

Hazardous Materials Remedial Closure Report

For
On The Sound
Bronx, New York
Block 5643, Lot 235
NYC VCP Project Number 14CVCP169X
OER Project Number 13RH-A145X

Prepared for:
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REMEDIAL CLOSURE REPORT

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LIST OF ACRONYMS

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

CERTIFICATION

I, Robert B. Simpson, P.E., certify the following:

- I 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 On The Sound site, site number 14CVCP169X.
- I have reviewed this document, to which my signature and seal are affixed.
- Engineering Controls implemented during this remedial action, including the vapor barrier, were designed by me or a person under my direct supervision and achieve the goals established in the Remedial Action Work Plan for this site.
- The Engineering Controls constructed during this remedial action were professionally observed by me or by a person under my direct supervision and (1) are consistent with the Engineering Control design established in the Remedial Action Work Plan and (2) are accurately reflected in the text and drawings for as-built design reported in this Remedial Action Report.
- The OER-approved Remedial Action Work Plan dated August 2013 and Stipulations in a letter dated 2 December 2013 were implemented and that all requirements in those documents have been substantively complied with. I certify that contaminated soil, fill, liquids or other material from the property were taken to facilities licensed to accept this material in full compliance with applicable laws and regulations.

Name

Robert B. Simpson, P.E.

PE License Number

081840

Signature



Date

2/14/20



I, Meredith R. Anke, P.E., certify the following:

- I am a Qualified Environmental Professional.
- I had primary direct responsibility for implementation of the remedial program for the On The Sound site, site number 14CVCP169X.
- The OER-approved Remedial Action Work Plan dated August 2013 and Stipulations in a letter dated 2 December 2013 were implemented and that all requirements in those documents have been substantively complied with. I certify that contaminated soil, fill, liquids or other material from the property were taken to facilities licensed to accept this material in full compliance with applicable laws and regulations.

QEP Name

Meredith R. Anke, P.E.

QEP Signature



Date

2/14/20

EXECUTIVE SUMMARY

City Island Reserve LLC has enrolled in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a property located at 226 Fordham Place in City Island, Bronx, New York. A Remedial Investigation (RI) was performed to compile and evaluate data and information necessary to develop a Remedial Action Work Plan (RAWP). A remedial action was performed pursuant to an OER-approved RAWP in a manner that has rendered the Site protective of public health and the environment consistent with the proposed use of the property. This RCR describes the remedial action performed under the RAWP for the full Site, which was completed in phases as follows:

- Phase I of the project consisted of buildings 1-5 (aka 1/3, 5/7, 61/63, 65/67, and 69/71) plus detached garages 1A, 5A, 61A, 65A, and 69A;
- Phase II is defined as buildings 6-8 (aka 49/51, 53/55, and 57/59), detached garages 49A, 53A, and 57A, the club house and pool, and the pedestrian esplanade;
- Phase III of the project is defined as buildings 9-11 (aka 45/47, 66/68, and 70/72) plus detached garages 45A, 66A, and 70A;
- Phase IV is defined as buildings 12-16 (aka 13/15, 17/19, 21/23, 27/29, and 31) plus detached garage 13A;
- Phase V is defined as building 17 (aka 9/11) and detached garage 9A;
- Phase VI consisted of buildings 18-20 (aka 33/35, 37/39, and 41/43); and
- Phase VII of the project is defined as buildings 21-22 (aka 26/28 and 30/32) plus detached garages 26A and 30A.

The remedial action described in this document fulfills the remedial objectives defined in the RAWP, complies with applicable environmental standards, criteria and guidance and conforms with applicable laws and regulations.

Site Location and Background

The full Site is located at 226 Fordham Place in the City Island section in Bronx, New York and is identified as Block 5643 and Lots 235 and 625 on the New York City Tax Map. The entire Site is 6.4 acres (approximately 278,000 square feet) and is bounded by the Fordham Street and a New York City Department of Corrections ferry terminal to the north, a multi-family residential property to the south, the Long Island Sound to the east, and Fordham Place to the west. The previously completed Phase I portion of the site is approximately 39,490 square feet in area. The previously completed Phase II portion of the site is approximately 39,407 square feet in area. The previously completed Phase III portion of the site is approximately 22,360 square feet in area. The previously completed Phase IV portion of the site is approximately 51,830 square feet in area. The previously completed Phase V portion of the site is approximately 5,280 square feet in area. The previously completed Phase VI portion of the site is approximately 32,270 square feet in area. The now completed Phase VII portion of the site is approximately 15,255 square feet in area. Prior to development, the entire Site was vacant and undeveloped.

Summary of Redevelopment Plan

The overall redevelopment of the full Site consists of construction of 21 two-family residential buildings, one (1) single family building, 15 detached garages, plus a club house building with a pool. All structures are built as slab on grade. The current zoning designation is R3A, which is a residential district that features modest single-family and two-family detached residences. The proposed use is consistent with existing zoning for the property.

Phase I of the development was previously completed in April 2016 and consisted of construction of 5 new 2-story residential slab-on-grade buildings (Buildings 1/3, 5/7, 61/63, 65/67, and 69/71) and 5 new slab-on-grade detached garages (Buildings 1A, 5A, 61A, 65A, and 69A). After 90.48 tons of soil and fill from three hotspot areas were excavated from the Phase I and Phase II portions of the property and disposed of off-Site, the site was re-graded using on-site soil material. New underground utilities, asphalt paved roads, and stormwater infrastructure were installed and required excavation from 0 to 8 feet below grade. The Phase I portion of the Site is now covered with 10,238 square feet of

building space, approximately 12,000 square feet of landscaped areas, 1,990 square feet of concrete sidewalks, and 15,262 square feet of asphalt-paved roads and driveways. The landscaped open space in the Phase I area has been covered with two (2) feet of clean soil material.

Phase II of the development was previously completed in November 2016 and consisted of construction of 3 new 2-story residential slab-on-grade buildings (Buildings 49/51, 53/55, and 57/59), 3 new slab-on-grade detached garages (Buildings 49A, 53A, and 57A), and the club house building and pool. In addition, the pedestrian esplanade from Fordham Street to the easternmost portion of the site, which is an open space/viewing area open to the public, was part of Phase II. The Phase II portion of the site was re-graded using on-site soil material. New underground utilities, asphalt paved roads, and stormwater infrastructure were installed and required excavation from 0 to 8 feet below grade. The Phase II portion of the Site is now covered with 9,328 square feet of building and pool space, approximately 10,432 square feet of landscaped areas, 725 square feet of concrete paver areas, 3,936 square feet of concrete (sidewalks and pool deck), 7,710 square feet of esplanade retaining walls and permeable pavers, and 7,276 square feet of asphalt-paved roads and driveways. The landscaped open space in the Phase II area has been covered with two (2) feet of clean soil material.

Phase III of the development was previously completed in July 2017 and consisted of construction of 3 new 2-story residential slab-on-grade buildings (Buildings 45/47, 66/68, and 70/72) and 3 new slab-on-grade detached garages (Buildings 45A, 66A, and 70A). The Phase III portion of the site was re-graded using on-site soil material. New underground utilities, asphalt paved roads, and stormwater infrastructure were installed and required excavation from 0 to 8 feet below grade. The Phase III portion of the Site is now covered with 6,690 square feet of building space, approximately 7,777 square feet of landscaped areas, 1,044 square feet of concrete paver areas, 1,742 square feet of concrete sidewalks, and 4,928 square feet of asphalt-paved roads and driveways. The landscaped open space in the Phase III area has been covered with two (2) feet of clean soil material.

Phase IV of the development was previously completed in February 2018 and consisted of construction of 5 new 2-story residential slab-on-grade buildings (Buildings 13/15, 17/19,

21/23, 27/29, and 31) and 1 new slab-on-grade detached garages (Building 13A). The Phase IV portion of the site was re-graded using on-site soil material. New underground utilities, asphalt paved roads, and stormwater infrastructure were installed and required excavation from 0 to 8 feet below grade. The Phase IV portion of the Site is now covered with 10,830 square feet of building space, approximately 17,808 square feet of landscaped areas, 11,858 square feet of concrete paver areas (patios and roads), 3,025 square feet of concrete sidewalks, and 8,309 square feet of asphalt-paved roads and driveways. The landscaped open space in the Phase IV area has been covered with two (2) feet of clean soil material.

Phase V of the development was previously completed in January 2019 and consisted of construction of 1 new 2-story residential slab-on-grade building (Building 9/11) and 1 new slab-on-grade detached garage (Building 9A). The Phase V portion of the site was re-graded using on-site soil material. New underground utilities were installed and required excavation from 0 to 5 feet below grade. The Phase V portion of the Site is now covered with 2,020 square feet of building space, approximately 1,690 square feet of landscaped areas, 228 square feet of concrete paver areas (patio), 356 square feet of concrete sidewalks, and 986 square feet of asphalt-paved driveways. The landscaped open space in the Phase V area has been covered with two (2) feet of clean soil material.

Phase VI of the development was previously completed in June 2019 and consisted of construction of 3 new 2-story residential slab-on-grade buildings (Buildings 33/35, 37/39, and 41/43). The Phase VI portion of the site was re-graded using on-site soil material. New underground utilities were installed and required excavation from 0 to 5 feet below grade. The Phase VI portion of the Site is now covered with 7,143 square feet of building space, approximately 18,126 square feet of landscaped areas, 5,065 square feet of concrete paver area (3,925 square feet in the road and 1,140 square feet of patios), 1,006 square feet of concrete sidewalks, and 930 square feet of asphalt-paved driveways. The landscaped open space in the Phase VI area has been covered with two (2) feet of clean soil material.

