REMEDIAL ACTION WORK PLAN

Draft

for

BROOME STREET PARKING LOT SITE
New York, New York
NYSDEC BCP Site No. C231137

Prepared For:

GO Broome LLC
432 Park Avenue South, 2nd Floor
New York, New York 10016

Prepared By:

Langan Engineering, Environmental, Surveying,
Landscape Architecture and Geology, D.P.C.
300 Kimball Drive
Parsippany, New Jersey 07054

31 August 2020
Langan Project No. 100646801

LANGAN

CERTIFICATION

I, Ronald D. Boyer, certify that I am currently a Professional Engineer as defined in 6 NYCRR Part 375 and that this Remedial Action Work Plan (RAWP) was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the Division of Environmental Remediation (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.

NYS Professional Engineer	Date	Signature

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.

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LIST OF ACRONYMS

Acronym	Definition
AOC	Area of Concern
AST	Aboveground Storage Tank
AWQS	Ambient Water Quality Standards
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
bgs	Below Grade Surface
BOA	Brownfield Opportunity Area
BTEX	Benzene, Toluene, Ethylbenzene, and Total Xylene
C/D	Construction/Demolition
CAMP	Community Air Monitoring Program
CCR	Construction Completion Report
CFR	Code of Federal Regulations
CHASP	Construction Health and Safety Plan
CQAP	Construction Quality Assurance Plan
COC	Contaminants of Concern
COD	Chemical Oxygen Demand
CPP	Citizen Participation Plan
CSM	Conceptual Site Model
CVOC	Chlorinated Volatile Organic Compound
DER	Division of Environmental Remediation
DMM	Division of Materials Management
DO	Dissolved Oxygen
DOT	Department of Transportation
EC	Engineering Control
el	Elevation
ELAP	Environmental Laboratory Approval Program
EPA	United States Environmental Protection Agency
EPH	Extractable Petroleum Hydrocarbons
ESA	Environmental Site Assessment
ESI	Environmental Site Investigation
eV	Electron Volt
FEMA	Federal Emergency Management Agency
FER	Final Engineering Report
FWRIA	Fish and Wildlife Resources Impact Analysis

Acronym	Definition
GPR	Ground Penetrating Radar
IC	Institutional Control
IRMWP	Interim Remedial Measures Work Plan
ISCO	In-Situ Chemical Oxidation
µg/L	Microgram Per Liter
µg/m^3	Microgram Per Cubic Meter
mg/kg	Milligram Per Kilogram
MS/MSD	Matrix Spike/Matrix Spike Duplicate
MTBE	Methyl tert Butyl Ether
NAVD88	North American Vertical Datum of 1988
NYCRR	New York Codes, Rules and Regulations
NYCDEP	New York City Department of Environmental Protection
NYCDOB	New York City Department of Buildings
NYCOER	New York City Office of Environmental Remediation
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
ORP	Oxidation-Reduction Potential
OSHA	United States Occupational Safety and Health Administration
PAH	Polycyclic Aromatic Hydrocarbon
PBS	Petroleum Bulk Storage
PCB	Polychlorinated Biphenyls
PCE	Tetrachloroethene
PG	Protection of Groundwater
PID	Photoionization Detector
PPE	Personal Protective Equipment
ppm	Parts per million
PVC	Polyvinyl Chloride
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
QEP	Qualified Environmental Professional
RAO	Remedial Action Objective
RAWP	Remedial Action Work Plan
RCA	Recycled Concrete Aggregate
RCRA	Resource Conservation and Recovery Act
RE	Remediation Engineer
REC	Recognized Environmental Condition

Acronym	Definition
RI	Remedial Investigation
RIR	Remedial Investigation Report
RURR	Restricted Use – Restricted Residential
SCG	Standards, Criteria, and Guidance
SCO	Soil Cleanup Objective
SMDS	Sub-Membrane Depressurization System
SMMP	Soil/Materials Management Plan
SMP	Site Management Plan
STARS	Spills Technology and Remediation Series
SVOC	Semivolatile Organic Compound
TAL	Target Analyte List
TCE	Trichloroethene
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TOC	Total Organic Carbon
TOGS	Technical and Operational Guidance Series
UST	Underground Storage Tank
VOC	Volatile Organic Compound

EXECUTIVE SUMMARY

This Remedial Action Work Plan (RAWP) was prepared on behalf of GO Broome LLC, for the proposed development located southwest of the intersection of Broome Street and Suffolk Street (Block 346, Lot 75) in the Lower East Side section of Manhattan, New York (the Site). The Volunteer has enrolled in the New York State Brownfield Cleanup Program (BCP) as a volunteer and will implement this RAWP pursuant to the Brownfield Cleanup Agreement (BCA) executed on 2 January 2020 with the New York State Department of Environmental Conservation (NYSDEC).

This RAWP summarizes the nature and extent of contamination as determined from data gathered during the Remedial Investigation (RI) work completed by Langan, provides evaluations of Track 1, Track 2 and Track 4 remedies, their associated costs, and recommends the preferred remedy. The remedy was selected consistent with the procedures defined in DER-10 and complies with applicable standards, criteria, and guidance, as well as with applicable federal, state and local laws, regulations and requirements.

Site Description/Physical Setting/Site History

The Site is located in the Lower East Side section of Manhattan, New York and is identified as Block 346 Lot 75. The Site is an approximately 23,960-square foot parcel and contains asphalt paved parking and concrete patio, and landscaped areas. The Site is bound to the north by Broome Street followed by an at-grade parking facility, to the east by Suffolk Street followed by a mixed-use property with a large asphalt-paved parking area, to the south by a five-story mixed-use building, and to the west by the 14-story Hong Ning Housing for the Elderly building and the former Beth Hamedrash Hagodol Synagogue which was demolished in June 2020.

According to the Boundary and Topographic Survey prepared by Langan dated 29 December 2017, last revised 14 May 2018, the Site slopes gently downward from the northeast (elevation el 31.5) to the southwest (elevation el 33.7). All elevations are North American Vertical Datum of 1988 (NAVD 88).

Summary of the Remedial Investigation Findings

The findings summarized herein are based on qualitative data (field observations and instrumental readings) and laboratory analytical soil, groundwater, and soil vapor sample results collected during the 2019 Remedial Investigation (2019 RI) performed prior to the Site being submitted for acceptance into the BCP and the 2020 Remedial Investigation (2020 RI) performed during the BCP.

1. Stratigraphy: The Site is underlain by a layer of historic fill that ranges from approximately 11.5 feet thick in the central portion to at least 30 feet thick in the northeast portion. Historic fill was found to be at least 20 feet in the southeastern, northwestern, and north-central portion of the

site. The historic fill layer consists of light brown to brown and red brown sand and varying amounts of brick, gravel, concrete, wood, and silt. Native sand was encountered at depths between 11 and 28 feet below sidewalk grade in all soil borings, with the exception of soil borings LSB-7, LSB-19, LSB-20, LSB-9, and LSB-28 (completed to 20 feet below grade as noted above) and LSB-4 (completed to 30 feet below grade in the northeast portion of the Site).

According to the Preliminary Geotechnical Investigation completed by Langan in February 2019, subsurface conditions consist of miscellaneous fill underlain by a 9 to 25 foot thick upper sand unit, a 20 to 60 foot silt stratum, followed by a lower sand unit. Bedrock was not encountered in any of the geotechnical borings, which were advanced to depths that ranged from 77 to 102 feet below sidewalk grade.

2. Hydrogeology: Monitoring wells installed during the 2020 RI revealed groundwater between 22.65 and 27.54 feet below site grade, corresponding to elevations 5.35 – 8.93 NAVD88 in LMW-7 through LMW-12. Based on the groundwater elevations recorded during the 2020 RI, groundwater flows to the south.

3. Historic Fill Quality: Up to 30 feet of fill material was identified below surface cover. Contaminants related to historic fill material include SVOCs, metals, and pesticides, which were detected at concentrations above Unrestricted Use SCOs and/or Restricted Residential RUSCOs within this layer.

4. Groundwater Quality: The VOC chloroform, PAHs, and metals were detected at concentrations exceeding the SGVs. Chloroform was detected in one groundwater sample collected in the eastern portion of the Site. PAHs were detected in one well in the southeastern part of the site; however, these results are attributable to elevated turbidity during sample collection. Metals were detected throughout the Site and are attributed to naturally occurring background concentrations and elevated turbidity during sample collection. Groundwater analytical results revealed concentrations of PFAS above the guidance values presented in the NYSDEC Guidelines Sampling and Analysis of PFAS dated January 2020.

5. Soil Vapor Quality: Results of the soil vapor evaluation completed as part of the previous investigations and the RI identified impacts of PCE and TCE that would require monitoring and/or mitigation per the NYSDOH guidance values in three samples. Additionally, concentrations of BTEX above laboratory reporting limits were identified in the sample results.

6. Emerging Contaminants: Results of the emerging contaminant evaluation completed as part of the RI did not detect the compound 1,4-dioxane in any soil or groundwater samples collected. PFAS compounds were detected in soil and groundwater samples collected. There are currently no regulatory soil or groundwater standards for PFAS compounds in New York State. Groundwater analytical results revealed concentrations of PFAS above the guidance values presented in the NYSDEC Guidelines Sampling and Analysis of PFAS dated January 2020. The sources of this PFAS

contamination may be related to the two former laundry services historically present on-Site or impacts caused to the Site from firefighting runoff from building materials when a fire occurred at the adjacent synagogue site.

Qualitative Human Health Exposure Assessment

Based upon the conceptual Site model (CSM) and review of environmental data, complete on-Site exposure pathways appear to be present, in the absence of protective measures and remediation. The complete exposure pathways indicate there is a risk of exposure to humans from Site contaminants via exposure to soil, groundwater, and soil vapor for current and construction conditions unless certain site access restrictions are implemented, which have already been put in place.

1. Under current conditions, there is a marginal risk for exposure for personnel completing investigations related to Site redevelopment and any construction work though dermal contact, ingestion and inhalation of soil. The marginal risk has been mitigated by Site fencing around landscaped areas, restricting access by tenants to all portions of the Site other than the concrete patio area and by employees of the adjacent Hong Ning Housing for the Elderly building who are temporarily parking on the Site, and implementation of a Site-specific HASP and CAMP. Tenant access restricted to the concrete patio cannot result in exposure since there is no exposed soil. Temporary fencing and posted notification/signage has restricted access to all in relation to current landscaped areas. The public has no exposure potential to groundwater since the excavation will not extend into the groundwater table and groundwater in New York City is not a drinking water source. The only potential exposure to groundwater is limited to those completing investigation activities, and any soil vapor dissipates once exposed to outdoor air. These exposure risks will be avoided or minimized by limiting Site access as described above and implementing the appropriate health and safety and vapor and dust suppression measures outlined in a Site-specific HASP and CAMP during ground-intrusive activities and the requirements of the Site Restrictive Declaration, which has been imposed on the Site by the New York City Department of City Planning (NYCDCP). Members of the public, including employees of the adjacent Hong Ning Housing for the Elderly building who currently park vehicles on the Site, and tenants who currently access the patio area, will not be allowed access once the remediation commences.
2. Since a complete exposure pathway is possible for the migration of Site contaminants to off-Site human receptors by the potential creation of dust and vapors during the remedial construction phase, all necessary measures will be taken to eliminate this pathway by: limiting Site access to only authorized visitors and workers; implementation of protective measures to prevent completion of exposure pathways, including implementing the Site-specific HASP and CAMP;

controlling dust generation via approved dust suppression methods, controlling soil tracking via the use of a truck wash and inspection station; and, implementing any additional measures required by the Restrictive Declaration imposed by NYCDCP.

3. The existence of a complete exposure pathway for Site contaminants to human receptors during proposed future conditions is unlikely, as the majority of on-Site contamination will be excavated and transported for off-Site disposal. Regional groundwater is not used as a potable water source in this part of New York City. It is not anticipated that dewatering will be required; the proposed building is not expected to be set within the groundwater table, which will minimize exposure to groundwater. The potential pathway for soil vapor intrusion into the buildings will be minimized for occupied portions of the building basement by the SSDS and sealing layer vapor barrier.

Summary of the Remedy

The selected remedy will include the following elements:

- Development and implementation of a CHASP and CAMP for the protection of on-Site workers, community/residents, and the environment during remediation and construction activities.
- Design and construction of the support of excavation (SOE) system to facilitate the preferred Track 2 remediation.
- Implementation of soil erosion, pollution and sediment control measures in compliance with applicable laws and regulations.
    - Excavation, stockpiling, off-Site transport, and disposal of historic fill and/or native soil exceeding the Track 2 Restricted Residential RUSCOs as defined by 6 NYCRR Part 375-6.8(b) to a minimum depth of 15 feet below street level in accordance with 6 NYCRR Part 375-3.8(e)(2)(iii)(a-d), and deeper as needed for the proposed redevelopment as follows:
        - to el 14 NAVD88 (corresponding to approximately 18 feet below street level) across the majority of the Site for construction of the new building foundation across 96.8% of the Site;
        - to el 18 NAVD88 (corresponding to approximately 15 feet below street level) in the northwestern portion of the Site for construction of the new building across 1.4% of the Site;
        - to between el 18 NAVD88 and el 11 NAVD88 (corresponding to between approximately 15 and 22 feet below street level) in the northwestern portion of the Site for excavation of the SOE berm on a 1:1.5 slope for construction of the new building across 1.7% of the Site; and,

- to el 11 NAVD88 (corresponding to approximately 22 feet below street level) in the northwestern portion of the Site for excavation of the new building across 0.1% of the site.

Any source material below a depth of 15 feet below street level will be removed to the extent feasible.

- Screening for indications of contamination (by visual means, odor, and monitoring with PIDs) of excavated material during intrusive Site work If encountered, removal and decommissioning of any encountered USTs and/or associated appurtenances (e.g., fill lines, vent line, and electrical conduit) and disposal off-Site during Site redevelopment in accordance with DER-10, 6 NYCRR Part 613.9, NYSDEC CP-51, and other applicable NYSDEC UST closure requirements.
- Collection and analysis of confirmation soil samples from the excavation base and sidewalls of the excavation, in accordance with DER-10 to confirm Restricted Residential RUSCOs were achieved; over-excavation may be completed if necessary to meet Restricted Residential RUSCOs or to document any remaining exceedances to the extent present.
- Completion of a topographic survey of final excavation sub-grade.
- Importation of certified-clean material (i.e., material meeting Restricted Residential RUSCOs), virgin stone, or recycled concrete aggregate (RCA), or virgin, native crushed stone to backfill over-excavated areas to development depth.
- Installation of a subslab depressurization system (SSDS) and the required sealing layer for the SSDS consisting of a vapor barrier/waterproofing membrane to prevent soil vapor intrusion.
- Reuse of Site soil meeting at least Restricted Residential RUSCOs, if necessary.
- Recording of an Environmental Easement (EE) to memorialize and make enforceable the institutional controls (ICs) and engineering controls (ECs), which shall require the current and all future owners of the Site to comply with certain land use restrictions and continue to maintain the SSDS.
- Establishment of an approved SMP to describe the protocols required to ensure long-term management of engineering and institutional controls, including the performance of periodic inspections and certification that the controls are performing as they were intended.

The preferred Track 2 restricted residential remedial action has been selected based on the results of the Remedial Investigations completed for the Site. Remedial activities will be performed in accordance with this RAWP, and the Department-issued Decision Document. Deviations from the RAWP and/or Decision Document would be promptly reported to the NYSDEC for approval and explained in the Final Engineering Report (FER).

1.0 INTRODUCTION

This Remedial Action Work Plan (RAWP) was prepared on behalf of GO Broome LLC (the Volunteer) for the property to the southwest of the intersection of Broome Street and Suffolk Street (Block 346, Lot 75) in the Lower East Side section of Manhattan, New York (the Site). GO Broome LLC is participating in the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) as a Volunteer as defined in ECL 27-1405 (1)(b) and as identified in the executed Brownfield Cleanup Agreement dated 2 January 2020. The Site is identified in the BCP as Site No. C231137.

This RAWP summarizes the nature and extent of contamination as determined from data gathered during the Remedial Investigation (RI) work completed by Langan in 2019 and documented in a May 2019 Remedial Investigation Report (2019 RIR) and the Remedial Investigation completed by Langan in 2020 and documented in the July 2020 Remedial Investigation Report (2020 RIR). The selected remedy is consistent with the procedures defined in DER-10/Technical Guidance for Site Investigation and Remediation and complies with applicable standards, criteria, and guidance, and with applicable federal, state and local laws, regulations and requirements.

1.1 Site Location and Description

The Site is located in the Lower East Side section of Manhattan, New York and is identified as Lot 75. The Site is an approximately 23,960-square foot parcel and contains asphalt paved parking, a concrete patio, and landscaped areas. The Site is bound to the north by Broome Street followed by an at-grade parking facility, to the east by Suffolk Street followed by a mixed-use property with a large asphalt-paved parking area, to the south by a five-story mixed-use building, and to the west by the 14-story Hong Ning Housing for the Elderly building and the former Beth Hamedrash Hagodol Synagogue which was demolished in June 2020 A Site location map and Site Plan/AOC and Sample Location Plan are provided as Figures 1 and 2, respectively. A Site survey is provided as Appendix A.

According to the Boundary and Topographic Survey prepared by Langan dated 29 December 2017, last revised 14 May 2018, the site slopes gently downward from the northeast (elevation el 31.5) to the southwest (elevation el 33.7). All elevations are North American Vertical Datum of 1988 (NAVD 88).

1.2 Redevelopment Plan

The planned redevelopment of the Site consists of a multi-story mixed use 25% permanently affordable housing building with a full cellar. The proposed building will contain mechanical and residential and retail

storage spaces and a locker room and break room in the cellar and a ground-floor residential lobby, retail spaces, and community space. The second and third floors will be used for community facility spaces and the upper floors will be occupied by residential apartments and amenities. Residential units will include 25% permanently affordable housing.

Excavation will be performed as part of the remediation of the Site to between elevation (el) 18 and 11 NAVD88; however, the majority of the Site will be excavated to el 14 NAVD88 (corresponding to a depth of approximately 18 feet below street level) across the entire Site footprint. The proposed development plans are included as Appendix B.

