Hazardous Materials
Remedial Closure Report

For

1100-1104 Fulton Street

Block 2016, Lot 28, 29 & 30

OER Project Number 15EH-N177K

E-Designation E-185

CEQR Number 07DCP070K

Bedford Stuyvesant South Rezoning Action

Prepared for:

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NOVEMBER 21, 2018

REMEDIAL CLOSURE REPORT

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LIST OF ACRONYMS

Acronym	Definition
AST	Aboveground Storage Tank
CAMP	Community Air Monitoring Plan
C&D	Construction & Demolition
CEQR	City Environmental Quality Review
CFR	Code of Federal Regulations
CHASP	Construction Health and Safety Plan
CO	Certificate of Occupancy
CPC	City Planning Commission
DSNY	Department of Sanitation
“E”	E-Designation
EAS	Environmental Assessment Statement
EIS	Environmental Impact Statement
ESA	Environmental Site Assessment
EC/IC	Engineering Control and Institutional Control
ELAP	Environmental Laboratory Accreditation Program
FDNY	New York City Fire Department
GPR	Ground Penetrating Radar
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations Emergency Response
IDW	Investigation Derived Waste
Notice - NNO	Notice of No Objection
Notice - NTP	Notice to Proceed
Notice - NOS	Notice of Satisfaction
Notice - FNOS	Final Notice of Satisfaction
NYC BSA	New York City Board of Standards and Appeals
NYC DCP	New York City Department of City Planning
NYC DEP	New York City Department of Environmental Protection
NYC DOB	New York City Department of Buildings
NYC DOF	New York City Department of Finance
NYC HPD	New York City Housing Preservation and Development
NYCRR	New York Codes Rules and Regulations
NYC OER	New York City Office of Environmental Remediation

NYS DEC	New York State Department of Environmental Conservation
NYS DEC DER	New York State Department of Environmental Conservation Division of Environmental Remediation
NYS DEC PBS	New York State Department of Environmental Conservation Petroleum Bulk Storage
NYS DOH	New York State Department of Health
NYS DOT	New York State Department of Transportation
OSHA	United States Occupational Health and Safety Administration
PAHs	Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
PE	Professional Engineer
PID	Photo Ionization Detector
PM	Particulate Matter
QEP	Qualified Environmental Professional
RA	Register Architect
RAP	Remedial Action Plan
RCA	Recycled Concrete Aggregate
RCR	Remedial Closure Report
RD	Restrictive Declaration
RI	Remedial Investigation
SCOs	Soil Cleanup Objectives
SCG	Standards, Criteria and Guidance
SMP	Site Management Plan
SPDES	State Pollutant Discharge Elimination System
SSDS	Sub-Slab Depressurization System
SVOCs	Semi-Volatile Organic Compounds
USCS	Unified Soil Classification System
USGS	United States Geological Survey
UST	Underground Storage Tank
TAL	Target Analyte List
TCL	Target Compound List
TCO	Temporary Certificate of Occupancy
VB	Vapor Barrier
VOCs	Volatile Organic Compounds

CERTIFICATION

The original Professional Engineer, who certified the RAP, Mr. Shaik Saad, a registered professional engineer licensed by the State of New York, performed professional engineering services and had primary direct responsibility for implementation of the remedial program for the 1104 Fulton Street site, site number 15EH-N177K.

Mr. Saad is no longer available to stamp this RCR. Since the field work was completed under Hydro Tech supervision, I, Tarek Z. Khouri, P.E. certify the following:

- I am currently a registered professional engineer licensed by the State of New York.
- I have reviewed this document, to which my signature and seal are affixed.
-
- Engineering Controls implemented during this remedial action were reviewed by me or a person under my direct supervision and achieve goals established in the Remedial Action Plan for this site.
- The Engineering Controls constructed during this remedial action were professionally observed by a Hydro Tech Engineer, and have been reviewed by me, and are (1) are consistent with the Engineering Control design established in the Remedial Action Plan and (2) are accurately reflected in the text and drawings for as-built design reported in this Remedial Closure Report.
- The OER-approved Remedial Action Plan dated February 12, 2016, Stipulations in a letter dated October 7, 2016 and RAP Amendment dated November 9, 2016 were implemented by Hydro Tech personnel and that all requirements in those documents have been substantively complied with. I certify that contaminated soil, fill, liquid or other material from the property was taken to facilities licensed to accept this material in full compliance with applicable laws and regulations.

Name: Tarek Z. Khouri, P.E.

PE License Number: 086611

Signature :

Date: November 21, 2018

I, Mark Robbins, certify the following:

I am a Qualified Environmental Professional. I had primary direct responsibility for implementation of the remedial program for the 1104 Fulton Street site, site number 15EH-N177K.

The OER-approved Remedial Action Plan dated February 12, 2016, Stipulations in a letter dated October 7, 2016 and RAP Amendment dated November 9, 2016 were implemented and that all requirements in those documents have been substantively complied with. I certify that contaminated soil, fill, liquid or other material from the property was taken to facilities licensed to accept this material in full compliance with applicable laws and regulations.

QEP Name

QEP Signature

Date

EXECUTIVE SUMMARY

Power Realty Partners LLC has performed this remedial action to remediate a 10,296-square foot site located at 1100 – 1104 Fulton Street in the Bedford-Stuyvesant section of Brooklyn, New York. A Remedial Investigation (RI) was performed to compile and evaluate data and information necessary to develop a Remedial Action Plan (RAP). The remedial action described in this document fulfills the remedial objectives defined in the RAP, complies with applicable environmental standards, criteria and guidance and conforms with applicable laws and regulations.

Site Location and Prior Usage

The Site is located in the Bedford-Stuyvesant section of Brooklyn, New York and is identified as Block 2016, Lots 30 (formerly Lots 28, 29 and 30) on the New York City Tax Map. The Site is 10,296-square feet and is bounded by 3-story commercial building to the north, two 3-story residential buildings to the south, a 3-story mixed use commercial residential building to the east, and a 3-story mixed use commercial/residential building to the west. The site was previously developed with a vacant 1- story commercial building, which occupied the entire site, and contained a partial basement across the northern portion. The building was occupied by a retail establishment until commencement of this project.

Summary of Proposed Redevelopment Plan

The new development consists of a 6-story building with a slab-on-grade portion and an an extension of the existing 9 foot partial basement. The building footprint covers the entire site, while the partial basement only covers 3,520-square feet. The new 6-story building consists of a school lobby and retail space occupying the 1st floor and a school occupying floor 2 through 6. The partial basement consists of equipment rooms. The new development required limited excavation to extend the partial basement of the former building across the full width of the northern property line along Fulton Street. The existing partial basement was extended 30-feet horizontally. The extension area was excavated down to 9 feet 6 inches below grade so that it would be level with the new slab poured in the pre-existing portion of the partial basement. The 6 inch slab in the existing portion of the basement was removed and replaced (therefore the

bottom of the excavation in this portion was located at 9 feet 6 inches bgs). The dimensions of the partial basement extension are approximately 9 feet 6 inches deep (or 8 feet 6 inches from top of slab), 30 feet long, and 40 feet wide. The basement, including the extension dimensions are 9 feet 6 inches deep (or 8 feet 6 inches from top of slab), 88 feet long, and 40 feet wide. The existing basement walls were maintained on three sides. The existing basement slab was removed and replaced with a new 6-inch building slab poured on top of a ¾-inch layer of bluestone. No additional excavation was performed to below the existing/extended basement area for the installation of the elevator shaft since the elevator shaft is level with the elevation of the partial basement. Limited excavation was performed for the installation of the slab-on-grade (down to 1foot bgs) and for the placement of footings (down to 3 feet bgs). A total of 2,213.46 tons of soil was excavated and removed from the Site during redevelopment. Groundwater was detected at approximately 61 feet bgs at the site, and therefore, was not encountered during excavation activities.

Site Description, Physical Setting and Site History

This site is located in a residential district with a commercial overlay. The neighborhood is characterized by multi-story mixed-use commercial/residential buildings. The adjoining properties also consist of multi-story mixed-use commercial/residential buildings. The site is bounded by 3-story commercial building to the north, two 3-story residential buildings to the south, a 3-story mixed use commercial residential building to the east, and a 3-story mixed use commercial/residential building to the west. Properties located within a ¼-mile radius of the Site are zoned R6B/R7D (residential districts characterized by traditional row-houses/new contextual development along transit corridors) and C2-4 (commercial overlay). There were no sensitive receptors located within a 500-foot radius of the Site.

Summary of Past Uses of Site and Areas of Concern

The following environmental reports were developed for the Site:

- *Phase I Environmental Site Assessment*, April 2014, prepared by Hydro Tech Environmental, Corp.
- *Remedial Investigation Report*, September 2015, prepared by Hydro Tech Environmental,
- Corp.

The Phase I ESA indicates that the site was developed prior to 1888 with four (4) 3-story stores. Historical maps indicated that two of these buildings were used as stores until between 1982 and 1987, and the other two buildings were used as stores until between 1908 and 1932 until they were vacated sometime

between 1951 and 1962. Another building utilized as a factory was constructed between 1888 and 1908 and was later vacated between 1908 and 1932. The historical maps further indicate that two of the stores were demolished between 1982 and 1987 and the other two stores were demolished between 1965 and 1976. A 1-story commercial building was constructed in 1996. The building was occupied by a retail establishment until the commencement of this project.

The Phase I ESA identified the following areas of concern:

- The presence of a Little “E” designation listing of the site for Hazmat and Noise.

