sub-slab soil vapor samples; however, these detections may be related to the petroleum spill to the north or documented petroleum impacts associated with Lots 3 and 12. Based on field observations and laboratory analytical results, the presence of the ASTs in this area does not appear to have impacted soil, groundwater and sub-slab soil vapor.

2.4.2.11 AOC-11: Historic Fill

AOC 11 represents a layer of historical fill of unknown origin identified across the site between ground surface and depths ranging from about 2.5 to 24 feet below bgs. This fill layer contains SVOCs, metals and pesticides, at concentrations above RURR SCOs. The nature and extent of historical fill impacts was delineated and characterized during the RI. AOC 11 is a site-wide AOC. All borings and monitoring wells are associated with this AOC.

According to historical topographical maps, extensive land reclamation likely occurred to create the site as it exists today. Historic fill is ubiquitous across the site at depths ranging from 2.5 feet bgs in RB21 to 24 feet bgs in RB15.

PAHs detected in soil samples are attributed to historic fill quality.

Iron, magnesium, manganese, and sodium detected in groundwater samples above the SGVs are indicative of regional groundwater conditions. SVOCs detected in groundwater may be the result of entrained sediments in groundwater samples and associated with historic fill quality, and/or with on-site petroleum impacts.

2.4.2.12 AOC-12: Carbon Tetrachloride and PCE Impacts to Soil Vapor from an Off-Site Source

Analytical results from the RI indicate the presence of carbon tetrachloride and PCE in sub-slab and soil vapor points across the site at concentrations greater than the ambient air sample. AOC 12 is a site-wide AOC. The following sub-slab, soil vapor, and ambient air samples are associated with this AOC: RSSV01 through RSSV09, RSV01, RSV02, SV01, SV06, SV08, and RAA01.

PCE was detected at concentrations above ambient air concentrations in all but one sub-slab soil vapor sample collected across the site. Carbon tetrachloride was detected in RSSV08 at a concentration that may warrant mitigation. Because carbon tetrachloride and PCE were not detected in soil or groundwater above the UU SCOs or SGVs, respectively, carbon tetrachloride and PCE concentrations in soil vapor may be indicative of an off-site chemical release associated with historical or current use of surrounding properties. Additional soil vapor samples were

collected in the sidewalks of East 144th Street and East 146th Street on February 14, 2020, as part of an SRI, and results do not indicate soil vapor is migrating off-site.

2.4.3 Identification of Standards, Criteria and Guidance

The following standards, criteria, and guidance are typically applicable to Remedial Action projects in New York State, and will be consulted and adhered to as applicable:

- 29 CFR Part 1910.120 – Hazardous Waste Operations and Emergency Response
- 6 NYCRR Part 371 – Identification and Listing of Hazardous Wastes
- 6 NYCRR Part 372 – Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities
- 6 NYCRR Subpart 373-4 – Facility Standards for the Collection of Household Hazardous Waste and Hazardous Waste from Conditionally Exempt Small Quantity Generators
- 6 NYCRR Subpart 374-1 – Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
- 6 NYCRR Subpart 374-3 – Standards for Universal Waste
- 6 NYCRR Part 375 – Environmental Remediation Programs
- 6 NYCRR Part 376 – Land Disposal Restrictions
- 6 NYCRR Part 750 – State Pollutant Discharge Elimination System (SPDES) Permits
- 12 NYCRR Part 56 – Industrial Code Rule 56 (Asbestos)
- CP-43 – Commissioner Policy on Groundwater Monitoring Well Decommissioning (December 2009)
- CP-51 – Soil Cleanup Guidance (2010)
- DER-10 – Technical Guidance for Site Investigation and Remediation (May 3, 2010)
- DER-23 – Citizen Participation Handbook for Remedial Programs (March, 2010)
- NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (October 2006)
- TOGS 1.1.1 – Ambient Water Quality Standards & Guidance Values and Groundwater Effluent Limitations
- USEPA OSWER Directive 9200.4-17 – Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites (December 1997)

- Screening and Assessment of Contaminated Sediment (Division of Fish, Wildlife and Marine Resources, June 2014)

2.4.4 Soil/Fill Contamination

Historic fill consisting predominantly of brown, fine- to medium-grained sand, with varying amounts of silt, clay, gravel, brick, coal, coal ash, slag, concrete, asphalt, glass, plastic, metal, ceramic tile, wood ash, and wood, was encountered across the site beneath the surface cover to depths ranging from about 2.5 to 24 feet bgs. SVOCs, metals, and pesticides detected at concentrations above the Part 375 UU, PGW, and/or RURR SCOs are likely related to the quality of historic fill. One sample collected from soil boring RB06 contains hazardous concentrations of lead in the 0- to 2-foot interval.

Petroleum-related contamination in the northern part of the site was generally identified at or below the water table from about 13 to 32 feet bgs, with the exception of RB03 and RB13, where localized impacts were identified. Field evidence of petroleum impacts were observed at RB03 between 1 and 2 feet bgs and petroleum-related VOCs were detected above UU, PGW, and/or RURR SCOs at RB13 between 0 to 2 and 8 to 9 feet bgs. The depth of petroleum impacts was delineated vertically (as evidenced by the absence of visual/olfactory observations, PID readings above background, and/or analytical data indicating petroleum-related VOCs at, or below, the groundwater interface) at RB04/RMW04, RB06, RB16/RMW16, RB17/RMW17, and RB20.

The horizontal extent of the petroleum impacts in the northern part of the site was delineated to the eastern, western, and northern site boundaries, and is defined by petroleum impacts in soil and groundwater at RB01/RMW01, RB02, RB03/RMW03, RB09/RMW09 through RB11/RMW11, RB12, RB13, RB14/RMW14, RB15, SB01/MW01, SB06/MW06, SB08/MW08, and SB11 through SB13 and the absence of petroleum impacts in RB04/RMW04, RB06, RB16/RMW16, RB17/RMW17, and RB20. The petroleum-impacted area is roughly 16,650 square feet and occupies about 55% of the site. Petroleum-related contamination is related to the historical and current petroleum bulk storage and/or the oil-water separators on-site.

2.4.5 On-Site and Off-Site Groundwater Contamination

PID headspace readings of up to 730 ppm, petroleum-like odors, and petroleum-related VOCs and/or SVOCs above SGVs were observed at monitoring wells MW01, MW06, MW08, RMW03, RMW09, RMW10, RMW11, and RMW14. Petroleum impacts to groundwater were delineated horizontally by the absence of visual/olfactory observations, PID headspace readings above background, and/or petroleum-related VOCs above SGVs in monitoring wells RMW04, RMW05, RMW16, and RMW17. Petroleum-related VOCs were localized to the northern part of the site and are related to the historical and current petroleum bulk storage at the site.

SVOCs were detected at concentrations above the SGVs in groundwater samples collected throughout the site and, with the exception of naphthalene, are likely related to entrained sediments from historic fill.

Dissolved metals (including iron, magnesium, manganese, and sodium) were detected at concentrations above the SGVs in groundwater samples collected throughout the site. Iron, magnesium, manganese, and sodium are attributable to regional groundwater conditions and are not indicative of a release.

2.4.6 Soil Vapor Contamination

All but one vapor sample contained PCE detections that may be indicative of an off-site chemical release associated with historical or current use of surrounding properties. Two vapor samples contained carbon tetrachloride that may also be indicative of an off-site chemical release associated with historical or current use of surrounding properties. The petroleum-related VOCs detected in soil vapor are likely related to the historical and current USTs and/or oil-water separators located on each lot. Additional soil vapor samples were collected in the sidewalks of East 144th Street and East 146th Street on February 14, 2020, as part of an SRI requested by the NYSDEC in a letter dated January 27, 2020. The results do not indicate soil vapor is migrating off-site.

2.5 Environmental and Public Health Assessments

2.5.1 Qualitative Human Exposure Assessment

Based on the CSM and the review of environmental data, complete on-site exposure pathways appear to be present, in the absence of engineering controls, in current and construction-phase conditions. The complete exposure pathways indicate there is a risk of exposure to humans from site contaminants via exposure to soil, groundwater, and soil vapor if mitigation and controls are not implemented.

Complete exposure pathways have the following five elements: 1) a contaminant source; 2) a contaminant release and transport mechanism; 3) a point of exposure; 4) a route of exposure; and 5) a receptor population. A discussion of the five elements comprising a complete pathway as they pertain to the site is provided below.

2.5.1.1 Current Conditions

Contaminant sources include historic fill with varying concentrations of SVOCs, metals, and pesticides; petroleum-impacted soil and groundwater containing varying concentrations of VOCs and/or SVOCs; and soil vapor with carbon tetrachloride, PCE, and petroleum-related VOCs.

Contaminant release and transport mechanisms include potential release and transport during penetration of the site cover for soil, groundwater, and soil vapor sampling. The potential receptor is the on-site sampling personnel, workers on Lot 1, and the nearby public. Under current conditions, the likelihood of exposure to humans is limited due to the following:

- The site footprint is covered by a continuous concrete building slabs and an asphalt-paved lot (Lot 3), which prevents direct contact with soil, groundwater, and soil vapor.
- The site is fenced off and warehouse buildings on Lots 3, 12, and 20 are vacant and locked, preventing access to the public.
- The warehouse building on Lot 1 is locked, preventing access to the public
- Sampling activities are completed in accordance with a HASP and CAMP that is designed to monitor and prevent exposure to soil, groundwater, and soil vapor contaminants.
- Groundwater at the site is not a potable water source.

2.5.1.2 Construction/Remediation Activities

During the excavation and foundation construction stage of redevelopment, which includes remediation, points of exposure include disturbed and exposed soil during excavation, dust and potential organic vapors generated during excavation, and contaminated groundwater encountered during excavation and/or dewatering operations. Routes of exposure include ingestion and dermal absorption of contaminated soil and groundwater, inhalation of potential organic vapors arising from contaminated soil vapor and groundwater, and inhalation of dust originating from contaminated soil. The receptor population includes construction and remediation workers and, to a lesser extent, the public adjacent to the site.

The potential for completed exposure pathways is present since all five elements exist; however, the risk can be avoided or minimized by applying appropriate health and safety measures during construction and remediation, such as monitoring the air for organic vapors and dust, using vapor and dust suppression measures, cleaning truck undercarriages and securing tarp covers before they leave the site to prevent off-site soil tracking, maintaining site security, and wearing the appropriate personal protective equipment (PPE).

A HASP, a RAWP, and a CAMP that include measures such as conducting an air-monitoring program, donning PPE, covering soil stockpiles, altering work sequencing, maintaining a secure construction entrance, proper housekeeping, and applying vapor and dust suppression measures to prevent off-site migration of contaminants during construction will be implemented. Such

measures will prevent completion of potential migration pathways for soil, groundwater, and soil vapor contaminants.

