# REMEDIAL INVESTIGATION WORK PLAN

# for

# 691 Lenox Avenue – Phase 2
# New York, New York
# BCP Site No. C231146



***Prepared for:***

**One45 Lenox LLC**
**55 Broadway**
**New York, New York, 10002**

***Prepared by:***

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**DRAFT**

**December 2, 2021**
**Langan Project No. 170635401**

## TABLE OF CONTENTS

## TABLES



## FIGURES



## APPENDICES

## CERTIFICATION

I, Jason J. Hayes, certify that I am currently a Qualified Environmental Professional as defined in 6 New York Codes, Rules, and Regulations (NYCRR) Part 375 and that this Remedial Investigation Work Plan (RIWP) was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the New York State Department of Environmental Conservation (NYSDEC) Division of Environmental Remediation (DER)-10 Technical Guidance for Site Investigation and Remediation.

_____**DRAFT**_____
Jason J. Hayes, P.E., LEED AP

## 1.0 INTRODUCTION

This Remedial Investigation Work Plan (RIWP) was prepared on behalf of One45 Lenox LLC (the Applicant) for the property known as 691 Lenox Avenue – Phase 2 in New York, New York (the site). The site was accepted into the New York State Brownfield Cleanup Program (BCP) as a Participant and was assigned BCP Site No. C231146. A Brownfield Cleanup Agreement (BCA) was executed on December 02, 2021.

The objective of this RIWP is to investigate and characterize the nature and extent of environmental impacts at the site, determine whether the impacts may be emanating off-site, provide sufficient information to evaluate potential impacts to human health and determine remedial alternatives, as required. This RIWP was developed in accordance with the process and requirements identified in the NYSDEC Division of Environmental Remediation (DER)-10 Technical Guidance for Site Investigation and Remediation (May 2010), Title 6 of New York Codes, Rules, and Regulations (NYCRR) Part 375, Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (PFAS) Under NYSDEC's Part 375 Remedial Programs (January 2021) and the New York State Department of Health (NYSDOH) Guidance for Evaluating Soil Vapor Intrusion in the State of New York (October 2006, with subsequent updates).

# 2.0 SITE BACKGROUND

## 2.1 Site Description

The site is located in the Harlem neighborhood of New York, New York and encompasses part of Manhattan Block 2013, Lot 29 (formerly Lots 44 and 50 and part of Lot 38) and comprises about 34,900 square feet (± 0.8 acres) in area. The site is of a larger, two-part development property known as "One45". The second half of the development property, known as "691 Lenox Avenue – Phase 1", adjoins the site to the east and comprises the remainder of Block 2013, Lot 29 (formerly Lots 29, 33, and the remainder of Lot 38". On June 23, 2021, prior to submission of the BCP Application, the New York City Department of Finance (NYCDOF) approved a tax lot merger to combine Block 2013, Lots 29, 33, 38, 44 and 50.

The site is currently improved with a one-story commercial building (former Lot 38), a vacant building and canopy associated with a former gasoline filling station (Speedway brand) (former Lot 44), and a one-story automotive repair garage and Mobil-branded gasoline filling station with a canopy (former Lot 50). Two 10,000-gallon and one 8,000-gallon active gasoline underground storage tanks (UST) and two active 250-gallon used oil and fuel oil aboveground storage tanks (AST) are present on former Lot 50. A site location map is presented as Figure 1 and a site plan is presented as Figure 2.

The site is bound by West 145th Street followed by multi-story residential buildings and a self-storage facility to the north; single-story mixed use/commercial buildings (consisting of a nail salon, Islamic religious center, a vacant pharmacy, a restaurant, and a community center) followed by Lenox Avenue and Colonel Charles Young Playground to the east; multi-story residential buildings (owned and operated by the New York City Housing Authority [NYCHA]), a church, and a community center, followed by West 144th Street to the south; and a mixed residential/commercial building, followed by Adam Clayton Powell Jr Boulevard to the west.

## 2.2 Surrounding Property Land Use

According to the New York City Department of City Planning (NYCDCP) Zoning Map 9A, dated June 29, 2019, the site is currently located in a C8-3 commercial district. The following is a summary of surrounding property usage:

| Direction | Parcel Number | Adjoining Properties | Surrounding Properties |
|---|---|---|---|
| **North** | Block 2104, Lot 6 | West 145th Street followed by a multi-story residential building (163 West 145th Street) | Commercial/office buildings and West 146th Street followed by a NYC Transit Bus Depot |
| | Block 2104, Lot 8 | West 145th Street followed by a multi-story residential building (159 West 145th Street) | |
| | Block 2104, Lot 10 | West 145th Street followed by a multi-story residential building (155 West 145th Street) | |
| | Block 2104, Lot 11 | West 145th Street followed by a multi-story residential building (151 West 145th Street) | |
| | Block 2104, Lot 13 | West 145th Street followed by a multi-story residential building (147 West 145th Street) | |
| | Block 2104, Lot 14 | West 145th Street followed by a multi-story residential building (145 West 145th Street) | |
| | Block 2104, Lot 16 | West 145th Street followed by a multi-story residential building (141 West 145th Street) | |
| | Block 2104, Lot 18 | West 145th Street followed by a multi-story residential building (137 West 145th Street) | |
| | Block 2104, Lot 20 | West 145th Street followed by a multi-story residential building (113 West 145th Street) | |
| | Block 2104, Lot 21 | West 145th Street followed by a self-storage facility (119 West 145th Street) | |
| **South** | Block 2013, Lot 6 | One multi-story church (147 West 144th Street) | West 144th Street followed by multi-story commercial and residential buildings |
| | Block 2013, Lot 9 | One multi-story community center (107 West 144th Street) | |
| | Block 2013, Lot 12 | One multi-story residential building (137 West 144th Street) | |
| | Block 2013, Lot 14, 16, 18, 20, and 22 | Five multi-story NYCHA residential buildings (133 to 117 West 144th Street) | |
| **East** | Block 2013, Lot 29 | Single story mixed use/commercial buildings and vacant land (691 Lenox Avenue) | Lenox Avenue followed by Colonel Charles Young Playground |
| **West** | Block 2013, Lot 61 | One multi-story mixed residential/commercial building (2495 Adam C Powell Blvd) | Adam C. Powell Jr. Boulevard followed by multi-story mixed-use commercial and residential buildings |

Land use within a half-mile radius is urban in nature and includes multi-story residential buildings, some with ground-level retail stores and restaurants; school and day care facilities; parking lots; office buildings; and small-scale commercial, industrial and manufacturing facilities. The adjoining

parcels are used for residential and commercial purposes, with the surrounding area generally consisting of residential, commercial, light industrial, and institutional (i.e. schools and churches) uses. The Harlem River is the closest ecological receptor, which is located approximately 950 feet to the east of the site.