Summary of Environmental Findings

1. Elevation of the property above mean sea level is 69 feet.
2. No anomalies indicative of USTs were identified during the GPR survey.
3. Depth to groundwater beneath the Site was established during the additional groundwater investigation performed in July 2016. Groundwater depth was determined to be approximately 61 feet below grade surface.
4. Groundwater flow was determined during the additional groundwater investigation performed in July 2016. Groundwater flow was determined to be towards the north.
5. Depth to bedrock at the Site is unknown.
6. The stratigraphy of the site, from the surface down to approximately 6 to 12 feet bgs consists of fill material underlain by a mixture of brown sand with pebbles.
7. Soil/fill samples collected during the Phase II Investigation were compared to the 6NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives (SCOs) as well as to Restricted Use SCOs for Residential Use and Commercial Use. Soil sampling results showed naphthalene (26 mg/kg) was detected in one of the eleven deep samples at concentration exceeding its respective Unrestricted Use SCO but below its SCO for Residential Use. Chlorinated VOCs were not detected in any sample at concentrations exceeding their respective Unrestricted Use SCOs. Seven (7) SVOCs including benzo(a)anthracene (max. 5.89 mg/kg), benzo(a)pyrene (max. 3.61 mg/kg), benzo(b)fluoranthene (max. 2.93 mg/kg), chrysene (max. 7.62 mg/kg), dibenzo(a,h)anthracene (max. 1.1 mg/kg) and indeno(1,2,3-cd)pyrene (max. 2.08 mg/kg) were detected in seven shallow and four deep samples at concentrations exceeding their respective SCOs for Residential Use. Among these SVOCs, the detected concentrations of benzo(a)anthracene, benzo(a)pyrene and dibenzo(a,h)anthracene also exceed their respective SCOs for Commercial Use in four shallow and two deep samples. Three (3) pesticides including 4,4'-DDD (max. 0.399 mg/kg), 4,4'-DDE (max. 0.0937 mg/kg) and 4,4'-DDT (max. 0.12 mg/kg) were detected in eight shallow and two deep samples at concentrations exceeding their respective Unrestricted Use SCOs but below the SCOs for Residential Use. The total PCBs was detected in one shallow and one deep samples at concentrations slightly exceeding its respective Unrestricted Use SCO. Six (6) metals

including chromium (trivalent) (152 mg/kg), lead (max. 235 mg/kg), manganese (2,100 mg/kg), mercury (0.192 mg/kg), nickel (max. 31.7 mg/kg), selenium (max. 7.37 mg/kg) and zinc (max. 201 mg/kg) were detected in nine shallow and nine deep samples at concentrations exceeding their respective Unrestricted Use SCOs. Among these detections, the concentration of manganese also exceeds its respective SCO for Residential Use. Overall, soil chemistry is indicative of historic fill material underneath the Site.

8. Groundwater samples were not collected during the original Phase II Investigation. Five to seven attempts were made to install monitoring wells or groundwater probes. Due to the limited access to the interior of the building and the partial basement, a Stanley Geoprobe Remote Access drill was used to install the probes. The drill was unable to reach depths greater than 5 feet; therefore, groundwater samples could not be collected during this initial investigation. Additional groundwater investigation was performed in July 2016, however. The investigation consisted of installing, surveying, gauging, and sampling of three monitoring wells.
9. Soil vapor samples collected during the Phase II Investigation were compared to the compounds listed by the New York State Department of Health (NYSDOH) located in the NYSDOH Final Guidance for Evaluating Soil Vapor Intrusion dated October 2006. Soil vapor results show a wide range of petroleum related VOCs (BTEX and their associated derivatives) in all soil vapor samples. The total concentration of BTEX compounds range from 125 µg/m3 to 236.7 µg/m3. BTEX compounds were also detected in ambient indoor air sample with a total concentration of 14.3 µg/m3. Trace to elevated chlorinated VOCs were detected in all soil vapor samples. Among the detected chlorinated VOCs, 1,1,1-trichloroethane (1,1,1-TCA) (max. 3.5 µg/m3) and carbon tetrachloride (max. 0.5 µg/m3) were detected in three samples; chloroform (max. 41µg/m3) was detected in four samples; methylene chloride (max. 47 µg/m3), trichloroethylene (TCE) max. 310 µg/m3) were detected in five samples; and tetrachloroethylene (PCE) (max. 210 µg/m3) was detected in all six samples. These chlorinated VOCs were also detected in ambient indoor sample, among which carbon tetrachloride (0.56 µg/m3) and chloroform (1.2 µg/m3) were detected at concentrations exceeding their respective NYSDOH Background Standards for Indoor Air. Based on the

Soil Vapor/Indoor Air Matrix established by NYSDOH, the concentrations of PCE were above the monitoring level in two samples; and the concentrations of TCE were above the monitoring level in one sample and exceeds the monitoring/mitigation level in four samples.

Summary of the Remedy

The proposed remedial action achieves the remedial objectives established in the RAP. The proposed remedial action consisted of:

1. Performed Community Air Monitoring Program from 1/11/2017 to 4/28/2018 during invasive activities to screen for particulates and volatile organic carbon compounds during intrusive activities.
2. Established Site-Specific Soil Cleanup Objectives (SCOs) for contaminants of concern. The following SCOs were utilized: SVOCs: 250 ppm and barium: 800 ppm.
3. Performed site mobilization in May 2016 involving security setup, equipment mobilization, utility mark outs, and marking and steaking excavation areas.
4. Performed additional site characterization which included installation of three monitoring wells on July 12, 2016 and collection and analysis of three (3) groundwater samples on July 19th and July 21st, 2017. This investigation was conducted following demolition of the existing building. The monitoring wells were installed at the locations of soil vapor sampling locations SV-4, SV-5 and SV-6, where elevated vapor concentrations of chlorinated solvents were detected. Prior to collection of supplemental data, a supplemental investigation work plan was submitted to OER on July 1, 2017 for review and approval was issued by OER on July 7, 2016. A summary of the additional site characterization results was submitted to OER on October 7, 2016 through the Remedial Action Plan Stipulation List.
5. Completed a Waste Characterization Study prior to excavation activities on October 12, 2015 and October 13, 2015. Collected eight (8) waste characterization samples, one per 800 cubic yards of material, as dictated by the disposal facilities.

6. The new development required limited excavation to extend the partial basement of the former building across the full width of the northern property line along Fulton Street. The existing partial basement was extended 30 feet horizontally. The extension area was excavated down to approximately 9 feet 6 inches feet below grade. The dimensions of the partial basement extension are approximately 9 feet 6 inches deep, 30 feet long, and 40 feet wide. The basement including the extension dimensions are 9 feet 6 inches deep (or 8 feet 6 inches from top of slab), 88 feet long, and 40 feet wide. The existing basement walls were maintained on three sides. The existing basement slab was removed and replaced with a new 6 inch slab underlain by 6 inches of ¾-inch bluestone. No additional excavation was performed to below the existing/extended basement slab for the installation of the elevator shaft since the elevator shaft is level with the elevation of the partial basement. Limited excavation was performed for the installation of the slab-on-grade (down to 1foot bgs) and for the placement of footings (down to 3 feet bgs). A total of 2,213.46 tons of soil was excavated and removed from the Site during redevelopment. Approximately 2,213.46 tons of non-hazardous soil/fill material was excavated and removed from the Site and transported to Clean Earth of Bethlehem located at 3000 Commerce Center Blvd in Bethlehem, Pennsylvania 18015.
7. Screened excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID.
8. Conducted materials management of excavated materials including temporarily stockpiling soil/fill that was not disposed of via live-loading. Appropriately segregated excavated media on-Site prior to disposal to prevent co-mingling of materials.
9. Performed transportation and disposal of excavated soil/fill material at permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal.
10. Collected and analyzed seven (7) post-excavation confirmatory samples to determine the performance of the remedy with respect to the attainment of Restricted Residential Use SCOs. Based on the post-excavation sample results, the site achieved Site-Specific SCOs.

11. Installed and operated an active sub-slab depressurization system (SSDS) consisting of a network of three separate loops of 4-inch schedule 40 PVC perforated piping; two loops were installed beneath the slab-on-grade and are surrounded with 6-inches of ¾ inch bluestone and one loop was installed beneath the partial basement and runs along trenches dug beneath the new basement slab. This loop is surrounded by a 6-inch layer of ¾ inch bluestone and is installed in the new extended portion of the development. Three pressure test points were installed as part of the system. Two test point are located beneath the slab-on-grade and one is located beneath the partial basement. The engineer for the SSDS was HAKS Architects, Engineers, and Land Surveyors, DPC located at 40 Wall Street in Manhattan, New York 10003 and the contractor responsible for installation of the SSDS was Greenside Corp located at 251 Monitor Street, Brooklyn NY 11222.

12. Installed a Vapor Barrier System (VBS) consisting of Raven Industries 20-mil VaporBlock Plus installed beneath the new building slab-on-grade. Raven Industries 20-mil Pour-N-Seal Membrane was installed beneath the mat foundation of elevator shaft that is level with the elevation of the partial basement. In the partial basement, this membrane was installed on top of a layer of geofabric underlain by a 6-inch layer of ¾ inch bluestone and was capped with a 6-inch-thick building slab. The vapor barrier system beneath the slab of the partial basement is connected to 62-mil Grace Bituthene® 3000 that was installed on the interior sides of the basement walls up to grade surface. The vapor barrier installed on the interior sides of the basement walls is insulated using rigid 1-inch ToughRock Gypsum Boards affixed to metal studs. The vapor barrier beneath the slab-on grade was installed on top of a layer of geofabric underlain by 1foot layer of ¾ inch bluestone. The membrane was then extended vertically 2 inches and sealed on interior walls of the building using Denso Butyl 35 Tape. All penetrations through the slab for utility lines were sealed utilizing Pour-N-Seal by Raven Industries The remedial engineer at HydroTech oversaw the installation of the vapor barrier and the contractor responsible for installation of the VBS was Greenside Corp located at 251 Monitor Street, Brooklyn NY 11222.

13. Installed a Composite Cover System consisting of a new 6-inch building slab underlain by 6 inches of ¾ inch bluestone, in the partial basement extension, and removed and replaced the existing slab with a new 6-inch slab underlain by 6 inches of ¾ inch bluestone in the pre-existing partial basement, to prevent human exposure to residual soil/fill remaining under the Site. The contractor for the cover construction was Greenside Corp located at 251 Monitor Street, Brooklyn NY 11222.
14. Imported 231.95 tons of ¾ inch bluestone from Tilcon New York, Inc located at 162 Old Mill Road in West Nyack, New York 10994 to be used for the construction of the SSDS. The bluestone originated from the Mt. Hope Quarry located in Wharton, New Jersey.
15. Implemented storm-water pollution prevention measures in compliance with applicable laws and regulations.
16. Performed all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations.
17. Submitted nineteen (19) daily reports documenting air monitoring and soil/fill disposal activities from January 11, 2017 through August 6, 2018. Also submitted two (2) weekly reports on July 27, 2018 and August 3, 2018 and a monthly report in April 2017 to document construction activities through February 2018.
18. Submitted an approved Site Management Plan (SMP) in this RCR for long-term management of residual contamination, including plans for operation, maintenance, monitoring, inspection and certification of Engineering and Institutional Controls and reporting at a specified frequency.
19. Submitted this Remedial Closure Report (RCR) which describes the remedial activities, certifies the remedial requirements have been achieved, and describes all Engineering and Institutional Controls to be implemented at the Site and lists any changes from the RAP.
20. The property will continue to be registered with an E-Designation at the NYC Buildings Department. Establishment of Engineering Controls and Institutional Controls in this RAP and a requirement that management of these controls must be in compliance with

an approved SMP. Institutional Controls will include prohibition of the following: (1) vegetable gardening and farming; (2) use of groundwater without treatment rendering it safe for the intended use; (3) disturbance of residual contaminated material unless it is conducted in accordance with the SMP; and (4) higher level of land usage without OER approval.

