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# REMEDIAL CLOSURE REPORT

for

**3514 SURF AVENUE  
Brooklyn, New York**

**Block 7065, Lot 20 (Zoning Lot B)  
Restrictive Declaration R-46  
CEQR No. 03DCP065K  
OER Project No. 17RHAZ116K**

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***LANGAN***

**June 25, 2019  
Langan Project No. 005798903**

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## TABLE OF CONTENTS

<b>TABLE OF CONTENTS .....</b>	<b>ii</b>
<b>LIST OF ACRONYMS.....</b>	<b>iv</b>
<b>CERTIFICATION .....</b>	<b>vi</b>
<b>EXECUTIVE SUMMARY.....</b>	<b>vii</b>
<b>REMEDIAL CLOSURE REPORT .....</b>	<b>1</b>
<b>1.0 SITE BACKGROUND.....</b>	<b>1</b>
1.1 Site Location and Prior Usage .....	1
1.2 Redevelopment Plan.....	1
1.3 Description of Surrounding Property .....	2
1.4 Summary of Past Uses of the Site and Areas of Concern.....	3
1.5 Summary of Environmental Work Performed Under the Remedial Investigation.....	3
1.6 Findings of the Remedial Investigation.....	4
<b>2.0 DESCRIPTION OF REMEDIATION.....</b>	<b>7</b>
2.1 Objectives.....	7
2.2 Summary of Remedial Actions .....	7
<b>3.0 COMPLIANCE WITH THE REMEDIAL ACTION PLAN .....</b>	<b>11</b>
3.1 Construction Health and Safety Plan .....	11
3.2 Community Air Monitoring Plan.....	11
3.3 Soil/Materials Management Plan .....	11
3.4 Storm-Water Pollution Prevention .....	11
3.5 Deviations from the Remedial Action Plan .....	12
<b>4.0 REMEDIAL PROGRAM .....</b>	<b>13</b>
4.1 Project Organization.....	13
4.2 Site Controls .....	13
4.3 Soil Cleanup Objectives .....	15
4.4 Materials Excavation and Removal .....	16
4.5 Materials Disposal .....	16
4.6 Imported Material and Reuse of Soils.....	17
4.7 Documentation Endpoint Soil Samples .....	18
4.8 Demarcation.....	18
<b>5.0 ENGINEERING CONTROLS.....</b>	<b>19</b>
5.1 Composite Cover System.....	19
5.2 Waterproofing/Vapor Barrier.....	19
<b>6.0 INSTITUTIONAL CONTROLS .....</b>	<b>20</b>
<b>7.0 SITE MANAGEMENT PLAN .....</b>	<b>21</b>
7.1 Engineering Controls.....	21
7.2 Institutional Controls.....	22
7.3 Inspections .....	23
7.4 Composite Cover and Waterproofing/Vapor Barrier System.....	23
7.5 Site Use Prohibitions.....	24
7.6 Inspection and Certification Letter Report.....	24
7.7 Notifications.....	25
7.8 Soil/Materials Management Plan .....	25

## **TABLES**

Table 1A	Material Disposal Log - Capital
Table 1B	Material Disposal Log - Greenvue
Table 1C	Material Disposal Log - Hazleton
Table 1D	Material Disposal Log - Phillipsburg
Table 2	Material Import Log
Table 3	Documentation Endpoint Soil Sample Analytical Results Summary

## **FIGURES**

Figure 1	Site Location Map
Figure 2	Development Plan
Figure 3	Surrounding Land Use Map
Figure 4	Excavation and Backfill Plan
Figure 5	Documentation Endpoint Soil Sample Location Map
Figure 6	Composite Cover System Plan
Figure 7A	Waterproofing/Vapor Barrier Layout Plan
Figure 7B	Waterproofing/Vapor Barrier Detail Plan

## **APPENDICES**

Appendix A	Redevelopment Plans
Appendix B	Previous Environmental Reports
Appendix C	Community Air Monitoring Reports
Appendix D	Daily Field Reports
Appendix E	Waste Disposal Documentation
Appendix F	Import Material Documentation
Appendix G	Laboratory Analytical Data Reports
Appendix H	Waterproofing/Vapor Barrier Documentation

## LIST OF ACRONYMS

Acronym	Definition
Alpha	Alpha Analytical Laboratories of Westborough, Massachusetts
AOC	Areas of Concern
ASTM	American Society for Testing and Materials
bgs	Below Grade Surface
BTEX	Benzene, Toluene, Ethylbenzene and Total Xylenes
BUD	Beneficial Use Determination
C&D	Construction & Demolition
CAMP	Community Air Monitoring Plan
CEQR	City Environmental Quality Review
CHASP	Construction Health and Safety Plan
CP	Commissioner Policy
EC	Engineering Control
ELAP	Environmental Laboratory Accreditation Program
EPA	Environmental Protection Agency
ESA	Environmental Site Assessment
ESI	Environmental Site Investigation
eV	Electron Volt
HASP	Health and Safety Plan
HDPE	High-density Polyethylene
Hudson Meridian	Hudson Meridian Construction Group
IC	Institutional Control
Kingdom	Kingdom Contracting, LLC
NOC	Notice of Completion
NYC	New York City
NYC DEP	New York City Department of Environmental Protection
NYC DOB	New York City Department of Buildings
NYCRR	New York Codes Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDEC DER	New York State Department of Environmental Conservation Division of Environmental Remediation
NYS DOH	New York State Department of Health

NYC OER	New York City Office of Environmental Remediation
PCBs	Polychlorinated Biphenyls
P.E.	Professional Engineer
PID	Photoionization Detector
PM-10	Particulate Matter Less Than 10 Micrometers
QA/QC	Quality Assurance/Quality Control
QEP	Qualified Environmental Professional
RAP	Remedial Action Plan
RCA	Recycled Concrete Aggregate
RCR	Remedial Closure Report
RI	Remedial Investigation
RIR	Remedial Investigation Report
RURR	Restricted Use Restricted-Residential
SCG	Standards, Criteria and Guidance
SCOs	Soil Cleanup Objectives
SGV	Standards and Guidance Values
SMMP	Soil/Materials Management Plan
SMD	Sub-Membrane Depressurization
SMP	Site Management Plan
SPDES	State Pollutant Discharge Elimination System
SVOCs	Semi-Volatile Organic Compounds
TAL	Target Analyte List
TCL	Target Compound List
TOGS	Technical and Operational Guidance Series
UST	Underground Storage Tank
UU	Unrestricted Use
VCA	Voluntary Cleanup Agreement
VCP	Voluntary Cleanup Program
VOCs	Volatile Organic Compounds

### CERTIFICATION

I, Jason Hayes, 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 3514 Surf Avenue site, Site No. 17RHAZ116K. 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 February 1, 2017 Remedial Action Plan (RAP) 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 RAP and (2) are accurately reflected in the text and drawings for as-built design reported in this Remedial Closure Report (RCR).
- The NYC OER-approved February 1, 2017 RAP and August 7, 2017 RAP Addendum were implemented and all requirements in those documents have been substantively complied with. I certify that, to the best of my knowledge, in my function as a remedial engineer, contaminated soil, fill, liquids or other material from the site were taken to facilities licensed to accept this material in full compliance with applicable laws and regulations.

Jason Hayes  
Name

089491  
PE License Number

[Signature]  
Signature

6/25/2019  
Date



## **EXECUTIVE SUMMARY**

Red Apple Surf Realty III remediated an approximately 75,000-square-foot site located at 3514 Surf Avenue in 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 and complies with applicable environmental standards, criteria, guidance, applicable laws and regulations.

### **Site Location and Prior Usage**

The approximately 75,000-square-foot site is located in the Coney Island neighborhood of Brooklyn, New York and is identified as Block 7065, Lot 20 (former Lots 15, 20, and 25) on the New York City (NYC) Borough of Brooklyn Tax Map. The site, also known as Zoning Lot B on project documents and plans, encompasses a continuous city block that is bound by Surf Avenue followed by multi-story residential buildings to the north, West 35<sup>th</sup> Street followed by a community center building to the east, West 36<sup>th</sup> Street followed by Zoning Lot A to the west, and the Riegelmann Boardwalk followed by Coney Island Beach to the south.

Prior to redevelopment, the site was vacant and covered with vegetation and discontinuous patches of asphalt and concrete. The pre-construction elevation of the site ranged from elevation (el.) 6.37 feet<sup>1</sup> to 12.93 feet. The site is subject to a Restrictive Declaration (R-46) for hazardous materials pursuant to the Surf Avenue Rezoning Action (City Environmental Quality Review [CEQR] No. 03DCP065K) in 2005.

### **Summary of Proposed Redevelopment Plan**

Development of the 75,000-square-foot site consists of two towers atop a shared two-story podium on the northern part of the site and a three-story parking garage on the southern part of the site. The parking garage and podium have different ground floor elevations but have a connected roof with landscaping. The ground floor of the podium contains vestibules, a lobby and retail space and the second floor contains utility rooms, amenity spaces, a fitness center, pool, locker rooms and access to the landscaped roof. The towers only contain residential units. The development contains about 20,000 square feet of retail, 82,000 square feet of parking, and 320,000 square feet of residential space. Preparation of the site for development required a net cut of about 8,000 cubic yards of soil/fill material.