No schools or day care facilities are located on the site. Sensitive receptors, as defined in DER-10, within a half mile of the site include those listed below:

| Number | Name<br>(Approximate distance from site) | Address |
|---|---|---|
| 1 | P.S. 194 Countee Cullen<br>(approximately 0.17 miles west of the site) | 244 West 144th Street<br>Manhattan, NY 10030 |
| 2 | P.S. 200 The James Mccune Smith School<br>(approximately 0.26 miles northeast of the site) | 2589 Adam C Powell Blvd<br>Manhattan, NY 10039 |
| 3 | Saint Charles Borromeo School<br>(approximately 0.20 miles southwest of the site) | 218 West 142nd Street<br>Manhattan, NY 10030 |
| 4 | St. Mark the Evangelist School<br>(approximately 0.32 miles south of the site | 55 West 138th Street<br>Manhattan, NY 10037 |
| 5 | Thurgood Marshall Academy Lower School<br>(approximately 0.36 miles north of the site) | 282 West 151st Street<br>Manhattan, NY 10039 |
| 6 | P.S. 123 Mahalia Jackson<br>(approximately 0.35 miles west of the site) | 301 West 140th Street<br>Manhattan, NY 10030 |
| 7 | P.S. 197 John B Russwurm<br>(approximately 0.50 miles south of the site) | 2230 5th Avenue<br>Manhattan, NY 10037 |

## 2.3 Site Physical Conditions

### 2.3.1 Topography

According to a survey prepared by TrueNorth Surveyors (dated August 13, 2020), the topography of the site slopes down from the west to the east resulting in an elevation change of about 7 feet. The elevations range from about 24 feet North American Vertical Datum of 1988 (NAVD88) to about 17 feet NAVD88.

### 2.3.2 Site Geology

Based on a Phase II Environmental Site Investigation (ESI) completed by Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C. (Langan) in November 2020, subsurface stratigraphy generally consists of non-native fill composed of varying amounts of sand, silt, and gravel and varying amounts of anthropogenic materials (brick, coal, slag, asphalt, ceramics, ash, glass, wood, nails and concrete) extending to depths ranging from 7 to 23 feet below sidewalk grade (bsg). The fill layer is underlain by native soil consisting of varying amounts of sand, clay, gravel, silt and organics.

Bedrock was not encountered during the Phase II ESI; however, bedrock was observed at depths ranging from 50 to 150 feet bsg at the site during Langan's geotechnical investigation completed in September-October 2020.

### 2.3.3 Hydrogeology

Based on Langan's Phase II ESI, depth to site groundwater ranges from about 17 to 18 feet bsg. Previous environmental reports associated with the site indicate local groundwater flow is to the northwest. However, groundwater in the area is expected to generally flow northeast towards the Harlem River, based on groundwater elevation data for surrounding sites and hydrogeological principles. Groundwater flow is typically topographically influenced because shallow groundwater tends to originate in areas of topographic highs and flows toward areas of topographic lows, such as rivers, stream valleys, ponds, and wetlands. A broader, interconnected hydrogeologic network often governs groundwater flow at depth or in the bedrock aquifer. Groundwater depth and flow direction are also subject to hydrogeological and anthropogenic variables such as precipitation, evaporation, extent of vegetative cover, coverage by impervious surfaces, and subsurface structures. Other factors influencing groundwater include depth to bedrock, the presence of anthropogenic fill, and variability in local geology and groundwater sources or sinks.

### 2.3.4 Wetlands and Floodplain

Wetlands on and near the site were evaluated by reviewing the National Wetlands Inventory and NYSDEC regulated wetlands map. There are no wetlands on the site. The closest mapped waterbody is the Harlem River which is approximately 950 feet to the east of the site.

According to the Federal Emergency Management Agency (FEMA) preliminary flood insurance rate map (PFIRM) map (3604970083G) dated December 5, 2013, the site is located outside of a flood zone.

## 2.4 Environmental History

The site was initially developed in 1939 with auto garages and auto repair shops (former Lots 38, 44 and 50), a gasoline filling station (former Lots 44 and 50), and a poultry shop (former Lot 50). Historical Sanborn Maps (reviewed as part of a November 10, 2020 Phase I Environmental Site Assessment [ESA], prepared by Langan) noted two 1,000-gallon buried gasoline tanks on former Lots 44 and 50; however the exact locations are unknown. Two 550-gallon gasoline tanks associated with the gasoline filling station on former Lots 44 and 50 are depicted in the north-central parts of the two lots on historical Sanborn Maps. Gasoline filling station operations on former Lot 44 ended circa 2016 and the tax lot is currently vacant with remnants of the former gas station present. Former Lot 50 remains an active gasoline filling station with automotive repair. Former Lot 38 is currently occupied by various commercial tenants including restaurants, a nail salon, retail stores, and community/religious centers.

Historical uses at adjoining and surrounding properties of environmental concern include automotive repair facilities, underground petroleum bulk storage, car wrecking, junk yards, tire repair facilities, radiator repair facilities, and blacksmithing operations.

## 2.5 Previous Investigations

Nine previous reports and related documents were reviewed and summarized as part of this RIWP (See Appendix A).

1. April 30, 2008 *Order on Consent (File No. R2-20070214-80),* prepared by the NYSDEC (former Lot 50)
2. April 17, 2009 *Remedial Action Plan for Mobile Service Station No. 12827 (17-QDM), 150-154 West 145th Street, New York, NY,* prepared by Kleinfelder (former Lot 50)
3. May 2009 *Supplemental Investigation Work Plan and RAP Addendum for Mobile Service Station No. 12827 (17-QDM), 150-154 West 145th Street, New York, NY,* prepared by Kleinfelder (former Lot 50)
4. November 2, 2009 *Consent Order (Case No. 07-51061SWO),* prepared by NYSDEC (former Lot 50)
5. September 8, 2015 *Site Status Update Report for Mobile Branded Service Station (Former Mobil 12827 [17-QDM], 150-154 West 145th Street, New York, NY,* prepared by Arcadis (former Lot 50)
6. October 20, 2015 *No Further Action Letter,* prepared by NYSDEC (former Lot 50)

7. October 21, 2016 *Tank System Closure Report for Speedway #7825 and NYSDEC Spill No. 16-06459, 122 West 145th Street, New York, NY,* prepared by EnviroTrac Ltd. (EnviroTrac) (former Lot 44)
8. November 10, 2020 *Phase I ESA Report for One45, 691 Lenox Avenue, New York, NY,* prepared by Langan
9. February 24, 2021 *Phase II ESI Report for One45, 691 Lenox Avenue, New York, NY,* prepared by Langan

Data gathered during previous investigations will be supplemented by Remedial Investigation (RI) data to characterize the nature and extent of contamination, inform the qualitative human health exposure assessment, provide sufficient basis to generate and evaluate remedial alternatives, and support a positive or negative significant threat determination (were the site to be accepted into the NYSDEC BCP).

*2.5.1* April 30, 2008 *Order on Consent*

The NYSDEC issued this Order on Consent (NYSDEC File No. R2-20070214-80) in April 2008 to ExxonMobil Oil Corporation for four violations related to petroleum bulk storage (PBS) requirements during a site inspection of former Lot 50 on February 9, 2007. Langan contacted the NYSDEC in July 2020, and the NYSDEC indicated that compliance was achieved, penalties were paid, and the consent order was terminated.