2.5.1.3 Proposed Future Conditions

For the proposed future conditions, residual contaminants may remain on-site, depending on the efficacy of the groundwater remedy. If residual impacts exist and engineering/institutional controls are not implemented, points of exposure could include potential cracks in the foundation of the proposed development, exposure during any future ground-intrusive work, or inhalation of vapors entering the building. The receptor population includes residential and commercial use occupants, employees, and the nearby community, including children. The possible routes of exposure can be avoided or mitigated by removal of contaminated soil or construction and maintenance of a site capping system (e.g., concrete building slab or at least 2 feet of clean soil), installation of a waterproofing/vapor barrier, and implementation of a Site Management Plan (SMP), if necessary, depending on the remedy.

2.5.1.4 Human Health Exposure Assessment Conclusions

1. Human exposure to site contaminants is limited under current conditions due to the surface cover, and access is limited to investigation workers, workers on Lot 1, and authorized guests. The primary exposure pathways are dermal contact, ingestion, and inhalation of soil, groundwater, or soil vapor by site investigation workers and, to a lesser extent, the nearby public. The exposure risks can be avoided or minimized by following the appropriate HASP and vapor and dust suppression measures, and by implementing a CAMP during investigation activities.
2. In the absence of mitigation and controls, there is potential for exposure during the construction-phase activities. The primary exposure pathways are:
3. Dermal contact, ingestion, and inhalation of contaminated soil, groundwater, or soil vapor by construction workers.
4. Dermal contact, ingestion, and inhalation of soil (dust) and inhalation of soil vapor by the community in the vicinity of the site.
5. These can be avoided or minimized by implementing CAMP and by following the appropriate HASP, vapor and dust suppression, site security measures, and following a NYSDEC-approved RAWP.
6. The existence of a complete exposure pathway for site contaminants to human receptors during proposed future conditions is unlikely, as contaminated soil will be excavated and transported to an off-site disposal facility, groundwater will be remediated, and residual

soil will be capped, if required, with an impermeable cover or 2 feet of clean soil. Regional groundwater is not used as a potable water source in New York City. The potential pathway for soil vapor intrusion into the building would be addressed by installation of a waterproofing/vapor barrier, which will minimize soil vapor infiltration.

7. It is possible that a complete exposure pathway exists for the migration of site contaminants to off-site human receptors during current, construction-phase, and future conditions. Monitoring and control measures have been and will continue to be used during investigation and construction to prevent completion of this pathway. Under future conditions, the site will be remediated and, if necessary, engineering and institutional controls will be implemented to prevent completion of this pathway.

2.5.2 Fish and Wildlife Remedial Impact Analysis

The site was assessed against the Fish and Wildlife Resources Impact Analysis (FWRIA) Decision Key to determine if an FWRIA was required, and it was not.

2.6 Interim Remedial Action

An Interim Remedial Action Work Plan (IRMWP) was submitted to the NYSDEC on December 13, 2019 and approved by the NYSDEC on December 18, 2019. The IRMWP was provided to document repositories on December 19, 2019, and the public notice fact sheet was made available by the NYSDEC on December 24, 2019.

The objective of the IRM is to remove sources of petroleum contamination and prevent potential additional environmental impacts to soil, groundwater, and soil vapor through the removal of the USTs, ASTs, oil-water separators, associated fuel lines, pumps, and appurtenances, and surrounding petroleum-impacted soil, to the extent practical.

The scope of the IRMWP includes the following:

- Decommissioning and removal of five USTs, five ASTs and four oil-water separators
- Excavation and off-site disposal of historic fill and petroleum-impacted soil in the vicinity of the USTs, ASTs and oil-water separators, if encountered
- Backfilling the excavation with clean soil (meeting the lower of PGW and RURR SCOs), recycled concrete aggregate (RCA), or virgin crushed stone to restore the site until the RAWP is implemented
- Preparation of the site for remediation including demolition of the existing buildings and abating hazardous building materials (ACM) and lead based paint (LBP), which is required to perform the full-scale remediation

- Preparation of a Construction Completion Report (CCR) to document satisfactory implementation of the IRMWP

2.7 Remedial Action Objectives

Based on the results of the RI, the following Remedial Action Objectives (RAO) have been identified:

2.7.1 Soil

RAOs for Public Health Protection:

- Prevent ingestion/direct contact with contaminated soil
- Prevent inhalation exposure to contaminants volatilizing from soil

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination

2.7.2 Groundwater

RAOs for Public Health Protection:

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards
- Prevent contact with, or inhalation of, volatiles from contaminated groundwater

RAOs for Environmental Protection

- Remove site source(s) of groundwater contamination
- Restore the groundwater aquifer, to the extent practicable, to pre-disposal/pre-release conditions

2.7.3 Soil Vapor

RAOs for Public Health Protection:

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at a site

3.0 DESCRIPTION OF REMEDIAL ACTION PLAN

This section presents an analysis of the proposed remedial alternatives that can potentially be achieved under the BCP. The proposed SCOs under Alternative I are the Part 375 UU and PGW SCOs under a Track 1 cleanup. Alternative II will be RURR and PGW SCOs under a Track 4 cleanup. Both alternatives are expected to achieve the established RAOs.

3.1 Technical Description of Alternative I – Track 1

Alternative I, a Track 1 remedy, would include the following tasks:

- Completion of in-situ groundwater treatment via injection of activated persulfate and oxygen release compound on the northern half of the site
- Abatement of hazardous materials (including asbestos-containing materials [ACM] identified in floor tile, pipe and boiler insulation, roofing materials, duct tar, window and door caulking, and various mastics; lead based paint [LBP] identified at various locations; and other universal waste and miscellaneous hazardous waste articles) and demolition of the existing buildings in order to prepare the site for remediation
- Screening of all excavated soil for visual, olfactory or instrumental indications of contamination during intrusive site work
- Construction of the support of excavation (SOE) system to facilitate the Track 1 remediation
- Dewatering and treatment, as necessary, to accommodate the removal of material that exceeds UU and PGW SCOs reach the proposed development subgrade depth, and facilitate foundation construction
- Excavation, stockpiling, off-site transport, and disposal of historic fill, petroleum-impacted soil, hazardous lead impacted soil, and native soil to achieve a Track 1 remediation (about 16 feet bgs on Lots 1 and 3 and 25 feet bgs on Lots 3, 12 and 20)
- Removal and decommissioning of any encountered USTs, associated appurtenances (e.g., fill lines, vent line, and electrical conduit) or other potential sources and disposal off-site
- Collection and analysis of bottom confirmation soil samples to confirm UU and PGW SCOs are achieved
- Importation of certified-clean material (i.e., material meeting UU and PGW SCOs), virgin stone, or RCA, or virgin, native crushed stone to backfill over-excavated areas to construction depth

- Development and implementation of a construction HASP (and CAMP for the protection of on-site workers, community/residents, and the environment during remediation and construction activities

The Alternative I remediation extent is shown on Figure 8 and is based on data presented in the RIR. UU and PGW SCOs are provided in Table 1. The requirements for each of the Alternative I tasks are described below.

3.1.1 Groundwater Treatment

Groundwater would be treated by in-situ chemical oxidation (ISCO) via injection of activated persulfate and oxygen release compound to reduce petroleum-related VOCs in groundwater. The oxidant would be applied after source removal directly to the petroleum-impacted groundwater via temporary injection points in the northern half of the site. The treatment depth would target the approximate depth of petroleum impacts (assumed to be about 8 to 18 feet bgs on Lots 1 and 3 and 18 to 28 feet bgs on Lots 12 and 20). Application of the oxidant would provide rapid and sustained degradation of the targeted petroleum-related VOCs.

3.1.2 Abatement of Hazardous Materials and Demolition

Abatement of hazardous materials (including asbestos-containing materials [ACM] identified in floor tile, boiler insulation, pipe insulation, roofing materials; lead based paint [LBP] identified on interior plaster walls, exterior brick walls, metal columns and beams; and other universal waste and miscellaneous hazardous waste articles) and demolition of the existing warehouse buildings in order to prepare the site for remediation.

3.1.3 Excavation, SOE and Fill and Soil Removal

VOCs, SVOCs, metals, and pesticides were detected in historic fill at concentrations that exceed the UU and PGW SCOs, which are shown on Table 1. To achieve Track 1, soil removal and disposal would extend from surface grade to depths of up to 25 feet bgs across the site. The estimated volume of material requiring removal and off-site disposal for a Track 1 cleanup is about 33,000 cubic yards. To accommodate removal of soil that exceeds UU and PGW SCOs, an SOE system would be constructed. Excavation would extend below the water table across the site footprint.

3.1.4 Dewatering

Dewatering of groundwater would be required to accommodate remedial excavation of soil that exceeds UU and PGW SCOs. The contractor would be responsible for dewatering in accordance with applicable New York City Department of Environmental Protection (NYCDEP) and NYSDEC regulations. Treatment of dewatering fluids may be required to reduce contaminant concentrations below NYCDEP/NYSDEC effluent limitations prior to discharge. The dewatering

and treatment system would be designed by the contractor's NYS-licensed Professional Engineer.

3.1.5 AST/UST System Removal

USTs encountered during remedial excavation would be decommissioned in accordance with DER-10, 6 NYCRR Part 613.9, NYSDEC Commissioner's Policy (CP)-51, and other applicable NYSDEC UST closure requirements. Petroleum-impacted soil would be excavated, stockpiled separately, characterized, and disposed of off-site at a permitted disposal facility. Following removal of any UST and associated grossly-impacted soil, if encountered, confirmation soil samples would be collected from the base and sidewalls of the excavation in accordance with DER-10. If the excavation were enlarged horizontally beyond the dimensions of the tank, additional confirmation soil samples would be collected as required. Following removal of the AST and any encountered USTs, the NYSDEC PBS registration would be updated. Closure documentation, such as contractor affidavits, bills of lading for sludge disposal, and tank disposal receipts, would be provided as appendices in the Final Engineering Report (FER).

3.1.6 Confirmation Soil Sampling

Per NYSDEC DER-10, confirmation soil samples would be collected from the excavation base at a frequency of one per 900 square feet. Sidewall samples would not be collected from the site perimeter because excavation would extend across the site footprint and support of excavation (SOE) measures (e.g., sheeting and lagging) would preclude access to soil sidewalls. An estimated 43 confirmation soil samples, plus quality assurance/quality control (QA/QC) samples, would be collected and analyzed for the Part 375 list of VOCs, SVOCs, PCBs, pesticides, cyanide, metals including hexavalent and trivalent chromium, 1,4-dioxane, and PFAS. A reduced-frequency endpoint sampling plan may be proposed, with supporting rationale, in accordance with DER-10 Section 1.6.