1.3 Description of Surrounding Property

According to records maintained online by New York City Open Accessible Space Information System (NYCOASIS) and aerial/street-view observations provided by Google Maps, surrounding properties include multi-story mixed-use residential/commercial buildings and parking lots. The following is a summary of adjacent property usage:

Direction	Adjacent Properties		
	Block No.	Lot No.	Description
North	346	150	Broome Street followed by a site currently under development (145 Clinton Street)
East	346	39	Suffolk Street followed by a vacant lot
	346	7501	Suffolk Street followed by one 15-story mixed-use residential/commercial building (145 Clinton Street)
South	346	95	A five-story missed-use residential/commercial building (384 Grand Street)
West	346	1	A 14-story Hong Ning Housing for the Elderly building (50 Norfolk Street)
	346	37	The former one-story Beth Hamedrash Hagodol Synagogue (60 Norfolk Street) [demolition completed in June 2020]

	351	1	Norfolk Street followed by three 23-story mixed-use residential/commercial buildings (62 Essex Street)

Public infrastructure (storm drains, sewers, and underground utility lines) exists within the streets surrounding the Site. Sensitive receptors, as defined in DER-10, located within a half-mile of the Site, include those listed below:

Number	Name (Approximate distance from site)	Address
1	Hong Ning Housing for the Elderly (located adjacent to the southwest of the site)	50 Norfolk Street New York, NY 10002
2	Seward Park HS (approximately 0.1-miles west of the site)	350 Grand Street New York, NY 10002
3	PS 042 Benjamin Altman (approximately 0.2-miles west-southwest of the site)	71 Hester Street New York, NY 10002
4	Cmsp-Marte Valle Sec. School (approximately 0.2-miles north of the site)	145 Stanton Street New York, NY 10002
5	PS 142 Amalia Castro (approximately 0.2-miles northeast of the site)	100 Attorney Street New York, NY 10002
6	PS 140 Nathan Straus (approximately 0.25-miles northeast of the site)	123 Ridge Street New York, NY 10002
7	PS 134 Henrietta Szold (approximately 0.25-miles southeast of the site)	293 East Broadway New York, NY 10002
8	JHS 056 Corlears (approximately 0.25-miles south-southeast of the site)	220 Henry Street New York, NY 10002
9	PS 002 Meyer London (approximately 0.3-miles southwest of the site)	122 Henry Street New York, NY 10002
10	I S 131 (approximately 0.3-miles west of the site)	100 Hester Street New York, NY 10002
11	PS 020 Anna Silver (approximately 0.3-miles north of the site)	166 Essex Street New York, NY 10002
12	University Neighborhood H.S. (approximately 0.35-miles southeast of the site)	200 Monroe Street New York, NY 10002
13	PS 137 John L Bernstein (approximately 0.4-miles south-southeast of the site)	327 Cherry Street New York, NY 10002
14	New Explorations Sci, Tech, Math	111 Columbia Street

Number	Name (Approximate distance from site)	Address
	(approximately 0.4-miles northeast of the site)	New York, NY 10002
15	PS 110 Florence Nightingale (approximately 0.4-miles east of the site)	285 Delancy Street New York, NY 10002
16	PS 124 Yung Wing (approximately 0.45-miles west-southwest of the site)	40 Division Street New York, NY 10002

1.4 Site History

1.4.1 Past Uses and Ownership

According to the Phase I ESA completed by Langan in November 2017, the Site was historically occupied by residential and mixed-use commercial/residential buildings between approximately 1894 and approximately 1983. The Site was reportedly vacant between approximately 1983 and 1990, at which time a portion of the Site was used for parking. Historical uses of concern included printing, a coppersmith and tinsmith, and two laundry services. The presence of contaminated historic urban fill and deteriorated remains of former on-Site buildings in the subsurface was identified as a Business Environmental Risk (BER) in the Phase I ESA, as this material is typically characterized by elevated concentrations of polycyclic-aromatic hydrocarbons (PAHs) and metals. The historical Site operations including printing, metalsmithing, and two laundry services were identified as a Recognized Environmental Condition (REC) due to the potential use of chemicals associated with these operations and the duration of the activities. Current and historical operations conducted at adjacent and nearby properties involving the use of ASTs, USTs, spills, and the generation and disposal of hazardous waste.

1.4.2 Previous Environmental Reports

The following environmental assessment and investigation reports have been prepared for the Site, which are provided in Appendix C.

- Phase I Environmental Site Assessment prepared by Langan, dated 27 November 2017;
- Remedial Investigation Report prepared by Langan, dated 7 May 2019;
- Draft Phase 1B Archaeology Workplan prepared by VHB Engineering, Surveying, Landscape Architecture, and Geology, P.C. (VHB), dated November 2019;
- Interim Remedial Measures Work Plan prepared by Langan, dated January 2020;
- Remedial Investigation Work Plan prepared by Langan, dated July 2020; and,

- Final Remedial Investigation Report prepared by Langan, dated August 2020.

Summaries of environmental findings of these reports are provided below:

November 2017 Phase I Environmental Site Assessment, prepared by Langan

A Phase I Environmental Site Assessment (ESA) dated November 2017 was prepared by Langan. This Phase I ESA identified the following recognized environmental condition (RECs) and business environmental risks (BERs) associated with the Site:

1. Historical Site operations including printing, metalsmithing, and laundry services were identified as a REC due to the potential use of chemicals associated with these operations and the duration of the activities.

2. The presence of historic urban fill and the deteriorated remains of former on-Site buildings in the subsurface was identified as a BER, as this material is typically characterized by elevated concentrations of PAHs and metals.

3. Potential impacts from current and historical operations conducted at adjacent and nearby properties was identified as a BER due to the potential for offsite migration of contaminants to impact sub-slab soil and/or groundwater below the subject site.

May 2019 Remedial Investigation Report, prepared by Langan

A Remedial Investigation Report (RIR) dated 17 May 2019 was prepared by Langan for GO Broome LLC. The RI was completed in January 2019 to investigate potential impacts to the soil and groundwater at the Site associated with the RECs or BERs as identified in the Phase I ESA. The scope of work included:

- Completion of a geophysical investigation;

- Completion of eight soil borings and collection of seventeen soil samples (two samples from each boring plus a one duplicate sample) to assess soil conditions;

- Installation and sampling of four monitoring wells in order to collect groundwater samples to assess current site groundwater conditions; and,

- Installation and sampling of seven soil vapor points in order to assess current site soil vapor conditions.

- Completion of eight additional soil borings in conjunction with the RI for the collection of composite soil samples in 5-foot intervals from 0 to 20 feet below ground surface in order to assess waste disposal options.

The results of the January 2019 RI were documented in the 2019 RIR submitted to NYSDEC as part of the Brownfield Cleanup Program Application approved on 25 November 2019 and are included in the discussion of the RI activities and results in Section 2.0.

November 2019 Draft Phase 1B Archaeology Workplan, prepared by VHB

A Draft Phase 1B Archaeology Workplan dated November 2019 was prepared by VHB for GO Broome LLC. The Phase 1B Workplan was prepared in order to describe procedures for the investigation of the historical land use of the Site as previously identified in their January 2019 Phase 1A Archaeological Documentary Study. The Phase 1A concluded that portions of the Site have a moderate to high sensitivity for the presence of 19th Century archaeological features. As such, VHB prepared a Phase 1B Workplan to investigate the presence or absence of archaeological materials on Site.

January 2020 Interim Remedial Measures Work Plan, prepared by Langan

An Interim Remedial Measures (IRM) Work Plan dated January 2020 was prepared by Langan for GO Broome LLC. The IRM Work Plan describes the procedures for conducting an archaeological investigation in support of the ULURP and CEQR process and geotechnical investigations at the Site. As part of the investigation activities soil borings and test pits will be installed at locations throughout the Site which will result in soil disturbance. No remedial activities were proposed as part of the IRM Work Plan; however, contingencies were provided to address unforeseen contamination that may be discovered during the soil disturbance activities, including removal of grossly and/or petroleum-impacted soil hotspots and closure of any underground storage tanks (USTs) encountered during soil disturbance activities, in advance of implementation of a RAWP for the redevelopment of the Site.

July 2020 Remedial Investigation Work Plan, prepared by Langan

A Remedial Investigation Work Plan (RIWP) dated 22 July 2020 was prepared by Langan for GO Broome LLC. The RIWP was prepared to investigate and characterize "the nature and extent of the contamination at and/or emanating from the brownfield site," per ECL Article 27, Title 14 (Brownfield Cleanup Program) and to supplement the investigation activities and results documented in the May 2019 Remedial Investigation (RI) Report.

The scope of work for the RI presented in the RIWP consisted of:

- A limited ground-penetrating radar (GPR) survey within the vicinity of soil boring locations to investigate the location of subsurface utilities;
- Advancement of ten soil borings (LSB-19 through LSB-28) and collection of 43 soil samples (including two duplicate samples);
- Collection of 12 surficial soil samples (including one duplicate sample) from 11 surficial soil sampling locations (LSS-1 through LSS-11)
- Installation of six permanent monitoring wells (LMW-7 through LMW-12) and collection of six groundwater samples (including one duplicate sample) from LMW-7 through LMW-10 and LMW-12;
- Survey and gauging of monitoring wells to evaluate groundwater elevation and flow direction; and,
- Installation of nine soil vapor sampling points (LSV-10 through LSV-18) and collection of ten soil vapor samples (including one duplicate sample) and one ambient sample.

August 2020 Remedial Investigation Report, prepared by Langan

A Draft Remedial Investigation Report dated 26 August 2020 was prepared by Langan for GO Broome LLC to document the Remedial Investigation completed in accordance with the RIWP. The results of the 2020 RI are included in the discussion of the RI activities and results in Section 2.0.

2.0 DESCRIPTION OF REMEDIAL INVESTIGATION FINDINGS

The RI was completed in accordance with the Remedial Investigation Work Plan (RIWP) approved by the NYSDEC on 20 July 2020 after an extended 60-day public comment period, which ended on 29 June 2020, and Title 6 of the New York Codes, Rules and Regulations (6 NYCRR) Part 375-1, 3.8, 6.8, NYSDEC Division of Environmental Remediation (DER) Program Policy: Technical Guidance for Site Investigation and Remediation (DER-10), and the NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006, with updates. The RI field work was completed in 2019 and 2020 to determine, to the extent practical, the nature and extent of contamination in soil, groundwater, and soil vapor. The

August 2020 RIR summarizes the RI work completed to characterize the nature and extent of contamination at the Site.

The findings of the 2019 and 2020 investigations are summarized in the following sections.

2.1 Field Investigation

The investigation completed during the January 2019 RI and documented in the 2019 RIR consisted of the following:

- Completion of a full geophysical investigation;
- Completion of eight soil borings and collection of seventeen discrete soil samples (two samples from each boring plus a one duplicate sample) between 0 and 20 feet below street level to assess soil conditions;
- Installation and sampling of four monitoring wells in order to collect groundwater samples to assess current site groundwater conditions; and,
- Installation and sampling of seven soil vapor points in order to assess current site soil vapor conditions.
- Completion of eight additional soil borings in conjunction with the RI for the collection of 21 composite soil samples (including one duplicate) in 5-foot intervals from 0 to 20 feet below street level in order to assess waste disposal options.

The investigation completed during the 2020 RI consisted of the following:

- A limited ground-penetrating radar (GPR) survey within the vicinity of soil boring locations to investigate the location of subsurface utilities;
- Advancement of ten soil borings (LSB-19 through LSB-28) and collection of 43 soil samples (including two duplicate samples) between 0 and 22 feet below street level;
- Collection of 12 surficial soil samples (including one duplicate sample) from 11 surficial soil sampling locations (LSS-1 through LSS-11)
- Installation of six permanent monitoring wells (LMW-7 through LMW-12) and collection of six groundwater samples (including one duplicate sample) from LMW-7 through LMW-10 and LMW-12;
- Survey and gauging of monitoring wells to evaluate groundwater elevation and flow direction; and,
- Installation of nine soil vapor sampling points (LSV-10 through LSV-18) and collection of ten soil vapor samples (including one duplicate sample) and two ambient samples.

2.1.1 Summary of Remedial Investigation Findings

The findings summarized herein are based on field observations and instrumental readings and laboratory analytical results of soil, groundwater, and soil vapor samples collected during the 2019 and 2020 RI. Cross-sectional diagrams showing inferred soil profiles are included as Figures 3A and 3B. Soil sample results are summarized on Figure 4, groundwater sample results are summarized on Figure 5, and soil vapor results are summarized on Figure 6. Findings and conclusions are as follows:

1. Stratigraphy: The Site is underlain by a layer of historic fill that ranges from approximately 11.5 feet thick in the central portion to at least 30 feet thick in the northeast portion. Historic fill was found to be at least 20 feet in the southeastern, northwestern, and north-central portion of the site. The historic fill layer consists of light brown to brown and red brown sand and varying amounts of brick, gravel, concrete, wood, and silt. Native sand was encountered at depths between 11 and 28 feet below sidewalk grade in all soil borings, with exception of soil borings LSB-7, LSB-19, LSB-20, LSB-9, and LSB-28 (completed to 20 feet below grade as noted above) and LSB-4 (completed to 30 feet below grade in the northeast portion of the site).

   According to the Preliminary Geotechnical Investigation completed by Langan in February 2019, subsurface conditions consist of miscellaneous fill underlain by a 9 to 25 foot thick upper sand unit, a 20 to 60 foot silt stratum, followed by a lower sand unit. Bedrock was not encountered in any of the geotechnical borings, which were advanced to depths that ranged from 77 to 102 feet below sidewalk grade.

2. Hydrogeology: Monitoring wells installed during the 2020 RI revealed groundwater between 22.65 and 27.54 feet below site grade, corresponding to elevations 5.35 – 8.93 NAVD88 in LMW-7 through LMW-12. Based on the groundwater elevations recorded during the 2020 RI, groundwater flows to the south.

3. Historic Fill Quality: Up to 30 feet of fill material was identified below surface cover. Contaminants related to historic fill material include SVOCs, metals, and pesticides, which were detected at concentrations above Unrestricted Use SCOs and/or Restricted Residential RUSCOs within this layer.

4. Groundwater Quality: The VOC chloroform, PAHs, and metals were detected at concentrations exceeding the SGVs. Chloroform was detected in one groundwater sample collected in the eastern portion of the site. PAHs were detected in one well in the southeastern part of the site; however, these results are attributable to elevated turbidity during sample collection. Metals were detected throughout the site and are attributed to naturally occurring background concentrations and elevated turbidity during sample collection.

5. Soil Vapor Quality: Results of the soil vapor evaluation completed as part of the previous investigations and this RI identified impacts of PCE and TCE that would require monitoring and/or

mitigation per the NYSDOH guidance values in three samples. Additionally, concentrations of BTEX above laboratory reporting limits were identified in the sample results.

6. Emerging Contaminants: Results of the emerging contaminant evaluation completed as part of the RI did not detect the compound 1,4-dioxane in any groundwater samples collected. PFAS compounds were detected in soil and groundwater samples collected. There are currently no regulatory soil or groundwater standards for PFAS compounds in New York State. Groundwater analytical results revealed concentrations of PFAS above the guidance values presented in the NYSDEC Guidelines Sampling and Analysis of PFAS dated January 2020. The sources of PFAS contamination may be related to the two former laundry services historically present on-Site, impacts caused to the Site from firefighting runoff from building materials when a fire occurred at the adjacent synagogue site, or an unidentified off-site source.

2.2 Geological Conditions

Provided below is a description of the geologic and hydrogeologic observations made during the 2019 and 2020 RI. Subsurface profiles are included as Figures 3A and 3B. Soil boring logs, a groundwater contour map, and groundwater monitoring well construction logs were included in the May 2019 and August 2020 RIRs.

2.2.1 Historic Fill Material

Historic fill was encountered during the RIs in all borings at depths ranging from 11.5 to 30 feet below street level. Fill material generally consists of light brown to brown and red brown sand and varying amounts of brick, gravel, concrete, wood, and silt.

2.2.2 Native Soil Layers

Historic fill is underlain by native soil consisting of fine to medium-grained sand with varying amounts of silt that extended to the termination depth of each boring, with exception of LSB-7, LSB-9, LSB-19, LSB-20, and LSB-28 (completed to 20 feet below grade) and LSB-4 (completed to 30 feet below grade).

2.2.3 Hydrogeology

Monitoring wells installed during the 2020 RI revealed groundwater between 22.65 and 27.54 feet below site grade, corresponding to elevations 5.35 to 8.93 NAVD88 in LMW-7 through LMW-12. Based on the groundwater elevations recorded during the 2020 RI, groundwater flows to the south.

2.3 Contaminant Conditions

2.3.1 Conceptual Site Model

A conceptual Site model (CSM) was developed based on the findings of the RI to produce a simplified framework for understanding the distribution of impacted materials, potential migration pathways, and potentially complete exposure pathways.

2.3.1.1 Potential Sources of Contamination

Potential sources of contamination have been identified and include past uses of the Site and contaminated historic fill material. Historical on-Site use for printing, laundry services, and metalsmithing are potential sources of SVOCs in soil and petroleum-related and chlorinated VOCs in soil vapor. The Site-wide presence of historic fill has been established as a source of SVOCs, pesticides, and metals in soil. Detections of dissolved metals in all monitoring wells and of PAHs in one monitoring well are likely attributable to naturally occurring background concentrations (metals) and elevated turbidity during sample collection (metals, PAHs). Groundwater is not considered to be impacted by contamination caused by historic fill or historical Site operations based on available analytical results.

PFAS was identified on-Site in groundwater and soil and may be attributed to the two former laundry services on-Site, impacts caused to the Site from firefighting runoff from building materials when a fire occurred at the adjacent synagogue site, or an unidentified off-Site source.

2.3.1.2 Exposure Media

Impacted media include soil and soil vapor. Analytical data indicates that historic fill material contains SVOCs, pesticides, and metals at concentrations greater than the Unrestricted Use SCOs and Restricted Residential RUSCOs. Soil vapor at the Site is impacted with petroleum-related VOCs (BTEX) and the chlorinated VOCs tetrachlorethene (PCE) and trichloroethene (TCE) at concentrations exceeding the NYSDOH soil vapor intrusion guidance levels which would require monitoring or mitigation. This RAWP is designed to eliminate the exposure impacts from these media.

2.3.1.3 Receptor Populations

The Site consists of an old asphalt paved surface parking lot, concrete walkways and patio, and landscaped areas. The parking lot was recently significantly disturbed by the archeological test pit investigation which was completed in accordance with the January 2020 IRM Work Plan; the disturbed areas will be temporarily covered with a layer of gravel following completion of the IRM Work Plan activities until the remediation commences. The Site is enclosed in fencing and access is restricted to tenants and employees of the adjacent Hong Ning Housing for the Elderly building, personnel completing site investigations related to Site redevelopment, and other authorized personnel. Site access for tenants from the adjacent building is limited to the concrete patio where there is no potential exposure to any Site contaminants. The landscaped area around the concrete patio has also been fenced off to prevent

access. Otherwise, site access is currently restricted to employees of the adjacent building who are temporarily allowed to park vehicles in the parking lot area.

During Site development and remedial construction, the only individuals accessing the Site will be limited to construction and remediation workers, authorized personnel, and design team members visiting the Site. Members of the public, including employees of the adjacent Hong Ning Housing for the Elderly building who currently park vehicles on the Site, will not be allowed access once the remediation commences. Tenants will also not be allowed to access the patio area since the entire Site will be enclosed with a new construction fence. The public adjacent to the Site will be protected from any potential exposure through the implementation of multiple prevention measures discussed in detail in Section 2.4 (i.e., community air monitoring, implementation of dust suppression, truck inspection station, etc.). Under future conditions, receptors will include the new building occupants, visitors to the building, and building management/maintenance employees, who will be protected by the sub-slab depressurization system (SSDS) constructed with a required vapor barrier sealing layer, which can be converted to an active system if required, as discussed herein.

2.3.2 Description of Areas of Concern

Langan compared the laboratory analytical results for soil to the 6 NYCRR Subpart 375-6.8(a-b) Remedial Program Soil Cleanup Objectives for Unrestricted Use, Residential Restricted Use, and Protection of Groundwater. Groundwater analytical results were compared to a combination of the New York State 6 NYCRR Part 703.5 Class GA groundwater standards and the NYSDEC Technical & Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards (collectively referred to as SGVs). Soil vapor was compared to NYSDOH Final Guidance for Evaluating Soil Vapor Intrusion Matrices A through C dated October 2006 and revised in May 2017. Soil, groundwater, and soil vapor laboratory analytical results are summarized in Tables 1A through 7, and Figures 4 through 6.

This section discusses the results of the RI completed in 2019 and 2020 with respect to the Areas of Concern (AOCs) identified.

2.3.2.1 AOC-1: Historic Fill

Material from unknown sources were used as backfill during various phases of the Site development history. The historic fill layer consists of light brown to brown and red brown sand and varying amounts of brick, gravel, concrete, wood, and silt and was observed at depths ranging from 11.5 to 30 feet below street level.

A total of 26 soil borings were advanced to depths ranging between 15 and 35 feet below street level during the RI, and a total of 11 surface soil samples, 57 discrete soil samples, and 20 composite soil samples were collected between 0 and 22 feet below street level in order to assess the on-Site historic fill.

AOC-1 Findings Summary

AOC-1 Soil

Exceedances of analytes associated with historic fill, including PAHs, pesticides, and metals, above the NYSDEC Unrestricted Use SCOs, Restricted Residential RUSCOs, and/or Protection of Groundwater SCOs were detected within the historic fill layer. PCBs and herbicides were not detected at concentrations exceeding the applicable SCOs in soil samples collected.

