ADVANCED SITE RESTORATION, LLC
ENVIRONMENTAL SERVICES

300 LAFAYETTE STREET

NEW YORK, NEW YORK

Remedial Action Report

NYC VCP Project Number 14CVCP201M
OER Project Number 14CVCP201M

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JANUARY 2018

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LIST OF ACRONYMS

Acronym	Definition
CAMP	Community Air Monitoring Plan
DER-10	NYS DEC Division of Environmental Remediation Technical Guidance Manual 10
EC	Engineering Control
HASP	Health and Safety Plan
IC	Institutional Control
NYC VCP	New York City Voluntary Cleanup Program
NYC DEP	New York City Department of Environmental Protection
NYC DOHMH	New York City Department of Health and Mental Hygiene
NYC OER	New York City Office of Environmental Remediation
ORC	Oxygen Release Compound
PID	Photoionization Detector
QA/QC	Quality Assurance/Quality Control
QEP	Qualified Environmental Professional
RAR	Remedial Action Report
RAWP	Remedial Action Work Plan
SCG	Standards, Criteria and Guidance
SCO	Soil Cleanup Objective
SMMP	Soil/Materials Management Plan
SMP	Site Management Plan
SVOCs	Semi-Volatile Organic Compounds
UST	Underground Storage Tank
VOCs	Volatile Organic Compounds

CERTIFICATION

I, John A. Rhodes, am currently a registered professional engineer licensed by the State of New York. I performed professional engineering services and had primary direct responsibility for implementation of the remedial program for the 300 Lafayette Site, VCP #14CVCP201M, DCP Project ID # P2013M0115, CEQR # 77DCP091. I certify to the following:

- I have reviewed this document, to which my signature and seal are affixed.
- Engineering Controls implemented during this remedial action were designed by me or a person under my direct supervision and achieve the goals established in the Remedial Action Work Plan for this site.
- The Engineering Controls constructed during this remedial action were professionally observed by me or by a person under my direct supervision and (1) are consistent with the Engineering Control design established in the Remedial action Work Plan and (2) are accurately reflected in the text and drawings for as-built design reported in this Remedial Action Report.
- The OER-approved Remedial Action Work Plan dated November 5, 2013 and Stipulations in a letter dated [May 7, 2014] were implemented and that all requirements in those documents have been substantively complied with. I certify that contaminated soil, fill, liquids or other material from the property were taken to facilities licensed to accept this material in full compliance with applicable laws and regulations.

John A. Rhodes, PE

PE License: 84423

12/22/2017

I, Richard Levato, am a Qualified Environmental Professional. I had primary direct responsibility for implementation of the remedial program for the 300 Lafayette Site, VCP #14CVCP201M, DCP Project ID # P2013M0115, CEQR # 77DCP091 I certify to the following:

- The OER-approved Remedial Action Work Plan dated November 5, 2013 and Stipulations in a letter dated [May 7, 2014] were implemented and that all requirements in those documents have been substantively complied with. I certify that contaminated soil, fill, liquids or other material from the property were taken to facilities licensed to accept this material in full compliance with applicable laws and regulations.

Richard Levato

12/22/2017

EXECUTIVE SUMMARY

Paco Lafayette, LLC enrolled in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a property located at 298, 300, 302-308 Lafayette Street in Manhattan, New York. A Remedial Investigation (RI) was performed and a Remedial Action Work Plan (RAWP) prepared and submitted to the NYC Office of Environmental Remediation (OER). A remedial action was performed pursuant to an OER-approved RAWP and RAWP Stipulation List dated March 25, 2014, in a manner that has rendered the Site protective of public health and the environment consistent with the proposed use of the property. This RAR describes the remedial action performed in compliance with the RAWP and Stipulation List. The remedial action described in this document provides for the protection of public health and the environment, complies with applicable environmental standards, criteria and guidance and applicable laws and regulations.

As seen in the end point samples results in Table 1, Track 1 SCOs were achieved. We are respectfully request that the site's E-designation be removed.

Site Location and Background

The Site is located at 298, 300, 302-308 Lafayette Street at the corner of East Houston Street and Lafayette Street in Manhattan, New York and is identified as Block 510 and Lot(s) 38, 39, and 40 on the New York City Tax Map. The Site is 13,000-square feet and is bounded by East Houston Street to the north, Lafayette Street to the east, and Crosby Street to the west. Before demolition, Lot 40 was used as a gasoline service station and contained underground storage tanks, dispensers, a canopy, and a small convenience kiosk. Lots 38 and 39 had single-story brick buildings; Lot 38 had a bar and restaurant and Lot 39 had a real estate sales office.