3.1.7 Excavation Backfill

Areas of the site requiring over-excavation to achieve a Track 1 cleanup would be backfilled to development grade (i.e., the grade required to complete construction of the foundation components). Excavation backfill would comply with 6 NYCRR Part 375-6.7(d) and NYSDEC DER-10 Section 5.4(e), Table 5.4(e)10, and Appendix 5.

Imported material would consist of fill that meets UU SCOs or other acceptable fill material such as virgin stone from a quarry or RCA. If RCA is imported to the site, it would come from a NYSDEC-registered facility in compliance with 6 NYCRR Part 360 registration and permitting requirements for the period of RCA acquisition. RCA imported from compliant facilities would not require chemical testing, unless required by NYSDEC under its terms for operation of the facility. Imported RCA must be derived from recognizable and uncontaminated concrete (less

than 10% by weight passing through a No. 80 sieve). RCA is not acceptable for, and would not be used as, site cover or drainage material. An estimated 21,000 cubic yards of backfill would be required to raise the site to development grade upon completion of the Track 1 remediation.

3.1.8 On-Site Worker, Public Health, and Environmental Protection

A site-specific HASP would be enforced during excavation and foundation construction to protect on-site workers from accidents and acute and chronic exposures to the identified contaminated media. Public health would be protected by implementing and enforcing dust, odor, and organic vapor control and monitoring procedures included in the CAMP. The CAMP would include continuous perimeter monitoring of dust and organic vapor using DustTrak aerosol monitors and PIDs capable of recording data and calculating 15-minute averages. A Langan field representative would monitor site perimeters for visible dust and odors. The environment would be protected by implementing and enforcing the appropriate soil erosion prevention measures.

3.2 Technical Description of Alternative II – Track 4

Alternative II, a Track 4 remedy, would include the following tasks:

- Completion of in-situ groundwater treatment via injection of activated persulfate and oxygen release compound on the northern half of the site
- Abatement of hazardous materials (including asbestos-containing material [ACM] identified in floor tile, pipe and boiler insulation, roofing materials, duct tar, window and door caulking, and various mastics; lead-based paint [LBP] identified at various locations in the four buildings; and other universal waste and miscellaneous hazardous waste articles) and demolition of the existing buildings in order to prepare the site for remediation
- Screening of all excavated soil for visual, olfactory or instrumental indications of contamination during intrusive site work;
- Construction of the SOE system to facilitate the Track 4 remediation
- Dewatering and treatment, as necessary, to accommodate the removal of material that exceeds SCOs, reach the proposed development subgrade depth, and facilitate foundation construction
- Excavation, stockpiling, off-site transport, and disposal of historic fill and native soil to achieve a Track 4 cleanup. Installation of excavation support will be required. The following soil types must be removed to achieve a Track 4 cleanup:
    - Soil in the upper two feet of material that exceeds the RURR SCOs
    - Soils above the groundwater table that exceeds the PGW SCOs, as defined by 6 NYCRR Part 375-6.8 for those contaminants found in site groundwater

above SGVs. Soils below the groundwater table that exceeds the PGW SCOs, as defined by 6 NYCRR Part 375-6.8 for those contaminants found in site groundwater above SGVs will be treated via an in-situ chemical oxidation program.

  - Soil that exceeds the 6 NYCRR Part 371 hazardous criteria for lead
  - Soils that create a nuisance condition, as defined in Commissioner Policy CP-51 Section G

- Removal and decommissioning of any encountered USTs, associated appurtenances (e.g., fill lines, vent line, and electrical conduit) or other potential sources and disposal off-site
- Collection and analysis of bottom documentation soil samples in accordance with DER-10 to document post-excavation conditions in relation to PGW and RURR SCOs
- Importation of certified-clean material (i.e., material meeting the lower of protection of groundwater [PGW] and RURR SCOs), RCA, or virgin, native crushed stone to backfill over-excavated areas to construction depth
- Development and implementation of a HASP and CAMP for the protection of on-site workers, community/residents, and the environment during remediation and construction activities
- Establishment of use restrictions (institutional controls [IC]) including prohibitions on the use of groundwater from the site and prohibitions on sensitive site uses, such as farming or vegetable gardening in residual site soil, to mitigate future exposure pathways
- Establishment of engineering controls (EC), which include installation of a site cover system consisting of the concrete building foundation and/or a minimum of two feet of clean fill in areas not capped by the building foundation. A vapor barrier/waterproofing membrane will be installed as part of the composite cap, and will also serve to mitigate potential soil vapor intrusion into the planned building.
- Establishment of an approved SMP to ensure long-term management of ECs and ICs, including the performance of periodic inspections and certification that the controls are performing as they were intended. The SMP will include a provision for evaluation of the potential for soil vapor intrusion for any occupied buildings on the site, including a provision for implementing actions recommended to address exposures related to soil vapor intrusion.
- Recording of an Environmental Easement (EE) to memorialize the remedial action and the ECs and ICs to ensure that future owners of the site continue to maintain these controls as required

The Alternative II remediation extent is shown on Figure 9 and is based on data presented in the RIR and the proposed development plans. Track 4 RURR and PGW SCOs are provided in Table 2. The requirements for each of the Alternative II tasks are described below.

3.2.1 Soil and Groundwater Treatment

Soil below the groundwater table and groundwater would be treated with ISCO via injection or direct mixing of activated persulfate and oxygen release compound to reduce petroleum-related VOCs and SVOCs in soil and groundwater. The oxidant would be applied directly to the petroleum-impacted groundwater via direct injection or direct mixing with site soils in petroleum impacted areas. The treatment depth would target the approximate depth of petroleum impacts (assumed to be about 8 to 18 feet bgs on Lot 3 and 18 to 28 feet bgs on Lots 12 and 20). Application of the oxidant would provide rapid and sustained degradation of the targeted petroleum-related VOCs and SVOCs.

3.2.2 Abatement of Hazardous Materials and Demolition

Abatement of hazardous materials (including ACM identified in floor tile, boiler insulation, pipe insulation, roofing materials; LBP identified on interior plaster walls, exterior brick walls, metal columns and beams; and other universal waste and miscellaneous hazardous waste articles) and demolition of the existing warehouse buildings in order to prepare the site for remediation.

3.2.3 Dewatering

Localized dewatering of groundwater may be required to accommodate excavation of soil to reach the proposed development subgrade depth and excavation of soil that Track 4 RURR and PGW SCOs. The contractor would be responsible for dewatering in accordance with applicable regulations. Treatment of dewatering fluids may be required to reduce contaminant concentrations below NYCDEP/NYSDEC effluent limitations prior to discharge. The dewatering and treatment system would be designed by the contractor's NYS-licensed Professional Engineer.

3.2.4 Fill and Soil Removal

VOCs, SVOCs, metals, and pesticides were detected in historic fill and native soil at concentrations that exceed the Track 4 PGW (for compounds exceeding the SGVs in groundwater) and RURR SCOs, which are shown on Table 2. To achieve Track 4, soil removal and disposal would extend from surface grade to depths ranging from about 2 feet bgs on Lot 1, 8 to 10 feet bgs on Lot 3, and 18 to 20 feet on Lots 12 and 20. Track 4 PGW and RURR exceedances at 15 feet bgs in RB16 and 6 feet bgs in RB17 will be excavated as part of the sloped excavation. The estimated volume of material requiring removal and off-site disposal for a Track 4 cleanup is about 13,000 cubic yards.

3.2.5 AST/UST System Removal

USTs encountered during remedial excavation would be decommissioned in accordance with DER-10, 6 NYCRR Part 613.9, NYSDEC Commissioner's Policy (CP)-51, and other applicable NYSDEC UST closure requirements. Petroleum-impacted soil would be excavated, stockpiled separately, characterized, and disposed of off-site at a permitted disposal facility. Following removal of any UST and associated grossly-impacted soil, if encountered, confirmation soil samples would be collected from the base and sidewalls of the excavation in accordance with DER-10 to document remaining soil conditions. Following removal of the AST and any encountered USTs, the NYSDEC PBS registration would be updated. Closure documentation, such as contractor affidavits, bills of lading for sludge disposal, and tank disposal receipts, would be provided as appendices in the FER.

3.2.6 Documentation Soil Sampling

Per NYSDEC DER-10, documentation soil samples would be collected from the excavation base at a frequency of one per 900 square feet to document remaining soil conditions. Sidewall samples would not be collected from the site perimeter because excavation would extend across the site footprint and SOE measures (e.g., sheeting and lagging) would preclude access to soil sidewalls. An estimated 43 documentation soil samples, plus QA/QC samples, would be collected and analyzed for the Part 375 list of VOCs, SVOCs, PCBs, pesticides, cyanide, metals including hexavalent and trivalent chromium, 1,4-dioxane and PFAS. A reduced-frequency endpoint sampling plan may be proposed, with supporting rationale, in accordance with DER-10 Section 1.6. Approval from the NYSDEC will be required before a reduced-frequency endpoint sampling plan is implemented.

3.2.7 Excavation Backfill

Areas of the site requiring over-excavation to achieve PGW and/or RURR SCOs would be backfilled to development grade (i.e., the grade required to complete construction of the foundation components). Excavation backfill would comply with 6 NYCRR Part 375-6.8(b) and NYSDEC DER-10 Section 5.4(e), Table 5.4(e)10, and Appendix 5.

Imported material would consist of fill that meets the lower of protection of groundwater (PGW) and RURR SCOs or other acceptable fill material such as virgin stone from a quarry or RCA. If RCA is imported to the site, it would come from a NYSDEC-registered facility in compliance with 6 NYCRR Part 360 registration and permitting requirements for the period of RCA acquisition. RCA imported from compliant facilities would not require chemical testing, unless required by NYSDEC under its terms for operation of the facility. Imported RCA must be derived from recognizable and uncontaminated concrete (less than 10% by weight passing through a No. 80

sieve). RCA is not acceptable for, and would not be used as, site cover or drainage material. An estimated 3000 cubic yards would be required to raise the site to development grade.

3.2.8 On-Site Worker, Public Health, and Environmental Protection

A site-specific HASP would be enforced during excavation and foundation construction to protect on-site workers from accidents and acute and chronic exposures to the identified contaminated media. Public health would be protected by implementing and enforcing dust, odor, and organic vapor control and monitoring procedures included in the CAMP. The CAMP would include continuous perimeter monitoring of dust and organic vapor using DustTrak aerosol monitors and PIDs capable of recording data and calculating 15-minute averages. A Langan field representative would monitor site perimeters for visible dust and odors. The environment would be protected by implementing and enforcing the appropriate soil erosion prevention measures.

