
INTERIM REMEDIAL MEASURE WORK PLAN

for

GREENPOINT MARINA 43-57 WEST STREET & 2-24 OAK STREET BROOKLYN, NEW YORK

NYSDEC BCP NO.: C224190

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1.0 INTRODUCTION

1.1 General

57 West LLC and 24 Oak LLC (the "Participants") entered into a Brownfield Cleanup Agreement (BCA) with the New York State Department of Environmental Conservation (NYSDEC) on September 12, 2014 to investigate and remediate a 3.98-acre (178,390-square-foot) property located at 43-57 West Street (Block 2567, Lot 1) and 2-24 Oak Street (Block 2570, Lot 36) in the Greenpoint neighborhood of Brooklyn, New York (the "site"). A site location map is provided as Figure 1.

To initiate the remediation, the Participants directed Langan to prepare this Interim Remedial Measures (IRM) Work Plan to address known environmental conditions and contaminant sources at the site. This IRM Work Plan was prepared to address petroleum impacts related to NYSDEC spill No. 13-08069 and resulting from releases from seven underground storage tanks (UST). The scope of this IRM Work Plan includes the following:

- Decommissioning and removal of seven registered (Petroleum Bulk Storage [PBS] No. 2-612246) USTs and update of the NYSDEC PBS registration status;
- Excavation, to the extent practicable, to remove grossly impacted petroleum material;
- Removal of residual light, non-aqueous phase liquid (LNAPL) from the open excavation;
- Demolition of a vacant masonry structure located north of the UST area to allow for additional removal of LNAPL and excavation of petroleum-impacted material;
- Collection of documentation soil samples from the base and sidewalls of all excavations;
- Backfilling of excavations, as necessary;
- Installation of three monitoring wells after excavation is complete for continued monitoring and potential recovery of residual LNAPL; and
- Closure of NYSDEC Spill No. 13-08069.

Locations of the known USTs are shown on the site plan provided as Figure 2.

This IRM Work Plan has been prepared in accordance with requirements of the New York State Brownfield Cleanup Program (BCP) and NYSDEC's May 2010 Division of Environmental Remediation (DER)-10 - Technical Guidance for Site Investigation and Remediation. The IRM will be completed in advance of completing a final remedy in accordance with the definition of an IRM (May 2010 DER-10):

***"Interim remedial measure" or "IRM"** means activities to address both emergency and non-emergency site conditions, which can be undertaken without extensive investigation and evaluation, to prevent, mitigate or remedy environmental damage or the consequences of environmental damage attributable to a site, including, but not limited to, the following activities: construction of diversion ditches; collection systems; drum removal; leachate collection systems; construction of fences or other barriers; installation of water filters; provision of alternative water systems; the removal of source areas; or plume control.*

1.2 Site Description

The site encompasses an area of about 3.98 acres (178,390 square feet) and comprises two trapezoidal-shaped lots and includes the northern and southwestern parts of Oak Street. Block 2567, Lot 1 (43-57 West Street; hereinafter referred to as the "northern lot"), is bordered by Noble Street to the north, West Street to the east, the southern part of Oak Street to the south, and the top of the riprap-stabilized shoreline of the East River to the west. Block 2570, Lot 36 (2-24 Oak Street, hereinafter referred to as the "southern lot"), is bordered by the northern part of Oak Street to the north, a parking lot and lumber facility to the east and south, and the top of the riprap-stabilized shoreline of the East River to the west. The elevation of the site varies from about el¹ 5 in the southwest to el 11 in the northeast. A site plan is provided as Figure 2.

The site is currently used for equipment storage including scaffolding, garbage containers, cranes, HVAC equipment, granite, and flatbed trucks. Improvements to the site include asphalt- and concrete-paved areas in the southern lot and eastern portion of the northern lot, and a riprap-stabilized shoreline along the East River. The site was previously occupied by five separate buildings that were demolished after a fire in 2006. The only remaining structure is an approximately 1,400-square-foot dilapidated masonry former coal silo located in the southwestern corner of the northern lot.

The USTs to be removed as part of this IRM Work Plan are located on Oak Street and a portion of the northern lot in the southwestern portion of the site. Petroleum impacts to be removed extend across the southern lot, northern lot and Oak Street.

¹ Elevations herein are in feet and referenced to the North American Vertical Datum of 1988 (NAVD88).

1.3 Redevelopment Plan

The purpose of the project is to develop an underutilized, contaminated parcel into a mixed-use residential and commercial development with open public spaces while implementing remedial measures that are protective of human health and the environment. The on-site development is anticipated to include four mixed-use buildings with towers ranging from 8 to 43 stories, open public space on the northern lot, and an esplanade along the East River.

1.4 Site History

The site is located in an area of historical industrial usage and has been used for manufacturing purposes since the late 1800s. Past uses of the site include a shipyard, manufacturing facility, a mill, and Greenpoint Terminal Corporation facility. Sanborn maps, dated 1905 and 1916, indicate oil tanks and an oil pump house in the northwest corner of the site. Sanborn maps from 1942 to 2007 indicate seven USTs beneath the western end of Oak Street. The USTs were uncovered and surveyed during the Remedial Investigation (RI) for the site.

Adjacent and surrounding properties were historically used for commercial and manufacturing purposes. Sanborn maps indicate surrounding properties were used for the Continental Iron Works, American Manufacturing Co., and a gasoline filling station.

1.5 Summary of Remedial Investigation Report Findings

Remedial investigation sampling was conducted between August 19 and December 14, 2015, in accordance with the NYSDEC-approved Remedial Investigation Work Plan (RIWP), to characterize the nature and extent of contamination at the site. The analytical results, findings, and conclusions of the RI were presented in the January 2016 draft RIR, which is undergoing NYSDEC review.