Summary of Redevelopment Plan

The Site will consist of a new 7-story commercial development at 298 - 308 Lafayette Street (Block 510, Lots 38, 39, and 40) in the SoHo neighborhood of Manhattan. The proposed project would contain approximately 21,600 gross square feet (gsf) or 32,600

gsf of retail uses and either 49,500 gsf or 38,500 gsf of office uses depending on whether the second floor is occupied by a retail or office use.

The current zoning designation is M1-5B. The project Site is located in Manhattan Community District 2, within the SoHo-Cast Iron Historic District Extension and an M1-5B zoning district. The use is consistent with existing zoning for the property. To facilitate the proposed project, two special permits were required, under Zoning Resolution (ZR) Sections 74-712 and 74-922.

The development and construction required a full excavation of the proposed building footprint of approximately thirty-five (35) feet bgs to accommodate the two (2) cellar levels. Five previously unknown underground storage tanks (USTs) were removed and end-point samples were taken. The excavation activities removed all residual soil contamination that was encountered.

Summary of Description of Surrounding Property

The Site is bounded by East Houston Street to the north, Lafayette Street to the east, Crosby Street to the west, and by a residential apartment building to the south. New York City subway tunnels run down East Houston Street to the north of the Site and Lafayette Street to the east of the Site.

Summary of Past Site Uses and Areas of Concern

Lot 38 (298 Lafayette a/k/a 133 Crosby Street) contained a one (1) story pub/restaurant before demolition. It was originally a five-story brick factory, with the most recent building dating to about the 1930s. Lot 39 (300 Lafayette a/k/a 135 Crosby Street) contained a one (1) story building. It was originally a six -story brick factory which had its upper stories removed between 1934 and 1948. Lot 40 (302-308 Lafayette a/k/a 21 E. Houston Street) contained a seven -story building in the late 19th century, which was demolished during the subway construction beneath Houston Street. Before demolition, a gas station had been present at this location since at least the 1930s.

The AOCs identified for this Site include:

1. Petroleum contamination from the retail gasoline service station on Lot 40.
2. The uppermost stratum (first 15 to 20 feet) is made up of fill materials including brick, gravel, traces of concrete and wood, sand and some fine

to course sand and silt

3. Historically Lots 38 and 39 have been used for various commercial businesses, including auto repair companies on Lots 38 and 39 and a battery company on Lot 38.

Summary of the Work Performed under the Remedial Investigation

Paco performed the following scope of work:

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);

2. Installed five (5) soil borings, collected ten (10) soil samples for chemical analysis, and to evaluate soil quality;

3. Installed one (1) groundwater monitoring well, adding to the two (2) existing wells installed in 2006, and collected a groundwater sample from each of the three (3) monitoring wells for chemical analysis to evaluate groundwater quality and flow;

4. Installed three (3) soil vapor probes and collected three (3) samples for chemical analysis.

Summary of Findings of Remedial Investigation

1. Elevation of the property is approximately 40 feet above mean sea level (MSL).

2. Depth to groundwater is approximately 40 to 42 feet below ground surface at the Site.

3. Groundwater flow is generally from the northwest to the southeast beneath the Site.

4. Depth to bedrock is approximately 70 to 80 feet below ground surface at the Site.

5. The stratigraphy of the Site, from the surface down, consists of 15 to 20 feet of a sandy fill underlain by another 50 feet of a brown fine to course sand with trace to some silt and gravel.

6. Soil/fill samples collected during the RI showed volatile organic compounds (VOCs), SVOCs, polychlorinated biphenyls (PCBs) or pesticides were not

detected above Unrestricted Use Track 1 or Track 2 Commercial Soil Clean-up Objectives (SCOs). Several metals including arsenic (max. of 21.5 ppm), copper (max. of 305 ppm), chromium (max. of 32.3 ppm), lead (max. of 1650 ppm), magnesium (max. of 7,140 ppm), mercury (max. of 20.3 ppm) and zinc (max. of 3,140 ppm) exceeded Unrestricted Use SCOs. Of these metals arsenic, copper, lead and mercury also exceeded their respective Track 2 Commercial SCO.

7. Groundwater samples collected during the RI showed no VOCs or SVOCs exceeded their respective 6NYCRR Part 375 Class GA Groundwater Quality Standards (GQS). Only one pesticide, chlordane at a concentration of 0.071 µg/L, exceeded its standard of 0.050 µg/L. One PCB, Aroclor 1254 at 0.43 µg/L, exceeded its standard of 0.09 µg/L. Dissolved metals including aluminum, iron, manganese and sodium exceeded their respective GQS. None of the four metals detected above the Track 2 Restricted Commercial SCOs in soil exceeded the Class GA Groundwater standards in the tests for dissolved metals.