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<sup>1</sup> North American Vertical Datum of 1988 (NAVD 88). Vertical datum for elevations referenced in this document is the North American Vertical Datum of 1988, which is approximately 1.1 feet above mean sea level datum at Sandy Hook, New Jersey as defined by the United States Geologic Survey (USGS NGVD 1929).

Areas outside of the building footprint include terraced stairs with landscaping along the Surf Avenue entrance and landscaped areas containing pathways to the street and boardwalk. The end use of the site is consistent with the zoning designation for the site (R7-3 with a commercial [C2-4] overlay).

### Site Description, Physical Setting and Site History

The site is located in an area generally characterized by multi-story residential and community buildings in zoning districts designated for residential and commercial uses, as summarized in the following table:

DIRECTION	ADJOINING PROPERTIES	SURROUNDING PROPERTIES
North	Surf Avenue	Multi-story residential and community buildings including the Jasa Scheuer House Senior Center (3601 Surf Avenue), the O'Dwyer Gardens Coney Island Site 8 Housing Development (2950-2952 West 35 <sup>th</sup> Street) and O'Dwyer Gardens Housing Development (2950-2952 West 33 <sup>rd</sup> Street)
East	West 35 <sup>th</sup> Street	The F.E.G.S. Community Rehabilitation Center (3312-3330 Surf Avenue)
South	Riegelmann Boardwalk	Coney Island Beach and the Lower Bay/Atlantic Ocean
West	West 36 <sup>th</sup> Street	Vacant lot "Zoning Lot A" and the Surf Solomon Senior Center/YMCA Robert Wright Learning Center (3001 Surf Avenue) followed by West 37 <sup>th</sup> Street and the Sea Gate Beach & Cabana Club (3700 Surf Avenue)

Nearby sensitive receptors include the Surf Solomon Senior Center/YMCA Robert Wright Learning Center (located about 300 feet west of the site) and the F.E.G.S. Community Rehabilitation Center (located about 75 feet east of the site). The nearest hospital is the Coney Island Hospital, located about 2 miles northeast of the site. A public school (Primary School 329) is located about 1,400 feet to the northeast of the site.

### Summary of Past Uses of the Site and Areas of Concern

According to the June 2002 Phase I Environmental Site Assessment (ESA) by Merritt Engineering Consultants, P.C. (Merritt) and the November 20, 2007 Phase I ESA by Langan, the site has been developed since at least 1905. Former on-site uses include hotels (Lots 6 and 12), bathhouses (Lots 6, 12, 15 and 20), a laundry (Lots 15 and 20), retail buildings (Lots 12 and 15), multi-story residential buildings (Lots 12, 15, 20, and 25), an auto-wrecking yard (Lot 15), parking lots (Lots



15 and 25), a 1-story parking structure (Lot 15), food stores (Lot 12), a construction storage yard (Lots 15, 20, and 25), and a truck and school bus repair facility (Lots 6 and 12).

The areas of concern (AOC) identified during the previous investigations consist of the following:

1. Fill Material – Historic fill material was identified during previous environmental investigations and typically consists of construction and demolition debris (brick, wood, concrete, metal, etc.). Soil samples collected as part of previous subsurface investigations identified concentrations of semivolatile organic compounds (SVOC) and metals consistent with concentrations typically seen in historic fill in New York City.
2. Historical Site Use – The site was historically used as an auto-wrecking yard (Lot 12) and a former truck and school bus repair facility (Lots 6 and 12). In addition, previous investigations have identified oil staining on the ground, miscellaneous oil, waste oil, unknown drum storage areas, and oil associated with these former uses seeping from under a concrete wall at the Lot 12 and 36th Street boundary.
3. Current and Historical Surrounding Property Use – Potential environmental impacts may be associated with historical and current usage of the surrounding properties, including active LTANKS facilities and surrounding properties that were used for a variety of manufacturing operations.

### **Summary of the Work Performed under the Remedial Investigation (RI)**

A Phase II Environmental Site Investigation (ESI) was completed by Langan in 2007, and a supplemental RI was performed from July 18 through August 3, 2016. These investigations were completed for both the site (Zoning Lot B) and Block 7065 Lots 6 and 12 (the west adjacent lots known as Zoning Lot A).

The following scope of work was performed during the 2007 Phase II ESI:

- Implemented a site-specific Health and Safety Plan (HASP)
- Conducted a site inspection, including a geophysical survey, to identify potential Areas of Concern (AOCs) and buried obstructions (i.e. former structures, etc.)
- Advanced 28 soil borings and collected 21 grab soil samples for laboratory analysis to evaluate soil quality
- Installed four groundwater monitoring wells and collected four groundwater samples for laboratory analysis to evaluate groundwater quality

To supplement data from the 2007 Phase II ESI, Langan performed the following scope of work during the RI:

- Implemented the site-specific HASP included in the July 2016 Remedial Investigation Work Plan (RIWP)
- Conducted a site inspection, including a geophysical survey, to identify potential AOCs and buried obstructions (i.e. former structures, etc.)
- Advanced 6 soil borings and collected 13 grab soil samples (including one duplicate) for laboratory analysis to evaluate soil quality
- Installed 4 groundwater monitoring wells and collected 4 groundwater samples for laboratory analysis to evaluate groundwater quality
- Installed 6 soil vapor probes and collected 6 soil vapor samples for laboratory analysis to evaluate soil vapor quality
- Collected 1 field blank sample and included one trip blank for quality assurance/quality control (QA/QC) purposes
- Conducted a tidal survey within 2 geotechnical observation wells installed during a June 2016 Geotechnical Study by Langan
- Advanced 5 test pits during Langan's June 2016 geotechnical study to further investigate geophysical anomalies identified during the 2007 Phase II ESI

### **Summary of the Remedial Investigation**

1. Pre-development elevation of Zoning Lots A and B ranged from el. 6.37 feet to 12.93 feet.
2. The geophysical survey indicated the presence of a decommissioned gas line within Lot 25, two 'high noise' areas within Lot 25, and a 'high noise' area running north-south within Lot 6 (Zoning Lot A).
3. Depth to groundwater ranges from about 6 to 9 feet below pre-development grade surface (bgs). The tidal survey indicated an average depth to groundwater fluctuation of about 0.4 feet, indicating minimal tidal influence on the depth to groundwater beneath the site.
4. Groundwater flow below both zoning lots is generally from north to south.
5. Depth to bedrock is greater than 200 feet below both zoning lots.
6. The stratigraphy of both zoning lots, from the surface down, consists of up to five feet of historic fill consisting of fine to medium sand with gravel, glass, brick, plastic, wood, concrete, and asphalt; underlain by native fine to medium sand.

7. Soil/fill samples collected during the 2007 Phase II ESI and 2016 RI were compared to the 6 New York Codes, Rules and Regulations (NYCRR) Part 375 Section 6.8 Unrestricted Use (UU) Soil Cleanup Objectives (SCOs) and Restricted Use Restricted-Residential (RURR) SCOs. The Phase II and RI sample results are summarized as follows:

- Zoning Lot B: The volatile organic compounds (VOCs) 1,4-dioxane (maximum of 0.361 milligrams per kilogram [mg/kg]), 2-butanone (maximum of 0.141 mg/kg) and acetone (maximum of 0.079 mg/kg), a common laboratory contaminant, were detected at trace concentrations. SVOCs including benzo(a)anthracene (maximum of 1.4 mg/kg), benzo(b)fluoranthene (maximum of 2.31 mg/kg), benzo(k)fluoranthene (maximum of 1.3 mg/kg), chrysene (maximum of 1.2 mg/kg), and indeno(1,2,3-cd)pyrene (maximum of 0.886 mg/kg) were detected at concentrations above the UU SCOs in shallow soil samples. The metals arsenic (maximum of 13.3 mg/kg), lead (maximum of 638 mg/kg), mercury (maximum of 1.56 mg/kg), and zinc (maximum of 260 mg/kg) were detected at concentrations above the UU SCOs in shallow soil samples. Lead and mercury were also detected at concentrations exceeding the RURR SCOs in shallow soil samples. Pesticides 4,4'-DDD (maximum of 0.008 mg/kg), 4,4'-DDE (maximum of 0.01 mg/kg), 4,4'-DDT (maximum of 0.025 mg/kg), alpha chlordane (maximum of 0.229 mg/kg), and dieldrin (maximum of 0.0169 mg/kg) were detected at concentrations above the UU SCOs, but below the RURR SCOs in shallow soil samples. Polychlorinated biphenyls (PCBs) and herbicides were not detected.
- Zoning Lot A: VOCs including 1,4-dioxane (maximum of 0.361 mg/kg), 2-butanone (maximum of 0.141 mg/kg) and acetone (maximum of 0.471 mg/kg), a common laboratory contaminant, were detected at concentrations above the UU SCOs but below the RURR SCOs. The SVOCs benzo(a)anthracene (maximum of 1.64 mg/kg), benzo(a)pyrene (maximum of 1.33 mg/kg), benzo(b)fluoranthene (maximum of 2.53 mg/kg), benzo(k)fluoranthene (maximum of 1.26 mg/kg), chrysene (maximum of 1.95 mg/kg), and indeno(1,2,3-cd)pyrene (maximum of 1.02 mg/kg) were detected at concentrations above the UU SCOs in shallow soil samples, and with the exception of benzo(k)fluoranthene and chrysene, were also detected at concentrations above the RURR SCOs. The metals arsenic (maximum of 15.9 mg/kg), barium (maximum of 1,550 mg/kg), copper (52.6 mg/kg), lead (maximum of 1,910 mg/kg), mercury (maximum of 0.19 mg/kg), nickel (51.2 mg/kg), and zinc (maximum of 994 mg/kg) were detected at concentrations above the UU SCOs in shallow soil samples. The concentrations of barium

and lead were also detected at concentrations exceeding the RURR SCOs in shallow soil samples. The pesticides 4,4'-DDD (maximum 0.0114 mg/kg), 4,4'-DDE (maximum of 0.0189 mg/kg), 4,4'-DDT (maximum of 0.237 mg/kg), and dieldrin (0.0169 mg/kg) were detected at concentrations above the UU SCOs, but below the RURR SCOs in shallow soil samples. PCBs and herbicides were not detected. Overall, soil chemistry for Zoning Lot A is similar to sites with historic fill in NYC.