The RI consisted of the following:

1. Excavation to uncover the USTs and a survey of the tank extents;
2. Advancement of 23 soil borings (SB11 through SB33) and collection of 54 soil samples, including three duplicate samples;
3. Installation of 20 groundwater monitoring wells (MW11 through MW27, and MW31 through MW33) and collection of 21 groundwater samples, including two duplicate samples;
4. Installation of 12 soil vapor points (SV08 through SV19) and collection of 13 soil vapor samples, including one duplicate sample. An ambient air sample was also collected; and

5. Collection of six sediment samples from the East River site border, including one duplicate sample.

The findings and conclusions of the RIR are as follows:

1. Stratigraphy: Beneath the partial site surface cover (i.e., asphalt or concrete), overburden at the site includes a historic fill layer, which extends to a depth of about 6 feet below grade surface (bgs) throughout the majority of the site and to a maximum depth of about 10 feet bgs. The historic fill layer generally consists of light brown to brown fine- to medium-grained sand with varying amounts of gravel, brick, silt, concrete, asphalt, coal, slag, wood, and cobbles and/or boulders. Underlying the fill is light brown to tan fine- to medium-grained sand with trace silt and clay. Bedrock was not encountered during this investigation. Based on previous geotechnical investigations in the vicinity of the site, depth to bedrock is estimated at about 80 to 110 feet bgs.
2. Hydrogeology: Groundwater elevations recorded during the December 2013 Phase II ESI ranged from el 3.59 to el -0.28 feet or about 5 to 7 feet bgs. Groundwater elevations recorded during the RI sampling ranged from el 5.32 to el 0.53 feet or about 4 to 7 feet bgs. The groundwater elevation is highest in the eastern part of the site and appears to flow west toward the East River.
3. UST Investigation: The geophysical survey during the December 2013 Phase II ESI identified seven USTs, which are also indicated on the 1942 through 2006 Sanborn maps. A spill was reported to NYSDEC (Spill No. 1308069) on November 7, 2013 based on observation of LNAPL, petroleum-impacted soil, and an oily sheen on groundwater in the southwestern portion of the site (around the USTs primarily beneath Oak Street). Petroleum impacts are further described below. The USTs were uncovered and the UST extents were surveyed during the RI.
4. Soil Impacts:
 - a. Petroleum impacts were observed in the southwest portion of the site near the USTs (NYSDEC Spill No. 1308069). Petroleum-Impacted Soil – Grossly-impacted petroleum soil was observed in borings SB01, SB03, SB23, SB24, SB26, and SB27, and in test pits TP01, TP02, TP03, TP04, TP10, and TP12. In addition, soil with staining or odor was observed in borings SB21 test pit TP14. Volatile organic compounds (VOC) in petroleum-impacted soil did not exceed NYSDEC Unrestricted Use (UU) Soil Cleanup Objectives (SCO) and semivolatile organic compound (SVOC) concentrations were typical of historic fill concentrations (discussed below). VOCs in sediment samples along the East River shoreline

did not exceed UU SCOs and SVOC concentrations in sediment were not indicative of a petroleum release.

- b. Historic Fill – The historic fill layer contains concentrations of SVOCs, polychlorinated biphenyls (PCB), pesticides, and metals at concentrations that exceed their respective UU or Restricted Use Restricted-Residential (RURR) SCOs.
 - i. SVOCs were detected at concentrations above RURR SCOs within the fill layer throughout the site at levels considered typical of historic fill found in New York City, except for anomalously high concentrations, relative to the other site samples, in samples collected from boring SB06 and test pit TP16.
 - ii. PCB and pesticide concentrations were reported above UU SCOs, but below the RURR SCOs and are not considered contaminants of concern (COC).
 - iii. Metals were detected at concentrations above RURR SCOs within the fill layer throughout the site at concentrations typical of fill in New York City.
5. Groundwater Impacts: Groundwater was impacted with LNAPL and VOC, SVOC, and metal concentrations that exceeded NYSDEC Technical and Operational Guidance Series (TOGS) Class GA Ambient Water Quality Standards and Guidance Values (SGV).
 - a. Free product (LNAPL) was observed on groundwater in monitoring wells MW01 and MW03 and test pits TP01, TP03, TP10, and TP12 during the Phase II ESI and MW23, MW24, MW26, and MW27 during the RI. An oily sheen was observed on groundwater in test pits TP02, TP04, and TP14. The LNAPL was concentrated around the USTs and was delineated. Based on sediment samples collected from the East River and observations of the East River during the investigation, the LNAPL does not appear to be entering the East River.
 - b. Trichloroethene (TCE) was detected at a concentration above the Class GA SGV in one monitoring well, MW13, along the northern border of the site near Noble Street. The detection was less than an order of magnitude above the standard. No source of TCE was detected in site soil and the TCE source is likely off-site.
 - c. SVOCs were detected at concentrations exceeding Class GA SGVs in 8 of 24 groundwater samples. The exceeding sample locations were dispersed widely throughout the site, and are believed to be a result of entrained historic fill in

samples and not dissolved-phase contamination. SVOCs in groundwater are not COCs.

- d. Metals impacts to groundwater are generally consistent with regional groundwater quality and are not considered COCs.
6. Soil Vapor Impacts: Soil vapor sampling results indicate the presence of several VOCs including petroleum and chlorinated VOCs. Concentrations of chlorinated VOCs in soil vapor warrant monitoring and/or mitigation based on evaluation of the New York State Department of Health (NYSDOH) decision matrices.
7. Sufficient analytical data were gathered during the RI to establish site-specific soil cleanup levels and to develop a remedy for the site. The remedy will be described and evaluated in a Remedial Action Work Plan (RAWP) prepared in accordance with NYS BCP guidelines. The remedy will need to address petroleum impacts, historic fill impacted with metals and SVOCs, the potential for soil vapor intrusion from petroleum and chlorinated VOCs, and the removal and closure of USTs.

More details of the RI, including sample location and results maps, can be found in the Draft RIR provided under separate cover. NYSDEC requested additional sampling east of the LNAPL plume to be incorporated into an updated Draft RIR. This additional investigation occurred in August 2016.

2.0 QUALITATIVE HUMAN AND FISH/WILDLIFE EXPOSURE ASSESSMENT

Human health exposure risk was evaluated for both current and future site and off-site conditions, in accordance with the May 2010 NYSDEC Final DER-10 Technical Guidance for Site Investigation and Remediation. The assessment includes an evaluation of potential sources and migration pathways of contamination, potential receptors, exposure media, and receptor intake routes and exposure pathways.

In addition to the human health exposure assessment, NYSDEC DER-10 requires an on-site and off-site Fish and Wildlife Resources Impact Analysis (FWRIA) if certain criteria are met. Based on the requirements stipulated in Section 3.10 and Appendix 3C of DER-10, a FWRIA was not needed. The completed DER-10 Appendix 3C form is included as Appendix J.

2.1 Current Conditions

The site comprises two trapezoidal-shaped lots separated by Oak Street and encompasses an approximate area of 178,390 square feet (3.98 acres). The site is currently used for equipment storage, including scaffolding, garbage containers, cranes, HVAC equipment, granite, and flatbed trucks. Improvements to the site include asphalt- and concrete-paved areas in the southern lot and eastern portion of the northern lot, and a riprap-stabilized shoreline along the East River. The site was previously occupied by five separate buildings that were demolished after a fire in 2006. The only remaining structure is an approximately 1,400-square-foot, dilapidated former coal silo located in the southwestern corner of the northern lot.

