results for the soil samples is provided in Section 2.4.

2.1 Drilling Events

Soil boring advancement conducted at the site during each of these events was conducted by our sub-contracted driller using a tracked-mounted Geoprobe® vibratory direct-push unit under Tighe & Bond observation. During boring advancement, soil samples were collected continuously using macro core liners.

2.1.1 March 2018 Drilling Event

During this event, 12 borings (B-1 through B-12) were advanced across the park in areas outside of the baseball field area (see Figure 1). Each soil boring was advanced to at least 5 feet below surface grade ("BSG"), with borings B-6 (15'), B-9 (15'), and B-12 (10') advanced to deeper depths to log site stratigraphy. These soil boring findings are summarized in Table 1[1] provided in Appendix B. In general:

- Anthropogenic fill, with evidence of ash, brick, glass, coal, glass, and/or porcelain pieces, was encountered in each of the borings.
- The groundwater table was generally encountered at five feet BSG.

[1] Subsurface data provided herein are not guaranteed as to accuracy or completeness, nor are they a part of the Contract Documents. Contractors are cautioned that the subsurface data have been utilized for general reference purposes only. No explicit or implicit representation is made as to the nature of the materials which may be encountered below the surface of the ground during the Phase 2 park renovation work.

- In the deeper borings, the anthropogenic fill continued below the groundwater table to depths of at least 10 feet BSG. In boring B-6, native marine-type deposits (consisting of grey, silty-clay with shell fragments) were encountered below the fill.
- In deeper boring B-9, some petroleum-type staining and odor were observed at, and below the groundwater table interval.

Soil samples were screened in the field for volatile compounds using a photo-ionization detector ("PID") instrument. In summary, PID results were all below 1 part per million (ppm), except in sample B-9 (10-15') where PID reading was 31.5 ppm and where there was evidence of petroleum type staining and odors (also see Table 1 for reference). Samples B-9 (5-10') and B-9 (10-15') where evidence of petroleum staining and odors were observed were also screened in the field for total petroleum hydrocarbons ("TPH") using a Dexsil® Petroflag analyzer kit. Dexsil results were 774 ppm and 583 ppm, respectively, in these two samples (also see Table 1 for reference). There was little to no evidence of petroleum odors or staining in the other soil borings.

Select samples from the borings were submitted for laboratory analysis, with most of the samples selected being collected from the top 3 feet. The soil samples were submitted for the following laboratory analyses:

- RCRA 8 metals (9 samples)
- Extractable petroleum hydrocarbons ("EPH") with target polycyclic aromatic hydrocarbons ("PAHs" - 8 samples)
- Polychlorinated biphenyls ("PCBs" - 4 samples)
- Pesticides (2 samples)
- Volatile organic compounds ("VOCs" - 2 samples)

In addition, B-12 (0.5-2') was submitted for electron microscopy to confirm the presence of coal, coal ash, and/or wood ash.

2.1.2 October 2018 Drilling Event

During this event, boring advancement occurred in the areas of earlier borings B-4, B-11, and B-12, and at a new location (B-13) near the central portion of the park (see Figure 1). Table 1 provided in Appendix B summarizes the findings from this soil boring event In general:

- Earlier Boring B-4 Area: At this location, soil boring B-4A was advanced to a depth of approximately 15 feet BSG. From this boring, samples B-4A (0.5-1.5'), B-4A (4-6'), and B-4A (13-15') were submitted for lead analysis.
- Earlier Boring B-9 Area: At this location, soil boring B-9A was advanced adjacent to the earlier boring, to a depth of approximately 15 feet BSG. From this boring, sample B-9A (8-12'), where petroleum-type contamination was observed to be most prevalent in the boring, was submitted for EPH analysis.
- Earlier Boring B-11 Area: At this location, soil boring B-11A was advanced adjacent to the earlier boring, to a depth of approximately 15 feet BSG. From this boring, sample B-11A (0.5-1') was submitted for hexavalent chromium analysis, and sample B-11A (5-7') was submitted for laboratory analysis of hexavalent chromium, barium and mercury. Three additional borings (B-11B, B-11C, and B-11D) were advanced in the vicinity of soil boring B-11A to a depth of approximately four feet BSG. From these borings, samples B-11B

(2-4') and B-11D (3-4') were submitted for laboratory analysis of barium and mercury.

- Boring B-13: This additional boring was advanced in the outfield area of the baseball field. From this boring, sample B-13 (0.5-2') was submitted for lead analysis, sample B-13 (4-6') was submitted for lead analysis, and sample B-13 (10-12') was submitted for EPH analysis.

In general, fill soi consisting of sand, silt and gravel were encountered below the organic topsoil in the borings. Evidence of anthropogenic fill containing evidence of ash and debris was encountered at depth in each of the borings. Further boring descriptions are provided in Table 1.

2.1.3 August 2022 Drilling Event

During this event, 14 additional borings (B-301 through B-314) were advanced on the northern portion of the park (see Figure 2). Table 1 provided in Appendix B summarizes the findings from this additional soil boring event.

In general, each of the soil borings was advanced to four feet BSG, and soil samples were collected in two-foot intervals with each 0 to 2-foot sample submitted for lead analysis and select 2 to 4-foot sample submitted for lead analysis.

2.2 Exploratory Test Pit Events

Test pit explorations were completed by our sub-contracted excavator under Tighe & Bond observation.

2.2.1 October 2018 Test Pit Event

During this event, five test pits (TP-1 through TP-5) were excavated along the perimeters of the park field area (see Figure 1).

At each test pit location, excavation occurred to at least 5.5 feet BSG, and continued to at least the groundwater table. Table 1 provided in Appendix B summarizes the findings from the test pit program. In general:

- Fill soil generally consisting of sand, silt and comingled grave were observed beneath the organic topsoil layer. Little to no evidence of debris or ash was observed in this upper fill layer, which varied between approximately 1 and 2 feet in thickness in test pits TP-1 through TP-4, before encountering anthropogenic fill containing debris and ash. In test pit TP-5, which was excavated on the western portion of the site near Salem Street (see Figure 3), little or no evidence of anthropogenic fill/debris was encountered to approximately 7 feet BSG (end of test pit).
- In test pits TP-1 through TP-4, anthropogenic fill was encountered beneath the upper fill layer to the end of excavations (between 5.5 and 6.5 feet BSG). In general, the anthropogenic fill contained evidence of ash, brick, and glass, with the pieces of debris generally less than three inches in size. The percentage of debris by volume in the fill was less than 10 percent, but the percentage of visible ash commingled with the fill soil was upwards of 50 percent in some locations.
- Little or no evidence of petroleum-type contamination was observed in the test pits.

- The groundwater table was observed between approximately 5.5 and 6.5 feet BSG in test pits TP-1 through TP-4. The groundwater table was not encountered in test pit TP-5.

From test pits TP-1 through TP-4, a sample from the upper fill layer was collected from each location and submitted for lead analysis. In addition, samples TP-1 (1.5-3'), TP-3 (2-4'), and TP-4 (1-3') collected from the anthropogenic fill materials were submitted for lead analysis. Samples TP-2 (0.5-2') and TP-4 (0.5-1') were also submitted for barium and mercury analysis. From test pit TP-5, a sample collected from approximately 2 to 4-feet BSG was submitted for EPH analysis.

2.2.2 July 2020 Test Pit Event

During this event, five additional test pit explorations (TP-6 through TP-10) were conducted across the site (see Figure 1).

At each test pit location, excavation occurred to where the groundwater table was encountered. Test pit logs[2] with a separate photolog of the test pits are provided in Appendix C for reference. In general, the findings from these additional test pits were consistent with our earlier test pits. In addition:

- In each of these five additional test pits there was little to no visual evidence of anthropogenic fill until approximately two feet below grade where darker soil and/or evidence of ash with limited debris was observed. In general, the upper fill layer (i.e., from approximately 0 to 2 feet below grade) observed in each of these test pits was characterized as fine to coarse sand, some silt and little gravel.
- Anthropogenic fill with visual evidence of ash and limited debris was encountered beneath the top two feet of soil in each test pit to the depth of the water table. In summary, the pieces of debris observed in the anthropogenic fill included glass, brick, wood and/or porcelain, with most of debris less than three inches in size. In addition, other than some veins of mostly ash material, the anthropogenic fill contained greater than 50 percent soil.
- In general, native soil (or previous "cove area" sediments prior to when this area was filled) with dark/black organics and marine-type odor mixed with little to some anthropogenic fill was observed slightly below the groundwater table in each of the test pits, except in test pit TP-6 where the native soil encountered did not contain dark/black organics.

From each test pit, the sample collected from 0 to 1 foot below grade was submitted for lead analysis. In addition, at test pit TP-10 within the area where the community gardens are scheduled to be rebuilt, the sample collected from the 0 to 1-foot interval was also submitted for laboratory analysis of target PAHs via EPH method, and for mercury and barium. From this test pit, the samples collected from approximately 3 to 5 feet and from 5 to 7 feet below grade, respectively, were also submitted for MCP 14 metals and target PAHs. In addition, samples TP-6 (3-6'), TP-7 (3-5.5'), TP-8 (3-5') and TP-9 (3-6'), where the most visual evidence of anthropogenic fill/debris was generally observed in the respective test pits, were submitted for MCP 14 metals and target PAHs analysis.

[2] Note 1 above also applies to the test pit logs.

2.3 Hand Boring Events

Hand borings were completed by Tighe & Bond personnel during each of the events discussed below, with the stainless-steel hand boring equipment being cleaned between locations.

2.3.1 October 2018 Hand Boring Event

During this event, five hand borings (HB-1 through HB-5) were advanced within a community garden area that previously existed on the southeastern portion of the park (see Figure 1). Hand borings were advanced in the grassy corridor areas between the sectioned garden plot areas that existed at that time. Each hand boring was advanced to approximately 2 feet BSG. In each boring, apparent fill soil was observed beneath the organic topsoil, but there was little to no evidence of anthropogenic fill to these depths. From each location, a soil sample was collected from 0.5-2 feet BSG, and submitted for laboratory analysis of lead, hexavalent chromium, barium, mercury, and antimony.

2.3.2 July 2020 Hand Boring Event

During this event, 22 additional hand borings (HB-101 through HB-122) were advanced across the park site (see Figure 1).

At each location, the hand borings were advanced in grass or dirt covered areas to a depth of 12 inches BSG. Consistent with the test pit findings, the top fill soil observed in each of hand boring was generally characterized as fine to coarse sand, some silt and little gravel. In hand borings HB-101, HB-102 and HB-103 on the northern portion of the site (see Figures 1 and 2), evidence of anthropogenic debris was also observed, with pieces of brick, porcelain, glass, metal and ash visible at depth in HB-101, trace pieces of glass visible at depth in HB-102, and trace pieces of glass and bricks visible at depth in HB-103. In the other hand borings, no anthropogenic debris was observed in the top 12 inches.

Each of the 22 samples was submitted for laboratory analysis of lead. In addition, 12 of the samples were also submitted for laboratory analysis of target PAHs, mercury and barium. This included hand borings HB-109 through HB-116, which were advanced where the new community gardens were scheduled to be rebuilt, as well as hand borings HB-101, HB-117, HB-118, HB-119 and HB-120.

2.3.3 June 2023 Hand Boring Event

During this event, six additional soil borings (HB-401 through HB-406) were advanced on the northern portion of the park (see Figure 2). At each location, the hand borings were advanced in grass or dirt covered areas to a depth of 12 inches BSG. Each sample was submitted for lead analysis.

2.4 Previous Site Investigation Laboratory Results

As further reviewed below, Table 2[3] provided in Appendix B summarize the laboratory results for the soil samples from previous site investigations (reviewed above in Section

[3] Data summary tables are based on laboratory reports completed for the site and are not guaranteed as to accuracy or completeness, nor are they a part of the Contract Documents. Contractors are cautioned that the analytical soil summary data have been utilized for general reference purposes only. No explicit or implicit representation is made as to the nature of the materials which may be encountered below the surface of the ground during the Phase 2 park renovation work.

2.1 through 2.3) that were collected from across the park within or close proximity to where Phase 2 park renovation work is scheduled to occur. Table 2A[4] summarizes total lead results in soil samples collected within the top 2 feet of surface grade on the northern portion of park where Phase 2 park renovation work is scheduled to occur and where more elevated lead levels were detected in site soil.

Within Tables 2 and 2A, soil results are compared to applicable RCS-1 reporting category values for soil in accordance with 310 CMR 40.0361. .

As indicated in Table 2:

- EPH carbon ranges were not detected above RCS-1 values in the 8 samples submitted for analysis.
- A total of 4 different target PAHs were detected above RCS-1 values in one or more samples.
- Lead was detected above the RCS-1 value of 200 milligrams per kilogram ("mg/kg") in 52 of the 68 samples submitted for lead analysis. As reviewed herein, lead is the primary contaminant of concern for the site.
- Zinc was detected above RCS-1 value of 1,000 mg/kg in 1 of 4 samples submitted for zinc analysis. No other metal was detected above RCS-1 values in the soil samples.
- PCBs were not detected above laboratory reporting limits in the 3 samples submitted for PCB analysis.
- No VOC analyte was detected above laboratory reporting limits in the 2samples submitted for VOC analysis.
- Two pesticides were detected above laboratory reporting limits, but below RCS-1 values.

As indicated in Table 2A, lead was detected above the RCS-1 value of 200 mg/kg in 35 of the 39 soil samples collected within the top 2 feet of surface on the northern portion of the park.

Based on these findings and the observations during subsurface investigations, the more elevated levels of contaminants (primarily lead) in site soil generally begin below an approximate two-foot layer of apparent "cover" soil (with lower levels of contaminants) across the site, except on the northern portion of the park where there is little to no buffer soil layer before elevated lead levels are present in the soil. In any event, all soil disturbed and/or managed on or off-site during the Phase 2 park renovation work are subject to RTN 3-35086 and must be properly managed under the MCP.

[4] Note 3 above also applies to Table 2A.

Section 3
Summary of Previous Soil Disposal Characterization Events

During the "Phase 1" park renovation project in 2021 and during the new tide gate manhole installation project in earlier 2023, excess/displaced soil was generated and managed off-site under separate RAM Plan submittals to MassDEP under RTN 3-35086. During those earlier projects, Tighe & Bond collected representative soil samples for disposal characterization analysis, as further discussed below.

3.1 Park Soil Managed Off-Site From the Phase 1 Park Renovation Project

As part of this project, two soil stockpiles of excess soil were generated as summarized below:

- Stockpile #1: Approximately 15 cubic yards of soil were generated from depths of approximately five feet below grade during a new storm drain installation on the southwestern portion of the site. This soil contained urban fill soil generally consisting brown fine to coarse sand, little gravel, trace ash and pieces of brick and glass debris.
- Stockpile #2: Approximately 75 cubic yards of soil were generated from depths of approximately two feet below grade during basketball court area improvements on the northern portion of the site. This generated soil contained urban fill soil generally consisting brown fine to coarse sand, little silt and gravel, trace ash and pieces of brick and glass debris.

In July 2021, Tighe & Bond collected representative soil samples from the two separate stockpiles (samples SP-1 and SP-2) and submitted the samples for laboratory analyses in accordance with soil pre-characterization and acceptance criteria pursuant to the MassDEP Interim Policy COMM-15-01: *Re-Use of Soil for Large Reclamation Projects Policy*.

3.2 Park Soil Managed Off-Site From the New Tide Gate Manhole Project

As part of this project on the southeastern portion of the park, approximately 50 cubic yards of soil were displaced and stockpiled on site. In March 2023, Tighe & Bond collected a representative soil sample from the stockpile and submitted the samples for laboratory analyses in accordance with soil pre-characterization and landfill acceptance criteria pursuant to MassDEP Policy COMM-97-001.