*2.5.2* April 17, 2009 *Remedial Action Plan for Mobile Service Station No. 12827 (17-QDM)* (Former Lot 50)

Kleinfelder prepared a Remedial Action Plan (RAP) to address on- and off-site contamination at former Lot 50 related to Spill No. 07-51061. The remedial action proposed in the RAP included installation of an air sparging/soil vapor extraction (AS/SVE) system to remediate petroleum hydrocarbons in groundwater. The AS/SVE system design included thirteen on-site AS wells and eight on-site SVE wells.

The RAP summarized a series of prior investigations completed in February 2008 to evaluate and delineate petroleum-related volatile organic compounds (VOC) and semivolatile organic compounds (SVOC) in soil and groundwater in the western part of former Lot 50. Liquid petroleum hydrocarbon (LPH) was detected in five monitoring wells and confirmed via gas chromatography fingerprinting to be gasoline. Benzene, toluene, ethylbenzene, and total xylene (BTEX) was detected in groundwater at a maximum concentration of 61,689 micrograms per liter (µg/L) and methyl tertiary butyl ether (MTBE) was detected in groundwater at a maximum concentration of 1,000 µg/L.

The RAP also summarized an Interim Remedial Measure (IRM) that began in January 2009 and included the removal of five 4,000-gallon gasoline underground storage tanks (UST) and associated piping, one 1,000-gallon fuel oil UST and twelve 550-gallon USTs and the excavation of petroleum-impacted soil.

*2.5.3* May 2009 *Supplemental Investigation Work Plan and RAP Addendum for Mobile Service Station No. 12827 (17-QDM)* (Former Lot 50)

Kleinfelder prepared a Supplemental Investigation Work Plan (SIWP) and RAP addendum for former Lot 50 to further investigate off-site impacts and, if warranted, install off-site AS/SVE wells. The RAP proposed an additional six AS and two SVE wells on the west-adjoining property (for a total of 19 AS and 10 SVE wells for the system).

*2.5.4* November 2, 2009 *Consent Order* (Former Lot 50)

NYSDEC issued a second Consent Order (NYSDEC Case No. 07-51061SWO) to ExxonMobil Oil Corporation in relation to Spill No. 07-51061 on former Lot 50. The Consent Order was executed on November 16, 2009 for the investigation and remediation of the petroleum spill. The Consent Order contains a Corrective Action Plan schedule prepared by Kleinfelder that was submitted after submission of the RAP (discussed above). Based on correspondence between Langan and NYSDEC in July 2020, this consent order was also terminated after Spill No. 07-51061 was closed in 2015.

*2.5.5* September 8, 2015 *Site Status Update Report for Mobil Branded Service Station (Former Mobil 12827 [17-QDM]* (Former Lot 50)

Arcadis reportedly prepared fifteen Site Status Update Reports (SSUR) beginning in February 2011 on behalf of Liberty Petroleum LLC (2011 to 2014) and Alliance Energy LLC (2015) to document remedial activities performed on former Lot 50. The September 2015 SSUR was the latest report received from a NYSDEC Freedom of Information Act (FOIA) request. The report summarized activities conducted at the property from March 2015 through May 2015 as well as relevant past remedial activities.

Past remedial activities summarized in the report included:

- Operation of an active product recovery system between November 4, 2008 and January 23, 2009 that recovered approximately 622 gallons of LPH from on-site monitoring wells
- Excavation and off-site disposal of approximately 2,260 tons of soil between January and April 2009
- Installation of a passive product recovery bailer in one monitoring well in January 2010
- Installation and operation of a vapor abatement system (VAS) comprising two off-site vapor extraction wells on the west-adjoining property from March 5, 2010 to June 24, 2011, when an AS/SVE system was commissioned
- Operation of the AS/SVE system from April 2011 through at least the October 2013 - The AS/SVE system included 19 AS and 10 SVE wells across the western part of former Lot 50 and on the eastern part of the western-adjoining property. Five SVE wells were active during the June to August 2013 reporting period. Arcadis received approval from the NYSDEC to temporarily shut down the system on October 8, 2013 to evaluate

groundwater for rebound concentrations. Subsequent groundwater sampling events did not indicate rebound and instead documented a sustained decreasing trend in contaminate concentrations. The AS/SVE system was not reactivated after October 2013.

A summary of groundwater sampling data from May 2015 was compared to previous sampling events and is provided below:

- Twelve monitoring wells were sampled during the May 2015 sampling event.
- BTEX concentrations ranged from below their detection limits to a maximum concentration of 755 µg/L in one monitoring well and individual compounds were detected at concentration below NYSDEC Standards and Guidance Values (SGV) in six of the twelve wells sampled. The maximum BTEX concentration previously detected at the site was 94,760 µg/L in May 2010.
- MTBE concentrations ranged from below detection limits to a maximum concentration of 4 µg/L, and MTBE concentrations were below the NYSDEC SGV in ten of the twelve wells. The maximum MTBE concentration previously detected at the site was 12,900 µg/L in May 2010.
- Ethanol concentrations were below detection limits in three wells. The previous maximum concentration of ethanol was 12,000 µg/L in August 2011.
- LPH was previously detected in ten monitoring wells during gauging events from 2008 to 2011, with a maximum NAPL thickness of 2.61 feet in 2009. LPH was not detected in any monitoring wells between the November 2011 and May 2015 gauging events.

*2.5.6* October 20, 2015 *No Further Action Letter* (Former Lot 50)

The NYSDEC issued a letter dated October 20, 2015 to ExxonMobil Environmental Services of Inwood, NY indicating no further action was required in relation to Spill No. 07-51061 on former Lot 50 and closed the spill case. However, the NYSDEC closed the spill with the designation "does not meet standards" and indicated they reserve the right to reopen the spill if it is determined that additional investigation and remediation activities are required based on new information. The NYSDEC also requested that all monitoring wells be abandoned in accordance with NYSDEC Commissioner's Policy (CP-43).

*2.5.7* October 21, 2016 *Tank System Closure Report for Speedway #7825 and NYSDEC Spill No. 16-06459* (Former Lot 44)

EnviroTrac. Ltd. prepared a Tank System Closure Report to document the decommissioning and removal of USTs and associated piping on former Lot 44 to address Spill No. 16-06459 (reported September 29, 2016 and closed December 6, 2016). Five 4,000-gallon gasoline USTs, one 550-gallon wastewater UST, and the associated dispenser islands and piping were removed between September 26, 2016 and October 5, 2016. Six bottom and fifteen sidewall post-excavation endpoint samples were collected from the UST excavation area, and an additional 21 endpoint samples were collected in the areas of former product lines and dispenser islands. Petroleum-

related VOCs and SVOCs were either non-detect or detected below the respective CP-51 Soil Cleanup Objectives (SCO) in the five endpoint samples collected from the dispenser islands. Petroleum-related SVOCs exceeded the CP-51 SCOs in nine of the UST excavation sidewall samples (approximately 8 feet below grade surface [bgs]) and six of the product line samples (approximately 3 feet bgs). Petroleum-related VOCs exceeded the CP-51 SCOs in four of the six bottom endpoint samples collected from beneath a two-foot concrete slab at the base of the tank excavation area (approximately 14 feet bgs). EnviroTrac concluded the detections of the petroleum-related VOCs and SVOCs were either below Commercial Use SCOs and/or related to non-native fill material and requested closure of the spill. The NYSDEC later closed this spill case on December 6, 2016.