Phase VII of the development is now complete and consisted of construction of 2 new 2-story residential slab-on-grade buildings (Buildings 26/28 and 30/32) and 2 new slab-on-grade detached garages (Buildings 26A and 30A). The Phase VII portion of the site was re-

graded using on-site soil material. New underground utilities were installed and required excavation from 0 to 5 feet below grade. The Phase VII portion of the Site is now covered with 4,557 square feet of building space, approximately 6,733 square feet of landscaped areas, 523 square feet of concrete paver areas, 1,518 square feet of concrete sidewalks, and 1,924 square feet of asphalt-paved driveways. The landscaped open space in the Phase VII area has been covered with two (2) feet of clean soil material.

Summary of Surrounding Property

The area immediately surrounding the entire Site generally consists of residential and commercial properties. There are single family and multi-family residential properties to the west and multi-family residential buildings to the south. To the north of the site, across Fordham Street, are commercial and residential properties. There are no sensitive receptors such as schools, hospitals, or day care facilities within a 500-foot radius of the full Site.

Summary of Past Site Uses of Site and Areas of Concern

The full Site was formerly occupied by a shipyard and then various maritime related uses, including ship and yacht building, boat storage and boat repair, sail making, and a diving business.

The former structures on the property included the following: 1) a two-story wood frame structure in the northern portion of the site, which was reportedly used as an office building; 2) a one-story metal building in the western portion of the site, which was reportedly used as a machine shop; 3) a two-story metal building in the center, northern portion of the property, which was reportedly used as a garage and was also used by a diving business; and 4) a dilapidated two-story wood frame structure in the southwest corner of the site, which was at one time identified as a carpentry building. These buildings were demolished in 2012.

The scope of work for the RI was developed in response to the proposed development project. An investigation of soil, soil vapor, and groundwater was performed to characterize the entire Site for potential environmental contamination from historic on-site uses, operations, etc. The sampling event was designed to provide general coverage across the entire site and to characterize the historic fill material that will remain on Site.

The following Areas of Concern have been identified for the entire Site:

1. Two (2) 10,000-gallon USTs which were removed and documented by HDR's August 2007 Tank Closure Report. These tanks were located in the Phase I portion of the Site;
2. Previous boring B-3 and a 550-gallon UST which has not been located since GTA's 2003 Investigation. This area was in the Phase VI portion of the Site. This tank is believed to have been removed based on multiple test pits and GPR surveys;
3. A former drum storage area which was excavated and documented by Carlin-Simpson's July 2012 Remedial Action Closure Report (RACR) completed for NYS DEC. Residual levels of SVOCs and metals above Restricted Residential SCOs remain and are believed to be associated with historic fill. This was located in the Phase VII portion of the Site;
4. Stained surface area west of the former garage building which was excavated and documented by HDR's August 2007 Tank Closure Report. Excavated material was stockpiled on-site until the 2011-2012 Remedial Action. This was located in the Phase I portion of the Site;
5. Stained surface area near southeast corner of the site which was excavated and documented by HDR's August 2007 Tank Closure Report. Excavated material was stockpiled on-site until the 2011-2012 Remedial Action. This was located in the Phase VI portion of the Site;
6. Area of discarded batteries which was excavated and documented by HDR's August 2007 Tank Closure Report. Excavated material was stockpiled on-site until the 2011-2012 Remedial Action. This was located in the Phase IV portion of the Site;
7. Discolored area east of the office building which was excavated and documented by Carlin-Simpson's July 2012 RACR; Residual levels of SVOCs and metals above Restricted Residential SCOs remain and are believed to be

associated with historic fill. This area was located in the Phase IV portion of the Site;

8. Previous boring B-10 and an area of high metal concentrations which was excavated and documented by HDR's August 2007 Tank Closure Report. Excavated material was stockpiled on-site until the 2011-2012 Remedial Action. This was located in the Phase IV portion of the Site but near the Phase II and Phase VI portions of the Site;
9. Previously stockpiled areas which were removed. Residual levels of SVOCs and metals above Restricted Residential SCOs remain and are believed to be associated with historic fill. These areas were located in the Phase I, Phase II, Phase IV, and Phase VI portions of the Site; and
10. Groundwater contamination which was addressed under NYSDEC Petroleum Spill 07-02222 by installing an absorbent sock in a groundwater well in response to a sheen/ lens identified during excavation. No petroleum was identified, and no oil recovery was required. The spill was closed on October 17, 2012.
11. Historic fill material is present to depths ranging from 6 to greater than 17 feet below the pre-development site grades throughout the entire Site.

Summary of the Work Performed under the Remedial Investigation

As part of the investigation, Carlin-Simpson & Associates performed the following scope of work:

1. Installed 12 soil borings across the entire project Site, and collected 19 soil samples for chemical analysis from the soil borings to evaluate soil quality;
2. Installed 5 groundwater monitoring wells throughout the entire Site to establish groundwater flow and collected 5 groundwater samples for chemical analysis to evaluate groundwater quality;

In addition, Environmental Maintenance Contractors, Inc. (EMC) performed the following scope of work:

1. Installed 13 soil vapor probes across the entire project Site and collected 10 samples for chemical analysis.

Summary of Findings of Remedial Investigation

1. The majority of the full Site is relatively flat with surface elevations ranging from approximately elevation +10.0 feet to elevation +20.0 feet.
2. In the eastern portion of the full property, the surface elevations slope down steeply to the adjacent Long Island Sound, which has a mean high water level at elevation +2.05.
3. Depth to groundwater ranges from 10.25 feet to 14.25 feet below the existing ground surface for the entire Site.
4. Groundwater flow beneath the entire Site is tidally influenced as a result of the adjacent Long Island Sound.
5. Depth to bedrock is approximately 13 feet in the northwest portion of the Site. Bedrock is more than 25 feet below the surface in the remainder of the Site.
6. The stratigraphy of the site, from the surface down, consists of 6 feet to more than 17 feet of fill material (Class 7) that is underlain by medium dense to dense Sand or Silty Sand with Gravel and occasional cobbles (Class 3b).
7. Soil/fill samples collected during the RI showed that there is historic fill material present throughout the full Site and that the fill material showed no detectable concentrations of PCBs. The following results represent the entire property. One VOC (acetone) was detected in one sample at a concentration that exceeds the Unrestricted Use SCO but is well below the Residential Use SCO. All other VOCs detected were found to be at very low levels, including PCE at a max concentration of 0.0007 ppm. One pesticide (4,4'-DDT) was detected at a concentration that slightly exceeded the Unrestricted Use SCO but is well below the Residential Use SCO. Five SVOCs including benzo(a)anthracene (max 3.2 ppm), benzo(a)pyrene (max 3.9 ppm), benzo(b)fluoranthene (max 4.7 ppm), dibenz(a,h)anthracene (max 0.80 ppm),

and indeno(1,2,3-cd)pyrene (max 3.1 ppm) exceeded Restricted Residential Use Soil Cleanup Objectives (SCOs) in most shallow and roughly a quarter of the deep soil samples. These SVOCs are all in a class of compounds known as polycyclic aromatic hydrocarbons (PAHs) which are commonly found in historic fill material. Eight metals exceeded Track 1 Unrestricted Use SCOs, and six of these metals arsenic (max of 20.0 ppm), barium (max of 506 ppm), chromium (max of 113 ppm), copper (max of 382 ppm), lead (max of 3,960 ppm), and mercury (max of 4.9 ppm), also exceeded Track 2 Restricted Residential Use SCOs. These sampling results, with the exception of two shallow hotspot areas, one for lead and one for mercury, are consistent with findings in historic fill material at Sites throughout NYC.

8. Groundwater samples collected during the RI showed that dissolved metals including antimony, cobalt, iron, magnesium, manganese, and sodium exceeded the New York State 6 NYCRR Part 703.5 Class GA groundwater quality standards (GQS). The following results represent the entire property. Two SVOCs (benzo(a)anthracene and benzo(b)fluoranthene) were detected above GQSs in one sample. Three petroleum-related VOCs were also detected at trace concentrations but were well below their GQSs. Groundwater samples showed no detectable concentrations of PCBs or pesticides. Given that the Site is located immediately adjacent to the Long Island Sound, we expect that the groundwater below the Site is brackish.
9. Soil vapor samples collected during the RI showed several petroleum and chlorinated VOCs at generally low concentrations. The following results represent the entire property. Acetone (maximum of 89 $\mu\text{g}/\text{m}^3$) and carbon disulfide (maximum of 79 $\mu\text{g}/\text{m}^3$) were detected in all samples. Most other detections were generally less than 10 $\mu\text{g}/\text{m}^3$. PCE was identified in 9 of ten soil vapor samples at a maximum concentration of 12 $\mu\text{g}/\text{m}^3$, TCE was identified in two of the ten soil vapor samples at a maximum concentration of 1.0 $\mu\text{g}/\text{m}^3$, carbon tetrachloride was identified in two samples at a max concentration of 1.0 $\mu\text{g}/\text{m}^3$, and 1,1,1-TCA was identified in five samples at a

max concentration of 6.2 $\mu\text{g}/\text{m}^3$. None of these chlorinated VOCs were identified in groundwater samples collected during this RI, and only PCE was identified at trace levels in soil. All soil vapor concentrations were reported below the monitoring level ranges established within the NYS DOH soil vapor guidance matrices. Methane was only detected in one sample at 0.032 percent, which is over two orders of magnitude (less than 1%) of the lower explosive limit of 5.0 percent.