3.3 Previous Disposal Characterization Laboratory Results

Table 3[5] provided in Appendix B summarizes the results for the soil disposal characterization samples collected during those separate earlier projects, as reviewed herein. Within Table 3, the soil disposal characterization results are compared to the contractors' selected receiving facilities used during those projects. In summary, during the Phase 1 park renovation project in 2021, a total of 94.52 tons of soil were disposed at the Turnkey Landfill in Bethlehem New Hampshire, and during the tide gate manhole installation project in earlier 2023, a total of 87.05 tons of soil were transported to the Brox facility in Dracut Massachusetts for asphalt batch recycling.

[5] Note 3 above also applies to Table 3.

Section 4
Material Management Procedures

Material management procedures and other related concerns relative to RTN 3-35086 are reviewed below.

4.1 Scheduled Phase 2 Park Renovations – Relevance to SMP

In general, the key items where the management of soil triggers MCP implications during the scheduled Phase 2 park renovation project that are depicted on Crowley Cottrell's project plan set include the following:

- Construction of an additional basketball court area, immediately adjacent to and south of the existing basketball court on the northern portion of the park.
- Construction of a new "playground" area to the immediate east of the new basketball court on the northern portion of the park.
- Construction of other new concrete and asphalt paved surfaces on the northern portion of the park.
- Construction of new pedestrian walkways on other portions of the park.
- The planting of new trees along new walkway areas.
- Removal of clay infield.
- The stripping of existing grass layer in the scheduled park renovation improvement areas where new loam and/or seed will be planted. On the northern portion of the park in areas not scheduled to be covered by new impervious surfaces, this includes the removal of underlying soil to 1 foot below grade before these areas are backfilled and finished with new loam and seed.

The general areas where Phase 2 park renovations are scheduled to occur that are subject of this SMP are depicted on Figures 1 and 2 in Appendix A for reference.

Crowley Cottrell's Phase 2 park renovation project incorporated design features intended to accomplish the following:

- Reduce, to the extent feasible, the mixing of the underlying contaminated soil with the materials scheduled to be removed.
- Limit the volume of "excess" soil or other materials that require proper off-site disposal under the MCP regulations.
- "Capping" of the more elevated levels of contaminants (i.e., lead) in soil scheduled to remain on site, to the extent feasible under this park renovation project.

4.2 Soil Management

For this Phase 2 park renovation project, the management of contaminated soil (or potentially contaminated soil) shall be conducted in accordance with the following SMP specifications provided in Appendix D:

- Section 01350 – Health & Safety Plan
- Section 02110 – Contaminated Soil Excavation
- Section 02120 – Transportation and Disposal of Contaminated Materials

4.2.1 Soil Types

An overview of typical disposal facility classifications based on guidelines of the MCP, the Massachusetts Hazardous Waste Management Rules (310 CMR 30.0000), MassDEP's *Similar Soil Provision Guidance* (WSC-13-500), and MassDEP Policy COMM-97-001: *Reuse & Disposal of Contaminated Soil at Massachusetts Landfills* is presented below.

- **Beneficial Reuse Facility:** Soil which do not contain OHM, or contain OHM below levels consistent with "natural" soil per MassDEP's Similar Soil Provision Guidance (WSC-13-500) are not considered Remediation Waste and may be reused at an active sand and gravel processing facility (or at off-site industrial/commercial locations provided that pre-existing OHM concentrations at the fill location are equal to or higher than those that exist in the construction generated soil) that holds a Site Assignment Authorization with approval from the LSP of Record. These facilities must have a MassDEP approved Administrative Consent Order in place in accordance with MassDEP Interim Policy COMM-15-01: *Re-Use of Soil for Large Reclamation Projects Policy*.
- **Massachusetts Landfills:** Soil that contains OHM concentrations above MCP RCS-1 levels but below the criteria for Massachusetts Unlined or Lined landfills per MassDEP Policy COMM-97-001.
- **Asphalt Batch Facility:** Soil that contains OHM concentrations above MCP RCS-1 levels and above the criteria for Massachusetts unlined and lined landfills per MassDEP Policy COMM-97-001 but meets acceptance criteria for a permitted asphalt batch facility can be recycled at such facilities.
- **Thermal Desorption Facility:** Soil that contains OHM concentrations above MCP RCS-1 levels and above the criteria for Massachusetts unlined and lined landfills per MassDEP Policy COMM-97-001 but meets acceptance criteria for a permitted thermal desorption facility can be recycled at such facilities.
- **Non-Hazardous Waste Out of State Subtitle D Landfill Facility:** Soil that contains OHM concentrations above MCP RCS-1 levels and above the criteria for Massachusetts unlined and lined landfills per MassDEP Policy COMM-97-001 but meets acceptance criteria for a permitted non-hazardous waste out of state Subtitle D landfill facility for use as daily cover or for disposal.
- **U.S. EPA Hazardous Waste Subtitle C RCRA Landfill Facility:** Soil containing OHM concentrations that exceed reuse levels for Massachusetts landfills, asphalt batch and/or thermal desorption facilities and exceed federal TCLP limits or otherwise meets the definition of hazardous waste. Meets acceptance criteria for a permitted hazardous waste out of state Subtitle C Resource Conservation and Recovery Act (RCRA) landfill facility.
- **U.S. EPA Hazardous Waste PCB TSCA Landfill:** Soil that either contain PCB concentrations greater than 50 mg/kg or are TSCA regulated and being managed under a Performance Based Cleanup can be disposed at approved TSCA facilities in accordance with 40 CFR 761.

4.2.2 Soil Management – Potential Off-Site Disposal Options

For reference, as reviewed above and as depicted on Table 3, the displaced soil during the Phase 1 park renovation project in 2021 met the requirements for disposal at a Subtitle D Landfill Facility (i.e., Turnkey facility in Bethlehem New Hampshire), and the soil displaced during the new tide gate manhole installation project earlier in 2023 met the requirements for recycling at an asphalt batch facility (i.e., Brox facility in Dracut Massachusetts). In both instances, the contractor selected the receiving facility based on our disposal characterization sample results from those earlier projects. It should be also noted that the soil from the Phase 1 park renovation project were disposed at a Subtitle D Landfill because total lead was detected above the lined landfill acceptance criteria of 2,000 mg/kg pursuant to MassDEP Policy COMM-97-001 (and above typical asphalt batch receiving criteria for total lead) in the disposal characterization sample collected from the "Stockpile #2" (i.e., the soil generated during basketball court area improvements on the northern portion of the site). As shown on Table 3, the soil in "Stockpile #1" (i.e., the soil generated during a new storm drain installation on the southwestern portion of the park) met the Massachusetts line landfill COMM-97-001 criteria, as well as the soil generated during the new tide gate manhole installation project.

Due to these earlier findings, the excess/displaced soil scheduled to be generated from the northern portion of the site are scheduled to be stockpiled separately from the excess/displaced soil scheduled to be generated from other (i.e., southern) portions of the site during the Phase 2 park renovation project (refer to Section 02110 – Contaminated Soil Excavation). The types of receiving facilities that can accept the excavated/removed/displace soil from these two separate areas during the Phase 2 park renovation work will be dependent on the disposal characterization results from the representative samples to be collected during construction (refer to Section 2120 – Transportation and Disposal of Contaminated Materials)[6].

4.2.3 Stockpiling Soil and Other Relevant Demolition Debris

Refer to Section 02110 – Contaminated Soil Excavation.

4.2.4 Dust Control

Refer to Section 01350 – Health & Safety Plan.

4.2.5 Characterization of Contaminated Materials for Disposal

Refer to Section 2120 – Transportation and Disposal of Contaminated Materials

4.3 Groundwater Management

Based on known site conditions to date from our subsurface investigations, groundwater management should not be warranted during this park renovation project. However, if encountered, the Contractor shall refer to the requirements described in separate Project Specifications (if applicable).

[6] As indicated, no representative soil samples have been collected "in-situ" for disposal characterization analyses in preparation for this Phase 2 park renovation project.

4.4 Monitoring Well Abandonment

In addition to the work shown on the project plan set, groundwater monitoring well MW-4 is located where Phase 2 park renovation work is scheduled to occur (see Figure 1 in Appendix A for reference). Therefore, Contractor shall remove and/or abandon the well in accordance with MassDEP's *Standard References for Monitoring Wells (*WSC-310-91) procedures. [Note: Monitoring well MW-4 was installed using one-inch diameter, Schedule 40 PVC well materials to approximately 15-feet BSG.]

4.5 Management of Other Project Materials or Unexpected Soil Conditions

Refer to Section 02110 – Contaminated Soil Excavation.

Section 5
Responsibilities

Refer the SMP specification sections in Appendix D for Owner and Contractor responsibilities under this SMP.

Section 6
Limitations

1. This report has been prepared on behalf of and for the exclusive use of the Client and is subject to and issued in accordance with the Agreement and the provisions thereof. Documents provided on this project shall not, in whole or in part, be disseminated or conveyed to any other party, nor used by any other party without the prior written consent of Tighe & Bond. Reuse of documents by Client or others without Tighe & Bond's written permission and mutual agreement shall be at the user's sole risk, without liability on Tighe & Bond's part and Client agrees to indemnify and hold Tighe & Bond harmless from all claims, damages, and expenses, including attorney's fees, arising out of such unauthorized use or reuse.

2. Tighe & Bond acknowledges and agrees that, subject to the Limitations set forth herein and prior written approval by Tighe & Bond, this report may be provided to specific financial institutions, attorneys, title insurers, lessees and/or governmental agencies identified by Client at or about the time of issuance of the report in connection with the conveyance, mortgaging, leasing, or similar transaction involving the real property which is the subject matter of a report and any work product. Use of this report for any purpose by any persons, firm, entity, or governmental agency shall be deemed acceptance of the restrictions and conditions contained therein, these Limitations and the provisions of Tighe & Bond's Agreement with Client. No warranty, express or implied, is made by way of Tighe & Bond's performance of services or providing an environmental site assessment, including but not limited to any warranty with the contents of a report or with any and all work product.

3. Tighe & Bond performed the subsurface investigation in accordance with our Agreement (including any stated scope and schedule limitations) and used the degree of care and skill ordinarily exercised under similar circumstances by members of the profession practicing in the same or similar locality. The objective of a subsurface investigation is to evaluate the presence or absence of contamination. Where access was denied or conditions obscured, Tighe & Bond provides no opinion or report on such areas. The subsurface investigation may not identify all contaminated media as our scope may be limited to certain locations within a site or due to geologic variability, contamination variability, seasonal conditions, obstructions such as buildings, utilities, or other site features and/or other unknown conditions. Tighe & Bond performed the subsurface investigation using reasonable methods to access and identify the presence of contaminated media. Therefore, additional contaminated media may be present at the site and may be discovered during development and site work, so an appropriate cost contingency should be carried by the Client based on their risk tolerance. Tighe & Bond also makes no opinion or report of contamination that may have migrated off site unless off-site investigations are specifically included in the scope of services.

4. Findings, observations, and conclusions presented in this report, including but not limited to the extent of any subsurface explorations or other tests performed by Tighe & Bond, are limited by the scope of services outlined in the Agreement, which may establish schedule and/or budgetary constraints for an environmental assessment or phase thereof. Furthermore, while it is anticipated that each

assessment will be performed in accordance with generally accepted professional practices and applicable standards (such as ASTM, etc.) and applicable state and Federal regulations, as may be further described in the report and/or the Agreement, Tighe & Bond does not assume responsibility for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of its services.

5. In preparing this report, Tighe & Bond, Inc. may have relied on certain information provided by governmental agencies or personnel as well as information and/or representations provided by other persons, firms, or entities, and on information in the files of governmental agencies made available to Tighe & Bond at the time of the site assessment. To the extent that such information, representations, or files may be inaccurate, missing, incomplete or not provided to Tighe & Bond, Tighe & Bond is not responsible. Although there may be some degree of overlap in the information provided by these various sources, Tighe & Bond does not assume responsibility for independently verifying the accuracy, authenticity, or completeness of any and all information reviewed by or received from others during the course of the site assessment.

6. The assessment presented is based solely upon information obtained or received prior to issuance of the report. If additional environmental or other relevant information is developed at a later date, Client agrees to bring such information to the attention of Tighe & Bond promptly. Upon evaluation of such information, Tighe & Bond reserves the right to recommend modification of this report and its conclusions.

7. Emerging contaminants, including per- and poly-fluorinated alkyl substances (PFAS), are hazardous materials or mixtures (including naturally occurring or manmade chemical, microbial, or radiological substances) that are characterized by having a perceived or real threat to human health, public safety, or the environment for which there are no published health standards or guidelines and there is insufficient or limited available toxicological information or toxicity information that is evolving or being re-evaluated; or there is not significant new source, pathway, or detection limit information. The state of these compounds is constantly being updated and therefore, Tighe & Bond cannot be held liable for not including these compounds in the list of analytes that are analyzed when our services are performed. Unless otherwise specified, Tighe & Bond will only analyze for compounds ordinarily included under similar circumstances by members of the profession practicing in the same or similar locality. Tighe & Bond will not be liable for not including these or any other compounds in the list of target analytes if information regarding their use is not made available by current or former operators/owners at the facility being evaluated. We will also not be liable for not analyzing for the presence of an emerging contaminant, even if that compound is detected at a later date.

8. Tighe & Bond makes no guarantee or warranty that this report (if provided to a regulatory agency) will pass a regulatory audit/review. The Licensed Site Professional (LSP), Licensed Environmental Professional (LEP), Professional Geologist (PG), Professional Engineer (PE) or other relevant professional licensure and the applicable regulatory reviewing agency may have differences of opinion on aspects of (and approaches to) the assessment, remediation, risk evaluation or

closure and the regulatory agency may request additional information, sampling data, analysis and/or remediation. Such differences of opinion will not be interpreted to imply that Tighe & Bond's services were not performed competently and in accordance with the standard of care. If additional investigations, response action evaluations, or discussions are needed following a regulatory audit/review, Tighe & Bond can provide these services under a separate Agreement.

9. If an Opinion of Probable Construction Costs (OPCC) is provided, Tighe & Bond has no control over the cost or availability of labor, equipment or materials, or over market conditions or the contractor's method of pricing, and that the opinion of probable costs is made on the basis of Tighe & Bond's professional judgment and experience is based on currently available information. Tighe & Bond makes no guarantee nor warranty, expressed or implied, that the actual costs of the construction work will not vary from the OPCC.

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APPENDIX A

FIGURE 1
SOIL MANAGEMENT PLAN

See Figure 2 - Soil Management Plan (Northern Portion of Park) for additional boring and hand boring locations

HARRISON AVENUE
PRINCE STREET
NAUMKEAG STREET
CONGRESS STREET
PINGREE STREET
LEAVITT STREET
CHASE STREET
SALEM STREET
SALTONSTALL PARKWAY
PIONEER TERRACE
LAFAYETTE PLACE

HB-101, B-3, B-4, B-4A/MW-4, HB-103, TP-3, HB-102, B-6, TP-4, B-5, HB-104, TP-6, B-2, HB-105, HB-108, HB-106, TP-7, HB-107, B-7, B-1, HB-1, HB-2, HB-120, B-13, TP-8, HB-110, B-8, HB-5, HB-3, TP-5, HB-111, B-12, HB-109, HB-119, HB-121, TP-9, HB-112, HB-4, HB-113, HB-117, TP-2, HB-114, B-9A/MW-9, B-9, HB-115, HB-118, HB-122, B-11C, B-11D, B-11, B-10, TP-10, B-11A/MW-11, B-11B, TP-1, HB-116

LEGEND

- Soil Boring
- Hand Boring
- Test Pit
- Groundwater Monitoring Well
- Site Parcel
- Parcel Boundary
- City Boundary
- General Area where Phase 2 Park Renovations are scheduled to occur

LOCUS MAP

N

0 50 100
Feet
1:1,200

NOTES

1. Based on MassGIS Orthophotography (2021)
2. 2022 Parcels downloaded from MassGIS and are approximate.
3. All locations are considered approximate.