3.2.9 Institutional Controls, Engineering Controls and Site Management

An EE would be recorded to impose the IC/ECs that are part of the selected remedy and that would be binding upon all subsequent owners and occupants of the property. The ICs would restrict the site's use to restricted-residential use and would include notice-of-use restrictions regarding excavation requirements related to site soil and groundwater monitoring. The ECs that would be included in the EE would include maintenance of the cover system described in this alternative and proper soil and groundwater management during post-development excavation work (if any). A vapor barrier/waterproofing membrane would be installed as part of the cover system to mitigate potential soil vapor intrusion into the planned building. The vapor barrier membrane would be installed under the slab of the entire proposed building and along all foundation sidewalls to grade, would be a minimum 20 mil thickness, and would be compatible with petroleum and chlorinated VOC contaminants. The SMP would identify all use restrictions and long-term monitoring and maintenance requirements to ensure the ICs and/or ECs remain in place and are effective.

3.3 Evaluation of Remedial Alternatives

The following is an evaluation of the proposed remedial alternatives based on the NYSDEC BCP remedy evaluation criteria listed below. The first two criteria are considered "threshold criteria" and the remaining criteria are "balancing criteria". A remedial alternative must meet the threshold criteria in order to be considered and evaluated further under the balancing criteria.

- Protection of human health and the environment
- Compliance with standards, criteria, and guidance (SCG)
- Short-term effectiveness and impacts
- Long-term effectiveness and permanence

- Reduction of toxicity, mobility, or volume of contaminated material
- Implementability
- Cost effectiveness
- Community acceptance
- Land use

3.3.1 Protection of Public Health and the Environment

Alternative I – The remedy would eliminate pathways of exposure from on-site contaminated media. Remediating the site to Track 1 standards would result in the removal of on-site soil with contaminant concentrations above UU and PGW SCOs. The dissolved- and sorbed- phase petroleum contamination in the northern half of the site would be remediated via in-situ groundwater treatment. Any USTs that are encountered would be decommissioned, removed and disposed off-site, and petroleum-impacted material would be excavated and disposed off-site.

The RAOs for public health and environmental protection would be met through the removal of contaminated media, which would eliminate possible ingestion, inhalation, or dermal contact. Since no engineering or institutional controls would be required for this remedy to maintain the site in the future, this remedy is the most protective of human health and the environment.

Alternative II – The Track 4 remedy would provide similar overall protection to public health and the environment to Alternative I. Completing a Track 4 remedy would result in the removal of about 13,000 cubic yards of soil that exceed Track 4 PGW and RURR SCOs to the proposed remedial depth. The remaining dissolved- and sorbed-phase petroleum contamination below excavation depth in the northern half of the site would be remediated via in-situ groundwater treatment. Exposure would be further limited by the establishment of an EE, governed by an SMP. The RAOs for public health and environmental protection would be met through the combination of contaminant removal, ECs (including site capping), and ICs (including an EE and SMP).

Public health would be protected during remediation under both remedial alternatives by implementing and enforcing dust, odor, and organic vapor control and monitoring procedures when needed. The environment would be protected by implementing and enforcing soil management controls when needed during future site excavation (if any) and any other IC/ECs by implementation of the SMP and through enforcement of the EE.

3.3.2 Compliance with Standards, Criteria, and Guidance

Alternative I – Remediating the site to Track 1 standards would comply with all applicable SCGs listed in Section 4.1.1 because of the removal of all impacted on-site materials.

Alternative II – This remedy was designed to meet the requirements of a Track 4 cleanup. Remediation includes removal and treatment of site material to achieve Track 4 PGW and RURR SCOs, as set forth in DER-10, CP-51, and 6 NYCRR Part 375. Alternative II also complies with the restricted SCGs, but requires future site management through an SMP and EE.

Both remedial alternatives would comply with SCGs that involve protection of human health and the environment by implementing and enforcing a site-specific HASP during the remedy. Occupational Safety and Health Administration (OSHA) requirements for on-site construction safety would be followed by any site contractors performing work under Alternatives I or II.

3.3.3 Short-Term Effectiveness and Permanence

Alternative I - The most significant short-term adverse impacts and risks to the community would be the potential complications and risk involved with designing and constructing SOE. Potential impositions on roadway and pedestrian traffic associated with construction may be a result of the remedial excavation to achieve a Track 1 cleanup. Increased truck traffic and construction-related noise levels may be necessary to haul soil that exceeds UU and PGW SCOs to achieve Track 1 standards, relative to Alternative II.

The excavated soil and fill would require about 1,320 25-cubic-yard capacity truck trips. Implementing the Alternative I concept would require approximately 6 months of effort (assuming normal work hours). Truck traffic would be routed on the most direct course using major thoroughfares where possible and flaggers would be used to protect pedestrians at site entrances and exits. Waiting times associated with analysis of confirmation sampling and resampling may delay construction, leaving soil exposed for a longer time resulting in a potential increase in dust, odors, and/or organic vapor from the excavation and construction-related noise. The effects of these potential adverse impacts to the community, workers, and the environment would be minimized by implementing the respective control plans.

Alternative II - Alternative II would result in similar short-term adverse impacts and risks to the community for a shorter duration than Alternative I. The excavated soil and fill would require approximately 520 25-cubic-yard capacity truck trips (approximately 61% fewer truck trips than Alternative I). Implementing the Alternative II concept would require approximately 4 months of effort (assuming normal work hours). The shorter implementation period would mean fewer potential impacts to the community, such as a shorter period of truck traffic and less potential for exposure to contaminated media.

Under both remedial alternatives, dust would be controlled by the on-site application of water spray as needed. Engineering controls, such as slowing the pace of work, applying foam and/or dust suppressant, and/or covering portions of the excavation would be used to suppress odors/dust when required. Work would be modified or stopped according to the action levels defined in the CAMP. There would be fewer short-term impacts for Alternative II than Alternative I.

3.3.4 Long-Term Effectiveness and Permanence

Alternative I – A Track 1 remedy would remove from the site all contaminated media exceeding UU and PGW SCOs. Petroleum-impacted groundwater would be treated via in-situ groundwater treatment. Residual contaminated groundwater would be treated through monitored natural attenuation. In addition, groundwater in New York City is not used for drinking water. Because an EE and SMP are not required as part of the Track 1 remedy, Article 141 of the NYSDOH code would be relied upon to prevent ingestion of groundwater, which prohibits potable use of groundwater without prior approval. Future site use would be unrestricted; therefore, the long-term effectiveness of this remedy would eliminate environmental risks and satisfy the objectives of this criterion.

Alternative II – Contaminants in soil may remain at concentrations above UU SCOs; however, potential exposure to remaining contaminated soil would be prevented by the composite cover system. Long-term effectiveness and permanence of this alternative would be achieved through the implementation of the SMP and through enforcement of the EE. Potential exposure pathways for soil vapor that may migrate onto the site would be mitigated by installing a vapor barrier/waterproofing membrane. In addition, groundwater is not a source of potable water in New York City.

3.3.5 Reduction of Toxicity, Mobility, and Volume

Alternative I – The Track 1 remedy would permanently and significantly reduce the toxicity, mobility, and volume of contamination through excavation and off-site disposal of all soil exceeding UU and PGW SCOs, and dewatering/groundwater treatment, and discharge of groundwater to the New York City sewer system. Therefore, this remedy provides the highest level of toxicity, mobility and volume reduction of contaminated material.

Alternative II – The Track 4 remedy would significantly reduce the toxicity, mobility, and volume of contaminated material by removing the vast majority of the contaminated soil exceeding the UU, PGW, and RURR SCOs. Soil exceeding PGW and RURR SCOs may remain below the remedial depth.

Groundwater treatment will be completed under both alternatives.

3.3.6 Implementability

Alternative I – Implementing a Track 1 remedy would be technically challenging because of SOE and dewatering requirements associated with the protection of sidewalks and streets. The hardship associated with construction of the SOE system and dewatering would be significant. This remedy would include groundwater treatment but would consist primarily of excavation with standard bucket excavators. The availability of local contractors, personnel, and equipment suitable to working in a structurally challenging environment is high due to the frequency of this type of remediation in the region. Schedule extensions and additional costs associated with construction of SOE for remedial excavation are expected. Additionally, if deeper contamination above UU and PGW SCOs is encountered below proposed excavation depths and requires over-excavation, the additional costs and delays incurred to remediate the site would not outweigh the benefit of achieving a restricted use remediation that includes implementation of long-term engineering and institutional controls. Additional coordination between trades may be required. This alternative is not considered practical.

Alternative II – The technical feasibility of implementing the Alternative II remedy is greater than that of Alternative I, as the extend of the SOE system, dewatering, and excavation would be reduced to achieve the Track 4 cleanup. This alternative would consist of in-situ groundwater treatment in the northern half of the site, excavation with standard bucket excavators, and installation of a vapor barrier/waterproofing membrane. The availability of local contractors, personnel, and equipment suitable to working in a structurally challenging environment is high due to the frequency of this type of remediation in the region. Additional coordination between trades may be required. This alternative is considered feasible.

3.3.7 Cost Effectiveness

Alternative I – Based on the assumptions detailed for Alternative I, the estimated remediation cost of a Track 1 Cleanup is about $25.8 million. Because the site would be remediated to UU and PGW SCOs, there are no long-term operation, maintenance, or monitoring costs associated with the proposed remedy. This alternative is the most costly because of additional time and costs associated with handling and disposal of fill and soil above UU and PGW SCOs, SOE, and dewatering. Table 3 details the individual cost components used to arrive at this cost estimate.

Alternative II – Based on the assumptions detailed for Alternative II, the estimated remediation cost of a Track 4 Cleanup is about $9.3 million. The cost of SOE is only included to the extent that remedial excavation is required. This alternative is about 64% less expensive over the long term than a Track 1 remedy because the costs for handling and disposal of soil above UU and PGW SCOs, extensive SOE, and site-wide dewatering would not be incurred. Alternative II is the most cost-effective alternative. Table 4 details the individual cost components used to arrive at this cost estimate.

3.3.8 Community Acceptance

Both remedial alternatives are expected to be acceptable to the community because the potential exposure pathways to on-site contamination would be eliminated or significantly reduced upon completion of the remedial actions. The end-use of the site would provide new commercial retail spaces, attractive residential spaces, and parking on an underutilized parcel. The selected remedy would be subject to a 45-day public comment period in accordance with the Citizen Participation Plan (CPP), included as Appendix C. Any substantive public comments received would be addressed before the remedy is approved.