8. Groundwater samples collected during the 2007 Phase II ESI and 2016 RI were compared to the New York State Department of Environmental Conservation (NYSDEC) Technical and Operational Guidance Series (TOGS) Ambient Water Quality Standards and Guidance Values (SGVs) and Groundwater Effluent Limitations for Class GA Groundwater Soil Guidance Values. VOCs, SVOCs, pesticides, and PCBs were not detected at concentrations above the SGVs. Total metals including antimony (3.8 micrograms per liter [ $\mu\text{g/L}$ ]), iron (maximum of 5,020  $\mu\text{g/L}$ ), manganese (maximum of 533.1  $\mu\text{g/L}$ ), and sodium (maximum of 110,000  $\mu\text{g/L}$ ) were detected at concentrations above the SGVs. In addition, dissolved metals antimony (3.9  $\mu\text{g/L}$ ), iron (maximum of 5,080  $\mu\text{g/L}$ ), manganese (523.6  $\mu\text{g/L}$ ), and sodium (maximum of 119,000  $\mu\text{g/L}$ ) were detected at concentrations above the SGVs.
9. Six soil vapor samples were collected during the RI and compared to the decision matrices established by the New York State Department of Health (NYSDOH) October 2006 Final Guidance on Soil Vapor Intrusion. Petroleum related compounds were detected at trace concentrations with maximum (benzene, toluene, ethylbenzene and total xylenes [BTEX]) at 42 micrograms per cubic meter ( $\mu\text{g/m}^3$ ). The chlorinated VOC, tetrachloroethene (PCE), was detected as high as 29.3  $\mu\text{g/m}^3$ . Other chlorinated compounds (1,1,1-trichloroethane (TCA), trichloroethylene (TCE), carbon tetrachloride and vinyl chloride) were not detected. Based on the NYSDOH decision matrices, the concentration of PCE are below the monitoring ranges and requires no further action. Total VOCs ranged from 883.80 to 1,587.43  $\mu\text{g/m}^3$ .

### **Summary of the Remedy**

The remedial action was performed in accordance with an NYC Office of Environmental Remediation (OER)-approved RAP and achieved the remedial action objectives established for the project. The remedy was 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 RI Report (February 7, 2017) was prepared to evaluate data and information necessary to develop a Remedial Action Work Plan (RAWP).
- The RAWP dated February 7, 2017 and amended Stipulation List dated May 31, 2017 respectively were approved by the New York City Office of Environmental Remediation (OER) on December 28, 2015.
- OER briefed NYSDEC and NYC DOHMH on November 30, 2016.

A pre-construction meeting was held on October 2, 2017. Excavation began on October 18, 2017.

The remedy consisted of the following:

1. Implemented the Community Air Monitoring Program (CAMP) for particulates and VOCs. CAMP was performed between June 29, 2017 and October 22, 2018. CAMP exceeded several times for organic vapors and dust and proper measures were taken to control these.
2. Mobilized site security and equipment (October 2017); completed utility mark outs; and identified excavation areas.
3. Performed a waste characterization study prior to excavation. Twenty-nine five-point composite waste characterization soil samples (including two field duplicates) and 29 waste characterization soil grab samples (including two field duplicates) were collected between February 21 and 23, 2017. Waste characterization samples were collected at a frequency dictated by disposal facilities.
4. Established Track 4 site-specific SCOs. The Track 4 SCOs are the NYSDEC Part 375 Restricted Residential Use SCOs with the following site-specific exceptions: Total SVOCs (250 mg/kg), lead (700 mg/kg), mercury (2 mg/kg), and barium (650 mg/kg).
5. Excavated and removed soil/fill exceeding Track 4 site-specific SCOs and reused some soil/fill meeting site-specific SCOs as needed. Excavations were performed to the following elevations:
  - About el. -1.5 feet and el. 1 feet (about 6 to 7 feet bgs) to accommodate the foundation slab in the northern portion of the site;
  - About el. 2 (about 4 to 10 feet bgs) to accommodate the foundation slab in the southern portion of the site; and
  - About el. -1.5 feet to el. 2 feet (about 4 to 10 feet bgs) to accommodate deep foundation elements (i.e., auto lift pit, elevator pits, and sump pits).

6. Transported and disposed of 7,921.52 tons of non-hazardous soil/fill material at permitted facilities in accordance with the RAP and applicable laws and regulations for materials handling, transport, and disposal, unless approved and used for on-site backfilling.
  - 4,056.79 tons of non-hazardous soil/fill material to the Coplay Quarry and Capital Quarry Reclamation Project facilities in East Bangor, Pennsylvania
  - 2,119.91 tons of non-hazardous soil/fill material to the Earth Efficient Greenview facility in Stroudsburg, Pennsylvania
  - 1,267.31 tons of non-hazardous soil/fill material to the Hazleton Creek Properties facility in Moosic, Pennsylvania
  - 477.51 tons of non-hazardous soil/fill material to the Former Ingersoll Rand Company Facility in Phillipsburg, New Jersey
7. Screened excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a photoionization detector (PID). Instrumental inspections were performed with a calibrated PID equipped with a 10.6 electron volt (eV) lamp.
8. Conducted materials management of excavated and stockpiled material to prevent commingling of contaminated and non-contaminated materials.
9. Material reused for backfill was sampled in accordance with the Soil/Materials Management Plan.
10. Implemented stormwater pollution prevention measures, as necessary, in compliance with applicable laws and regulations.
11. No underground storage tanks (USTs) were encountered during redevelopment.
12. Collected and analyzed 10 documentation endpoint samples (including one duplicate sample) to determine attainment of SCOs. The analytical results indicated site-specific SCOs were achieved in all documentation endpoint samples.
13. Imported material in compliance with the RAP and in accordance with applicable laws and regulations, including:
  - About 113.89 tons of American Society for Testing and Materials (ASTM) #57/67 Stone from the Tilcon New York Inc., facility in West Nyack, New York
  - About 288 cubic yards of recycled 1.5-inch to 3-inch stone from the New York Recycling, LLC facility in Bronx, New York

- About 18 cubic yards of virgin ¾-inch stone from the New York Recycling, LLC facility in Bronx, New York
14. Constructed an engineered composite cover system across the site consisting of a 12- to 48-inch concrete building slab or two feet of clean fill to prevent human exposure to residual soil/fill remaining under the site.
  15. Installed a waterproofing/vapor barrier system comprised of Grace Preprufe® 300R and 160R high-density polyethylene (HDPE) waterproofing membranes beneath the building and along foundation sidewalls. Seams were sealed using Grace Preprufe® adhesive applied to the membrane by the manufacturer and/or Preprufe® tape. Grace Preprufe® tape was wrapped around typical utility penetrations. Grace Bituthene Liquid Membrane was then applied around the penetrations to provide a seal between the Preprufe® membrane and Preprufe® tape. The contractor for the waterproofing/vapor barrier system construction was Kingdom Contracting, LLC (Kingdom).
  16. Dewatering of groundwater was required to lower the groundwater table and reach excavation depths. On-site discharge of groundwater within 50 feet of the extraction point was approved by NYSDEC via email on November 22, 2016.
  17. Installed a demarcation layer (orange construction safety fencing) on top of the residual soil layer prior to placing the clean soil cap in landscaped areas.
  18. Performed activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations.
  19. Submitted daily reports during construction oversight. Daily field reports were submitted from June 29, 2018 to October 22, 2018.
  20. Submitted an approved Site Management Plan (SMP) for long-term management of residual soil, including plans for maintenance, inspection and reporting of the performance of Engineering Controls and Institutional Controls. Inspections will be performed every 10 years. Inspection and Certification reports will be submitted by July 30, 2021 (for the reporting period calendar year 2020), and every 10 years thereafter (for the reporting period consisting of the 10 prior calendar years). Inspection and Certification Reports will cover all calendar years since the prior reporting period.
  21. Submitted this Remedial Closure Report that describes the remedial activities, certifies that the remedial requirements have been achieved, and lists any changes from the Remedial Action Plan

## **REMEDIAL CLOSURE REPORT**

### **1.0 SITE BACKGROUND**

This Remedial Closure Report (RCR) was developed for 3514 Surf Avenue located in Brooklyn, New York (the site). The site is subject to Restrictive Declaration R-46 pursuant to the 2005 Surf Avenue Rezoning action (City Environmental Quality Review [CEQR] No. 03DCP065K). This project was assigned project number 17RHAZ116K by the New York City (NYC) Office of Environmental Remediation (OER). This RCR describes the remediation and mitigation activities that were implemented at the site in coordination with OER for the purposes of satisfying the requirements of the Hazardous Materials Restrictive Declaration and obtaining a Notice to Proceed. The remedial action described in this document provides for the protection of public health and the environment and complies with applicable environmental standards, criteria and guidance (SCGs) and applicable laws and regulations.