Summary of the Remedial Action

Prior remedial action for the full site consisted of removal of two (2) 10,000-gallon USTs as documented by HDR's August 2007 Tank Closure Report; a 550-gallon UST is also believed to have been removed based on multiple test pits and GPR surveys; a former drum storage area was excavated and documented by Carlin-Simpson's July 2012 RACR. Residual levels of SVOCs and metals above Restricted Residential SCOs remain below the composite cover system on the entire Site and are believed to be associated with historic fill; stained surface area west of the former garage building and near the southeast corner of the site were excavated and documented by HDR's August 2007 Tank Closure Report. Excavated material was stockpiled on-site until the 2011-2012 Remedial Action; area of discarded batteries was excavated and documented by HDR's August 2007 Tank Closure Report. Excavated material was stockpiled on-site until the 2011-2012 Remedial Action; discolored area east of the office building was excavated and documented by Carlin-Simpson's July 2012 RACR; Previous boring B-10 and an area of high metal concentrations was excavated and documented by HDR's August 2007 Tank Closure Report. Excavated material was stockpiled on-site until the 2011-2012 Remedial Action; Groundwater contamination was addressed under NYSDEC Petroleum Spill 07-02222 by installing an absorbent sock in a groundwater well in response to a sheen/lens identified during excavation. No petroleum was identified, and no oil recovery was required. The spill was closed by NYSDEC on October 17, 2012.

The remedial action performed at the Site achieved protection of public health and the environment for the intended use of the property for the Phase I area defined as buildings 1-5 (aka 1/3, 5/7, 61/63, 65/67, and 69/71), for the Phase II area defined as buildings 6-8

(aka 49/51, 53/55, and 57/59), the club house and pool, and the pedestrian esplanade, for the Phase III area defined as buildings 9-11 (aka 45/47, 66/68, and 70/72), for the Phase IV area defined as buildings 12-16 (aka 13/15, 17/19, 21/23, 27/29, and 31), for the Phase V area defined as building 17 (aka 9/11), for the Phase VI area defined as buildings 18-20 (aka 33/35, 37/39, and 41/43), and for the Phase VII area defined as buildings 21-22 (aka 26/28 and 30/32). The Remedial Action achieved all of the remedial action objectives established for the completed project and addressed applicable standards, criterion, and guidance; was effective in both the short-term and long-term and reduced mobility, toxicity and volume of contaminants; was cost effective and implementable; and used standard methods that are well established in the industry.

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

- A Pre-Application Meeting was held on 23 January 2013.
- A Remedial Investigation (RI) was performed in March 2013. A RI Report was prepared to evaluate data and information necessary to develop a Remedial Action Work Plan (RAWP).
- A Site Contact List was established. A RAWP was prepared and released with a Fact Sheet on October 18, 2013 for a 30-day public comment period.
- The RAWP and Stipulation List dated December 2013 was approved by the New York City Office of Environmental Remediation (OER) on February 20, 2014.
- A Fact Sheet providing notice of the start of the remedial action was issued on 6 January 2014.
- The removal of Hotspots #1 and #2 was performed in January 2014. Hotspot #1 was located in the Phase I portion of the site and Hotspot #2 was located in the Phase II portion of the site.
- A Pre-Construction Meeting was held on 9 June 2014.
- Remedial action began in June 2014 and was completed for Phase I (buildings 1-5) in April 2016.

- Remedial action began in June 2014 and was completed for Phase II (buildings 6-8, club house, pool, and esplanade) in November 2016.
- Remedial action began in June 2014 and was completed for Phase III (buildings 9-11) in July 2017.
- Remedial action began in June 2014 and was completed for Phase IV (buildings 12-16) in February 2018.
- Remedial action began in June 2014 and was completed for Phase V (building 17) in October 2018.
- Remedial action began in June 2014 and was completed for Phase VI (buildings 18-20) in June 2019.
- Remedial action began in June 2014 and was completed for Phase VII (buildings 21-22) in November 2019.

The remedial action for the full Site consisted of the following tasks:

1. Prepared a Community Protection Statement and implemented a Citizen Participation Plan for the full Site.
2. Mobilized site security, equipment, utility mark outs and marking & staking excavation areas for the full site (January 2014). Mobilization was conducted as necessary for each phase of work at the Site.
3. Performed a Community Air Monitoring Program (CAMP) for particulates and volatile organic carbon compounds for the full Site. CAMP was performed on a limited basis during the period from December 2016 to November 2019, which corresponds to Phase III through Phase VII of the development and periodically during utility excavations. No dust or odor complaints were noted during the development.
4. Established Track 4 Site Specific Soil Cleanup Objectives (SCO's) for the entire Site. The following Track 4 SCO's were utilized: Lead at 1,200 ppm; Mercury at 2.5 ppm; and total SVOCs at 500 ppm.

5. Endpoint samples were collected and evaluated in conjunction with samples collected during remedial investigations. Site Specific Track 4 remediation is achieved.
6. Numerous excavations were performed at the Site as part of the site development. This included excavation of a virgin soil borrow pit from approximately 3 to 8 feet below grade in the northwest portion of the Site for use in other areas on the Site; utility excavations to approximately 5 to 8 feet below grade; excavation to approximately 12 feet below grade for removal of buried barges; excavation to approximately 3 to 8 feet below grade for installation of stormwater infrastructure; excavations for site grading; and excavation to a depth of 2 feet below the planned finished grade in open space areas.
7. Transported and disposed 906 tons of soil/fill material at permitted facilities in accordance with all applicable laws and regulations for handling, transporting, and disposing, and the RAWP. Soil/fill were disposed as:
 - a. 37.32 tons of mercury contaminated soils were transported to Clean Earth, 24 Middlesex Avenue, Carteret, NJ;
 - b. 6.89 tons of lead contaminated soils were transported to Clean Earth, 105 Jacobus Avenue, Kearny, NJ;
 - c. 46.27 tons of petroleum contaminated soils were transported to Clean Earth, 24 Middlesex Avenue, Carteret, NJ
 - d. 815.70 tons of non-hazardous soil/fill were transported to Clean Earth, 24 Middlesex Avenue, Carteret, NJ; and
 - e. Two 55-gallon drums of non-hazardous oil/water were transported to Republic Env. Systems (PA), LLC, Hatfield, PA.
8. Screened excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID.

9. Conducted materials management of excavated materials including temporarily stockpiling and segregating in accordance with defined material types and to prevent co-mingling of contaminated material and non-contaminated materials.
10. Residual soil for the full Site was demarcated using geosynthetic material (orange construction fencing) placed beneath the cover layer in landscaped areas and will be subject to Site Management under this Remedial Action.
11. Constructed an engineered Composite Cover System consisting of 5 inches of concrete in the building areas, 4 inches of concrete and 6 inches of crushed stone sub-base in sidewalk areas, 2.5 to 3.5 inches of asphalt and 8 inches of recycled concrete aggregate (RCA) sub-base in the paved areas, 4 inches of concrete pavers over 12 inches of crushed stone in the patio areas, and two (2) feet of clean soil in open space and landscape areas to prevent human exposure to residual soil/fill remaining under the Site. The contractor for the cover construction was Lawrence Construction Company, Inc.
12. Installed a Vapor Barrier System that consisted of a 20-mil polyethylene vapor barrier liner (VaporBlock Plus 20 by Raven Industries, Inc.) beneath the entire surface area of the concrete slab for the residential buildings and the garages. The contractor for the Vapor Barrier System construction was Lawrence Construction Company, Inc.
13. Performed all activities required for the Remedial Action for the full site, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations.
14. Implemented storm-water pollution prevention measures in compliance with applicable laws and regulations for the full site.
15. Reused excavated soil/fill from various areas on the Site. These soils were placed below the composite cover system throughout the entire Site.
16. Imported topsoil and clean soil to be used for backfill and cover for the full Site. This was performed in compliance with the Remedial Action Work Plan and in

accordance with applicable laws and regulations. The total quantities of the cover soil materials generated on the Site and imported to the Site through November 2019 are as follows:

- a. 1,800 cubic yards of on-site virgin soil.
- b. 955 cubic yards of topsoil from Premium Mulch in Coram, NY.
- c. 330 cubic yards of topsoil from Delea Sod Farms in East Northport, NY.
- d. 3,014 cubic yards of imported cover soil from Lawton Adams in Somers, NY.

17. Submitted intermittent daily reports during construction oversight activities.
18. Submitted a Sustainability Report for the full Site.
19. Established common ownership of the land within the project area by a condominium association to provide continuous management of Site Management requirements by this common owner/condominium association to implement the SMP and ensure that engineering controls and institutional controls remain in place to protect public health. In particular, the condominium association will ensure that there is no vegetable gardening on the site and that all land surfaces are maintained to address potential erosion of cover material. Identification of the Remedial Action, Engineering Controls, Institutional Controls and limitations on land use in the offering plan for sale of real estate on the site. The existence of this remedial action and the engineering controls and institutional controls to protect public health will be communicated to prospective owners and occupants in this offering plan and will be made available prior to ownership or occupancy.
20. Submitted this Final RCR that describes the remedial activities for the full Site, certifies that the remedial requirements defined in the Remedial Action Work Plan have been achieved; defines the Site boundaries; describes all Engineering and Institutional Controls applicable to the Site; and describes any changes from the RAWP.
21. Submitted a Site Management Plan (SMP) for long-term management of residual soil, including plans for operation, maintenance, inspection and certification of

the performance of Engineering Controls and Institutional Controls. The Site will be inspected every 3 years by the QEP beginning in June or July 2021. Inspections shall be performed during each calendar year during the summer months to evaluate prohibitions on vegetable gardening. Inspection and Certification reports will be submitted by July 30, 2022 (for the reporting period calendar year 2021) and every 3 years thereafter (for the reporting period consisting of the prior calendar year).