Palmer Cove Park Renovation Project
30 Leavitt Street
Salem, Massachusetts

July 2023

Tighe&Bond

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FIGURE 2
SOIL MANAGEMENT PLAN
(NORTHERN PORTION OF PARK)

LEGEND

- Soil Boring
- Hand Boring
- Test Pit
- Groundwater Monitoring Well
- Site Parcel
- Parcel Boundary
- City Boundary
- General Area where Phase 2 Park Renovations are scheduled to occur

LOCUS MAP

N

0 15 30
Feet
1:300

NOTES

1. Based on MassGIS Orthophotography (2021)
2. 2022 Parcels downloaded from MassGIS and are approximate.
3. All locations are considered approximate.

Palmer Cove Park Renovation Project
30 Leavitt Street
Salem, Massachusetts

July 2023

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APPENDIX B

TABLE 1
Summary of Subsurface Investigations[1]
Palmer Cove Park, 30 Leavitt Street
Street, MA

Investigation Date	Boring / Test Pit ID	Boring / Test Pit Depth (in feet)	Approximate Sample Depth (in feet)	PID Responses (in ppm)	Dexsil Results (in ppm)	Laboratory Analysis	General Description[2]
March 9, 2018	B-1	5'	1-3'	0	-	PCBs, RCRA 8 Metals	Organic topsoil followed by fill/anthropogenic fill to end of boring at 5 feet BSG. Anthropogenic fill contained evidence of ash, brick, glass, coal and porcelain.
	B-2	5'	1-3'	0	-	EPH/Target PAHs	Organic topsoil followed by fill/anthropogenic fill to end of boring at 5 feet BSG. Anthropogenic fill contained evidence of ash, brick, glass, coal and porcelain.
	B-3	5'	0.5-2'	0	-	RCRA 8 Metals	Organic topsoil followed by fill/anthropogenic fill to end of boring at 5 feet BSG. Anthropogenic fill contained evidence of ash and brick.
			3-5'	0	-	-	
	B-4	5'	1-3'	0	-	RCRA 8 Metals, EPH/Target PAHs	Organic topsoil followed by fill/anthropogenic fill to end of boring at 5 feet BSG. Anthropogenic fill contained evidence of ash, brick and coal.
October 25, 2018	B-4A	15'	0.5-1.5'	-	-	Lead	Organic topsoil followed by 1.5 feet of apparent fill soils (brown sand, silt and comingled gravel), then anthropogenic fill material from 1.5 feet to 11 feet BSG. Anthropogenic fill material contained evidence of brick and ash. Native soils were encountered from 11 feet to 15 feet BSG (end of boring), which consisted of sand and silt with trace amounts of shell. Wet soils/groundwater table was encountered at 6.5 feet BSG.
			4-6'	-	-	Lead	
			13-15'	-	-	Lead	
March 9, 2018	B-5	5'	1-3'	0	-	RCRA 8 Metals	Organic topsoil followed by fill/anthropogenic fill to end of boring at 5 feet BSG. Anthropogenic fill contained evidence of ash, brick and coal.
	B-6	15'	0.5-2'	0	-	EPH/Target PAHs, RCRA 8 Metals and Pesticides	Organic topsoil followed by fill/anthropogenic fill encountered to 12+ feet BSG. Anthropogenic fill contained evidence of ash, brick, glass and coal. Native marine-type deposits (consisting of grey, silty-clay with shell fragments) encountered below the anthropogenic fill. Wet soils/groundwater table encountered at 5 feet BSG.
			2-3'	0.1	-	-	
			6-10'	0	-	-	
			11-15'	0	-	-	
	B-7	5'	0.5-2'	0	-	PCBs, Pesticides and EPH/Target PAHs	Organic topsoil followed by fill/anthropogenic fill to end of boring at 5 feet BSG. Anthropogenic fill contained evidence of ash, brick and coal.
			3-5'	0	-	-	
	B-8	5'	0.5-2'	0	-	EPH/Target PAHs and RCRA 8 Metals	Organic topsoil followed by fill/anthropogenic fill to end of boring at 5 feet BSG. Anthropogenic fill contained evidence of ash, brick and coal.
			2-3'	0	-	-	
			3-5'	0	-	RCRA 8 Metals	
	B-9	15'	0.5-2'	0	-	EPH/Target PAHs, PCBs and RCRA 8 Metals	Organic topsoil followed by fill/anthropogenic fill encountered to end of boring at 15 feet BSG. Anthropogenic fill contained evidence of ash, brick, porcelain, wood, glass and coal. Some petroleum-type staining and odor observed at depths ranging from 5-15 feet BSG. Wet soils/groundwater table encountered at 5 feet BSG.
			2-3'	0	-	-	
			5-10'	0.8	774	-	
			10-15'	31.5	563	-	
October 25, 2018	B-9A	15'	8-12'	-	-	-	Organic topsoil followed by 2.5 feet of apparent fill soils (brown sand, silt and comingled gravel), then anthropogenic fill material from 2.5 feet to 12 feet BSG. Anthropogenic fill material contained evidence of coal, ash, brick, glass. Some petroleum-type staining and odor observed, along with slight sheening at depths ranging from 8-12 feet BSG. Native soils were encountered from 12 feet to 15 feet BSG (end of boring), which consisted of sand and silt with trace amounts of shell. Wet soils/groundwater table was encountered at 6 feet BSG.
				-	-	-	
				-	-	EPH	
				-	-	-	
March 9, 2018	B-10	5'	2-3'	0	-	EPH/Target PAHs and PCBs	Organic topsoil followed by fill/anthropogenic fill to end of boring at 5 feet BSG. Anthropogenic fill contained evidence of ash, brick and coal.
	B-11	5'	1-3'	0	-	RCRA 8 Metals	Organic topsoil followed by fill/anthropogenic fill to end of boring at 5 feet BSG. Anthropogenic fill contained evidence of ash, brick and glass.
October 25, 2018	B-11A*	15'	0.5-1'	-	-	Hex Chromium	Organic topsoil followed by 2.5 feet of fill soils (brown sand, silt and comingled gravel), then anthropogenic fill material from 2.5 feet to 12 feet BSG. Anthropogenic fill material contained evidence of ash, brick, glass and pottery. Native soils were encountered from 12 feet to 15 feet BSG (end of boring), which consisted of sand and silt with trace amounts of shell. Wet soils/groundwater table was encountered at 6.5 feet BSG.
			5-7'	-	-	Barium, Hex Chromium, and Mercury	
				-	-	-	
				-	-	-	
	B-11B	4'	2-4'	-	-	Barium and Mercury	Organic topsoil followed by 2.5 feet of apparent fill soils (brown sand and silt), then anthropogenic fill material was encountered from 3 feet to 4 feet BSG (end of boring). Anthropogenic fill material contained evidence of brick, glass and ash.
	B-11C	4'	-	-	-	-	Organic topsoil followed by 3 feet of apparent fill soils (brown sand and silt with comingled amounts of gravel), then anthropogenic fill material was encountered from 3 feet to 4 feet BSG (end of boring). Anthropogenic fill material contained evidence of trace brick and ash.
	B-11D	4'	3-4'	-	-	Barium and Mercury	Organic topsoil followed by 2 feet of apparent fill soils (brown sand and silt), then anthropogenic fill material was encountered from 2.5 feet to 4 feet BSG (end of boring). Anthropogenic fill material contained evidence of coal and glass.
March 9, 2018	B-12	10'	0.5-2'	0	-	EPH/Target PAHs	Organic topsoil followed by fill/anthropogenic fill encountered to end of boring at 10 feet BSG. Anthropogenic fill contained evidence of ash, brick, coal, glass, shell and glass. Wet soils/groundwater table encountered at 5 feet BSG.
			5-6'	0	-	-	
			8-10'	0	-	-	
October 25, 2018	B-13	15'	0.5-2'	-	-	Lead	Organic topsoil followed by 3 feet of apparent fill soils (brown sand, silt and comingled gravel), then anthropogenic fill material from 3 feet to 12 feet. Anthropogenic fill material contained evidence of ash, brick and glass. Native soils were encountered from 12 feet to 15 feet BSG (end of boring), which contained sand and silt. Wet soils/groundwater table was encountered at 4 feet BSG.
			4-6'	-	-	Lead	
			10-12'	-	-	EPH	
	TP-1	5.5'	0.5-1.5'	-	-	Lead	Organic topsoil followed by 1 foot of apparent fill soils (brown sand, silt and comingled gravel), then anthropogenic fill from 1.5 to 5.5 feet BSG (end of test pit). Anthropogenic fill contained evidence of ash, brick, and glass, with debris percentage less than 10%. The percentage of ash in the fill soils up to 20%. Wet soils/groundwater table was encountered at 5.5 feet BSG.
			1.5-3'	-	-	Lead	
	TP-2	5.5'	0.5-2'	-	-	Barium, Lead, and Mercury	Organic topsoil followed by 1.5 feet of apparent fill soils (brown sand, silt and comingled gravel), then anthropogenic fill from 2 feet to 5.5 feet BSG (end of test pit). Anthropogenic fill contained evidence of ash, brick and glass, with debris percentage less than 10%. The percentage of ash in the fill soils up to 50%. Wet soils/groundwater table was encountered at 5.5 feet BSG.
			2-3'	-	-	EPH	
	TP-3	6.5'	0.5-2'	-	-	Lead	Organic topsoil followed by 1.5 feet of fill soils (brown sand, silt and comingled gravel), then anthropogenic fill from 2 feet to 6.5 feet BSG (end of test pit). Anthropogenic fill contained evidence of ash, brick and glass, with debris percentage less than 10%. The percentage of ash in the fill soils also less than 10%. Wet soils/groundwater table was encountered at 6.5 feet BSG.
			2-4'	-	-	Lead	
	TP-4	5.5'	0.5-1'	-	-	Barium, Lead, and Mercury	Organic topsoil followed by 0.5 feet of apparent fill soils (brown sand, silt and comingled gravel), then anthropogenic fill from 1 foot to 5.5 feet BSG (end of test pit). Anthropogenic fill contained evidence of ash, brick and glass, with debris percentage less than 40%. Wet soils/groundwater table was encountered at 5.5 feet BSG.
			1-3'	-	-	Lead	
	TP-5	7'	2-4'	-	-	EPH	Organic topsoil followed by 6.5 feet of apparent fill soils (brown sand, silt and comingled gravel/end of test pit). Little to no evidence of anthropogenic type fill with ash or debris was encountered. Wet soils/groundwater table was not encountered.

TABLE 1
Summary of Subsurface Investigations[1]
Palmer Cove Park, 30 Leavitt Street
Street, MA

Investigation Date	Boring / Test Pit ID	Boring / Test Pit Depth (in feet)	Approximate Sample Depth (in feet)	PID Responses (in ppm)	Dexsil Results (in ppm)	Laboratory Analysis	General Description[2]
August 23, 2022	B-301	4'	0-2'	-	-	Lead	Advanced through bituminous asphalt - 3 inches or less of asphalt and road base materials. Below the asphalt is fill soils (fine to coarse sand) with ash and trace of glass and wood chips. Beginning clay layer encountered at 4 feet BSG.
			2-4'	-	-	-	
	B-302	4'	0-2'	-	-	Lead	Advanced through bituminous asphalt - 3 inches or less of asphalt and road base materials. Below the asphalt is fill soils (fine to coarse sand) with trace of brick, glass and wood. Beginning clayey silt layer encountered at 4 feet BSG.
			2-4'	-	-	Lead	
	B-303	4'	0-2'	-	-	Lead	Advanced through bituminous asphalt - 3 inches or less of asphalt and road base materials. Below the asphalt is fill soils (fine to coarse sand) with trace of brick, glass and porcelain. Beginning clayey silt layer encountered at 4 feet BSG.
			2-4'	-	-	-	
	B-304	4'	0-2'	-	-	Lead	Advanced through bituminous asphalt - 3 inches or less of asphalt and road base materials. Below the asphalt is fill soils (fine to coarse sand and gravel, some silt).
			2-4'	-	-	-	
	B-305	4'	0-2'	-	-	Lead	Advanced through bituminous asphalt - 3 inches or less of asphalt and road base materials. Below the asphalt is fill soils (fine to coarse sand, little silt) with trace of brick and glass.
			2-4'	-	-	Lead	
	B-306	4'	0-2'	-	-	Lead	Organic topsoil followed by fill soils (fine to coarse sand, some silt at depth) with ash and trace brick, glass and wood.
			2-4'	-	-	-	
	B-307	4'	0-2'	-	-	Lead	Organic topsoil followed by fill soils (fine sand and silt, trace gravel) with trace of glass.
			2-4'	-	-	Lead	
	B-308	4'	0-2'	-	-	Lead	Organic topsoil followed by fill soils (fine sand and silt, some gravel).
			2-4'	-	-	Lead	
	B-309	4'	0-2'	-	-	Lead	Organic topsoil followed by fill soils (fine sand and silt, trace gravel) with ash, trace of glass from 2 to 4 feet.
			2-4'	-	-	Lead	
	B-310	4'	0-2'	-	-	Lead	Organic topsoil followed by fill soils (fine sand and silt, some gravel) with ash and some brick from 2 to 4 feet.
			2-4'	-	-	Lead	
	B-311	4'	0-2'	-	-	Lead	Organic topsoil followed by fill soils (fine sand and silt, trace gravel) with ash and little coal from 2 to 4 feet.
			2-4'	-	-	-	
	B-312	4'	0-2'	-	-	Lead	Organic topsoil followed by fill soils (fine sand and silt) with ash and some coal from 2 to 4 feet.
			2-4'	-	-	-	
	B-313	4'	0-2'	-	-	Lead	Organic topsoil followed by fill soils (fine sand and silt, trace gravel) with trace glass from 0 to 2 feet, and with ash and little coal from 2 to 4 feet.
			2-4'	-	-	-	
	B-314	4'	0-2'	-	-	Lead	Organic topsoil followed by fill soils (fine to coarse sand) with some glass and little brick from 0 to 2 feet, and with ash and little coal, glass and silt from 2 to 4 feet.
			2-4'	-	-	-	

NOTES:
[1] Subsurface data are not guaranteed as to accuracy or completeness, and no explicit or implicit representation is made as to the nature of the materials which may be encountered below the surface of the ground during the Phase 2 park renovation work.
[2] General description of stratigraphy and other observations in the macro-liner samples (for borings) and test pits, with depths reported as feet below surface grade (BSG). All depths are considered approximate.