#### **1.1 Site Location and Prior Usage**

The approximately 75,000-square-foot site is located in the Coney Island neighborhood of Brooklyn, New York and is identified as Block 7065, Lot 20 (former Lots 15, 20, and 25) on the NYC Borough of Brooklyn Tax Map. The site, also known as Zoning Lot B, encompasses a continuous city block that is bound by Surf Avenue followed by multi-story residential buildings to the north, West 35th Street followed by a community center building to the east, West 36th Street followed by Zoning Lot A to the west, and the Riegelmann Boardwalk followed by Coney Island Beach to the south.

Prior to redevelopment, the site was vacant and covered with vegetation and discontinuous patches of asphalt and concrete. The pre-construction elevation of the site ranged from elevation (el) 6.37 feet<sup>2</sup> to 12.93 feet. A site location map is included as Figure 1 and a site development plan is included as Figure 2.

#### **1.2 Redevelopment Plan**

Development of the 75,000-square-foot site consists of two towers atop a shared two-story podium on the northern part of the site and a three-story parking garage on the southern part of the site. The parking garage and podium have different ground floor elevations but have a connected roof with landscaping. The ground floor of the podium contains vestibules, a lobby and retail space and the second floor contains utility rooms, amenity spaces, a fitness center, pool, locker rooms and access to the landscaped roof. The towers only contain residential units.

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<sup>2</sup> North American Vertical Datum of 1988 (NAVD 88). Vertical datum for elevations referenced in this document is the North American Vertical Datum of 1988, which is approximately 1.1 feet above mean sea level datum at Sandy Hook, New Jersey as defined by the United States Geologic Survey (USGS NGVD 1929).



The development contains about 20,000 square feet of retail, 82,000 square feet of parking, and 320,000 square feet of residential space. Preparation of the site for development required a net cut of about 8,000 cubic yards of soil/fill material.

Areas outside of the building footprint include terraced stairs with landscaping along the Surf Avenue entrance and landscaped areas containing pathways to the street and boardwalk. The end use of the site is consistent with the zoning designation for the site (R7-3 with a commercial [C2-4] overlay).

Copies of the development plans are included in Appendix A. A redevelopment plan is included as Figure 2.

### 1.3 Description of Surrounding Property

The site is located in an area generally characterized by multi-story residential and community buildings in zoning districts designated for residential and commercial uses, as summarized in the following table:

DIRECTION	ADJOINING PROPERTIES	SURROUNDING PROPERTIES
North	Surf Avenue	Multi-story residential and community buildings including the Jasa Scheuer House Senior Center (3601 Surf Avenue), the O'Dwyer Gardens Coney Island Site 8 Housing Development (2950-2952 West 35 <sup>th</sup> Street) and O'Dwyer Gardens Housing Development (2950-2952 West 33 <sup>rd</sup> Street)
East	West 35 <sup>th</sup> Street	The F.E.G.S. Community Rehabilitation Center (3312-3330 Surf Avenue)
South	Riegelmann Boardwalk	Coney Island Beach and the Lower Bay/Atlantic Ocean
West	West 36 <sup>th</sup> Street	Vacant lot "Zoning Lot A" and the Surf Solomon Senior Center/YMCA Robert Wright Learning Center (3001 Surf Avenue) followed by West 37 <sup>th</sup> Street and the Sea Gate Beach & Cabana Club (3700 Surf Avenue)

Nearby sensitive receptors include the Surf Solomon Senior Center/YMCA Robert Wright Learning Center (located about 300 feet west of the site) and the F.E.G.S. Community Rehabilitation Center (located about 75 feet east of the site). The nearest hospital is the Coney Island Hospital, located about 2 miles northeast of the site. A public school (Primary School 329) is located about 1,400 feet to the northeast of the site. A surrounding land use map is included as Figure 3.

## **1.4 Summary of Past Uses of the Site and Areas of Concern**

According to the June 2002 Phase I Environmental Site Assessment (ESA) by Merritt Engineering Consultants, P.C. (Merritt) and the November 20, 2007 Phase I ESA by Langan, the site has been developed since at least 1905. Former on-site uses included hotels (Lots 6 and 12), bathhouses (Lots 6, 12, 15 and 20), a laundry (Lots 15 and 20), retail buildings (Lots 12 and 15), multi-story residential buildings (Lots 12, 15, 20, and 25), an auto-wrecking yard (Lot 15), parking lots (Lots 15 and 25), a 1-story parking structure (Lot 15), food stores (Lot 12), a construction storage yard (Lots 15, 20, and 25), and a truck and school bus repair facility (Lots 6 and 12).

The areas of concern (AOC) identified during the previous investigations consist of the following:

1. Fill Material – Historic fill material was identified during previous environmental investigations and typically consists of construction and demolition debris (brick, wood, concrete, metal, etc.). Soil samples collected as part of previous subsurface investigations identified concentrations of semivolatile organic compounds (SVOC) and metals consistent with concentrations typically seen in historic fill in New York City.
2. Historical Site Use – The site was historically used as an auto-wrecking yard (Lot 12) and a former truck and school bus repair facility (Lots 6 and 12). In addition, previous investigations have identified oil staining on the ground, miscellaneous oil, waste oil, unknown drum storage areas, and oil associated with these former uses seeping from under a concrete wall at the Lot 12 and 36th Street boundary.
3. Current and Historical Surrounding Property Use – Potential environmental impacts may be associated with historical and current usage of the surrounding properties, including active LTANKS facilities and surrounding properties that were used for a variety of manufacturing operations

## **1.5 Summary of Environmental Work Performed Under the Remedial Investigation**

A Phase II ESI was completed by Langan in 2007, and a supplemental remedial investigation (RI) was performed from July 18 through August 3, 2016. These investigations were completed for both the site (Zoning Lot B) and Block 7065 Lots 6 and 12 (the west adjacent lots known as Zoning Lot A).

The following scope of work was performed during the 2007 Phase II ESI:

- Implemented a site-specific Health and Safety Plan (HASP)
- Conducted a site inspection, including a geophysical survey, to identify potential Areas of Concern (AOCs) and buried obstructions (i.e. former structures, etc.)

- Advanced 28 soil borings and collected 21 grab soil samples for laboratory analysis to evaluate soil quality
- Installed 4 groundwater monitoring wells and collected 4 groundwater samples for laboratory analysis to evaluate groundwater quality

To supplement data from the 2007 Phase II ESI, Langan performed the following scope of work during the RI:

- Implemented the site-specific HASP included in the July 2016 Remedial Investigation Work Plan (RIWP)
- Conducted a site inspection, including a geophysical survey, to identify potential AOCs and buried obstructions (i.e. former structures, etc.)
- Advanced 6 soil borings and collected 13 grab soil samples (including one duplicate) for laboratory analysis to evaluate soil quality
- Installed 4 groundwater monitoring wells and collected 4 groundwater samples for laboratory analysis to evaluate groundwater quality
- Installed 6 soil vapor probes and collected 6 soil vapor samples for laboratory analysis to evaluate soil vapor quality
- Collected 1 field blank sample and included 1 trip blank for quality assurance/quality control (QA/QC) purposes
- Conducted a tidal survey within two geotechnical observation wells installed during a June 2016 geotechnical study by Langan
- Advanced 5 test pits during Langan's June 2016 geotechnical study to further investigate geophysical anomalies identified during the 2007 Phase II ESI

A digital (PDF) copy of the Remedial Investigation Report (RIR), which includes the reports listed above, is included in Appendix B.

## **1.6 Findings of the Remedial Investigation**

1. Pre-development elevation of Zoning Lots A and B ranged from el. 6.37 feet to 12.93 feet.
2. The geophysical survey indicated the presence of a decommissioned gas line within Lot 25, two 'high noise' areas within Lot 25, and a 'high noise' area running north-south within Lot 6 (Zoning Lot A).
3. Depth to groundwater ranges from about 6 to 9 feet below grade (bgs). The tidal survey indicated an average depth to groundwater fluctuation of about 0.4 feet, indicating minimal tidal influence on the depth to groundwater beneath the site.