REMEDIAL CLOSURE REPORT

1.0 SITE BACKGROUND

This Remedial Closure Report (RCR) has been developed for 1104 Fulton Street located at 1100 – 1104 Fulton Street in the Bedford-Stuyvesant section of Brooklyn, New York (the Site). This project has been assigned project number 15EH-N177K by OER. This RCR describes the remediation and/or mitigation activities implemented at the Site in coordination with the New York City Office of Environmental Remediation (OER) for the purposes of satisfying the requirements of the Hazardous Materials E-Designation Program and obtaining a Notice of Satisfaction. An E-Designation for Hazardous Materials (E-185) was placed on the Site by the New York City Department of City Planning (DCP) as part of the September 10, 2007 Bedford Stuyvesant South Rezoning Action (CEQR number 07DCP070K).

1.1 SITE LOCATION AND PRIOR USAGE

The Site is located in the Bedford-Stuyvesant section of Brooklyn, New York and is identified as Block 2016, Lot 30 (Formerly Lots s 28, 29 and 30) on the New York City Tax Map. **Figure 1** provides a Site location map. The Site is 10,296-square feet and is bounded by 3-story commercial building to the north, two 3-story residential buildings to the south, a 3-story mixed use commercial residential building to the east, and a 3-story mixed use commercial/residential building to the west. **Figure 2** provides a Site boundary map. The site was previously developed with a vacant 1- story commercial building, which occupied the entire site, and contained a partial basement across the northern portion. The building was occupied by a retail establishment until commencement of this project.

1.2 REDEVELOPMENT PLAN

The new development consists of a 6-story building with a slab-on-grade portion and an extension of the existing 9 foot partial basement. The building footprint covers the entire site, while the partial basement only covers 3,520-square feet. The new 6-story building consists of a school lobby and retail space occupying the 1st floor and a school occupying floor 2 through 6. The partial basement consists of equipment rooms. The new development required limited excavation to extend the partial basement of the former building across the full width of the northern property line along Fulton Street. The existing partial basement was extended 30-feet

horizontally. The extension area was excavated down to 9 feet 6 inches below grade so that it would be level with the new slab poured in the pre-existing portion of the partial basement. The 6 inch slab in the existing portion of the basement was removed and replaced (therefore the bottom of the excavation in this portion was located at 9 feet 6 inches bgs). The dimensions of the partial basement extension are approximately 9 feet 6 inches deep (or 8 feet 6 inches from top of slab), 30 feet long, and 40 feet wide. The existing basement walls were maintained on three sides. The existing basement slab was removed and replaced with a new 6-inch building slab poured on top of a ¾-inch layer of bluestone. No additional excavation was performed to below the existing/extended basement area for the installation of the elevator shaft since the elevator shaft is level with the elevation of the partial basement. Limited excavation was performed for the installation of the slab-on-grade (down to 1foot bgs) and for the placement of footings (down to 3 feet bgs). A total of 2,213.46 tons of soil was excavated and removed from the Site during redevelopment. Groundwater was detected at approximately 61 feet bgs at the site, and therefore, was not encountered during excavation activities. Layout of the redevelopment plan is provided in **Figure 3**.

1.3 ENVIRONMENTAL INVESTIGATIONS

The following environmental reports were developed for the Site:

- *Phase I Environmental Site Assessment,* April 2014, prepared by Hydro Tech Environmental, Corp.
- *Remedial Investigation Report,* September 2015, prepared by Hydro Tech Environmental,
- Corp.

The Phase I ESA indicates that the site was developed prior to 1888 with four (4) 3-story stores. Historical maps indicated that two of these buildings were used as stores until between 1982 and 1987, and the other two buildings were used as stores until between 1908 and 1932 until they were vacated sometime

between 1951 and 1962. Another building utilized as a factory was constructed between 1888 and 1908 and was later vacated between 1908 and 1932. The historical maps further indicate that two of the stores were demolished between 1982 and 1987 and the other two stores were

demolished between 1965 and 1976. A 1-story commercial building was constructed in 1996. The building was occupied by a retail establishment until the commencement of this project.

The Phase I ESA identified the following areas of concern:

- The presence of a Little "E" designation listing of the site for Hazmat and Noise.

Summary of Environmental Findings

1. Elevation of the property above mean sea level is 69 feet.
2. No anomalies indicative of USTs were identified during the GPR survey.
3. Depth to groundwater beneath the Site was established during the additional groundwater investigation performed in July 2016. Groundwater depth was determined to be approximately 61 feet below grade surface.
4. Groundwater flow was determined during the additional groundwater investigation performed in July 2016. Groundwater flow was determined to be towards the north.
5. Depth to bedrock at the Site is unknown.
6. The stratigraphy of the site, from the surface down to approximately 6 to 12 feet bgs consists of fill material underlain by a mixture of brown sand with pebbles.
7. Soil/fill samples collected during the Phase II Investigation were compared to the 6NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives (SCOs) as well as to Restricted Use SCOs for Residential Use and Commercial Use. Soil sampling results showed naphthalene (26 mg/kg) was detected in one of the eleven deep samples at concentration exceeding its respective Unrestricted Use SCO but below its SCO for Residential Use. Chlorinated VOCs were not detected in any sample at concentrations exceeding their respective Unrestricted Use SCOs. Seven (7) SVOCs including benzo(a)anthracene (max. 5.89 mg/kg), benzo(a)pyrene (max. 3.61 mg/kg), benzo(b)fluoranthene (max. 2.93 mg/kg), chrysene (max. 7.62 mg/kg), dibenzo(a,h)anthracene (max. 1.1 mg/kg) and indeno(1,2,3-cd)pyrene (max. 2.08 mg/kg) were detected in seven shallow and four deep samples at concentrations exceeding their respective SCOs for Residential Use. Among these SVOCs, the detected concentrations of benzo(a)anthracene, benzo(a)pyrene and dibenzo(a,h)anthracene also exceed their respective SCOs for Commercial Use in four shallow and two deep samples. Three (3) pesticides including 4,4'-DDD (max. 0.399 mg/kg), 4,4'-DDE (max. 0.0937 mg/kg) and

4,4'-DDT (max. 0.12 mg/kg) were detected in eight shallow and two deep samples at concentrations exceeding their respective Unrestricted Use SCOs but below the SCOs for Residential Use. The total PCBs was detected in one shallow and one deep samples at concentrations slightly exceeding its respective Unrestricted Use SCO. Six (6) metals including chromium (trivalent) (152 mg/kg), lead (max. 235 mg/kg), manganese (2,100 mg/kg), mercury (0.192 mg/kg), nickel (max. 31.7 mg/kg), selenium (max. 7.37 mg/kg) and zinc (max. 201 mg/kg) were detected in nine shallow and nine deep samples at concentrations exceeding their respective Unrestricted Use SCOs. Among these detections, the concentration of manganese also exceeds its respective SCO for Residential Use. Overall, soil chemistry is indicative of historic fill material underneath the Site.

8. Groundwater samples were not collected during the original Phase II Investigation. Five to seven attempts were made to install monitoring wells or groundwater probes. Due to the limited access to the interior of the building and the partial basement, a Stanley Geoprobe Remote Access drill was used to install the probes. The drill was unable to reach depths greater than 5 feet; therefore, groundwater samples could not be collected during this initial investigation. Additional groundwater investigation was performed in July 2016, however. The investigation consisted of installing, surveying, gauging, and sampling of three monitoring wells.
9. Soil vapor samples collected during the Phase II Investigation were compared to the compounds listed by the New York State Department of Health (NYSDOH) located in the NYSDOH Final Guidance for Evaluating Soil Vapor Intrusion dated October 2006. Soil vapor results show a wide range of petroleum related VOCs (BTEX and their associated derivatives) in all soil vapor samples. The total concentration of BTEX compounds range from 125 µg/m3 to 236.7 µg/m3. BTEX compounds were also detected in ambient indoor air sample with a total concentration of 14.3 µg/m3. Trace to elevated chlorinated VOCs were detected in all soil vapor samples. Among the detected chlorinated VOCs, 1,1,1-trichloroethane (1,1,1-TCA) (max. 3.5 µg/m3) and carbon tetrachloride (max. 0.5 µg/m3) were detected in three samples; chloroform (max. 41µg/m3) was detected in four samples; methylene chloride (max. 47 µg/m3), trichloroethylene (TCE) max. 310 µg/m3) were detected in five samples; and

tetrachloroethylene (PCE) (max. 210 μg/m3) was detected in all six samples. These chlorinated VOCs were also detected in ambient indoor sample, among which carbon tetrachloride (0.56 μg/m3) and chloroform (1.2 μg/m3) were detected at concentrations exceeding their respective NYSDOH Background Standards for Indoor Air. Based on the Soil Vapor/Indoor Air Matrix established by NYSDOH, the concentrations of PCE were above the monitoring level in two samples; and the concentrations of TCE were above the monitoring level in one sample and exceeds the monitoring/mitigation level in four samples.

Appendix 1 includes the RIR.

2.0 DESCRIPTION OF REMEDIAL ACTIONS

The Site was remediated in accordance with the scope of work presented in the OER-approved Remedial Action Plan (RAP) dated February 2016 and the Stipulations List and RAP Addendum dated October 7, 2016 and November 9, 2016, respectively. Remedial actions were taken in accordance with applicable laws and regulations, and the site-specific-construction Construction Health and Safety Plan (CHASP). Any deviations from the RAP are noted below. **Appendix 2** includes the RAP, Stipulations List and RAP Amendment.

The following remedial actions were completed in this program:

1. Performed Community Air Monitoring Program from 1/11/2017 to 4/28/2018 during invasive activities to screen for particulates and volatile organic carbon compounds during intrusive activities.

2. Established Site-Specific Soil Cleanup Objectives (SCOs) for contaminants of concern. The following SCOs were utilized: SVOCs: 250 ppm and barium: 800 ppm.

3. Performed site mobilization in May 2016 involving security setup, equipment mobilization, utility mark outs, and marking and steaking excavation areas.

4. Performed additional site characterization which included installation of three monitoring wells on July 12, 2016 and collection and analysis of three (3) groundwater samples on July 19th and July 21st, 2017. This investigation was conducted following demolition of the existing building. The monitoring wells were installed at the locations of soil vapor sampling locations SV-4, SV-5 and SV-6, where elevated vapor concentrations of chlorinated solvents were detected. Prior to collection of supplemental data, a supplemental investigation work plan was submitted to OER on July 1, 2017 for review and approval was issued by OER on July 7, 2016. A summary of the additional site characterization results was submitted to OER on October 7, 2016 through the Remedial Action Plan Stipulation List.

5. Completed a Waste Characterization Study prior to excavation activities on October 12, 2015 and October 13, 2015. Collected eight (8) waste characterization samples, one per 800 cubic yards of material, as dictated by the disposal facilities.