TABLE 2

Summary of Soil Results (for General Areas where Soil Disturbance is Scheduled to Occur during Phase 2 Park Renovation)[1]
Palmer Cove Park, 30 Leavitt Street
Salem, Massachusetts

		Boring No.	B-1	B-2	B-3	B-4	B-4A			B-6	B-9	B-9A	B-10	B-13			TP-2		TP-3		TP-6		TP-7		TP-8		TP-9		HB-101	HB-102	HB-103	HB-104	HB-105	HB-106	HB-107	HB-108	HB-117	HB-118	HB-119	HB-201
	MCP	Sample Depth	1-3'	1-3'	0.5-2'	1-3'	0.5-1.5	4-6'	13-15'	0.5-2'	0.5-2'	8-12'	2-3'	0.5-2'	4-6'	10-12'	0.5-2'	2-3'	0.5-2'	2-4'	0-1'	3-6'	0-1'	3-5'	0-1'	3-5'	0-1'	3-6'	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'
Analytes	RCS-1	Sample Date:	3/9/2018	3/9/2018	3/9/2018	3/9/2018	10/25/18	10/25/18	10/25/18	3/9/2018	3/9/2018	10/25/18	3/9/2018	10/25/18	10/25/18	10/25/18	10/25/18	10/25/18	10/25/18	10/25/18	7/23/20	7/23/20	7/23/20	7/23/20	7/23/20	7/23/20	7/23/20	7/23/20	7/23/20	7/23/20	7/23/20	7/23/20	7/23/20	7/23/20	7/23/20	7/23/20	7/23/20	7/23/20	7/23/20	7/27/20	7/27/20	7/6/21
EPH carbon ranges																																								
C9-C18 Aliphatics	1,000		-	ND (17.7)	-	ND (18.1)	-	-	-	ND (17.9)	ND (21.3)	48.4	ND (37.7)	-	-	ND (41.2)	-	ND (34.9)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C11-C22 Aromatics	1,000		-	157	-	ND (18.1)	-	-	-	55.5	38	194	164	-	-	210	-	259	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C19-C36 Aliphatics	3,000		-	ND (17.7)	-	ND (18.1)	-	-	-	30.2	24.4	678	84.3	-	-	272	-	170	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Target PAHs																																								
Acenaphthene	1,000		-	0.79	-	ND (0.48)	-	-	-	ND (0.48)	ND (0.57)	0.8	ND (1.01)	-	-	ND (1.1)	-	3.17	-	-	-	ND (0.5)	-	ND (0.55)	-	ND (0.45)	-	ND (0.47)	ND (0.44)	-	-	-	-	-	-	-	-	ND (0.4)	ND (0.82)	ND (0.49)	-
Acenaphthylene	600		-	0.27	-	ND (0.24)	-	-	-	ND (0.24)	ND (0.28)	ND (0.35)	ND (0.5)	-	-	ND (0.55)	-	ND (0.47)	-	-	-	ND (0.25)	-	ND (0.27)	-	ND (0.22)	-	ND (0.24)	ND (0.22)	-	-	-	-	-	-	-	-	ND (0.2)	1.04	ND (0.25)	-
Anthracene	1,000		-	2.48	-	ND (0.48)	-	-	-	ND (0.48)	ND (0.57)	1.88	1.22	-	-	2.83	-	10.1	-	-	-	ND (0.5)	-	ND (0.55)	-	ND (0.45)	-	ND (0.47)	ND (0.44)	-	-	-	-	-	-	-	-	ND (0.4)	1.26	ND (0.49)	-
Benz(a)anthracene	7		-	4.55	-	ND (0.48)	-	-	-	0.94	0.71	2.41	2.3	-	-	5.44	-	**13.8**	-	-	-	0.84	-	ND (0.55)	-	0.48	-	ND (0.47)	1.5	-	-	-	-	-	-	-	-	ND (0.4)	3.68	ND (0.49)	-
Benzo(a)pyrene	2		-	**4.23**	-	ND (0.48)	-	-	-	1.2	0.69	1.92	**2.13**	-	-	**4.41**	-	**8.55**	-	-	-	0.81	-	ND (0.55)	-	0.5	-	ND (0.47)	1.74	-	-	-	-	-	-	-	-	ND (0.4)	**3.66**	ND (0.49)	-
Benzo(b)fluoranthene	7		-	4.91	-	ND (0.48)	-	-	-	1.5	0.91	2.27	2.64	-	-	5.41	-	**12.5**	-	-	-	0.82	-	0.63	-	0.52	-	0.49	2.08	-	-	-	-	-	-	-	-	ND (0.4)	3.84	ND (0.49)	-
Benzo(g,h,i)perylene	1,000		-	1.67	-	ND (0.48)	-	-	-	0.85	ND (0.57)	1.11	1.26	-	-	2.26	-	3.61	-	-	-	0.59	-	0.55	-	ND (0.45)	-	ND (0.47)	1.02	-	-	-	-	-	-	-	-	ND (0.4)	2.52	ND (0.49)	-
Benzo(k)fluoranthene	70		-	1.5	-	ND (0.48)	-	-	-	0.49	ND (0.57)	0.97	1.05	-	-	2.18	-	3.39	-	-	-	0.52	-	ND (0.55)	-	ND (0.45)	-	ND (0.47)	0.86	-	-	-	-	-	-	-	-	ND (0.4)	2.37	ND (0.49)	-
Chrysene	70		-	3.83	-	ND (0.48)	-	-	-	0.91	0.71	2.32	2.35	-	-	4.89	-	12	-	-	-	0.75	-	ND (0.55)	-	0.48	-	ND (0.47)	1.59	-	-	-	-	-	-	-	-	ND (0.4)	3.36	ND (0.49)	-
Dibenz(a,h)anthracene	0.7		-	0.55	-	ND (0.48)	-	-	-	ND (0.48)	ND (0.57)	0.43	0.52	-	-	**0.77**	-	**1.2**	-	-	-	ND (0.25)	-	ND (0.27)	-	ND (0.22)	-	ND (0.24)	0.27	-	-	-	-	-	-	-	-	ND (0.2)	0.62	ND (0.25)	-
Fluoranthene	1,000		-	10.4	-	ND (0.48)	-	-	-	1.52	1.48	7.28	4.96	-	-	16.7	-	28.1	-	-	-	2.03	-	1.13	-	1.21	-	1.1	2.86	-	-	-	-	-	-	-	-	ND (0.4)	8	0.68	-
Fluorene	1,000		-	0.93	-	ND (0.48)	-	-	-	ND	ND (0.57)	1.02	ND (1.01)	-	-	1.42	-	4.72	-	-	-	ND (0.5)	-	ND (0.55)	-	ND (0.45)	-	ND (0.47)	ND (0.44)	-	-	-	-	-	-	-	-	ND (0.4)	ND (0.82)	ND (0.49)	-
Indeno(1,2,3-cd)pyrene	7		-	2.16	-	ND (0.48)	-	-	-	**0.9**	ND (0.57)	1.23	1.62	-	-	2.35	-	4.38	-	-	-	**0.57**	-	ND (0.55)	-	ND (0.45)	-	ND (0.47)	**1.04**	-	-	-	-	-	-	-	-	ND (0.4)	2.68	ND (0.49)	-
2-Methylnaphthalene	80		-	0.3	-	ND (0.24)	-	-	-	ND (0.24)	ND (0.28)	0.42	ND (0.5)	-	-	ND (0.55)	-	0.9	-	-	-	ND (0.25)	-	ND (0.27)	-	ND (0.22)	-	ND (0.24)	ND (0.22)	-	-	-	-	-	-	-	-	ND (0.2)	ND (0.41)	ND (0.25)	-
Naphthalene	20		-	0.53	-	ND (0.48)	-	-	-	ND (0.48)	ND (0.57)	ND (0.69)	ND (1.01)	-	-	ND (1.1)	-	0.96	-	-	-	ND (0.5)	-	ND (0.55)	-	ND (0.45)	-	1.41	ND (0.44)	-	-	-	-	-	-	-	-	ND (0.4)	ND (0.82)	ND (0.49)	-
Phenanthrene	500		-	11.3	-	ND (0.48)	-	-	-	0.86	1.13	9.06	4.47	-	-	14.7	-	34.6	-	-	-	1.01	-	0.76	-	0.7	-	0.82	0.84	-	-	-	-	-	-	-	-	ND (0.4)	4.25	0.52	-
Pyrene	1,000		-	8.93	-	ND (0.48)	-	-	-	1.5	1.28	6.09	4.34	-	-	13.3	-	26.7	-	-	-	1.79	-	1.02	-	1.06	-	1.02	2.78	-	-	-	-	-	-	-	-	ND (0.4)	7.37	0.62	-
Metals																																								
Antimony	20		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (5.54)	-	ND (5.25)	-	ND (4.18)	-	ND (5.05)	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	20		9.46	-	13.8	4.38	-	-	-	10.7	10.1	-	-	-	-	-	-	-	-	-	-	10.5	-	9.8	-	6.71	-	10	-	-	-	-	-	-	-	-	-	-	-	-
Barium	1,000		214	-	144	196	-	-	-	104	164	-	-	-	-	-	37.1	-	-	-	-	128	-	204	-	140	-	373	220	-	-	-	-	-	-	-	-	44.8	30.8	46.2	-
Beryllium	90		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.75	-	0.61	-	0.56	-	0.59	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	70		0.4	-	ND (0.58)	ND (0.40)	-	-	-	ND (0.57)	1.7	-	-	-	-	-	-	-	-	-	-	ND (0.55)	-	0.9	-	ND (0.42)	-	1.06	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium (total)	100		20.6	-	36.9	15.3	-	-	-	34.3	55.4	-	-	-	-	-	-	-	-	-	-	11.7	-	24.2	-	22.8	-	27.4	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexavalent Chromium	100		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	200		**1,140**	-	**233**	**1,620**	**316**	**4,150**	**595**	**232**	**397**	-	-	90	200	-	51.5	-	**444**	**249**	77.6	**201**	86.5	**610**	87.5	**298**	**274**	**474**	**1,890**[2]	**591**	**697**	58.2	55.9	155	30.1	**424**	84.7	71.8	98.8	**808**
Mercury	20		4.37	-	0.198	0.262	-	-	-	0.723	1.43	-	-	-	-	-	0.052	-	-	-	-	ND (0.05)	-	0.302	-	0.818	-	0.336	0.662	-	-	-	-	-	-	-	-	0.161	0.071	0.412	-
Nickel	600		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14.7	-	20.4	-	20.8	-	18.7	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium	400		0.66	-	ND (0.58)	ND (0.40)	-	-	-	ND (0.57)	0.87	-	-	-	-	-	-	-	-	-	-	ND (5.54)	-	ND (5.25)	-	ND (4.18)	-	5.05	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver	100		0.41	-	ND (0.58)	ND (0.40)	-	-	-	ND (0.57)	1.1	-	-	-	-	-	-	-	-	-	-	ND (0.55)	-	1.45	-	2.62	-	1.11	-	-	-	-	-	-	-	-	-	-	-	-	-
Thallium	8		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND (5.54)	-	ND (5.25)	-	ND (4.18)	-	ND (5.05)	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	400		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26.5	-	38	-	29.5	-	41	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	1,000		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	115	-	395	-	153	-	**1,070**	-	-	-	-	-	-	-	-	-	-	-	-	-
PCBs																																								
All PCB Arochlors	1		ND (0.3)	-	-	-	-	-	-	-	ND (0.07)	-	ND (0.06)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VOCs																																								
All Analytes	CS		-	-	-	-	-	-	-	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pesticides[3]																																								
4,4´-DDT	6		-	-	-	-	-	-	-	0.0042	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
gamma-chlordane	NE		-	-	-	-	-	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

NOTES:
All results are reported in milligrams per kilogram (mg/kg).
[1] Data summary tables are based on laboratory reports completed for the site and are not guaranteed as to accuracy or completeness, nor are they a part of the Contract Documents. Contractors are cautioned that the analytical soil summary data have been utilized for general reference purposes only. No explicit or implicit representation is made as to the nature of the materials which may be encountered below the surface of the ground during the Phase 2 park renovation work.
[2] Only analytes detected above laboratory reporting limits are shown in the table.
Bold values indicates exceedance of RCS-1 value.
NE indicates that the analyte was not detected above laboratory reporting limits.
CS indicates compound specific.
- indicates sample not analyzed for respective analyte.

TABLE 2

Summary of Soil Results (for General Areas where
Palmer Cove Park, 30 Leavitt Street
Salem, Massachusetts

Analytes	MCP RCS-1	HB-202 0-1' 7/6/21	HB-203 0-1' 7/6/21	HB-204 0-1' 7/6/21	HB-205 0-1' 7/6/21	HB-206[1] 0-1' 7/6/21	HB-207 0-1' 7/6/21	HB-208 0-1' 7/6/21	HB-209[1] 0-1' 7/6/21	HB-210 0-1' 7/6/21	B-301 0-2' 8/23/22	B-302 0-2' 8/23/22	B-302 2-4' 8/23/22	B-303 0-2' 8/23/22	B-304 0-2' 8/23/22	B-305 0-2' 8/23/22	B-305 2-4' 8/23/22	B-306 0-2' 8/23/22	B-307 0-2' 8/23/22	B-307 2-4' 8/23/22	B-308 0-2' 8/23/22	B-308 2-4' 8/23/22	B-309 0-2' 8/23/22	B-309 2-4' 8/23/22	B-310 0-2' 8/23/22	B-310 2-4' 8/23/22	B-311 0-2' 8/23/22	B-312 0-2' 8/23/22	B-313 0-2' 8/23/22	B-314 0-2' 8/23/22	HB-401 0-1' 6/28/23	HB-402 0-1' 6/28/23	HB-403 0-1' 6/28/23	HB-404 0-1' 6/28/23	HB-405 0-1' 6/28/23	HB-406 0-1' 6/28/23
EPH carbon ranges																																					
C9-C18 Aliphatics	1,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C11-C22 Aromatics	1,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C19-C36 Aliphatics	3,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Target PAHs																																				
Acenaphthene	1,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	600	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	1,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benz(a)anthracene	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	1,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	1,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	1,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	1,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals																																				
Antimony	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium	1,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Beryllium	90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium (total)	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexavalent Chromium	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	200	**1,220**	**527**	**969**	**243**	**584**	**1,170**	**298**	**312**	**578**	**372**	**229**	**776**	**649**	**207**	**910**	**5,320**	**645**	**447**	**288**	**451**	108	**444**	**295**	167	**666**	**349**	156	**439**	**1,800**	**993**	**875**	**473**	**1,840**	**466**	**118**
Mercury	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	600	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium	400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thallium	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	1,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PCBs																																				
All PCB Arochlors	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VOCs																																				
All Analytes	CS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pesticides[2]																																				
4,4´-DDT	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
gamma-chlordane	NE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

NOTES:
All results are reported in milligrams per kilogram
(1) Data summary tables are based on laboratory
for the site and are not guaranteed as to accur
completeness, nor are they a part of the Contr
Contractors are cautioned that the analytical s
have been utilized for general reference purpo
or implicit representation is made as to the nat
which may be encountered below the surface o
the Phase 7 work renovation work
(2) Only analytes detected above laboratory repor
Bold values indicates exceedance of RCS-1
NE indicates that the analyte was not detected ab
CS indicates compound specific.
- indicates sample not analyzed for respective a

TABLE 2A

Summary of Lead Results in Soil - Within Top 2 Feet on Northern Portion of the Park[1]
Palmer Cove Park, 30 Leavitt Street
Salem, Massachusetts

	MCP RCS-1	Sample ID Location	B-3	B-4A	B-6	TP-3	TP-6	HB-101	HB-102	HB-103	HB-104	HB-201	HB-202	HB-203	HB-204	HB-205	HB-206[1]	HB-207	HB-208	HB-209[1]	HB-210	B-301	B-302
		Sample Depth	0.5-2'	0.5-1.5	0.5-2'	0.5-2'	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'	0-2'	0-2'
		Sample Date:	3/9/2018	10/25/18	3/9/2018	10/25/18	7/23/20	7/23/20	7/23/20	7/23/20	7/23/20	7/6/21	7/6/21	7/6/21	7/6/21	7/6/21	7/6/21	7/6/21	7/6/21	7/6/21	7/6/21	8/23/22	8/23/22
Metals																							
Lead	200		**233**	**316**	**232**	**444**	77.6	**1,890**	**591**	**697**	58.2	**808**	**1,220**	**527**	**969**	**243**	**584**	**1,170**	**298**	**312**	**578**	**372**	**229**

NOTES:
Results are reported in milligrams per kilogram (mg/kg).

[1] Data summary tables are based on laboratory reports completed for the site and are not guaranteed as to accuracy or completeness, nor are they a part of the Contract Documents. Contractors are cautioned that the analytical soil summary data have been utilized for general reference purposes only. No explicit or implicit representation is made as to the nature of the materials which may be encountered below the surface of the ground during the Phase 2 park renovation work.

Bold values indicates exceedance of RCS-1 value.