4. Groundwater flow below both zoning lots is generally from north to south.
5. Depth to bedrock is greater than 200 feet below both zoning lots.
6. The stratigraphy of both zoning lots, from the surface down, consists of up to five feet of historic fill consisting of fine to medium sand with gravel, glass, brick, plastic, wood, concrete, and asphalt; underlain by native fine to medium sand.
7. Soil/fill samples collected during the 2007 Phase II ESI and 2016 RI were compared to the 6 New York Codes, Rules and Regulations (NYCRR) Part 375 Section 6.8 Unrestricted Use (UU) Soil Cleanup Objectives (SCOs) and Restricted Use Restricted-Residential (RURR) SCOs. The Phase II and RI sample results are summarized as follows:
  - Zoning Lot B: The volatile organic compounds (VOCs) 1,4-Dioxane (maximum of 0.361 milligrams per kilogram [mg/kg]), 2-butanone (maximum of 0.141 mg/kg) and acetone (maximum of 0.079 mg/kg), a common laboratory contaminant, were detected at trace concentrations. SVOCs, including benzo(a)anthracene (maximum of 1.4 mg/kg), benzo(b)fluoranthene (maximum of 2.31 mg/kg), benzo(k)fluoranthene (maximum of 1.3 mg/kg), chrysene (maximum of 1.2 mg/kg), and indeno(1,2,3-cd)pyrene (maximum of 0.886 mg/kg) were detected at concentrations above the UU SCOs in shallow soil samples. The metals, arsenic (maximum of 13.3 mg/kg), lead (maximum of 638 mg/kg), mercury (maximum of 1.56 mg/kg), and zinc (maximum of 260 mg/kg) were detected at concentrations above the Unrestricted Use SCOs in shallow soil samples. Lead and mercury were also detected at concentrations exceeding the RURR SCOs in shallow soil samples. Pesticides, 4,4'-DDD (maximum of 0.008 mg/kg), 4,4'-DDE (maximum of 0.01 mg/kg), 4,4'-DDT (maximum of 0.025 mg/kg), alpha chlordane (maximum of 0.229 mg/kg), and dieldrin (maximum of 0.0169 mg/kg) were detected at concentrations above the UU SCOs, but below the RURR SCOs in shallow soil samples. Polychlorinated biphenyls (PCBs) and herbicides were not detected.
  - Zoning Lot A: VOCs including 1,4-dioxane (maximum of 0.361 mg/kg), 2-butanone (maximum of 0.141 mg/kg) and acetone (maximum of 0.471 mg/kg), a common laboratory contaminant, were detected at concentrations above the UU SCOs but below the RURR SCOs. The SVOCs benzo(a)anthracene (maximum of 1.64 mg/kg), benzo(a)pyrene (maximum of 1.33 mg/kg), benzo(b)fluoranthene (maximum of 2.53 mg/kg), benzo(k)fluoranthene (maximum of 1.26 mg/kg), chrysene (maximum of 1.95 mg/kg), and indeno(1,2,3-cd)pyrene (maximum of 1.02 mg/kg) were detected at concentrations above the UU SCOs in shallow soil samples, and with the exception of benzo(k)fluoranthene and chrysene, were also detected at concentrations above the RURR SCOs. The metals arsenic (maximum of 15.9 mg/kg), barium (maximum of 1,550 mg/kg), copper (52.6 mg/kg), lead (maximum of 1,910 mg/kg), mercury

(maximum of 0.19 mg/kg), nickel (51.2 mg/kg), and zinc (maximum of 994 mg/kg) were detected at concentrations above the UU SCOs in shallow soil samples. The concentrations of barium and lead were also detected at concentrations exceeding the RURR SCOs in shallow soil samples. The pesticides 4,4'-DDD (maximum 0.0114 mg/kg), 4,4'-DDE (maximum of 0.0189 mg/kg), 4,4'-DDT (maximum of 0.237 mg/kg), and dieldrin (0.0169 mg/kg) were detected at concentrations above the UU SCOs, but below the RURR SCOs in shallow soil samples. PCBs and herbicides were not detected. Overall, soil chemistry for Zoning Lot A is similar to sites with historic fill in NYC.

8. Groundwater samples collected during the 2007 Phase II ESI and 2016 RI were compared to the New York State Department of Environmental Conservation (NYSDEC) Technical and Operational Guidance Series (TOGS) Ambient Water Quality Standards and Guidance Values (SGVs) and Groundwater Effluent Limitations for Class GA Groundwater Soil Guidance Values. VOCs, SVOCs, pesticides, and PCBs were not detected at concentrations above the SGVs. Total metals including antimony (3.8 micrograms per liter [ $\mu\text{g/L}$ ]), iron (maximum of 5,020  $\mu\text{g/L}$ ), manganese (maximum of 533.1  $\mu\text{g/L}$ ), and sodium (maximum of 110,000  $\mu\text{g/L}$ ) were detected at concentrations above the SGVs. In addition, dissolved metals antimony (3.9  $\mu\text{g/L}$ ), iron (maximum of 5,080  $\mu\text{g/L}$ ), manganese (523.6  $\mu\text{g/L}$ ), and sodium (maximum of 119,000  $\mu\text{g/L}$ ) were detected at concentrations above the SGVs.
9. Six soil vapor samples were collected during the RI and compared to the decision matrices established by the New York State Department of Health (NYSDOH) October 2006 Final Guidance on Soil Vapor Intrusion. Petroleum related compounds were detected at trace concentrations with maximum (benzene, toluene, ethylbenzene and total xylenes [BTEX]) at 42 micrograms per cubic meter ( $\mu\text{g/m}^3$ ). The chlorinated VOC, tetrachloroethene (PCE), was detected as high as 29.3  $\mu\text{g/m}^3$ . Other chlorinated compounds (1,1,1-trichloroethane (TCA), trichloroethylene (TCE), carbon tetrachloride and vinyl chloride) were not detected. Based on the NYSDOH decision matrices, the concentration of PCE are below the monitoring ranges and requires no further action. Total VOCs ranged from 883.80 to 1,587.43  $\mu\text{g/m}^3$ .

## **2.0 DESCRIPTION OF REMEDIATION**

### **2.1 Objectives**

The site remediation and mitigation objectives are:

#### **Soil**

- Prevent direct contact with contaminated soil
- Prevent migration of contaminants that would result in groundwater or surface water contamination

#### **Groundwater**

- Prevent direct exposure to contaminated groundwater

#### **Soil Vapor**

- Prevent exposure to contaminants in soil vapor
- Prevent migration of soil vapor into dwelling and other occupied structures

The remedial measures were performed in accordance with applicable laws and regulations, and the site-specific Construction Health and Safety Plan (CHASP). The remedy is protective of public health and the environment for the intended use.

### **2.2 Summary of Remedial Actions**

The remedial action was performed in accordance with an OER-approved Remedial Action Plan (RAP) dated February 2017, and achieved the remedial action objectives established for the project. The remedy was determined to be protective of human health and the environment, compliant with 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 RI Report (February 7, 2017) was prepared to evaluate data and information necessary to develop a Remedial Action Work Plan (RAWP).
- The RAWP dated February 7, 2017 and amended Stipulation List dated May 31, 2017 respectively were approved by the New York City Office of Environmental Remediation (OER) on December 28, 2015.
- OER briefed NYSDEC and NYC DOHMH on November 30, 2016.

- A pre-construction meeting was held on October 2, 2017. Excavation began on October 18, 2017.

The remedial action consisted of the following:

1. Implemented the Community Air Monitoring Program (CAMP) for particulates and VOCs. CAMP was performed between June 29, 2017 and October 22, 2018. CAMP exceeded several times for organic vapors and dust and proper measures were taken to control these.
2. Mobilized site security and equipment (October 2017); completed utility mark outs; and identified excavation areas.
3. Performed a waste characterization study prior to excavation. Twenty-nine five-point composite waste characterization soil samples (including two field duplicates) and 29 waste characterization soil grab samples (including two field duplicates) were collected between February 21 and 23, 2017. Waste characterization samples were collected at a frequency dictated by disposal facilities.
4. Established Track 4 site-specific SCOs. The Track 4 SCOs are the NYSDEC Part 375 Restricted Residential Use SCOs with the following site-specific exceptions: Total SVOCs (250 mg/kg), lead (700 mg/kg), mercury (2 mg/kg), and barium (650 mg/kg).
5. Excavated and removed of soil/fill exceeding Track 4 site-specific SCOs and reused some soil/fill meeting site-specific SCOs as needed. Excavations were performed to the following elevations:
  - About el. -1.5 feet and el. 1 feet (about 6 to 7 feet bgs) to accommodate the foundation slab in the northern portion of the site;
  - About el. 2 (about 4 to 10 feet bgs) to accommodate the foundation slab in the southern portion of the site; and
  - About el. -1.5 feet to el. 2 feet (about 4 to 10 feet bgs) to accommodate deep foundation elements (i.e., auto lift pit, elevator pits, and sump pits).
6. Transported and disposed of 7,921.52 tons of non-hazardous soil/fill material at permitted facilities in accordance with the RAP and applicable laws and regulations for materials handling, transport, and disposal, unless approved and used for on-site backfilling.
  - 4,056.79 tons of non-hazardous soil/fill material to the Coplay Quarry and Capital Quarry Reclamation Project facilities in East Bangor, Pennsylvania
  - 2,119.91 tons of non-hazardous soil/fill material to the Earth Efficient Greenview facility in Stroudsburg, Pennsylvania