6. The new development required limited excavation to extend the partial basement of the former building across the full width of the northern property line along Fulton Street. The existing partial basement was extended 30-feet horizontally. The extension area was excavated down to 9 feet 6 inches below grade. The dimensions of the partial basement extension are approximately 9 feet 6 inches deep (or 8 feet 6 inches from top of slab), 30 feet long, and 40 feet wide. The basement including the extension dimensions are 9 feet 6 inches deep (or 8 feet 6 inches from top of slab), 88 feet long, and 40 feet wide The existing basement walls were maintained on three sides. The existing basement slab was removed and replaced with a new 6-inch slab poured on top of a 6-inch-thick layer of ¾-inch bluestone. No additional excavation was performed to below the existing/extended basement area for the installation of the elevator shaft since the elevator shaft is level with the elevation of the partial basement. Limited excavation was performed for the installation of the slab-on-grade (down to 1foot bgs) and for the placement of footings (down to 3 feet bgs). A total of 2,213.46 tons of soil was excavated and removed from the Site during redevelopment. Approximately 2,213.46 tons of non-hazardous soil/fill material was excavated and removed from the Site and transported to Clean Earth of Bethlehem located at 3000 Commerce Center Blvd in Bethlehem, Pennsylvania 18015.
7. Screened excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID.
8. Conducted materials management of excavated materials including temporarily stockpiling soil/fill that was not disposed of via live-loading. Appropriately segregated excavated media on-Site prior to disposal to prevent co-mingling of materials.
9. Performed transportation and disposal of excavated soil/fill material at permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal.
10. Collected and analyzed seven (7) post-excavation confirmatory samples to determine the performance of the remedy with respect to the attainment of Restricted Residential Use SCOs. Based on the post-excavation sample results, the site achieved Site-Specific SCOs.

11. Installed and operated an active sub-slab depressurization system (SSDS) consisting of a network of three separate loops of 4-inch schedule 40 PVC perforated piping; two loops were installed beneath the slab-on-grade and are surrounded with 6-inches of ¾ inch bluestone and one loop was installed beneath the partial basement and runs along trenches dug beneath the new basement slab. This loop is surrounded by a 6-inch layer of ¾ inch bluestone and is installed in the new extended portion of the development. Three pressure test points were installed as part of the system. Two test point are located beneath the slab-on-grade and one is located beneath the partial basement. The engineer for the SSDS was HAKS Architects, Engineers, and Land Surveyors, DPC located at 40 Wall Street in Manhattan, New York 10003 and the contractor responsible for installation of the SSDS was Greenside Corp located at 251 Monitor Street, Brooklyn NY 11222.

12. Installed a Vapor Barrier System (VBS) consisting of Raven Industries 20-mil VaporBlock Plus installed beneath the new building slab-on-grade. Raven Industries 20-mil Pour-N-Seal Membrane was installed beneath the mat foundation of elevator shaft that is level with the elevation of the partial basement. In the partial basement, this membrane was installed on top of a layer of geofabric underlain by a 6-inch layer of ¾ inch bluestone and was capped with a 6-inch-thick building slab. The vapor barrier system beneath the slab of the partial basement is connected to 62-mil Grace Bituthene® 3000 that was installed on the interior sides of the basement walls up to grade surface. The vapor barrier installed on the interior sides of the basement walls is insulated using rigid 1-inch ToughRock Gypsum Boards affixed to metal studs. The vapor barrier beneath the slab-on grade was installed on top of a layer of geofabric underlain by 1-foot layer of ¾ inch bluestone. The membrane was then extended vertically 2 inches and sealed on interior walls of the building using Denso Butyl 35 Tape. All penetrations through the slab for utility lines were sealed utilizing Pour-N-Seal by Raven Industries The remedial engineer at HydroTech oversaw the installation of the vapor barrier and the contractor responsible for installation of the VBS was Greenside Corp located at 251 Monitor Street, Brooklyn NY 11222.

13. Installed a Composite Cover System consisting of a new 6-inch building slab underlain by 6 inches of ¾ inch bluestone, in the partial basement extension, and removed and replaced the existing slab with a new 6-inch slab underlain by 6 inches of ¾ inch bluestone, in the pre-existing partial basement, to prevent human exposure to residual soil/fill remaining under the Site. The contractor for the cover construction was Greenside Corp located at 251 Monitor Street, Brooklyn NY 11222.
14. Imported 231.95 tons of ¾ inch bluestone from Tilcon New York, Inc located at 162 Old Mill Road in West Nyack, New York 10994 to be used for the construction of the SSDS. The bluestone originated from the Mt. Hope Quarry located in Wharton, New Jersey.
15. Implemented storm-water pollution prevention measures in compliance with applicable laws and regulations.
16. Performed all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations.
17. Submitted nineteen (19) daily reports documenting air monitoring and soil/fill disposal activities from January 11, 2017 through August 6, 2018. Also submitted two (2) weekly reports on July 27, 2018 and August 3, 2018 and a monthly report in April 2017 to document construction activities through February 2018.
18. Submitted an approved Site Management Plan (SMP) in this RCR for long-term management of residual contamination, including plans for operation, maintenance, monitoring, inspection and certification of Engineering and Institutional Controls and reporting at a specified frequency.
19. Submitted this Remedial Closure Report (RCR) which describes the remedial activities, certifies the remedial requirements have been achieved, and describes all Engineering and Institutional Controls to be implemented at the Site and lists any changes from the RAP.
20. The property will continue to be registered with an E-Designation at the NYC Buildings Department. Establishment of Engineering Controls and Institutional Controls in this RAP and a requirement that management of these controls must be in compliance with

an approved SMP. Institutional Controls will include prohibition of the following: (1) vegetable gardening and farming; (2) use of groundwater without treatment rendering it safe for the intended use; (3) disturbance of residual contaminated material unless it is conducted in accordance with the SMP; and (4) higher level of land usage without OER approval.

3.0 COMPLIANCE WITH REMEDIAL ACTION PLAN

3.1 CONSTRUCTION HEALTH AND SAFETY PLAN

The remedial construction activities performed under this program were in compliance with the site-specific CHASP and applicable laws and regulations. The Site Safety Coordinator was Paul Matli.

3.2 COMMUNITY AIR MONITORING PLAN

The Community Air Monitoring Plan provided for the collection and analysis of air samples during remedial construction activities to ensure proper protections were employed to protect workers and the neighboring community. Monitoring was performed in compliance with the Community Air Monitoring Plan in the approved RAP. The results of Community Air monitoring are shown in **Appendix 3**.

3.3 SOIL/MATERIALS MANAGEMENT PLAN

The Soil/Materials Management Plan in the RAP provided detailed plans for managing all soils/materials that were disturbed at the Site, including excavation, handling, storage, transport and disposal. It also included a series of controls to assure effective, nuisance free remedial activity in compliance with applicable laws and regulations. Remedial construction activities performed under this program were in compliance with the SMMP in the approved RAP.

3.4 STORM-WATER POLLUTION PREVENTION

Storm water pollution prevention included physical methods and processes to control and/or divert surface water flows and to limit the potential for erosion and migration of Site soils, via wind or water. Remedial construction activities performed under this program were in compliance with applicable storm-water pollution prevention laws and regulations and the RAP.

3.5 DEVIATIONS FROM THE REMEDIAL ACTION PLAN

Deviations from the OER approved RAP are as follows:

1. The daily report for 1/16/17 notes eight (8) truckloads of material were removed from the site under the "activities" section and later notes nine (9) truckloads of material in the summary table. The number of truckloads noted under "activities" is a typo and the nine (9) truckloads noted in the summary table is consistent with the actual trucking activities that occurred on that day.

2. Excavation and off-site transport and disposal of soil/fill material was performed on 4/27/2017 without QEP oversight and CAMP. HydroTech was not made aware of any on-site activities occurring on this day. However, manifests indicate that three truckloads of soil were disposed of at Clean Earth of Bethlehem in compliance with applicable laws and facility approval.

3. The NYCOER approved RAP Addendum issued on November 9, 2016 proposed a vapor barrier system consisting of a 30-mil GSE HDPE geomembrane installed beneath the new building slab and on-top of the existing slab in the partial basement. Following approval of the addendum, the developer revised the VBS design to include a Raven Industries 20-mil Vapor Block Plus Membrane in place of the GSE HDPE membrane. This deviation, which meets the 20-mil minimum vapor barrier thickness noted in the October 2016 Stipulation letter, was approved by OER via email correspondence on July 19, 2017.

4. The NYCOER approved RAP Addendum issued on November 9, 2016 indicated that the composite cover system would consist of a new 2-inch thick slab poured on top of existing slab in existing partial basement; however, the existing slab in the partial basement was removed and a new slab was poured. The new slab consists of a 6-inch-thick building slab poured on top of a 6-inch layer of ¾-inch bluestone. The composite cover system is continuous throughout the pre-existing portion of the basement and the new basement extension. The basement extension required excavation down to 9 feet 6 inches bgs in order to maintain the same depth to the top of the building slab throughout the new extended basement (top of slab is at approximately 8 feet 6 inches bgs). The

composite cover system installed at the site mitigates exposure to any underlying residual soil/fill and is therefore protective of human health and the environment.

5. As per the NYCOER approved RAP dated February 2016, a Sub Slab Depressurization System (SSDS) was to be installed at Site. The RAP states that the piping for the SSDS would be placed under the vapor barrier and would be surrounded with a minimum of 6-inch of ¾ inch bluestone placed across the site. The development team contacted OER regarding import of ¾ inch (clean washed) bluestone material from the Mt. Hope Quarry located in Wharton, New Jersey. The sieve analysis for this material indicated that 3% of the stone is 3/4" or greater. The majority of stone is between 1/2" and 3/4" (63%). However, based upon the sieve analysis, there were no excessive fines in this material. NYCOER indicated, via an email issued on August 3, 2017, that the proposed stone did not meet the ¾-inch spec in the approved RAP and requested that the engineer submit a letter certifying that the stone would perform as an equivalent alternative and would be protective of human health and the environment, when used as the permeable layer for the SSDS. Per NYCOER request, HAKS issued a PE-certified letter to address this deviation on August 4, 2017. In this letter, the P.E. indicated that the material would perform equivalently to the RAP specified material given the nature and extent of characterized soil vapor contaminants and would result in mitigation that is protective of human health and the environment.

6. According to the RAP Stipulation List dated October 7, 2016, daily reports were to be provided during excavation work. When no work was being performed for an extended time period, reporting frequency was to be reduced to a weekly basis. Additionally, monthly reports were required following NTP issuance and up to submittal of the Remedial Closure Report. In an email correspondence dated July 19, 2017, NYCOER indicated that there had been a 6-month gap in the daily reports submitted via EPIC and requested an update of the site conditions and project schedule. HydroTech responded with an update on July 19, 2017.