3.3.9 Land Use

The current, intended, and reasonably anticipated future land use of the site and its surroundings are compatible with both remedial alternatives. The site is part of the Lower Concourse Rezoning. The proposed development will include mixed-use commercial and residential space, which is expected to cover the entire site footprint. The proposed development is consistent with zoning and land use in the area.

3.4 Selection of Preferred Remedy

Both alternatives would be protective of human health and the environment and would meet the remedy selection criteria. Alternative II would achieve all of the remedial action goals established for the redevelopment project, and would be more effective in the short-term. Alternative II would effectively reduce contaminant mobility and toxicity and would be similarly effective in the reduction of contaminant toxicity and volume. Alternative I would be more effective in the long-term because it would achieve unrestricted land use that would be free of long-term site management, ECs, ICs, an EE, and associated future costs that would be required under Alternative II; however, the technical challenges and additional costs associated with constructing the SOE, and short-term nuisances such as greater truck traffic make this Alternative less feasible than Alternative II.

Alternative I is preferred over Alternative II if it can be feasibly and practically implemented at a similar cost while providing greater overall protection to human health and the environment. However, the implementation of Alternative I is neither practical nor economically feasible. Alternative II is similarly protective of human health and the environment. If ICs and ECs are required, these controls should be easily implementable long term pursuant to an SMP and EE.

Alternative II is the selected remedy. Figure 9 depicts the Alternative II cleanup plan.

3.4.1 Zoning

According to the New York City Planning Commission Zoning Map 6a, the site is located within the Lower Concourse Special Mixed Use Paired District (M1-4/R8A). This paired district

promotes development and expansion of the longstanding mix of residential, commercial, industrial, and cultural use throughout the area. M1 districts typically include light industrial uses such as woodworking shops, repair shops, and wholesale service and storage facilities, and R8 districts promote residential development. Zoning is consistent with the proposed mixed-use development. The surrounding area is primarily commercial and industrial, but also includes residential buildings, public parks, day care centers, and schools.

3.4.2 Surrounding Property Uses

The current, intended, and reasonably anticipated future land use of the site and its surroundings are compatible with the selected remedy. Surrounding land uses include multi-story industrial and institutional buildings, residential and hotel buildings, vacant lots, and open space and outdoor recreation areas.

3.4.3 Citizen Participation

The CPP is discussed in Section 4.1.9 and the preferred alternative would be conducted in accordance with the approved CPP.

3.4.4 Environmental Justice Concerns

Per the "Potential Environmental Justice Areas in Southwest Bronx County, New York" map, the site is not located in a potential environmental justice area.

3.4.5 Land Use Designations

There are no federal or state land use designations.

3.4.6 Population Growth Patterns

The population growth patterns and projections support the proposed land use. The United States Census Bureau estimated a 3.4% increase in the population of the borough of The Bronx between April 2010 and July 2018. This represents the largest growth percentage amongst all NYC boroughs. The proposed land use includes residential dwellings, providing additional spaces for the increased population.

3.4.7 Accessibility to Existing Infrastructure

To construct the proposed development, the four warehouse buildings will be demolished. To demolish these structures, the property will be disconnected from its existing infrastructure. Upon completion of the proposed development, water and sewer service will be provided by NYC water and sewer utilities, and electric and natural gas services will be supplied by Consolidated Edison. The property is nearby New York City subway and bus routes.

3.4.8 Proximity to Cultural Resources

There are three City Landmarks listed sites within ½-mile of the site. The table below lists City Landmarks (L) within approximately ½-mile of the site. Two properties in the National Register (NR) of Historic Places within approximately ½-mile of the site are listed below as a resource type Building (B) or Structure (S). The proposed remedy is not anticipated to adversely impact these cultural resources.

Property/Site	Status	Address
Bronx Public School 31	L	425 Grand Concourse Bronx, NY
Bronx Post Office	L/B	558/560 Grand Concourse Bronx, NY
369th Regiment Armory	L	2360 Fifth Avenue New York, NY
145th Street Subway Station (IRT)	S	Under Lenox Avenue at the junction with 145th Street New York, NY
Sources: NYS Historic Preservation Office, New York City Landmark's Preservation Commission https://nyclpc.maps.arcgis.com/apps/webappviewer/index.html?id=93a88691cace4067828b1eede432022b, and National Park Service Database of Listed properties on the National Register, https://www.nps.gov/maps/full.html?mapId=7ad17cc9-b808-4ff8-a2f9-a99909164466		

3.4.9 Proximity to Natural Resources

The site is not located in close proximity to important federal, state, or local natural resources including waterways, wildlife refuges, wetlands, and critical habitats of endangered or threatened species. The nearest ecological receptor is the Harlem River that is located about 450 feet west of the site.

3.4.10 Off Site Groundwater Impacts

Municipal water supply wells are not present in this area of New York City; therefore, groundwater from the site cannot affect municipal water supply wells or recharge areas.

3.4.11 Proximity to Flood Plains

According to the National Flood Insurance Rate map for the City of New York published by the Federal Emergency Management (FEMA) (Community Panel No. 3604970083F, effective date September 5, 2007), the site is located in Zone X, which is designated for areas determined to be outside the 0.2% annual chance of flood.

3.4.12 Geography and Geology of the Site

Historic fill consisting predominantly of brown, fine- to medium-grained sand, with varying amounts of silt, clay, gravel, brick, coal, coal ash, slag, concrete, asphalt, glass, plastic, metal, ceramic tile, wood ash, and wood, was encountered across the site beneath the surface cover to depths ranging from about 2.5 to 24 feet bgs. Native soil encountered below historic fill consists predominantly of fine-to medium-grained sand with varying amounts of fine gravel and silt, and a clay layer varying in thickness between 1 and 7 feet, which was encountered at depths ranging between 13 and 24 feet. Groundwater elevations ranged from el 2.26 to el 3.12, which correspond to depths of about 12.08 and 18.95 feet bgs, respectively. Groundwater generally flows to the west toward the Harlem River.

3.4.13 Current Institutional Controls

The site was assigned an E-Designation for hazardous materials, air quality, and noise (E-227) as part of the June 2009 Lower Concourse Rezoning, pursuant to a City Environmental Quality Review (CEQR No. 08DCP071X). The New York City Mayor's Office of Environmental Remediation (NYCOER) is aware of the project's proposed development plans and involvement in the BCP.

3.5 Summary of Selected Remedial Actions

Alternative II, a Track 4 remedy, will include the following tasks:

- Completion of in-situ groundwater treatment via injection of activated persulfate and oxygen release compound on the northern half of the site
- Abatement of hazardous materials (including asbestos-containing material [ACM] identified in floor tile, pipe and boiler insulation, roofing materials, duct tar, window and door caulking, and various mastics; lead-based paint [LBP] identified at various locations in the four buildings; and other universal waste and miscellaneous hazardous waste articles) and demolition of the existing buildings in order to prepare the site for remediation
- Construction of the SOE system to facilitate the Track 4 remediation
- Screening of all excavated soil for visual, olfactory or instrumental indications of contamination during intrusive site work;
- Dewatering and treatment, as necessary, to accommodate the removal of material that exceeds SCOs, reach the proposed development subgrade depth, and facilitate foundation construction

- Excavation, stockpiling, off-site transport, and disposal of historic fill and native soil to achieve a Track 4 cleanup. Installation of excavation support will be required. The following soil types must be removed to achieve a Track 4 cleanup:
    - Soil in the upper two feet of material that exceeds the RURR SCOs
    - Soil above the groundwater table that exceeds the PGW SCOs as defined by 6 NYCRR Part 375-6.8 for those contaminants found in site groundwater above SGVs. Soil below the groundwater table that exceeds the PGW SCOs, as defined by 6 NYCRR Part 375-6.8 for those contaminants found in site groundwater above SGVs will be treated via an in-situ chemical oxidation program, as discussed in Section 5.5
    - Soil that exceeds the 6 NYCRR Part 371 hazardous criteria for lead
    - Soils that create a nuisance condition, as defined in Commissioner Policy CP-51 Section G
- Removal and decommissioning of any encountered USTs, associated appurtenances (e.g., fill lines, vent line, and electrical conduit) or other potential sources and disposal off-site
- Collection and analysis of bottom documentation soil samples in accordance with DER-10 to document post-excavation conditions in relation to PGW and RURR SCOs
- Importation of certified-clean material (i.e., material meeting the lower of protection of groundwater [PGW] and RURR SCOs), RCA, or virgin, native crushed stone to backfill over-excavated areas to construction depth
- Development and implementation of a HASP and CAMP for the protection of on-site workers, community/residents, and the environment during remediation and construction activities
- Establishment of use restrictions (institutional controls [IC]) including prohibitions on the use of groundwater from the site and prohibitions on sensitive site uses, such as farming or vegetable gardening in residual site soil, to mitigate future exposure pathways
- Establishment of engineering controls (EC), which include installation of a site cover system consisting of the concrete building foundation and/or a minimum of two feet of clean fill in areas not capped by the building foundation. A vapor barrier/waterproofing membrane will be installed as part of the composite cap, and will also serve to mitigate potential soil vapor intrusion into the planned building.
- Establishment of an approved SMP to ensure long-term management of ECs and ICs, including the performance of periodic inspections and certification that the controls are performing as they were intended. The SMP will include a provision for evaluation of the

potential for soil vapor intrusion for any occupied buildings on the site, including a provision for implementing actions recommended to address exposures related to soil vapor intrusion.

- Recording of an EE to memorialize the remedial action and the ECs and ICs to ensure that future owners of the site continue to maintain these controls as required

Remedial activities will be performed in accordance with this RAWP, and the Department-issued Decision Document. Deviations from the RAWP and/or Decision Document will be promptly reported to the NYSDEC for approval and fully explained in the FER.

4.0 REMEDIAL ACTION PROGRAM

4.1 Governing Documents

The primary documents governing the remedial action are summarized in this section.