Surficial Soil (0 to 2 inches)

Discrete surficial soil samples LSS-1 through LSS-11 were collected from 0 to 2 inches below ground surface or below the vegetative cover.

- Acetone is the only VOC that was detected above the Unrestricted Use SCOs and/or Protection of Groundwater SCOs in samples collected from LSS-2, LSS-4, and LSS-7 through LSS-11.
- Seven SVOCs including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene were detected above the Unrestricted Use SCOs, Restricted Residential RUSCOs, and/or Protection of Groundwater SCOs in samples collected from LSS-3, LSS-5 through LSS-7, and LSS-8 through LSS-10.
- Four pesticides (4,4'-DDD, 4,4'-DDE, 4,4'-DDT, and dieldrin) were detected above the Unrestricted Use SCOs in samples collected from LSS-1 through LSS-11.
- Four metals, including barium, lead, mercury, and zinc were detected above the Unrestricted Use SCOs, Restricted Residential RUSCOs, and/or Protection of Groundwater SCOs in samples collected from LSS-1 through LSS-10.

0 to 5 feet

Discrete soil samples were collected from within the 0- to 5-foot interval from soil borings LSB-2, LSB-4, LSB-5, LSB-6, LSB-7, LSB-8, LSB-9, LSB-10, LSB-19, LSB-20, LSB-21, LSB-22, LSB-23, LSB-24, LSB-25, LSB-26, LSB-27, and LSB-28.

- Acetone is the only VOC that was detected above the Unrestricted Use SCOs and/or Protection of Groundwater SCOs in LSB-21, LSB-23, LSB-24, and LSB-27.

- Seven SVOCs including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene were detected above the Unrestricted Use SCOs, Restricted Residential RUSCOs, and/or Protection of Groundwater SCOs in samples collected from LSB-2, LSB-5 through LSB-9, LSB-19 through LSB-22, LSB-24, and LSB-28.
- Four pesticides (4,4'-DDD, 4,4'-DDE, 4,4'-DDT, and dieldrin) were detected above the Unrestricted Use SCOs in samples collected from LSB-2, LSB-5, LSB-6, LSB-8, LSB-9, LSB-10, LSB-21, LSB-21 through LSB-24, and LSB-27.
- Ten metals, including arsenic, barium, cadmium, hexavalent trivalent chromium, copper, lead, mercury, nickel, silver, and zinc were detected above the Unrestricted Use SCOs, Restricted Residential RUSCOs, and/or Protection of Groundwater SCOs in samples collected from LSB-2, LSB-4 through LSB-10 and LSB-19 through LSB-28.

Composite soil samples WC-1A, WC-2A, WC-3A, WC-4A, and WC-5A were collected from soil borings LSB-2 and LSB-4 through LSB-18 samples for waste characterization analysis. Each composite sample was obtained by compositing at least five discrete soil samples within the 0- to 5-foot interval from the borings noted.

- Acetone is the only VOC that was detected above the Unrestricted Use SCOs and/or Protection of Groundwater SCOs in sample WC-1A.
- Four pesticides (4,4'-DDD, 4,4'-DDE, 4,4'-DDT, and dieldrin) were detected above the Unrestricted Use SCOs in samples WC-1A through WC-5A.
- Seven SVOCs including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene were detected above the Unrestricted Use SCOs, Restricted Residential RUSCOs, and/or Protection of Groundwater SCOs in samples WC-1A through WC-5A.
- Four metals including barium, lead, mercury, and zinc were detected above the Unrestricted Use SCOs, Restricted Residential RUSCOs, and/or Protection of Groundwater SCOs in samples WC-1A through WC-5A.

5 to 10 feet

Discrete soil samples were collected from within the 5- to 10-foot interval from soil borings LSB-19 through LSB-28.

- Seven SVOCs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene) were

detected above the Unrestricted Use SCOs, Restricted Residential RUSCOs, and/or Protection of Groundwater SCOs in samples collected from LSB-19, LSB-21, and LSB-28.

- Four metals, including barium, lead, mercury, and zinc were detected above the Unrestricted Use SCOs, Restricted Residential RUSCOs, and/or Protection of Groundwater SCOs in samples collected from LSB-19, LSB-21, LSB-22, LSB-23, and LSB-28.

Composite soil samples WC-1B through WC-5B were collected from soil borings LSB-2 and LSB-4 through LSB-18 samples for waste characterization analysis. Each composite sample was obtained by compositing at least five discrete soil samples within the 5- to 10-foot interval from the borings noted.

- The pesticides 4,4'-DDT was detected above the Unrestricted Use SCOs in samples WC-1B, WC-2B, WC-3B, and WC-5B; 4,4'-DDD, 4,4'DDE, and dieldrin were also detected above the Unrestricted Use SCOs in WC-2B.
- Seven SVOCs including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene were detected above the Unrestricted Use SCOs, Restricted Residential RUSCOs, and/or Protection of Groundwater SCOs in samples WC-1B, WC-3B, and WC-5B.
- Four metals including barium, lead, mercury, and zinc were detected above the Unrestricted Use SCOs, Restricted Residential RUSCOs, and/or Protection of Groundwater SCOs in samples WC-1B through WC-5B.

<u>10 to 15 feet</u>

Discrete soil samples were collected from within the 10- to 15-foot interval from soil borings LSB-19 through LSB-28.

- Seven SVOCs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene) were detected above the Unrestricted Use SCOs, Restricted Residential RUSCOs, and/or Protection of Groundwater SCOs in samples collected from LSB-19 and LSB-22.
- Six metals, including cadmium, copper, lead, mercury, nickel and zinc were detected above the Unrestricted Use SCOs, Restricted Residential RUSCOs, and/or Protection of Groundwater SCOs in samples collected from LSB-19 through LSB-22.

Composite soil samples WC-1C through WC-5C were collected from soil borings LSB-2 and LSB-4 through LSB-18 samples for waste characterization analysis. Each composite sample was obtained by compositing at least five discrete soil samples within the 10- to 15-foot interval from the borings noted.

- Three pesticides (4,4'-DDD, 4,4'-DDE, and 4,4'-DDT) were detected above the Unrestricted Use SCOs in samples WC-2C through WC-4C.
- Seven SVOCs including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene were detected above the Unrestricted Use SCOs, Restricted Residential RUSCOs, and/or Protection of Groundwater SCOs in samples WC-1C, WC-3C, and WC-4C.
- Four metals including barium, lead, mercury, and zinc were detected above the Unrestricted Use SCOs, Restricted Residential RUSCOs, and/or Protection of Groundwater SCOs in samples WC-1C, WC-3C, WC-4C, and WC-5C.

15 to 20 feet

Discrete soil samples were collected from within the 15- to 20-foot interval from soil borings LSB-2, LSB-4, LSB-5, LSB-6, LSB-7, LSB-8, LSB-9, LSB-10, LSB-19, LSB-20, LSB-21, LSB-22, LSB-24, and LSB-28.

- The pesticide 4,4'-DDT was detected above the Unrestricted Use SCO in LSB-9.
- The metal nickel was detected above the Unrestricted Use SCO in LSB-2, LSB-4, and LSB-9; lead, mercury, and zinc were also detected above the Unrestricted Use SCOs in LSB-9.
- Composite soil samples WC-1D through WC-5D were collected from soil borings LSB-2 and LSB-4 through LSB-18 samples for waste characterization analysis. Each composite sample was obtained by compositing at least five discrete soil samples within the 15- to 20-foot interval from the borings noted. The pesticide 4,4-DDT was detected above the Unrestricted Use SCO in samples WC-3D and WC-4D.
- Six SVOCs including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, and indeno(1,2,3-cd)pyrene were detected above the Unrestricted Use SCOs, Restricted Residential RUSCOs, and/or Protection of Groundwater SCOs in sample WC-3D.
- Five metals including barium, lead, mercury, nickel, and zinc were detected above the Unrestricted Use SCOs, Restricted Residential RUSCOs, and/or Protection of Groundwater SCOs in samples WC-3D through WC-5D.

20 to 22 feet

Discrete soil samples were collected from within the 20- to 22-foot interval from soil borings LSB-21 and LSB-22.

- Acetone is the only VOC that was detected above the Unrestricted Use SCOs and/or Protection of Groundwater SCOs in samples collected from all five borings.

- Two SVOCs (benzo(b)fluoranthene and indeno(1,2,3-cd)pyrene) were detected above the Unrestricted Use SCOs, Restricted Residential RUSCOs, and/or Protection of Groundwater SCOs in the sample collected from LSB-21.
- Four pesticides, including 4'4-DDD, 4,4'-DDE, 4,4-DDT, and dieldrin were detected above the Unrestricted Use SCOs in LSB-21.
- Two metals were detected above the Unrestricted Use SCOs including lead in LSB-21 and nickel in LSB-22.

AOC-1 Groundwater

Soil borings LSB-2, LSB-4 through LSB-6, LSB-21 through LSB-24 and LSB-27 were completed as permanent monitoring wells LMW-2, LMW-4 through LMW-10, and LMW-12, respectively. A summary of the groundwater analytical results for AOC-1 is summarized as follows:

- One VOC (chloroform) was detected above the SGV in LMW-8.
- Six SVOCs including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, and indeno(1,2,3-cd)pyrene were detected in LMW-10.
- Seven total and four dissolved metals, including iron, lead, magnesium, manganese, nickel, selenium, and sodium were detected in all groundwater samples collected.
- Pesticides, PCBs and herbicides were not detected above the SGVs in any groundwater samples collected.

AOC-1 Soil Vapor

Soil vapor points LSV-2 and LSV-4 through LSV-18 were installed as part of the site-wide soil vapor assessment. The results for soil vapor points LSV-2, LSV-4, LSV-5, LSV-8, and LSV-11 through LSV-14 are discussed below in Section 2.3.2.2 with regard to AOC-2. A summary of the soil vapor analytical results for LSV-6, LSV-7, LSV-10, and LSV-15 through LSV-18 is summarized as follows:

- No NYSDOH Soil Vapor Intrusion Matrix compounds were detected above monitoring and/or mitigation thresholds in any of the soil vapor samples collected outside of AOC-2, which is discussed in detail below. Petroleum-related VOCs including BTEX, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene were detected in all seven samples.

AOC-1 Conclusions

Historic fill is ubiquitous across the Site from approximately 11.5 feet thick in the central portion to at least 30 feet thick in the northeast portion, and was found to be at least 20 feet thick in the southeastern, northwestern, and north-central portion of the site. Soil samples were collected from 0 to 22 feet below

street level at the Site. Soil analytical results exceeding the Unrestricted Use SCOs, Residential RUSCOs, and/or Protection of Groundwater SCOs for SVOCs, pesticides, and metals were detected throughout the Site. The historic fill layer was visually observed up to approximately 30 feet below street level in the northeastern portion of the Site and predominantly consisted of light brown to brown and red brown sand and varying amounts of brick, gravel, concrete, wood, and silt; however, soil samples were not collected from material deeper than 22 feet below street level as this exceeds the feasible level of excavation with the planned support of excavation (SOE) system.

Due to the depth to groundwater, groundwater monitoring wells were installed within the native material, with the exception of LMW-4 where the bottom of the historic fill layer was not encountered. Detections of metals in groundwater are attributed to naturally occurring background concentrations; detections of SVOCs are attributed to elevated turbidity during sample collection at LMW 10, as all groundwater parameters had stabilized within appropriate ranges although turbidity readings remained above 120 NTU.

Concentrations of NYSDOH Soil Vapor Intrusion Matrix compounds were not detected above monitoring and/or mitigation thresholds in any of the samples collected outside of AOC-2, which is discussed in detail below. Petroleum-related VOCs including BTEX, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene were detected in all five samples.

2.3.2.2 AOC-2: Historical Site Use

Operations of concerns were historically located along the northern and eastern frontage of the Site including printing between 1905 and 1950, a coppersmith and tinsmith (1920), and two laundry services (1922, 1947-1968). Potential releases of petroleum products, solvents, and/or other hazardous materials associated with these uses during the on-site operations may have adversely affected soil, groundwater and/or soil vapor.

Three soil borings (LSB-21, LSB-22, and LSB-23) were advanced to 22 feet below ground surface and six discrete soil samples were collected from the interval directly below ground surface (0- to 2 feet below street level) and from 20 to 22 feet below street level to characterize potential impacts the from historical Site operations. Soil borings LSB-2, LSB-4, LSB-5, LSB-9, and LSB-10 were also advanced in the immediate vicinity of historical operations of concern, and ten discrete soil samples were collected from the interval directly below ground surface (0- to 2 feet below street level) and the two foot interval corresponding to immediately below the maximum excavation depth for the proposed development (i.e., 18 to 20 feet below street level).

AOC-2 Findings Summary

AOC-2 Soil

Elevated concentrations of PAHs, pesticides, and metals, above the NYSDEC Unrestricted Use SCOs, Restricted Residential RUSCOs, and/or Protection of Groundwater SCOs were detected in samples collected to evaluate impacts from historical site operations. PCBs and herbicides were not detected at concentrations exceeding the applicable SCOs in soil samples collected.

- One VOC (acetone) was detected above the Unrestricted Use SCOs in shallow soil samples collected from LSB-21 and LSB-23 and in deep soil samples collected from all three boring locations. Acetone is a common laboratory artifact and is likely not associated with historical site uses.
- Seven SVOCs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene) were detected above the Unrestricted Use SCOs, Restricted Residential RUSCOs, and/or Protection of Groundwater SCOs in both samples collected from LSB-21, the shallow samples collected from LSB-2, LSB-5, LSB-9, and LSB-22, and the deep sample collected from LSB-23.
- Seven metals, including barium, cadmium, hexavalent chromium, trivalent chromium, lead, mercury, nickel, and zinc were detected above the Unrestricted Use SCOs in both samples collected from LSB-2, LSB-4, LSB-9, LSB-21, and LSB-22 and from the shallow samples collected from LSB-5 and LSB-23.
- Four pesticides, including 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, and dieldrin were detected above Unrestricted use SCOs in both samples collected from LSB-9, LSB-21, and LSB-23 and the shallow samples collected from LSB-2, LSB-5, LSB-9, and LSB-22.
- PFAS compounds were detected in all soil samples collected for which the analysis was completed with the exception of the sample collected from LSB-23 from 0 to 2 feet below street level.

AOC-2 Groundwater

Soil borings LSB-2, LSB-4, LSB-5, LSB-21, LSB-22, and LSB-23 were completed as permanent monitoring wells LMW-2, LMW-4, LMW-5, LWM-7, LMW-8, and LMW-9, respectively, to characterize potential groundwater impacts from the historical operations throughout the Site. A summary of the groundwater analytical results for AOC-2 is summarized as follows:

- One VOC (chloroform) was detected above the SGV in LMW-8.

- Six SVOCs including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, and indeno(1,2,3-cd)pyrene were detected in LMW-10.
- Seven total and four dissolved metals, including iron, lead, magnesium, manganese, nickel, selenium, and sodium were detected in all groundwater samples collected.
- Pesticides, PCBs and herbicides were not detected above the SGVs in any groundwater samples collected.
- PFAS compounds were detected in all groundwater samples for which they were analyzed at concentrations exceeding the guidance values of 10 ng/L, 100 ng/L, and 500 ng/L. PFAS contamination in groundwater may be related to the two former laundry services historically present on-Site, impacts caused to the Site from firefighting runoff from building materials when a fire occurred at the adjacent synagogue site, or an unidentified off-site source. 1,4-Dioxane was not detected in groundwater samples.

AOC-2 Soil Vapor

Soil vapor points LSV-2, LSV-4, LSV-5, LSV-9, and LSV-11 through LSV-14 were installed in the vicinity of the historical site uses of concern along the norther frontage (LSV-2, LSV-9, LSV-11, LSV-12, and LSV-14) and the eastern frontage (LSV-4, LSV-5, and LSV-13). A summary of the soil vapor analytical results for AOC-2 is summarized as follows:

- NYSDOH Soil Vapor Intrusion Matrix compound TCE was identified above the monitoring and/or mitigation threshold of 6 µg/m^3 in LSV-11 and LSV-13.
- NYSDOH Soil Vapor Intrusion Matrix compound PCE was identified above the monitoring and/or mitigation threshold of 100 µg/m^3 in LSV-13 and LSV-14.
- NYSDOH Soil Vapor Intrusion Matrix compounds cis-1,2-dichloroethene, 1,1-dichloroethene, 1,1,1-trichloroethane, carbon tetrachloride, methylene chloride, and vinyl chloride were not detected above monitoring and/or mitigation thresholds in any of the soil vapor samples.
- Petroleum-related VOCs including BTEX, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene were detected in all four samples. The highest concentrations of petroleum related compounds were identified in LSV-12 located in the northern portion of the Site.

AOC-2 Conclusions

Concentrations of VOCs, PAHs, pesticides, and metals in soil are attributed to the presence of contaminated historic fill material and not the historical site uses. PFAS contamination in soil may be related to the two former laundry services on-Site, impacts caused to the Site from firefighting runoff

from building materials when a fire occurred at the adjacent synagogue site, or an unidentified off-site source.

Due to the depth to groundwater, groundwater monitoring wells were installed within the native material, with the exception of LMW-4 where the bottom of the historic fill layer was not encountered. Detections of metals in groundwater are attributed to naturally occurring background concentrations; detections of SVOCs are attributed to elevated turbidity during sample collection at LMW 10, as all groundwater parameters had stabilized within appropriate ranges although turbidity readings remained above 120 NTU. PFAS compounds were detected in all groundwater samples for which they were analyzed at concentrations exceeding the guidance values presented in the NYSDEC Guidelines Sampling and Analysis of PFAS dated January 2020.

Detections of TCE and PCE above the NYSDOH Soil Vapor Intrusion Matrices monitoring and/or mitigation thresholds were identified in three of the eight soil vapor samples collected in close proximity to historical site uses of concern and petroleum-related VOCs including BTEX, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene were detected in all eight samples. As these three sample locations are located in close proximity to historical uses of concern including the former printers and two laundry facilities, the presence of elevated concentrations of TCE and PCE and petroleum-related VOCs may be attributed to releases associated with historical site operations.

2.3.3 Nature and Extent of Contamination

2.3.3.1 Soil Contamination

Acetone was detected from 0 to 22 feet below sidewalk grade at concentrations exceeding the NYSDEC Unrestricted Use SCO in seven surficial samples and nine subsurface soil samples throughout the site during the RI. No other VOCs were detected in soil at concentrations exceeding the Unrestricted Use SCOs, Restricted Residential RUSCOs, or Protection of Groundwater SCOs.

SVOCs commonly associated with the presence of historic fill material including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, were detected from 0 to 22 feet below street level in seven surficial soil samples and 16 subsurface soil samples collected throughout the Site footprint during the RI activities completed in 2020 and in six subsurface soil samples collected during the 2019 investigation at concentrations exceeding the Unrestricted Use SCOs, Restricted Residential RUSCOs, and/or Protection of Groundwater SCOs. These SVOCs were also detected from 0 to 20 feet in 11 composite soil waste characterization samples collected during the 2019 investigation.

Metals including arsenic, barium, cadmium, hexavalent chromium, trivalent chromium, copper, lead, mercury, nickel, silver, and zinc were detected from 0 to 22 feet below sidewalk grade in 10 surficial soil samples and 30 subsurface soil samples collected throughout the Site footprint during the RI at concentrations exceeding Unrestricted Use SCOs, Restricted Residential RUSCOs, and/or Protection of Groundwater SCOs. These metals were also detected from 0 to 20 feet in 18 composite soil waste characterization samples collected at the Site.

Pesticides including 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, and dieldrin were detected from 0 to 22 feet below sidewalk grade at concentrations exceeding the Unrestricted Use SCOs, Restricted Residential RUSCOs, and/or Protection of Groundwater SCOs in 12 surficial soil samples and 13 subsurface soil samples collected during the RI. These pesticides were also detected from 0 to 20 feet in 14 composite soil waste characterization samples collected during the 2019 investigation.