2.2 Proposed Conditions

The proposed development includes remediation of the site and construction of four mixed-use residential and commercial buildings with towers ranging from 8 to 43 stories.

The remediation will be described in a RAWP, but is roughly anticipated to include:

- Removal and administrative closure of seven UST and related piping;
- Excavation and off-site disposal of grossly-impacted soil;
- Recovery of LNAPL from groundwater;
- Demolition of the existing coal silo and remnants from former buildings; and
- Implementation of remedial elements, as required, concurrent with development.

Proposed development plans are provided in Appendix A.

2.3 Summary of Environmental Conditions

Soil sample analysis revealed SVOCs, metals, pesticides, and PCBs at concentrations that exceeded their respective UU SCOs; SVOC and metal concentrations also exceed RURR SCOs in the historic fill layer. Historic fill material is present at depths ranging from surface grade to about 10 feet bgs. SVOC and metal concentrations were observed in the range of typical concentrations found in New York City historic fill, except for two locations represented by SB06 and TP16, where atypical concentrations were found. Petroleum-related soil impacts (e.g., black staining, petroleum-like odors, LNAPL) were observed in the southwestern portion of the site near the seven USTs, extending to a maximum depth of 10 feet bgs. Considering the proposed use, soil COCs include petroleum, SVOCs and metals.

Groundwater samples had concentrations of VOCs, SVOCs, metals, and dissolved metals that exceeded their respective NYSDEC TOGS SGVs. TCE was detected above the NYSDEC Class GA SGV in the sample collected from monitoring well MW13. SVOC exceedances in groundwater were attributes to entrained sediment in turbid samples. Dissolved metals were detected at concentrations above the NYSDEC TOGS SGVs throughout the site, but are consistent with regional groundwater conditions. LNAPL was detected in monitoring wells MW01, MW03, MW23, MW24, MW26, and MW27, and test pits TP01, TP03, TP10, TP12, and TP14. The groundwater COCs are LNAPL and TCE.

Several VOCs, including petroleum-related and solvent-related VOCs, were detected in soil vapor samples. Soil vapor results were evaluated using the NYSDOH decision matrices, and mitigation is recommended based on the concentrations of carbon tetrachloride, TCE, and 1,1,1-trichloroethane (1,1,1-TCA). The soil vapor COCs are carbon tetrachloride, TCE, and 1,1,1-TCA.

2.4 Conceptual Site Model

A conceptual site model (CSM) has been developed based on the findings of the RI. The purpose of the conceptual site model is to develop a simplified framework for understanding the distribution of impacted materials, potential migration pathways, and potentially complete exposure pathways, as discussed below.

2.4.1 Potential Sources of Contamination

Potential sources of contamination have been identified in Section 3.4 and include historic fill, the spill associated with the seven USTs, and historic site and off-site uses. The historic fill and historic site use is likely a source of SVOCs and metals in soil. The USTs (NYSDEC Spill No. 1308069) are a source of petroleum-related impacts to soil, soil vapor and groundwater in the southwestern corner of the site. VOC impacts to groundwater and soil vapor likely occurred

as a result of the use of solvents during historic use on adjacent or surrounding properties. No soil samples collected during investigations at the Site had concentrations of CVOCs above their respective UU SCOs.

2.4.2 Exposure Media

The impacted media include soil, groundwater, and soil vapor. Analytical data indicates that the soil is contaminated with SVOCs, metals, pesticides and PCBs. Groundwater impacts include VOCs, SVOCs, and metals. Soil vapor is impacted by VOCs.

2.4.3 Receptor Populations

The site is currently used for storage of equipment, including scaffolding, garbage containers, cranes, HVAC equipment, granite, and flatbed trucks. Access is limited to the current workers, authorized guests, and consultants investigating environmental conditions on the site. During site development, human receptors will be limited to construction and remediation workers, authorized guests visiting the site and the public adjacent to the site. Under future conditions, receptors will include the new building tenants, workers, and visitors to the residential properties, including children.

2.5 Potential Exposure Pathways – On-Site

2.5.1 Current Conditions

The site is currently improved with partial asphalt- and concrete-paved areas in the southwestern and eastern sections (about 50% of the site) with some additional areas covered with gravel and/or soil. Typical site activities are limited to industrial-type storage with deliveries dropped off and picked up intermittently, but not full-time occupancy. Workers accessing the site on this limited basis do not perform ground intrusive activities and exposure pathways through dermal absorption, inhalation, and ingestion are avoided.

Groundwater in this area of New York City is not used as a potable water source. There is a potential exposure pathway during groundwater sampling associated with site investigation. The potential pathway is through dermal absorption, inhalation and ingestion.

As there are no buildings on the site, accumulation of impacted soil vapor is not anticipated.

2.5.2 Construction/Remediation Condition

Construction and remediation may result in potential exposures to Site contaminants in the absence of a health and safety plan (HASP) and a Community Air Monitoring Plan (CAMP). Construction and remedial activities include demolition (of the concrete silo), excavation and off-site disposal of impacted soil, and construction of foundation components. In the absence

of a HASP and CAMP, this scenario presents the potential for exposure to soil COCs by construction and remediation workers via dermal absorption, ingestion, and inhalation of vapors and particulate matter.

Groundwater may be encountered during excavation by workers, and there is potential for exposure to groundwater COCs, in the absence of a HASP, to construction workers via dermal absorption, ingestion, or inhalation.

Soil vapor results indicated the presence of petroleum-related and chlorinated VOCs. In the absence of a HASP, workers may be exposed to soil vapor COCs via inhalation during construction. In the absence CAMP, activities may also result in exposure to the public adjacent to the Site through volatilization of vapors into the air and potential off-site migration.

2.5.3 Proposed Future Conditions

The proposed development will include residential, commercial and recreational uses. Upon completion of the new development, the entire site will be capped with a concrete building foundation, by asphalt/pavement or by landscaped areas covered with at least two feet of clean imported fill. There is no risk of ingesting groundwater COCs because the site and surrounding areas will continue to obtain their drinking water supply from surface water reservoirs located upstate and not from groundwater. Considering this, there are no potential pathways for soil and groundwater impacts.

In the absence of engineering controls (e.g., vapor mitigation system and/or ventilated parking garage), the presence of VOCs in the soil vapor creates potential for VOCs to intrude and accumulate in proposed site buildings, which would be an inhalation exposure pathway for future users.

2.6 Potential Exposure Pathways – Off-Site

In the absence of CAMP and a HASP, soil has the potential to be transported off-site by wind in the form of dust or on the vehicle or equipment tires leaving the site during development and remediation activities and create an exposure pathway to the off-site public. Under future conditions, the site soil would be capped by buildings, surface cover and clean soil. Groundwater flows to the adjoining East River, rather than towards the adjoining neighborhood, which precludes a complete exposure pathway for groundwater to the public adjacent to the site. In addition, groundwater in this area of New York City is not used as a source of drinking water.