8. Soil vapor samples collected during the RI showed low to moderate concentrations of VOCs typical of gasoline service station operations as would be expected in the vicinity of an operating gasoline service station. Highest concentrations of petroleum-related VOCs included benzene (maximum of 200 µg/m3), ethanol (maximum of 260 µg/m3), ethylbenzene (maximum of 195 µg/m3), xylene (maximum of 699 µg/m3) and toluene (maximum of 2,390 µg/m3). These compounds were not detected in soil and groundwater. Chlorinated compounds were detected at low concentrations. Tetrachloroethylene (PCE) was identified in all three soil vapor samples at a maximum concentration of 14 µg/m3. Trichloroethylene (TCE) was identified in all three soil vapor samples at a maximum concentration of 6.8 µg/m3. Carbon tetrachloride was detected at a maximum concentration of 0.5 µg/m3. TCA was not detected in soil vapor. The TCE concentrations are above the monitoring level ranges established within the State DOH soil vapor guidance matrix.

Summary of the Remedial Action

The Remedial Action was performed in accordance with an OER-approved

Remedial Action Work Plan and RAWP Stipulation List. It achieved the Remedial Action Objectives established for the project. The Remedial Action was evaluated and determined to be protective of human health and the environment, compliant with standards, criteria, and guidelines (SCGs), effective in the short-term, effective in the long-term, capable of attaining appropriate levels of reduction of toxicity, mobility, or volume of contaminated material, implementable, cost effective, acceptable to the community, consistent with land uses, and sustainable.

A summary of the milestones achieved in the Remedial Action is as follows:

- A Pre-Application Meeting was held in April 2013.
- A Remedial Investigation (RI) was performed from May to June, 2013.
- A RI Report was prepared to evaluate data and information necessary to develop a Remedial Action Work Plan (RAWP).
- A Site Contact List was established.
- A RAWP was prepared and released with a Fact Sheet on November, 5, 2013 for a 30-day public comment period.
- The RAWP and Stipulation List dated November 5, 2013 were approved by the New York City Office of Environmental Remediation (OER) on May 7, 2014.
- Pre-Construction Meetings were held on November 13, 2015 and March 22, 2016.
- A Fact Sheet providing notice of the start of the remedial action was issued on January 3, 2014.
- The remedial action was begun in May, 2016 and completed in about April, 2017. The remedial action consisted of the following tasks:
- Prepared a Community Protection State and performed all required NYC VCP Citizen Participation activities according to an approved Citizen Participation Plan.
- Performed a Community Air Monitoring Program for particulate and volatile organic carbon compounds.
- Established Track 1 Unrestricted Soil Cleanup Objectives (SCOs).
- Site mobilization involved Site security setup, equipment mobilization, utility mark outs and permitting marking and staking excavation areas with MTA.

- Closure of gasoline station and removal of tanks and associated pipes. The gasoline service station facility was decommissioned and all UST's were removed including all associated piping, dispensers, and fill-ports in accordance with the NYSDEC regulations and applicable regulations of the Fire Department of the City of New York. The previously unknown tanks were registered and a PBS Application was submitted for those tanks on June 30, 2016. A PBS Facilities Modification form was submitted to the NYSDEC, see appendix 11.
- Excavated and removed soil/fill exceeding SCOs. Excavated and removed soil/fill exceeding Track 1 Unrestricted Use SCOs. Entire property was excavated to a depth of approximately 35 feet below grade for development purposes. Approximately 13,420 tons of soils were excavated from the Site.
- Screened soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID. Appropriate segregation of excavated media on-Site was conducted.
- Transported off-Site disposal of all soil/fill material at permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities. Appropriate segregation of excavated media on-Site was conducted.
- Collected and analyzed end-point samples to determine the performance of the remedy with respect to attainment of SCOs.
- Imported materials that was used for backfill and cover was in compliance with the plan and in accordance with applicable laws and regulations.
- Performed all activities required for the Remedial Action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations. Since groundwater is at a depth of 40 feet below ground surface; dewatering was not required.
- Implemented storm-water pollution prevention measures in compliance with applicable laws and regulations.

- Submitted daily reports during construction oversight activities. Daily reports were submitted from May 13, 2016 to April 10, 2017.
- Submitted a Sustainability Report.
- Submitted an RAR that describes the Remedial Action; certified that the remedial requirements defined in the RAWP had been achieved; defined the Site boundaries; and listed any changes from the RAWP.
- As part of development, a vapor barrier/waterproofing system was installed below the concrete slab underneath the building and behind foundation walls. The vapor barrier system consists of Grace Preprufe 300R on all slabs, pits, and sub-grade wall; Grace Preprufe SCS System on side walls with the addition of Raven Industries Stego Wrap 15 mil outboard to increase permeance of the SCS System, and Bituthene 3000 for the blind side vertical foundation wall along Cosby Street.
- As part of development, construction of an engineered composite cover consisting of a minimum six (6) inch concrete slab across the footprint of the new building.