PCBs and herbicides were not detected above the Unrestricted Use SCOs, Restricted Residential RUSCOs, and/or Protection of Groundwater SCOs in any of the samples collected.

Soil sample analytical results exceeding the Unrestricted Use SCOs, Restricted Residential RUSCOs, and/or Protection of Groundwater SCOs for SVOCs, pesticides, and metals were detected throughout the Site and are attributed to the presence of a contaminated historic fill layer observed up to 30 feet in depth at the Site.

PFAS compounds were detected in all eleven surficial soil samples collected, four of the five soil samples collected from 0 to 2 feet below street level for which the analysis was completed, and in all five soil samples collected from 20 to 22 feet below street level for which the analysis was completed. The sources of PFAS contamination may be related to the two former laundry services on-Site, impacts caused to the Site from firefighting runoff from building materials when a fire occurred at the adjacent synagogue site, or an unidentified off-site source.

2.3.3.2 Groundwater Contamination

Groundwater sample analytical results did not identify the presence of pesticides, herbicides, or PCBs at concentrations above laboratory detection limits. One VOC, chloroform, was detected marginally above the SGV in LMW-8. SVOCs including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, and indeno(1,2,3-cd)pyrene were detected in LMW-10. Seven total and four dissolved metals, including iron, lead, magnesium, manganese, nickel, selenium, and sodium were detected in all groundwater samples collected. Due to the depth to groundwater, groundwater monitoring wells were installed within the native material, with the exception of LMW-4 where the bottom of the historic fill layer was not encountered. Detections of metals in groundwater are attributed to naturally occurring background concentrations; detections of SVOCs are attributed to elevated

turbidity during sample collection at LMW-10, as all groundwater parameters had stabilized within appropriate ranges although turbidity readings remained above 120 NTU.

The compound 1,4-dioxane was not detected in groundwater samples collected during the RI. PFAS was detected in all groundwater samples collected at concentrations above the guidance values provided in the NYSDEC Guidelines Sampling and Analysis of PFAS dated January 2020. There are currently no regulatory groundwater standards for PFAS compounds in New York State.

2.3.3.3 Soil Vapor Contamination

Soil vapor sample analytical results detected chlorinated VOCs PCE and TCE at concentrations above the NYSDOH soil vapor intrusion guidance levels which would require monitoring or mitigation in addition to petroleum-related VOCs (BTEX) for which there are no NYSDOH guidance values.

2.4 Qualitative Human Exposure Assessment

Based upon the CSM and the review of environmental data, incomplete exposure pathways appear to be present under current conditions at the Site. Institutional and engineering controls will be implemented to prevent complete on-Site exposure pathways in construction/remediation and future conditions.

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.

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 for the Site is not required.

2.4.1 Current Conditions

The Site is located in the Lower East Side section of Manhattan, New York and is identified as Lot 75. The Site is an approximately 23,960-square foot parcel and is bound to the north by Broome Street followed by an at-grade parking facility, to the east by Suffolk Street followed by a mixed-use property with a large asphalt-paved parking area, to the south by a five-story mixed-use building, and to the west by the 14-story Hong Ning Housing for the Elderly building and the former Beth Hamedrash Hagodol Synagogue which was demolished in June 2020.

The Site consists of an old asphalt paved surface parking lot, concrete walkways and patio, and landscaped areas. The Site is currently zoned for commercial and residential use (C2-5/R9-1) and has been approved for the proposed project through the Uniform Land Use Review Procedure (ULURP) and City Environmental Quality Review (CEQR) process. The ULURP resulted in the establishment of a Restrictive Declaration for the Site which formalizes the requirements for redevelopment in accordance with the findings of the Final Environmental Impact Statement including elements included in this RAWP such as traffic, noise, dust and air emission requirements and controls. The Restrictive Declaration will be executed upon financial closing. The draft document is provided as Appendix D.

The parking lot was recently significantly disturbed by the archeological test pit investigation which was completed in accordance with the January 2020 IRM Work Plan; the disturbed areas will be temporarily covered with a layer of gravel following completion of the IRM Work Plan activities until the remediation commences. The Site is enclosed in fencing and access is restricted to tenants and employees of the adjacent Hong Ning Housing for the Elderly building, personnel completing site investigations related to Site redevelopment, and other authorized personnel. Tenants are currently restricted from accessing all portions of the Site via temporary fencing and posted notification/signage with the exception of the concrete patio. Personnel completing Site investigations prevent direct contact with subsurface conditions through the implementation of a Site-specific health and safety plan (HASP). Similarly, implementation of a community air monitoring plan (CAMP) in accordance with the HASP protects the adjacent public from exposure during soil disturbance activities; there were no exceedances of monitoring levels identified in the HASP for either dust or vapor during implementation of the RI or the ongoing IRM. Therefore, the potential exposure pathway for dermal absorption, inhalation, and ingestion has been and will continue to be fully controlled throughout the planned remediation and construction activities at the Site.

Due to the depth of groundwater, and the fact that detections of metals are attributed to naturally occurring background concentrations and elevated turbidity during sample collection, there is no pathway of exposure to groundwater. Additionally, groundwater in New York City is not used as a potable water source, there is no complete exposure pathway under current Site conditions. There is a potential exposure pathway through dermal absorption, inhalation, and ingestion by contractors during investigative groundwater sampling, but it is controlled by limiting Site access and through the implementation of the HASP during sampling. Because the Site consists of an open-air parking lot, concrete walkways and patio, and restricted landscaped areas and lacks enclosed spaces, any soil vapor that may vertically migrate up through cracks in the pavement or the unpaved surface of the Site will dissipate and immediately dilute with ambient air once it reaches the surface of the Site.

2.4.2 Construction/Remediation Activities

During remedial construction, institutional and engineering controls will be implemented to prevent complete on-Site exposure pathways. Potential points of exposure for remedial contractors or workers include disturbed and exposed soil during excavation and dust and organic vapors generated during soil excavation and off-Site disposal. However, ingestion and dermal absorption of contaminated soil, inhalation of organic vapors arising from contaminated soil, and inhalation of dust arising from contaminated soil will all be controlled through implementation of the HASP and the training these workers have received to avoid exposure. The public adjacent to the Site will be protected by implementation of the HASP and additional measures including the CAMP implementation to avoid any off-Site dust generation or vapor migration, dust suppression measures to minimize the generation of dust and dust migration, and a truck wash and inspection station to eliminate the off-Site migration of dust and soil.

Therefore, while the potential for completed exposure pathways is present since all five elements exist, the actual risk will be minimal since the pathways will be controlled to minimize exposure to any person on-Site and off-Site. Site access will also be highly restricted during remediation to only parties required to be present. Members of the public, including employees of the adjacent Hong Ning Housing for the Elderly building who currently park vehicles on the Site, will not be allowed access once the remediation commences. Through implementation of appropriate health and safety measures, such as monitoring the air for organic vapors and dust, using vapor and dust suppression measures if any issues are encountered, cleaning truck undercarriages before they leave the Site to prevent off-Site soil tracking, maintaining Site security, and wearing the appropriate personal protective equipment (PPE), all potential exposure scenarios should be completely prevented.

2.4.3 Proposed Future Conditions

Currently, the contemplated project includes a 25% permanently affordable housing residential building with a commercial ground floor and community spaces on the second and third floors. The proposed building will have a full cellar, which will contain mechanical and residential and retail storage spaces as well as a locker room and break room. A SSDS with a sealing layer vapor barrier/waterproofing membrane will serve as a long term mitigation measure to prevent any future human exposure to soil vapor that may remain after the extensive remedial source removal effort is implemented.

Remedial construction is expected to remove all on-Site contaminants to el 18 NAVD88 (corresponding to a depth of approximately 15 feet below street level) across the entire Site footprint; the majority of the Site will be excavated to el 14 NAVD88 and small areas of the Site will be excavated to between el 18 and el 11 NAVD88. Protective measures implemented during remediation and remedial construction will eliminate points of exposure as the result of soil removal and any potential exposure to soil vapor will be mitigated through the SSDS and vapor barrier sealing layer.

2.4.4 Human Health Exposure Assessment Conclusions

1. Under current conditions, there is a marginal risk for exposure for personnel completing investigations related to Site redevelopment and any construction work though dermal contact, ingestion and inhalation of soil. The marginal risk has been mitigated by Site fencing, restricting access to tenants and employees of the adjacent Hong Ning Housing for the Elderly building from the landscaped areas, and implementation of a Site-specific HASP. Tenant access is restricted to the concrete patio where there is no exposed soil via temporary fencing and posted notification/signage. Tenant access to the landscaped area around the patio has been restricted by temporary fencing and to all other landscaped areas via posted notification/signage. Potential exposure to groundwater is limited to those completing investigation activities, and any soil vapor dissipates once exposed to outdoor air. These exposure risks will be avoided or minimized by limiting Site access and implementing the appropriate health and safety and vapor and dust suppression measures outlined in a Site-specific HASP and CAMP during ground-intrusive activities and the requirements of the Site Restrictive Declaration. Members of the public, including employees of the adjacent Hong Ning Housing for the Elderly building who currently park vehicles on the Site, and tenants who currently access the patio area, will not be allowed access once the remediation commences.
2. Since a complete exposure pathway is possible for the migration of Site contaminants to off-Site human receptors during the remedial construction phase, all necessary measures will be taken to eliminate this pathway by: limiting Site access to authorized visitors and workers and implementation of protective measures to prevent completion of exposure pathways; implementing the Site-specific HASP; implementing the CAMP; controlling dust generation via approved dust suppression methods, controlling soil tracking via the use of a truck wash and inspection station; and, implementing any additional measures required by the Restrictive Declaration.
3. The existence of a complete exposure pathway for Site contaminants to human receptors during proposed future conditions is unlikely, as the majority of on-Site sources of contamination will be excavated and transported for off-Site disposal. Regional groundwater is not used as a potable water source in this part of New York City. It is not anticipated that dewatering will be required; the proposed building is not expected to be set within the groundwater table, which will minimize exposure to groundwater. The potential pathway for soil vapor intrusion into the buildings will be minimized for occupied portions of the building basement by the SSDS and sealing layer vapor barrier.

2.5 Remedial Action Objectives

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

2.5.1 Soil

RAOs for Public Health Protection:

- Prevent ingestion/direct contact with contaminated soil
- Prevent inhalation of, or exposure to, contaminants volatilizing from contaminated soil or contaminated soil in particulate form

RAOs for Environmental Protection

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

2.5.2 Groundwater

RAOs for Public Health Protection:

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

RAOs for Environmental Protection

- Remove Site source(s) of groundwater contamination

2.5.3 Soil Vapor

RAOs for Public Health Protection:

- Mitigate the risk of impacts to public health resulting from existing, or the potential for, soil vapor intrusion into building(s) at the Site.

3.0 DESCRIPTION OF REMEDIAL ACTION PLAN

This section presents an analysis of the proposed remedial alternatives that can potentially be achieved under the BCP. The proposed SCOs under Alternative I will be the Part 375 Restricted Residential RUSCOs under a Track 2 cleanup. While a Track 1 remedial alternative is typically required to be evaluated, a preliminary review of a potential Track 1 remedy determined that that Track 1 cannot be achieved via the anticipated 18 foot excavation across the majority of the Site footprint due to the deeper presence of contamination exceeding the Unrestricted Use SCOs. Pursuing a Track 1 remediation would require extending the depth of the currently contemplated SOE by at least an additional 12 feet to remove all historic fill to 30 feet below street level throughout the Site footprint, and introduce the need for the

design and construction of a significantly deeper SOE and Site dewatering system. While implementation of a Track 1 remedy is technically feasible, the effort required to do so is cost prohibitive without providing any significant environmental benefits, and therefore is not an economically viable option. Furthermore, as discussed below, a SSDS is an engineering control required for the Site remedy, which eliminates an unconditional Track 1 cleanup as a possible remedial alternative. As such, a Track 1 cleanup is not further analyzed in this RAWP. Alternative II will be a Track 4 cleanup in the event that some source material, documented by a significant number of endpoint confirmation samples above the Restricted Residential RUSCOs, remains present at the bottom of the planned excavation, and over-excavation is not deemed to be feasible. Both alternatives are expected to achieve the established RAOs. The Restricted Residential RUSCOs are presented in Table 8.

3.1 Technical Description of Alternative I – Track 2

- Development and implementation of a construction HASP (CHASP) and CAMP for the protection of on-Site workers, community/residents, and the environment during remediation and construction activities.
- Design and construction of the support of excavation (SOE) system to facilitate the Track 2 remediation.
- Implementation of soil erosion, pollution and sediment control measures in compliance with applicable laws and regulations.
- Excavation, stockpiling, off-Site transport, and disposal of historic fill and/or native soil exceeding the Track 2 Restricted Residential RUSCOs as defined by 6 NYCRR Part 375-6.8(b) to a minimum depth of 15 feet below street level in accordance with 6 NYCRR Part 375-3.8(e)(2)(iii)(a-d), and deeper as needed for the proposed redevelopment as follows:
    - to el 14 NAVD88 (corresponding to approximately 18 feet below street level) across the majority of the Site for construction of the new building foundation across 96.8% of the Site;
    - to el 18 NAVD88 (corresponding to approximately 15 feet below street level) in the northwestern portion of the Site for construction of the new building across 1.4% of the Site;
    - to between el 18 NAVD88 and el 11 NAVD88 (corresponding to between approximately 15 and 22 feet below street level) in the northwestern portion of the Site for excavation of the SOE berm on a 1:1.5 slope for construction of the new building across 1.7% of the Site; and,

  - to el 11 NAVD88 (corresponding to approximately 22 feet below street level) in the northwestern portion of the Site for excavation of the new building across 0.1% of the site.

Any source material below a depth of 15 feet below street level will be removed to the extent feasible.

- If encountered, removal and decommissioning of any encountered USTs and/or associated appurtenances (e.g., fill lines, vent line, and electrical conduit) and disposal off-Site during Site redevelopment in accordance with DER-10, 6 NYCRR Part 613.9, NYSDEC CP-51, and other applicable NYSDEC UST closure requirements.
- Collection and analysis of confirmation soil samples from the excavation base and sidewalls of the excavation, in accordance with DER-10 to confirm Restricted Residential RUSCOs were achieved; over-excavation may be completed if necessary to meet Restricted Residential RUSCOs.
- Completion of a topographic survey of final excavation sub-grade.
- Importation of certified-clean material (i.e., material meeting Restricted Residential RUSCOs), virgin stone, or recycled concrete aggregate (RCA), or virgin, native crushed stone to backfill over-excavated areas to development depth.
- Installation of a subslab depressurization system (SSDS) and required sealing layer in the form of a vapor barrier/waterproofing membrane for the proposed building.
- Reuse of Site soil meeting Restricted Residential RUSCOs, if necessary.
- Recording of an Environmental Easement (EE) to memorialize the institutional controls (ICs) and engineering controls (ECs) and require future owners of the site to comply with certain land use restrictions and continue to maintain these controls.
- Establishment of an approved SMP to ensure long-term management of the SSDS and institutional controls, including the performance of periodic inspections and certification that the controls are performing as they were intended.

The Alternative I remediation extent is shown on Figure 7 and is based on data presented in the RIR.

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

A Site-specific CHASP will be enforced during excavation and foundation construction to protect on-Site workers from accidents and acute and chronic exposures to the identified contaminated media. Public health will be protected by implementing and enforcing dust, odor, and organic vapor control and

monitoring procedures included in the CAMP and in this RAWP. The CAMP will include continuous perimeter monitoring of dust and organic vapor using DustTrak aerosol monitors and PIDs capable of recording data and calculating 15-minute averages. A field engineer, scientist, or geologist will monitor Site perimeters for visible dust and odors. The environment will be protected by implementing and enforcing the appropriate soil erosion prevention measures.

3.1.2 SOE Construction and Fill and Soil Removal

VOCs, SVOCs, metals, and pesticides were detected at concentrations that exceed the Restricted Residential RUSCOs. To accommodate the proposed remedial construction (including foundation elements and elevator pits), excavation is required to depths of between approximately 15 and 22 feet below street level across the entire Site footprint.

The estimated volume of material requiring removal and off-Site disposal for a Track 2 cleanup is approximately 17,500 cubic yards. This estimate is based on vertical excavation limits derived from the field observations and laboratory analytical results presented in the RIR. Soil will be screened for visual, olfactory, and instrumental evidence of environmental impacts during excavation. Over-excavation beyond the proposed extents could be necessary to remove soil that does not comply with the Restricted Residential RUSCOs and/or represents a source of groundwater or soil vapor contamination.

An SOE system will be constructed around the perimeter of the excavation area to accommodate Site-wide removal of soil exceeding the Track 2 Restricted Residential RUSCOs. The excavated material will be transported and disposed off-Site in accordance with municipal, state, and federal regulations. Remediation would take place concurrently with development. The estimated extent of the remedial excavation for the Track 2 alternative is shown on Figure 7.

It is not anticipated that excavation will extend into the groundwater table; as such, implementation of a dewatering system is not required.

3.1.3 UST System Removal

If encountered, any USTs and/or associated appurtenances (e.g., fill lines, vent line, and electrical conduit) would be decommissioned in accordance with applicable NYSDEC tank closure requirements, including DER-10 Section 5.5 and 6 NYCRR Part 613.9, and NYSDEC CP-51. USTs and/or associated appurtenances would be registered and administratively closed with the NYSDEC Petroleum Bulk Storage (PBS) unit. Petroleum-impacted soil would be excavated, stockpiled separately, characterized, and disposed of off-site at a permitted disposal facility in accordance with applicable regulations. Following removal of any UST and associated grossly-impacted soil, if encountered, confirmation soil samples would be collected from the base and sidewalls of the excavation in accordance with DER-10. If the excavation were enlarged

horizontally beyond the dimensions of the tank, additional confirmation soil samples would be collected as required. Closure documentation, such as contractor affidavits, bills of lading for sludge disposal, and tank disposal receipts, would be provided as appendices in the Final Engineering Report (FER).

3.1.4 Confirmation Soil Sampling

Confirmation and/or documentation soil samples will be collected from the excavation base at a frequency of one per 900 square feet and from excavation sidewalls at a frequency of one per 30 linear-feet, in accordance with DER-10. Sidewall samples will be collected along the perimeters of the Site footprint from the base of the excavation sidewall. Documentation samples would be collected where the remedial excavation extends beyond the remedial excavation depth described in Section 3.1 if source material removal is required; if not, confirmation samples would be collected to confirm that Track 2 Restricted Residential RUSCOs have been achieved or to document any remaining exceedances. Sidewall samples will be collected along the perimeters of the Site footprint from the base of the excavation sidewall. An estimated 56 confirmation and/or documentation soil samples, plus QA/QC samples, will be collected to confirm remedial performance and will be analyzed for the Part 375 list of VOCs, SVOCs, PCBs, pesticides, cyanide, metals including hexavalent and trivalent chromium, and per- and PFAS and 1,4-dioxane.

3.1.5 SSDS and Required Sealing Layer Vapor Barrier/Waterproofing Membrane

Chlorinated VOCs PCE and TCE were detected above the NYSDOH Soil Vapor Intrusion Matrices monitoring and/or mitigation thresholds associated with AOC-2 and petroleum related VOCs were detected in soil vapor throughout the site. To mitigate potential soil vapor intrusion, a SSDS and minimum 20-mil vapor barrier/waterproofing membrane (required sealing layer) will be designed and installed in the new building. The SSDS will be installed as a passive system with the capability of conversion to an active system, based on the findings of a post-installation soil vapor intrusion evaluation.

3.1.6 Excavation Backfill

After the Track 2 remedial excavation is completed, portions of the Site would be backfilled where necessary to restore the Site grade to the development elevation needed for foundation construction. Up to an estimated 1,000 cubic yards of backfill would be required to raise the Site to development grade upon completion of the Track 2 remediation.