2.7 Evaluation of Human Health Exposure

Based on the CSM and the review of environmental data, complete on-site exposure pathways appear to be present, in the absence of institutional and engineering controls, in current, construction and remediation, and future 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 institutional and engineering 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.

2.7.1 Current Conditions

Contaminants include the following: 1) historic fill with varying levels of SVOCs, metals, pesticides, and PCBs; 2) petroleum and USTs; 3) a CVOC in groundwater; and 4) CVOCs in soil vapor. Contaminant release and transport mechanisms include contaminated soil transported as dust, contaminated groundwater flow and volatilization of contaminants from the soil and groundwater matrices to the soil vapor phase, and existing soil vapor contaminants.

The site is currently used by tenants for industrial-type equipment storage. Workers are intermittently on site operating forklifts for loading and unloading of deliveries. Loading and unloading activities are primarily in the concrete or asphalt-paved areas, time on site is limited, and work is not ground intrusive; therefore, potential exposure is avoided. Under current conditions, a complete exposure pathway for investigation workers, completing ground intrusive sampling, exists due to subsurface soil, groundwater and soil vapor sampling. However, the risk is avoided or minimized by applying appropriate health and safety measures and implementing a HASP during site investigation activities. Groundwater is not accessible and is not used as a potable water supply in this area of New York City. The site property is kept locked and activity is limited to authorized guests.

In accordance with a HASP and CAMP, measures such as conducting an air-monitoring program, donning personal protective equipment (PPE), and applying vapor and dust suppression measures to prevent off-site migration of contaminants will be implemented as required. Such measures would prevent completion of potential migration pathways.

Under current conditions, there are no occupied structures on-site where soil vapor could potentially accumulate.

2.7.2 Construction/Remediation Activities

During development and remediation, points of exposure include disturbed and exposed soil during excavation, dust and organic vapors generated during excavation, and contaminated groundwater that will be encountered during excavation and dewatering operations. Routes of exposure include ingestion and dermal absorption of contaminated soil and groundwater, inhalation of organic vapors arising from contaminated soil and groundwater, and inhalation of dust arising from contaminated soil disturbance. The receptor population includes the construction and remediation workers, trespassers and, to a lesser extent, the public adjacent to the site.

The potential for completed exposure pathways is present because 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 before they leave the Site to prevent off-site soil tracking, maintaining Site security, and wearing the appropriate PPE.

In accordance with a HASP, a Soil/Materials Management Plan (SoMP), and a CAMP, 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 these potential migration pathways.

2.7.3 Proposed Future Conditions

For the proposed future conditions, some residual contaminants may remain on-site, depending on the remedy, and would, to a lesser extent, include those listed under current conditions. Contaminant release and transport mechanisms include volatilization of contaminants from the groundwater matrix to the soil vapor phase.

If institutional and/or engineering controls are not implemented, points of exposure include permeation of soil vapor through the concrete slab of the proposed development, and exposure during any future soil-disturbing activities. Routes of exposure may include inhalation of vapors entering the building. The receptor population includes the building tenants, residential property employees, visitors and maintenance workers.

The possible routes of exposure can be avoided or mitigated by removal of contaminant sources during remediation, installation of soil vapor mitigation measures (e.g., vapor barrier

and/or ventilated parking garage), construction and maintenance of a site capping system (e.g., impervious surface cover or at least two feet of clean imported soil) and implementation of a Site Management Plan.

2.7.4 Human Health Exposure Assessment Conclusions

1. Under current conditions, the primary exposure pathways are for dermal contact, ingestion and inhalation of soil by site investigation workers. The exposure risks can be avoided or minimized by following the appropriate health and safety and vapor and dust suppression measures.
2. In the absence of institutional and engineering controls, there are potential pathways of exposure during the construction and remediation activities. The primary exposure pathways are:
 - a. Dermal contact, ingestion and inhalation of contaminated soil, groundwater or soil vapor by construction workers.
 - b. Dermal contact, ingestion and inhalation of soil (dust) and inhalation of soil vapor by the nearby community in the vicinity of the site.

These can be avoided or minimized by performing community air monitoring and by following the appropriate health and safety, vapor and dust suppression and site security measures.

3. The existence of a complete exposure pathway for site contaminants to human receptors during proposed future conditions is unlikely, as: 1) a large quantity of contaminated soil will be excavated and transported to an off-site disposal facility; 2) whatever residual soil remains will be capped with an impermeable cover or two feet of clean soil; 3) groundwater is not used as a potable water source in New York City; and 4) the potential pathway for soil vapor intrusion into the building would be addressed through the use of soil vapor mitigation measures.
4. It is unlikely that a complete exposure pathway exists for the migration of site contaminants to off-site human receptors for current, construction phase, or future conditions. Monitoring and control measures will be used during investigation and construction to prevent completion of this pathway. Under future conditions, the site will be remediated and engineering and institutional controls will be implemented to prevent completion of this pathway.

3.0 SUMMARY OF INTERIM REMEDIAL MEASURE

The proposed IRM consists of the following tasks:

- Decommissioning and removal of seven registered (PBS No. 2-612246) USTs and update of the NYSDEC PBS registration status;
- Excavation, to the extent practicable, to remove grossly impacted petroleum material;
- Removal of residual LNAPL from the open excavation;
- Demolition of a vacant masonry structure located north of the UST area to allow for additional removal of LNAPL and excavation of petroleum-impacted material;
- Collection of documentation soil samples from the base and sidewalls of all excavations;
- Backfilling of excavations, as necessary;
- Installation of three monitoring wells after excavation is complete for continued monitoring and potential recovery of residual LNAPL; and
- Closure of NYSDEC Spill No. 13-08069.

Demolition of the vacant masonry structure cannot be completed until a permit is obtained from the Department of Buildings, which can take several months; therefore, the excavation and LNAPL recovery will be completed in two phases. The first phase will include the southern lot and other areas within the plume that can be excavated without undermining the structure. An estimated IRM schedule is provided in Appendix A. Proposed changes, delays, or deviations will be promptly reported to the NYSDEC.

The IRM described herein will be performed in accordance with applicable federal, state, and city regulations. A Construction Health and Safety Plan (CHASP) and Community Air Monitoring Plan (CAMP) will be implemented during the IRM. A CHASP is provided as Appendix B and the CAMP is provided as Appendix C.