7. Restricted Residential SCOs were proposed in the RAP however Site Specific SCOs were ultimately achieved. Exposure to any residual fill material will be prevented by the composite cover, vapor barrier and sub-slab depressurization systems installed at the site.

Based on the implementation of these engineering controls, the cleanup objectives achieved at the site are protective of human health and the environment.

The deviations implemented as part of the remedial action are protective of public health and the environment. **Appendix 4** provides correspondences with OER regarding the approved deviations.

4.0 REMEDIAL PROGRAM

4.1 PROJECT ORGANIZATION

The principal personnel who participated in the remedial action included Paul Matli, the Environmental Project Manager, Tarek Z. Khouri, the Professional Engineer (PE) and Mark E. Robbins, the Qualified Environmental Professional (QEP). The principal contractor involved in the Remedial Action, who was responsible for the SSDS, VBS, and composite cover installation, was Greenside Corp located at 251 Monitor Street, Brooklyn, New York 11222**.** The developer for the Site was Power Realty Partners LLC located at 15 Ocean Avenue in Brooklyn, New York 11226.

Remedial activities at the Site were overseen by NYC OER under the E-Designation program in accordance with the February 2016 RAP addressing the HAZMAT E-designation (E-185; CEQR 07DCP070K) (NYC E-Designation Project Number 15EH-N117K). The NYC OER Project Managers involved in this project include Horace Zhang, Zach Schreiber and Myrna Hannah.

4.2 SITE CONTROLS

Site Preparation

Prior to, and throughout, the different phases of remedial activities, all necessary construction permits were acquired and maintained on-site as per the New York City Department of Buildings (NYCDOB) rules and regulations. No site clearing and site grubbing of organic matter (wood, roots, stumps, etc.) or other solid waste were required prior to all remedial work.

A pre-construction meeting was held at the site on June 25, 2016. Site mobilization, including utility mark outs, site security setup, and marking and staking excavation areas was performed in May of 2016.

Mobilization

Mobilization was conducted as necessary prior to the start of construction at the Site. Mobilization included field personnel orientation, equipment mobilization (including securing all sampling equipment needed for the field investigation), marking/staking sampling locations and

utility mark-outs. Each field team member attended an orientation meeting to become familiar with the general operation of the Site, health and safety requirements, and field procedures.

Soil Screening

All excavated soil was examined for visual/olfactory evidence of petroleum contamination and for organic vapors utilizing a Photoionization Detector (PID). No organic vapors (<0.1 ppm) or visual/olfactory evidence of contamination were identified in the soil that was excavated and removed from the Site.

Stockpile Management

Excavated material, which was not live-loaded onto trucks for disposal, was stockpiled directly on 6-mil poly-sheeting and covered at all times with appropriately anchored plastic tarps. This task was completed in accordance with the soil material management plan in the RAP.

Truck Inspection

Truck inspection and cleaning was performed for all loaded trucks prior to leaving the site. Trucks were staged for loading contaminated soil/fill material along the Fulton Street sidewalk and were then inspected prior to leaving the Site for any debris adhering to their surface. Trucks also went through thorough cleaning on a stone pad (truck wash station). Cleaning included brushing and rinsing their tires with water, when necessary, in order to prevent any tracking of soil/fill into surrounding community. Hauling trucks were also covered in order to control the generation of fugitive dust and leakage of contaminated material during transport.

Site Security

Site security was maintained with a locked fence in accordance with the NYCDOB code.

Nuisance Controls

All necessary means were employed to prevent dust, odor and vapor nuisances during the remedial excavation and disposal of soil/fill material. Such measures included shrouding stockpiled material with plastic tarp. The nuisance control measures also included using water from the nearest fire hydrant to apply sprinkled water over dry surfaces to reduce dust

generation. Other provisions for mist applications of odor chemical solutions to suppress potential odor and vapors were also considered but did not need to be utilized.

No odors, dust or vapors were generated or identified during remedial work.

Reporting

Daily reports providing a general summary of invasive and other remedial activities were provided to the OER Project Manager for each day of active remedial work, except as noted in the deviations in Section 3.5 of this report. A total of nineteen (19) daily reports were submitted from January 11, 2017 through August 6, 2018 and excluded periods of no invasive or remedial activity during the reporting period. Two (2) weekly reports dated July 27, 2018 and August 3, 2018 and a monthly report dated April 2017 were also submitted to document construction activities through February 2018. The monthly report noted a Stop Work Order that was in effect from January 17, 2017 through March 3, 2017. All reports are included in **Appendix 5**. Digital photographs of the Remedial Action are included in **Appendix 6**.

4.3 MATERIALS EXCAVATION AND REMOVAL

A plan showing the approximate locations where excavations were performed, as well as approximate depth of the excavations, is provided in **Figure 4**. The new development consists of a 6-story building with a slab-on-grade portion and an extension of the existing 9-foot partial basement. The building footprint covers the entire site, while the partial basement only covers 3,520-square feet. The new 6-story building consists of a school lobby and retail space occupying the 1st floor and a school occupying floor 2 through 6. The partial basement consists of equipment rooms. The new development required limited excavation to extend the partial basement of the former building across the full width of the northern property line along Fulton Street. The existing partial basement was extended 30-feet horizontally. The extension area was excavated down to 9 feet 6 inches below grade. The dimensions of the partial basement extension are approximately 9 feet 6 inches deep (or 8 feet 6 inches from top of slab), 30 feet long, and 40 feet wide. The basement, including the extension dimensions are 9 feet 6 inches deep (or 8 feet 6 inches from top of slab), 88 feet long, and 40 feet wide. The existing basement walls were maintained on three sides. The existing basement slab was also removed and replaced with a new 6-inch building slab poured on top of a ¾-inch layer of bluestone. No additional

excavation was performed to below the existing/extended basement area for the installation of the elevator shaft since the elevator shaft is level with the elevation of the partial basement. Limited excavation was performed for the installation of the slab-on-grade (down to 1foot bgs) and for the placement of footings (down to 3 feet bgs). A total of 2,213.46 tons of soil was excavated and removed from the Site during redevelopment. Groundwater was detected at approximately 61 feet bgs at the site, and therefore, was not encountered during excavation activities. A total of 2,213.46 tons of non-hazardous soil/fill material was excavated from the Site and shipped to Clean Earth of Bethlehem located at 3000 Commerce Center Blvd in Bethlehem, Pennsylvania 18015 for disposal.

Post Excavation Confirmation Sample Results

Seven (7) post-excavation confirmation samples were collected from the bottom of the excavation and were analyzed for VOCs by EPA Method 8260, SVOCs by EPA Method 8270, Target Analyte List metals and Pesticides/PCBs by EPA Method 8081/8082. Analytical results for all these samples were compared to the 6NYCRR Part 375, Table 6.8(b) Restricted Residential Use SCOs.

No volatile organic compounds occurred in any soil samples at concentrations exceeding their respective Restricted Residential SCOs. However, several SVOCs were detected at concentrations exceeding their Restricted Residential SCOs in four of the post-excavation samples namely, EP-3, EP-4, EP-5 and EP-7. Barium (max. 815 mg/kg) was identified at a concentration in exceedance of the Restricted Residential SCO in EP-5 and EP-7. The concentration of barium identified in EP-7 was below the established Site-Specific SCOs; however, the concentration detected in EP-5 was above. Based on the results of the post-excavation confirmation sampling, and the fact that EP-5 was the only compound detected in exceedance of the established site-specific SCOs, the site achieved the established Site-Specific SCOs.

Soil sampling results from the RI identified several SVOCs, including benzo(a)anthracene (max. 5.89 mg/kg), benzo(a)pyrene (max. 3.61 mg/kg), benzo(b)fluoranthene (max. 2.68 mg/kg), chrysene (max. 7.62 mg/kg), dibenzo(a,h)anthracene (max. 0.563 mg/kg) and indeno(1,2,3-cd)pyrene (max. 0.985 mg/kg), at concentrations

exceeding their Restricted Residential SCOs, but below their Site-Specific SCOs, in two deep samples. Two (2) metals including chromium (trivalent) (152 mg/kg) and lead (max. 72.9 mg/kg) were detected in two deep samples at concentrations exceeding their respective Unrestricted Use SCOs but below their respective Restricted Residential SCOs. Based on these findings, the analytical results from the deep RI samples support the conclusion that the site achieved Site-Specific SCOs.

A map of the post-excavation confirmation sample locations is provided in **Figure 5**. Locations of soil borings during the RI are also provided in this figure for reference. A tabular summary of post-excavation confirmation sampling results compared to SCO's is included in **Table 2**. A tabular summary of the RI data is provided in **Table 1** for reference. The full laboratory report for post-excavation confirmation samples is provided in **Appendix 7**.

4.4 MATERIALS DISPOSAL

The type, quantity and disposal location of each material removed and disposed off-Site is presented below:

Destination	Type of Material	Quantity
Clean Earth of Bethlehem	Non-Hazardous Soil/Fill Material	2,213.46 tons

Letters from Power Realty Partners LLC to Clean Earth of Bethlehem providing materials type, source and data; and acceptance letters from disposal facility stating it is approved to accept these materials are attached in **Appendix 8**. The OER Historic Fill Notification Form is provided in **Appendix 9**. Manifests are included in **Appendix 10**. Waste characterization data for the approved material is provided in **Appendix 11**. A table of individual truck transport and material disposal quantities is provided in **Table 3**.

4.5 BACKFILL IMPORT

Approximately 231.95 tons of ¾ inch bluestone were imported from Tilcon New York, Inc located at 162 Old Mill Road in West Nyack, New York 10994, to be used for backfill in accordance with all Federal, State and City laws and regulations and with OER approval. The bluestone originated from the Mt. Hope Quarry located in Wharton, New Jersey. Weight tickets

for backfill import are provided in **Appendix 12**. A table of all sources of backfill with quantities for each source is shown in **Table 4**. A map showing backfill placement locations at the Site is shown in **Figure 6**.

4.6 DEMARCATION

Soil below the final cover is residual soil that will be addressed by Site Management under this Remedial Action.

5.0 ENGINEERING CONTROLS

Engineering Controls were employed in the remedial action to address residual contamination remaining at the site. The Site has three (3) primary Engineering Control Systems. These are:

(1) Composite Cover System;

(2) Vapor Barrier System; and

(3) Active Sub-Slab Depressurization System.

Composite Cover System

Exposure to residual soil/fill is prevented by an engineered, composite cover system that has been built on the Site. This composite cover system is comprised of a new 6-inch building slab underlain by 6 inches of ¾ inch bluestone in the partial basement extension, and removed and replaced the existing slab with a new 6-inch slab underlain by 6 inches of ¾ inch bluestone, in the pre-existing partial basement, to prevent human exposure to residual soil/fill remaining under the Site. The contractor for the cover construction was Greenside Corp located at 251 Monitor Street, Brooklyn NY 11222. **Appendix 13** shows the approved design for each remedial cover type used on this Site. **Figure 6** shows the location of the composite cover built at the Site.