22. A Declaration of Covenant and Restrictions has been established for the full property and the property will continue to be registered with a Restrictive Declaration by the NYC Department of Buildings. Engineering Controls and Institutional Controls will be managed in compliance with the SMP. Institutional Controls will include prohibition of the following: (1) prohibition of vegetable gardening and farming in residual soil; (2) prohibition of the use of groundwater beneath the site without treatment rendering it safe for the intended use; (3) prohibition of disturbance of residual soil material unless it is conducted in accordance with the SMP; and (4) prohibition of higher levels of land usage than the restricted residential uses addressed by this remedial action without prior notification and approval by OER.

REMEDIAL ACTION REPORT

1.0 SITE BACKGROUND

City Island Reserve LLC has enrolled in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a property located at 226 Fordham Place in the City Island section of Bronx, New York. The boundary of the full property is shown in Figure 2 and includes, in its entirety, Bronx Block 5643 and Lot 235. The Remedial Action was performed pursuant to the OER-approved RAWP in a manner that has rendered the property protective of public health and the environment consistent with its intended use. This RCR describes the remedial activities performed under the RAWP. The Remedial Action described in this document provides for the protection of public health and the environment, complies with applicable environmental standards, criteria and guidance and applicable laws and regulations.

1.1 SITE LOCATION AND BACKGROUND

The full Site is located at 226 Fordham Place in the City Island section in Bronx, New York and is identified as Block 5643 and Lot 235 on the New York City Tax Map. Figure 1 shows the location of the Site. The entire Site is 6.4 acres (approximately 278,000 square feet) and is bounded by the Fordham Street and a New York City Department of Corrections ferry terminal to the north, a multi-family residential property to the south, the Long Island Sound to the east, and Fordham Place to the west. Prior to development, the full Site was vacant and undeveloped.

1.2 REDEVELOPMENT PLAN

The overall redevelopment of the full Site consists of construction of 21 two-family residential buildings, one (1) single family building, 15 detached garages, plus a club house building with a pool. All structures will be slab on grade. Layout of the site development is presented in Figure 2. The current zoning designation is R3A, which is a residential district that features modest single-family and two-family detached residences. The proposed use is consistent with existing zoning for the property.

Phase I of the development was previously completed in April 2016 and consisted of construction of 5 new 2-story residential slab-on-grade buildings (Buildings 1/3, 5/7, 61/63, 65/67, and 69/71) and 5 new slab-on-grade detached garages (Buildings 1A, 5A, 61A, 65A, and 69A) as shown on Figure 4. After 90.48 tons of soil and fill from three hotspot areas were excavated from the Phase I and Phase II portions of the property and disposed of off-Site, the site was re-graded using on-site soil material. New underground utilities, asphalt paved roads, and stormwater infrastructure were installed and required excavation from 0 to 8 feet below grade. The Phase I portion of the Site is now covered with 10,238 square feet of building space, approximately 12,000 square feet of landscaped areas, 1,990 square feet of concrete sidewalks, and 15,262 square feet of asphalt-paved roads and driveways. The landscaped open space in the Phase I area has been covered with two (2) feet of clean soil material.

Phase II of the development was previously completed in November 2016 and consisted of construction of 3 new 2-story residential slab-on-grade buildings (Buildings 49/51, 53/55, and 57/59), 3 new slab-on-grade detached garages (Buildings 49A, 53A, and 57A), and the club house building and pool as shown on Figure 4. In addition, the pedestrian esplanade from Fordham Street to the easternmost portion of the site, which is an open space/viewing area open to the public, was also completed during Phase II as shown on Figure 4. The Phase II area of the site was re-graded using on-site soil material. New underground utilities, asphalt paved roads, and stormwater infrastructure were installed and required excavation from 0 to 8 feet below grade. The Phase II portion of the Site is now covered with 9,328 square feet of building and pool space, approximately 10,432 square feet of landscaped areas, 725 square feet of concrete paver areas, 3,936 square feet of concrete (sidewalks and pool deck), 7,710 square feet of esplanade retaining walls and permeable pavers, and 7,276 square feet of asphalt-paved roads and driveways. The landscaped open space in the Phase II area has been covered with two (2) feet of clean soil material.

Phase III of the development was previously completed in July 2017 and consisted of construction of 3 new 2-story residential slab-on-grade buildings (Buildings 45/47, 66/68, and 70/72) and 3 new slab-on-grade detached garages (Buildings 45A, 66A, and 70A) as shown on Figure 4. The Phase III portion of the site was re-graded using on-site soil

material. New underground utilities, asphalt paved roads, and stormwater infrastructure were installed and required excavation from 0 to 8 feet below grade. The Phase III portion of the Site is now covered with 6,690 square feet of building space, approximately 7,777 square feet of landscaped areas, 1,044 square feet of concrete paver areas, 1,742 square feet of concrete sidewalks, and 4,928 square feet of asphalt-paved roads and driveways. The landscaped open space in the Phase III area has been covered with two (2) feet of clean soil material.

Phase IV of the development was previously completed in February 2018 and consisted of construction of 5 new 2-story residential slab-on-grade buildings (Buildings 13/15, 17/19, 21/23, 27/29, and 31) and 1 new slab-on-grade detached garages (Building 13A) as shown on Figure 4. The Phase IV portion of the site was re-graded using on-site soil material. New underground utilities, asphalt paved roads, and stormwater infrastructure were installed and required excavation from 0 to 8 feet below grade. The Phase IV portion of the Site is now covered with 10,830 square feet of building space, approximately 17,808 square feet of landscaped areas, 11,858 square feet of concrete paver areas (patios and roads), 3,025 square feet of concrete sidewalks, and 8,309 square feet of asphalt-paved roads and driveways. The landscaped open space in the Phase IV area has been covered with two (2) feet of clean soil material.

Phase V of the development was previously completed in October 2018 and consisted of construction of 1 new 2-story residential slab-on-grade building (Building 9/11) and 1 new slab-on-grade detached garage (Building 9A) as shown on Figure 4. The Phase V portion of the site was re-graded using on-site soil material. New underground utilities were installed and required excavation from 0 to 5 feet below grade. The Phase V portion of the Site is now covered with 2,020 square feet of building space, approximately 1,690 square feet of landscaped areas, 228 square feet of concrete paver areas (patio), 356 square feet of concrete sidewalks, and 986 square feet of asphalt-paved driveways. The landscaped open space in the Phase V area has been covered with two (2) feet of clean soil material.

Phase VI of the development is the subject was previously completed in June 2019 and consists of construction of 3 new 2-story residential slab-on-grade buildings (Buildings 33/35, 37/39, and 41/43) as shown on Figure 4. The Phase VI portion of the site was re-

graded using on-site soil material. New underground utilities were installed and required excavation from 0 to 5 feet below grade. The Phase VI portion of the Site is now covered with 7,143 square feet of building space, approximately 18,126 square feet of landscaped areas, 5,065 square feet of concrete paver area (3,925 square feet in the road and 1,140 square feet of patios), 1,006 square feet of concrete sidewalks, and 930 square feet of asphalt-paved driveways. The landscaped open space in the Phase VI area has been covered with two (2) feet of clean soil material.

Phase VII of the development is now complete and consists of construction of 2 new 2-story residential slab-on-grade buildings (Buildings 26/28 and 30/32) and 2 new slab-on-grade detached garages (Buildings 26A and 30A) as shown on Figure 4. The Phase VII portion of the site was re-graded using on-site soil material. New underground utilities were installed and required excavation from 0 to 5 feet below grade. The Phase VII portion of the Site is now covered with 4,557 square feet of building space, approximately 6,733 square feet of landscaped areas, 523 square feet of concrete paver areas, 1,518 square feet of concrete sidewalks, and 1,924 square feet of asphalt-paved driveways. The landscaped open space in the Phase VII area has been covered with two (2) feet of clean soil material.

1.3 DESCRIPTION OF SURROUNDING PROPERTY

The area immediately surrounding the full Site generally consists of residential and commercial properties. There are single family and multi-family residential properties to the west and multi-family residential buildings to the south. To the north of the full Site, across Fordham Street, are commercial and residential properties. There are no sensitive receptors such as schools, hospitals, or day care facilities within a 500-foot radius of the full Site. Figure 1 and Figure 2 show the surrounding land usage.

1.4 SUMMARY OF PAST SITE USES AND AREAS OF CONCERN

The full Site was developed prior to 1893 for use as a shipyard with woodworking, storage, a machine shop, and a dwelling. The full Site has been used since that time for various maritime related uses, including ship and yacht building, boat storage and boat repair, sail making, and a diving business. From 1976 to 1978, the full Site was also used as a contractor's yard. Sometime between 1978 and 1981, the full Site was filled to its current

grade.

The following structures on the property were demolished in 2012: 1) a two-story wood frame structure in the northern portion of the site, which was reportedly used as an office building; 2) a one-story metal building in the western portion of the site, which was reportedly used as a machine shop; 3) a two-story metal building in the center, northern portion of the property, which was reportedly used as a garage and was also used by a diving business; and 4) a dilapidated two-story wood frame structure in the southwest corner of the site, which was at one time identified as a carpentry building.

The scope of work for the RI was developed in response to the proposed development project. An investigation of soil, soil vapor, and groundwater was performed to characterize the entire Site for potential environmental contamination from historic on-site uses, operations, etc. The sampling event was designed to provide general coverage across the entire site and to characterize the historic fill material that will remain on Site.