TABLE 2A

Summary of Lead Results in Soil - Within Top 2 Fe
Palmer Cove Park, 30 Leavitt Street
Salem, Massachusetts

	MCP RCS-1	B-303	B-304	B-305	B-306	B-307	B-308	B-309	B-310	B-311	B-312	B-313	B-314	HB-401	HB-402	HB-403	HB-404	HB-405	HB-406
		0-2'	0-2'	0-2'	0-2'	0-2'	0-2'	0-2'	0-2'	0-2'	0-2'	0-2'	0-2'	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'
		8/23/22	8/23/22	8/23/22	8/23/22	8/23/22	8/23/22	8/23/22	8/23/22	8/23/22	8/23/22	8/23/22	8/23/22	6/28/23	6/28/23	6/28/23	6/28/23	6/28/23	6/28/23
Metals																			
Lead	200	**649**	**207**	**910**	**645**	**447**	**451**	**444**	167	**349**	156	**439**	**1,800**	**993**	**875**	**473**	**1,840**	**466**	**118**

NOTES:
Results are reported in milligrams per kilogram (m
(1) Data summary tables are based on laboratory
site and are not guaranteed as to accuracy or
they a part of the Contract Documents. Contra
the analytical soil summary data have been uti
reference purposes only. No explicit or implicit
as to the nature of the materials which may be
surface of the ground during the Phase 2 park

Bold values indicates exceedance of RCS-

TABLE 3
Summary of Previous Soil Disposal Characterization Results[1]
Phase 1 Park Renovation Project and New Tide Gate Manhole Installation Project
Palmer Cove Park Restoration Project
Salem, Massachusetts

Sample Name	Disposal Implications			SP-1	SP-1 (VOCs)	SP-2	SP-2 VOCs	Tide Gate Stockpile-1	Tide Gate VOC-1
Sample Date	Comm 97-01	Subtitle D Landfill	Petroleum Soil Recycling	7/16/2021	7/16/2021	8/5/2021	8/5/2021	3/27/2023	3/27/2023
Lab Sample ID	MA Lined Landfill	Casella Bethlehem NH Landfill	Brox: Dracut MA Facility	21G0495-01	21G0495-02	21H0192-02	21H0192-01	23C0857-01	23C0857-02
VOCs 8260B (mg/kg)									
Acetone	NS	NS	NS	-	<0.0462	-	<0.0829	-	<2.05
Benzene	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Bromobenzene	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Bromochloromethane	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Bromodichloromethane	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Bromoform	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Bromomethane	NS	NS	NS	-	<0.0092	-	<0.0166	-	<0.409
Butylbenzene, n-	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Butylbenzene, sec-	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Butylbenzene, tert-	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Carbon disulfide	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Carbon tetrachloride	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Chlorobenzene	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Chloroethane	NS	NS	NS	-	<0.0092	-	<0.0166	-	<0.409
Chloroform	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Chloromethane	NS	NS	NS	-	<0.0092	-	<0.0166	-	<0.409
Chlorotoluene, 2-	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Chlorotoluene, 4-	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Dibromo-3-chloropropane, 1,2-	NS	NS	NS	-	<0.0046	-	<0.0083	-	<2.05
Dibromochloromethane	NS	NS	NS	-	<0.0046	-	<0.0050	-	<0.409
Dibromomethane	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Dichlorobenzene, 1,2- (o-DCB)	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Dichlorobenzene, 1,3-(m-DCB)	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Dichlorobenzene, 1,4- (p-DCB)	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Dichlorodifluoromethane	NS	NS	NS	-	<0.0092	-	<0.0166	-	<0.409
Dichloroethane, 1,1-	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Dichloroethane, 1,2-	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Dichloroethylene, 1,1-	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Dichloroethylene, cis-1,2-	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Dichloroethylene, trans-1,2-	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Dichloropropane, 1,2-	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Dichloropropane, 1,3-	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Dichloropropane, 2,2-	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Dichloropropene, 1,1-	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Dichloropropene, cis-1,3-	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Dichloropropene, trans-1,3-	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Diethyl Ether	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Diisopropyl Ether (DIPE)	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Dioxane, 1,4-	NS	NS	NS	-	<0.0740	-	<0.133	-	<81.8
Ethylbenzene	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Ethylene dibromide (EDB)	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Hexachlorobutadiene	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Isopropylbenzene (cumene)	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Isopropyltoluene, 4- (p-cymene)	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Methyl butyl ketone (2-Hexanone)	NS	NS	NS	-	<0.0462	-	<0.0829	-	<2.05
Methyl Ethyl Ketone (MEK; 2-Butanone)	NS	NS	NS	-	<0.0462	-	<0.0829	-	<2.05
Methyl Isobutyl Ketone (4-Methyl-2-pentanone)	NS	NS	NS	-	<0.0462	-	<0.0829	-	<2.05
Methyl Tert-Butyl Ether (MTBE)	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Methylene Chloride (Dichloromethane)	NS	NS	NS	-	<0.0231	-	<0.0415	-	<0.818
Naphthalene	NS	NS	NS	-	<0.0046	-	<0.0083	-	0.519
Propylbenzene, n-	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Styrene	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
tert-Amyl Methyl Ether (TAME)	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
tert-Butyl Ethyl Ether (TBEE)	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Tetrachloroethane, 1,1,1,2-	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Tetrachloroethane, 1,1,2,2-	NS	NS	NS	-	<0.0046	-	<0.0050	-	<0.409
Tetrachloroethylene (PCE)	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Tetrahydrofuran	NS	NS	NS	-	<0.0046	-	<0.0083	-	<2.05
Toluene	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Trichlorobenzene, 1,2,3-	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Trichlorobenzene, 1,2,4-	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Trichloroethane, 1,1,1-	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Trichloroethane, 1,1,2-	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Trichloroethylene (TCE)	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Trichlorofluoromethane	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Trichloropropane, 1,2,3-	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Trimethylbenzene, 1,2,4-	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Trimethylbenzene, 1,3,5-	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
Vinyl chloride	NS	NS	NS	-	<0.0092	-	<0.0166	-	<0.409
Xylene (Total)	NS	NS	NS	-	<0.00925	-	<0.0166	-	<0.818
Xylene, m,p-	NS	NS	NS	-	<0.0092	-	<0.0166	-	<0.818
Xylene, o-	NS	NS	NS	-	<0.0046	-	<0.0083	-	<0.409
VOCs (Total)	10	NS	1,800	-	ND	-	ND	-	0.519
SVOCs 8270D (mg/kg)									
Acenaphthene	NS	NS	NS	<0.370	-	<0.746	-	0.372	-
Acenaphthylene	NS	NS	NS	<0.370	-	<0.746	-	<0.309	-
Acetophenone	NS	NS	NS	<0.740	-	<1.49	-	<0.309	-
Aniline	NS	NS	NS	<1.85	-	<3.74	-	<0.309	-
Anthracene	NS	NS	NS	<0.370	-	<0.746	-	1.15	-
Azobenzene	NS	NS	NS	<0.370	-	<0.746	-	<0.309	-
Benzo(a)anthracene	NS	NS	NS	1.84	-	2.19	-	2.39	-
Benzo(a)pyrene	NS	NS	NS	2.04	-	2.04	-	2.54	-
Benzo(b)fluoranthene	NS	NS	NS	1.84	-	1.93	-	2.67	-
Benzo(g,h,i)perylene	NS	NS	NS	1.54	-	1.44	-	1.31	-
Benzo(k)fluoranthene	NS	NS	NS	1.51	-	1.68	-	0.974	-
Biphenyl, 1,1-	NS	NS	NS	-	-	-	-	0.045	-
bis(2-Chloroethoxy)methane	NS	NS	NS	<0.370	-	<0.746	-	<0.309	-
bis(2-Chloroethyl)ether	NS	NS	NS	<0.370	-	<0.374	-	<0.309	-
bis(2-Chloroisopropyl)ether	NS	NS	NS	<0.370	-	<0.374	-	<0.309	-
bis(2-Ethylhexyl)phthalate	NS	NS	NS	<0.370	-	0.956	-	<0.309	-
Bromophenyl phenyl ether, 4-	NS	NS	NS	<0.370	-	<0.746	-	<0.309	-
Butyl benzyl phthalate	NS	NS	NS	<0.370	-	<0.746	-	<0.309	-
Chloroanilne, p- (4-Chloroaniline)	NS	NS	NS	<0.740	-	<0.746	-	<0.309	-
Chloronaphthalene, 2-	NS	NS	NS	<0.370	-	<0.746	-	<0.309	-
Chlorophenol, 2-	NS	NS	NS	<0.370	-	<0.374	-	<0.309	-
Chrysene	NS	NS	NS	1.66	-	2.27	-	2.18	-
Dibenz(a,h)anthracene	NS	NS	NS	0.262	-	0.451	-	0.330	-
Dibenzofuran	NS	NS	NS	<0.370	-	<0.746	-	<0.309	-
Dichlorobenzene, 1,2- (o-DCB)	NS	NS	NS	<0.370	-	<0.746	-	<0.309	-
Dichlorobenzene, 1,3-(m-DCB)	NS	NS	NS	<0.370	-	<0.746	-	<0.309	-
Dichlorobenzene, 1,4- (p-DCB)	NS	NS	NS	<0.370	-	<0.374	-	<0.309	-
Dichlorobenzidine, 3,3-	NS	NS	NS	<0.740	-	<0.746	-	<0.309	-
Dichlorophenol, 2,4-	NS	NS	NS	<0.370	-	<0.374	-	<0.309	-
Diethyl phthalate	NS	NS	NS	<0.370	-	<0.746	-	<0.309	-
Dimethyl phthalate	NS	NS	NS	<0.370	-	<0.746	-	<0.309	-
Dimethylphenol, 2,4-	NS	NS	NS	<0.370	-	<0.374	-	<0.309	-
Di-N-Butyl phthalate	NS	NS	NS	<0.370	-	<0.746	-	<0.309	-
Dinitrophenol, 2,4-	NS	NS	NS	<1.85	-	<1.49	-	<1.24	-
Dinitrotoluene, 2,4-	NS	NS	NS	<0.370	-	<0.374	-	<0.309	-
Dinitrotoluene, 2,6-	NS	NS	NS	<0.370	-	<0.746	-	<0.309	-
Di-N-Octyl phthalate	NS	NS	NS	<0.370	-	<0.746	-	<0.619	-
Fluoranthene	NS	NS	NS	2.75	-	3.34	-	5.56	-
Fluorene	NS	NS	NS	<0.370	-	<0.746	-	0.471	-
Hexachlorobenzene	NS	NS	NS	<0.370	-	<0.374	-	<0.309	-
Hexachlorobutadiene	NS	NS	NS	<0.370	-	<0.746	-	<0.309	-
Hexachloroethane	NS	NS	NS	<0.370	-	<0.374	-	<0.309	-
Indeno(1,2,3-cd)pyrene	NS	NS	NS	1.83	-	1.67	-	1.45	-
Isophorone	NS	NS	NS	<0.370	-	<0.746	-	<0.309	-
Methylnaphthalene, 2-	NS	NS	NS	<0.370	-	<0.374	-	<0.309	-
Methylphenol, 2- (Cresol, o-)	NS	NS	NS	<0.370	-	<0.746	-	<0.309	-
Methylphenol, 3&4 (Cresol, m&p-)	NS	NS	NS	<0.740	-	<1.49	-	<0.309	-
Naphthalene	NS	NS	NS	<0.370	-	<0.746	-	0.397	-
Nitrobenzene	NS	NS	NS	<0.370	-	<0.746	-	<0.309	-
Nitrophenol, 2-	NS	NS	NS	<0.370	-	<0.746	-	<0.619	-
Nitrophenol, 4-	NS	NS	NS	<1.85	-	<3.74	-	<1.24	-
N-Nitrosodimethylamine	NS	NS	NS	<0.370	-	<0.746	-	<0.309	-

TABLE 3
Summary of Previous Soil Disposal Characterization Results[1]
Phase 1 Park Renovation Project and New Tide Gate Manhole Installation Project
Palmer Cove Park Restoration Project
Salem, Massachusetts

Sample Name	Disposal Implications			SP-1	SP-1 (VOCs)	SP-2	SP-2 VOCs	Tide Gate Stockpile-1	Tide Gate VOC-1
Sample Date	Comm 97-01	Subtitle D Landfill	Petroleum Soil Recycling	7/16/2021	7/16/2021	8/5/2021	8/5/2021	3/27/2023	3/27/2023
Lab Sample ID	MA Lined Landfill	Casella Bethlehem NH Landfill	Brox: Dracut MA Facility	21G0495-01	21G0495-02	21H0192-02	21H0192-01	23C0857-01	23C0857-02
Pentachlorophenol	NS	NS	NS	<1.85	-	<1.49	-	<1.24	-
Phenanthrene	NS	NS	NS	1.23	-	1.70	-	3.65	-
Phenol	NS	NS	NS	<0.370	-	<0.746	-	<0.309	-
Pyridine	NS	NS	NS	<1.85	-	<3.74	-	-	-
Pyrene	NS	NS	NS	3.24	-	4.28	-	4.98	-
Trichlorobenzene, 1,2,4-	NS	NS	NS	<0.370	-	<0.746	-	<0.309	-
Trichlorophenol, 2,4,5-	NS	NS	NS	<0.370	-	<0.746	-	<0.309	-
Trichlorophenol, 2,4,6-	NS	NS	NS	<0.370	-	<0.374	-	<0.309	-
SVOCs (Total)	100	NS	NS	19.74	-	23.9	-	30.5	-
Total Petroleum Hydrocarbons (mg/kg)	5,000	NS	50,000	199	-	211	-	496	
Metals 6010C (mg/kg)									
Antimony	NS	NS	NS	<4.62	-	<4.90	-	-	-
Arsenic	40	NS	30	8.34	-	12.5	-	7.72	-
Barium	NS	NS	NS	105	-	285	-	179	-
Beryllium	NS	NS	NS	0.54	-	0.69	-	-	-
Cadmium	80	NS	30	<0.46	-	0.53	-	1.22	-
Chromium (Total)	1,000	NS	500	18.7	-	22.4	-	32.6	-
Lead	2,000	NS	1,000	396	-	2,970	-	684	-
Mercury (7471B)	10	NS	10	0.358	-	4.56	-	4.53	-
Nickel	NS	NS	NS	18.4	-	67.3	-	-	-
Selenium	NS	NS	NS	<4.62	-	<4.90	-	<9.74	-
Silver	NS	NS	NS	<0.46	-	<0.49	-	2.19	-
Thallium	NS	NS	NS	<4.62	-	<4.90	-	-	-
Vanadium	NS	NS	NS	33.2	-	27.0	-	-	-
Zinc	NS	NS	NS	216	-	246	-	-	-
TCLP Metals 6010C (mg/l)*									
Lead	5	5	5	0.404	-	1.24	-	1.36	-
Mercury	0.2	0.2	0.2	-	-	0.00085	-	<0.0005	-
PCBs 8082A (mg/kg)									
PCBs (Total)	2	50	1	<0.06	-	<0.06	-	<0.06	-
Pesticides 8081B (mg/kg)									
Aldrin	NS	NS	NS	<0.0028	-	<0.0028	-	<0.0031	-
BHC, Alpha- (α-Lindane)	NS	NS	NS	<0.0028	-	<0.0028	-	0.0042	-
BHC, Beta- (β-Lindane)	NS	NS	NS	<0.0028	-	<0.0028	-	<0.0031	-
BHC, Delta- (δ-Lindane)	NS	NS	NS	<0.0028	-	<0.0028	-	<0.0031	-
BHC, Gamma- (Lindane)	NS	NS	NS	<0.0017	-	<0.0017	-	<0.0019	-
Chlordane	NS	NS	NS	<0.0224	-	<0.0221	-	<0.0250	-
Chlordane, Alpha-	NS	NS	NS	<0.0028	-	<0.0028	-	<0.0031	-
Chlordane, Gamma-	NS	NS	NS	<0.0028	-	<0.0028	-	<0.0031	-
DDD, 4,4-	NS	NS	NS	<0.0028	-	<0.0028	-	<0.0031	-
DDE, 4,4-	NS	NS	NS	0.0061	-	0.0199	-	<0.0031	-
DDT, 4,4-	NS	NS	NS	0.0086	-	0.0268	-	<0.0031	-
Dieldrin	NS	NS	NS	<0.0028	-	<0.0028	-	<0.0031	-
Endosulfan I	NS	NS	NS	<0.0028	-	<0.0028	-	<0.0031	-
Endosulfan II	NS	NS	NS	<0.0028	-	<0.0028	-	<0.0031	-
Endosulfan Sulfate	NS	NS	NS	<0.0028	-	<0.0028	-	<0.0031	-
Endrin	NS	NS	NS	<0.0028	-	<0.0028	-	<0.0031	-
Endrin Ketone	NS	NS	NS	<0.0028	-	<0.0028	-	<0.0031	-
Heptachlor	NS	NS	NS	<0.0028	-	<0.0028	-	<0.0031	-
Heptachlor Epoxide	NS	NS	NS	<0.0028	-	<0.0028	-	<0.0031	-
Hexachlorobenzene	NS	NS	NS	<0.0028	-	<0.0028	-	<0.0031	-
Methoxychlor	NS	NS	NS	<0.0028	-	<0.0028	-	<0.0031	-
Toxaphene	NS	NS	NS	<0.0028	-	<0.0028	-	-	
Herbicides 8151A (mg/kg)									
D, 2,4-	NS	NS	NS	<0.051	-	<0.050	-	<0.056	-
Dalapon	NS	NS	NS	<0.050	-	<0.049	-	<0.054	-
DB, 2,4-	NS	NS	NS	<0.052	-	<0.051	-	<0.057	-
Dicamba	NS	NS	NS	<0.010	-	<0.010	-	0.170	-
Dichloroprop	NS	NS	NS	<0.051	-	<0.050	-	0.433	-
Dinoseb	NS	NS	NS	<0.052	-	<0.051	-	<0.057	-
Mecoprop	NS	NS	NS	<2.57	-	<2.52	-	2.80	-
Methyl Chlorophenoxy Acetic Acid (MCPA)	NS	NS	NS	<2.54	-	<2.50	-	<2.77	-
T, 2,4,5-	NS	NS	NS	<0.010	-	<0.010	-	<0.011	-
TP, 2,4,5- (Silvex)	NS	NS	NS	<0.010	-	<0.010	-	<0.011	-
General Chemistry									
pH	2 - 12.5	2 - 12.5	2 - 12.5	7.06	-	6.67	-	8.03	-
Conductivity (umhos/cm)	8,000	NS	NS	154	-	363	-	2,050	-
Ignitability (Deg F)	>140	>140	>140	>200	-	>200	-	>200	-
ORP Count (mv)	NS	NS	NS	231	-	197	-	-	-
Reactive Cyanide (mg/Kg)	250	250	250	<2.0	-	<2.0	-	<2.0	-
Reactive Sulfide (mg/Kg)	500	500	500	<2.0	-	<2.0	-	<2.0	-