*2.5.8* November 10, 2020 *Phase I ESA*

The Phase I ESA identified the following Recognized Environmental Conditions (REC) associated with the site:

- REC-1: Current and/or historical uses/operations of environmental concern for the site include automotive service facilities, gasoline filling stations, and underground petroleum bulk storage from the late 1930s to the present day. Former Lot 50 is an active Mobil-branded gas station with an automotive service station (1939 to present), former Lot 44 was formerly occupied by a gasoline filling station (1939 to 2016), and former Lot 38 was historically used for gasoline storage and auto repair (1939 to 2005). Twelve closed petroleum spills are associated with former Lots 44 and 50. Past remediation activities at the site include removal of USTs and associated appurtenances/piping (former Lots 44 and 50), excavation and disposal of petroleum-impacted soil (former Lots 44 and 50), product extraction from on- and off-site recovery wells (former Lot 50), and operation of an AS/SVE system (former Lot 50). Although the consent orders and petroleum spill listings have been closed, past investigation and remediation activities were limited in scope (i.e., only targeted petroleum compounds) and available reports indicate residual contamination exists.
- REC-2: Historical uses at adjoining and surrounding properties include automotive repair facilities, underground petroleum bulk storage, gasoline filling stations, car wrecking, junk yards, tire repair facilities, radiator repair facilities, and blacksmiths.

The following Business Environmental Risks (BER) were identified for the site:

- BER-1: The site buildings were constructed circa 1961 (former Lot 50), and 1972 (former Lots 38 and 44). Based on the age of the buildings, asbestos containing materials, lead-based paint, and/or equipment containing polychlorinated biphenyls may be present.
- BER-2: Previous environmental reports for former Lots 44 and 50 identified the presence of non-native fill material.

### *2.5.9* February 24, 2020 *Phase II ESI*

Langan performed a Phase II ESI to: 1) investigate RECs identified in the November 10, 2020 Phase I ESA prepared by Langan, 2) assess potential impacts to soil, groundwater, and soil vapor at the site, and 3) evaluate eligibility for the enrollment of the site in the NYSDEC BCP. The investigation consisted of a geophysical survey to clear boring locations and identify subsurface anomalies; advancement of 21 soil borings, 3 temporary monitoring wells, and 4 soil vapor points; and collection and laboratory analysis of 30 grab soil samples, 3 groundwater samples, and 2 soil vapor samples. The findings of the investigation include:

- The stratigraphy at the site consists of a non-native fill layer below surface cover to a maximum depth of 23 feet below bsg. The fill is composed of varying amounts of sand, gravel, and silt and varying amounts of anthropogenic materials (brick, coal, slag, asphalt, ceramics, ash, glass, wood, organics, nails, and concrete). The fill layer is underlain by native soil consisting of sand, silt, and clay with varying amounts of gravel, and organics. Bedrock was not encountered during the Phase II ESI; however, bedrock was encountered at depths ranging from 50 to 150 feet bsg during Langan's preliminary geotechnical investigation completed in September-October 2020.
- VOCs, SVOCs, and metals were identified in soil at concentrations exceeding the Title 6 of the Official Compilation of the New York Codes, Rules and Regulations (6 NYCRR) Part 375 Unrestricted Use (UU) and/or Restricted Use Restricted - Residential (RURR) SCOs. Toxicity characteristic leachate procedure (TCLP) metals were not identified at concentrations above the United States Environmental Protection Agency (USEPA) Resource Conservation and Recovery Act (RCRA) Code of Federal Regulations (CFR) Part 261 Maximum Concentration of Contaminants for the Toxicity Characteristic.
- SVOCs and metals in groundwater exceeded the NYSDEC Title 6 NYCRR Part 703.5 and the Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values (SGV) for Class GA water (collectively referred to as the NYSDEC SGVs). VOCs and polychlorinated biphenyls (PCB) were not detected above applicable regulatory standards.
- BTEX and chlorinated VOCs were detected in soil vapor samples. Soil vapor sample results were evaluated using the NYSDOH Decision Matrices and the Air Guideline Values (AGV) in the NYSDOH October 2006 Guidance for Evaluating Soil Vapor Intrusion and subsequent updates (May 2017). One VOC addressed by the NYSDOH Decision Matrices, tetrachloroethene (PCE), was detected in one soil vapor sample at a concentration above its AGV and exceeded the minimum concentration for which mitigation is recommended.
- Petroleum contamination is present across the site from about 13 to 25 feet bsg at the site. Evidence of petroleum impacts, including staining, odors, photoionization detector (PID) readings above background, presence of light non-aqueous phase liquid (LNAPL),

and/or concentrations of petroleum-related VOCs and petroleum-related SVOCs above applicable regulatory standards, were observed in 17 soil borings completed across the site. No LNAPL was detected in the three temporary monitoring wells installed for the Phase II ESI.

### *2.5.3* November 19, 2020 *Phase 1 Geotechnical Engineering Report*

The geotechnical exploration advanced five borings from sidewalk grade within the western part of former Lot 50 to maximum depth of about 80 feet bsg, within former Lot 44 to a maximum depth of 150 feet, and in the sidewalk near the northwest corner of former Lot 38 to about 88 feet bsg.

Site stratigraphy includes about 10 to 13 feet of non-native fill followed by organic soils or loose sand, followed by silt and clay, dense sand, soft rock and bedrock. The fill layer consisted of fine to coarse sand with varying amounts of silt, gravel, and brick fragments. The top-of-bedrock was encountered about 65 feet bsg in borings advanced in the western parts of the site and about 150 feet bsg in Lot in eastern part of the site.

## 2.6 Potential Areas of Concern

Based on the history of the site and the findings of the previous studies, the potential areas of concern (PAOC) to be further investigated by this RI are shown on Figure 7 and described below.

**PAOC 1: Non-Native Fill**

Fill was identified from sidewalk grade to depths between 7 to 23 feet bsg and is composed of varying amounts of sand, clay, silt, gravel, and anthropogenic materials (brick, coal, slag, asphalt, ceramics, ash, glass, wood, nails and concrete). Contaminants associated with non-native fill were identified in soil samples, including VOCs, SVOCs, and metals exceeding the UU and/or RURR SCOs.

**PAOC 2: Historical On- and Off-site Use - Chlorinated VOC Impacts**

Historical operations of environmental concern at the site include a gasoline filling, oil service, radiator service, and auto repair facilities on former Lot 44 (1939 to 2016), former Lot 50 (1939 to present) and former Lot 38 (1939 to 2005). Historical off-site uses of environmental concern include gasoline filling stations and automobile repair garages.

The Phase II ESI completed in November 2020 identified one chlorinated VOC, PCE, in soil vapor. Chlorinated VOCs were historically used in degreasing operations and are commonly associated with automotive repair operations (a historical on- and off-site use).