3.1 Objectives and Rationale

The objective of the IRM is to initiate the immediate removal of contaminant sources and source material and thereby mitigate potential plume migration. The proposed IRM will prevent additional environmental impacts to site media (soil, groundwater, and soil vapor) through removal of the USTs, LNAPL, and petroleum-impacted material (to the extent practicable). The proposed IRM will also simultaneously prepare the southern lot for use by a new, temporary, commercial or industrial tenant and aid in the development of a final remedy.

3.1.1 Site Preparation

The site will be prepared by the Contractor for implementation of the proposed IRM. Activities to be performed by the Contractor will include, but are not limited to, the establishment of work zones, addition of support facilities, construction of decontamination facilities, installation of erosion and sediment controls, and implementation of site security measures (i.e., erection of security fencing or barriers around work zones and staging areas). The contractor will ensure that soil erosion and sediment control measures are in operation prior to the commencement of, and during all work operations contained in the proposed IRM.

Prior to intrusive activities, Dig Safely New York (811) will be contacted by the Contractor a minimum of three business days in advance of the work. Dig Safely New York will be informed of the nature of the work and the intent to perform excavation. The excavation will be sloped and sheeted as necessary to protect the adjacent shoreline to the west.

3.1.2 IRM Phase I – UST Removal and Remediation

During the first phase of the IRM, seven USTs located in the southwestern portion of the site and associated piping will be removed. If additional unknown USTs are encountered, they will be decommissioned and removed. Removal of the USTs will be performed in accordance with NYSDEC CP-51 Soil Cleanup Guidance and other applicable NYSDEC UST closure requirements. Following removal of USTs, the USTs will be registered and closed in the NYSDEC PBS database and FDNY affidavits of closure will be obtained by a licensed UST Installer/Remover.

Upon completion of UST removals, excavations will be inspected for the presence of petroleum-impacted soil and groundwater. LNAPL observed in the vicinity of the UST excavations will be removed using vacuum methods (or methods selected by the Contractor and approved by the Remediation Engineer [RE] in conjunction with NYSDEC) and characterized and disposed of off-site in accordance with all applicable regulations at a permitted disposal facility. Grossly impacted petroleum soil will be excavated, to the extent practicable, characterized and disposed of off-site in a likewise manner. Support of excavation to facilitate the contaminated material removal is expected to consist of a sheeting and shoring system (e.g., sheet pile wall, soldier piles and lagging, etc.) along the western portion of the excavation area abutting the riprap, and sloping along the rest of the excavation perimeter. For the purposes of the IRM, in the context of excavation the phrase “to the extent practicable” will mean that:

- the adjacent masonry structure foundation and the riprap-stabilized shoreline will not be damaged or put at risk;

- the excavation shall not extend outside of the property line;
- excavation will extend to a maximum of 1 to 2 feet below the water table.

Well point dewatering is not planned, but excess product with water accumulated within the excavation will be removed with sorbent materials and via vacuum truck as required and disposed of off-site. The proposed excavation extents are shown on Figure 3.

3.1.3 Building Demolition

Pending necessary approvals (i.e., Department of Buildings and NYSDEC Wetlands), the dilapidated building along the East River will be demolished by a licensed contractor. Demolition work will be done in accordance with applicable regulations. Concrete from above grade portions of this demolition will be crushed on-site and used as backfill, excluding visibly petroleum impacted material (if encountered). Concrete crushing procedures will be provided to NYSDEC in a forthcoming memo for approval by the Regional Materials Management Engineer. Specific crushing procedures will be provided to NYSDEC for approval prior to crushing. Below-ground concrete and masonry that is in contact with impacted site soil will be shipped off-site.

3.1.4 IRM Phase II – Remediation of Petroleum Impacts on Northern Lot

Following demolition of the masonry structure within the plume area, the Contractor will excavate additional grossly-impacted petroleum soil and recover LNAPL in areas previously inaccessible, to the extent practical. Upon completion of the excavations, the area will be inspected for the presence of LNAPL. LNAPL will be removed using vacuum methods (or methods selected by the Contractor and approved by the RE in conjunction with NYSDEC), characterized and disposed of off-site in accordance with all applicable regulations at a permitted disposal facility. Grossly impacted petroleum soil will be excavated, to the extent practicable, characterized and disposed off-site in a likewise manner. The proposed excavation extents are shown on Figure 3.

3.1.5 Post-Excavation Documentation Sampling

Post-excavation documentation samples will be collected from excavation sidewalls and bottom. A minimum of one sample per 30 linear feet of sidewall and one sample per 900 square feet of excavation bottom will be collected, in accordance with NYSDEC DER-10. Documentation samples will be analyzed for VOCs and SVOCs, as listed in NYSDEC CP-51 Soil Cleanup Guidance.

Based on these criteria, up to about 13 base and 16 sidewall confirmation samples, plus required QA/QC samples, would be collected. Samples will be collected from areas with the

greatest apparent contamination as evidenced by odors, staining, and/or PID readings. A Quality Assurance Project Plan discussing sample collection and analysis is included as Appendix D. The proposed excavation extents and documentation sample locations are shown on Figure 3.

3.1.6 Excavation Backfill

Backfill required to restore the excavation area to original grade will be imported to the site and comply with Section 2.8. The excavation area will be backfilled to about el 7 to match surrounding site grade. A demarcation layer (e.g., orange snow fencing, geotextile fabric) will be installed at the base of the excavation to delineate the line between imported backfill material and residual contaminated soil.

3.1.7 Monitoring Well Installation

Existing RI monitoring wells within the excavation area will be decommissioned via removal during the IRM. Following completion of the IRM, new groundwater wells will be installed in the remediation area that will be used to monitor for potential residual petroleum product. Four 4-inch-diameter monitoring wells will be installed (one within the tank area and one each to the west, northwest, and north of the UST area (locations may be revised based on field observations during the IRM)). Current and proposed monitoring well locations are shown on Figure 4.

As a post-IRM contingency, if recoverable LNAPL accumulates in the new monitoring wells, recovery methods (i.e. absorbent socks) will be implemented in coordination with NYSDEC. Potential recovered petroleum and petroleum-impacted disposable equipment (e.g., absorbent socks/pads) will be containerized (e.g., 55-gallon drums), characterized and disposed of at a facility permitted to accept this type of waste.

3.2 Remedial Activity Oversight

The IRM implementation will be overseen by a field engineer, geologist, or scientist under the supervision of the Remediation Engineer (RE). The RE is responsible for documenting that the contractor performs the work as specified in the IRM Work Plan and provides the proper documentation required by NYSDEC. These contractor documents will be submitted to the NYSDEC in the Construction Completion Report (CCR); which is described in Section 3.0.