The following Areas of Concern have been identified for the entire Site:

1. Two (2) 10,000-gallon USTs which were removed and documented by HDR's August 2007 Tank Closure Report. These tanks were located in the Phase I portion of the Site;
2. Previous boring B-3 and a 550-gallon UST which has not been located since GTA's 2003 Investigation. This was located in the Phase VI portion of the Site. This tank is believed to have been removed based on multiple test pits and GPR surveys;
3. A former drum storage area which was excavated and documented by Carlin-Simpson's July 2012 Remedial Action Closure Report (RACR) completed for NYS DEC. Residual levels of SVOCs and metals above Restricted Residential SCOs remain and are believed to be associated with historic fill. This was located in the Phase VII portion of the Site;
4. Stained surface area west of the former garage building which was excavated and documented by HDR's August 2007 Tank Closure Report. Excavated

material was stockpiled on-site until the 2011-2012 Remedial Action. This was located in the Phase I portion of the Site;

5. Stained surface area near southeast corner of the site which was excavated and documented by HDR's August 2007 Tank Closure Report. Excavated material was stockpiled on-site until the 2011-2012 Remedial Action. This was located in the Phase VI portion of the Site;
6. Area of discarded batteries which was excavated and documented by HDR's August 2007 Tank Closure Report. Excavated material was stockpiled on-site until the 2011-2012 Remedial Action. This was located in the Phase IV portion of the Site;
7. Discolored area east of the office building which was excavated and documented by Carlin-Simpson's July 2012 RACR; Residual levels of SVOCs and metals above Restricted Residential SCOs remain and are believed to be associated with historic fill. This area was located in the Phase IV portion of the Site;
8. Previous boring B-10 and an area of high metal concentrations which was excavated and documented by HDR's August 2007 Tank Closure Report. Excavated material was stockpiled on-site until the 2011-2012 Remedial Action. This was located in the Phase IV portion of the Site but near the Phase II and Phase VI portions of the Site;
9. Previously stockpiled areas which were removed. Residual levels of SVOCs and metals above Restricted Residential SCOs remain and are believed to be associated with historic fill. These areas were located in the Phase I, Phase II, Phase IV, and Phase VI portions of the Site; and
10. Groundwater contamination which was addressed under NYSDEC Petroleum Spill 07-02222 by installing an absorbent sock in a groundwater well in response to a sheen/ lens identified during excavation. No petroleum was identified, and no oil recovery was required. The spill was closed on October 17, 2012.

11. Historic fill material is present to depths ranging from 6 to greater than 17 feet below the pre-development site grades throughout the entire Site.

1.5 SUMMARY OF REMEDIAL INVESTIGATION WORK PERFORMED

As part of the remedial investigation for the full Site, Carlin-Simpson & Associates performed the following scope of work:

1. Installed 12 soil borings across the entire project Site and collected 19 soil samples for chemical analysis from the soil borings to evaluate soil quality. Soil borings locations are summarized below.
2. Installed 5 groundwater monitoring wells throughout the entire Site to establish groundwater flow and collected 5 groundwater samples for chemical analysis to evaluate groundwater quality. Monitoring well locations are summarized below.

Phase I – Borings B-111 and B-112; Monitoring Well MW-101

Phase II – Borings B-106 and B-110

Phase III – Borings B-102 and B-107; Monitoring Well MW-103

Phase IV – Borings B-101, B-104, B-105, and B-109; Monitoring Wells MW-102 and MW-105

Phase V – None

Phase VI – Borings B-103 and B-108; Monitoring Well MW-104

Phase VII – None

In addition, Environmental Maintenance Contractors, Inc. (EMC) performed the following scope of work:

3. Installed 13 soil vapor probes across the entire project Site and collected 10 samples for chemical analysis. The vapor probe locations are summarized below. Three of the 13 probes (VP-9, VP-10, and VP-11) were not sampled due to a shallow water table.

Phase I – Probes VP-2, VP-3, and VP-12

Phase II – Probes VP-9, VP-10, and VP-13

Phase III – Probes VP-1

Phase IV – Probes VP-4, VP-5, and VP-6

Phase V – None

Phase VI – Probes VP-7 and VP-8

Phase VII – Probes VP-11

1.6 SUMMARY OF FINDINGS OF REMEDIAL INVESTIGATION

1. The majority of the entire Site is relatively flat with surface elevations ranging from approximately elevation +10.0 feet to elevation +20.0 feet. In the eastern portion of the property, the surface elevations slope down steeply to the adjacent Long Island Sound, which has a mean high water level at elevation +2.05.
2. Depth to groundwater ranges from 10.25 feet to 14.25 feet below the existing ground surface at the Site. Groundwater flow beneath the entire Site is tidally influenced as a result of the adjacent Long Island Sound.
3. Depth to bedrock is approximately 13 feet in the northwest portion of the Site. Bedrock is more than 25 feet below the surface in the remainder of the Site.
4. The stratigraphy of the full Site, from the surface down, consists of 6 feet to more than 17 feet of fill material (Class 7) that is underlain by medium dense to dense Sand or Silty Sand with Gravel and occasional cobbles (Class 3b).
5. Soil/fill samples collected during the RI showed that there is historic fill material present throughout the entire Site and that the fill material showed no detectable concentrations of PCBs. The following results represent the entire property. One VOC (acetone) was detected in one sample at a concentration that exceeds the Unrestricted Use SCO but is well below the Residential Use SCO. All other VOCs detected were found to be at very low levels, including

PCE at a max concentration of 0.0007 ppm. One pesticide (4,4'-DDT) was detected at a concentration that slightly exceeded the Unrestricted Use SCO but is well below the Residential Use SCO. Five SVOCs including benzo(a)anthracene (max 3.2 ppm), benzo(a)pyrene (max 3.9 ppm), benzo(b)fluoranthene (max 4.7 ppm), dibenz(a,h)anthracene (max 0.80 ppm), and indeno(1,2,3-cd)pyrene (max 3.1 ppm) exceeded Restricted Residential Use Soil Cleanup Objectives (SCOs) in most shallow and roughly a quarter of the deep soil samples. These SVOCs are all in a class of compounds known as polycyclic aromatic hydrocarbons (PAHs) which are commonly found in historic fill material. Eight metals exceeded Track 1 Unrestricted Use SCOs, and six of these metals arsenic (max of 20.0 ppm), barium (max of 506 ppm), chromium (max of 113 ppm), copper (max of 382 ppm), lead (max of 3,960 ppm), and mercury (max of 4.9 ppm), also exceeded Track 2 Restricted Residential Use SCOs. These sampling results, with the exception of two shallow hotspot areas, one for lead and one for mercury, are consistent with findings in historic fill material at Sites throughout NYC. The soil results are attached in Appendix E of the RI Report. The entire RI Report is attached in Appendix A of this document.

6. Groundwater samples collected during the RI showed that dissolved metals including antimony, cobalt, iron, magnesium, manganese, and sodium exceeded the New York State 6 NYCRR Part 703.5 Class GA groundwater quality standards (GQS). The following results represent the entire property, not just the Phase VI area. Two SVOCs (benzo(a)anthracene and benzo(b)fluoranthene) were detected above GQSs in one sample. Three petroleum-related VOCs were also detected at trace concentrations but were well below their GQSs. Groundwater samples showed no detectable concentrations of PCBs or pesticides. Given that the Site is located immediately adjacent to the Long Island Sound, we expect that the groundwater below the Site is brackish. The groundwater results are attached in Appendix F of the RI Report. The entire RI Report is attached in Appendix A of this document.

7. Soil vapor samples collected during the RI showed several petroleum and chlorinated VOCs at generally low concentrations. The following results represent the entire property, not just the Phase VI area. Acetone (maximum of $89 \mu\text{g}/\text{m}^3$) and carbon disulfide (maximum of $79 \mu\text{g}/\text{m}^3$) were detected in all samples. Most other detections were generally less than $10 \mu\text{g}/\text{m}^3$. PCE was identified in 9 of ten soil vapor samples at a maximum concentration of $12 \mu\text{g}/\text{m}^3$, TCE was identified in two of the ten soil vapor samples at a maximum concentration of $1.0 \mu\text{g}/\text{m}^3$, carbon tetrachloride was identified in two samples at a max concentration of $1.0 \mu\text{g}/\text{m}^3$, and 1,1,1-TCA was identified in five samples at a max concentration of $6.2 \mu\text{g}/\text{m}^3$. None of these chlorinated VOCs were identified in groundwater samples collected during this RI, and only PCE was identified at trace levels in soil. All soil vapor concentrations were reported below the monitoring level ranges established within the NYS DOH soil vapor guidance matrices. Methane was only detected in one sample at 0.032 percent, which is over two orders of magnitude (less than 1%) of the lower explosive limit of 5.0 percent. The soil vapor results are attached in Appendix A of the RI Report. The entire RI Report is attached in Appendix A of this document.

2.0 DESCRIPTION OF REMEDIAL ACTIONS

The remedial action was performed in accordance with an OER approved Remedial Action Work Plan and achieved the remedial action objectives established for the project. The remedial action for the Site was completed in phases as follows:

- Phase I of the project consisted of buildings 1-5 (aka 1/3, 5/7, 61/63, 65/67, and 69/71) plus detached garages 1A, 5A, 61A, 65A, and 69A;
- Phase II is defined as buildings 6-8 (aka 49/51, 53/55, and 57/59), detached garages 49A, 53A, and 57A, the club house and pool, and the pedestrian esplanade;
- Phase III of the project is defined as buildings 9-11 (aka 45/47, 66/68, and 70/72) plus detached garages 45A, 66A, and 70A;
- Phase IV is defined as buildings 12-16 (aka 13/15, 17/19, 21/23, 27/29, and 31) plus detached garage 13A;
- Phase V is defined as building 17 (aka 9/11) and detached garage 9A;
- Phase VI consisted of buildings 18-20 (aka 33/35, 37/39, and 41/43); and
- Phase VII of the project is defined as buildings 21-22 (aka 26/28 and 30/32) plus detached garages 26A and 30A.

The remedial action was evaluated in an alternatives analysis and 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 for the full site is as follows:

- A Pre-Application Meeting was held on 23 January 2013.
- A Remedial Investigation (RI) was performed in March 2013. A RI Report was

prepared to evaluate data and information necessary to develop a Remedial Action Work Plan (RAWP).