**PAOC 3: Historical On-site Use - Petroleum Impacts**

The source of petroleum-related VOCs and SVOCs in soil, VOCs and SVOCs in groundwater, and VOCs in soil vapor is likely historical site use, including historical petroleum releases, the operations of automotive service facilities and gasoline filling stations, and use and maintenance of underground petroleum bulk storage tanks. There are two USTs and two ASTs currently operational at the site (former Lot 50), with their locations shown on Figure 2. In addition, historical Sanborn Maps identified two 1,000-gallon buried gasoline tanks which may still be present on former Lots 44 and 50, however the exact locations are unknown.

The February 24, 2021 Phase II ESI identified evidence of petroleum impacts, including staining, odors, PID readings above background, LNAPL sorbed to soil, and/or concentrations of petroleum-related VOCs and petroleum-related SVOCs above regulatory standards, that were observed/documented in 17 soil borings (PH2_SB02, PH2_SB04, PH2_SB05, PH2_SB06, PH2_SB07, PH2_SB08, PH2_SB09, PH2_SB11, PH2_SB13, PH2_SB14, PH2_SB15, PH2_SB16, PH2_SB17, PH2_SB18, PH2_SB19, PH2_SB20, and PH2_SB21, shown on Figure 7) at depths of 13 to 25 feet bsg.

## 3.0 SCOPE OF WORK

The objective of this RIWP is to supplement existing data to investigate and characterize "the nature and extent of the contamination at and/or emanating from a brownfield site", as required to satisfy New York Environmental Conservation Law (ECL) 27-1411.1.

The existing structures on the site may be abated of hazardous building materials and demolished in accordance with applicable laws and regulations to accommodate the implementation of the RIWP. The field investigation will include the tasks summarized below, which are discussed in more detail in the following sections. The rationale for each sampling location, in relation to the PAOCs and analytical parameters for each proposed sample, is provided in Table 1.

*Geophysical Survey*

- Perform a geophysical survey to locate USTs, underground structures, geophysical anomalies and utilities across accessible areas of the site, including in the vicinity of proposed sampling locations.

*Soil Borings and Sampling*

- Advance at least 8 soil borings to about 30 feet bsg and collect up to 24 soil samples (plus quality assurance/quality control [QA/QC] samples) to characterize the nature and extent of soil contamination

*Monitoring Well Installation and Sampling*

- Install and develop eight permanent monitoring wells
- Collect one groundwater sample from each new monitoring well for a total of eight samples (plus QA/QC samples) for laboratory analysis to evaluate groundwater quality across the site
- Survey and gauge newly-installed monitoring wells to evaluate groundwater elevations and flow direction and the potential presence of non-aqueous phase liquids (NAPL)

*Soil Vapor Sampling*

- Install four soil vapor points (plus a QA/QC sample) to about 10 feet bsg (anticipated depth of future cellar subgrade) or 2 feet above the groundwater table (whichever is more shallow)
- Collect one soil vapor sample from each soil vapor point for a total of four soil vapor samples for laboratory analysis to evaluate the nature and extent of soil vapor contamination across the site
- Collect one outdoor ambient air sample as a QA/QC sample for laboratory analysis

At the completion of the above scope of work, the NYSDEC and NYSDOH Project Managers will be consulted, as reasonable, to determine if additional samples are needed based on field

observations and/or analytical data. If any modifications to the RIWP are made, they will be discussed in the RIR.

The field investigation will be completed in accordance with the procedures specified in the Quality Assurance Project Plan (QAPP), Health and Safety Plan (HASP), and Community Air Monitoring Program (CAMP) included as Appendices B, C, and D, respectively.

The names, contact information and roles of the principal personnel who will participate in the investigation are listed below. Resumes for Langan employees involved in the project are included in the QAPP (Appendix B).

| Personnel | Investigation Role | Contact Information |
|---|---|---|
| Mimi S. Raygorodetsky<br>Langan Engineering | Project Director | Phone – 212-479-5441<br>Email – mraygorodetsky@langan.com |
| Gregory C. Wyka, PG<br>Langan Engineering | Project Manager | Phone – 212-479-5476<br>Email – gwyka@langan.com |
| Jason J. Hayes, PE<br>Langan Engineering | Project Engineer | Phone – 212-479-5427<br>Email – jhayes@langan.com |
| Woo Kim<br>Langan Engineering | Field Team Leader | Phone – 212-479-5499<br>Email – wkim@langan.com |
| Tony Moffa, CHMM<br>Langan Engineering | Langan Health & Safety Officer | Phone – 215-491-6500<br>Email – tmoffa@langan.com |
| Bill Bohrer, PG<br>Langan Engineering | Field Safety Officer | Phone – 410-984-3068<br>Email – wbohrer@langan.com |
| Michael Burke, PG, CHMM<br>Langan Engineering | Quality Assurance Officer | Phone – 212-479-5413<br>Email – mburke@Langan.com |
| Lorraine Kelly<br>Lakewood Environmental Services Corp. | Drilling Contractor | Phone – 631-257-5321<br>Email – lkelly@lakewoodenviro.com |
| Ben Rao<br>Alpha Analytical | Laboratory Contractor | Phone – 201-847-9100<br>Email – brao@alphalab.com |
| Marla Miller<br>Langan Engineering | Program Quality Assurance Monitor/ Data Validator | Phone – 480-383-2221<br>Email – mmiller@langan.com |

## 3.1 Geophysical Survey

A geophysical contractor will perform a geophysical survey to locate USTs, underground structures, geophysical anomalies, identify utilities across accessible areas of the site, and clear subsurface testing locations of potential subsurface obstructions. The geophysical survey will be completed using a collection of geophysical instruments, including electromagnetic and utility line locator instruments and ground-penetrating radar (GPR). The results of the survey may require relocating subsurface testing locations.

## 3.2 Soil Investigation

### 3.2.1 Soil Boring Installation

A drilling subcontractor will advance at least eight soil borings (PH2_SB22 through PH2_SB29) to further investigate the PAOCs identified in Section 2.6 and supplement the February 24, 2021 Phase II ESI. The borings will terminate at about 30 feet bsg provided no obstructions or refusal

are encountered at shallower depths. A plan showing proposed sample locations is included as Figure 6. Table 1 indicates the laboratory analyses for the samples. The following table associates borings with PAOC and describes the rationale for each boring.

| PAOC | Associated Soil Boring(s) | Rationale |
|---|---|---|
| PAOC 1 | SB22 through SB29 | Further evaluate the nature and extent of non-native fill across the site |
| PAOC 2 | SB22 through SB29 | Investigate the nature and extent of impacts related to chlorinated VOC impacts from potential releases of solvents historically used at on- and off-site automobile garages and repair shops |
| PAOC 3 | SB22 through SB29 | Investigate the nature and extent of known petroleum impacts in soil |

The soil borings will be advanced using direct-push drilling technology, sonic drilling technology, and/or hand auger by an experienced environmental driller. The direct-push drill rig will be equipped with a closed-point Macro-Core® sampler or dual-tube sampling system to prevent the collapse of sidewall material as borings are advanced.