Results presented in milligrams per kilogram (mg/kg), are equivalent to parts per million (ppm), unless otherwise stated.

[1] Data summary tables are based on laboratory reports completed for the site and are not guaranteed as to accuracy or completeness, nor are they a part of the Contract Documents. Contractors are cautioned that the analytical soil summary data have been utilized for general reference purposes only. No explicit or implicit representation is made as to the nature of the materials which may be encountered below the surface of the ground during the Phase 2 park renovation work.

< xx indicates compound was not detected. Reporting limit is provided.
ND - Parameter group not detected above reporting limits
" - " - Not Analyzed
PCBs- Polychlorinated Biphenyls
SVOCs- Semi-Volatile Organic Compounds
VOCs- Volatile Organic Compounds
* - TCLP testing was performed for compounds where the total concentration in the soil is equal to or exceeds 20 times the regulatory level listed in 40 CFR §261.24 ("20 Times Rule"), as allowed by Section 1.2 of EPA Method 1311.

Tighe&Bond

APPENDIX C

Tighe&Bond
Engineers | Environmental Specialists

Project/Site Information

Palmer's Cove Park
30 Leavitt Street
Salem, Massachusetts

Test Pit No. **TP-6**
Page No. 1 of 1
File No. S-1758-016A
Checked By: Todd Kirton

T&B Rep.	Kerri Lewis	Contractor	Technical Drilling Services			Date	07/23/20
		Operator	Donnie Watson			Ground Elev.	--
Weather	90° F, Sunny	Make	New Holland	Model	555 Backhoe	Time Started	11:15
		Capacity		Reach	12 ft.	Time Completed	11:30

Depth	Soil Description	Sample No.	PID Reading (ppm)	Excav. Effort	Boulder Count/ Class	Note No.
0						
1'	Brown, fine to coarse SAND, some Silt, little Gravel.	S-1		E	A	
2'				E	A	
3'	8" of ASH layer with little Glass (anthropogenic fill material)			E	A	
4'			NA	E	A	
5'	Brown, fine to coarse SAND, little Ash, coal slag, trace metal and brick pieces (anthropogenic fill material)	S-2		E	A	
6'				E	A	
7'				E	A	
8'	End of exploration at 7 feet BSG due to encountered groundwater					1/2
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

1.) Groundwater encountered at 7 feet BSG
2.) Native soils mixed with anthropogenic fill material consisting of ash, glass and brick present beneath the water table.

Test Pit Plan

10 × 4

Volume = 10 cu. yd.

Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" +

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
(X) Encountered
( ) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water

J:\S\S1758 Salem MA On Call Engineering\Palmer Cove Park\Field Work\July 2020\[Test Pit Logs 7-23-2020.xls]TP-6

Tighe&Bond
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Project/Site Information

Palmer's Cove Park
30 Leavitt Street
Salem, Massachusetts

Test Pit No.	**TP-7**
Page No.	1 of 1
File No.	S-1758-016A
Checked By:	Todd Kirton

T&B Rep.	Kerri Lewis	Contractor	Technical Drilling Services			Date	07/23/20
		Operator	Donnie Watson			Ground Elev.	--
Weather	90° F, Sunny	Make	New Holland	Model	555 Backhoe	Time Started	8:30
		Capacity		Reach	12 ft.	Time Completed	9:00

Depth	Soil Description	Sample No.	PID Reading (ppm)	Excav. Effort	Boulder Count/ Class	Note No.
0						
1'	Brown, fine to coarse SAND, some Silt, little Gravel.	S-1	NA	E	A	
2'				E	A	
3'	Beginning at approximately two feet - brown, fine to coarse SAND, some Silt, some Gravel with some components of ash, coal slag, glass, wood and brick (anthropogenic fill material).			E	A	
4'		S-2		E	A	
5'	Black organic muck with trace glass and wood within water table					1/2
6'	End of exploration at 5.5 feet BSG due to encountered groundwater					
7'						
8'						
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

1.) Groundwater encountered at 5.5 feet BSG
2.) Native soils mixed with trace anthropogenic fill material consisting of glass and wood identified in black, organic muck material. Slight marine odor.

Test Pit Plan

Volume = 10 cu. yd.

Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" +

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
(X) Encountered
( ) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water

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Tighe&Bond
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Project/Site Information

Palmer's Cove Park
30 Leavitt Street
Salem, Massachusetts

Test Pit No.	**TP-8**
Page No.	1 of 1
File No.	S-1758-016A
Checked By:	Todd Kirton

T&B Rep.	Kerri Lewis	Contractor	Technical Drilling Services	Date	07/23/20
		Operator	Donnie Watson	Ground Elev.	--
Weather	90° F, Sunny	Make	New Holland Model 555 Backhoe	Time Started	9:50
		Capacity	Reach 12 ft.	Time Completed	10:35

Depth	Soil Description	Sample No.	PID Reading (ppm)	Excav. Effort	Boulder Count/ Class	Note No.
0						
1'	Brown, fine to coarse SAND, some Silt, little Gravel.	S-1	NA	E	A	
2'				E	A	
3'				E	A	
4'	Beginning at approximately two feet - brown, fine to coarse SAND, some Silt, little Gravel, trace brick, procelein, glass, ash, coal slag (anthropogenic fill material).	S-2		E	A	
5'				E	A	
6'	Black, fine to coarse SAND, some Silt, little Gravel, trace glass, metal and coal			E	A	
	End of exploration at 6 feet BSG due to encountered groundwater					1/2
7'						
8'						
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

1.) Groundwater encountered at 6 feet BSG
2.) Native soils mixed with anthropogenic fill material consisting of ash, glass and metal present beneath the water table.

Test Pit Plan

10 × 4

Volume = 10 cu. yd.

Boulder Class

Letter	Designation Classification	Size Range
A		6" - 17"
B		18" - 36"
C		36" +

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
(X) Encountered
( ) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water

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Project/Site Information

Palmer's Cove Park
30 Leavitt Street
Salem, Massachusetts

Test Pit No.	**TP-9**
Page No.	1 of 1
File No.	S-1758-016A
Checked By:	Todd Kirton

T&B Rep.	Kerri Lewis	Contractor	Technical Drilling Services			Date	07/23/20
		Operator	Donnie Watson			Ground Elev.	--
Weather	90° F, Sunny	Make	New Holland	Model	555 Backhoe	Time Started	9:15
		Capacity		Reach	12 ft.	Time Completed	9:45

Depth	Soil Description	Sample No.	PID Reading (ppm)	Excav. Effort	Boulder Count/ Class	Note No.
0						
1'	Brown, fine to coarse SAND, some Silt, little Gravel.	S-1		E	A	
2'				E	A	
3'	Beginning at approximately two feet - gray, fine to coarse SAND, some Gravel, little Silt, little Ash, trace Coal Slag (anthropogenic fill material)			E	A	
4'			NA	E	A	
5'	Black, fine to coarse SAND, some Silt, little Gravel, trace glass, metal, coal slag, porcelein and wood pieces (anthropogenic fill material)	S-2		E	A	
6'				E	A	
7'	End of exploration at 6 feet BSG due to encountered groundwater					1/2
8'						
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

1.) Groundwater encountered at 6 feet BSG
2.) Native soils mixed with anthropogenic fill material consisting of trace amounts of glass, wood, ash and coal slag present beneath the water table.

Test Pit Plan

10 × 4

Volume = 10 cu. yd.

Boulder Class

Letter	Designation	Size Range
A	Classification	6" - 17"
B		18" - 36"
C		36" +

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
(X) Encountered
( ) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water

J:\S\S1758 Salem MA On Call Engineering\Palmer Cove Park\Field Work\July 2020\[Test Pit Logs 7-23-2020.xls]TP-9

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Project/Site Information

Palmer's Cove Park
30 Leavitt Street
Salem, Massachusetts

Test Pit No. **TP-10**
Page No. 1 of 1
File No. S-1758-016A
Checked By: Todd Kirton

T&B Rep.	Kerri Lewis	Contractor	Technical Drilling Services			Date	07/23/20
		Operator	Donnie Watson			Ground Elev.	--
Weather	90° F, Raining	Make	New Holland	Model	555 Backhoe	Time Started	12:45
		Capacity		Reach	12 ft.	Time Completed	1:30

Depth	Soil Description	Sample No.	PID Reading (ppm)	Excav. Effort	Boulder Count/ Class	Note No.
0						
1'	Brown, fine to coarse SAND, some Silt, little Gravel.	S-1		E	A	
2'				E	A	
3'	Beginning at approximately two feet - Reddish/brown, fine to coarse SAND, some Gravel, little Silt, some Glass, little ash, little coal slag, little brick, trace metal and wood pieces (anthropogenic fill material)			E	A	
4'		S-2	NA	E	A	
5'				E	A	
6'	Black, fine to coarse SAND, little seashells, trace glass.	S-3		E	A	
7'				E	A	
	End of exploration at 7 feet BSG due to encountered groundwater					1/2
8'						
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

1.) Groundwater encountered at 7 feet BSG
2.) Native soils mixed with anthropogenic fill material consisting of trace amounts of glass present beneath the water table.

Test Pit Plan

Volume = 10 cu. yd.

Boulder Class

Letter	Size Range Designation Classification
A	6" - 17"
B	18" - 36"
C	36" +

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
(X) Encountered
( ) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water

J:\S\S1758 Salem MA On Call Engineering\Palmer Cove Park\Field Work\July 2020\[Test Pit Logs 7-23-2020.xls]TP-10

Photographic Log

Client: City of Salem, Massachusetts

Site: Palmer's Cove Park

Job Number: S-1758-

Photograph No.: 1	**Date: 7/23/2020**	**Direction Taken: NA**
Description: Sidewall view of TP-6.		

Photograph No.: 2	**Date: 7/23/2020**	**Direction Taken: NA**
Description: View of temporarily stockpiled material from depths greater than 2 feet BSG from TP-6.		

Photographic Log

Client: City of Salem, Massachusetts

Site: Palmer's Cove Park

Job Number: S-1758-

Photograph No.: 3	**Date: 7/23/2020**	**Direction Taken: NA**
Description: View of material beyond the water table in TP-6. Trace glass and ash were observed.		

Photograph No.: 4	**Date: 7/23/2020**	**Direction Taken: NA**
Description: View of TP-7.		

Photographic Log

Client: City of Salem, Massachusetts

Site: Palmer's Cove Park

Job Number: S-1758-

Photograph No.: 5	**Date: 7/23/2020**	**Direction Taken: NA**
Description: View of temporarily stockpiled material from depths greater than 2 feet in TP-7.		

Photograph No.: 6	**Date: 7/23/2020**	**Direction Taken: NA**
Description: View of material from beneath water table in TP-7. Material contained trace amounts of glass and wood.		

Photograph No.: 7	**Date: 7/23/2020**	**Direction Taken: NA**
Description: Sidewall view of TP-8.		

Photograph No.: 8	**Date: 7/23/2020**	**Direction Taken: NA**
Description: View of temporarily stockpiled material from depths greater than 2 feet in TP-8.		

Photograph No.: 9	**Date: 7/23/2020**	**Direction Taken: NA**
Description: Sidewall view of TP-9.		

Photograph No.: 10	**Date: 7/23/2020**	**Direction Taken: NA**
Description: View of temporarily stockpiled material from depths greater than 2 feet in TP-9.		

Photograph No.: 11	**Date: 7/23/2020**	**Direction Taken: NA**
Description: Sidewall view of TP-10.		

Photograph No.: 12	**Date: 7/23/2020**	**Direction Taken: NA**
Description: View of temporarily stockpiled material from depths greater than 2 feet in TP-10.		

Photographic Log

Client: City of Salem, Massachusetts

Site: Palmer's Cove Park

Job Number: S-1758-

Photograph No.: 13	**Date: 7/23/2020**	**Direction Taken: NA**
Description: View of the material beneath the water table in TP-10, trace glass was observed.		

APPENDIX D

July 2023 SMP Appendix D

SECTION 01350

HEALTH & SAFETY PLAN

PART 1 GENERAL

1.1 SUMMARY

A. The Contractor shall:

1. develop a site-specific Health and Safety Plan (HASP) specifically addressing the potential hazards that may be encountered at the work site. The HASP shall include the information described in this specification (as applicable) and meet all applicable OSHA requirements.

2. furnish all labor, equipment, materials, and employee training for effective implementation of the HASP and worker health and safety protection of all Contractor personnel.

3. furnish all labor, equipment, materials, and employee training to effectively complete any required air monitoring and/or decontamination.

4. review the requirements and data provided for the project and supplement the HASP with any additional measures deemed necessary to fully comply with applicable regulatory requirements and to adequately protect personnel on the site.

5. maintain a copy of the HASP at the worksite, accessible to employees working at the site.

6. post the emergency response plan section of the HASP, inclusive of emergency alerting and response procedures and directions to the nearest hospital, in a visible location for all workers to see.

1.2 SITE-SPECIFIC PROJECT CONDITIONS

A. The Contractor shall review and understand all existing information as it relates to potential exposure to subsurface site contaminants, environmental data and reports.

B. The nature of the materials present at the site may require use of special protective clothing and the possible use of respiratory protective equipment, which is intended to help minimize worker exposure to known or suspected site hazards.

1. Levels of personal protection are established in reference standards and generally described for Levels C and D herein. It is anticipated that a majority of the Work to be performed on this project may be performed at Personnel Protection Level D.