Remedial Action Report

1.0 Site Background

1.1 Site Location and Background

The Site is located at 298, 300, 302-308 Lafayette Street at the corner of East Houston Street and Lafayette Street in Manhattan, New York and is identified as Block 510 and Lot(s) 38, 39, and 40 on the New York City Tax Map. The Site is 13,000-square feet and is bounded by East Houston Street to the north, Lafayette Street to the east, and Crosby Street to the west. Before demolition, Lot 40 was used as a gasoline service station and contained underground storage tanks, dispensers, a canopy, and a small convenience kiosk. Lots 38 and 39 had single-story brick buildings; Lot 38 had a bar and restaurant and Lot 39 had a real estate sales office.

1.2 Redevelopment Plan

The Site will consist of a new 7-story commercial development at 298 - 308 Lafayette Street (Block 510, Lots 38, 39, and 40) in the SoHo neighborhood of Manhattan. The proposed project would contain approximately 21,600 gross square feet (gsf) or 32,600 gsf of retail uses and either 49,500 gsf or 38,500 gsf of office uses depending on whether the second floor is occupied by a retail or office use.

The development and construction required a full excavation of the proposed building footprint of approximately thirty-five (35) feet bgs to accommodate the two (2) cellar levels. Therefore, excavation activities removed any residual soil contamination that was encountered. Additionally, the excavation allowed the discovery of five (5) previously unknown underground storage tanks (USTs) which were removed, end-point samples were taken, and contaminated soil remediated.

The current zoning designation is M1-5B. The project Site is located in Manhattan Community District 2, within the SoHo-Cast Iron Historic District Extension and an M1-5B zoning district. The use is 3 consistent with existing zoning for the property. To facilitate the proposed project, two special permits were required, under Zoning Resolution (ZR) Sections 74-712 and 74-922.

1.3 Surrounding Property

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1.4 Past Site Uses of Site and Areas of Concern

Lot 38 (298 Lafayette a/k/a 133 Crosby Street) contained a one (1) story pub/restaurant before demolition. It was originally a five-story brick factory, with the most recent building dating to about the 1930s. Lot 39 (300 Lafayette a/k/a 135 Crosby Street) contained a one (1) story building. It was originally a six -story brick factory which had its upper stories removed between 1934 and 1948. Lot 40 (302-308 Lafayette a/k/a 21 E. Houston Street) contained a seven -story building in the late 19th century, which was demolished during the subway construction beneath Houston Street. Before demolition, a gas station had been present at this location since at least the 1930s.

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1.5 Work Performed under the Remedial Investigation

Paco performed the following scope of work:

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2. Installed five (5) soil borings, collected ten (10) soil samples for chemical analysis, and to evaluate soil quality;
3. Installed one (1) groundwater monitoring well, adding to the two (2) existing wells installed in 2006, and collected a groundwater sample from each of the three (3) monitoring wells for chemical analysis to evaluate groundwater quality and flow;
4. Installed three (3) soil vapor probes and collected three (3) samples for chemical analysis.

Findings of Remedial Investigation

1. Elevation of the property is approximately 40 feet above mean sea level (MSL).
2. Depth to groundwater is approximately 40 to 42 feet below ground surface at the Site.
3. Groundwater flow is generally from the northwest to the southeast beneath the Site.
4. Depth to bedrock is approximately 70 to 80 feet below ground surface at the Site.
5. The stratigraphy of the Site, from the surface down, consists of 15 to 20 feet of a sandy fill underlain by another 50 feet of a brown fine to course sand with trace to some silt and gravel.
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2.0 DESCRIPTION OF REMEDIAL ACTIONS

The Remedial Action was performed in accordance with an OER-approved Remedial Action Work Plan and achieved the Remedial Action Objectives established for the project. The Remedial Action was evaluated and determined to be protective of

human health and the environment, compliant with standards, criteria, and guidelines (SCGs), effective in the short-term, effective in the long-term, capable of attaining appropriate levels of reduction of toxicity, mobility, or volume of contaminated material, implementable, cost effective, acceptable to the community, consistent with land uses, and sustainable.

A summary of the milestones achieved in the Remedial Action is as follows: A Pre-Application Meeting was held on April 2013. A Remedial Investigation (RI) was performed from May to June, 2013. A RI Report was prepared to evaluate data and information necessary to develop a Remedial Action Work Plan (RAWP). A Site Contact List was established. A RAWP was prepared and released with a Fact Sheet on November, 5, 2013 for a 30-day public comment period. The RAWP and Stipulation List dated November 5, 2013 was approved by the New York City Office of Environmental Remediation (OER) on May 7, 2014. A Pre-Construction Meeting was held on March 22, 2016. A Fact Sheet providing notice of the start of the remedial action was issued on January 3, 2014. The remedial action was begun in May, 2016 and completed in April, 2017.