- A Site Contact List was established. A RAWP was prepared and released with a Fact Sheet on October 18, 2013 for a 30-day public comment period.
- The RAWP and Stipulation List dated December 2013 was approved by the New York City Office of Environmental Remediation (OER) on February 20, 2014.
- A Fact Sheet providing notice of the start of the remedial action was issued on 6 January 2014.
- The removal of Hotspots #1 and #2 was performed in January 2014. Hotspot #1 was located in the Phase I portion of the site and Hotspot #2 was located in the Phase II portion of the site.
- A Pre-Construction Meeting was held on 9 June 2014.
- Remedial action began in June 2014 and was completed for Phase I (buildings 1-5) in April 2016.
- Remedial action began in June 2014 and was completed for Phase II (buildings 6-8, club house, pool, and esplanade) in November 2016.
- Remedial action began in June 2014 and was completed for Phase III (buildings 9-11) in July 2017.
- Remedial action began in June 2014 and was completed for Phase IV (buildings 12-16) in February 2018.
- Remedial action began in June 2014 and was completed for Phase V (building 17) in October 2018.
- Remedial action began in June 2014 and was completed for Phase VI (buildings 18-20) in June 2019.
- Remedial action began in June 2014 and was completed for Phase VII (buildings 21-22) in November 2019.

The remedial action for the full Site consisted of the following tasks:

1. Prepared a Community Protection Statement and implemented a Citizen Participation Plan for the full Site.
2. Mobilized site security, equipment, utility mark outs and marking & staking excavation areas for the full site (January 2014). Mobilization was conducted as necessary for each phase of work at the Site.
3. Performed a Community Air Monitoring Program (CAMP) for particulates and volatile organic carbon compounds for the full Site. CAMP was performed on a limited basis during the period from December 2016 to November 2019, which corresponds to Phase III through Phase VII of the development and periodically during utility excavations. No dust or odor complaints were noted during the development.
4. Established Track 4 Site Specific Soil Cleanup Objectives (SCO's) for the entire Site. The following Track 4 SCO's were utilized: Lead at 1,200 ppm; Mercury at 2.5 ppm; and total SVOCs at 500 ppm.
5. Endpoint samples were collected and evaluated in conjunction with samples collected during remedial investigations. Site Specific Track 4 remediation is achieved.
6. Numerous excavations were performed at the Site as part of the site development. This included excavation of a virgin soil borrow pit from approximately 3 to 8 feet below grade in the northwest portion of the Site for use in other areas on the Site; utility excavations to approximately 5 to 8 feet below grade; excavation to approximately 12 feet below grade for removal of buried barges; excavation to approximately 3 to 8 feet below grade for installation of stormwater infrastructure; excavations for site grading; and excavation to a depth of 2 feet below the planned finished grade in open space areas.
7. Transported and disposed 906 tons of soil/fill material at permitted facilities in accordance with all applicable laws and regulations for handling, transporting, and

disposing, and the RAWP. Soil/fill were disposed as:

- a. 37.32 tons of mercury contaminated soils were transported to Clean Earth, 24 Middlesex Avenue, Carteret, NJ;
 - b. 6.89 tons of lead contaminated soils were transported to Clean Earth, 105 Jacobus Avenue, Kearny, NJ;
 - c. 46.27 tons of petroleum contaminated soils were transported to Clean Earth, 24 Middlesex Avenue, Carteret, NJ
 - d. 815.70 tons of non-hazardous soil/fill were transported to Clean Earth, 24 Middlesex Avenue, Carteret, NJ; and
 - e. Two 55-gallon drums of non-hazardous oil/water were transported to Republic Env. Systems (PA), LLC, Hatfield, PA.
8. Screened excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID.
 9. Conducted materials management of excavated materials including temporarily stockpiling and segregating in accordance with defined material types and to prevent co-mingling of contaminated material and non-contaminated materials.
 10. Residual soil for the full Site was demarcated using geosynthetic material (orange construction fencing) placed beneath the cover layer in landscaped areas and will be subject to Site Management under this Remedial Action.
 11. Constructed an engineered Composite Cover System consisting of 5 inches of concrete in the building areas, 4 inches of concrete and 6 inches of crushed stone sub-base in sidewalk areas, 2.5 to 3.5 inches of asphalt and 8 inches of recycled concrete aggregate (RCA) sub-base in the paved areas, 4 inches of concrete pavers over 12 inches of crushed stone in the patio areas, and two (2) feet of clean soil in open space and landscape areas to prevent human exposure to residual soil/fill remaining under the Site. The contractor for the cover construction was Lawrence Construction Company, Inc.

12. Installed a Vapor Barrier System that consisted of a 20-mil polyethylene vapor barrier liner (VaporBlock Plus 20 by Raven Industries, Inc.) beneath the entire surface area of the concrete slab for the residential buildings and the garages. The contractor for the Vapor Barrier System construction was Lawrence Construction Company, Inc.
13. Performed all activities required for the Remedial Action for the full site, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations.
14. Implemented storm-water pollution prevention measures in compliance with applicable laws and regulations for the full site.
15. Reused excavated soil/fill from various areas on the Site. These soils were placed below the composite cover system throughout the entire Site.
16. Imported topsoil and clean soil to be used for backfill and cover for the full Site. This was performed in compliance with the Remedial Action Work Plan and in accordance with applicable laws and regulations. The total quantities of the cover soil materials generated on the Site and imported to the Site through November 2019 are as follows:
 - a. 1,800 cubic yards of on-site virgin soil.
 - b. 955 cubic yards of topsoil from Premium Mulch in Coram, NY.
 - c. 330 cubic yards of topsoil from Delea Sod Farms in East Northport, NY.
 - d. 3,014 cubic yards of imported cover soil from Lawton Adams in Somers, NY.
17. Submitted intermittent daily reports during construction oversight activities.
18. Submitted a Sustainability Report for the full Site.
19. Established common ownership of the land within the project area by a condominium association to provide continuous management of Site Management requirements by this common owner/condominium association to implement the

SMP and ensure that engineering controls and institutional controls remain in place to protect public health. In particular, the condominium association will ensure that there is no vegetable gardening on the site and that all land surfaces are maintained to address potential erosion of cover material. Identification of the Remedial Action, Engineering Controls, Institutional Controls and limitations on land use in the offering plan for sale of real estate on the site. The existence of this remedial action and the engineering controls and institutional controls to protect public health will be communicated to prospective owners and occupants in this offering plan and will be made available prior to ownership or occupancy.

20. Submitted this Final RCR that describes the remedial activities for the full Site, certifies that the remedial requirements defined in the Remedial Action Work Plan have been achieved; defines the Site boundaries; describes all Engineering and Institutional Controls applicable to the Site; and describes any changes from the RAWP.
21. Submitted a Site Management Plan (SMP) for long-term management of residual soil, including plans for operation, maintenance, inspection and certification of the performance of Engineering Controls and Institutional Controls. The Site will be inspected every 3 years by the QEP beginning in June or July 2021. Inspections shall be performed during each calendar year during the summer months to evaluate prohibitions on vegetable gardening. Inspection and Certification reports will be submitted by July 30, 2022 (for the reporting period calendar year 2021) and every 3 years thereafter (for the reporting period consisting of the prior calendar year).
22. A Declaration of Covenant and Restrictions has been established for the full property and the property will continue to be registered with a Restrictive Declaration by the NYC Department of Buildings. Engineering Controls and Institutional Controls will be managed in compliance with the SMP. Institutional Controls will include prohibition of the following: (1) prohibition of vegetable gardening and farming in residual soil; (2) prohibition of the use of groundwater beneath the site without treatment rendering it safe for the intended use; (3)

prohibition of disturbance of residual soil material unless it is conducted in accordance with the SMP; and (4) prohibition of higher levels of land usage than the restricted residential uses addressed by this remedial action without prior notification and approval by OER.

3.0 COMPLIANCE WITH REMEDIAL ACTION WORK PLAN

3.1 HEALTH & SAFETY PLAN

The remedial construction activities performed under this program were in compliance with the Health and Safety Plan and applicable laws and regulations. The Site Safety Coordinator was Meredith R. Anke, P.E.

3.2 COMMUNITY AIR MONITORING PLAN

The Community Air Monitoring Plan provided for the collection and analysis of air samples during remedial construction activities to ensure proper protections were employed to protect workers and the neighboring community. Limited monitoring was performed in compliance with the Community Air Monitoring Plan in the approved RAWP. The majority of the subsurface earthwork for the full Site was completed during the earlier development phases (Phases I through III). Earthwork after that time consisted of localized utility excavations, planting trees and shrubs, minor grading for preparation of final surfaces (i.e. concrete, asphalt, pavers), over-excavation of fill in landscape areas, placement of the demarcation layer, installation of cover soil, stockpiling of excess soil/fill, and loading of excess soil/fill for disposal. The results of community air monitoring for the entire project are included in Appendix E.