2. The Contractor shall be responsible for determining if a higher level of personnel protection is required based on the criteria outlined in the Contractor's HASP. In the event that the Contractor determines that a level of protection higher than Level D is required, the Contractor's personnel shall take the necessary steps outlined in the Contractor’s HASP.

3. The Contractor shall notify the LSP and Owner in writing prior to implementing any upgrades in personal protection. The LSP will review the Contractor's notification and determine the need to notify other applicable agencies.

1.3 REFERENCES

A. OSHA 29 CFR Part 1910 (General Industry standards)

B. OSHA 29 CFR Part 1926 (Construction Standards)

C. OSHA Regulation 29 CFR §1910.120 (HAZWOPER) OSHA Regulation 29 CFR §1926.65 (HAZWOPER)

D. Massachusetts Contingency Plan, 310 CMR 40.0000

E. OSHA Regulation 29 CFR §1926.62 (Lead)

1.4 DEFINITIONS

A. CHMM: Certified Hazardous Materials Manager, as certified by the Institute of Hazardous Materials Management.

B. CIH: Certified Industrial Hygienist, as certified by the American Board of Industrial Hygiene®.

C. CSP: Certified Safety Professional, as certified by the Board of Certified Safety Professionals.

D. Site Safety and Health Official (SSHO): The individual located at a job site who is responsible to the Contractor and has the authority and knowledge necessary to implement the HASP and verify compliance with applicable safety and health requirements.

E. HAZWOPER: Hazardous waste operations and emergency response (HAZWOPER) standards, per the Occupational Safety and Health Administration's (OSHA's) 29 CFR §1910.120 and 29 CFR §1926.65 regulations.

F. Regulated clean-up site: A site regulated under OSHA's HAZWOPER standards contained in 29 CFR §1910.120 and 29 CFR §1926.65, inclusive of the following:

1. clean-up operations required by a governmental body, whether federal, state, local or other involving hazardous substances that are conducted at uncontrolled hazardous waste sites,

2. corrective actions involving clean-up operations at sites covered by the Resource Conservation and Recovery Act of 1976 (RCRA), and

3. voluntary clean-up operations at sites recognized by federal, state, local or other governmental bodies as uncontrolled hazardous waste sites.

G. Uncontrolled Hazardous Waste Site: An area identified as an uncontrolled hazardous waste site by a governmental body, whether federal, state, local or other where an accumulation of hazardous substances creates a potential threat to the health and safety of individuals or the environment or both.

1.5 SUBMITTALS

A. On-site Work shall not begin until the HASP has been submitted by the Contractor and accepted by the Owner/LSP.

B. Informational Submittals

1. Submit the following within thirty (30) days after the Effective Date of the Agreement.

a. A site-specific HASP, including the information described in this Specification as applicable.

1) The HASP must be reviewed, approved, and signed by a CSP, CIH, or CHMM.

2) The LSP's review is only to determine if the HASP is consistent with the minimum requirements of this specification. LSP has no control over contractor's health & safety and the means and methods of health & safety implementation. LSP also does not perform health & safety monitoring of Contractor's Work.

3) The review will not determine the adequacy of the HASP to address all potential hazards, as that remains the sole responsibility of the Contractor.

b. Documentation of qualifications and experience of the SSHO.

c. Applicable health and safety training records.

2. Submit health and safety certification and training records, including:

a. current certifications of employee's HAZWOPER training, and

b. current certification of HAZWOPER supervisor training for project supervisors.

1.6 CONTRACTOR'S RESPONSIBILITIES

A. The Contractor is solely responsible for the health and safety of workers employed by the Contractor, any subcontractor, vendors/manufacturers, site visitors and anyone directly or indirectly employed by any of them.

B. Provide a designated SSHO for the project.

C. Pre-arrange emergency medical care services at a nearby hospital or medical clinic, including establishment of an emergency notification process and emergency routes of travel.

D. Conduct pre-entry and weekly safety meetings with all site personnel, documenting attendance and topics covered.

E. Develop and implement the site-specific HASP, inclusive of the elements contained in this specification.

F. For projects where contaminated media are known, likely, or suspected to be encountered:

1. monitor air quality in and around the work area using appropriate air monitoring equipment.

2. develop and implement a respiratory protection program per 29 CFR §1910.134 and 29 CFR §1926.103 for all workers authorized to wear respirators.

3. record all air quality readings and maintain records on site.

4. stop work and/or upgrade respiratory protection or personal protective equipment levels if action levels established in the HASP are exceeded.

5. ensure that the degree and type of respiratory protection provided is protective for the monitored concentrations and individual chemical parameters.

6. lawfully dispose of all personal protective equipment that cannot be decontaminated.

G. Work under this contract is being performed on a "Regulated clean-up site", as defined in 29 CFR §1910.120, 29 CFR §1926.65, and Article 1.4 F, above.

H. The site-specific HASP must include all elements required by OSHA's HAZWOPER standard, as contained in 29 CFR §1910.120(b) and 29 CFR §1926.65(b) and the elements in this specification.

I. Train all workers assigned to areas where contaminated media are likely to be encountered in accordance with 29 CFR §1910.120(e) and 29 CFR §1926.65(e).

J. Develop and implement a medical surveillance program per 29 CFR §1910.120(f) and 29 CFR §1926.65(f) for applicable employees.

1.7 HEALTH & SAFETY PLAN (HASP) REQUIREMENTS

A. The HASP shall comply with the requirements of 29 CFR §1910.120(b)(4) and 29 CFR §1926.65(b)(4).

B. The following items shall be included/addressed in the HASP:

1. a safety and health risk or hazard analysis for each site task and operation in the workplan;

a. a physical hazard evaluation and hazard control plan shall be included covering, but not limited to the following, as applicable:

1) equipment operation;

2) confined space entry;

3) slips, trips, and falls;

4) building collapse;

5) falling debris;

6) encountering unmarked utilities;

7) cold and heat stress;

8) hot work (cutting and welding);

9) drum and container handling;

10) trench and/or excavation entry.

2. employee training assignments to assure compliance with 29 CFR §1910.120(e) and 29 CFR §1926.65(e).

3. personal protective equipment to be used for each site task and operation in the workplan;

    a. inclusive of a personal protective equipment program to comply with 29 CFR §1910.120(g)(5) and 29 CFR §1926.65(g)(5).

4. medical surveillance requirements to comply with 29 CFR §1910.120(f) and 29 CFR §1926.65(f).

5. the frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used, including methods of maintenance and calibration of monitoring and sampling equipment to be used.

    a. The action level (AL) and Permissible Exposure Limit (PEL) for each contaminant must be listed along with the type of monitoring instrument that will be used.

    b. The frequency of the monitoring must also be included (i.e., continuous, daily, weekly, monthly).

6. site control measures to comply with 29 CFR §1910.120(d) and 29 CFR §1926.65(d).

7. decontamination procedures to comply with 29 CFR §1910.120(k) and 29 CFR §1926.65(k).

8. an emergency response plan for the safe and effective response to emergencies, including the necessary PPE and other equipment to comply with 29 CFR §1910.120(l) and 29 CFR §1926.65(l);

    a. including, but not limited to the following:

        1) a map indicating the route to a nearby hospital or medical clinic for emergency medical care;

        2) procedures for emergency medical treatment and first aid;

        3) the names of three (3) Emergency Response Contractors, experienced in the removal and disposal of oils and hazardous chemicals, that the Contractor intends to use in the event of an emergency;

        4) site evacuation routes and procedures;

        5) emergency alerting and response procedures.

9. confined space entry procedures to comply with 29 CFR §1910.146 and 29 CFR 1926, Subpart AA.

10. a spill containment program to comply with 29 CFR §1910.120(j) and 29 CFR §1926.65(j).

PART 2 PRODUCTS

2.1 AIR MONITORING EQUIPMENT

A. If organic vapors or total hydrocarbons are known, likely, or suspected to be encountered during the work:

1. provide and maintain a portable photo-ionization detector (PID) or flame-ionization detector (FID) capable of detecting organic vapors or total hydrocarbons. Equipment shall be sensitive to the 0.5 parts per million (PPM) level.

B. If hazardous atmospheres (oxygen, hydrogen sulfide, carbon monoxide, methane, etc.) are known, likely, or suspected to be encountered during the work:

1. provide and maintain an applicable multi-gas analyzer to measure concentrations in applicable work environments (i.e., confined spaces, trenches, tunnels, buildings, etc.).

C. If there is a potential for the accumulation of explosive gas:

1. provide and maintain an explosimeter (LEL meter).

D. If there is a potential for visible dust emissions at the site, dust monitoring must be considered.

1. The Contractor is responsible for monitoring fugitive dust emissions in accordance with applicable local, state, and federal regulations.

2. Equipment shall be sensitive to particulate matter less than 10 micrometer in size (PM_{10}) at a level of 100 micrograms per cubic meter ($\mu g/m^3$).

3. Contractor shall outline the dust monitoring program in their HASP, including applicable action levels.

E. All air monitoring equipment shall remain the property of the Contractor.

F. All air monitoring equipment readings must be recorded and be available for federal, state, and/or local regulatory personnel to review.

2.2 PERSONAL PROTECTIVE EQUIPMENT (PPE)

A. All PPE must conform to the OSHA requirements, as indicated in the previous Reference Standards Section. Various PPE to be furnished by the Contractor under different levels of protection for their own personnel and subcontractor's personnel include, but are not limited to, the following:

1. Level D Protection:

a. Coveralls or Tyvek

b. Gloves

c. Safety boots/shoes

d. Safety glasses

e. Hearing protection (for high noise operations)

f. Hard hat with optional face shield

2. Level C Protection:

a. Air-purifying respirator

b. Chemical protective overalls or Coveralls (e.g., Saran coated Tyvek)

c. Gloves, inner (disposable, surgical type)

d. Gloves, outer (Neoprene, Nitrile, Viton or Butyl)

e. Boots, chemical protective, steel toe and shank (Neoprene or Nitrile)

f. Booties, chemical protective (disposable PVC)

g. Hard hat

h. Face shield (if necessary)

3. Levels B and A represent increased levels of personal protection and are described in the Reference Standards.

4. Contractor is fully responsible for all PPE selection (including the various stages of protection), proper use, maintenance, and continuous monitoring.

PART 3 EXECUTION

3.1 HEALTH AND SAFETY PLANNING AND IMPLEMENTATION

A. Implement the HASP throughout the execution of all applicable work.

B. The Contractor shall perform all monitoring as detailed in the HASP.

C. Contractor(s) shall implement routine health and safety meetings and any follow-up supplemental briefings.

D. Provide applicable health and safety training for all personnel who may come in contact with or be exposed to various dangerous, hazardous, or changing site conditions.

E. Personnel who have not received applicable training and who are not equipped with the required PPE, shall not be permitted access to the site by the Contractor during the course of the work that may result in potential exposures to unsafe or hazardous site conditions.

F. All personnel, including personnel for subcontractors, who must maintain 40-hour OSHA training, shall provide certificates of completion for the applicable 8-hour OSHA refresher course.

3.2 DUST CONTROL AND MONITORING

A. Implement fugitive dust suppression to prevent unacceptable levels of dust resulting from contaminated soil excavation work. Dust suppression methods shall be subject to review by the LSP. Supervise fugitive dust control measures and monitor airborne particulate matter as required.

B. Contractor shall monitor dust conditions, as warranted. The dust monitoring results shall be compared to a permissible concentration for PM_{10} of 150 µg/m3. If a time-weighted average exceeds this dust action level, the Contractor shall implement dust control measures. Dust monitoring records must be provided to LSP.

3.3 PERSONNEL AND EQUIPMENT DECONTAMINATION

A. All equipment shall be provided to the work site free of contamination. LSP may prohibit from the site any equipment which in his opinion has not been thoroughly

decontaminated prior to arrival. Any decontamination of Contractor's equipment prior to arrival at the site shall be at the expense of Contractor. Contractor is prohibited from decontaminating equipment on the project site which is not thoroughly decontaminated prior to arrival.

B. Contractor shall furnish labor, materials, tools, and equipment for decontamination of all personnel, equipment and supplies which are used to handle contaminated materials.

C. Properly store and dispose of contaminated PPE and all other generated decontamination waste.

3.4 INCIDENT REPORTING

A. The Contractor shall comply with all accident and/or incident reporting requirements, including the following:

1. Should any unforeseen safety-related factor, hazard, or condition become evident during the course of the work, the Contractor must immediately take action to establish, maintain, and secure the site and working conditions. This shall be followed by immediate notice to the Owner and LSP.

2. If injury to any person on-site occurs, the Contractor shall immediately report the incident to the Owner and LSP. Corrective actions shall be implemented.

END OF SECTION

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July 2023 SMP Appendix D

SECTION 02110

CONTAMINATED SOIL EXCAVATION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Excavation, handling, stockpiling, and temporary storage of Contaminated Soil

2. Movement and placement of Contaminated Soil into temporary controlled stockpile areas

3. Decontamination of tools, equipment, and vehicles and the collection, management and disposal of resulting liquids and/or solids

4. Other work involving the handling of contaminated materials which may be required or incidental to the work related.

1.2 REFERENCES

A. 310 CMR 40.0000, Massachusetts Contingency Plan

B. MADEP Policy, WSC-94-400, "Interim Remediation Waste Policy for Petroleum Contaminated Soil"

C. 310 CMR 30.000, Massachusetts Hazardous Waste Regulations

D. 40 CFR Part 261, Identification and Listing of Hazardous Waste

E. 40 CFR Part 268, Land Disposal Restrictions

F. 520 CMR 14.00 Excavation and Trench Safety

1.3 DEFINITIONS

A. Natural Soil: Soil in which all substances naturally occurring therein are present in concentrations not exceeding the concentrations of such substance occurring naturally in the environment and in which soil no other substance is analytically detectable.

B. Contaminated Soil: Soil or fill determined by analytical results to contain oil and/or hazardous material at concentrations equal to or greater than a release notification threshold established by 310 CMR 40.0300 and 40.1600.

C. Special Handling: Methods used to excavate, collect, grade, load, move, transport, stockpile, dispose, or otherwise manage a contaminated material or Contaminated Soil are such that (1) the spillage, loss, co-mingling, or uncontrolled deposition of such material is minimized, (2) personal exposure to contaminants present in such a material are minimized, (3) the adverse impacts to the community and the surrounding environment from contaminants present in such material are minimized, (4) all applicable regulatory requirements applicable to such activity are satisfied.

1.4 QUALITY ASSURANCE

A. All Excavation, Trenching, and related Earth Retention Systems shall comply with the requirements of OSHA excavation safety standards (29 CFR Part 1926 Subpart P), 520 CMR 14.00, and other State requirements. Where conflict between OSHA and State regulations exists, the more stringent requirements shall apply.

B. All contaminated material excavated or otherwise collected, consolidated and managed during the course of the work will require Special Handling in accordance with these specifications, Contractor Health and Safety Plan, and all applicable permits, approvals, authorizations, and Regulations.

C. Perform the handling of contaminated materials with equipment and techniques in accordance with the performance requirements defined in this specification.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 GENERAL

A. Provide all employees and subcontractor(s) with personal protective equipment and protective clothing consistent with the levels of protection for this work as indicated in Contractor's Health and Safety Plan.

B. Perform all contaminated material handling operations in accordance with standard engineering practices applicable to such activity, according to MADEP regulations, and according to the provisions of Contractor Health and Safety Plan. Utilize methods which consider the health and safety of all Contractor and subcontractor personnel, support personnel, LSP and their representatives, and the surrounding environment.

C. All site health and safety controls shall be fully established and in operation prior to beginning any contaminated material handling activity. Site controls shall include but not be limited to work zones properly barricaded, decontamination facilities, air monitoring, and all support equipment and supplies including personal protective equipment. Comply with the requirements of Section 01350, Health and Safety Plan.

D. Minimize the spread of contaminated materials during handling. Transport vehicles used to move Contaminated Soil at the Project Site shall be free from leaks. Trucks or other conveyances deemed unacceptable for use by LSP shall not be used for the movement of contaminated materials.