A Langan field engineer, scientist or geologist will document the work, screen soil samples for environmental impacts, and collect representative environmental soil samples for laboratory analyses. Soil will be screened continuously to the boring termination depth for organic vapors with a PID equipped with a 10.6 electron volt (eV) bulb and for visual and olfactory evidence of environmental impacts (e.g., NAPL, staining, odor). Soil will be visually classified for color, grain size, texture, and moisture content, and will be recorded in a field log. Site operations will comply with the safety guidelines outlined in the HASP in Appendix C. Non-disposable, down-hole drilling equipment and sampling apparatus will be decontaminated between locations with Alconox® and water. Water used for decontamination and rinsate will be containerized into United Nations/Department of Transportation (UN/DOT)-approved 55-gallon drums, labeled, and staged for off-site disposal.

### 3.2.2 Soil Sampling and Analysis

Up to three grab soil samples will be collected for laboratory analysis from each boring (PH1_SB22 through PH2_SB29) to further investigate PAOCs and to provide vertical and horizontal delineation of identified impacts. Samples will be collected from two or more of the following intervals:

- One to two representative fill samples will be collected above the groundwater table. Fill samples will target select intervals where metals were detected above UU and/or RURR SCOs in nearby Phase II ESI borings.

- One to two samples will be collected from the interval exhibiting the greatest degree of contamination, where observed (based on the presence of staining, odor, and/or PID readings above background). Samples will target select intervals where VOCs were detected above UU and/or RURR SCOs in nearby Phase II ESI borings. If no impacts are observed, the sample will be collected from the groundwater interface.
- One sample will be collected from the one-foot interval below the vertical extent of identified impacts, if encountered. If no impacts are observed, the sample will be collected from the one-foot interval below the fill/native soil interface.

The following rationale will be utilized to further investigate analytical exceedances of end-use criteria from samples collected during the Phase II ESI, with their sample locations shown on Figure 7:

- Two soil samples from boring PH2_SB24 will be collected from the 10 to 12 feet bsg interval and the 22 to 24 feet bsg interval to delineate the vertical and horizontal extent of VOCs detected in samples collected in Phase II ESI soil boring PH2_SB08 and metals detected in samples collected in Phase II ESI soil boring PH2_SB12. Phase II ESI analytical data indicates the majority of VOC contamination exists below the 13 foot bsg interval; the 10 to 12 feet bsg sample will further investigate the nature and extent of the vertical extent of VOC impacts.
- Two soil samples from boring PH2_SB25 will be collected from the 10 to 12 feet bsg interval and the 22 to 24 feet bsg interval to delineate the vertical and horizontal extent of VOCs detected in samples collected in Phase II ESI soil boring PH2_SB08. Phase II ESI analytical data indicates the majority of VOC contamination exists below the 13 foot bsg interval; the 10 to 12 feet bsg sample will further investigate the nature and extent of the vertical extent of VOC impacts.
- One soil sample will be collected from boring PH2_SB29 from the 16 to 18 feet bsg interval to delineate the vertical and horizontal extents of VOCs and SVOCs detected in Phase II ESI soil borings PH2_SB14 and PH2_SB16.

Depending on the site conditions (e.g., fill depth, presence/absence of impacts) and recovery, the number of samples collected at each boring may vary.

The samples will be collected in laboratory-supplied containers and will be sealed, labeled, and placed in a chilled cooler (to attempt to maintain a temperature of <4°C) for delivery to a NYSDOH Environmental Laboratory Approval Program (ELAP)-certified laboratory. Soil samples will be analyzed using the latest USEPA methods as follows:

- Target Compound List (TCL) VOCs by USEPA Methods 8260C/5035
- TCL SVOCs by USEPA Method 8270D (1,4-dioxane by 8270 selected ion monitoring [SIM] isotope dilution)

- PCB by USEPA Method 8082A
- Target Analyte List (TAL) metals (including cyanide and hexavalent and trivalent chromium) by USEPA Methods 6010C/7471B/9010C/7196A
- Pesticides and herbicides by USEPA Methods 8081B and 8151A, respectively
- Per- and poly-fluoroalkyl substances (PFAS) (21-compound list) by USEPA Method 537

The proposed RI soil samples are summarized in Table 1. QA/QC procedures to be followed and sampling frequency are described in the QAPP in Appendix B.

## 3.3 Groundwater Investigation

### 3.3.1 Monitoring Well Installation

All eight soil borings will be converted into permanent groundwater monitoring wells (MW22 through MW29). A plan showing the proposed well locations is included as Figure 7. As indicated in Table 1, groundwater samples from the eight new monitoring wells will be used to investigate and characterize the nature and extent of contamination associated with each PAOC.

Monitoring well locations will be numbered in conjunction with their respective soil boring numbers and prefixed with "MW". Soil conditions will be screened and logged as described in Section 3.2. The wells will be constructed with screens across the observed water table using 1-inch-diameter, threaded, flush-joint, polyvinyl chloride (PVC) casing, and 0.01-inch-slot well screens. Clean sand (e.g., Morie No. 1) will be used to fill the annulus around the screen up to about 2 feet above the top of the screened interval. A 2-foot-thick bentonite seal will be installed above the sand, and the remaining borehole annulus will be backfilled with drill cuttings with no evidence of chemical or petroleum impacts (i.e., staining, odors, or elevated PID readings) to within 12 inches of the surface and/or grouted to the surface with bentonite and cement slurry. Monitoring wells will be finished at the surface with flush mounted access covers.

After installation, the wells will be developed by surging using either a weighted bailer or surge block across the well screen and casing to agitate and remove fines. After surging, the well will be purged via pumping until the water becomes visually clear. The well will then be allowed to stabilize for a minimum of one week prior to sampling.

### 3.3.2 Groundwater Sampling and Analysis

Before sampling, the headspace of each well will be monitored with a PID. Because groundwater samples will be analyzed for PFAS, wells will be gauged with an interface probe to determine the depth to groundwater and thickness of any NAPL after groundwater samples are collected and the water table elevation stabilizes to avoid potential cross contamination. If NAPL is encountered, representative samples of the product will be collected for laboratory fingerprint analysis. No groundwater samples will be collected from monitoring wells containing NAPL.

One groundwater sample will be collected from each newly installed well in general accordance with NYSDEC DER-10 and USEPA's Low Flow Purging and Sampling Procedures for the

Collection of Groundwater Samples from Monitoring Wells (EQASOP-GW4 Revised Sep. 2017) and the NYSDEC guidance for Sampling, Analysis, and Assessment of PFAS under NYSDEC's Part 375 Remedial Programs (January 2021).

Before the groundwater samples are collected, wells will be continuously purged until groundwater quality parameters (pH, conductivity, turbidity, dissolved oxygen, temperature, and oxidation-reduction potential) stabilize, to the extent practical, in accordance with the USEPA low-flow guidance. A multi-parameter water-quality system will be used to monitor the groundwater-quality parameters during sampling. Samples will be collected with a peristaltic pump[1], submersible pump, and/or bladder pump (or equivalent) and dedicated polyethylene tubing. The pump will be decontaminated with Alconox® and water between each sample location. Development and purge water will be containerized into UN/DOT-approved 55-gallon drums, labeled, and staged for off-site disposal.