Vapor Barrier System

Exposure to soil vapor is prevented by a vapor barrier system (VBS) that has been installed at the Site. The VBS consists of Raven Industries 20-mil VaporBlock Plus installed beneath the new building slab. Raven Industries 20-mil Pour-N-Seal Membrane was installed beneath the mat foundation of elevator shaft that is level with the elevation of the partial basement. In the partial basement, this membrane was installed on top of a layer of geofabric underlain by a 6-inch layer of ¾ inch bluestone and was capped with a 6-inch thick building slab.

The vapor barrier system beneath the slab of the partial basement is connected to 62-mil Grace Bituthene® 3000 that was installed on the interior sides of the basement walls up to grade surface. The vapor barrier installed on the interior sides of the basement walls (new extension

walls and existing) is insulated using rigid 1-inch ToughRock Gypsum Boards affixed to metal studs.

The vapor barrier beneath the slab-on grade was installed on top of a layer of geofabric underlain by 1 foot of ¾ inch bluestone. The membrane was then extended vertically 2 inches and sealed on interior walls of the building using Denso Butyl 35 Tape. All penetrations through the slab for utility lines were sealed utilizing Pour-N-Seal by Raven Industries The remedial engineer at HydroTech oversaw the installation of the vapor barrier and the contractor responsible for installation of the VBS was Greenside Corp located at 251 Monitor Street, Brooklyn NY 11222.

Sub-Slab Depressurization System

Exposure to soil vapor is also prevented by an active SSDS that has been installed at the Site. The loop-type system consists of a network of three separate loops of 4-inch schedule 40 PVC perforated piping; two loops were installed beneath the slab-on-grade and are surrounded with 6-inches of ¾ inch bluestone and one loop was installed beneath the partial basement and runs along trenches dug beneath the new basement slab. This loop is surrounded by a 6-inch layer of ¾ inch bluestone and is installed in the new extended portion of the development. Each loop connects to a cast-iron riser vent pipe that connects from the basement level up to the roof. Each riser (total of 3) is outfitted with a RadonAway G-501 Model fan. Each vent pipe contains its own vacuum gauge and flow control alarm located in a secure SSDS equipment area located in the 6th floor stairwell. The roof exhaust is situated a minimum of 10 feet from all air intakes (approximately 11 feet from the closest HVAC system components – RTU 11), and all visible SSDS piping is labeled “Soil Vapor Venting System – Do Not Tamper with or Disturb”. The vent on the roof line terminates with a goose-neck pipe to prevent rain infiltration.

Three pressure test points were installed as part of the system. Two test point are located beneath the slab-on-grade and one is located beneath the partial basement. Pressure probes were installed to a depth of approximately 6-inches below the bottom of the concrete building slab and consist of a stainless-steel implant fitted with inert, laboratory quality ¼-inch tubing to the concrete slab surface. The pressure probes are surrounded by a 6-inch thick layer of ¾ inch bluestone underlain by native soil/existing lab in the basement and are sealed with caulking and

concrete. The locations of the pressure test points and other system components are provided in the as-built drawings provided in **Appendix 13**. A roof plan showing the locations of air intakes relative to the SSDS fans is provided in **Figure 7**.

Subsequent to installation, pressure readings were obtained from the pressure probes to determine if negative pressure is present beneath the concrete building slab. Sub-slab pressure was measured with an Extech HD755 Differential Pressure manometer which measures differential pressure in inches of mercury. Differential pressure readings obtained from each of the sampling ports indicated negative pressure of less than or equal to -0.002 inches of water beneath the slab. This indicates that there is communication across the slab and verifies proper functioning of the system. The vacuum at each location is provided in the table below:

Pressure Probe No.	**Pressure (Inches of Water)**
Pressure Test Point #1 (Basement)	-0.01
Pressure Test Point #2 (Closest to Fulton St. on 1st Floor)	-0.11
Pressure Test Point #3 (Right Corner of Building Furthest from Fulton St.)	-0.03

Photographs of the inspection, including photographs of the pressure meter showing the resulting vacuum at each of the respective monitoring points, are provided in **Appendix 6**.

The engineer for the SSDS was HAKS Engineers, Architects and Land Surveyors, DPC located at 40 Wall Street in Manhattan, New York 10003 and the contractor responsible for installation of the SSDS was Greenside Corp located at 251 Monitor Street, Brooklyn NY 11222. The remedial engineer at HydroTech oversaw the installation of the SSDS. **Appendix 13** provides PE certified as-built plans of the active SSDS, photos of the SSDS being tested and a certified contractor affidavit for the SSDS installation.

6.0 INSTITUTIONAL CONTROLS

A series of Institutional Controls are required under this Remedial Action to assure permanent protection of public health by elimination of exposure to residual materials. These IC's define the program to operate, maintain, inspect and certify the performance of Engineering Controls and Institutional Controls on this property. These Institutional Controls will be implemented in accordance with the Site Management Plan included in this RCR.

Institutional Controls for this property are:

(1) The property will continue to be registered with an E-Designation by the NYC Department of Buildings. Property owner and property owner's successors and assigns are required to comply with the approved SMP;

(2) Compliance with an OER-approved Site Management Plan including procedures for appropriate maintenance, inspection, and certification of performance of EC's and IC's. The property owner and property owner's successors and assigns will inspect EC's and IC's and submit to OER a written certification that evaluates their performance in a manner and at a frequency to be determined by OER;

(3) Engineering Controls will not be discontinued without prior OER approval;

(4) OER has the right to enter the Site upon notice for the purpose of evaluating the performance of EC's and IC's;

(5) Vegetable gardens and farming in residual soil/fill on the Site are prohibited;

(6) Use of groundwater underlying the Site without treatment rendering it safe for its intended use is prohibited;

(7) All future activities on the Site that will disturb residual soil/fill must be conducted pursuant to the Soil/Materials Management provisions of the SMP, or otherwise approved by OER;

(8) The Site is intended to be used for restricted residential use and will not be used for a higher level of use without prior approval by OER.

(9) Placement of a deed notice to record the ECs/ICs on the deed to ensure that future owners of the Site continue to comply with the SMP, as required.

7.0 SITE MANAGEMENT PLAN

Site Management is the last phase of the remedial process and begins after the approval of the Remedial Closure Report (RCR) and issuance of the Notice of Completion (NOC) by OER. It is the responsibility of the property owner to ensure that all Site Management responsibilities are performed. The penalty for failure to implement the SMP includes revocation of the Notice of Completion and all associated certifications and liability protections.

Engineering Controls and Institutional Controls have been incorporated into this Remedial Action to ensure that the site remains protective of public health and the environment. Generally, EC's provide physical protective measures and IC's provide restrictions on Site usage and establish remedial operation, maintenance, inspection and certification measures. This Site Management Plan has been established to govern long-term performance of EC's and IC's for this property.

The SMP provides a detailed description of procedures required to manage residual material at the Site following the completion of remedial construction in accordance with the NYC Voluntary Cleanup Agreement with OER. This includes: (1) operation and maintenance of Engineering Controls; (2) inspection of EC's and IC's; and (3) certification of performance of EC's and IC's.

ENGINEERING CONTROLS

Engineering Controls were employed in the remedial action to address residual materials remaining at the site. The Site has two Engineering Control Systems. Engineering Controls for this property are:

(1) Composite Cover System consisting of asphalt covered roads, concrete covered sidewalks, and concrete building slabs;

(2) Vapor Barrier System; and

(3) Active Sub-Slab Depressurization System.

Operation and Maintenance of Composite Cover System

Chapter 5 describes the Composite Cover System utilized in this Remedial Action and provides as-built design details and the location of each cover type. The Composite Cover System is a permanent Engineering Control for the Site. The system will be inspected, and its

performance certified at specified intervals defined in this SMP. A Soil/Materials Management Plan is included in this Site Management Plan and outlines the procedures to be followed in the event that the composite cover system and underlying residual soil/material must be disturbed after the Remedial Action is complete.

The Composite Cover System does not require any special operation or maintenance activities. If the system is breached during future construction activities, the system will be rebuilt by reconstructing the system according to the original design and tying newly constructed cover layers into existing cover layers to form a continuous layer(s).

Operation and Maintenance of Vapor Barrier System

Chapter 5 describes the Vapor Barrier System utilized in this Remedial Action and provides as-built design details and the system location. The Vapor Barrier System is a permanent Engineering Control for the Site. The system will be inspected, and its performance certified at specified intervals defined in this SMP.

The Vapor Barrier System does not require any special operation or maintenance activities. If the system is breached during future construction activities, the system will be rebuilt by reconstructing the vapor barrier layers and sealing the newly constructed materials with existing barrier materials in accordance with manufacturer specifications.

Operation and Maintenance of Sub-Slab Depressurization System

Chapter 5 describes the active Sub-Slab Depressurization System utilized in this Remedial Action and provides as-built design details and the system location. The SSDS is a permanent Engineering Control for the Site. The system will be inspected, and its performance certified at specified intervals defined in this SMP.

The SSDS is required to be run continuously. During operation, the minimum vacuum gauge reading beneath the slab should be 0.01 inches of water. During operation, the SSDS should be monitored for physical wear and damage and other operational problems, making component replacements as necessary. Any blockages in rise or discharge piping or vacuum alarm or gauge tubing should be cleared. Operation of vacuum alarms/monitors (red and green indicator lights, audible alarm) should be verified by disconnecting tubing from riser pipe and noting if the red indicator light and audible alarm turn on. Operation of vacuum gauges should be verified by disconnecting tubing from riser pipe and noting if the indicator moves to zero and checking high- and low-pressure ports to see if they are plugged correctly. Proper seal should be

maintained in riser pipe penetrations in concrete slab. Riser pipe connections at fan should be free of leaks and fan mounts should be in proper condition. A designated building supervisor will be appointed to be contacted in the event of a problem with the SSDS.

Institutional Controls

A series of Institutional Controls are required under this Remedial Action to assure permanent protection of public health by elimination of exposure to residual materials. These IC's define the program to operate, maintain, inspect and certify the performance of Engineering Controls and Institutional Controls on this property. These Institutional Controls will be implemented in accordance with the Site Management Plan included in this RCR.