E. Keep work areas, including but not limited to, areas adjacent to excavations, roadways leading to and from excavation areas, driveways, parking areas, and public roadways free of contaminated materials. If such materials are deposited, spilled, or spread, such material shall be removed promptly, and properly disposed of to the satisfaction of LSP no later than the end of each working day or as requested by LSP.

F. Owner is the generator and will sign all manifests and bills of lading. Except for materials required to be transported under manifest, transport all Contaminated Soil material under bills of lading (prepared by LSP) regardless of the chemical quality of the soil.

3.2 EXCAVATION AND/OR DISPLACEMENT OF CONTAMINATED MATERIALS

A. Perform excavation and other soil disturbance activities in the areas shown on Crowley Cottrell's separate Phase 2 Park Renovation project plan set.

B. For this project, the excavation, removal and/or displacement of contaminated soil is scheduled from the following:

1. NORTHERN SOIL MANAGEMENT ZONE

a. The Northern Soil Management Zone is depicted on Figure 2 of the Soil Management Plan.

b. Scheduled excavation, removal and/or displacement of contaminated soil in the Northern Soil Management Zone is to include, but is not limited to, for the construction of the new basketball court, construction of new play surface area, construction of new concrete paving, asphalt paving, and other areas not to be covered by impervious surfaces where one foot of soil is scheduled to be removed before being backfilled and finished with loam and seed.

c. The soil from the Northern Soil Management Zone cannot be spread in the immediate vicinity of where excavated/removed/displaced. Excess soil generated from Northern Soil Management Zone shall be managed in accordance with these SMP specifications.

d. The soil from the Northern Soil Management Zone must be managed and stockpiled separately from the soil from the Southern Soil Management Zone, as reviewed below in Section 3.4.

2. SOUTHERN SOIL MANAGEMENT ZONE

a. The Southern Soil Management Zone is the other areas outside of the Northern Soil Management Zone, as depicted on the Figures of the Soil Management Plan.

b. Scheduled excavation, removal and/or displacement of contaminated soil in the Southern Soil Management Zone is to include, but is not limited to, construction of new pedestrian walkways and new tree plantings.

c. The soil from the Southern Soil Management Zone cannot be spread in the immediate vicinity of where excavated/removed/displaced, to the extent feasible. Excess soil generated from Southern Soil Management Zone shall be managed in accordance with these SMP specifications.

d. The soil from the Southern Soil Management Zone must be managed and stockpiled separately from the soil from the Northern Soil Management Zone, as reviewed below in Section 3.4.

3. All other work where underling contaminated soil may be excavated, removed or displaced from its origin and may warrant proper off-site management includes, but is not limited to the following:

a. stripping of the existing grass layer

C. Minimize the spread and loss of contaminated materials during demolition, excavation and other soil disturbance activities.

1. Following excavation, transport contaminated materials directly to the temporary controlled stockpile areas for stockpiling. Excavated contaminated materials shall not be placed directly on the ground.

D. Employ methods necessary to isolate or remove contaminated soil from potentially non-contaminated material to the degree practicable.

1. For the stripped grass layer:

a. In the Northern Soil Management Zone, remove soil from the stripped grass, to the extent feasible, and consolidate the soil with the other excavated/removed/displaced soil from this area.

b. In the Southern Soil Management Zone, remove soil from the stripped grass, to the extent feasible, for reuse in the nearby disturbed areas.

c. The goal of this work is to limit the volume of grass debris requiring proper off-site management.

d. The grass debris scheduled for off-site disposal shall be stockpiled in accordance with these specifications.

2. Segregate construction debris, if present, from excavated contaminated materials at the point of excavation, prior to the movement of contaminated materials from excavation areas. LSP may evaluate debris to determine if such material can be designated uncontaminated general demolition material.

3.3 UNFORESEEN CONTAMINATED MATERIALS

A. In the event that unforeseen contaminated materials are encountered during the course of the work, permit the LSP sufficient time to devise an appropriate course of action based upon the conditions present.

1. Until such appropriate course of action is devised, Contractor shall secure the work area in question such that it does not pose a health and safety risk.

2. LSP will provide the Contractor with a scope of work and performance requirements for the collection, consolidation, removal or excavation of unforeseen contaminated material. Contractor shall then undertake contaminated material remediation with equipment and techniques established by Contractor in accordance with said scope of work and performance requirements.

3.4 STORAGE OF EXCAVATED MATERIALS

A. Excavated/removed/displaced contaminated (or potentially contaminated) material shall be temporarily stockpiled on-site in separate areas designated by the LSP, as follows:

1. Excavated/removed/displaced soil from the Northern Soil Management Zone shall be stockpiled separately from the excavated/removed/displaced soil from the Southern Soil Management Zone, with temporary signs posted for each stockpile and at least 50 feet in separation between the stockpiles to help avoid inadvertent mixing of the soil.

2. Stripped grass from the Northern Soil Management Zone shall be stockpiled separately from the stripped grass from the Southern Soil Management Zone for LSP review, with temporary signs posted for each stockpile.

B. Stockpile materials in such a manner to protect existing site surface, materials and structures from contamination, runoff and erosion. Place the material on a minimum of 6 mil polyethylene sheeting and at the end of each day the stockpiled material shall be covered with 6 mil polyethylene sheeting and secure the covering to prevent the stockpile from becoming uncovered due to winds.

3.5 DUST CONTROL

A. See Section 01350 – Health & Safety Plan.

END OF SECTION

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SECTION 02120

TRANSPORTATION AND DISPOSAL OF CONTAMINATED SOIL

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Transportation and disposal of Contaminated Soil or materials collected, consolidated, excavated, and generated during performance of the Work.

2. Coordination, loading, transportation and disposal of contaminated materials.

B. Related Sections

1. Section 01350, Health & Safety Plan

2. Section 02110, Contaminated Soil Excavation

1.2 DEFINITIONS

A. Disposal: The discharge, deposit, injection, dumping, spilling, leaking, incineration or placing of any contaminated material or otherwise hazardous substance into or on any land or water so that such hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including ground waters.

B. Generator: Any person, by site, whose act or process produces hazardous waste, or whose act first causes an oil or hazardous material to become subject to regulation.

C. Regulated Waste: Non-Resource Conservation and Recovery Act (RCRA) hazardous wastes such as oils, petroleum products or residuals, chemical liquids, chemical gases or vapors, non-Toxic Substances Control Act (TSCA) polychlorinated biphenyls (PCBs), waste chemical solids, including soil, and other contaminated material wastes not defined as RCRA Hazardous, TSCA-regulated, or Special Waste.

D. Manifest: An approved form used as a shipping document to identify the quantity, composition, and the origin, routing, and destination of regulated or hazardous waste from the site of generation to the point of disposal, treatment, storage, or use.

E. Shipping Paper: An invoice, bill of lading, or other shipping document serving a similar purpose; other than a hazardous waste manifest used to document the conveyance of materials between different locations, including regulated wastes when applicable.

F. Treatment: Any method, technique or process, including neutralization, incineration, stabilization or solidification, designed to change the physical, chemical or biological character or composition of any hazardous waste so as to neutralize such waste or so as to render such waste less hazardous, non-hazardous, safer to transport, amenable to storage, or reduced in volume, except such method or technique as may be included as an integral part of a manufacturing process at the point of generation.

G. TSCA/RCRA Landfill: This type of landfill is permitted to accept soil that contains PCB at levels of 50 ppm to 500 ppm, acceptable for landfill disposal as defined in 40 CFR Part 761; soil that is classified as either a RCRA characteristic waste or RCRA

listed waste as defined in 40 CFR Part 261 but meets the treatment standards established in 40 CFR Part 268 - Land Disposal Restrictions; and all other soil classified as a hazardous material in 310 CMR 30.00. This type of landfill shall be approved to operate under a Federal Part B operating permit and shall be permitted to accept material with PCB concentrations up to 500 ppm under TSCA. The landfill shall be designed with a double composite liner meeting minimum RCRA design requirements. The landfill shall operate a leachate collection system and shall also operate a leak detection well system. The landfill shall be capable of stabilizing soil for meeting requirements of the USEPA's present rules required under the 1984 amendments to RCRA, banning the land disposal of hazardous material.

H. RCRA Subtitle C Landfill: This type of landfill is permitted to accept soil that contains PCBs levels below 50 ppm; soil that is classified as either a RCRA characteristic waste or RCRA listed waste as defined in 40 CFR Part 261 but meets the treatment standards established in 40 CFR Part 268 - Land Disposal Restrictions and all other soil classified as a hazardous material in 310 CMR 30.00. This type of landfill shall be approved to operate under a Federal Part B operating permit. The landfill shall be designed with a double composite liner meeting minimum RCRA design requirements. The landfill will operate a leachate collection system and will also operate a leak detection well system. The landfill shall be capable of stabilizing soil for meeting requirements of the land ban.

I. RCRA Subtitle D Out-of-State Lined Landfill: This type of landfill shall be state approved or permitted to accept soil that is defined as a hazardous material in 310 CMR 30.00, but is not classified as either a RCRA characteristic waste or RCRA listed waste as defined in 40 CFR Part 261; soil containing PCBs below 50 ppm; and all other soil not permitted or unsuitable for in-state disposal or recycling.

J. Out-of-State Recycling Facility: This type of facility shall be state approved or permitted to accept soil that is defined as a hazardous material in 310 CMR 30.00, but is not classified as either a RCRA characteristic waste or RCRA listed waste as defined in 40 CFR Part 261; soil containing PCBs below the facility's permitted level; and all other soil not permitted or unsuitable for in-state disposal or recycling.

K. In-State Recycling Facility: This type of facility shall be approved by the Commonwealth of Massachusetts to accept soil that is classified as petroleum contaminated soil, that would be classified as a hazardous material in 310 CMR 30.00 if not managed under M.G.L. c.21 E and 310 CMR 40.00; and is not classified as a RCRA characteristic waste or RCRA listed waste as defined in 40 CFR Part 261.

L. In-State Landfill Facility (Reuse as Cover Material): This type of facility shall be approved by the Commonwealth of Massachusetts to accept soil that is classified as petroleum contaminated soil, that would be classified as a hazardous material in 310 CMR 30.00 if not managed under M.G.L. c.21 E and 310 CMR 40.0000; and is not classified as a RCRA characteristic waste or RCRA listed waste as defined in 40 CFR Part 261.

1.3 SUBMITTALS

A. Submit all pertinent information relating to the transport and disposal of materials specified herein, within 14 days after issuance of the Notice to Proceed and prior to transport and disposal. The information submitted be in one package and shall include the following, as a minimum:

1. Information for proposed treatment/disposal facility or facilities including the following:

    a. General Information

        1) Facility Name

        2) Facility Address

        3) Name of Contact Person

        4) Title of Contact Person

        5) Telephone Number of Contact Person

        6) Permit Number

    b. The facility shall specify the volume of material that can be accepted from the Project on a weekly and a total basis.

    c. The facility shall provide written confirmation that they are permitted to accept and will accept the classified contaminated materials the general quality and quantity described by these specifications.

    d. The facility shall provide a listing of all current and valid permits, licenses, letters of approval, and other authorizations to operate that they hold, pertaining to the receipt and treatment/disposal of the contaminated materials described by these specifications.

2. Massachusetts Department of Transportation Transporter Identification Number and expiration date.

3. Name and address of all hazardous material transporters to be used to transport materials including proof of permit, license, or authorization to transport hazardous material in all affected states.

B. Upon receipt of final approval from treatment/disposal facility to accept contaminated materials, submit copy of said approval.

C. Within ten (10) working days after the off-site transportation of contaminated materials, submit copies of all paperwork related to transportation of contaminated materials. Such paperwork may include, but not be limited to receipts, weight tickets, and disposal certificates.

1. Provide certified tare and gross weight slips for each load received at the designated treatment/disposal facility which shall be attached to copy of related manifest or bill of lading.

D. Prior to receiving progress payment, submit documentation certifying that all materials were transported to, accepted, and disposed of, at the selected treatment/disposal facility. The documentation shall include the following, as a minimum.

1. Documentation for each load from the site to the disposal facility, including all manifests and any other applicable transfer documentation.

2. All documentation for each load shall be tracked by the original manifest or bill of lading document number assigned at the project site at time of signature by LSP.

1.4 REGULATORY REQUIREMENTS

A. Obtain all Federal, State and local permits, approvals, or authorizations required for the transport and disposal of contaminated materials. Adhere to all requirements of such permits, approvals, or authorizations.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 GENERAL

A. Sample, test, or analyze contaminated material for approval of final disposal. LSP will sample and analyze contaminated soil.

B. Contaminated (or potentially contaminated) materials to be disposed of include, but are not limited to contaminated soil, rock and miscellaneous contaminated debris, as referenced in Section 02110, Contaminated Soil Excavation.

C. All contaminated materials excavated, consolidated, or otherwise managed during the course of the work will require special handling in accordance with these specifications, the Contractor's Health and Safety Plan, and all applicable permits, approvals, authorizations, and regulations.

D. Dispose of contaminated materials at facilities approved by Owner or LSP.

E. All Contractor personnel shall wear personal protective equipment and protective clothing consistent with the levels of protection for this Work as indicated in the Site Health and Safety Plan.

F. Contractor shall select treatment/disposal facilities to receive contaminated materials from the Project which are established, fully operational, and in full compliance with all applicable Federal, State, and local regulations.

G. Perform collection of characterization (except soil) samples and laboratory analyses to satisfy the acceptance criteria for selected receiving facility(s).

H. Remove all contaminated materials from the project site and legally dispose of materials.

3.2 CHARACTERIZATION FOR DISPOSAL-CONTAMINATED SOIL

A. Disposal characterization sampling will be conducted by the LSP.

B. The LSP will collect separate representative soil samples from the separate stockpiles of excavated/removed/displaced soil (and other debris, as warranted) from the Northern Soil Management Zone and from the Southern Soil Management Zone, as referenced in Section 02110, Contaminated Soil Excavation.

3.3 DISPOSAL COORDINATION AND TRANSPORT

A. Contractor is solely responsible for coordinating treatment/disposal facility approval, scheduling, loading, transport, and ultimate disposal of contaminated materials at

treatment/disposal facilities. No claim for delay will be considered based upon Contractor's facility failing to meet Contractor's production schedule. No payments will be made for rejected loads.

3.4 MANIFESTS AND SHIPPING PAPERS

A. Owner is designated as the "Generator" and will sign all Manifests or Bills of Lading and Shipping Papers.

1. Manifests and Shipping Papers shall be prepared by Contractor at least twenty-four (24) hours in advance of shipment of contaminated materials to the approved receiving facility. Authorized Owner's representative will sign as "Generator" as each load of contaminated material leaves the Project Site.

2. LSP Opinion letter(s) and Material Shipping Record (MSR) or Bills of Lading (BOL) under M.G.L. c.21 E and 310 CMR 40.0000 shall be prepared by LSP at least twenty-four (24) hours in advance of shipment of contaminated materials to the approved receiving facility.

B. Contractor shall forward appropriate original copies of Manifests or Bills of Lading to LSP on the same day the contaminated materials leave the Project Site.

3.5 TRANSPORT OF CONTAMINATED MATERIAL

A. Transport contaminated materials off-site after all treatment/disposal facility documentation has been completed and the material accepted by said facility.

B. Transport contaminated materials from the site to treatment/disposal facility in accordance with all United States Department of Transportation (DOT), USEPA, Massachusetts regulations and other regulations of all affected states.

C. The Hauler(s) shall be licensed in all states affected by transport.

D. Provide to LSP copies of all weight slips, both tare and gross, for every load weighed and disposed of at the accepted disposal facility. The slips shall be tracked by the original manifest document number that was assigned by LSP at the site. Owner will only make progress payments upon receipt of these weight slips.

E. Minimize the potential for development of free liquid during transport. Do not load wet soil for transport. If free liquid does develop during transport, Contractor shall be responsible for proper collection and disposal of same.

END OF SECTION

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