4.1.1 Standards, Criteria, and Guidance

The following standards, criteria, and guidance are typically applicable to Remedial Action projects in New York State, and will be consulted and adhered to as applicable:

- 29 CFR Part 1910.120 – Hazardous Waste Operations and Emergency Response
- 6 NYCRR Part 371 – Identification and Listing of Hazardous Wastes
- 6 NYCRR Part 372 – Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities
- 6 NYCRR Subpart 373-4 – Facility Standards for the Collection of Household Hazardous Waste and Hazardous Waste from Conditionally Exempt Small Quantity Generators
- 6 NYCRR Subpart 374-1 – Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
- 6 NYCRR Subpart 374-3 – Standards for Universal Waste
- 6 NYCRR Part 375 – Environmental Remediation Programs
- 6 NYCRR Part 376 – Land Disposal Restrictions
- 6 NYCRR Part 750 – State Pollutant Discharge Elimination System (SPDES) Permits
- 12 NYCRR Part 56 – Industrial Code Rule 56 (Asbestos)
- CP-43 – Commissioner Policy on Groundwater Monitoring Well Decommissioning (December 2009)
- CP-51 – Soil Cleanup Guidance (2010)
- DER-10 – Technical Guidance for Site Investigation and Remediation (May 3, 2010)
- DER-23 – Citizen Participation Handbook for Remedial Programs (March, 2010)
- NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (October 2006)
- TOGS 1.1.1 – Ambient Water Quality Standards & Guidance Values and Groundwater Effluent Limitations

- USEPA OSWER Directive 9200.4-17 – Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites (December 1997)
- Screening and Assessment of Contaminated Sediment (Division of Fish, Wildlife and Marine Resources, June 2014)

4.1.2 Site Specific Health & Safety Plan

The Remediation Engineer (RE) prepared a site-specific HASP (Appendix D). The HASP will address site-specific contaminants and will apply only to remedial and construction-related work on-site. Contractors operating on the site are required to adhere to their own plans that, at a minimum, meet the requirements of the HASP. Remedial work performed under this plan will be in compliance with governmental requirements, including site and worker safety requirements mandated by the Federal Occupational Safety and Health Administration (OSHA). The HASP provides a mechanism for establishing on-site safe working conditions, safety organization, procedures, and PPE requirements during implementation of the remedy. The HASP meets the requirements of 29 CFR 1910 and 29 CFR 1926 (which includes 29 CFR 1910.120 and 29 CFR 1926.65). The HASP includes, but is not limited to, the following components:

- Organization and identification of key personnel
- Training requirements
- Medical surveillance requirements
- List of site hazards
- Excavation safety
- Drill rig safety
- Work zone descriptions and monitoring procedures
- Personal safety equipment and PPE requirements
- Decontamination requirements
- Standard operating procedures
- Protective measure plan
- CAMP
- Safety Data Sheets (SDS)

The Volunteer and associated parties preparing the remedial documents submitted to the State and those performing the construction work are responsible for the preparation of an appropriate HASP and for the appropriate performance of work according to that plan and applicable laws.

The HASP and requirements defined in this RAWP pertain to all remedial and invasive work performed at the site until the issuance of a Certificate of Completion. The Langan Site Safety Coordinator will be William Bohrer. If required for site workers, confined space entry will comply with all OSHA requirements to address the potential risk posed by combustible and toxic gasses. Langan personnel will not enter confined spaces.

4.1.3 Quality Assurance Project Plan

The RE prepared a Quality Assurance Project Plan (QAPP) that describes the quality control components that will ensure that the proposed remedy accomplishes the remedial goals, remedial action objectives, and is completed in accordance with the design specifications. The QAPP is provided as Appendix E and includes:

- Responsibilities of key personnel and their organizations for the proposed remedy
- Qualifications of the quality assurance officer
- Sampling requirements including methodologies, quantity, volume, locations, frequency, acceptance and rejection criteria
- Description of the reporting requirements for quality assurance activities including weekly quality assurance review reports, periodic quality assurance and quality control audits, and other report and data submissions

4.1.4 Construction Quality Assurance Plan

The RE prepared a Construction Quality Assurance Plan (CQAP) that describes the quality control components that will ensure that the proposed remedy accomplishes the remedial goals and RAOs, and is completed in accordance with the design specifications. Because the remedy is being accomplished concurrent with building construction, the contractor and construction manager will have the primary responsibility to provide construction quality. A list of engineering personnel involved in implementation of the CQAP and procedures that will be carried out by the remedial engineering team are identified below. Project personnel resumes are provided in Appendix F.

The following project personnel are anticipated to implement the RAWP.

Remediation Engineer (RE):	Jason Hayes, P.E.
Project Manager:	Julia Leung, P.E
Langan Health & Safety Officer:	Tony Moffa, ASP, CHMM, COSS
Langan Site Safety Coordinator:	William Bohrer, PG
Qualified Environmental Professional (QEP):	Brian Gochenaur, QEP
Field Team Leader:	Joshua Golding
Quality Assurance Officer:	Ryan Manderbach, CHMM

The QEP or RE will directly supervise Langan field representatives that will be on site during the remedial action to monitor particulates and organic vapor in accordance with the CAMP. Daily reports will be submitted to the NYSDEC and NYSDOH and will include reporting of any CAMP results that exceed the specified action levels.

The QEP or RE will directly supervise Langan field representatives who will meet with the Construction Superintendent on a daily basis to discuss the plans for that day and schedule upcoming activities. The field representative will document remedial activities in the daily report. This document will be forwarded to the Field Team Leader on a daily basis and to the Project Manager and the RE on a weekly basis.

The QEP or RE will directly supervise Langan field representatives who will screen the excavation with a PID during intrusive activities. PID readings will be noted in the record. PID readings that exceed action levels will be reported to the NYSDEC and NYSDOH in the daily reports. The field representative will collect the post-excavation soil samples in accordance with this RAWP.

A photo log will be kept to document construction activities by still photos. The photo log may also be used to record activities recorded in the daily report.

The project field book will be used to document sample collection and how it corresponds to the RAWP. Observations, field and/or laboratory tests will be recorded in the project field book or on separate logs. Recorded field observations may take the form of notes, charts, sketches, or photographs.

The Field Team Leader will maintain the current field book and original field paperwork during the performance of work. The Project Manager will maintain the field paperwork after completion and will maintain all submittal document files.

4.1.5 Soil/Materials Management Plan

The RE prepared a Soil/Materials Management Plan (SMMP) that includes detailed plans for managing soil/materials that are disturbed at the site, including excavation, handling, storage, transport and disposal. It also includes controls that will be applied to these efforts to mitigate nuisances (e.g., dust and odor) in compliance with applicable federal, state and local laws and regulations. The SMMP is further described in Section 5.4.

4.1.6 Storm-Water Pollution Prevention Plan

A Stormwater Pollution Prevent Plan (SWPPP) is not required because the site is less than 1 acre in size. Erosion and sediment controls will be in conformance with requirements presented in the New York State Guidelines for Urban Erosion and Sediment Control. Erosion and sediment controls will be implemented as necessary and are included in Appendix G. Best Management Practices (BMP) for soil erosion will be selected to minimize erosion and sedimentation off site from the start of the remediation to the completion of development. Erosion and sediment control measures will be implemented as described in Section 5.4.9. If required, dewatering fluids will be removed from the site and will be treated in accordance with a NYSDEC-approved SPDES permit prior to discharge into a combined sewer.

4.1.7 Community Air Monitoring Program

Community air monitoring will be conducted in accordance with the CAMP discussed in the HASP and in accordance with the NYSDOH Generic CAMP included as Appendix 1A in DER-10.

4.1.8 Contractor's Site Operations Plan

Prior to remediation, the RE will review plans and submittals for this remedial project (including those listed above and contractor and sub-contractor document submittals) and confirm that the plans and submittals are in compliance with this RAWP. The RE is responsible for documenting that contractor and subcontractor submittals for this remedial project are in compliance with this RAWP. Remedial documents will be submitted to NYSDEC and NYSDOH in a timely manner and prior to the start of work.

4.1.9 Citizen Participation Plan

Fact Sheets describing the Remedial Action proposed in the RAWP will be distributed through DEC Delivers, the NYSDEC's email listserv service. Additional Fact Sheets will be distributed to announce 1) the issuance of the Decision Document prior to the start of the Remedial Action, 2) the completion of the Remedial Action with a summary of the FER, and 3) the issuance of the Certificate of Completion for the site.

No changes will be made to the approved Fact Sheets authorized for release by the NYSDEC without written consent of the NYSDEC. Other information, such as brochures and flyers, will not be included with the Fact Sheet mailing. The CPP for this project is included in Appendix C.

Document repositories have been established at the following locations and contain all applicable project documents:

Bronx Community Board 1
Attn: Cedric Loftin, District Manager
3024 Third Avenue
Bronx, New York 10455
Phone: (718) 585-7117
Email: brxcb1@optonline.net
Office Hours: 9:00 a.m. to 5:00 p.m.

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Hours (call to verify):

Monday through Thursday	10:00 a.m. to 7:00 p.m.
Friday and Saturday	10:00 a.m. to 5:00 p.m.
Sunday	Closed

4.1.10 Green Remediation Principles

Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows:

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term
- Reducing direct and indirect greenhouse gases and other emissions
- Increasing energy efficiency and minimizing use of non-renewable energy
- Conserving and efficiently managing resources and materials
- Reducing waste, increasing recycling and increasing reuse of materials that would otherwise be considered a waste
- Maximizing habitat value and creating habitat when possible

- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development
- Additionally, to incorporate green remediation principles and techniques to the extent feasible in the future development at this site, any future on-site buildings will include, at a minimum, a 20-mil vapor barrier/waterproofing membrane on the foundation to improve energy efficiency as an element of construction

4.2 General Remedial Construction Information

4.2.1 Project Organization

Section 4.1.4 presents the anticipated project organization and associated roles, including key personnel, descriptions of duties, and lines of authority in the management of the RAWP. Information regarding the organization/personnel and their associated responsibilities is provided below. Resumes of key personnel involved in the Remedial Action are included in Appendix F.

4.2.2 Remedial Engineer

The RE for this project will be Jason Hayes, P.E. The RE is a registered professional engineer licensed by New York State. The RE will have primary direct responsibility for implementation of the remedial program for the site. The RE will certify in the FER that the remedial activities were observed by qualified environmental professionals under his supervision and that the remediation requirements set forth in the RAWP and any other relevant provisions of ECL 27-1419 have been achieved in full conformance with the RAWP. Other RE certification requirements are listed later in this RAWP.

The RE will coordinate the work of other contractors and subcontractors involved in aspects of remedial construction, including groundwater treatment, soil excavation, stockpiling, characterization, removal and disposal, air monitoring, dewatering treatment system installation and implementation, construction of ECs, emergency spill response services, import of backfill material, and management of waste transport and disposal. The RE will be responsible for all appropriate communication with NYSDEC and NYSDOH.

The RE will review pre-remedial plans submitted by contractors for compliance with this RAWP and will certify compliance in the FER. The RE will provide the certifications listed in Section 9.1.

4.2.3 Remedial Action Construction Schedule

The remedial action construction schedule is discussed below in Section 10 and is provided in Appendix H. The NYSDEC will be promptly notified of proposed changes, delays and/or deviations to the schedule.