Imported material will consist of clean fill that meets the Restricted Residential RUSCOs, NYSDEC Guidelines for Sampling and Analysis of PFAS (January 2020) and Part 360.13(f) requirements for acceptable fill material uses, or other acceptable fill material such as virgin stone from a quarry or RCA. If RCA is imported to the Site, it will come from a NYSDEC-registered facility in compliance with 6 NYCRR Part 360 registration and permitting requirements for the period of RCA acquisition. RCA imported from

compliant facilities will not require chemical testing, unless required by NYSDEC under its terms for operation of the facility. Imported RCA must be derived from recognizable and uncontaminated concrete (less than 10% by weight passing through a No. 80 sieve). RCA is not acceptable for, and will not be used as, Site cover or drainage material.

3.1.7 Environmental Easement

An environmental easement would be recorded referencing Institutional Controls (ICs) and Engineering Controls (ECs) that are part of the selected remedy, which would be binding upon all subsequent owners of the property. The ICs would: 1) restrict the Site's use to restricted residential, commercial and industrial uses, although land use is subject to local zoning laws; 2) restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDEC or NYSDOH; 3) require implementation of an NYSDEC-approved SMP; 4) require the completion and submission to the NYSDEC a periodic certification of ICs and ECs in accordance with Part 375; and 5) include land use restrictions and a Soil Excavation Work Plan in the event Site soil is ever disturbed again in the future. The ECs are the SSDS, including the required sealing layer vapor barrier described in this RAWP.

3.1.8 Site Management Plan

The SMP will identify all use restrictions and ECs and long-term monitoring and maintenance requirements to ensure the ICs and/or ECs remain in place and are effective. The SMP will include, but may not be limited to:

1. An Excavation Work Plan which details the provisions for management of future excavations in areas of any remaining soil contamination.
2. Descriptions of the provisions of the environmental easement including any land use, and/or groundwater use restrictions.
3. Provision for monitoring and maintaining the SSDS.
4. Provisions for the management and inspection of the identified ECs.
5. Maintaining Site access controls and NYSDEC notification.
6. The steps necessary for the periodic reviews and certification of the ICs and/or ECs.
7. A Monitoring Plan to assess the performance and effectiveness of the remedy. The Monitoring Plan includes, but may not be limited to:
    a. A schedule of monitoring and frequency of submittals to NYSDEC.

3.2 Technical Description of Alternative II – Track 4

Alternative II, a Track 4 remedy, would include all of the elements of Alternative II, with the following modifications:

- Excavation, stockpiling, off-Site transport, and disposal of soil containing SVOC and/or metals concentrations exceeding the Restricted Residential RUSCOs to remove the majority of fill as follows:
    - to el 14 NAVD88 (corresponding to approximately 18 feet below street level) across the majority of the Site for construction of the new building foundation across 96.8% of the Site;
    - to el 18 NAVD88 (corresponding to approximately 15 feet below street level) in the northwestern portion of the Site for construction of the new building across 1.4% of the Site;
    - to between el 18 NAVD88 and el 11 NAVD88 (corresponding to between approximately 15 and 22 feet below street level) in the northwestern portion of the Site for excavation of the SOE berm on a 1:1.5 slope for construction of the new building across 1.7% of the Site; and,
    - to el 11 NAVD88 (corresponding to approximately 22 feet below street level) in the northwestern portion of the Site for excavation of the new building across 0.1% of the site.
- Collection and analysis of documentation soil samples to document soil quality remaining at the Site, some of which may not meet the Restricted Residential RUSCOs.
- Placement of post-excavation demarcation barrier in residual soil areas not covered with impermeable surfaces.
- Installation of an engineered composite Site cover system, including the building foundation, and importation of certified-clean material (i.e., material meeting Restricted Residential RUSCOs) or virgin, native crushed stone to for construction of the composite Site cover outside of the building footprint.
- Recording of an Environmental Easement (EE) to memorialize the institutional controls (ICs) and engineering controls (ECs) and require future owners of the site to comply with certain land use restrictions and continue to maintain these controls.

- Establishment of an approved SMP to ensure long-term management of engineering and institutional controls, including the performance of periodic inspections and certification that the controls are performing as they were intended.

The remediation extent is shown on Figure 8 and is based on data presented in the RIR and the proposed development plans. The requirements for each of the Alternative II tasks are described below.

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

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

3.2.2 SOE Construction and Fill and Soil Removal

The RI revealed that even at the relatively deep proposed excavation depth for the Track 2 remedy (approximately 18 feet below street level across the majority of the Site footprint), VOCs, SVOCs, metals, and pesticides were detected at concentrations that exceed the Restricted Residential RUSCOs. As a result, only a Track 4 remedy may be possible on all or some portions of the Site depending on the extent of the material containing concentrations of contaminants exceeding Track 2 Restricted Residential RUSCOs remaining.

An SOE system will be constructed around the perimeter of the excavation area to accommodate removal of soil to achieve a Track 4 cleanup. The estimated volume of material requiring removal and off-Site disposal for a Track 4 cleanup is about 17,500 cubic yards. This estimate is based on the majority of the Site being excavated to el 14 NAVD88 (corresponding to a depth of approximately 18 feet below street level) across the entire Site footprint. The Track 4 alternative estimated remedial excavation extent is shown on Figure 8.

3.2.3 UST System Removal

If encountered, any USTs and/or associated appurtenances (e.g., fill lines, vent line, and electrical conduit) would be decommissioned in accordance with applicable NYSDEC tank closure requirements, including DER-10 Section 5.5 and 6 NYCRR Part 613.9, and NYSDEC CP-51. USTs and/or associated appurtenances would be registered and administratively closed with the NYSDEC Petroleum Bulk Storage (PBS) unit.

Petroleum-impacted soil would be excavated, stockpiled separately, characterized, and disposed of off-site at a permitted disposal facility in accordance with applicable regulations. Following removal of any UST and associated grossly-impacted soil, if encountered, confirmation soil samples would be collected from the base and sidewalls of the excavation in accordance with DER-10. If the excavation were enlarged horizontally beyond the dimensions of the tank, additional confirmation soil samples would be collected as required. Closure documentation, such as contractor affidavits, bills of lading for sludge disposal, and tank disposal receipts, would be provided as appendices in the Final Engineering Report (FER).

3.2.4 Documentation Soil Sampling

Documentation soil samples will be collected from the excavation base at a frequency of one per 900 square feet and from excavation sidewalls at a frequency of one per 30 linear-feet, in accordance with DER-10. Sidewall samples will be collected along the perimeters of the Site footprint from the base of the excavation sidewall. An estimated 56 documentation soil samples, plus QA/QC samples, will be collected to confirm remedial performance and will be analyzed for the Part 375 list of VOCs, SVOCs, PCBs, pesticides, cyanide, metals including hexavalent and trivalent chromium, and per- and PFAS and 1,4-dioxane. Documentation soil samples will evaluate soil to remain in place after the development. No off-site excavation would be required.

3.2.5 SSDS and Required Sealing Layer Vapor Barrier/Waterproofing Membrane

Chlorinated VOCs PCE and TCE were detected above the NYSDOH Soil Vapor Intrusion Matrices monitoring and/or mitigation thresholds associated with AOC-2 and petroleum related VOCs were detected in soil vapor throughout the Site. To mitigate potential soil vapor intrusion, a SSDS and minimum 20-mil vapor barrier/waterproofing membrane (required sealing layer) will be designed and installed in the new building. The SSDS will be installed as a passive system with the capability of conversion to an active system, based on the findings of a post-installation soil vapor intrusion evaluation.

3.2.6 Demarcation Barrier

After the excavation is complete and prior to any backfilling with clean imported material, a land survey would be performed by a NYS-licensed surveyor. The survey would define the top elevation of residual contaminated soil. In areas that would not be covered with an impermeable surface, a physical demarcation layer, consisting of orange snow fence or equivalent material would be placed on the top of residual contaminated soil to provide a visual reference. This demarcation layer would constitute the top of the zone that requires adherence to special conditions for disturbance of contaminated residual soil defined in an SMP. The survey would measure the grade covered by the demarcation layer before the placement of cover soil, pavement and sub-soil, structures, or other materials. This survey and the demarcation layer placed on this grade surface would constitute the physical and written record of the

upper surface of restricted-use soil in such SMP, and a map showing the survey results would be included in the FER and an SMP.

3.2.7 Excavation Backfill

To the extent backfill is necessary to restore the Site grade to the development elevation needed for foundation construction, any imported backfill would comply with 6 NYCRR Part 375-6.7(d) and NYSDEC DER-10 Section 5.4(e), Table 5.4(e)10, and Appendix 5.

Imported material will consist of clean fill that meets the Restricted Residential RUSCOs, NYSDEC Guidelines for Sampling and Analysis of PFAS (January 2020) and Part 360.13(f) requirements for acceptable fill material uses, or other acceptable fill material such as virgin stone from a quarry or RCA. If RCA is imported to the Site, it will come from a NYSDEC-registered facility in compliance with 6 NYCRR Part 360 registration and permitting requirements for the period of RCA acquisition. RCA imported from compliant facilities will not require chemical testing, unless required by NYSDEC under its terms for operation of the facility. Imported RCA must be derived from recognizable and uncontaminated concrete (less than 10% by weight passing through a No. 80 sieve). RCA is not acceptable for, and will not be used as, Site cover or drainage material.

3.2.8 Composite Site Cover

A composite cover system will be constructed consisting of a concrete building slab and foundation walls a minimum two feet of approved imported material throughout the Site. The cover system would serve for the protection of human health by preventing contact with residual contaminated Site soil.

Imported material for construction of composite Site cover will consist of clean fill that meets the Restricted Residential RUSCOs, NYSDEC Guidelines for Sampling and Analysis of PFAS (January 2020) and Part 360.13(f) requirements for acceptable fill material uses, or other acceptable fill material such as virgin stone from a quarry. RCA is not acceptable for, and will not be used as, Site cover.

3.2.9 Environmental Easement

An environmental easement would be recorded referencing Institutional Controls (ICs) and Engineering Controls (ECs) that are part of the selected remedy, which would be binding upon all subsequent owners and occupants of the property. The ICs would: 1) restrict the Site's use to restricted residential, commercial and industrial uses, although land use is subject to local zoning laws; 2) restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDEC or NYSDOH; 3) require implementation of an NYSDEC-approved SMP; 4)

require the completion and submission to the NYSDEC a periodic certification of ICs and ECs in accordance with Part 375; and 5) include a Soil Excavation Work Plan to manage future excavation of on-Site soil. The ECs would be the composite cover system and SSDS/vapor barrier described in this RAWP.

3.2.10 Site Management Plan

The SMP would identify all use restrictions and ECs and long-term monitoring and maintenance requirements to ensure the ICs and/or ECs remain in place and are effective. The SMP will include, but may not be limited to:

1. An Excavation Work Plan which details the provisions for management of future excavations in areas of remaining contamination.
2. Descriptions of the provisions of the environmental easement including any land use, and/or groundwater use restrictions.
3. Provision for monitoring and maintaining the SSDS.
4. Provisions for the management and inspection of the identified ECs.
5. Maintaining Site access controls and NYSDEC notification.
6. The steps necessary for the periodic reviews and certification of the ICs and/or ECs.
7. A Monitoring Plan to assess the performance and effectiveness of the remedy. The Monitoring Plan includes, but may not be limited to:
    a. A schedule of monitoring and frequency of submittals to NYSDEC.

3.3 Evaluation of Remedial Alternatives

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

1. Protection of Human Health and Environment
2. Compliance with Standards Criteria and Guidance (SCGs)
3. Short-Term Effectiveness and impacts
4. Long-Term Effectiveness and Permanence
5. Reduction of Toxicity, Mobility, or Volume
6. Implementability

7. Cost Effectiveness
8. Community Acceptance
9. Land Use

3.3.1 Overall Protection of Public Health and the Environment

Alternative I - This remedy will eliminate pathways of exposure from on-Site contaminated media. Remediating the Site to Track 2 standards would result in the removal of on-Site soil with contaminant concentrations above Restricted Residential RUSCOs to 18 feet below street level across the majority of the Site footprint and to between 15 and 22 feet below street level in the northwestern portion of the Site. Excavation across the entire Site footprint will be required to remove contaminants in material above Restricted Residential RUSCOs. Any encountered USTs would be decommissioned, removed and disposed off-Site, and petroleum-impacted material, if encountered, would be excavated and disposed off-Site. The RAOs for public health and environmental protection will be met through the removal of contaminated source soil, which will eliminate possible ingestion, inhalation, or dermal contact.

The SSDS including the sealing layer vapor barrier membrane will mitigate the risk of potential soil vapor intrusion in the basement.

Alternative II – This remedy will also eliminate pathways of exposure from on-Site contaminated media, however, the Track 2 Restricted Residential RUSCOs will not be achieved in every end point sample collected from the base of the remedial excavation and some source material may remain present. Nevertheless, this remedy would also result in the removal of the majority of on-Site source soil with contaminant concentrations above the Restricted Residential RUSCOs. Residual contaminants may remain below the depth of remedial excavation of (approximately 18 feet below street level across the majority of the Site footprint, and between approximately 15 and 22 feet below street level in the northwestern portion of the Site).

Public health will be protected during remediation under both remedial alternatives by implementing and enforcing dust, odor, and organic vapor control and monitoring plans, procedures and the Restrictive Declaration when needed. The environment will be protected by implementing and enforcing soil management controls when needed during future Site excavation and any other institutional and engineering controls by implementation of the SMP and through enforcement of the EE.

3.3.2 Compliance with Standards, Criteria, and Guidance

Both Alternatives will be in compliance with all applicable standards, criteria, and guidance listed in Section 4.1.1 by removing a majority of on-Site sources of contamination to achieve the RAOs and through the use of long term Site Management controls. While implementing either remedy, protection of public health and the environment will be maintained by enforcing a Site-specific CHASP and CAMP and the Restrictive Declaration. Occupational Safety and Health Administration (OSHA) requirements for on-Site construction safety will be followed by Site contractors performing work.

3.3.3 Short-Term Effectiveness and Permanence

Alternative I - In the short-term, there will be increased truck traffic and operational noise levels associated with the transport of impacted material excavated to achieve Track 2 standards and the import of backfill required to bring the Site to construction grade. However, traffic and noise will be mitigated in accordance with the requirements of the Restrictive Declaration.

The excavated soil and fill would require about 1,000 20-cubic-yard trips. Implementing the Alternative I concept would require approximately 6 months of effort (assuming normal work hours). Flaggers will be used to protect pedestrians at Site entrances and exits. Dust, odors, and/or organic vapor from the excavation and construction-related noise all need to be controlled during this period of time. However, this remedy creates the greatest long term permanence and leaves the lowest amount of remaining residual contamination on the Site below the depth of remedial excavation (approximately 18 feet below street level across the majority of the Site footprint, and between approximately 15 and 22 feet below street level in the northwestern portion of the Site) and located under the proposed on-Site building and approved backfill.

Alternative II - A Track 4 remedial excavation would involve comparable soil removal related to construction, for a similar duration as Alternative I but some end point samples may not achieve the Track 2 Restricted Residential RUSCOs. The excavated soil and fill would require the same approximately 1,000 20-cubic-yard truck trips. Implementing the Alternative II concept would also require approximately 6 months of effort (assuming normal work hours). Dust, odors, and potential organic vapor from the excavation and construction-related noise would have a similar duration relative to Alternative I.

Under both remedial alternatives, dust will be controlled by the on-Site application of water spray as needed and the truck inspection station to avoid off-Site tracking of soil. Engineering controls, such as slowing the pace of work, applying foam and/or dust suppressant, and/or covering portions of the excavation will be used to suppress odors/dust when required. Work will be modified or stopped according to the action levels defined in the CAMP. Short term impacts are similar between Alternative I and Alternative II. This remedy is similar in scope to Alternative I, and therefore has a similar level of

permanence; l; however, all end point samples will not achieve the preferred Track 2 Restricted Residential RUSCOs.

3.3.4 Long-Term Effectiveness and Permanence

Alternative I – A Track 2 remedy will remove all source media soils exceeding Restricted Residential RUSCOs. Groundwater in this area of New York City is not used for drinking water; therefore, the long term effectiveness of this remedy would eliminate risks and satisfy the objectives of this criterion. An EE would be put in place, supported by an SMP, to maintain the SSDS at the Site and, if necessary, prohibit ingestion of groundwater, which is also prevented by Article 141 of the NYCDOH code, which prohibits potable use of groundwater without prior approval. The long-term effectiveness of this remedy mitigates environmental risks and satisfy the objectives of this criterion.

Alternative II – As required with all remedies, the Track 4 remedy will also remove all source soil media to approximately 18 feet below street level across the majority of the Site footprint, and between approximately 15 and 22 feet below street level in the northwestern portion of the Site; even though some source material may remain and some end point samples may exceed the Track 2 Restricted Residential RUSCOs. In addition, groundwater in this area of NYC is not used for drinking water. An EE and SMP would be put in place to maintain the cover system and the SSDS at the Site and, if necessary, prohibit ingestion of groundwater, which is also prevented by Article 141 of the NYCDOH code, which prohibits potable use of groundwater without prior approval. The long-term effectiveness of this remedy similarly mitigates environmental risks and satisfies the objectives of this criterion and will only be implemented to the extent the Track 2 Restricted Residential RUSCOs cannot be feasibly achieved throughout or in certain locations at the bottom of the excavation.

3.3.5 Reduction of Toxicity, Mobility, and Volume

Both remedial alternatives would permanently and significantly reduce the toxicity, mobility, and volume of contamination through removal of the vast majority of contaminated fill/soil source material through excavation and off-Site disposal, and control vapor through the construction of a SSDS.

3.3.6 Implementability

Alternative I – The Track 2 remedy will consist primarily of excavation with standard bucket excavators and installation of a SSDS with a sealing layer vapor barrier, which can be converted to an active system if required. The implementability of this remedy is high due to the availability of local contractors, personnel, and equipment suitable to working in a structurally challenging environment due to the frequency of this type of remediation in this region. If deeper contamination above Restricted Residential

RUSCOs is encountered below proposed remedial excavation depths and requires over-excavation to achieve a Track 2 cleanup, the additional costs and delays incurred to complete a Track 2 cleanup will have to be evaluated to determine if it is practical at the additional depths that may be required to achieve Track 2, and depending on the type of equipment, location of the contamination exceeding Track 2 Restricted Residential RUSCOs, design of the SOE, necessity of dewatering, and the risk of subsidence of adjacent properties. Additional coordination between trades may be required. This alternative is considered feasible.

Alternative II – The technical feasibility of implementing the Track 4 Alternative II remedy is similar to that of Alternative I, as the same extent of excavation will be required in an attempt to achieve the Track 2 Restricted Residential RUSCOs; however, achieving Track 2 Restricted Residential RUSCOs may not be possible under this Alternative given the factors that will have to be evaluated once the end point samples can be obtained. This alternative will also consist mostly of excavation with standard bucket excavators and installation of a SSDS with a sealing layer vapor barrier, which can be converted to an active system if required. The implementability of this remedy is high due to the availability of local contractors, personnel, and equipment suitable to working in a structurally challenging environment due to the frequency of this type of remediation in this region. Additional coordination between trades may be required. This alternative is considered feasible.

3.3.7 Cost Effectiveness

Alternative I – Based on the assumptions detailed for Alternative I, the estimated remediation cost of a Track 2 Cleanup is about $6.1 million. There are also long-term operation, maintenance, or monitoring costs associated with the proposed remedy to maintain the SSDS. This Alternative I is the cost effective option because it remedies the contamination on-Site in most economically and technically feasible manner to the highest level cleanup given the very deep historic fill soils at the Site. Table 9 details the individual cost components used to arrive at this cost estimate.