- 1,267.31 tons of non-hazardous soil/fill material to the Hazleton Creek Properties facility in Moosic, Pennsylvania
  - 477.51 tons of non-hazardous soil/fill material to the Former Ingersoll Rand Company Facility in Phillipsburg, New Jersey
7. Screened excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a photoionization detector (PID). Instrumental inspections were performed with a calibrated PID equipped with a 10.6 electron volt (eV) lamp.
  8. Conducted materials management of excavated and stockpiled material to prevent commingling of contaminated and non-contaminated materials.
  9. Material reused for backfill was sampled in accordance with the Soil/Materials Management Plan.
  10. Implemented stormwater pollution prevention measures, as necessary, in compliance with applicable laws and regulations.
  11. No underground storage tanks (USTs) were encountered during redevelopment.
  12. Collected and analyzed 10 documentation endpoint samples (including one duplicate sample) to determine attainment of SCOs. The analytical results indicated site-specific SCOs were achieved in all documentation endpoint samples.
  13. Imported material in compliance with the RAP and in accordance with applicable laws and regulations, including:
    - About 113.89 tons of American Society for Testing and Materials (ASTM) #57/67 Stone from the Tilcon New York Inc., facility in West Nyack, New York
    - About 288 cubic yards of recycled 1.5-inch to 3-inch stone from the New York Recycling, LLC facility in Bronx, New York
    - About 18 cubic yards of virgin ¾-inch stone from the New York Recycling, LLC facility in Bronx, New York
  14. Constructed an engineered composite cover system across the site consisting of a 12- to 48-inch concrete building slab or two feet of clean fill to prevent human exposure to residual soil/fill remaining under the site.
  15. Installed a waterproofing/vapor barrier system comprised of Grace Preprufe® 300R and 160R high-density polyethylene (HDPE) waterproofing membranes beneath the building and along foundation sidewalls. Seams were sealed using Grace Preprufe® adhesive applied to the membrane by the manufacturer and/or Preprufe® tape. Grace Preprufe®



tape was wrapped around typical utility penetrations. Grace Bituthene Liquid Membrane was then applied around the penetrations to provide a seal between the Preprufe® membrane and Preprufe® tape. The contractor for the waterproofing/vapor barrier system construction was Kingdom Contracting, LLC (Kingdom).

16. Dewatering of groundwater was required to lower the groundwater table and reach excavation depths. On-site discharge of groundwater within 50 feet of the extraction point was approved by NYSDEC via email on November 22, 2016.
17. Installed a demarcation layer (orange construction safety fencing) on top of the residual soil layer prior to placing the clean soil cap in landscaped areas.
18. Performed activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations.
19. Submitted daily reports during construction oversight. Daily field reports were submitted from June 29, 2018 to October 22, 2018.
20. Submitted an approved Site Management Plan (SMP) for long-term management of residual soil, including plans for maintenance, inspection and reporting of the performance of Engineering Controls and Institutional Controls. Inspections will be performed every 10 years. Inspection and Certification reports will be submitted by July 30, 2021 (for the reporting period calendar year 2020), and every 10 years thereafter (for the reporting period consisting of the 10 prior calendar years). Inspection and Certification Reports will cover all calendar years since the prior reporting period.
21. Submitted this Remedial Closure Report that describes the remedial activities, certifies that the remedial requirements have been achieved, and lists any changes from the Remedial Action Plan.

### **3.0 COMPLIANCE WITH THE 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 for Langan was William Bohrer, PG. The CHASP is attached to the RAP, which is included in Appendix B.

#### **3.2 Community Air Monitoring Plan**

The CAMP provided for the collection and analysis of perimeter air samples during earthwork to ensure proper protections were employed to protect the neighboring community. The CAMP was executed during soil-intrusive activities to document that potential VOCs and particulates were not migrating off-site. Monitoring was performed between June 29, 2017 and October 22, 2018 in compliance with the CAMP in the OER-approved RAP. In instances where the ambient air concentration of total organic vapors at the downwind perimeter of the work area exceeded 5 parts per million (ppm) above background for the 15-minute average, work activities were temporarily halted, an attempt was made to identify a vapor source, and corrective actions were taken to abate emissions. After the total organic vapor level decreased (per instantaneous readings) below 5 ppm over background, work activities resumed with continued monitoring. In instances where the downwind particulate level was  $100 \mu\text{g}/\text{m}^3$  greater than background (upwind perimeter) for the 15-minute period or if airborne dust was observed leaving the work area, then dust suppression techniques, including applying water to the work area, were employed. CAMP data results are included in Appendix C.

#### **3.3 Soil/Materials Management Plan**

The Soil/Materials Management Plan (SMMP) in the RAP provided detailed plans for managing soils/materials that were disturbed, 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 complied with the SMMP and are summarized in the approved RAP (Appendix B).

#### **3.4 Stormwater Pollution Prevention**

Stormwater 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 water. Remedial construction activities performed under this program complied with methods and processes defined in the RAP for stormwater prevention and applicable laws and regulations.

### **3.5 Deviations from the Remedial Action Plan**

As a result of design changes, the extent of excavation and placement of backfill deviated from the OER-approved RAP Addendum. The RAP addendum proposed excavation to about el. 7 (about 0 to 5 feet bgs) for the parking garage in the southern part of the site and deeper excavations to about el. 2.6 and el. 4 (about 3 and 10 feet bgs) for the offset utility room, elevator pit and pile caps. No excavation was proposed in the location of the two-story podium in the northern part of the site.

Remediation included excavation to the following elevations:

- el. 2 (about 4 to 10 feet bgs) in the southern part of the site for the parking garage
- el. -1.5 to el. 2 (about 6 to 7 feet bgs) in the northern part of the site for the two-story podium
- el. -1.5 to el. 2 feet (about 4 to 10 feet bgs) for the auto lift pit, elevator pit, and sump pits

Approximately 2,000 cubic yards of additional material was removed and disposed off-site beyond the quantity proposed in the RAP Addendum.

The RAP addendum proposed filling the northern part of the site to about el. 7 feet for the two-story podium; however, the area was backfilled to about el. 11 feet to facilitate the updated design. Portions of the site outside the building perimeter were not excavated and were capped with at least two feet of clean soil cover.

The proposed excavation and backfill extents are presented in Figure 1 of the RAP Addendum. The actual excavation and backfill extents are presented in Figure 4.

## **4.0 REMEDIAL PROGRAM**

### **4.1 Project Organization**

The remedial action was performed concurrently with site development on behalf of Red Apple 86 Fleet Place Development, LLC. Kingdom Contracting of Ridgewood, New York (Kingdom), performed excavation and foundation construction. Hudson Meridian Construction Group (Hudson Meridian) of East Rutherford, New Jersey, provided administrative and construction management services. Langan provided environmental engineering services, including documentation of earthwork. Jason Hayes, P.E. of Langan was the New York State Professional Engineer responsible for management of environmental oversight of the project and Maria Luisa Mis of Langan was the primary field engineer on-site during earthwork.

### **4.2 Site Controls**

#### **Site Preparation**

Prior to the initiation of the remedial activities, the perimeter of the site was secured with plywood construction fencing. Appropriate New York City Department of Buildings (DOB) permits were placed on the fence during all phases of the remedial action. A subsurface utility survey was completed prior to excavation. Underground utilities were decommissioned prior to construction.

A pre-construction meeting was held on October 2, 2017. Excavation began on October 18, 2017. Kingdom was contracted by Hudson Meridian to perform the site excavation and waterproofing/vapor barrier system. Kingdom and Hudson Meridian conducted weekly tailgate safety meetings, which included a discussion of potential work-zone hazards, proper handling of dangerous tools and equipment, and avoidance of unsafe work conditions.

#### **Mobilization**

Mobilization was conducted as necessary for each phase of work. Mobilization included field personnel orientation, equipment mobilization, and identifying 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.

#### **Utility Marker Layouts, Easement Layouts**

The presence of utilities on the site were fully investigated prior to the performance of invasive work such as excavation or drilling under this plan by using, at a minimum, the One-Call System (811). All invasive activities were performed in compliance with applicable laws and regulations to assure safety. Utility companies and other responsible authorities were contacted to locate and mark the locations, and a copy of the Markout Ticket was retained by the contractor prior to the start of any invasive subsurface operations. Electrical hazards associated with drilling in the

vicinity of overhead utilities was prevented by maintaining a safe distance between overhead power lines and drill rig masts.

Proper safety and protective measures pertaining to utilities and compliance with applicable laws and regulations were employed during invasive and other work performed under the RAP. Off-site structures were maintained during invasive, excavation or other remedial activity performed under the RAP.

### **Dewatering**

Dewatering of groundwater was required to lower the groundwater table and reach excavation depths. On-site discharge of groundwater within 50 feet of the extraction point was approved by NYSDEC via email on November 22, 2016. The dewatering system was designed by the contractor's New York State-licensed Professional Engineer.

### **Soil Screening**

Soil screening was performed by Langan during excavation. Excavated material was screened for visual and olfactory evidence of impacts (i.e., staining and odor) and with a calibrated PID. Excavated soil was segregated (as necessary), based on these observations, laboratory data and facility acceptance criteria, pending transport and disposal at the appropriate facilities.

### **Stockpile Management**

Stockpiling was minimized and soil was direct-loaded into trucks as often as possible. Kingdom generated stockpiles containing less than 1,000 cubic yards of soil whenever soil could not be direct-loaded. Material was segregated as construction and demolition (C&D), historic fill material, or native soil. No material exhibiting staining, odors, and/or PID readings indicative of a petroleum release was encountered during redevelopment. Stockpiles were covered with a minimum of 6-mil poly sheeting at the end of each workday.