The remedial action consisted of the following tasks:

- Prepared a Community Protection State and performed all required NYC VCP Citizen Participation activities according to an approved Citizen Participation Plan.
- Performed a Community Air Monitoring Program for particulate and volatile organic carbon compounds.
- Established Track 1 Unrestricted Soil Cleanup Objectives (SCOs).
- Site mobilization involved Site security setup, equipment mobilization, utility mark outs and permitting marking and staking excavation areas with MTA.
- Closure of gasoline station and removal of tanks and associated pipes. The gasoline service station facility was decommissioned and all UST’s were removed including all associated piping, dispensers, and fill-ports in accordance with the NYSDEC regulations and applicable regulations of the Fire Department of the City of New York. The previously unknown tanks were registered and a PBS

Application was submitted for those tanks on June 30, 2016. A PBS Facilities Modification form was submitted to the NYSDEC, see appendix 11.

- Excavated and removed soil/fill exceeding SCOs. Excavated and removed soil/fill exceeding Track 1 Unrestricted Use SCOs. Entire property was excavated to a depth of approximately 35 feet below grade for development purposes.
- Screened soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID. Appropriate segregation of excavated media on-Site was conducted.
- Transported off-Site disposal of all soil/fill material at permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities. Appropriate segregation of excavated media on-Site was conducted.
- Collected and analyzed end-point samples to determine the performance of the remedy with respect to attainment of SCOs.
- Imported materials that was used for backfill and cover was in compliance with the plan and in accordance with applicable laws and regulations.
- Performed all activities required for the Remedial Action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations. Since groundwater is at a depth of 40 feet below ground surface, dewatering was not required.
- Implemented storm-water pollution prevention measures in compliance with applicable laws and regulations.
- Submitted daily reports during construction oversight activities. Daily reports were submitted from May 13, 2016 to April 10, 2017
- Submitted a Sustainability Report.
- Submitted (herein) an RAR that describes the Remedial Action; certifies that the remedial requirements defined in the RAWP had been achieved; defines the Site boundaries; and lists any changes from the RAWP.

- As part of development, a vapor barrier/waterproofing system was installed below the concrete slab underneath the building and behind foundation walls. The vapor barrier system consists of Grace Preprufe 300R on all slabs, pits, and sub-grade wall; Grace Preprufe SCS System on side walls with the addition of Raven Industries Stego Wrap 15 mil outboard to increase permeance of the SCS System, and Bituthene 3000 for the blind side vertical foundation wall along Cosby Street.
- As part of development, construction and maintenance of an engineered composite cover consisting of a minimum six (6) inch concrete slab across the footprint of the new building.

3.0 COMPLIANCE WITH REMEDIAL ACTION WORK PLAN

3.1 CONSTRUCTION HEALTH & SAFETY PLAN

The remedial construction activities performed under this program were in compliance with the Construction Health and Safety Plan and applicable laws and regulations. The Site Safety Coordinator was John Paul Murano.

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 from June 2016 to December 2016 in compliance with the Community Air Monitoring Plan in the approved RAWP. The results of Community Air Monitoring are provided in Appendix 13.

3.3 SOIL/MATERIALS MANAGEMENT PLAN

The Soil/Materials Management Plan provided detailed plans for managing all soil/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 RAWP.

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 full compliance with methods and processes defined in the RAWP for storm water prevention and applicable laws and regulations.

3.5 PROJECT ORGANIZATION

The Professional Engineer responsible for preparation of the Remedial Action and oversight of its implementation was John A. Rhodes, P.E. Site work related to remediation was managed by Richard Levato, Advanced Site Restoration, LLC, under the supervision of John Rhodes. This constituted the team responsible for the remediation aspects of this development construction. The contractors involved in the Remedial Action included LargaVista and The Related Companies.

3.6 SITE CONTROLS

Site Preparation

An OER Project Notice was erected at the project entrance and was in place during all phases of the Remedial Action.

Mobilization

Mobilization was conducted as necessary for each phase of work 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.

Erosion and Sedimentation Control

Tarp covers and erosion fencing, and a program for frequent inspection were

implemented for erosion and sedimentation control. Silt fencing and hay bales were used as needed near catch basins, surface waters and other discharge points.

Agency Approvals

All permits or government approvals required for remediation and construction were obtained prior to the start of remediation and construction.

Soil Screening

Visual, olfactory and PID soil screening and assessment was performed under the supervision of Richard Levato, the Qualified Environmental Professional, and John Rhodes, the Professional Engineer.

Stockpile Management

Excavated soils were directly loaded onto transport trucks in accordance with pre-excavation testing. This avoided the creation of extensive stockpiles of excavated soils.

Truck Inspection

An outbound-truck inspection station was set up close to the Site exit. Before exiting the Site, trucks were required to stop at the truck inspection station and examined for evidence of contaminated soil on the undercarriage, body, and wheels. Soil and debris was removed. Brooms, shovels and potable water was utilized for the removal of soil from vehicles and equipment, as necessary. The Site Development Constructor and/or development Construction Manager was required to assist in this process for contaminated soil loads.