Alternative II – Based on the assumptions detailed for Alternative II, the estimated soil source removal remediation cost of a Track 4 Cleanup is about $8.8 million. The excavation cost for this alternative is less expensive since no over-excavation below the proposed remedial excavation depth (approximately 18 feet below street level across the majority of the Site footprint, and between approximately 15 and 22 feet below street level in the northwestern portion of the Site) is included in the costs; however, some contamination will be left in place above the Track 2 Restricted Residential RUSCOs, which requires a cover system. Residual contamination will remain below the depth of remedial excavation and located under

the proposed on-Site building and approved backfill. There will similarly be long-term operation, maintenance, or monitoring costs associated with the proposed remedy to maintain the cover system and SSDS. Table 10 details the individual cost components used to arrive at this cost estimate.

3.3.8 Community Acceptance

Both remedial Alternatives are expected to be acceptable to the community since each remedy removes the maximum amount of soil source material Site-wide using traditional construction equipment and without any impact to adjacent buildings. Alternative 1 will remove all contaminated source soil media and Alternative II will remove the vast majority of contaminated soil media to a depth of 18 feet below street level across the majority of the Site footprint. As such, potential exposure pathways to on-Site contamination would be eliminated upon completion of each of the respective remedies and the Site would be remediated to allow for a higher level use. The end-use of the Site will provide new community spaces, and affordable and attractive residential spaces on a currently contaminated brownfield parcel. The selected remedy will be subject to a 45-day public comment period and will incorporate substantive public comments before being approved.

3.3.9 Land Use

The current, intended, and reasonably anticipated future land use of the Site and its surroundings are compatible with either of the Alternatives.

3.4 Selection of Preferred Remedy

Both alternatives will be protective of human health and the environment and meet the remedy selection criteria. Alternative II achieves all of the remedial action goals established for the redevelopment project, effectively reduces contaminant mobility and toxicity and is a similarly effective in the reduction of contaminant toxicity and volume. However, Alternative I is more preferable if it can be achieved since the more stringent Track 2 Restricted Residential RUSCOs will be achieved. Therefore, the preferred remedy will be the Track 2 Alternative I remedy if it can be achieved Site-wide. It is also possible that portions of the Site will achieve the Track 2 SCOs while other portion of the Site will have to remain Track 4 resulting in a split Track 2/4 remedy. Both remedies, or an ultimately split Track 2/4 remedy, require some long-term Site management, engineering controls, and associated future costs.

Alternative I is recommended over Alternative II if it can be feasibly and practically implemented Site-wide at a similar cost while resulting in slightly less residual contamination and thus providing greater overall protection to human health and the environment. However, Alternative II is similarly protective of human health and the environment since the residual contamination left rafter completion of the remedial excavation would remain at least 15 feet below street level and up to 22 feet below street level and be

located under the proposed new building , which is unlikely to be encountered or excavated again in the future. The controls should be easily implementable long term pursuant to an SMP and EE, which runs with the land.

Alternative I is the selected remedy. Figure 7 depicts the Alternative I cleanup plan.

3.4.1 Zoning

According to the New York City Planning Commission Zoning Map 12c, the Site is located within a R9-1 zoning area with a C2-5 overlay. The Volunteer has obtained all zoning approvals for this project to proceed through the ULURP and CEQR processes as recorded in the 10 January 2020 Notice of Completion issued for the Final Environmental Impact Statement.

3.4.2 Surrounding Property Uses

The surrounding land uses include multi-story mixed-use residential/commercial buildings and parking lots.

The current, intended, and reasonably anticipated future land use of the Site and its surroundings are compatible with the selected remedy.

3.4.3 Citizen Participation

The CPP is discussed in Section 4.1.9.

3.4.4 Environmental Justice Concerns

The majority of the Site is located in an Environmental Justice area due to the high Asian American and Hispanic populations in the area. As a result, all Fact Sheets have been and will continue to be translated into Spanish and Chinese. Links to all of the Site-related documents have been posted on the NYSDEC DECinfo Locator website (https://www.dec.ny.gov/ data/DecDocs/C231137/). NYSDEC staff are available to explain to the community why the implementation of the remediation at this Site is preferable to leaving the Site as is.

3.4.5 Land Use Designations

There are no federal or state land use designations.

3.4.6 Population Growth Patterns

The population growth patterns and projections support the proposed land use.

3.4.7 Accessibility to Existing Infrastructure

The Site has been an underutilized parking lot since approximately 1990 and is located in an area in need of more affordable housing. Upon completion of the proposed development, water and sewer service will be provided by NYC water and sewer utilities, and electric and natural gas services will be supplied by Consolidated Edison. The property is nearby New York City subway and bus routes.

3.4.8 Proximity to Cultural Resources

There are 34 sites listed as City Landmarks (L) within ½-mile of the site, summarized in the table below. The proposed remedy is not anticipated to adversely impact these cultural resources.

Property/Site	Status	Address
Beth Hamerdash Hagodol Synagogue (Demolition completed in June 2020)	L	60 Norfolk Street Manhattan, NY
Neighborhood Playhouse	L	466 Grand Street Manhattan, NY
Willett Street Methodist Episcopal Church	L	7-13 Bialystoker Place Manhattan, NY
511 Grand Street House	L	511 Grand Street Manhattan, NY
513 Grand Street House	L	513 Grand Street Manhattan, NY
All Saints' Free Church	L	290 Henry Street Manhattan, NY
281 East Broadway House	L	281 East Broadway Manhattan, NY
267 Henry Street Building	L	267 Henry Street Manhattan, NY
265 Henry Street Building	L	265 Henry Street Manhattan, NY
263 Henry Street Building	L	263 Henry Street Manhattan, NY
Bialystoker Center and Home for the Aged	L	228 East Broadway Manhattan, NY
New York Public Library, Seward Park Branch	L	192 East Broadway Manhattan, NY
Forward Building	L	173-175 East Broadway Manhattan, NY
Loew's Canal Street Theatre	L	31 Canal Street Manhattan, NY
Pike Street Synagogue	L	13 Pike Street Manhattan, NY

Property/Site	Status	Address
S. Jarmulowsky Bank Building	L	54 Canal Street Manhattan, NY
Eldridge Street Synagogue	L	12-16 Eldridge Street Manhattan, NY
William and Rosamond Clark House	L	51 Market Street Manhattan, NY
Northern Reformed Church	L	61 Henry Street Manhattan, NY
Manhattan Bridge Arch and Colonnade	L	Manhattan Bridge Plaza at Canal Street Manhattan, NY
339 Grand Street House	L	339 Grand Street Manhattan, NY
Edward Ridley & Sons Department Store Buildings	L	315-317 Grand Street and 319-321 Grand Street Manhattan, NY
97 Bowery Building	L	97 Bowery Manhattan, NY
Kehila Kadosha Janina Synagogue	L	280 Broome Street Manhattan, NY
Bowery Bank of New York Building	L	124 Bowery Manhattan, NY
Bowery Savings Bank	L	130 Bowery Manhattan, NY
Fire Engine Company 55	L	363 Broome Street Manhattan, NY
Germania Bank Building	L	190 Bowery Manhattan, NY
Young Men's Institute Building	L	222 Bowery Manhattan, NY
Bowery Mission	L	227 Bowery Manhattan, NY
143 Allen Street House	L	143 Allen Street Manhattan, NY
Anshe Chesed Synagogue	L	172-176 Norfolk Street Manhattan, NY
Hamilton Fish Park Play Center	L	130 Pitt Street Manhattan, NY
First Houses	L	29-41 Avenue A and 112-138 East 3rd Street Manhattan, NY
Sources: NYS Historic Preservation Office, New York City Landmark's Preservation Commission https://nyclpc.maps.arcgis.com/apps/webappviewer/index.html?id=93a88691cace4067828b1eede432022b, and National Park Service Database of Listed properties on the National Register, https://www.nps.gov/maps/full.html?mapId=7ad17cc9-b808-4ff8-a2f9-a99909164466		

3.4.9 Proximity to Natural Resources

Potential wetlands on or near the Site were evaluated by reviewing the National Wetlands Inventory and NYSDEC regulated wetlands. Based on these documents no mapped wetlands are listed on the subject property.

3.4.10 Off Site Groundwater Impacts

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

3.4.11 Proximity to Flood Plains

According to the National Flood Insurance Rate map for the City of New York published by the Federal Emergency Management (FEMA) (Community Panel No. 3604970203F, effective date September 5, 2007), the Site is located in Zone X, which is designated for areas determined to be outside the 0.2% annual chance of flood and in an area of minimal flood hazard.

3.4.12 Geography and Geology of the Site

The Site geology is described in Section 2.2 of this report.

3.4.13 Current Institutional Controls

The Site was assigned an E-Designation for hazardous materials, air quality, and noise attenuation (E-548) as part of the GO Broome Street Development rezoning action, pursuant to a City Environmental Quality Review (CEQR No. 19DCP119M). Therefore, a RAWP and CHASP are required to obtain a new building permit and remediation is required in order to obtain a Certificate of Occupancy from the NYC Buildings Department. A Restrictive Declaration will also be imposed on the Site at the financial closing.

3.5 Summary of Selected Remedial Actions

Alternative I, a Track 2 remedy, will include the following tasks:

- Development and implementation of a construction HASP (CHASP) and CAMP for the protection of on-Site workers, community/residents, and the environment during remediation and construction activities.
- Design and construction of the support of excavation (SOE) system to facilitate the Track 2 remediation.

- Implementation of soil erosion, pollution and sediment control measures in compliance with applicable laws and regulations.
- Excavation, stockpiling, off-Site transport, and disposal of historic fill and/or native soil exceeding the Track 2 Restricted Residential RUSCOs as defined by 6 NYCRR Part 375-6.8(b) to a minimum depth of 15 feet below street level in accordance with 6 NYCRR Part 375-3.8(e)(2)(iii)(a-d), and deeper as needed for the proposed redevelopment as follows:
    - to el 14 NAVD88 (corresponding to approximately 18 feet below street level) across the majority of the Site for construction of the new building foundation across 96.8% of the Site;
    - to el 18 NAVD88 (corresponding to approximately 15 feet below street level) in the northwestern portion of the Site for construction of the new building across 1.4% of the Site;
    - to between el 18 NAVD88 and el 11 NAVD88 (corresponding to between approximately 15 and 22 feet below street level) in the northwestern portion of the Site for excavation of the SOE berm on a 1:1.5 slope for construction of the new building across 1.7% of the Site; and,
    - to el 11 NAVD88 (corresponding to approximately 22 feet below street level) in the northwestern portion of the Site for excavation of the new building across 0.1% of the site.

  Any source material below a depth of 15 feet below street level will be removed to the extent feasible.

  Screening for indications of contamination (by visual means, odor, and monitoring with PIDs) of excavated material during intrusive Site work.
- If encountered, removal and decommissioning of any encountered USTs and/or associated appurtenances (e.g., fill lines, vent line, and electrical conduit) and disposal off-Site during Site redevelopment in accordance with DER-10, 6 NYCRR Part 613.9, NYSDEC CP-51, and other applicable NYSDEC UST closure requirements.
- Collection and analysis of confirmation soil samples from the excavation base and sidewalls of the excavation, in accordance with DER-10 to confirm Restricted Residential RUSCOs were achieved; over-excavation may be completed if necessary to meet Restricted Residential RUSCOs Site-wide.
- Completion of a topographic survey of final excavation sub-grade.

- Importation of certified-clean material (i.e., material meeting Restricted Residential RUSCOs), virgin stone, or recycled concrete aggregate (RCA), or virgin, native crushed stone to backfill over-excavated areas to development depth.
- Installation of a subslab depressurization system (SSDS) and required sealing layer in the form of a vapor barrier/waterproofing membrane for the proposed building.
- Reuse of Site soil meeting Restricted Residential RUSCOs, if necessary.
- Recording of an Environmental Easement (EE) to memorialize the institutional controls (ICs) and engineering controls (ECs) and require future owners of the site to comply with certain land use restrictions and continue to maintain these controls.
- Establishment of an approved SMP to ensure long-term management of the SSDS and institutional controls, including the performance of periodic inspections and certification that the controls are performing as they were intended.

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

4.0 REMEDIAL ACTION PROGRAM

4.1 Governing Documents

The primary documents governing the remedial action are summarized in this section. Where referenced, copies of the full plan are provided in the appendices.

4.1.1 Standards, Criteria and Guidance

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

- 29 CFR Part 1910.120 – Hazardous Waste Operations and Emergency Response
- 6 NYCRR Part 371 – Identification and Listing of Hazardous Wastes
- 6 NYCRR Part 372 – Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities
- 6 NYCRR Subpart 373-4 – Facility Standards for the Collection of Household Hazardous Waste and Hazardous Waste from Conditionally Exempt Small Quantity Generators

- 6 NYCRR Subpart 374-1 – Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
- 6 NYCRR Subpart 374-3 – Standards for Universal Waste
- 6 NYCRR Part 375 – Environmental Remediation Programs
- 6 NYCRR Part 376 – Land Disposal Restrictions
- 6 NYCRR Part 750 –SPDES Permits
- CP-43 – CP on Groundwater Monitoring Well Decommissioning (December 2009)
- CP-51 – Soil Cleanup Guidance (2010)
- DER-10 – Technical Guidance for Site Investigation and Remediation (May 3, 2010)
- DER-23 – Citizen Participation Handbook for Remedial Programs (March, 2010)
- NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (October 2006)
- TOGS 1.1.1 – Ambient Water Quality Standards & Guidance Values and Groundwater Effluent Limitations
- USEPA OSWER Directive 9200.4-17 – Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites (December 1997)
- Screening and Assessment of Contaminated Sediment (Division of Fish, Wildlife and Marine Resources, June 2014)

4.1.2 Site Specific Construction Health & Safety Plan

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

- Organization and identification of key personnel
- Training requirements

- Medical surveillance requirements
- List of Site hazards
- Excavation safety
- Work zone descriptions
- Personal safety equipment and protective clothing requirements
- Decontamination requirements
- Standard operating procedures
- Protective measure plan
- CAMP
- Safety Data Sheets

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

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

4.1.3 Quality Assurance Project Plan

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

- Responsibilities of key personnel and their organizations for the proposed remedy;
- Qualifications of the quality assurance officer;
- Sampling requirements including methodologies, quantity, volume, locations, frequency, acceptance and rejection criteria; and

- Description of the reporting requirements for quality assurance activities including weekly quality assurance review reports, periodic quality assurance and quality control audits, and other report and data submissions.

4.1.4 Construction Quality Assurance Plan

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

The following project personnel are anticipated to implement the RAWP.

Remediation Engineer (RE):	Ronald E. Boyer, P.E.
Project Manager:	Amanda Forsburg, CHMM
Langan Health & Safety Officer:	Tony Moffa, ASP, CHMM, COSS
Langan Site Safety Coordinator:	Ashley Sandve
Qualified Environmental Professional (QEP):	Chris McMahon, CHMM
Field Team Leader:	Ashley Sandve
Quality Assurance Officer:	Joe Conboy

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

The QEP or RE will directly supervise field engineers, scientists, and geologists who will meet with the Construction Superintendent on a daily basis to discuss the plans for that day and schedule upcoming activities. The field engineer/scientist/geologist will document remedial activities in the daily report. This document will be forwarded to the Field Team Leader on a daily basis and to the Project Manager and the RE on a weekly basis.

The QEP or RE will directly supervise field engineers, scientists and geologists who will screen the excavation with a PID during intrusive activities. PID readings will be noted in the record. PID readings that exceed action levels will be reported to the NYSDEC and NYSDOH in the daily reports. The field engineer/scientist/geologist will collect the post-excavation soil samples in accordance with this RAWP.

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

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

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

4.1.5 Soil/Materials Management Plan

The RE has prepared a Soil/Materials Management Plan (SMMP), which includes detailed plans for managing soil/materials that are disturbed at the Site, including excavation, handling, storage, transport and disposal. It also includes controls that will be applied to these efforts to assure effective, nuisance-free performance in compliance with applicable federal, state and local laws and regulations. The SMMP is further described in Section 5.4.

4.1.6 Erosion and Sediment Control Plan

Erosion and sediment controls will be implemented as necessary. Best Management Practices (BMP) for soil erosion will be selected to minimize erosion and sedimentation off Site from the start of the remediation to the completion of development. Erosion and sediment control measures will be implemented as described in Section 5.4.10. A Stormwater Pollution Prevention Plan (SWPPP) is not necessary because the project will disturb less than one acre, and stormwater discharge, if required, will be to a combined sewer in accordance with the New York City generic sewer discharge permit.

4.1.7 Community Air Monitoring Program

A CAMP was prepared for the Site as part of the CHASP (Appendix E), and is further discussed in Section 5.4.12.

4.1.8 Contractor's Site Operations Plan

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

4.1.9 Citizen Participation Plan

Fact Sheets describing the Remedial Action proposed in the RAWP will be distributed through DEC Delivers, the NYSDEC's email listserv service and online Environmental Notice Bulletin. Additional Fact Sheets, translated into both Spanish and Chinese, will be distributed to parties on the Site Contact List to announce: 1) a 45-day comment period for this RAWP; 2) the completion of the Remedial Action once implemented, with a summary of the FER; and, 3) the issuance of the Certificate of Completion for the Site.

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

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

Community Board No. 3, Manhattan
59 East 4th Street
New York, NY 10003
Phone: (212) 533-5300
Email: mn03@cb.nyc.gov
Website: https://www1.nyc.gov/html/mancb3/html/home/home.shtml

New York Public Library – Seward Branch
192 East Broadway
New York, New York 10002
Phone: (212) 477-6770
Hours (Call to verify):

Monday - Thursday	10:00 a.m. to 8:00 p.m.
Friday and Saturday	10:00 a.m. to 5:00 p.m.

Sunday	Closed

Documents will also be posted on the NYSDEC DECinfo Locator website (https://www.dec.ny.gov/data/DecDocs/C231137/).

4.1.10 Remedial Design and Green Remediation Principles

A remedial design program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and Site management of the remedy as per DER-31. The major green remediation components are as follows:

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term
- Reducing direct and indirect greenhouse gases and other emissions
- Increasing energy efficiency and minimizing use of non-renewable energy
- Conserving and efficiently managing resources and materials
- Reducing waste, increasing recycling and increasing reuse of materials that would otherwise be considered a waste
- Maximizing habitat value and creating habitat when possible
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development
- The newly constructed building will incorporate sustainable features including various methods of insulation in the building envelope, efficient heating and cooling systems, no-VOC or low-VOC paints, sealants, and coatings, and low-flow plumbing fixtures.

4.2 General Remedial Construction Information

4.2.1 Project Organization

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

4.2.2 Remedial Engineer

The RE for this project will be Ronald E. Boyer, P.E. The RE is a registered professional engineer licensed by the State of New York. The RE will have primary direct responsibility for implementation of the remedial program for the Broome Street Parking Lot Site. The RE will certify in the FER that the remedial activities were observed by Langan personnel under his supervision and that the remediation requirements set forth in the RAWP and any other relevant provisions of ECL 27-1419 have been achieved in full conformance with the RAWP.

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

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

4.2.3 Remedial Action Construction Schedule

The remedial action construction schedule is discussed below in Section 11 and is provided in Appendix I. The NYSDEC will be promptly notified of proposed changes, delays and/or deviations to the schedule.

4.2.4 Work Hours

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

4.2.5 Site Security

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

4.2.6 Traffic Control

Site traffic will be controlled through designated points of access and in compliance with the New York City approved Restrictive Declaration. Access points will be continuously monitored and if necessary, a

flagging system will be used to protect workers, pedestrians and authorized guests. Traffic will also adhere to applicable local, state, and federal laws.