The RE will provide full-time oversight of the IRM activities. The activities that occur during the IRM will be properly documented in monthly BCP progress reports and in the CCR as described in Section 3.0.

3.3 Soil Screening Methods

Visual, olfactory and instrumental soil screening and assessment will be performed by a field engineer, geologist, or scientist during excavations into known or potentially-impacted material. Instrumental screening will be performed with a PID equipped with a 10.6 electron Volt (eV) bulb and will be calibrated daily.

3.4 Waste Characterization

Prior to or during excavation, waste characterization samples will be collected from the material to be disposed of off-site. This activity will be coordinated by the RE and overseen by a field engineer, geologist, or scientist under the supervision of the RE. A driller or excavation contractor will mobilize to the site to advance borings or test pits, and the field engineer will collect samples considered representative of the material requiring disposal at a frequency consistent with disposal facility requirements. Petroleum-impacted liquids and LNAPL will be sampled as required by the disposal facilities.

Waste characterization samples will be submitted to an NYSDOH ELAP-certified laboratory for analysis in accordance with the QAPP provided in Appendix D.

3.5 Stockpile Methods

Soil stockpile areas, as needed for the different soil materials, will be constructed for staging of site soil, pending loading or characterization testing. Separate stockpile areas will be constructed to avoid comingling materials of differing waste types. Any impacted source material will be directly loaded into trucks for off-site disposal or stockpiled temporarily. All stockpile areas will meet the following minimum requirements:

- The excavated soil will be placed onto a minimum 10-mil thickness, low-permeability liner of sufficient strength and thickness to prevent puncture during use; separate stockpiles will be created where material types are different (e.g., petroleum-impacted material stockpiled in a contaminated soil area). The use of multiple layers of thinner liners is permissible;
- Equipment and procedures will be used to place and remove the soil that will minimize the potential to jeopardize the integrity of the liner;
- Stockpiles will be covered at the designated times (see below) with minimum 6-mil plastic sheeting or tarps which will be securely anchored to the ground – Stockpiles will be routinely inspected and broken sheeting covers will be promptly replaced;

- Stockpiles will be covered upon reaching their capacity of approximately 1,000 cubic yards until ready for loading – Stockpiles that have not reached their capacity will be covered at the end of each workday;
- Active stockpiles will be covered at the end of each workday;
- Each stockpile area will be encircled with silt fences and hay bales, as needed to contain and filter particulates from any rainwater that has drained off the soils, and to mitigate the potential for surface water run-off; and
- The stockpile areas will be inspected daily and noted deficiencies will be promptly addressed. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by NYSDEC.
- Water will be available on-site at suitable pressure for use in dust control.

3.6 Material Load Out and Transport

Non-hazardous, petroleum-impacted material will be handled, transported and disposed by a licensed hauler in accordance with applicable 6 NYCRR Part 360, General Provisions and 6 NYCRR Part 364, Waste Transporter Permits regulations and other applicable federal, state and local regulations. The waste removal contractor will provide the appropriate permits, certifications, and written commitments from disposal facilities to accept the material throughout the duration of the project. Petroleum-impacted material will be transported by a waste removal contractor who possesses a valid New York State Part 364 Waste Transporter Permit. Waste manifests will be used to track the material that is transported off-site. Haulers will be appropriately licensed and trucks will be properly placarded.

The RE will oversee the load-out of excavated material. Once the loading of a container, dump truck, or trailer has been completed, the material will be transported to the approved off-site disposal facility. Loaded vehicles leaving the site will be appropriately lined, securely covered, and tracked using a manifest system, in accordance with appropriate federal, state, local, and New York State Department of Transportation (NYSDOT) requirements (or other applicable transportation requirements), prior to leaving the site. If loads contain wet material capable of producing free liquid, free liquids will be stabilized prior to shipping off-site. A truck wash/cleaning area will be operated on-site, if necessary. The RE will be responsible for documenting that all outbound trucks will be washed/cleaned at the truck wash before leaving the site until the interim remedial action is complete. Truck wash waters impacted with petroleum will be collected and disposed of off-site in an appropriate manner. Locations where vehicles enter or exit the site shall be inspected daily for evidence of off-site sediment tracking.

Proposed in-bound and out-bound truck routes and proposed controlled construction entrance to work area are shown on Figure 5.

Proposed in-bound and out-bound truck routes to the Site are shown in Figure 5. This is the most appropriate route and takes into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting off- Site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport; [(g) community input [where necessary]]

Trucks will be prohibited from stopping and idling in the neighborhood outside the project Site.

Egress points for truck and equipment transport from the Site will be kept clean of dirt and other materials during Site remediation and development.

To the extent practical, queuing of trucks will be performed on-Site in order to minimize off-site disturbance. Off-Site queuing for idling trucks will be prohibited.

3.7 Material Off-Site Disposal

The RE will review submittals for proposed disposal facilities before any materials leave the site to document that the facility has the proper permits and to review their acceptance requirements. The following documentation will be obtained and reported by the RE for each disposal location used in this project to fully demonstrate and document that disposal of material derived from the site conforms to all applicable laws:

- 1) A letter from the RE or BCP Volunteer to the receiving facility describing the material to be disposed of and requesting formal written acceptance of the material. This letter will state that material to be disposed of is contaminated material generated at an environmental remediation site in New York State. The letter will provide the project identity and the name and phone number for the RE. The letter will include as an attachment a summary of all chemical data for the material being transported (include site characterization data); and
- 2) A letter from each receiving facility stating it is in receipt of the correspondence described above and is approved to accept the material. These documents will be included in the FER.

The quantity of material expected to be disposed off-site is estimated at about 3,000-3,500 cubic yards.

All soil/fill/solid waste excavated and removed from the Site will be treated as contaminated and regulated material and will be disposed in accordance with all local, State (including 6NYCRR Part 360) and Federal regulations. If disposal of soil/fill from this Site is proposed for unregulated disposal (i.e. clean soil removed for development purposes), a formal request with an associated plan will be made to NYSDEC's Project Manager. Unregulated off-site management of materials from this Site is prohibited without formal NYSDEC approval.

Material that does not meet Track 1 unrestricted SCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360-16 Registration Facility).

Non-hazardous historic fill and contaminated soils taken off-site will be handled, at minimum, as a Municipal Solid Waste per 6NYCRR Part 360-1.2

Historical fill and contaminated soils from the Site are prohibited from being disposed at Part 360-16 Registration Facilities (also known as Soil Recycling Facilities).