3.3 SOIL/MATERIALS MANAGEMENT PLAN

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

3.4 STORM-WATER POLLUTION PREVENTION

Storm water pollution prevention included physical methods and processes to control and/or divert surface water flows and to limit the potential for erosion and migration of Site soils, via wind or water. Remedial construction activities performed under this

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

3.5 DEVIATIONS FROM THE REMEDIAL ACTION WORK PLAN

The Remedial Action work was performed in accordance with the OER approved RAWP. The following deviations occurred:

1. The anticipated construction schedule for the full Site was significantly altered. The project was temporarily delayed due to a Notice of Violation and stop work order issued on 13 August 2014 by the NYSDEC regarding construction activity in the tidal wetland area.
2. Although the RAWP called for import of 6,800 cubic yards of soil (cover soil and topsoil) for the full Site, only 4,299 cubic yards were imported.
3. The end point analytical results indicate that soil remains in one location on the Site (sample B-102B at a depth of 8 to 10 feet below the surface) at concentrations that exceed the Track 4 SCOs for lead and mercury. This material was allowed to remain in place since it was covered by several feet of existing soil, it will be protected under the composite cover system, and groundwater sampling at this location has shown that the metals are not mobilizing into groundwater. The selected remedy remains protective of public health and the environment.
4. Air monitoring was not performed during the placement of clean imported cover soil. Air monitoring was only performed on a limited basis during the period from December 2016 to November 2019, which corresponds to Phase III through Phase VII of the development. Limited air monitoring was performed periodically during times of utility excavations, minor grading, and the excavation and loading out of excess soil/fill for off-site disposal.
5. The RAWP required that daily reports for each day of active remedial work would be communicated to OER by the following work day. Daily reports were received at various times during and after the remediation.

4.0 REMEDIAL PROGRAM

4.1 PROJECT ORGANIZATION

Principal personnel who participated in the remedial action include Meredith R. Anke, P.E., Project Manager for Carlin-Simpson & Associates, Thomas Pugliese, Project Manager for City Island Reserve, LLC, and James Triano, Site Manager for City Island Reserve, LLC. The Professional Engineer (PE) and Qualified Environmental Professionals (QEP) for this project are Robert B. Simpson, P.E. and Meredith R. Anke, P.E., respectively. The Site Contractor was initially SCE Environmental Group but was later changed to Lawrence Construction Company, Inc.

4.2 SITE CONTROLS

Site Preparation

Mobilization was conducted as necessary for each phase of work at the Site. Mobilization included field personnel orientation, equipment mobilization (including securing all sampling equipment needed for the field investigation), marking/staking sampling locations and utility mark-outs. Each field team member attended an orientation meeting to become familiar with the general operation of the Site, health and safety requirements, and field procedures. The initial hotspot removals (Hotspots #1 and #2) in the Phase I and Phase II portions of the Site were performed in January 2014 and mobilization for the remainder of the remedial action was in June 2014.

The presence of utilities and easements on the entire Site was investigated prior to the performance of invasive work by contacting 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.

The entire Site was cleared and grubbed in 2014 and a construction fence was erected around the western, northern, and southern property boundaries.

Erosion and sedimentation control measures were implemented for the entire Site in accordance with the NYSDEC regulations and with the approved Sediment and Erosion Control Plan for the project.

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

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

Soil Screening

Visual, olfactory and PID soil screening and assessment was performed under the supervision of a Qualified Environmental Professional during all remedial and development excavations. Soil screening was performed during invasive work performed during the remedy and development phases, such as the borrow pit excavation in the Phase I portion of the site, excavations for underground utilities, and excavations required for site grading. Other than the soil encountered in the area of Hotspot #3, no visual/olfactory evidence of petroleum contamination was identified in the site excavations. Hotspot #3 is discussed in more detail in a following section of this report.

Stockpile Management

Excavated soil from the virgin soil borrow pit area, which was excavated from the Phase I portion of the Site, was stockpiled separately in other areas of the Site, and was segregated from the historic fill material on the site using 8-mil thick plastic sheeting. Imported materials were also stockpiled on the full site and were either staged on final cap surfaces (i.e. asphalt pavement) or were segregated from the historic fill material using 8-mil thick plastic sheeting.

All stockpile activities were compliant with applicable laws and regulations. Soil stockpile areas were appropriately graded to control run-off in accordance with applicable laws and regulations. Stockpiles of excavated soils and other materials were located at least 50 feet from the property boundaries, where possible. Hay bales or equivalent was used to surround soil stockpiles except for areas where access by equipment is required. Silt

fencing and hay bales were used as needed near catch basins, surface waters and other discharge points.

Truck Inspection

Before exiting the NYC VCP Site, trucks were examined for evidence of contaminated soil on the undercarriage, body, and wheels. Soil and debris were removed, as necessary.

Site Security

The entire perimeter of the Site was secured with a plywood fence in accordance with New York City DOB requirements. The applicant maintained a daily presence log sheet of all workers, contractors and visitors. The Site was secured at night in accordance with New York City DOB Construction Codes.

Nuisance Controls

All invasive work during the remedial action was conducted in accordance with the dust control plan outlined in the RAWP. Air quality was monitored by personnel and equipment stationed near the soil excavation activities and downwind of the work area. Dust suppression was performed whenever necessary by wetting dry surfaces and using a gravel truck entrance pad. The contractors were responsible for limiting all noise levels to a minimum and conformed to the New York City DEP noise control standards. Nuisance odors were not identified during the remedial action. No dust or odor complaints were noted during the development.

Reporting

All daily and monthly reports are included in Appendix C. Digital photographs of the Remedial Action are included in the daily reports and additional photographs are included in Appendix D.

4.3 MATERIALS EXCAVATION AND REMOVAL

Based on the results of the Remedial Investigation, the following Track 4 Site-specific SCOs were proposed for the Site:

Lead	1,200 ppm
Mercury	2.5 ppm
Total SVOCs	500 ppm

Numerous excavations were performed throughout the Site as part of the site development. This included excavation of a virgin soil borrow pit from approximately 3 to 8 feet below grade in the northwest portion of the Site for use in other areas on the Site; utility excavations to approximately 3 to 8 feet below grade; excavation to approximately 12 feet below grade for removal of buried barges; excavation to approximately 3 to 8 feet below grade for installation of stormwater infrastructure; excavations for site grading; and excavation to a depth of 2 feet below the planned finished grade in open space areas. A map showing the location of the virgin soil borrow pit and the barge removal areas is shown in Figure 3.

In addition, three (3) hotspot areas were removed from the western portion of the Site during the remedial action. Hotspot areas #1 and #2 were identified during the Remedial Investigation and were included in the RAWP. Hotspot #1 was located in the Phase I portion of the site and Hotspot #2 was located in the Phase II portion of the site. However, these areas were excavated in January 2014 prior to beginning the remedial action for the full Site. Hotspot #3 was encountered during excavation of the virgin soil borrow pit from the western portion of the site. This area was located in and excavated during the Phase I portion of the development.

Hotspot #1 was identified as an area around boring B-111, where the shallow soil/fill exceeded the Track 4 Site-Specific SCO for mercury. This area is identified on Figure 3. Pre-delineation sampling was performed in August 2013 prior to the Remedial Action to determine the horizontal and vertical limits of the soil/fill exceeding the SCO. The end point sampling analytical results for Hotspot #1 are summarized in Table 1. The hotspot area was excavated on 21 January 2014. The resulting excavation was approximately 10 feet by 15 feet by 4 feet deep. A total of 37.32 tons of soil/fill was loaded directly into containers for off-site disposal.

Hotspot #2 was identified as an area around boring B-110, where the shallow soil/fill

exceeded the Track 4 Site-Specific SCO for lead. This area is identified on Figure 3. Pre-delineation sampling was performed in August 2013 prior to the Remedial Action to determine the horizontal and vertical limits of the soil/fill exceeding the SCO. The end point sampling analytical results for Hotspot #2 are summarized in Table 1. The hotspot area was excavated on 21 January 2014. The resulting excavation was approximately 7 feet by 7.5 feet by 2 feet deep. A total of 6.89 tons of soil/fill was loaded directly into containers for off-site disposal.

Hotspot #3 was encountered on 2 July 2014 during the general excavation of a virgin soil borrow pit in the western portion of the site. During the field screening of the excavated soil, the QEP observed stained soils, petroleum odors, and elevated PID readings. The source of the contamination was not identified and presumed to be an old surface spill. The spill was reported to the OER case manager and to the NYSDEC. Spill No. 1403504 was subsequently assigned to the site. The approximate GPS coordinates for the hotspot area are N+40.847675, W-73.783751. On 7 July 2014, the contaminated soil was excavated and placed onto plastic sheeting on the site until disposal arrangements could be made. The resulting excavation was approximately 16 feet long and ranged from approximately 3 feet to 9 feet in width and 4 feet to 4.5 feet in depth. The end point sampling results for Hotspot #3 are summarized in Table 2. Track 4 SCOs were achieved. Before the soil could be hauled off-site for disposal, the project was temporarily delayed due to an unrelated construction violation and a stop work order. The stockpile remained on the site for an extended period of time. The stockpile was on plastic sheeting, covered with plastic sheeting, and surrounded by hay bales the entire time it remained on the property. On 29 July 2015, a total of 46.27 tons of soil/fill were loaded onto two (2) trucks for off-site disposal. The spill remains open at the time of this report, but a Spill Closure Report has been submitted to the NYSDEC.

Excavated soil/fill from various areas on the Site was reused below the composite cover system throughout the entire Site. However, there was excess soil/fill that could not be reused at the completion of the site development. As this material was generated, it was stockpiled in the Phase VI and Phase VII portions of the Site and covered with plastic sheeting. In May 2019, a total of 198.28 tons of soil/fill were loaded onto six (6) trucks for

off-site disposal. In June 2019, a total of 193.07 tons of soil/fill were loaded onto six (6) trucks for off-site disposal. In July 2019, a total of 365.02 tons of soil/fill were loaded onto 13 trucks for off-site disposal. In October 2019, a total of 59.33 tons of soil/fill were loaded onto two (2) trucks for off-site disposal.