Site Security

Site access was controlled by the Site Development Constructor and development Construction Manager in accordance with New York City regulations.

Nuisance Controls

Odor Control

All necessary means were employed to prevent on- and off-Site odor nuisances. At a minimum, procedures included: (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 developed and couldn’t otherwise be controlled,

additional means to eliminate odor nuisances included: (d) direct load-out of soils to trucks for off-Site disposal; and use of chemical odorants in spray or misting systems.

This odor control plan was capable of controlling emissions of nuisance odors. No nuisance odors were identified, Implementation of all odor controls, including halt of work, was the responsibility of the PE/QEP's certifying the RCR.

Dust Control

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

- Use of a dedicated water spray methodology for roads, excavation areas and stockpiles.
- Use of properly anchored tarps to cover stockpiles.
- Exercised 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.

This dust control plan was capable of controlling emissions of dust. No nuisance dust emissions were identified,. Implementation of all dust controls, including halt of work, was the responsibility of the PE/QEP's responsible for certifying the Remedial Closure Report.

Other Nuisances

Noise control was exercised during the remedial program. All remedial work conformed, at a minimum, to NYC noise control standards.

Reporting

Job-site record keeping for all remedial work was performed. These records were maintained on-Site during the project and were available for inspection by OER staff.

Daily reports provided a general summary of activities for each day of active remedial work and were emailed to the OER Project Manager by the end of the following day. Those reports included:

- Project number and statement of the activities and an update of progress made and locations of work performed;
- Quantities of material imported and exported from the Site;

- Status of on-Site soil/fill stockpiles;
- A summary of all citizen complaints, with relevant details (basis of complaint; actions taken; etc.);
- A summary of CAMP excursions, if any;
- Photograph of notable Site conditions and activities.

Representative photographs were taken of the Site prior to any remedial activities and during major remedial activities to illustrate remedial program elements and contaminant source areas.

Monthly reports were prepared and submitted to the OER.

All daily and monthly reports are included in Appendix 3. Digital photographs of the Remedial Action are included in Appendix 4.

3.7 MATERIALS EXCAVATION AND REMOVAL ACTION

Petroleum contaminated soil, fill, and clean soil were removed from the site during the excavation for building construction. Figure 5 is a map showing the locations and depths of excavation.

A total of 13,420 cubic yards of soil/fill were excavated and removed from the property during the Removal Action. Materials removed from the property under this Removal Action is generally classified, as follows:

45 gallons of petroleum contaminated liquid waste,
Seven (7) USTs,
13,420 cubic yards of soil comprised of approximately 12,640 cubic of shallow fills and contaminated soil, and approximately 780 cubic yards of native and clean soil, of which 780 cubic yards were recycled using the NYC Clean Soil Bank program.

The tanks discovered during the remediation were: Tank #1 (550 gal.) found near the south west corner of the Site; Tanks #2. #3, and #4 (275 gal. each) found next to each

other on the south side and close to the middle of the Site; and Tank #5 (550 gal.) found on the north side and close to the middle of the Site.

The Removal Action was performed under the oversight of Richard Levato, the Qualified Environmental Professional, and John Rhodes, PE.

Removal Action Performance Criteria.

The site was excavated to a depth of 35 fbg as per the development plan. This allowed all contaminated soil to be removed. End Point samples demonstrated achievement of Track 1 SCOs.

Material Type.

Clean soil as well as petroleum contaminated soil, fill, and clean soil were encountered during excavation, as expected.

Former Automotive Service station UST Removal

For the two known USTs, Gemstar removed the two (2) UST's in accordance with New York State Department of Environmental Conservation (NYSDEC), Spill Prevention Operations Technology Series (SPOTS) Memo #14, Site Assessments at Bulk Storage Facilities (August 1994).

In accordance with the approved RAWP for this site, the five (5) side wall and three (3) bottom soil samples were to be collected from the final excavation depth. However, once the USTs were exposed and the pea gravel encasing the USTs removed, the original installation supports comprised of solder piles and shoring were found to still be in place. This precluded the collection of any side wall or bottom soil samples at that time. The bottom tank foundation was determined to be approximately 14 inches thick and there was no indication of staining on the concrete foundation or the pea gravel that was beneath the two tanks. The clean appearance of the bottom tank foundation indicated that there were no leaks or spills of product into the ground.

After the Site had been fully excavated, the RAWP end point samples confirmed the absence of contamination from the two known USTs. The RAWP end point samples

were provided to and accepted by the NYSDEC who approved the tank closure.