Institutional Controls are also designed to prevent future exposure to residual soil/materials by controlling disturbances in the subsurface, restrict higher uses of the property than those addressed by the Remedial Action and establish restrictions on activities and site usage. Institutional Controls for this property are:

(1) The property will continue to be registered with an E-Designation by the NYC Department of Buildings. Property owner and property owner's successors and assigns are required to comply with the approved SMP;

(2) Compliance with an OER-approved Site Management Plan including procedures for appropriate maintenance, inspection, and certification of performance of EC's and IC's. The property owner and property owner's successors and assigns will inspect EC's and IC's and submit to OER a written certification that evaluates their performance in a manner and at a frequency to be determined by OER;

(3) Engineering Controls will not be discontinued without prior OER approval;

(4) OER has the right to enter the Site upon notice for the purpose of evaluating the performance of EC's and IC's;

(5) Vegetable gardens and farming in residual soil/fill on the Site are prohibited;

(6) Use of groundwater underlying the Site without treatment rendering it safe for its intended use is prohibited;

(7) All future activities on the Site that will disturb residual soil/fill must be conducted pursuant to the Soil/Materials Management provisions of the SMP, or otherwise approved by OER;

(8) The Site is intended to be used for restricted residential use and will not be used for a higher level of use without prior approval by OER.

(9) Placement of a deed notice to record the ECs/ICs on the deed to ensure that future owners of the Site continue to comply with the SMP, as required.

Inspections

Engineering Controls and Institutional Controls will be inspected annually. The inspections will evaluate the following:

- If Engineering Controls or Institutional Controls employed at the Site continue to perform as designed and continue to be protective of human health and the environment;
- If anything has occurred that impairs the ability of the Engineering Controls or Institutional Controls to protect public health and the environment;
- If changes are needed to the remedial systems or controls;
- If compliance with this SMP has been maintained;
- If site records are complete and up to date; and
- General Site conditions at the time of inspection.

In an addition, if an emergency occurs, such as a natural disaster, or if an unforeseen failure of any of the Engineering Controls occurs, an inspection of the Site will be performed within 14 days to evaluate the Engineering Controls and a letter report of findings will be submitted to OER.

Inspection of Composite Cover System

The composite cover will be visually inspected for any breaks or cracks in the building slab and the backyard cap. Any breaks should be promptly repaired with concrete. Evidence of active invasive activity through the cover system, or past invasive activity, such as patches and repairs, should be evaluated. Photographs should be taken and presented in the Report to document findings.

Inspection of Vapor Barrier System

The vapor barrier will be visually inspected for any tears or breaks. If the vapor barrier is believed to be torn or broken, the system will be repaired. Photographs should be taken and presented in the Report to document findings.

Inspection of Sub-Slab Depressurization System

Inspection of the SSDS will performed on an annual basis and will constitute the following:

- Observe visible components (fan, vacuum alarm/monitor, vacuum gauge, tubing, riser pipe, etc.) for physical wear, damage and operational issues, and replace as necessary;
- Remove any blockages in vacuum alarm/monitor and gauge tubing and riser pipe taps;
- Verify operation of vacuum alarm/monitor (red and green indicator lights, audible alarm) by disconnecting tubing from riser pipe and noting if the red indicator light and audible alarm turn on;
- Verify operation of vacuum gauge by disconnecting tubing from riser pipe and noting if the indicator moves to zero (check high- and low-pressure ports to see if they are plugged correctly);
- Inspect riser pipe penetrations in concrete slab for proper seal;
- Inspect riser pipe connections at fan for leaks and tightness;
- Inspect power to fan by operating dedicated switch;
- Inspect fan mounts.

Site Use Prohibitions

Inspections to evaluate the status of site use prohibitions will include an evaluation of whether there is vegetable gardening or farming in residual soil/fill; whether groundwater underlying the site has been used without treatment rendering it safe for its intended use; whether activities that have disturbed site soil/fill have been conducted pursuant to the Soil/Material Management provisions of the SMP, or otherwise approved by OER; and whether the site has been used for a higher level of use other than the restricted residential use addressed by the Remedial Action.

Inspection and Certification Letter Report

Results of inspections performed during a reporting period and certification of performance of all Engineering Controls and Institutional Controls will be included in an Inspection and Certification Letter Report. Inspections will be performed in 2019, 2020 and every 1 year

thereafter. Inspection and Certification Letter Reports will be submitted by July 30, 2020 (for the reporting period calendar year 2019), July 30, 2021 (for the reporting period calendar years 2020) and every 1 year thereafter (for the reporting period consisting of the 1 prior calendar years). Inspection and Certification Reports will cover all calendar years since the prior reporting period. Inspection and Certification Letter Reports will be submitted to OER in digital format. The letter report will include, at a minimum:

- Date of inspections;
- Personnel conducting inspections;
- Description of the inspection activities performed;
- Any observations, conclusions, or recommendations;
- Copy of any inspection forms;
- A determination as to whether groundwater plume conditions, if any, have changed since the last reporting event; and
- Certification of the performance of Engineering Controls and Institutional Controls, as discussed below.

The certification of the performance of EC's and IC's will establish:

- If Engineering Controls or Institutional Controls employed at the Site continue to be in place and perform as designed and continue to be protective of human health and the environment;
- If anything has occurred that impairs the ability of Engineering Controls or Institutional Controls to protect public health and the environment;
- If changes are needed to the remedial systems or controls;
- If compliance with this Site Management Plan has been maintained;
- If vegetable gardening and farming in residual soils has been prevented;
- If groundwater underlying the Site is being utilized without treatment rendering it safe for the intended purpose has been prevented;
- If activities on the Site that have disturbed residual soil/fill material have been in accordance with the Soil/Materials Management Plan in this SMP;
- If the Site has been used for a higher level of use other than the restricted residential use addressed by the Remedial Action;

- If site records are complete and up to date;
- If the Site continues to be registered as an E-Designated property by the NYC Department of Buildings;
- If the Site continues to be subject to the deed notice notifying of site ICs/ECs;

OER may enter the Site upon notice for the purpose of evaluating the performance of EC's and IC's.

NOTIFICATIONS

Notifications will be submitted by the property owner to OER as described below:

- 60-day advance notice of any proposed changes in Site use, such as an upgrade from existing use to commercial use that was not contemplated is the Remedial Action.
- Notice within 30 days of any emergency, such as a fire, flood, or earthquake that has the potential to reduce the effectiveness of Engineering Controls in place at the Site.

SOIL/MATERIALS MANAGEMENT PLAN

Any future intrusive work that will disturb residual soil/fill beneath the property, including modifications or repairs to the existing composite cover system, will be performed in compliance with this Soil/Materials Management Plan (SMMP). Intrusive work will also be conducted in accordance with the procedures defined in the Community Air Monitoring Plan (CAMP) included in this chapter and a Construction Health and Safety Plan (HASP). The HASP is the responsibility of the property owner and should be in compliance with NYSDEC DER-10 Technical Guide and 29 CFR 1910 and 1926, and all other applicable Federal, State and City regulations. Intrusive construction work should be compliant with this SMMP and described in the next Inspection and Certification Letter Report.

SOIL/MATERIALS MANAGEMENT PLAN

Any future intrusive work that will disturb residual soil/fill beneath the property, including modifications or repairs to the existing composite cover system, will be performed in compliance with this Soil/Materials Management Plan (SMMP). Intrusive work will also be conducted in accordance with the procedures defined in the Community Air Monitoring Plan (CAMP) in this plan and a Construction Health and Safety Plan (HASP). The HASP is the responsibility of the

property owner and should be in compliance with NYSDEC DER-10 Technical Guide and 29 CFR 1910 and 1926, and all other applicable Federal, State and City regulations. Intrusive construction work should be compliant with this SMMP and described in the next Inspection and Certification Letter Report.

Soil Screening Methods

Visual, olfactory and PID soil screening and assessment will be performed under the supervision of a Qualified Environmental Professional (QEP). Soil screening will be performed during any future intrusive work.

Stockpile Methods

Stockpiles will be used to isolate excavated soil and will be removed as soon as practicable. While stockpiles are in place, they will be inspected daily, and before and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by OER. Excavated soils will be stockpiled on, at minimum, double layers of 6-mil minimum sheeting, will be kept covered at all times with appropriately anchored plastic tarps, and will be routinely inspected. Broken or ripped tarps will be promptly replaced.

All stockpile activities will be compliant with applicable laws and regulations. Soil stockpile areas will be appropriately graded to control run-off in accordance with applicable laws and regulations. Stockpiles of excavated soils and other materials shall be located at least of 50 feet from the property boundaries, where possible. Hay bales or equivalent will surround soil stockpiles except for areas where access by equipment is required. Silt fencing and hay bales will be used as needed near catch basins, surface waters, and other discharge points.

Characterization of Excavated Materials

Soil/fill or other excavated media that is transported off-Site for disposal will be sampled in a manner required by the receiving facility, and in compliance with applicable laws and regulations. Excavated soil will only be reused on-site with prior approval by OER.

Materials Excavation, Load-Out and Departure

The PE/QEP overseeing the remedial action will:

- Oversee intrusive work and the excavation and load-out of excavated material;
- Ensure that there is a party responsible for the safe execution of invasive and other work performed under this management plan;
- Ensure that Site maintenance activities and maintenance-related grading cuts will not interfere with, or otherwise impair or compromise the remedial measures established during the remediation construction phase;
- Ensure that the presence of utilities and easements on the Site has been investigated and that any identified risks from work proposed under this plan are properly addressed by appropriate permits or authorized notifications;
- Ensure that all loaded outbound trucks are inspected and cleaned if necessary before leaving the Site; and
- Ensure that all egress points for truck and equipment transport from the Site will be kept clean of Site-derived materials during Site intrusive work.

Locations where vehicles exit the Site shall be inspected daily for evidence of soil tracking off premises. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to Site-derived materials.

Off-Site Materials Transport

Loaded vehicles leaving the Site will comply with all applicable materials transportation requirements (including appropriate covering, manifests, and placards) in accordance with applicable laws and regulations, including use of licensed haulers in accordance with 6 NYCRR Part 364. If loads contain wet material capable of causing leakage from trucks, truck liners will be used. Queuing of trucks will be performed on-Site, when possible in order to minimize off Site disturbance.

The selected outbound trucking routing takes into account the following factors: (a) limiting transport through residential areas and past sensitive sites; (b) use of mapped truck routes; (c)

minimizing off-Site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport. To the extent possible, all trucks loaded with Site materials will travel from the Site using these truck routes. Trucks will not stop or idle in the neighborhood after leaving the project Site.

Materials Disposal Off-Site

The following documentation will be established and reported by the PE/QEP for each disposal destination used in this project to document that the disposal of regulated material exported from the Site conforms with applicable laws and regulations: (1) a letter from the PE/QEP or Enrollee to each disposal facility describing the material to be disposed and requesting written acceptance of the material. This letter will state that material to be disposed is regulated material generated at an environmental remediation Site in Brooklyn, New York under a governmental remediation program. The letter will provide the project identity and the name and phone number of the PE/QEP or Enrollee. The letter will include as an attachment a summary of all chemical data for the material being transported; and (2) a letter from each disposal facility stating it is in receipt of the correspondence (1, above) and is approved to accept the material.