Soils that are contaminated but non-hazardous and are being removed from the Site are considered by the Division of Materials Management (DMM) in NYSDEC to be Construction and Demolition (C/D) materials with contamination not typical of virgin soils. These soils may be sent to a permitted Part 360 landfill. They may be sent to a permitted C/D processing facility without permit modifications only upon prior notification of NYSDEC Region 2 DMM. This material is prohibited from being sent or redirected to a Part 360-16 Registration Facility. In this case, as dictated by DMM, special procedures will include, at a minimum, a letter to the C/D facility that provides a detailed explanation that the material is derived from a DER remediation Site, that the soil material is contaminated and that it must not be redirected to on-site or off-site Soil Recycling Facilities. The letter will provide the project identity and the name and phone number of the Remedial Engineer. The letter will include as an attachment a summary of all chemical data for the material being transported.

The Final Engineering Report will include an accounting of the destination of all material removed from the Site during this IRM, including excavated soil, contaminated soil, historic fill, solid waste, and hazardous waste, non-regulated material, and fluids. Documentation associated with disposal of all material must also include records and approvals for receipt of the material. This information will also be presented in a tabular form in the FER.

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 Final Engineering Report.

Hazardous wastes derived from on-site will be stored, transported, and disposed of in full compliance with applicable local, State, and Federal regulations.

Appropriately licensed haulers will be used for material removed from this Site and will be in full compliance with all applicable local, State and Federal regulations.

Waste characterization will be performed for off-site disposal in accordance with receiving facility requirements and in conformance with applicable permits. Sampling and analytical methods, sampling frequency, analytical results and QA/QC methods will be reported in the CCR upon completion of the IRM and in the Final Engineering Report (FER) upon completion of the final remedy. All data available for soil/material to be disposed at a given facility will be submitted to the disposal facility with suitable explanation prior to shipment and receipt.

3.8 Backfill Import and Placement

Import material used to backfill the excavations will comply with DER-10 Section 5.4(e). If soil is imported, it will be sampled in accordance with Table 5.4(e)4 - Reuse of Soil, and analytical results will comply with the concentrations listed in DER-10, Appendix 5, for Restricted Use – Restricted Residential and SVOC concentrations shall comply with Protection of Groundwater SCOs. Virgin gravel, rock or stone may be imported without sampling if it contains less than 10% by weight passing through a size 80 sieve, contains no material greater than 4 inches in diameter, and is sourced from a permitted or registered mine or quarry. Recycled concrete aggregate (RCA) may be imported without sampling if it contains less than 10% by weight passing through a size 80 sieve and is sourced from an NYSDEC Part 360 registered facility. RCA and gravel, rock or stone will not require chemical testing if the above-listed requirements are met. It is anticipated that only RCA will be used for backfill during the IRM. Prior to its use on site, documentation regarding the source(s) of imported fill material must be provided to the NYSDEC for approval.

Prior to its placement, imported material will be screened for evidence of contamination (visual, olfactory and instrument). Material from industrial sites, spill sites, other environmental remediation sites and/or other potentially impacted sites will not be imported to the site. The import material will also meet applicable structural fill requirements. All materials proposed for import onto the site will be approved by the RE and will be in compliance with provisions in this IRM Work Plan prior to receipt at the site.

The Construction Completion Report and/or Final Engineering Report will include the following certification by the Remedial Engineer: "I certify that all import of soils from off-site, including

source evaluation, approval and sampling, has been performed in a manner that is consistent with the methodology defined in the IRM Work Plan”.

A demarcation layer (e.g., orange snow fence, geotextile fabric) will be installed at the base of the excavation prior to backfilling to delineate the backfill material from the residual contaminated soil.

3.9 Dust, Odor, Vapor and Nuisance Control Plan

This dust, odor, organic vapor and nuisance control plan was developed in accordance with the NYSDOH Generic Community Air Monitoring Plan (CAMP) and Occupational Safety and Health Administration (OSHA) standards for construction (29 Code of Federal Regulations [CFR] 1926). Remediation and construction activities will be monitored for dust and odors by the RE’s field engineer, scientist, or geologist. Continuous monitoring on the perimeter of the work zones for odor, VOCs, and dust will be required for all ground intrusive activities, such as soil excavation and handling activities.

The work zone is defined as the general area in which machinery is operating in support of remediation activities. A PID will be used to monitor the work zone during UST removal and for periodic monitoring for VOCs during post-excavation soil sampling.

The site perimeter will be monitored for fugitive dust emissions by visual observations as well as instrumentation measurements. Particulate or dust will be monitored continuously with real-time field instrumentation that will meet, at a minimum, the performance standards from DER-10 Appendix 1B.

Action levels for site worker respiratory use are set forth in Section 6.0 of the CHASP, included in Appendix B. Action levels for the protection of the community and visitors are discussed below in Section 2.9.1, and in the CAMP, which is included in Appendix C.

3.9.1 Dust, Odor and Vapor Control

Work practices to minimize odors and organic vapors include limiting the time that the excavations remain open, wetting exposed fill or soil, minimizing stockpiling of impacted-source soil, and minimizing the handling of impacted material. Offending odor and organic vapor controls may include the application of foam suppressants or tarps over the odor or petroleum source areas. Foam suppressants may include biodegradable foams that are applied over the source material for short-term control of the odor. If nuisance odors are identified, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events

and of all other complaints about the project. Implementation of all odor controls is the responsibility of the Remedial Contractor. Observance of non-compliance and issuance of halt of work orders is the responsibility of the Volunteer's Remedial Engineer, who is responsible for certifying the Final Engineering Report.

If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: (a) direct load-out of soils to trucks for off-site disposal; (b) use of chemical odorants in spray or misting systems; and, (c) use of staff to monitor odors in surrounding neighborhoods.

Where odor nuisances have developed during remedial work and cannot be corrected, or where the release of nuisance odors cannot otherwise be avoided due to on-site conditions or close proximity to sensitive receptors, odor control will be achieved by limiting the area of open excavations and application of covers to open excavations and stockpiles. If all else fails, sheltering excavation and handling areas under tented containment structures equipped with appropriate air venting/filtering systems will be considered.

VOCs will be monitored with a handheld PID in accordance with the CHASP and CAMP. If the action level is exceeded and adequate ventilation cannot be provided, work will cease and the potential affected portion of the work area will be evacuated until adequate mechanical ventilation can be implemented to control the hazard. Level C respiratory protection may be donned in accordance with the HASP if untrained personnel are not present and the action level is exceeded. The following actions will be taken based on VOC levels measured:

- If total VOC levels exceed 5 parts per million (ppm) above background for the 15-minute average at the perimeter, work activities will be temporarily halted and monitoring continued. If levels readily decrease (per instantaneous readings) below 5 ppm above background, work activities will resume with continued monitoring.
- If total VOC levels at the downwind perimeter of the hot zone persist at levels in excess of 5 ppm above background but less than 25 ppm, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps work activities will resume provided that the total organic vapor level 200 feet downwind of the hot zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less – but in no case less than 20 feet, is below 5 ppm above background for the 15-minute average.
- If the total VOC level is above 25 ppm at the perimeter of the hot zone, activities will be shut down.