4.2.7 Contingency Plan

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

4.2.7.1 Discovery of Additional USTs

As a contingency, if an unknown UST is discovered via exploratory test pit or excavation, it will be decommissioned in accordance with 6 NYCRR Part 612.2 and 613.9, and DER-10 section 5.5. Once the tank and its contents are removed, post-excavation soil samples will be collected per the NYSDEC DER-10 requirements, if deemed necessary by the NYSDEC and the RE. Post-excavation soil sampling is not expected where the excavation will extend below the UST. If encountered, petroleum-contaminated soils will be removed. UST closure documentation, such as contractor affidavits, bills of lading for sludge disposal, and tank disposal receipts, will be provided as appendices in the FER. The NYSDEC Petroleum Bulk Storage (PBS) registration will be updated as necessary, depending on the type, number, and capacity of discovered tanks.

4.2.7.2 Discovery of Additional Contaminated Soil

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

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

4.2.8 Worker Training and Monitoring

Worker training and monitoring will be conducted in accordance with the Site-specific CHASP, included as Appendix E.

4.2.9 Agency Approvals

The Site is in an E-designation zone for hazardous materials, air quality, and noise attenuation (CEQR Number 19DCP119M). The scope of work proposed in this RAWP fulfills requirements with the New York

City Office of Environmental Remediation (NYCOER) for hazardous materials. Permits or government approvals required for remedial construction will be obtained prior to the start of remedial construction.

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

4.2.10 Pre-Construction Meeting with NYSDEC

Prior to the onset of construction, a meeting will be held between the NYSDEC, QEP and/or RE, Volunteer, Construction Manager, and Contractor to discuss project roles, responsibilities, and expectations associated with the NYSDEC-approved RAWP. Notice will be provided to the NYSDEC seven days prior to Site mobilization.

4.2.11 Emergency Contact Information

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

4.2.12 Remedial Action Costs

The estimated cost of the Track 2 Remedial Action is $6.1 million. An itemized and detailed summary of estimated costs for the remedy is provided in Table 9.

4.3 Site Preparation

4.3.1 Mobilization

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

- Identifying the location of all aboveground and underground utilities (e.g., power, gas, water, sewer, communications), equipment, and structures (as necessary to implement the remediation);
- Mobilizing necessary remediation personnel, equipment, and materials to the Site;
- Constructing one or more stabilized construction entrances consisting of nonhazardous material capped with a gravel roadway at or near the Site exit, which takes into consideration the Site setting and Site perimeter;

- Constructing an equipment decontamination pad for trucks, equipment, and personnel that come into contact with impacted materials during remedial activities;
- Installing erosion and sedimentation control measures, as necessary; and,
- Installing temporary fencing or other temporary barriers to limit unauthorized access to areas where remediation activities will be conducted.

4.3.2 Erosion and Sedimentation Controls

Since the planned earthwork activities will be below the adjacent sidewalk grade, full-time erosion and sedimentation measures are not anticipated. Best management practices for soil erosion will be selected and implemented, as needed, to minimize erosion and sedimentation off Site.

4.3.3 Monitoring Well Decommissioning

Existing groundwater monitoring wells will be properly decommissioned in accordance with NYSDEC policy CP-43 Groundwater Monitoring Well Decommissioning Policy or during excavation as part of future foundation construction.

4.3.4 Temporary Gravel Construction Entrance(s)

A temporary gravel construction entrance and exit will be installed on-Site for all vehicles exiting the BCP Site. The entrances will be covered with gravel or RCA and graded so that runoff water will be directed back into the Site. Vehicles exiting construction areas will be cleaned using clean water or dry brushing, as needed, to remove Site soil from the tires and undercarriages. The Contractor will protect and maintain the sidewalks and roadway at Site access and existing points.

4.3.5 Utility Marker and Easements Layout

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

The presence of utilities and easements on the Site has been investigated. It has been determined that no risk or impediment to the planned work under this RAWP is posed by utilities or easements on the Site.

4.3.6 Support-of-Excavation

The currently contemplated SOE will include the installation of soldier piles, tiebacks, wales, corner braces, rakers, and heel blocks and construction of a lagging system from street level to the proposed final remedial excavation grade of el 14 NAVD88 (approximately 18 feet below street level). Appropriate management of structural stability of on-Site or off-Site structures during remedial activities, including excavation, is the responsibility of the Volunteer and its contractors. The Volunteer and its contractors are solely responsible for safe execution of work performed under this RAWP. The Volunteer and its contractors must obtain the necessary local, state, or federal permits or approvals that may be required to perform work under this RAWP. Further, the Volunteer and its contractors are responsible for the implementation of all required, appropriate, or necessary health and safety measures during performance of work under the approved RAWP.

4.3.7 Equipment and Material Staging

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

4.3.8 Truck Wash and Inspection Station

An outbound-truck inspection station will be set up at or near the Site exit. Before exiting the Site, trucks will be required to stop at the truck inspection station and will be examined for evidence of contaminated soil on the undercarriage, body, and wheels. If observed, soil and debris will be removed. Brooms, shovels and potable water will be utilized for the removal of soil from vehicles and equipment, as necessary. The Contractor is responsible for collecting any soil that is inadvertently tracked immediately off Site and returning the soil to the Site.

4.3.9 Site Fencing

The Site perimeter will be secured with gated, signed, plywood fencing. The purpose of the fencing is to limit Site access to authorized personnel, protect pedestrians from Site activities, minimize construction noise, and maintain Site security. A minimum 12-foot fence is required by the Restrictive Declaration.

4.3.10 Demobilization

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

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

4.4 Reporting

Periodic reports and an FER will be submitted to the NYSDEC as required to document the remedial action. The Project RE responsible for certifying all reports will be an individual licensed to practice engineering in the State of New York. Ronald E. Boyer, P.E. of Langan, will have this responsibility. Should Mr. Boyer become unable to fulfill this responsibility, another suitably qualified Professional Engineer will take his place.

Daily and monthly reports will be included as appendices to the FER. In addition to the periodic reports and the FER, copies of the relevant contractor documents will be submitted to the NYSDEC.

4.4.1 Daily Reports

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

- An update of progress made during the reporting day
- Locations of work and quantities of material imported and exported from the Site
- References to an alpha-numeric map for Site activities
- A summary of complaints with relevant details (names, phone numbers)
- A summary of CAMP findings, including trigger action levels, and
- An explanation of notable Site conditions

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

Daily Reports will reference the NYSDEC-assigned project number and include a description of daily activities keyed to an alpha-numeric map that identifies work areas. These reports will include a summary of air monitoring results, odor and dust problems and corrective actions, and complaints received from the public.

4.4.2 Monthly Reports

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

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

4.4.3 Other Reporting

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

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

4.4.4 Complaint Management Plan

The management plan for documenting complaints is detailed below.

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

4.4.5 Deviations from the RAWP

Necessary deviations from the RAWP will be coordinated with the NYSDEC in advance. Notification will be provided to the NYSDEC by telephone/email for conditions requiring immediate action (e.g., conditions

judged to be a danger to the surrounding community). Based on the significance of the deviation, an addendum to this RAWP may be necessary and will include:

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

5.0 REMEDIAL ACTION: MATERIAL REMOVAL FROM SITE

5.1 Soil Cleanup Objectives

The Soil Cleanup Objectives for the selected remedy are listed in Table 8.

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

5.2 Remedial Performance Evaluation (Confirmation Sampling)

5.2.1 Confirmation Sampling Frequency

Documentation soil samples will be collected from the excavation base at a frequency of one per 900 square feet. Sidewall samples would not be collected from the site perimeter because excavation would extend across the site footprint and SOE measures (i.e., sheet pile wall) would preclude access to soil sidewalls. An estimated 56 documentation soil samples, plus QA/QC samples, will be collected to confirm remedial performance.

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

5.2.1.1 Methodology

Confirmation soil samples will be collected from the base of the remedial excavation in accordance with NYSDEC DER-10 to confirm remedial performance and will be analyzed for the Part 375 list of VOCs, SVOCs, PCBs, herbicides, pesticides, cyanide, metals including hexavalent and trivalent chromium, and per- and PFAS and 1,4-dioxane. Should additional soil sampling be deemed necessary (e.g., additional tank closure, unknown environmental condition through visual evidence of a remaining source, over-excavation of failed confirmation sample), confirmation sampling will be conducted in accordance with NYSDEC DER-10.

If a confirmation soil sample does not comply with the Restricted Residential RUSCOs, over-excavation may be completed and additional confirmation or documentation samples will be collected, at the

frequency of one sample per 900 square feet of over-excavation area. No off-Site excavation is required. The results will be presented in NYSDEC ASP Category B deliverable format.

5.2.1.2 Quality Assurance/Quality Control

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

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

5.2.1.3 Data Usability Summary Reports

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

5.2.1.4 Confirmation Sampling Reporting

Analytical laboratories that analyze confirmation soil samples, prepare results, and perform contingency sampling will be NYSDOH ELAP-certified laboratories. Confirmation and endpoint soil sampling will be performed in accordance with NYSDEC DER-10 sample frequency requirements. The FER will provide a tabular and map summary of all confirmation soil sample results with a comparison to the Restricted Residential RUSCOs. Soil samples with concentrations of contaminants above the Restricted Residential RU SCOs, if any, will be identified.

5.3 Estimated Material Removal and Backfill Quantities

The estimated volume of soil requiring removal and off-Site disposal for the Track 2 remedy is about 17,500 cubic yards. Over-excavation and backfilling is not expected. In the event that over-excavation is

required, backfill that meets the Restricted Residential RUSCOs and the requirements outlined in Section 3.2.5 will be imported to the Site.

5.4 Soil/Materials Management Plan

This section presents the approach to management, disposal, and reuse of soil, fill, and materials excavated from the Site. This plan is based on the current knowledge of Site conditions and will be augmented, as necessary, using additional data collected during remediation. A field engineer, scientist, or geologist, under the direction of the RE will monitor and document the handling and transport of contaminated material removed from the Site for disposal as a regulated solid waste. A field engineer, scientist, or geologist, under the direction of the RE, will assist the remediation contractor in identifying impacted materials during remediation, determining materials suitable for direct load out versus temporary on-Site stockpiling, selection of samples for waste characterization, if necessary, and determining the proper off-Site disposal facility. Separate stockpile areas will be constructed as needed for the various materials to be excavated or generated, with the intent to most efficiently manage and characterize the materials and to avoid comingling impacted materials with non-impacted soil.

The following material types are reasonably anticipated to be encountered during remediation:

- Non-hazardous Historic Fill Material – This material refers to historic fill that contains contaminants above the Restricted Residential RUSCOs and will not be reused on-Site. This material will be excavated across the cellar footprint to approximately 18 feet below street level across the majority of the Site footprint, and between approximately 15 and 22 feet below street level in the northwestern portion of the Site. This material will be transported off-Site and disposed of at a facility permitted to accept the material.
- Non-hazardous Native Soil – Analytical results indicate contaminants are present in some areas of the Site within native material above the Track 2 Restricted Residential RUSCOs. This material will be included in areas excavated to approximately 18 feet below street level across the majority of the Site footprint, and between approximately 15 and 22 feet below street level in the northwestern portion of the Site. Non-hazardous native soil excavated from areas exceeding the Track 2 Restricted Residential RUSCOs will be transported off-Site and disposed of at a facility permitted to accept the material. Non-hazardous native soil excavated from areas below the Track 2 Restricted Residential RUSCOs may be reused as detailed in Section 5.4.6 or will be transported off-Site and disposed of at a facility permitted to accept the material. Confirmation samples will be collected from the base of the excavation to document compliance with the Restricted Residential RUSCOs. A proposed endpoint confirmation sample location plan is provided as Figure 9.

5.4.1 Soil Screening Methods

Visual, olfactory and PID soil screening and assessment will be performed by an engineer, geologist, or scientist under the direct supervision of a PE or QEP during all remedial and development excavations into known or potentially contaminated material. Soil screening will be performed regardless of the time of year that invasive work is conducted and will take place during excavation and invasive work performed as part of the remedy and development-related construction performed prior to issuance of the Certificate of Completion, including, but not limited to, excavating for remediation, foundation construction, and utility work.

Screening will be performed by qualified environmental professionals. Resumes are provided herein for personnel responsible for field screening (i.e., those representing the RE) the excavation and other ground-intrusive work performed during remediation and development.

5.4.2 Stockpile Methods

Stockpiles will be constructed as necessary to separate and stage excavated material pending loading or characterization sampling. Separate stockpile areas will be constructed to avoid comingling materials of differing waste types. Stockpile areas will meet the following minimum requirements:

- Excavated soil will be placed onto a minimum thickness of 6 mil 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 (i.e., about 1,000 cubic yards) until ready for loading. Stockpiles that have not reached their capacity, whether active or inactive, will be covered at the end of each workday.
- Each stockpile will be encircled with silt fences and hay bales, as needed, to contain and filter particulates from rainwater that has drained off the soils and to mitigate the potential for surface water run-off.

- Stockpiles will be inspected at a minimum of once daily and after every storm event. Results of inspections will be recorded in a logbook, maintained at the Site, and made available for inspection by the NYSDEC.

5.4.3 Materials Excavation and Load Out

A field engineer, scientist, or geologist under the supervision of the RE will monitor ground-intrusive work and the excavation and load-out of excavated material.

The Volunteer and its contractors are solely responsible for safe execution of ground-intrusive and other remedial work performed under this RAWP. The Volunteer and its contractors are solely responsible for the identification of utilities and/or easements that might be affected by the work conducted under this RAWP.

Loaded vehicles leaving the Site will be appropriately lined (as needed), securely covered, manifested, and placarded in accordance with the appropriate federal, state, and local requirements, including applicable transportation requirements (i.e., New York State Department of Transportation [NYSDOT] and NYCDOT requirements). Trucks hauling historic fill material will not be lined unless free liquids are present or the material is grossly impacted.

A truck wash will be operated on Site. The RE will be responsible for documenting that outbound trucks will be washed at the truck wash, as necessary, before leaving the Site until the remedial construction is complete. Locations where vehicles enter or exit the Site will be inspected daily for evidence of off-Site sediment tracking.

The RE will be responsible for documenting that egress points for truck and equipment transport from the Site will be clean of dirt and other materials derived from the Site during remediation and development. The remediation contractor will clean adjacent streets as necessary to maintain a clean condition with respect to Site-derived materials.

The Volunteer and associated parties preparing the remedial documents submitted to New York State, and the parties performing this work, are responsible for the safe performance of ground-intrusive work, the structural integrity of excavations, and for structures that may be affected by excavations (such as building foundations and bridge footings).

The Volunteer and associated parties will ensure that Site development activities will not interfere with, or otherwise impair or compromise, remedial activities proposed in this RAWP.

Development-related grading cuts and fills will not be performed without NYSDEC approval and will not interfere with, or otherwise impair or compromise, the performance of remediation required by this RAWP.

Mechanical processing of historic fill and contaminated soil on-Site is prohibited unless otherwise approved by NYSDEC.

Primary contaminant sources (including, but not limited to, tanks and hotspots) identified during Site characterization, the RI, and implementation of the remedy will be located via field measurements to the nearest permanent structures or property lines. The information will be shown on maps to be included with the FER. If the primary contaminant sources are removed under Track 4 cleanup, the final excavation subgrade will be surveyed.

5.4.4 Materials Transport Off-Site

Transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded. The trucking entrance will be determined prior to the initiation of the remedy. All trucks loaded with Site materials exit the vicinity of the Site using only approved truck routes.

These routes are the most appropriate routes to and from the Site and take into account:

- Limiting transport through residential areas and past sensitive Sites
- Use of city mapped truck routes
- Prohibiting off-Site queuing of trucks entering the facility
- Limiting total distance to major highways
- Promoting safety in access to highways
- Overall safety in transport
- Community input (where necessary)

Truck routes are shown on Figure 10. Trucks will be prohibited from excessive stopping and idling in the neighborhood outside of the Site.

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

To the extent possible, queuing of trucks will be performed on-Site in order to minimize off-Site disturbance. Off-Site queuing will be minimized.

Material transported by trucks exiting the Site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

5.4.5 Materials Disposal Off-Site

Disposal facilities will be determined at a later date and will be reported to the NYSDEC Project Manager prior to off-Site transport and disposal of excavated material. Soil/fill/solid waste excavated and removed from the Site will be handled, transported and disposed in accordance with local, State (including 6 NYCRR 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.

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 the disposal of material derived from the Site conforms to applicable laws:

(1) A letter from the RE or BCP Volunteer to the receiving facility describing the material to be disposed and requesting formal written acceptance of the material. This letter will state that material to be disposed 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 of the RE. The letter will include as an attachment a summary of all chemical data for the material being transported (including waste characterization data).

(2) A letter from all receiving facilities stating it is in receipt of the correspondence (above) and is approved to accept the material.

These documents will be included in the FER.

Non-hazardous historic fill material and contaminated soil transported off-Site will be handled, at a minimum, as a solid waste per 6 NYCRR Part 360. Historic fill and contaminated soil excavated from the Site are prohibited from being disposed of at Part 360 Registration Facilities (also known as Soil Recycling Facilities).

Soil that is contaminated but non-hazardous and is being removed from the Site may be sent to a permitted Part 360 landfill. This material is prohibited from being sent or redirected to a Part 360-15 Registration Facility.

The FER will include an accounting of the destination of material removed from the Site during implementation of the remedy, including excavated soil, contaminated soil, historic fill, solid waste, hazardous waste, non-regulated material, and fluids. Documentation associated with disposal of each material type must also include records and approvals for receipt of the material. This information will also be presented in a table to be included in the FER.

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

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

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

5.4.6 Materials Reuse On-Site

Soil excavated during the remedy may be reused on Site if the requirements in this section are met. Grossly-impacted soil will not be reused. Reused soil must be non-hazardous and must meet the Restricted Residential RUSCOs (refer to Table 8). Soil removed during implementation of the remedy or removed for grading or other purposes which meets the Restricted Residential RUSCOs may be reused as backfill but will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines. Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the Site is prohibited for reuse on-Site. Reuse of soil will be coordinated in advance with the NYSDEC Project Manager. Material deemed unfit for reuse will be transported for off-Site disposal.

5.4.7 Fluids Management

Due to the depth of groundwater, dewatering is not anticipated to be required for a Track 2 Site remediation.

5.4.8 Demarcation

It is anticipated that the Site will be remediated to Restricted Residential RUSCOs; therefore, remaining contaminated soil will not be left on-Site and a physical demarcation barrier will not be installed. A survey denoting the base and sidewalls of the excavation will still be required, because an Environmental Easement will be filed as part of the Track 2 remedy. If a Track 2 remedy is not achieved, a physical demarcation layer, consisting of orange snow fencing material or equivalent material will be placed on this surface to provide a visual reference. The proposed foundation slab may also serve as a demarcation layer.

5.4.9 Backfill from Off-Site Sources

Materials proposed for import onto the Site will be approved by the RE and will be in compliance with the provisions in this RAWP prior to receipt at the Site. Imported soil for backfill must meet the Restricted Residential RUSCOs or other acceptable fill material such as virgin, native stone from a quarry or RCA. Material from industrial Sites, spill Sites, other environmental remediation Sites, or other potentially contaminated Sites will not be imported to the Site. Solid waste will not be imported onto the Site.

The FER will include the following certification by the RE: "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 RAWP".

Backfill material will consist of clean fill (as described in the following paragraph) or other acceptable fill material such as virgin stone from a quarry or RCA. If RCA is imported to the Site, it will be from a NYSDEC-registered facility in compliance with 6 NYCRR Part 360 registration and permitting requirements for the period of acquisition of RCA. RCA imported from compliant facilities will not require chemical testing, unless required by the NYSDEC under the terms for operation of the facility. RCA imported to the Site must be derived from recognizable and uncontaminated concrete, with no more than 10% by weight passing through a No. 10 sieve. RCA is not acceptable for and will not be used as cover or drainage material or to fill areas beneath the groundwater table. Crushed virgin stone from a permitted mine or quarry may also be imported without chemical testing is sieve analysis shows no more than 10% by weight passing through a No. 10 sieve.