The groundwater samples will be collected in laboratory-supplied containers and will be sealed, labeled, and placed in a chilled cooler (to attempt to maintain a temperature of <4°C) for delivery to the laboratory. Groundwater samples will be analyzed using the latest USEPA methods as follows, which currently include:

- TCL VOCs by USEPA Method 8260C
- TCL SVOCs by USEPA Method 8270D (1,4-dioxane by 8270 SIM isotope dilution)
- PCBs by USEPA Method 8082A
- TAL Metals (field-filtered and unfiltered) (including cyanide and hexavalent and trivalent chromium) by USEPA Method 6010C/7470
- Pesticides and herbicides by USEPA Methods 8081B and 8151A, respectively
- PFAS (21-compound list) by USEPA Method 537

The proposed groundwater samples are summarized in Table 1. QA/QC sample collection procedures and sampling frequency are described in the QAPP in Appendix B.

### 3.3.3 Monitoring Well Survey and Synoptic Gauging

Langan will survey the vertical location of the monitoring wells, including ground surface elevation (well covers) and the top of well casing to the nearest 0.01 foot. Vertical control will be established by surveying performed relative to NAVD88 by a New York State-licensed land surveyor. The horizontal well locations will be established using field measurements. A synoptic gauging event will be performed after the wells are installed to document static water levels across the site. These data will be used to prepare a groundwater contour map depicting the elevation of the water table across the site.

[1] The peristaltic pump will not be utilized for VOC analysis.

## 3.4 Soil Vapor Investigation

### 3.4.1 Soil Vapor Point Installation

Four soil vapor points (SV23, SV24, SV25, and SV28) will be installed using direct-push technology in accordance with the NYSDOH's Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York (October 2006). A plan showing the proposed soil vapor point locations is included as Figure 7. As indicated in Table 1, soil vapor samples from each sampling location will be used to investigate and characterize the nature and extent of contamination associated with each PAOC.

Soil vapor points will be installed by advancing a probe implant to about 10-15 feet bsg or 2 feet above the groundwater table (whichever is shallower).

The soil vapor collection points will consist of a 1.875-inch polyethylene implant with inert sample tubing (e.g., Teflon or Teflon-lined polyethylene) and inert sample tubing only, respectively. The annulus (i.e., the sampling zone) around the soil vapor implant and tubing will be filled with a clean, coarse sand pack followed by a hydrated bentonite seal to surface grade. Hydrated bentonite will also be used to create a seal around the tubing at the surface of the soil vapor point.

### 3.4.2 Soil Vapor Sampling and Analysis

Samples will be collected in general accordance with the NYSDOH's Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York (October 2006, with updates). Before collecting vapor samples, a maximum of 3 soil vapor point volumes (i.e., the volume of the sample implant and tubing) will be purged from each sample location at a rate of less than 0.2 liters per minute using a RAE Systems MultiRAE® meter set at a low flow setting. The purged soil vapor will be monitored for VOCs with the MultiRAE® during purging.

A helium tracer gas will be used in accordance with the NYSDOH guidance to serve as a QA/QC technique to document the integrity of each soil vapor point seal before and after sampling. The tracer gas will be introduced into a container, which will shroud the soil vapor point and seal. Helium will be measured from the sampling tube and inside the container. If the sample tubing contains more than 10% of the tracer gas concentration that was introduced into the container, then the seal will be considered compromised and will be enhanced or reconstructed to reduce outdoor air infiltration.

A log sheet for each soil vapor sample will be completed to record sample identification; date and time of sample collection; sampling depth; name of the field engineer, geologist or scientist responsible for sampling; sampling methods and equipment; vapor purge volumes; volume of vapor extracted; flow rate; and vacuum of canisters before and after sample collection.

After the integrity of each seal is confirmed, soil vapor samples will be collected into laboratory-supplied batch-certified clean 2.7- or 6-liter Summa® canisters with calibrated flow controllers.

Soil vapor samples will be collected over a 2-hour sampling period and analyzed for VOCs by USEPA Method TO-15.

The proposed vapor samples are summarized in Table 1. QA/QC sample collection procedures and sampling frequency are described in the QAPP in Appendix B.

#### 3.4.3 Ambient Air Sampling

One outdoor ambient air sample will be collected at a height above the ground representative of the breathing zone (about 3 to 5 feet). The air sample will be collected over a 2-hour sampling period (concurrently with the soil vapor samples) and analyzed for VOCs by USEPA TO-15 to evaluate potential outdoor air interferences with sampling apparatus.

## 3.5 Sampling Contingency

Additional soil, groundwater, and soil vapor sampling locations may be completed, as needed, to evaluate unanticipated contamination and to horizontally and vertically delineate identified contamination (e.g., NAPL, VOCs, SVOCs, metals, or other analytes) based on field observations and analytical results. The objective of a sampling contingency is to provide adequate delineation of PAOCs during a single mobilization event, if possible. The decision to complete additional sampling and delineation (including step-out distances and target-depth intervals) based on field observations and/or preliminary (non-validated) laboratory data will be made by Langan, potentially in consultation with NYSDEC and/or NYSDOH Project Managers. The location of any step-out soil borings and additional monitoring wells will be based on field observations and analytical data from adjacent borings and wells, site access and drilling considerations. Sampling depths and analyses will be contingent on observations/findings.

## 3.6 Data Management and Validation

Laboratory analyses of soil, groundwater, and soil vapor samples will be conducted by a NYSDOH ELAP-approved laboratory in accordance with USEPA SW-846 methods and the data collected will be reported in NYSDEC ASP Category B deliverable format. Environmental data will be reported electronically using the database software application EQuIS as part of NYSDEC's Environmental Information Management System (EIMS) and/or email.

QA/QC procedures required by the NYSDEC ASP and SW-846 methods, including initial and continuing instrument calibrations, standard compound spikes, surrogate compound spikes, and analysis of other samples (blanks, laboratory control samples, and matrix spikes/matrix spike duplicates), will be followed during the RI. The laboratory will provide sample bottles for the RI, which will be pre-cleaned and preserved in accordance with the SW-846 methods. Where there are differences in the SW-846 and NYSDEC ASP requirements, the NYSDEC ASP will take precedence.

Data validation will be performed in accordance with the USEPA validation guidelines for organic and inorganic data review. Validation will include the following:

- Verification of QC sample results (qualitative and quantitative)
- Verification of sample results (positive hits and non-detects)
- Recalculation of 10 percent of all investigative sample results
- Preparation of DUSRs

The DUSRs will be prepared and reviewed by the Program Quality Assurance Monitor (PQAM). The DUSRs will provide a detailed assessment of each sample delivery group (SDG) and present the results of data validation, including a summary assessment of laboratory data packages, sample preservation and Chain of Custody procedures, and a summary assessment of precision, accuracy, representativeness, comparability, and completeness for each analytical method. Additional details on the DUSRs are provided in the QAPP in Appendix B.

The results from the RI will be reported in NYSDEC ASP Category B deliverable format and validated by the Data Validator identified in the QAPP. Additionally, analytical results generated from the Phase II ESI completed in November 2020 will be validated concurrently with results from the RI. The DUSRs from the RI and the Phase II ESI will be prepared and included as an appendix in the RIR.