### **Truck Inspection**

Outbound-trucks were inspected before exiting the site. Trucks were examined for evidence of soil on the undercarriage, body, and wheels. Soil and debris were removed with brooms, shovels, and potable water, as necessary. Soil and fill were not tracked from the site into the surrounding community.

### **Site Security**

Site access was controlled by gated entrances to the fenced property.

## **Nuisance Controls**

Site perimeter, CAMP stations, and the surrounding vicinity were monitored during earthwork activities by a qualified Langan field representative. Kingdom was immediately notified if elevated particulate concentrations, odors, or visible dust was observed, and corrective on-site action (e.g., application of water) was taken in accordance with the CAMP, CHASP, and RAP. Dust suppression occurred periodically and included applying water to the excavation areas. There were no instances of apparent nuisance dust or VOCs migrating off-site.

## **Reporting**

A Langan field engineer, geologist or scientist was on-site during soil excavation, material stockpiling and truck loading, air monitoring, installation of the vapor barrier, and to collect post-excavation endpoint samples. Observations were recorded in field books and in daily reports. Those reports included the following information:

- Project number, work summary, an update of progress made and locations of work performed;
- Quantities of material imported to and exported from the site;
- Status of on-site soil/fill stockpiles;
- A summary of any citizen complaints, with relevant details (basis of complaint; actions taken; etc.);
- A summary of CAMP excursions, if any; and
- Photographs of notable site conditions and activities.

During work, Langan collected soil disposal documentation and CAMP station air monitoring data. Digital photographs of the remedial action progress are included within daily and weekly field reports provided in Appendix D.

### **4.3 Soil Cleanup Objectives**

Track 4 Site-Specific SCOs were utilized for this project. The 6 NYCRR Part 375-6.8(b) RURR SCOs, with the following exceptions, were used as the Track 4 Site-Specific SCOs.

- Total SVOCs – 250 mg/kg
- Lead – 700 mg/kg
- Mercury – 2 mg/kg
- Barium – 650 mg/kg.

#### 4.4 Materials Excavation and Removal

Between November 8, 2017 and April 3, 2018, 7,894.50 tons of non-hazardous soil/fill material was excavated and removed from the site footprint to a maximum depth of about 10 feet bgs. Langan documented soil excavation and disposal in accordance with the OER-approved RAP. Real time air monitoring for VOCs and particulates was performed continuously during soil-intrusive activities.

Historic fill and native soil were removed from the site using traditional bucket excavators. As material was excavated, it was screened for visual, olfactory, and/or instrumental evidence of petroleum impacts. No material exhibiting staining, odors, and/or PID readings indicative of a petroleum or chemical release were encountered during redevelopment.

The remedial action was performed under the oversight of Jason J. Hayes, P.E. Waste disposal documentation is included as Appendix E. A table of individual truck transport and material disposal quantities is included in Tables 1A through 1D.

#### 4.5 Materials Disposal

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

Destination	Material Description	Quantity
Coplay Quarry and Capital Reclamation Project East Bangor, Pennsylvania	Non-hazardous soil/fill material	4056.79 tons
Earth Efficient Greenvue Facility Stroudsburg, Pennsylvania	Non-hazardous soil/fill material	2,119.91 tons
Hazleton Creek Properties Moosic, Pennsylvania	Non-hazardous soil/fill material	1,267.31 tons
Former Ingersoll Rand Company Facility Phillipsburg, New Jersey	Non-hazardous soil/fill material	477.51 tons

Waste characterization sample results are presented in the May 22, 2017 Waste Characterization Report (Appendix B). Profile applications, waste characterization data, and previous reports for the site were sent to disposal facilities by Hudson Meridian and acceptance letters from the disposal facilities stating approval to accept excavated materials generated from the site are provided in Appendix E. Tabular summaries of individual truck transport and material disposal quantities are included in Tables 1A through 1D. A map showing excavation areas is included as Figure 4.

#### 4.6 Imported Material and Reuse of Soils

Import of material onto the property and reuse of on-site soil was performed in accordance with the SMMP. Imported and reuse material was screened for indications of contamination using instrumental (PID), visual, and olfactory methods and were appropriately segregated on-site before use. Imported soil met the lower of RURR SCOs or the Protection of Groundwater SCOs in 6 NYCRR Part 375-6.8. On-site material used for backfill was sampled and analyzed prior to reuse and did not exceed site-specific SCOs or Table 4 of the NYSDEC Commissioner Policy (CP)-51 Soil Cleanup Guidance.

The following table summarizes the imported materials, imported material types, imported volumes, and import facilities.

Import Location/Address	Type of Material	Quantity <sup>3</sup>
Tilcon New York Inc., facility West Nyack, New York	American Society for Testing and Materials (ASTM) #57/67 Stone	113.89 Tons
New York Recycling, LLC facility Bronx, New York	Recycled 1.5-inch to 3-inch Stone	288 Cubic Yards
New York Recycling, LLC facility Bronx, New York	Virgin ¾-inch Stone	18 Cubic Yards

Material imported to the property achieved the OER-approved backfill and cover soil quality objectives, which corresponded with the lower of Restricted Use Restricted-Residential or Protection of Groundwater SCOs, as specified in the SMMP. Imported material documentation

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<sup>3</sup> The quantity is expressed in units provided in the associated import tickets



is included as Appendix F, and a tabulated list of imported backfill loads is included as Table 2. A map showing backfill placement locations is included as Figure 4.

#### **4.7 Documentation Endpoint Soil Samples**

The site-specific Track 4 SCOs for this project were achieved. Between October 17, 2017 and March 29, 2018, Langan collected 10 documentation endpoint samples (including one duplicate sample from EP06) from the final depth of the development excavation. Post-excavation sample locations were biased towards the areas of highest contamination identified during previous sampling events or based on field measurements or visual contamination identified during remedial action. Documentation endpoint soil sample locations are shown on Figure 5.

#### **Quality Assurance/Quality Control**

Soil samples were collected into laboratory-certified, pre-cleaned containers and placed into coolers with ice for transport to Alpha Analytical Laboratories of Westborough, Massachusetts (Alpha), an NYSDOH Environmental Laboratory Approval Program (ELAP)-approved laboratory. Samples were preserved through the use of ice or “cold-paks” to maintain a temperature of 4°C.

Dedicated disposable sampling materials were used for the collection of endpoint samples and eliminated the need to prepare field equipment (rinsate) blanks.

#### **Documentation Endpoint Soil Sample Analytical Results**

Documentation endpoint soil samples were analyzed for Target Compound List (TCL) SVOCs by United States Environmental Protection Agency (EPA) Method 8270 and Target Analyte List (TAL) metals by EPA Methods 6010C and 7471B. All soil sample results met the site-specific Track 4 SCOs. Residual soil/fill will be managed with engineering and institutional controls (including a composite cover system) in accordance with the Site Management Plan (SMP). A documentation endpoint soil sample analytical results summary is included in Table 3 and copies of the analytical laboratory reports are provided in Appendix G.

#### **4.8 Demarcation**

Material below the final cover is residual soil that will be addressed in accordance with the SMP. Where clean soil cover was used in landscaped areas, a demarcation layer (orange construction safety fencing) was installed on top of the residual soil layer prior to placing the clean soil cap.

## **5.0 ENGINEERING CONTROLS**

### **5.1 Composite Cover System**

Exposure to residual soil/fill is prevented by an engineered composite cover system, consisting of a 12- to 48-inch-thick concrete pressure slab or a minimum 2 feet of clean fill material (meeting the RURR SCOs for landscaped areas or other areas not covered by the building slab. The contractor for the composite cover system construction was Kingdom.

Figure 6 shows a map of the location of each composite cover system type built at the site. Photographs of construction of the composite cover system are presented in daily field reports in Appendix D.

### **5.2 Waterproofing/Vapor Barrier**

To prevent potential exposure to impacted soil vapor, a waterproofing/vapor barrier system was installed beneath the concrete slab, at the base and sidewalls of elevator pits and sump excavations, and along the subgrade exterior of the foundation walls. The waterproofing/vapor barrier membrane system consists of Grace Preprufe® 300R (46 mils) and 160R (32 mils) HDPE waterproofing membranes. Seams were sealed using Grace Preprufe® CJ Tape LT applied to the membrane and wrapped around any penetrations. Bituthene® liquid membrane was then applied around the penetrations to provide a seal between the Preprufe® membrane and Preprufe® tape. The waterproofing/vapor barrier system was installed in accordance with the manufacturer's specifications.

Figure 7A shows the waterproofing/vapor barrier system layout and Figure 7B shows the waterproofing/vapor barrier system detail. The contractor for the waterproofing/vapor barrier system construction was Kingdom. Waterproofing and vapor barrier documentation is included as Appendix H.

## **6.0 INSTITUTIONAL CONTROLS**

A series of Institutional Controls (ICs) were required as a component of the remedy to implement measures for the protection of public health by elimination of exposure to residual materials. These ICs define the program to operate, maintain, inspect and certify the performance of Engineering Controls (ECs) and ICs. These ICs were implemented in accordance with the SMP included in Section 7.0 of this RCR.