Discovered UST Removal

For the 5 unknown USTs, after any residual liquid was removed from the USTs, they were crushed and placed into a roll-off container owned by Action Environmental Services, Inc., Newark, New Jersey for disposal. Tank contents were disposed of by American Petroleum Equipment & Construction Company and AARCO Environmental Services Corp. Contaminated soil from beneath USTs #2, # 3 and #4 was disposed of at Soil Safe Inc. Metro 12 facility located in Carteret, New Jersey. The approximate location of USTs are shown in Figure 7. FDNY tank removal affidavit is included in Appendix 14. All tanks were registered with NYS DEC PBS unit.

UST Post-excavation Samples

Endpoint soil samples were collected beneath the USTs and if feasible from the sidewalls. A total of eight (8) soil samples were collected, three (3) sidewall and five (5) bottom samples.

Soil samples were submitted to Phoenix Environmental Laboratories, Inc. (Phoenix) of Manchester Connecticut, a New York State (NYS) Department of Health Environmental Laboratory Accreditation Program, I.D. No. 11301. The soil samples were analyzed for volatile organic compounds (VOCs) by United States Environmental Protection Agency (USEPA) Method 8260C and for semi volatile organic compounds (SVOCS) by USEPA method 8270D. The analytical results compared to the NYSDEC NYCRR Part 375-6 Soil Cleanup Objectives are shown on Table 1. The analytical reports from Phoenix is provided in Appendix 8.

A sample of the oil from UST #2 was collected for evaluation using a Gas Chromatograph/ Flame Ionization Detector (GC/FID) for product identification and submitted to Phoenix. The analytical results indicated a mid-range petroleum oil rather than gasoline.

The petroleum impacted soils from the five (5) undocumented USTs were excavated with off-site disposal of the contaminated soil.

The continuation of the construction excavation completed the remediate the soil

beneath and surrounding the USTs that contained concentrations of SVOCs that exceeded the Unrestricted Use and Restricted Residential Use SCOs. In addition, in accordance with the OER RAWP, side wall and bottom end point samples were collected. These samples also confirmed the adequacy of the remediation of contamination associated with the five (5) undocumented USTs.

The NYS DEC Petroleum Spill Number associated with the five (5) discovered USTs is 16-06456. The spill closure report is dated July 13th, 2017. Correspondence associated with the NYS DEC Petroleum Spill and approval of the spill closure is located in Appendix 11.

3.8 Soil Cleanup Objectives and End Point Sample Results

The SCOs for this Remedial Action are Track 1 SCOs listed in Table 2.

End Point Samples

RAWP specified end point samples were taken from January 17, 2017 to April 18, 2017. All sample results were below Track 1 SCOs as no contaminants were detected. End point samples included:

Sidewall Endpoint Samples (18-20 ft.): GRID 9 SW #1, GRID 10 SW, GRID 13 SW, GRID 9 SW #2, ASR SW 3, ASR SW 1, ASR SW 2, ASR-C-1 SW, and ASR-C-2 SW.

Bottom Endpoint Samples (35-40 ft.): ASR 12-2 BOTTOM, ASR 11-3 BOTTOM, ASR 10-5 BOTTOM, ASR 11-6 BOTTOM, and ASR 8-3 BOTTOM.

A map of end-point sample locations is shown in Figure 3. A tabular summary of end-point sampling results compared to SCO's is included in Table 1.

End Point Data Usability Summary

Soil Sampling

Soil samples were collected using disposable spatulas at the bottom of the excavation.

Decontamination Methods

The soil samples were collected with disposable plastic spatulas and no equipment decontamination will be required.

Sample Containers, Preservatives and Holding Times

ANALYSIS	NO.	BOTTLE TYPE	PRESERVATIVE(1)	HOLDING TIME(2)
Soil, Sediment, Solid Waste				
TCL organics		Wide mouth, plastic or glass	None	7 days (until extraction, 40 days extracted)
TCL inorganics		Wide mouth, plastic or glass	None	6 months Cyanide: 12 days Mercury: 28 days

(1) All samples were preserved with ice during collection and shipment.

(2) From verified time of sample receipt by the analytical laboratory (within 24 to 48 hours of collection).

(3) Metals refers to the 24 metals and cyanide in the Target Compound List (NYSDEC-CLP 11/87).

Lab Blanks and QA/QC

The validity of the data produced was assessed for precision and accuracy. Analytical methods used include gas chromatography/mass spectrometry (GC/MS), gas chromatography (GC), colorimetry, atomic spectroscopy, gravimetric and titrimetric techniques. The following outlines the procedures for evaluating precision and accuracy, routine monitoring procedures, and corrective actions to maintain analytical quality control. All data evaluations were consistent with NYSDEC-ASP procedures (June

2000). Data was 100 percent compliant with NYSDEC-ASP requirements.

The requirements of QA/QC are both method specific and matrix dependent. The number of duplicate, spiked and blank samples analyzed were dependent upon the total number of samples of each matrix to be analyzed, but there was at least one split per matrix. The inclusion and frequency of analysis of field blanks and trip blanks was on the order of one per each site. Samples analyzed for volatile organic compounds were accompanied by trip and field blanks (water matrix) or field blanks (soil, sediment matrices).