4.2.4 Work Hours

The hours for operation of remedial construction will conform to the New York City Department of Buildings (NYCDOB) construction code requirements or according to specific variances issued by that agency. NYSDEC will be notified by the Volunteer of any variances issued by the NYCDOB. NYSDEC reserves the right to deny alternate remedial construction hours.

4.2.5 Site Security

The site perimeter will be secured with gated, signed, plywood fencing with points of entry and exit in accordance with NYCDOB and New York City Department of Transportation (NYCDOT) permits and requirements. The purpose of the fencing is to limit site access to authorized personnel, protect pedestrians from site activities, and maintain site security.

4.2.6 Traffic Control

Site traffic will be controlled through designated points of access along East 146th Street or Gerard Avenue. Access points will be continuously monitored and if necessary, a flagging system will be used to protect workers, pedestrians and authorized guests. Traffic will also adhere to applicable local, state, and federal laws.

4.2.7 Contingency Plan

Contingency plans, as described below, have been developed to effectively address unexpected discoveries of additional USTs or contaminated media.

4.2.7.1 Discovery of Additional USTs

Historical records and geophysical surveys identified evidence of oil water separators and USTs at the site. As a contingency, if additional USTs are discovered during remediation, they will be decommissioned in accordance with 6 NYCRR Part 612.2 and 613.9, and DER-10 section 5.5. Once the tank, its contents, and associated piping are removed, post-excavation soil samples will be collected per the NYSDEC DER-10 requirements, if deemed necessary by the NYSDEC and the RE. Additional post-excavation soil samples will not be collected where the excavation will extend further to the development depth. If encountered, petroleum-contaminated soil will be removed. UST closure documentation, such as contractor affidavits, bills of lading for sludge disposal, and tank disposal receipts, will be provided as appendices in the FER. The NYSDEC

PBS registration will be updated as necessary, depending on the type, number, and capacity of discovered tanks.

4.2.7.2 Discovery of Additional Contaminated Soil

During remediation and construction activities, the soil will be continuously monitored by the RE's field representatives using a PID as well as visual and olfactory field screening techniques to identify additional soil that may not be suitable for disposal at the NYSDEC-approved disposal facilities. If discovered, this material will be segregated and sampled in accordance with disposal facility requirements. If the facility is not permitted to receive the suspect materials, the material will be disposed of off-site at a permitted facility able to receive the material based on the characterization data.

Identification of unknown or unexpected contaminated media identified by screening during ground-intrusive site work will be promptly communicated by phone and email to the NYSDEC Project Manager. These findings will be detailed in the daily reports and the subsequent monthly BCP progress report.

4.2.8 Worker Training and Monitoring

Worker training and monitoring will be conducted in accordance with the site-specific HASP, included as Appendix D.

4.2.9 Agency Approvals

The site has an E-Designation for hazardous materials, air quality, and noise (CEQR Number 08DCP071X). The scope of work proposed in this RAWP fulfills requirements with the NYCOER for hazardous materials. New York City Department of Building (NYCDOB) New Building permit and New York City Department of Transportation (NYCDOT) permits are required for remedial construction and will be obtained prior to the start of remedial construction. New York City Department of Environmental Protection (NYCDEP) permits for water discharge will be obtained if required.

The planned end use for the site conforms to current zoning for the property as determined by New York City Department of Planning. A Certificate of Completion will not be issued for the project unless conformance with zoning designation is demonstrated.

4.2.10 NYSDEC BCP Signage

Signs are optional for BCP sites and is not planned to be displayed. If a sign is to be displayed, it must follow NYSDEC specifications for design and content. The NYSDEC Project Manager can provide details on signage protocol.

4.2.11 Pre-Construction Meeting with NYSDEC

Prior to the onset of construction, a meeting will be held between the NYSDEC, RE, Volunteer, Construction Manager, and Contractor to discuss project roles, responsibilities, and expectations associated with the NYSDEC-approved RAWP.

4.2.12 Emergency Contact Information

An emergency contact sheet with names and phone numbers is included in the HASP. That document will define the specific project contacts for use by NYSDEC and NYSDOH in the case of a day or night emergency.

4.2.13 Remedial Action Costs

The total estimated engineering and contractor costs for the Remedial Action is $9.3 million. An itemized and detailed summary of estimated costs for all remedial activity is attached as Table 4. This will be revised based on actual costs and submitted as an Appendix to the FER.

4.3 Site Preparation

4.3.1 Mobilization

Prior to commencing the remedial excavation, the Remediation Contractor will mobilize to the site and prepare for remedial activities. Descriptions of mobilization and site preparation activities may include the following:

- Identifying the location of all aboveground and underground utilities (e.g., power, gas, water, sewer, communications), equipment, and structures (as necessary to implement the remediation)
- Mobilizing necessary remediation personnel, equipment, and materials to the site
- Constructing one or more stabilized construction entrances consisting of nonhazardous material capped with a gravel roadway at or near the site exit, which takes into consideration the site setting and site perimeter
- Constructing an equipment decontamination pad for trucks, equipment, and personnel that come into contact with impacted materials during remedial activities
- Installing erosion and sedimentation control measures, as necessary
- Installing temporary fencing or other temporary barriers to limit unauthorized access to areas where remediation activities will be conducted

4.3.2 Erosion and Sedimentation Controls

Based on the size of the site and the planned excavation, select common erosion and sedimentation control practices will be necessary and are included in Appendix G. Best Management Practices (BMP) for soil erosion will be selected and implemented, including use of the NYS Standards and Specifications for Erosion and Sediment Control (August 2005); as needed, to minimize erosion and sedimentation off site. Silt fencing or hay bales will be installed around the perimeter of the remedial construction area, as required. Accumulated sediments will be removed as required to keep the barrier and hay bale check functional. All undercutting or erosion of the silt fence toe anchor shall be repaired immediately with appropriate backfill materials. Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

4.3.3 Monitoring Well and Soil Vapor Point Decommissioning

Existing groundwater monitoring wells will be properly decommissioned in accordance with NYSDEC policy CP-43 Groundwater Monitoring Well Decommissioning Policy. The exception is if the full length of the well is to be excavated during remediation and development. If required, well decommissioning will be performed by an experienced driller and logged by the driller and a Langan field representative. If conducted, decommissioning documentation will be provided in the FER. Soil vapor points were installed temporarily during the RI and were removed at the end of each sampling event.

4.3.4 Temporary Stabilized Construction Entrance(s)

Temporary stabilized entrances will be constructed along East 146th Street or Gerard Avenue. The entrances will be covered with gravel or RCA and graded so that runoff water will be directed to the site. Vehicles exiting construction areas will be cleaned using clean water or dry brushing, as needed, to remove site soil from the tires and undercarriages. The Contractor will protect and maintain the existing sidewalks and roadways at both site access points.

4.3.5 Utility Marker and Easements Layout

The Volunteer and its contractors are responsible for identifying utilities and easements that might be affected by the remedial work and implementation of all required, appropriate, or necessary health and safety measures under this RAWP. The Volunteer and its contractors are responsible for safe execution of all invasive and other work performed under this RAWP. The Volunteer and its contractors must obtain any local, state, or federal permits or approvals pertinent to such work that may be required to implement this RAWP. Approval of this RAWP by NYSDEC does not constitute satisfaction of these requirements.

The presence of utilities and easements on the site has been investigated by the Remedial Engineer. The Volunteer and its contractors are responsible for safe implementation of the planned work under this RAWP. Existing electrical utilities and water main utilities were turned off in anticipation of site remediation and therefore, unlikely to impact the planned work under this RAWP.

4.3.6 Sheeting and Shoring

Appropriate management of structural stability of on-site or off-site structures during remedial activities, including excavation, is the responsibility of the Volunteer and its contractors. The Volunteer and its contractors are responsible for safe execution of all invasive and other work performed under this RAWP. The Volunteer and its contractors must obtain any local, state, or federal permits or approvals that may be required to perform work under this RAWP. Further, the Volunteer and its contractors are responsible for the implementation of all required, appropriate, or necessary health and safety measures during performance of work under the approved RAWP.

4.3.7 Equipment and Material Staging

The Contractor will notify the RE and the Volunteer, in writing with receipt confirmed, at least 30 calendar days in advance of pending site mobilization. During mobilization, construction equipment will be delivered to the site, temporary facilities constructed, and temporary utilities installed. The Contractor will place and maintain temporary toilet facilities within the work areas for use by all site personnel.

4.3.8 Decontamination Area

The contractor will construct decontamination pads at each site entrance/exit planned for construction vehicle usage. The location of decontamination pads may change periodically to accommodate the contractor's sequencing of work. Where required, the pads will be constructed by the contractor to collect wastewater for off-site disposal or treatment and discharge, if generated during decontamination activities. The design will consider adequate space to decontaminate equipment and vehicles, and sloping and liners to facilitate collection of wastewater. Collected decontamination wastewater shall be either discharged in accordance with the contractor's NYCDEP permit or tested and transported to an off-site disposal facility that is permitted to accept this waste, in accordance with applicable local, state and federal regulations. The contractor will maintain the decontamination pad(s) throughout the duration of site work. Prior to demobilization, the contractor will deconstruct the pads and dispose of materials as required.

If the contractor uses high pressure washing methods, the contractor shall provide splash protection around the vehicle decontamination facility to prevent splatter and mist migrating off-

site during the vehicle decontamination process. Splash protection shall be temporary and stable and capable of being dismantled in the event of high winds.

4.3.9 Site Fencing

The site perimeter will be secured with gated, signed, plywood fencing maintained by the contractor. The purpose of the fencing is to limit site access to authorized personnel, protect pedestrians from site activities, and maintain site security.

4.3.10 Demobilization

After remediation and construction is completed, the Contractor will be responsible for demobilizing labor, equipment, and materials not designated for off-site disposal. The RE will document that the Contractor performs follow-up coordination and maintenance for the following activities:

- Removal of sediment and erosion control measures and disposal of materials in accordance with applicable rules and regulations
- Removal of remaining contaminated material or waste
- Equipment decontamination
- General refuse disposal

4.4 Reporting

Daily and monthly reports and an FER will be submitted to the NYSDEC as required to document the remedial action. Copies of daily and monthly reports will be included in the FER. The Project RE responsible for certifying all reports will be an individual licensed to practice engineering in New York State. Jason Hayes, P.E. of Langan, will have this responsibility. Should Mr. Hayes become unable to fulfill this responsibility, another suitably qualified Professional Engineer will take his place. In addition to the periodic reports and the FER, copies of all relevant contractor documents will be submitted to the NYSDEC.