The following actions will be taken based on visual observations and measured dust levels using a quantitative meter following minimum performance standards from DER-10 Appendix 1B:

- If the downwind particulate level is $100 \mu\text{g}/\text{m}^3$ greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression must be employed. Work may continue with dust suppression techniques provided that downwind PM10 levels do not exceed $150 \mu\text{g}/\text{m}^3$ above the background level and provided that no visible dust is migrating from the work area.
- If, after implementation of dust suppression techniques, downwind PM10 levels are greater than $150 \mu\text{g}/\text{m}^3$ above the background level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM10 concentration to within $150 \mu\text{g}/\text{m}^3$ of the upwind level and in preventing visible dust migration.

This plan will be implemented to control emissions of VOCs and nuisance odors. Specific VOC and odor control methods to be used on a routine basis will include limiting the time that the excavations remain open, minimizing stockpiling of impacted-source soil, and minimizing the handling of impacted material. If nuisance odors or vapors exceeding action levels set forth in the IRM Work Plan are identified off-site, work will be halted and the source of odors will be identified and corrected. Work will not resume until all VOCs or nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor and vapor events and of all other complaints about the project. Implementation of all odor and vapor controls, including the halting of work, will be the responsibility of the Remediation Contractor under the oversight of the RE, who is responsible for certifying the CCR.

3.10 Construction Health and Safety Plan

The RE prepared a site-specific CHASP for the IRM, which is included as Appendix B. The CHASP provides a mechanism for establishing on-site safe working conditions, safety organization, procedures, and personal protective equipment (PPE) requirements. The CHASP 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 listed below:

- Organization and Identification of key personnel;
- Training requirements;

- Medical surveillance requirements;
- List of site hazards;
- Excavation safety;
- Work zone descriptions and monitoring procedures;
- Personal safety equipment and protective clothing requirements;
- Decontamination requirements;
- Standard operating procedures;
- Contingency Plan; and
- Material Safety Data Sheets.

3.11 Notification

The NYSDEC will be notified at least 7 calendar days prior to commencement of IRM-related work. A preconstruction meeting will be coordinated between the RE, the Remediation Contractor, and the NYSDEC. This meeting must be coordinated prior to the implementation of this IRM Work Plan.

4.0 REPORTING

Upon completion of the IRM, a CCR will be prepared and submitted to the NYSDEC. The RE responsible for certifying all reports will be an individual licensed to practice engineering in the State of New York; Jason J. Hayes, P.E. of Langan will have this responsibility. Should Mr. Hayes become unable to fulfill this responsibility, another suitably qualified New York State professional engineer will take his place. All project reports will be submitted to the NYSDEC electronically as PDFs. Laboratory analytical data for documentation samples will be submitted in an electronic data deliverable (EDD) format that complies with the NYSDEC's electronic data warehouse standards.

4.1 Daily Reports

Daily reports will be prepared for the project file and for review by the NYSDEC Project Managers. Daily reports will include:

- An update of progress made during the reporting day;
- Locations of work and quantities of material imported and exported from the site;
- References to map for site activities;
- A summary of any and all complaints with relevant details (names, phone numbers);
- A summary of CAMP findings, including excursions; and
- An explanation of notable site conditions.

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 IRM Work Plan or other sensitive or time critical information; however, such conditions will also be included in the daily reports. Emergency conditions and changes to the IRM Work Plan will be addressed directly to the NYSDEC Project Managers via personal communication. If site conditions warrant, the RE may request to change from daily to weekly reports that include the above information.

4.2 Construction Completion Report

A CCR will be submitted to the NYSDEC Project Managers within 120 days of completing the IRM. The CCR will document the implementation of the IRM. The CCR will be incorporated into and referenced in the FER for the site when issued. The CCR will provide the following information:

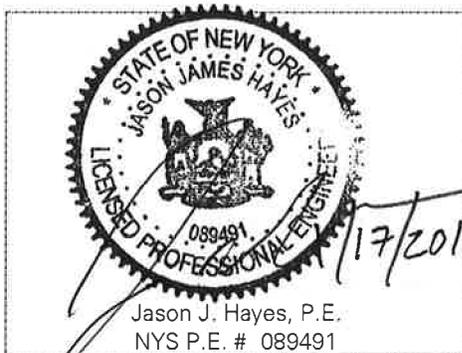
1. The RE will certify that:

- a. Data generated was useable and met the remedial requirements;
 - b. The remedial work conformed to the IRM Work Plan;
 - c. Dust, odor, and vapor control measures were implemented during invasive work and conformed with the IRM Work Plan; and
 - d. Remediation waste was transported and disposed in accordance with the IRM Work Plan.
 - e. Source approval and sampling of imported acceptable fill (not anticipated) was completed in a manner consistent with the methodology of the IRM Work Plan;
2. Description of any problems encountered and their resolutions;
 3. Description of changes in the IRM from the elements provided in the IRM Work Plan and associated design documents and the reasons for them;
 4. Description of the deviations from the approved IRM Work Plan;
 5. Listing of waste streams, quantity of materials disposed, and where they were disposed;
 6. List of the remediation standards applied to the remedial actions;
 7. Documentation of NYSDEC PBS database registry and closure;
 8. Affidavits of closure submitted to FDNY for removed USTs;
 9. Description of source and quality of fill;
 10. A summary of residual impacted material left on the site;
 11. A tabular summary of sampling results and all material characterization results and other sampling and chemical analysis performed as part of the IRM;
 12. Written and photographic documentation of all remedial work performed under this remedy;
 13. Copies of the submitted progress reports;
 14. Manifests and bills of lading for excavated materials transported off-site;
 15. A log of the destination of material removed from the site, including excavated impacted soil, historic fill, solid waste, hazardous waste, non-regulated material, and fluids; and
 16. Documentation associated with disposal of material must also include records and approvals for receipt of the material.

5.0 CERTIFICATION

I Jason J. Hayes, P.E. certify that I am currently a NYS registered professional engineer as defined in 6 NYCRR Part 375 and that this Interim Remedial Measure Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

I certify that all information and statements in this certification are true. I understand that a false statement made herein is punishable as Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.



It is a violation of Article 145 of New York State Education Law for any person to alter this document in any way without the express written verification of adoption by any New York State licensed engineer in accordance with Section 7209(2), Article 145, New York State Education Law.