Quality assurance audit samples were prepared and submitted by the laboratory QA manager for each analytical procedure used. The degree of accuracy and the recovery of analyte expected for the analysis of QA samples and spiked samples was dependent upon the matrix, method of analysis, and compound or element being determined. The concentration of the analyte relative to the detection limit was also a major factor in determining the accuracy of the measurement. The lower end of the analytical range for most analyses was generally accepted to be five times the detection limit. At or above this level, the determination and spike recoveries for metals in water samples was expected to range from 75 to 125 percent. The recovery of organic surrogate compounds and matrix spiking compounds determined by GC/MS was compared to the guidelines for recovery of individual compounds as established by the United States Environmental Protection Agency Contract Laboratory Program dated 7/85 or as periodically updated.

The quality of results obtained for inorganic ion and demand parameters was assessed by comparison of QC data with laboratory control charts for each test.

3.9 MATERIALS DISPOSAL

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

Disposal Location/Address	Type of Material	Quantity
Soil Safe Metro-12/300 Salt	Non-	8,660 cubic yards

Meadow Road, Carteret, NJ, 07008 Vanbro Richmond Disposal Facility/1900 South Avenue, Staten Island, NY, 10314	Hazardous/Petroleum Contaminated Soil	
P Park/100 Planten Avenue, Prospect Park, NJ, 07508	Clean Soil	3,980 cubic yards
Former Cascade	Clean Soil in NYC Clean Soil Bank	780 cubic yards

Letters to disposal facility providing materials type, source and data, and acceptance letters from disposal facility stating it is approved to accept above materials are attached in Appendix 5. Manifests are provided in Appendix 6. Characterization sample results are presented in Appendix 7.

3.10 BACKFILL IMPORT

Backfill came from NYC Concrete Materials, LLC, 320 tons of recycled blend, P Park, 2 ½" stone and ¾" stone, and American Materials, 218.38 tons of 3/8" clean stone.

Full laboratory reports are included in Appendix 12.

3.11 DEVIATIONS FROM THE REMEDIAL ACTION WORK PLAN

The RAWP specified Raven Industries VaporBlock Plus 20, manufactured by Raven industries, or its equivalent or superior, for the vapor barrier beneath the building slab, turned up at the vertical walls to meet the vertical vapor barrier. Additionally, the RAWP specified that the vapor barrier for the vertical walls would be determined later in conjunction with the Architect's plans for building water proofing. An overall permeance of 0.0098 perms was specified.

The vapor barrier constructed beneath the slab was modified and vertical wall materials clarified to be comprised of Grace vapor barrier and water proofing products; these changes were proposed to and approved by the OER. Specifically, Preprufe 300R was used under all slabs, pits, and sub-grade walls. A Preprufe 300R SCS System with a Bituthene overlap was used on vertical walls. To increase the permeance, and additional wrap of Raven Industries Stego 15 was used around and supplementing the SCS System on vertical walls. On the blind side wall along Cosby Street, Bithuene was used after confirmation of its permeance at 0.009 perms or less.

The OER-approved RAWP specified the removal of two known USTs and associated piping. In addition to these removals, five (5) previously unknown USTs were removed.

4.0 ENGINEERING CONTROLS

A Track 1 Remedial Action criteria are achieved and Engineering Controls are not required. However, as part of construction, several protective systems were specified in the RAWP and installed. These are:

(1) a Composite Cover System consisting of concrete building slabs;

(2) Vapor Barrier 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 The building footprint and sidewalks. No soils were left exposed.

Vapor Barrier System

Exposure to soil vapor is prevented by a Vapor Barrier System that has been built on the Site. The vapor barrier system consists of Grace Preprufe 300R on all slabs, pits, and sub-grade walls; Grace Preprufe SCS System on side walls with the addition of Raven Industries Stego Wrap 15 mil outboard to increase permeance of the SCS System, and Bituthene 3000 for the blind side vertical foundation wall along Cosby Street.

The certifying professional engineer for the Vapor Barrier System was John Rhodes, PE. The design and construction of the vapor system were done by WJE Engineers and Architects, PC. Figure 8 shows the as-built drawing for the Vapor Barrier System provided by WJE Engineers and Architects. Photographs of installation of the Vapor Barrier System are included in Appendix 10. A copy of the certificates of warranty is included in Appendix 10.

5.0 INSTITUTIONAL CONTROLS

Track 1 Remedial criteria were achieved by the Remedial Action. Therefore, Institutional Controls are not required. We are respectfully asking that the E-designation be removed from the Site.

6.0 SITE MANAGEMENT PLAN

A Track 1 Remedial Action criteria were achieved. Further Site Management is not required.