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

1. The property will continue to be registered with an E-Designation by the NYC Department of Buildings (DOB). Property owner and property owner's successors and assigns are required to comply with the approved SMP;
2. Compliance with an OER-approved SMP including procedures for appropriate operation, maintenance, inspection, and certification of performance of ECs and ICs. The property owner and property owner's successors and assigns will inspect ECs and ICs and submit to OER a written certification that evaluates their performance in a manner and at a frequency to be determined by OER;
3. ECs 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 ECs and ICs;
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; and
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.

## **7.0 SITE MANAGEMENT PLAN**

Site management is the last phase of the remedial process and begins after the approval of the RCR and issuance of the Notice of Satisfaction (NOS) by the 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 providing notice of the revocation to the DOB.

ECs and ICs were incorporated as a component of the remedy so that the site remains protective of public health and the environment. Generally, ECs provide physical protective measures and ICs provide restrictions on site usage and establish remedial operation, maintenance, inspection and certification measures. This SMP has been established to govern long-term performance of ECs and ICs for this property.

The SMP provides a detailed description of procedures required to manage residual contamination following the completion of remedial construction in accordance with the NYC Voluntary Cleanup Agreement (VCA) with OER. This includes: (1) operation and maintenance of Engineering Controls; (2) inspection of ECs and ICs; and (3) certification of performance of ECs and ICs.

### **7.1 Engineering Controls**

ECs were employed in the remedial action to address residual materials remaining at the site. The Site has two Engineering Control Systems. The site has two primary engineering controls including the following:

1. Composite cover system
2. Waterproofing/Vapor barrier system

#### **Operation and Maintenance of Composite Cover System**

Section 5.1 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 (SMMP) is included in this SMP 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 [or “normal wear and tear”], 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/Waterproofing System**

Section 5.2 describes the waterproofing/vapor barrier system utilized in this remedial action and provides as-built design details and the system location. The vapor barrier/waterproofing system is a permanent engineering control for the site. The system will be inspected and its performance certified at specified intervals defined in the SMP.

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

The project's Professional Engineer (P.E.) licensed by the State of New York will have responsibility for overseeing the implementation of the vapor barrier/waterproofing membrane repairs.

## **7.2 Institutional Controls**

A series of ICs are required as a component of the remedial action to implement measures for the protection of public health by elimination of exposure to residual materials. These ICs define the program to operate, maintain, inspect and certify the performance of engineering controls and institutional controls on this property and will be implemented in accordance with the SMP.

ICs are also designed to prevent future exposure to residual soil/materials by controlling disturbances in the subsurface, restricting higher uses of the property than those addressed by the remedial action and establishing restrictions on activities and site usage. ICs for this property are:

1. The property will continue to be registered with a Restrictive Declaration by the NYC DOB. Property owner and property owner's successors and assigns are required to comply with the approved SMP;
2. Compliance with an OER-approved SMP including procedures for appropriate operation, maintenance, inspection, and certification of performance of engineering controls and institutional controls. The property owner and property owner's successors and assigns will inspect engineering controls and institutional controls and submit to OER a written certification that evaluates their performance in a manner and at a frequency to be determined by OER;
3. ECs 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 engineering and institutional controls;

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.

### **7.3 Inspections**

ECs and ICs will be inspected on a periodic basis at a 10 year frequency established in this plan. The inspections will evaluate the following:

- If ECs or ICs 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 ECs or ICs 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 addition, if an emergency occurs, such as a natural disaster, or if an unforeseen failure of any of the ECs occurs, an inspection of the site will be performed within 30 days to evaluate the ECs, and a letter report of findings will be submitted to OER.

### **7.4 Composite Cover and Waterproofing/Vapor Barrier System**

Visual inspection of the composite cover and underlying waterproofing/vapor barrier system will be performed on a regular schedule at a minimum of once per 10 years. The inspection will also be performed after all severe weather conditions that may affect ECs. Observations made during inspections will be documented in a dedicated notebook and photographs will be taken. If the inspector observes a failure in the slab that exposes the waterproofing/vapor barrier or historical fill, the system will be inspected for any damage which would prevent the system from completing its intended purpose. Cracks, holes, penetrations, or slab disturbances shall be recorded and repaired, as appropriate.

## **7.5 Site Use Prohibitions**

Inspections to evaluate the status of site use prohibitions will include an evaluation of all of the institutional controls listed above, including:

- 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.

## **7.6 Inspection and Certification Letter Report**

The composite cover and waterproofing/vapor barrier will be inspected on a 10-year cycle. Results of inspections performed during a reporting period and certification of performance of all ECs and ICs will be included in an Inspection and Certification Letter Report. Inspection and Certification Letter Reports will be submitted by July 30, 2020 (for the reporting period calendar years 2019 to 2020), and every 10 years thereafter (for the reporting period consisting of the 10 prior calendar years). 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;
- Observations, conclusions, or recommendations;
- Copy of any monthly inspection forms;
- Photographs; and
- Certification of the performance of ECs and ICs executed by the P.E. or Qualified Environmental Professional (QEP) responsible for this Inspection and Certification Letter Report, as discussed below.

The certification of the performance of engineering and institutional controls will establish:

- If ECs and ICs employed at the site continue to be in place, perform as designed and continue to be protective of human health and the environment;

- If anything has occurred that impairs the ability of ECs and ICs 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 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 SMMP 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 with a Restrictive Declaration.

## **7.7 Notifications**

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

- 60-day advance notice of any proposed changes in site use that was not contemplated during 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

## **7.8 Soil/Materials Management Plan**

All 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 SMMP. Intrusive work will also be conducted in accordance with the procedures defined in the CAMP included in this section and a CHASP. The CHASP is the responsibility of the property owner and should be in compliance with NYSDEC Division of Environmental Remediation (DER)-10 Technical Guide and 29 Code of Federal Regulations (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 QEP. Soil screening will be performed during any future intrusive work.

## **Stockpile Methods**

If stockpiles are used to isolate excavated soil they 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 the OER. Excavated soils will be stockpiled on, at minimum, double layers of 6-mil minimum sheeting, will be kept covered at all times when not in use 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 soil 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 the OER.

## **Materials Excavation, Load-Out and Departure**

The PE/QEP overseeing the remedial action will:

- Direct field personnel to document 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;

- Direct field personnel to document that all loaded outbound trucks are inspected and cleaned if necessary before leaving the site; and
- Direct field personnel to document 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 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.

Outbound truck transport routes will take 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 avoid unnecessary stopping or idling 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) an OER Historical Fill Notification Form and letter from the PE/QEP or property owner 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 NYC 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 soil taken off-site will be handled as regulated solid waste.

Waste characterization will be performed prior to 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 non-hazardous 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 the OER beforehand.

### **Repair of Remedial Systems**

After completion of invasive work, any damage to the engineering controls (composite cover system, waterproofing/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 the OER-approved backfill and cover soil quality objectives for this site. The backfill and cover soil quality objectives include NYSDEC Part 375 RURR and Protection of Groundwater SCOs. 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 NYSDEC; 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 Letter 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 will direct field personnel to document 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 from each source of virgin quarried material or other material with an NYSDEC approved BUD, unless otherwise approved by the OER. Once it is determined that the fill material meets imported backfill or cover soil chemical requirements, is non-hazardous, and lacks petroleum contamination, the material will be loaded onto trucks for delivery to the site.

RCA with less than 10% passing a Number 80 sieve may be imported from facilities permitted or registered by NYSDEC. A PE/QEP is responsible to ensure that the facility is compliant with 6 NYCRR 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

NYC sewer system will receive prior approval by NYCDEP. The NYCDEP regulates discharges to the NYC sewers under Title 15, Rules of the City of New York Chapter 19. If discharge to the NYC sewer system is not feasible, the dewatering fluids will be managed by transportation and disposal at an off-site treatment facility or some other means compliant with applicable laws and regulations. Discharge of water generated during remedial construction to surface waters (i.e. a stream or river) is prohibited without a State Pollutant Discharge Elimination System (SPDES) permit issued by NYSDEC.

### **Stormwater Pollution Prevention**

Applicable laws and regulations pertaining to stormwater pollution prevention will be addressed during the remedial program. All existing stormwater systems will be inspected for 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 be controlled by these means, 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.

The odor control plan must be 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. The OER will be notified of all odor complaint events. Implementation of work perimeter odor monitoring, including halt of work, will be the responsibility of the P.E./QEP. The contractor will be responsible for controlling odors.

### **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 soil/fill stockpiles;
- Exercise extra care during dry and high-wind periods; and
- Use of asphalt millings, 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 dust will be identified and corrected. Work will not resume until all nuisance dust emissions have been

abated. The OER will be notified of all dust complaint events. Implementation of work perimeter dust monitoring, including halt of work, will be the responsibility of the P.E./QEPs. The contractor will be responsible for controlling dust.

## **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 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 CAMP will be reported to the OER Project Manager and included in the Daily Report.

## **VOC Monitoring, Response Levels, and Actions**

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 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 shut down.

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 ( $\mu\text{g}/\text{m}^3$ ) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work will continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed  $150 \mu\text{g}/\text{m}^3$  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  $150 \mu\text{g}/\text{m}^3$  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  $150 \mu\text{g}/\text{m}^3$  of the upwind level and in preventing visible dust migration.

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