Documentation associated with disposal of all material will include records and approvals for receipt of the material. All impacted soil/fill or other waste excavated and removed from the Site will be managed as regulated material and will be disposed in accordance with applicable laws and regulations. Historic fill and contaminated soils taken off-Site will be handled as solid waste and will not be disposed at a Part 360-16 Registration Facility (also known as a Soil Recycling Facility).

Waste characterization will be performed for off-Site disposal in a manner required by the receiving facility and in conformance with its applicable permits. Waste characterization sampling and analytical methods, sampling frequency, analytical results and QA/QC will be retained and included in the following Inspection and Certification Report. A manifest system for off-Site transportation of exported materials will be employed. Hazardous wastes derived from on-Site will be stored, transported, and disposed of in compliance with applicable laws and regulations.

Materials Reuse On-Site

All of the soil excavated during any future repair or construction purposes will be placed in the same excavation it was derived from or will be disposed of off-site unless otherwise approved by OER beforehand.

Repair of Remedial Systems

After completion of invasive work, any damage of the engineering controls (composite cover system, vapor barrier, etc.) will be restored to the original condition established during initial construction.

Import of Backfill Soil from Off-Site Sources

In the event that soil importation is needed for the backfilling purposes, this Section presents the requirements for imported fill materials. All imported soils will meet OER-approved backfill and cover soil quality objectives for this Site. The backfill and cover soil quality objectives including NYSDEC Part 375 Restricted Residential SCOs and groundwater protections standards. A process will be established to evaluate sources of backfill and cover soil to be imported to the Site, and will include an examination of source location, current and historical use(s), and any applicable documentation. Material from industrial sites, spill sites, environmental remediation sites or other potentially contaminated sites will not be imported to the Site.

The following potential sources may be used pending attainment of backfill and cover soil quality objectives:

- Clean soil from construction projects at non-industrial sites in compliance with applicable laws and regulations;
- Clean soil from roadway or other transportation-related projects in compliance with applicable laws and regulations;
- Clean recycled concrete aggregate (RCA) from facilities permitted or registered by the regulations of NYS DEC; and

- Virgin quarried material or other materials with an approved Beneficial Use Determination (BUD) from NYSDEC for reuse as clean fill.

All materials received for import to the Site will be approved by a PE/QEP and will be in compliance with provisions in this SMP. The Inspection and Certification Report will report the source of the fill, evidence that an inspection was performed on the source, chemical sampling results, frequency of testing, and a Site map indicating the locations where backfill or soil cover was placed.

Source Screening and Testing

Inspection of imported fill material will include visual, olfactory, and PID screening for evidence of contamination. Materials imported to the Site will be subject to inspection, as follows:

- Trucks with imported fill material will be in compliance with applicable laws and regulations and will enter the Site at designated locations;
- The PE/QEP is responsible to ensure that every truck load of imported material is inspected for evidence of contamination; and
- Fill material will be free of solid waste including pavement materials, debris, stumps, roots, and other organic matter, as well as ashes, oil, perishables or foreign matter.

Composite samples of imported material from the identified clean soil sources will be taken at a minimum frequency of one sample for every 500 cubic yards of material. One composite sample will be collected form each source of virgin quarried material or other material with an NYSDEC approved BUD, unless otherwise approved by OER. Once it is determined that the fill material meets imported backfill or cover soil chemical requirements and is non-hazardous, and lacks petroleum contamination, the material will be loaded onto trucks for delivery to the Site.

Recycled concrete aggregate (RCA) may be imported from facilities permitted or registered by NYSDEC. A PE/QEP is responsible to ensure that the facility is compliant with 6NYCRR Part 360 registration and permitting requirements for the period of acquisition of RCA. RCA imported from compliant facilities will not require additional testing, unless required by NYSDEC under its terms for operation of the facility. RCA imported to the Site must be derived from recognizable and uncontaminated concrete. RCA will not be used as cover material.

Fluids Management

All liquids to be removed from the Site, including dewatering fluids, will be handled, transported, and disposed in accordance with applicable laws and regulations. Liquids discharged into the New York City sewer system will receive prior approval by New York City Department of Environmental Protection (NYC DEP). The NYC DEP regulates discharges to the New York City sewers under Title 15, Rules of the City of New York Chapter 19. If discharge to the City sewer system is not appropriate, the dewatering fluids will be managed by transportation and disposal at an off-Site treatment facility. Discharge of water generated during remedial construction to surface waters (i.e. a stream or river) is prohibited without a SPDES permit issued by NYSDEC.

Storm-water Pollution Prevention

Applicable laws and regulations pertaining to storm-water pollution prevention will be addressed during the remedial program. All existing stormwater systems will be inspected to ensure proper operation.

Odor Control

All necessary means will be employed to prevent on- and off-Site odor 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) use of foams to cover exposed odorous soils. If odors develop and cannot otherwise be controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-Site disposal; and (e) use of chemical odorants in spray or misting systems.

This odor control plan is capable of controlling emissions of nuisance odors. 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. OER will be notified of all odor complaint events. Implementation of all odor controls, including halt of work, will be the responsibility of the PE/QEPs.

Dust Control

Dust management during invasive on-Site work will include, at a minimum:

- Use of a dedicated water spray methodology for roads, excavation areas and stockpiles.
- Use of properly anchored tarps to cover stockpiles.
- Exercise extra care during dry and high-wind periods.
- Use of gravel or recycled concrete aggregate on egress and other roadways to provide a clean and dust-free road surface.

If nuisance dust emissions are identified, work will be halted, and the source of dusts will be identified and corrected. Work will not resume until all nuisance dust emissions have been abated. OER will be notified of all dust complaint events. Implementation of all dust controls, including halt of work, will be the responsibility of the PE/QEPs.

Noise

Noise control will be exercised during the remedial program. All remedial work will conform, at a minimum, to NYC noise control standards.

COMMUNITY AIR MONITORING PLAN

Real-time air monitoring for volatile organic compounds (VOCs) and particulate levels at the perimeter of the exclusion zone or work area will be performed. Continuous monitoring will be performed for all ground intrusive activities and during the handling of contaminated or potentially contaminated media. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pit excavation or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be performed during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. Periodic monitoring during sample collection, for instance, will consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. Depending upon the proximity of potentially exposed individuals, continuous monitoring may be performed during sampling activities. Examples of such situations include

groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence. Exceedances of action levels observed during performance of the Community Air Monitoring Plan (CAMP) will be reported to the OER Project Manager and included in the Daily Report.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) will be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis during invasive work. Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work will be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment will be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment will be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities will be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities will resume with continued monitoring.

- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities will resume provided that the total organic vapor level 200 feet downwind of the exclusion 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 over background for the 15-minute average.

- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities will be shutdown.

All 15-minute readings must be recorded and be available for OER personnel to review. Instantaneous readings, if any, used for decision purposes will also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations will be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring will be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment will be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work will continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work will be stopped, and a re-evaluation of activities initiated. Work will resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

All readings will be recorded and be available for OER personnel to review.

CONTINGENCY PLAN

This contingency plan is developed for the remedial construction or repair work to address the discovery of unknown structures or contaminated media during excavation. Identification of unknown contamination source areas during invasive Site work will be promptly communicated to OER's Project Manager. Petroleum spills will be reported to the NYS DEC Spill Hotline. If previously unidentified contaminant sources are found during on-Site remedial excavation or

development-related excavation, sampling will be performed on contaminated source material and surrounding soils and reported to OER. Chemical analytical testing will be performed for TAL metals, TCL volatiles and semi-volatiles, TCL pesticides and PCBs, as appropriate.

Emergency Telephone Numbers

In the event of any emergency condition pertaining to these remedial systems, the Owner's representative(s) should contact the appropriate parties from the contact list below. Prompt contact should also be made to Mark Robbins. These emergency contact lists must be maintained in an easily accessible location at the Site.

Emergency Contact Numbers

Medical, Fire, and Police:	911
One Call Center: 3 day notice required for utility mark out	(800) 272-4480
Poison Control Center:	(800) 222-1222
Pollution Toxic Chemical Oil Spills:	(800) 424-8802
NYSDEC Spills Hotline	(800) 457-7362

Contact Numbers

Mark Robbins, HydroTech Environmental Engineering and Geology, DPC	631-462-5866
Office of Environmental Remediation	(212) 788-8841; 311

8.0 SUSTAINABILITY REPORT

This Remedial Action provides for sustainable remediation and redevelopment through a variety of means that are defined in this Sustainability Report.

Reuse of Clean, Recyclable Materials and Conservation of Natural Resources.

Reuse of clean, recyclable materials reduces consumption of non-renewable virgin resources and can provide energy savings and greenhouse gas reduction since these materials can be locally-derived. To this end, all pre-construction and construction documents related to this project were printed on 30% post-consumer paper.

Reduced Energy Consumption and Promotion of Greater Energy Efficiency

Reduced energy consumption lowers greenhouse gas emissions, improves local air quality, lessens in-city power generation requirements, can lower traffic congestion, and provides substantial cost savings.

The following means were used to reduce energy consumption in this project: Efficient loading times of trucks to prevent extensive idling times and consolidating the number of days that soil was shipped from the Site to reduce truck traffic in the neighborhood.

Conversion to Clean Fuels.

Use of clean fuel improves NYC's air quality by reducing harmful emissions. Natural gas is utilized as the principal fuel in the new building.

Recontamination Control

Recontamination after cleanup and redevelopment is completed undermines the value of work performed, may result in a property that is less protective of public health or the environment, and may necessitate additional cleanup work later that could impede future redevelopment. Recontamination can arise from future releases that occur within the property or by influx of existing contamination from off-Site.

The methods used to provide recontamination controls in the development included the prevention of transport of contamination to the site from off-site by ensuring that no unapproved materials were brought to the Site, a vapor barrier and an SSDS were installed at the Site to provide protection from residual contaminants and if recontamination from off-site were to occur, and the use of natural gas to ensure no fuel oil will be leaked into the environment.

100% of the area of the Site, or 10,296 square feet, utilizes recontamination controls under this plan.

Paperless Brownfield Cleanup Program.

The entity Glacier Global Partners LLC participated in OER's Paperless Brownfield Cleanup Program. Under this program, submission of electronic documents replaced submission of hard copies for the review of project documents, communications and milestone reports. A best estimate of the mass (pounds) of paper saved under this plan is 75 pounds.

Low-Energy Project Management Program

The entity Power Realty Partners LLC participated in OER's low-energy project management program. Under this program, whenever possible, meetings were held using remote communication technologies, such as videoconferencing and teleconferencing to reduce energy consumption and traffic congestion associated with personal transportation. A gross estimate of the number of miles of personal transportation that was conserved in this process is 300 miles.