### 3.7 Management of Investigation-Derived Waste

Grossly-contaminated or excess soil cuttings and purge water will be containerized and staged on-site, pending proper disposal at an off-site waste management facility. Soil cuttings with no apparent staining, odors, or elevated PID readings will be used to backfill boreholes. Soil to be disposed of off-site will be placed in 55-gallon, UN/DOT-approved drums. Decontamination fluids, if necessary, will be placed in UN/DOT-approved fluid drums with closed tops. Drums will be properly labeled, sealed, and characterized as necessary. If RI analytical data is insufficient to gain disposal facility acceptance, additional waste characterization samples will be collected. Additional sampling and analyses may be required based on the selected disposal facility. Waste characterization samples will be submitted to by a NYSDOH ELAP-approved laboratory for analysis in accordance with the QAPP provided in Appendix B. Management of IDW will comply with NYSDEC DER-10 3.3(e).

### 3.8 Air Monitoring

Air monitoring will be conducted for site personnel and the community (CAMP) (Appendix D). Fugitive particulate (dust) generation that could affect site personnel or the public is not expected because intrusive work is limited to boring, monitoring well, and soil vapor point installation, which does not disturb large volumes of soil.

Dust emissions will be monitored using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10). Organic vapors will be monitored with a PID. Odors will be periodically monitored by site personnel at and beyond the site

perimeter. Dust and odor suppression measures (e.g., water misting, odor suppressant) will be implemented as required. All PIDs used will be equipped with a 10.6 eV bulb.

### 3.8.1 Personnel Air Monitoring

Langan will conduct air monitoring of the breathing zone periodically during drilling and sampling activities to evaluate health and safety protection for the Langan field personnel. Initially, ambient air monitoring will be performed within the work area. Langan will monitor VOCs with a PID (MultiRAE 3000 or similar) in accordance with the HASP (Appendix C). If air monitoring during intrusive operations identifies the presence of VOCs, on-site personnel will follow the guidelines outlined in the HASP regarding action levels, permissible exposure, engineering controls, and personal protective equipment. If the VOC action level is exceeded, work will cease and the work location will be evacuated. Monitoring will be continued until the levels drop to safe limits. At that time, work can resume with continued monitoring. If high levels persist, field activities will be halted and the work relocated to another area. If dust emissions are observed, work will stop and dust suppression measures will be used.

### 3.8.2 Community Air Monitoring Plan

In addition to air monitoring in the worker breathing zone, Langan will conduct community air monitoring in compliance with the NYSDOH Generic CAMP. CAMP deployment will comply with NYSDEC DER-10 Appendix 1A and Appendix 1B.

Langan will conduct periodic monitoring for VOCs during non-intrusive work such as the collection of groundwater samples. Periodic monitoring may include obtaining measurements upon arrival at a location, when opening a monitoring well cap, when bailing/purging a well, and upon departure from a location.

Langan will also conduct continuous monitoring for VOCs and dust during ground-intrusive work (i.e., soil boring advancement and monitoring well installation). During exterior ground-intrusive work, Langan will measure upwind concentrations at the start of each workday to establish background concentrations. Langan will monitor VOCs and dust at the downwind perimeter of the work zone, which will be established at a point on the site where the general public or site employees may be present. Monitoring for VOCs will be conducted with a PID. Dust emissions will be monitored using real-time monitoring equipment capable of measuring PM-10 (e.g., DustTrak). If dust emissions are observed, work will stop and dust suppression measures will be used. Odors will be periodically monitored by site personnel at and beyond the site perimeter. When interior ground-intrusive work is being performed, VOC and dust emissions will be monitored with a single monitoring station in the vicinity of the work zone.

### 3.9 Qualitative Human Health Exposure Assessment

A Qualitative Human Health Exposure Assessment will be conducted in accordance with Appendix 3B of the NYSDEC DER-10, Technical Guidance for Site Investigation and Remediation. The assessment will be included in the RIR.

### 3.10 Fish and Wildlife Resources Impact Analysis

A Fish and Wildlife Resources Impact Analysis (FWRIA) screening-level review will be conducted in accordance with Section 3.10 and Appendix 3C of the NYSDEC DER-10, Technical Guidance for Site Investigation and Remediation. If necessary based on the results of the screening-level review, a full FWRIA will be performed. The assessment will be included in the RIR.

### 3.11 Waste Characterization Sampling

A waste characterization investigation, including the advancement of additional soil borings, may be implemented concurrent with or after the RI to facilitate the off-site disposal of soil during site remediation/development. Soil samples will be collected at a frequency consistent with the requirements of many disposal facilities that receive soil from NYC sites.

Waste characterization methodology and analytical results will be summarized in a separate waste characterization report. Analytical results from the waste characterization may be used to assist with evaluating the nature and extent of contamination, if necessary.

# 4.0 REMEDIAL INVESTIGATION REPORT

## 4.1 Remedial Investigation Report

Following completion of the RI and receipt of analytical data, an RIR will be prepared in accordance with the applicable requirements of DER-10 Section 3.14. The report will include:

(1) A summary of the site history and previous investigations

(2) A description of site conditions and the remedial investigation

(3) Sampling methodology and field observations

(4) Evaluation of the results and findings

(5) Conclusions

(6) Recommendations for any further assessment, if warranted

The report will summarize the nature and extent of contamination for each AOC and identify complete and potentially complete exposure pathways (as determined through the qualitative human health exposure assessment [QHHEA]). DUSRs will be included in the RIR and electronic data deliverables will be submitted to the NYSDEC EQuIS database prior to submission of the draft RIR.

The report will include soil boring and well-construction logs, sampling logs, tabulated analytical results, figures, and laboratory data packages. The analytical results will be organized in table format and include sample location; media sampled; sample depth; field/laboratory identification numbers; analytical results; and applicable Standards, Criteria, and Guidance (SCG) pertaining to the site and contaminants of concern for comparison. The report will include scaled figures showing the locations of soil borings, monitoring wells, and soil vapor points; sample concentrations above SCGs for each media; groundwater elevation contours and flow direction; and, if appropriate, groundwater contaminant concentration contours.

Soil analytical results will be compared to the UU and RURR SCOs. Groundwater analytical results will be compared to the NYSDEC SGVs for Class GA water, the maximum contaminant level (MCL) (drinking water standard) for 1,4-dioxane, and the screening levels set forth in the NYSDEC Part 375 Remedial Programs guidance for Sampling, Analysis, and Assessment of PFAS. (January 2021). Soil vapor results will be evaluated using the NYSDOH Decision Matrices.

The RIR will be provided in an electronic format to the NYSDEC.

## 5.0 SCHEDULE

The table below presents an anticipated schedule for the proposed RI and RIR. If the schedule changes, it will be updated and submitted to the NYSDEC.

| Milestone | Start of Milestone (weeks from NYSDEC RIWP approval) | Estimated Duration (weeks) |
|---|---|---|
| RI Scheduling and Mobilization | 1 | 2 |
| Implementation of RI Field Work | 3 | 2 |
| Laboratory Analysis | 3 | 2 |
| Data Validation and Remedial Investigation Report Preparation | 5 | 8 |
| Draft RIR Submission to NYSDEC | 13 | 12 |