Imported soil (i.e., clean fill) will meet the Restricted Residential RUSCOs. Non-compliant soils will not be imported to the Site. Clean fill will be segregated at a source/facility that is free of environmental contaminants. Qualified environmental personnel will collect representative samples at a frequency consistent with NYSDEC DER-10 Table 5.4(e)10 – Recommended Number of Soil Samples for Soil Imported To or Exported From a Site. The samples will be analyzed for Part 375 VOCs, SVOCs, pesticides/herbicides, PCBs, cyanide, metals including trivalent and hexavalent chromium and PFAS, and 1,4-dioxane by a

NYSDOH ELAP-certified laboratory. Upon meeting these criteria, the certified-clean fill will be transported to the Site and segregated from impacted material, as necessary, on plastic sheeting until it is used as backfill.

Soils that meet 'exempt' fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this Site, will not be imported onto the Site without prior approval by the NYSDEC. The contents of this RAWP and NYSDEC approval of this RAWP should not be construed as an approval for this purpose.

Trucks entering the Site with imported soils will be secured with tight fitting covers.

5.4.10 Stormwater Pollution Prevention

As the majority of planned earthwork activities will be below the adjacent sidewalk grade, full-time erosion and sedimentation measures are not anticipated. Best management practices for soil erosion will be selected and implemented, as needed, to minimize erosion and sedimentation off Site.

5.4.11 Contingency Plan

If USTs or other previously unidentified contaminant sources are found during on-Site remedial excavation or development-related construction, sampling will be performed on product, if encountered, and surrounding subsurface materials (e.g., soil, stone, etc.). Chemical analyses will be for full scan parameters (Part 375 VOCs, SVOCs, PCBs, pesticides, herbicides, cyanide, and metals including hexavalent and trivalent chromium) as well as emerging contaminants 1,4-dioxane and PFAs. Analyses will not be otherwise limited without NYSDEC approval.

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

It is anticipated that a Track 2 cleanup will be achieved. SCOs for a Track 2 cleanup are presented in Table 8.

5.4.12 Community Air Monitoring Plan

Community air monitoring will be conducted in compliance with the NYSDOH Generic CAMP outlined below.

The CAMP will include real-time monitoring for VOCs and particulates at the downwind perimeter of each designated work area when ground-intrusive work is in progress. Continuous monitoring will be required for all ground-intrusive work. Ground-intrusive work includes, but is not limited to, soil/fill excavation and

handling and utility trenching. Periodic monitoring for VOCs may be required during non-intrusive work such as the collection of soil samples. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location and taking a reading prior to leaving a sample location.

CAMP monitoring of total VOC levels will be conducted using PIDs, and monitoring for particulates will be conducted using particulate sensors equipped with filters that can detect airborne particulates less than 10 microns in diameter (PM10). Monitoring for particulates and odors will be conducted during ground-intrusive work by a field engineer, scientist, or geologist under the supervision of the RE. The work zone is defined as the general area in which machinery is operating in support of remediation. A portable PID will be used to monitor the work zone and for periodic monitoring of total VOC levels during work such as soil sampling. The Site perimeter will be visually monitored for fugitive dust emissions.

The following actions will be taken based on total VOC levels measured:

- If total VOC levels exceed 5 ppm above background for the 15-minute average at the perimeter, work will be temporarily halted and monitoring continued. If levels readily decrease (per instantaneous readings) below 5 ppm above background, work will resume with continued monitoring.
- If total VOC levels at the downwind perimeter of the work zone persist at levels in excess of 5 ppm above background but less than 25 ppm, work will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work will resume provided that the total VOC 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, work will be shut down.

The following actions will be taken based on dust levels measured or visual dust observations:

- If the downwind particulate level is 100 µg/m³ 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 µg/m³ 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 µg/m³ 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 µg/m³ of the upwind level and in preventing visible dust migration.

Sustained concentrations of VOCs or PM10 will be reported to the NYSDEC and NYSDOH Project Managers and included in the daily report. In addition, a map showing the location of the downwind and upwind CAMP stations will be included in the daily report.

5.4.13 Odor, Dust and Nuisance Control Plan

Dust, odor, and nuisance control will be accomplished by the remediation contractor as described in this section. The FER will include the following certification by the RE: "I certify that ground-intrusive work during remediation and development-related construction was conducted in accordance with dust and odor suppression methodology defined in the RAWP."

5.4.13.1 Odor Control Plan

This odor control plan is capable of controlling emissions of nuisance odors off-Site. Specific odor control methods to be used on a routine basis (if needed) will include application of foam suppressants or tarps over the odor or VOC source areas, if encountered. 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, including the halt of work, will be the responsibility of the Volunteers' RE, who is responsible for certifying the FER. Application of odor controls is the responsibility of the Remedial Contractor.

All necessary means will be employed to prevent on- and off-Site nuisances. At a minimum, procedures will include: (a) limiting the area of open excavations; (b) shrouding open excavations with tarps and other covers; and (c) using non-PFAS foams to cover exposed odorous soils or PFAS containing foams that will be remediated immediately after use. 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, (b) use of staff to monitor odors in surrounding neighborhoods.

Although not anticipated, 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 sheltering excavation and handling areas under tented containment structures equipped with appropriate air venting/filtering systems.

5.4.13.2 Dust Control Plan

A dust suppression plan that addresses dust management during ground-intrusive on-Site work will include, at a minimum, the items listed below:

- Dust suppression will be achieved through the use of a dedicated water distribution system or on-Site water truck for road wetting, or an alternate source with suitable supply and pressure for use in dust control.
- Stockpiles shall be maintained in accordance with Section 5.4.2.
- Gravel will be used on roadways to provide a clean and dust-free road surface.
- On-Site roads will be limited in total area to minimize the area required for water spraying.

5.4.13.3 Other Nuisances

A plan for rodent control will be developed and used by the remediation contractor during Site preparation (including clearing and grubbing) and during remedial work.

A plan for noise control will be developed and used by the remediation contractor during Site preparation and remedial work and will conform, at a minimum, to the NYCDEP noise control standards and the requirements of the Restrictive Declaration.

In addition to all of these controls, the Site will be subject to a Restrictive Declaration including traffic, noise, dust and air emission requirements and controls upon the financial closing.

6.0 RESIDUAL CONTAMINATION TO REMAIN ON-SITE

Because residual contaminated soil, groundwater, and soil vapor will exist beneath the Site above the Track 1 Unrestricted Use SCOs (soil), SGVs (groundwater), and NYSDOH monitoring and mitigation guidance values (soil vapor) after the Track 2 remedy is complete, ECs and ICs are required to protect human health and the environment. These ECs and ICs have been described throughout this RAWP and are described hereafter.

In the event a Site-wide or partial Track 4 remedy is implemented, ECs and ICs will also be implemented to protect public health and the environment by appropriately managing residual contamination.

Following completion of a Track 2 cleanup, the Site would have one primary EC system: (1) a SSDS including a sealing layer vapor barrier/waterproofing membrane.

To the extent only Track 4 can be achieved Site-wide or on portions of the Site, some areas may also require a cover system.

The FER will document the end point sample results on the Site in tabular and map form. This will include presentation of and exceedances of Unrestricted Use SCOs, Protection of Groundwater SCOs, and Restricted Residential RUSCOs.

7.0 ENGINEERING CONTROLS

Following completion of the remedy, it is anticipated that the Site will meet Track 2 Restricted Residential Use throughout the Site footprint. Nevertheless, long-term engineering controls will be required as part of the remedial action in the form of a SSDS and requiring sealing layer vapor barrier/waterproofing membrane. In the event that a Track 2 cleanup is not achieved on some or all of the Site, implementation of both a SSDS and a composite cover system will be required.

7.1 SSDS and Required Sealing Layer Vapor Barrier/Waterproofing Membrane

Exposure to residual contaminated soil vapor will be prevented by SSDS with a required sealing layer in the form of a vapor barrier/waterproofing membrane installed on all subsurface slabs and walls of the proposed building. The SSDS will be installed as a passive system with the capability of conversion to an active system, based on the findings of a post-installation soil vapor intrusion evaluation. The vapor barrier will consist of Grace Preprufe 300R (or its approved equivalent) underneath the slab and Grace Preprufe160R or Bituthene (or its approved equivalent) on the subsurface walls. Vapor barrier manufacturer's documentation and specifications are included as Appendix J.

7.2 Composite Cover System

In the event a Track 4 remedy is implemented on some or portions of the Site, exposure to residual contaminated soils will be prevented by an engineered, composite cover system that will be built on the Site. This composite cover system will be comprised of impervious cover such as concrete building slabs and foundation walls, and/or pavement, and at least two feet of clean fill in landscaped areas.

A Soil Management Plan will be included in the SMP and will outline the procedures to be followed in the event that soil with residual contamination remaining beneath following remedial excavation depth of approximately 18 feet below street level across the majority of the Site footprint, and between approximately 15 and 22 feet below street level in the northwestern portion of the Site is disturbed after the Remedial Action is complete. In the event a Track 4 remedy is implemented Site-wide or on portions of the Site, maintenance of the composite cover system will be described in the SMP in the FER.

8.0 CRITERIA FOR COMPLETION OF REMEDIATION/TERMINATION OF REMEDIAL SYSTEMS

8.1 SSDS and Required Sealing Layer Vapor Barrier/Waterproofing Membrane

The SSDS and required sealing layer vapor barrier/waterproofing membrane is a permanent control, and the quality and integrity of this system will be inspected at defined, regular intervals in perpetuity. The SSDS will operate as specified in the NYSDEC and NYSDOH approved, PE-certified design plans without modifications, unless such proposed modifications are approved in advance by NYSDEC and NYSDOH.

8.2 Composite Cover System

In the event of a Track 4 remedy on some or portions of the Site, the composite cover system is a permanent control, and the quality and integrity of this system will be inspected at defined, regular intervals in perpetuity.

9.0 INSTITUTIONAL CONTROLS

After either a Track 2 or Track 4 remedy is complete, the Site will have residual contamination remaining in place. ECs to manage the residual contamination have been incorporated into the Track 2 and Track 4 remedies to render the final remedy protective of public health and the environment. Two elements have been designed to ensure continual and proper management of residual contamination in perpetuity: an Environmental Easement and an SMP requiring compliance with the maintenance and monitoring of the SSDS (Track 2 or Track 4) and cover system (Track 4 only). These elements are described in this section.

A Site-specific Environmental Easement will be recorded with New York County to provide an enforceable means of ensuring the continual and proper management of residual contamination and protection of public health and the environment in perpetuity or until released in writing by NYSDEC. It requires that the grantor of the Environmental Easement and the grantor's successors and assigns adhere to all ECs and ICs placed on this Site by this NYSDEC-approved remedy. ICs provide restrictions on Site usage and mandate operation, maintenance, monitoring and reporting measures for all ECs and ICs. The SMP describes appropriate methods and procedures to ensure compliance with all ECs and ICs that are required by the Environmental Easement. Once the SMP has been approved by the NYSDEC, compliance with the SMP is required by the grantor of the Environmental Easement and grantor's successors and assigns.

9.1 Environmental Easement

An Environmental Easement, as defined in Article 71 Title 36 of the Environmental Conservation Law, is required when residual contamination above Unrestricted Use SCOs is left on-Site after the Remedial Action is complete. If the Site will have residual contamination after completion of all Remedial Actions, then an Environmental Easement is required. As part of this remedy, an Environmental Easement

approved by NYSDEC will be filed and recorded with the New York County Clerk. The Environmental Easement will be submitted as part of the FER.

The Environmental Easement renders the Site a Controlled Property. The Environmental Easement must be recorded with the New York County Clerk or City Register before the Certificate of Completion can be issued by NYSDEC. A series of ICs are required under this remedy to implement, maintain and monitor these EC systems, prevent future exposure to residual contamination by controlling disturbances of the subsurface soil and restricting the use of the Site to restricted residential and commercial use(s) only. These ICs are requirements or restrictions placed on the Site that are listed in, and required by, the Environmental Easement. ICs can, generally, be subdivided between controls that support ECs, and those that place general restrictions on Site usage or other requirements. ICs in both of these groups are closely integrated with the SMP, which provides all of the methods and procedures to be followed to comply with this remedy.

The ICs that support the ECs are:

- Compliance with the Environmental Easement by the Grantee and the Grantee's successors and adherence of all elements of the SMP is required
- All ECs must be operated and maintained as specified in the SMP
- All ECs on the Controlled Property must be inspected and certified at a frequency and in a manner defined in the SMP
- Environmental or public health monitoring must be performed as defined in the SMP
- Data and information pertinent to Site Management for the Controlled Property must be reported at the frequency and in a manner defined in the SMP
- ECs may not be discontinued without an amendment or extinguishment of the Environmental Easement. The Environmental Easement may be extinguished only by release by the Commissioner of New York State Department of Environmental Conservation, or the Commissioner's designee, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law

Adherence to these ICs for the Site is mandated by the Environmental Easement and will be implemented under the SMP (discussed in the next section).

The Controlled Property (Site) will also have a series of ICs in the form of Site restrictions and requirements. The Site restrictions that apply to the Controlled Property are:

- Vegetable gardens and farming on the Controlled Property are prohibited;
- Use of groundwater underlying the Controlled Property is prohibited without treatment rendering it safe for intended purpose as approved by NYSDOH and NYSDEC;
- All future activities on the Controlled Property that will disturb residual contaminated material, if present, are prohibited unless they are conducted in accordance with the soil management provisions in the SMP;
- The Controlled Property may be used for restricted-residential, commercial, or industrial use only, provided the long-term ECs and ICs included in the SMP are employed and in compliance with current zoning;
- The Controlled Property may not be used for a higher level of use, such as unrestricted residential use without an amendment or extinguishment of this Environmental Easement;
- Grantor agrees to submit to NYSDEC a written statement that certifies, under penalty of perjury, that: (1) controls employed at the Controlled Property are unchanged from the previous certification or that any changes to the controls were approved by the NYSDEC; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. NYSDEC retains the right to access such Controlled Property at any time in order to evaluate the continued maintenance of any and all controls. This certification shall be submitted annually, or an alternate period of time that NYSDEC may allow. This statement must be certified by an expert that the NYSDEC finds acceptable.

9.2 Site Management Plan

Site Management is the last phase of remediation. The SMP is submitted as part of the FER but will be written in a manner that allows its use as a complete and independent document. Site Management continues in perpetuity or until released in writing by NYSDEC. The property owner is responsible to ensure that all Site Management responsibilities defined in the Environmental Easement and the SMP are performed.

The SMP is intended to provide a detailed description of the procedures required to manage residual contamination left in place at the Site following completion of the Remedial Action in accordance with the BCA with the NYSDEC. This includes: (1) development, implementation, and management of all ECs and ICs; (2) development and implementation of monitoring systems and a Monitoring Plan; (3) development of a plan to operate and maintain any treatment, collection, containment, or recovery systems (including, where appropriate, preparation of an Operation and Maintenance Manual); (4) submittal of Site

Management Reports, performance of inspections and certification of results, and demonstration of proper communication of Site information to NYSDEC; and (5) defining criteria for termination of treatment system operation, if applicable.

The SMP will include three plans: (1) an Engineering and Institutional Control Plan for implementation and management of EC/ICs; (2) a Monitoring Plan for implementation of Site Monitoring;; and (3) a Site Management Reporting Plan for submittal of data, information, recommendations, and certifications to NYSDEC. The SMP will be prepared in accordance with the requirements in NYSDEC Draft DER-10 Technical Guidance for Site Investigation and Remediation and the guidelines provided by NYSDEC.

Site management, reporting, and EC/IC certification will be scheduled on a certification period basis. The certification period will be annual. The SMP will be based on a calendar year and will be due for submission to NYSDEC by March 1 of the year following the reporting period.

No exclusions for handling of residual contaminated soils, if any is remaining on the Site, will be provided in the SMP. All handling of residual contaminated material, if any, will be subject to provisions contained in the SMP.

10.0 FINAL ENGINEERING REPORT

A FER will be submitted to the NYSDEC following implementation of the remedy defined in this RAWP. The FER will be prepared in conformance with NYSDEC DER-10 and will include the following:

- Documentation that the remedial work required under this RAWP has been completed and has been performed in compliance with this plan
- A comprehensive account of the locations and characteristics of material removed from the site including the surveyed map(s) of each source, as necessary
- As-built drawings for constructed elements, certifications, manifests, and bills of lading
- A description of the changes to the remedy from the elements provided in the RAWP and associated design documents, if any
- A tabular summary of performance evaluation sampling results and material characterization results and other sampling and chemical analyses performed as part of the remedy
- Written and photographic documentation of remedial work performed under this remedy
- An itemized tabular description of actual costs incurred during implementation of the remedy
- For a Track 2 remedy, sufficient information to show that remaining soil left on-site meets the Restricted Residential RUSCOs.

- If necessary, a thorough summary of remaining contamination that exceeds the Restricted Residential RUSCOs and an explanation for why the material was not removed as part of the remedy. A table and a map that shows remaining contamination in excess of the Restricted Residential RUSCOs will also be included.
- An accounting of the destination of material removed from the site, including excavated contaminated soil, historic fill, solid waste, hazardous waste, non-regulated material, and fluids. Documentation associated with the disposal of material must also include records and approvals for receipt of the material.
- An accounting of the origin and chemical quality of each material type imported onto the site

Before approval of the FER and issuance of a Certificate of Completion, the daily reports and monthly BCP progress reports must be submitted in digital form on electronic media (i.e., PDF).

10.1 Certifications

The following certification will appear in front of the FER Executive Summary. The certification will be signed by the PE, Ronald D. Boyer, who is a NYS-licensed Professional Engineer. The certification will be appropriately signed and stamped. The certification will include the following statements:

I, Ronald D Boyer, am currently a registered professional engineer licensed by the State of New York. I had primary direct responsibility for implementation of the remedial program for the Broome Street Parking Lot Site.

I certify that the Site description presented in this Final Engineering Report is identical to the Site descriptions presented in the Brownfield Cleanup Agreement for the Broome Street Parking Lot Site.

I certify that the Remedial Action Work Plan dated [month day year] and Stipulations [if any] in a letter dated [month day year] and approved by the NYSDEC were implemented and that all requirements in those documents have been substantively complied with.

I certify that the remedial activities were observed by qualified environmental professionals under my supervision and that the remediation requirements set forth in the Remedial Action Work Plan and any other relevant provisions of ECL 27-1419 have been achieved.

I certify that the export of contaminated soil, fill, water, or other material from the property was performed in accordance with the Remedial Action Work Plan, and were taken to facilities licensed to accept this material in full compliance with all federal, state, and local laws.

I certify that import of soils from off-Site, including source approval and sampling, has been performed in a manner that is consistent with the methodology defined in the Remedial Action Work Plan.

I certify that ground-intrusive work during remediation and development-related construction was conducted in accordance with dust and odor suppression methodology defined in the Remedial Action Work Plan.

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 130 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 130, New York State Education Law.

11.0 SCHEDULE

Implementation of this RAWP is anticipated to begin in the first quarter of 2021. Mobilization is expected to take about one to two weeks. Once mobilization is complete, remediation of the site will continue. The remedy, which will be implemented in accordance with this RAWP, is anticipated to take about 6 months to complete. After completion of the remedy, a FER will be submitted to the NYSDEC for review and approval.

12.0 REFERENCES

1. Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C., Phase I Environmental Site Assessment, dated 23 March 2018.
2. Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C., Remedial Investigation Work Plan, dated 7 May 2019.
3. VHB Engineering, Surveying, Landscape Architecture, and Geology, P. C., Phase 1B Archaeology Work Plan, dated November 2019.
4. Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C., Remedial Investigation Report, dated August 2020.
5. New York State Department of Health, Final Guidance for the Evaluation of Soil Vapor Intrusion in the State of New York, dated October 2006.
6. New York State Department of Environmental Conservation, Division of Environmental Remediation, Draft Brownfield Cleanup Program Guide, dated May 2004.

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