4.4.1 Daily Reports

Daily reports will be submitted to NYSDEC and NYSDOH Project Managers during on-site remedial construction activities by the end of each day following the reporting period and will include:

- A description of daily activities made during the reporting day
- Locations of work and quantities of material imported and exported from the site
- References to an alpha-numeric map for site activities

- A summary of complaints with relevant details (names, phone numbers)
- A summary of CAMP findings, including trigger action levels, and
- An explanation of notable site conditions
-
- The NYSDEC assigned project number

Daily Reports will include a description of daily activities keyed to an alpha-numeric map for the site that identifies work areas. These reports will include a summary of air sampling results, odor and dust problems and corrective actions, and all complaints received from the public.

A site map that shows a predefined alpha-numeric grid for use in identifying locations described in reports submitted to NYSDEC is attached in Figure 2.

The NYSDEC assigned project number will appear on all reports.

Daily reports are not intended to be the mode of communication for notification to the NYSDEC of emergencies (accident, spill), requests for changes to the RAWP or other sensitive or time critical information; however, such conditions must also be included in the daily reports. Emergency conditions and changes to the RAWP will be addressed directly to NYSDEC Project Manager via personal communication.

4.4.2 Monthly Reports

Monthly reports will continue to be submitted to NYSDEC and NYSDOH Project Managers by the 10th day of the month following the reporting period and will include the following information, as well as the information required in the BCA:

- Activities relative to the site during the previous reporting period and those anticipated for the next reporting period, including a quantitative presentation of work performed (i.e. tons of material exported and imported, etc.)
- Description of approved activity modifications, including changes of work scope and/or schedule
- Sampling results received following internal data review and validation, as applicable
- An update of the remedial schedule including the percentage of project completion, unresolved delays encountered or anticipated that may affect the future schedule, and efforts made to mitigate such delays

4.4.3 Other Reporting

Photographs of remedial activities will be taken and submitted to the NYSDEC in digital (JPEG) format. Photographs will illustrate the remedial program elements and will be of acceptable quality. Representative photographs of the site will be provided. Field photographs will be included in daily reports, as necessary, and a comprehensive photograph log will be included in the FER. Upon request, photographs will be submitted to the NYSDEC and NYSDOH Project Managers on CD or other acceptable electronic media. CDs will have a label and a general file inventory structure that separates photographs into directories and sub-directories according to logical Remedial Action components. A photograph log keyed to photo file ID numbers will be prepared to provide explanation for all representative photographs.

Site record keeping for all remedial work will be appropriately documented. These records will be maintained on site at all times during the project and will be available for inspection by NYSDEC and NYSDOH staff.

4.4.4 Complaint Management Plan

The management plan for documenting complaints is detailed below.

Item	Description
Approach	Complaints regarding remediation or construction activities/operations to be minimized and mitigation measures implemented to reduce the incidence of complaints.
Objective	To manage environmental complaints from the community regarding construction or remediation.
Implementation Strategy/Mitigation Measures	All complaints will be documented on a complaint register. The register will be maintained as an ongoing record. The entry will include following information: • Time, date and nature of complaint; • Type of communication (telephone, letter, personal, etc.); • Name, contact address and contact number; • Response and investigation undertaken as a result of the complaint; and action taken and signature of responsible person. Each complaint will be investigated as soon as practical in relation to requirements.
Monitoring	A representative of the Volunteers or the RE will follow up on the complaint within two weeks of receipt to ensure it is resolved.
Reporting	Upon receipt and following the complaint investigation and resolution, the NYSDEC will be notified. Complaint resolutions will be documented in daily reports.
Corrective Action	Should an incident or failure to comply occur in relation to the management of environmental complaints, one or more of the following corrective actions will be undertaken as appropriate: • Conduct additional training of staff to handle environmental complaints • Investigate why the environmental complaint was not addressed within the specified time frame • Investigate complaint and action follow-up to results of investigation

4.4.5 Deviations from the RAWP

Necessary deviations from the RAWP will be coordinated with the NYSDEC in advance and will be documented in the FER. Notification will be provided to the NYSDEC by telephone/email for conditions requiring immediate action (e.g., conditions judged to be a danger to the surrounding community). Based on the significance of the deviation, an addendum to this RAWP may be necessary and will include:

- Reasons for deviating from the approved RAWP
- Approval process to be followed for changes/editions to the RAWP
- Effect of the deviations on the overall remedy

5.0 REMEDIAL ACTION: MATERIAL REMOVAL FROM SITE

Remediation will include the following material removal tasks:

1. Excavation of historic fill, petroleum-impacted soil, and hazardous lead impacted soil to achieve a Track 4 remediation (about 2 feet bgs on Lot 1, 8 to 10 feet on Lot 3 and 18 to 28 feet bgs on Lots 12 and 20). Track 4 PGW and RURR exceedances at 15 feet bgs in RB16 and 6 feet bgs in RB17 will be excavated as part of the sloped excavation.
2. Decommissioning and removal of unknown USTs or contaminant sources identified during earthwork.

5.1 Soil Cleanup Objectives

SCOs for the site will be the Track 4 RURR and PGW concentrations listed in Table 1. The following soil types must be removed above the groundwater table to achieve a Track 4 cleanup:

- Soil in the upper two feet of material that exceeds the RURR SCOs
- Soil above the groundwater table that exceeds the PGW SCOs, as defined by 6 NYCRR Part 375-6.8 for those contaminants found in site groundwater above SGVs. Soil below the groundwater table that exceed the PGW SCOs, as defined by 6 NYCRR Part 375-6.8 for those contaminants found in site groundwater above SGVs will be treated via an in-situ chemical oxidation program, as discussed in Section 5.5
- Soil that exceeds the 6 NYCRR Part 371 hazardous criteria for lead
- Soils that create a nuisance condition, as defined in Commissioner Policy CP-51 Section G

Residual site soil will be capped with a site cover system that will be installed and consist of the concrete building foundation, asphalt cover, and/or 2 feet of clean fill that meets the lower of PGW or RURR SCOs. Track 4 cleanup areas are shown in Figure 9.

Soil and materials management on-site and off-site will be conducted in accordance with the SMMP as described below.

5.2 Remedial Performance Evaluation (Documentation Sampling)

5.2.1 Soil Sampling Frequency

One documentation soil sample will be collected for every 900 square feet of excavation base site-wide in accordance with NYSDEC DER-10, or at an alternative frequency approved by NYSDEC. Sidewall samples will not be collected from the excavation perimeter because support of excavation measures (e.g., sheeting, lagging) will preclude collection of sidewall samples. An

estimated 43 documentation soil samples, plus QA/QC samples, will be collected to document remedial performance.

In the event over-excavation or hotspot removal is required, one sidewall soil sample will be collected for every 30 linear feet of sidewall in those areas.

5.2.2 Methodology

Documentation soil samples will be collected from the base of the excavations in accordance with NYSDEC DER-10 to document remedial performance and will be analyzed for the Part 375 list of VOCs, SVOCs, PCBs, pesticides, cyanide, metals including hexavalent and trivalent chromium, 1,4-dioxane, and PFAS.

5.2.3 QA/QC

Quality control procedures for documentation soil sampling are included in the QAPP (refer to Appendix E). Documentation sample analytical results will be provided in the NYSDEC's electronic data deliverable (EDD) format for EQuIS™. Guidance on the sampling frequency is presented in NYSDEC DER-10 Section 5.4.

The QA/QC procedures required by the NYSDEC Analytical Services Protocol (ASP) and SW-846 methods will be followed. This will include instrument calibration, standard compound spikes, surrogate compound spikes, and analysis of quality control samples. The laboratory will provide sample bottles, which will be pre-cleaned and preserved. Where there are differences in the SW-846 and NYSDEC ASP requirements, the NYSDEC ASP will take precedence.

5.2.4 DUSR

ASP Category B deliverables will be prepared for all remedial performance samples collected during implementation of this RAWP. Data Usability Summary Reports (DUSR) will be prepared by a qualified data validator and the findings will be reported in the FER.

5.2.5 Reporting

Analytical laboratories that analyze documentation soil samples, prepare results, and perform contingency sampling will be NYSDOH Environmental Laboratory Approval Program (ELAP)-certified laboratories. The FER will provide a tabular and map summary of all endpoint sample results and exceedances of SCOs.

5.3 Estimated Material Removal and Backfill Quantities

The estimated volume of soil requiring removal and off-site disposal for the Track 4 remedy is about 13,000 cubic yards. Over-excavation is not expected. In the event that over-excavation is

A "Bill of Lading" system or equivalent will be used for off-site movement of non-hazardous wastes and contaminated soils. This information will be reported in the FER. Hazardous wastes derived from the site, if any, will be stored, transported, and disposed of in compliance with applicable local, state, and federal regulations.

Appropriately licensed haulers, in compliance with applicable local, state, and federal regulations, will be used to transport the material removed from this site.

A waste characterization study will be performed for soil intended for off-site disposal in a manner suitable to the receiving facility and in conformance with applicable permits. Sampling and analytical methods, sampling frequency, analytical results, and QA/QC results will be reported in the FER. Data available for excavated material to be disposed of at a given facility must be submitted to the disposal facility with suitable explanation prior to shipment and receipt.

5.4.6 Materials Reuse On-Site

Soil excavated during the remedy may be reused on site if the requirements in this section are met. Grossly-impacted soil will not be reused. Reused soil must be non-hazardous and must meet the lower of DER-10 Table 6.8(b) PGW or RURR SCOs (shown in Table 2) and may not be used as a site cap. Soil will be analyzed in accordance with DER-10 Table 5.4(e) and analytical data will be provided to NYSDEC for review and approval prior to reuse on-site. Soil removed during implementation of the remedy or removed for grading or other purposes will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines. The Remedial Engineer will follow the procedures defined for materials reuse in this RAWP and unacceptable material will not remain on-site. Concrete crushing or processing on-site is prohibited.

Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the site is prohibited for reuse on-site. Reuse of soil will be coordinated in advance with the NYSDEC Project Manager. Material deemed unfit for reuse will be transported for off-site disposal.

5.4.7 Fluids Management

Liquids to be removed from the site, including dewatering fluids, will be handled, transported, and disposed of in accordance with applicable local, state, and federal regulations. Liquids discharged into the New York City sewer system will be addressed through approval by NYCDEP. Based on depth-to-groundwater observed during the RI, localized dewatering may be required to facilitate excavation of material that exceeds Track 4 SCOs and construction of foundation components and elevator pits. If necessary, a dewatering and treatment system will be designed by the Remediation Contractor's NYS-licensed Professional Engineer. For the remedy,