End Point Sample Results

As discussed above, pre-delineation sampling was performed for the Hotspot #1 and Hotspot #2 areas. The final excavation extent in these two removal areas was based on the analytical results of the soil samples that were collected during the pre-delineation sampling as outlined in the RAWP. The pre-delineation sampling involved the installation of 16 borings and the collection of 60 soil samples for horizontal and vertical delineation in the two hotspot areas. The analytical results are summarized in Table 1. The results indicated that in Hotspot #1 (B-111), the mercury concentrations detected in three of the four samples from the first delineation ring and the deeper sample at B-111 all met the Track 4 SCO for mercury (2.5 mg/kg). One sample to the north of B-111 exceeded the Track 4 SCO. Subsequent analysis of a sample (in a northerly direction) from the second delineation ring indicates that soil met the Track 4 SCO for mercury. Therefore, the removal area around B-111 was delineated to an area approximately 10 feet by 15 feet by 4 feet deep. The analytical results indicated that in Hotspot #2 (B-110), the lead concentrations detected in the first ring of delineation samples and in the deeper sample at B-110 all met the Track 4 SCO for lead (1,200 mg/kg). Therefore, the removal area around B-110 was delineated to an area approximately 7 feet by 7.5 feet by 2 feet deep. The pre-delineation sampling precluded the need for verification sampling after excavation. The excavation limits for Hotspots #1 and #2 are shown in Figure 3. The laboratory analytical data is included in Appendix F.

For Hotspot #3, four (4) end point samples were collected to verify that the contaminated soil had been completely removed. Based on the size of the excavation, the end point samples included three (3) sidewall samples at depths ranging from 2.5 feet to 3.5 feet below the surrounding ground surface and one (1) bottom sample from a depth of 4.5 feet below the surrounding ground surface in accordance with the approved RAWP. The samples were analyzed for TCL volatile organic compounds (VOCs) by EPA Method 8260

and TCL semi-volatile organic compounds (SVOCs) by EPA Method 8270 in accordance with NYSDEC requirements for petroleum spills. The analytical results indicated that end point samples meet the Unrestricted Use Soil Cleanup Objectives and that all of the petroleum contaminated soil had been successfully removed. The analytical results are summarized in Table 2. The excavation limits and the end point sample locations for Hotspot #3 are shown in Figure 3. The laboratory analytical data is included in Appendix G.

Soil samples collected during the RI of the entire Site also constitute end point samples since residual soil remains on the site to be managed under the SMP. All soil samples collected during the RI, except for B-110A and B-111A, are considered in-situ end point samples. The end point analytical results for soil from the RI of the entire Site are summarized in Table 3. The borings and sample locations are indicated on Figure 3. The borings performed within each phase of the site development are as follows:

Phase I – Borings B-111 and B-112

Phase II – Borings B-106 and B-110

Phase III – Borings B-102 and B-107

Phase IV – Borings B-101, B-104, B-105, and B-109

Phase V – None

Phase VI – Borings B-103 and B-108

Phase VII – None

The end point analytical results indicate that the soil on the Site meets the Track 4 SCOs for lead, mercury, and Total SVOCs.

4.4 MATERIALS DISPOSAL

Clean Earth was selected for disposal of all soil/fill materials from the Site. Republic Environmental Systems (PA), LLC was selected for disposal of two (2) drums from the Site. City Island Reserve, LLC prepared disposal facility documentation, which provided the material type, source, and analytical data. Characterization sampling was performed in

accordance with the disposal facility requirements. The characterization results for Hotspot #3 are presented in Appendix H. The characterization results for excess soil/fill are presented in Appendix N. The characterization results for the drums are presented in Appendix Q.

No material disposal was performed during the Phase II through Phase V portions of the remedial action. Soil excavated for utility trenches, stormwater infrastructure, and site grading was reused on the site below the composite cover system to the extent possible.

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

Disposal Location/Address	Type of Material	Quantity
Clean Earth, 24 Middlesex Avenue, Carteret, NJ	Mercury Contaminated Soil	37.32 tons
Clean Earth, 105 Jacobus Avenue, Kearny, NJ	Lead Contaminated Soil	6.89 tons
Clean Earth, 24 Middlesex Avenue, Carteret, NJ	Petroleum Contaminated Soil	46.27 tons
Clean Earth, 24 Middlesex Avenue, Carteret, NJ	Non-Hazardous Soil/Fill	815.70 tons
Republic Env. Systems (PA), LLC, Hatfield, PA	Non-Hazardous Oil & Water Drums	2 [55-gallon] Drums

Hotspot #1 and Hotspot #2 Characterization and Disposal

Hotspot areas #1 and #2 were identified during the Remedial Investigation and were included in the RAWP. Waste characterization sampling for Hotspot #1 and Hotspot #2 was performed on December 19, 2013 prior to excavation. One sample was collected from each area. The Hotspot #1 sample (B-111) was analyzed for Lead, TCLP Metals, Diesel Range Organics (DRO), Ignitability, Corrosivity, Reactive Cyanide, and Reactive Sulfide. The Hotspot #2 sample (B-110) was analyzed for TCLP Metals, Ignitability, Corrosivity, Reactive Cyanide, and Reactive Sulfide. The waste characterization sampling was performed to meet the laboratory analysis requirements specified by the disposal facilities.

No samples exceeded the TCLP limits. Once the material for Hotspot #1 and Hotspot #2 was accepted by the disposal facilities, the soil excavation was arranged. On 21 January 2014, the soil was loaded directly into three (3) lined facility provided containers in one (1) day. The containers were covered and subsequently removed from the site by the disposal facilities. Disposal manifests are included in Appendix J.

Hotspot #3 Characterization and Disposal

Initial waste characterization sampling for Hotspot #3 was performed on July 7, 2014 upon excavation and stockpiling of the material. The waste characterization samples consisted of the following:

- One (1) five-point composite sample (WC-1) for laboratory analytical testing for VOCs, SVOCs, PCBs, Ignitability, Corrosivity, Reactive Cyanide, and Reactive Sulfide.

A second waste characterization was performed for the Hotspot #3 material on October 7, 2014 and consisted of the following:

- One (1) composite sample (WC-2) for laboratory analytical testing for RCRA Metals, TCLP Metals, and Total Petroleum Hydrocarbons.

The supplemental waste characterization sampling was performed to meet the laboratory analysis requirements specified by the disposal facility. No samples exceeded the TCLP limits.

The laboratory analytical results and the required profile information along with the OER Historical Fill Notification Form was submitted to Clean Earth in Carteret, NJ in June 2015. Disposal facility documentation, including the Material Profile and OER Historical Fill Notification Form are included in Appendix I. An acceptance letter was not provided by the facility. The waste characterization analytical results are presented in Appendix H.

Once the material was accepted by the disposal facility, the soil loading was arranged. On July 29, 2015, a total of 46.27 tons of soil/fill was loaded onto two (2) facility provided trucks in one (1) day for transport to Clean Earth in Carteret, NJ. Disposal manifests are included in Appendix J.

Excess Soil/Fill Characterization and Disposal

Waste characterization sampling of an excess soil/fill stockpile was performed on December 3, 2018. Waste characterization samples consisted of the following:

- Two (2) five-point composite samples for laboratory analytical testing for VOCs, diesel range organics (DRO), and gasoline range organics (GRO).
- One (1) eight-point composite sample for laboratory analytical testing for SVOCs, PCBs, Pesticides, Herbicides, TAL Metals, Hexavalent Chromium, Cyanide, TCLP Metals, Ignitability, Corrosivity, Reactive Cyanide, Reactive Sulfide, and Paint Filter Test.

The number of waste characterization samples and the required laboratory analysis were dictated by the two potential disposal facilities.

The laboratory analytical results and the required profile information along with the OER Historical Fill Notification Form was submitted to Clean Earth in Carteret, NJ on January 11, 2019. Clean Earth issued an acceptance letter for the soil/fill material dated January 15, 2019. The information was later submitted to OER for review and an approval was issued on April 25, 2019.

Disposal facility documentation, including the Material Profile, OER Historical Fill Notification Form, and acceptance letter are included in Appendix O. The waste characterization analytical results are presented in Appendix N.

On May 22, 2019, June 3, 2019, July 22, 2019, July 23, 2019, and October 9, 2019, a total of 815.70 tons of excess soil/fill was removed from the Site and loaded into dump trucks for transport to Clean Earth in Carteret, NJ. Disposal manifests are included in Appendix P of this document.

Drum Characterization and Disposal

Two drums that were left on the Site by a previous contractor were removed from the southern portion of the Site during the Phase VI remedial action. The drums contained a mix of water and oil. It is believed that the drums were partially filled with monitoring well purge water before the contractor started using them for used oil generated during on-site

equipment maintenance.

Waste characterization sampling of the drums was performed on March 27, 2019. Waste characterization samples consisted of the following:

- One (1) sample from each drum for laboratory analytical testing for Flashpoint, pH, PCBs, TCLP Metals, and TCLP VOCs.

The number of waste characterization samples and the required laboratory analysis were dictated by the disposal facility.

The laboratory analytical results and the required profile information was submitted to Republic Environmental Systems (PA), LLC in Hatfield, PA on May 15, 2019. The facility subsequently accepted the drums and scheduled the pickup. Disposal facility documentation, including the Waste Characterization Report and the waste characterization analytical results are included in Appendix Q.

On May 28, 2019, the two (2) drums were removed from the southern portion of the Site and transported to Republic Environmental Systems (PA), LLC in Hatfield, PA. Disposal manifests are included in Appendix R.

4.5 BACKFILL AND REUSE

Numerous backfill materials have been imported to the Site for various construction purposes. Since the materials were used throughout the entire Site, it is not possible to distinguish which materials were used specifically in each phase of the site development. However, the imported 15-inch stone, the heavy stone, and the 3 ½-inch stone were used along the shoreline south of the Phase VI area. The materials imported to the entire Site through November 2019 include the following:

- 58 tons of 3/4-inch natural stone from Liberty Stone in Belleville, NJ.
- 275 tons of manufactured sand from Thalle Industries in Elmsford, NY.
- 524 tons of 2-3-inch natural stone from Wingdale Materials in Wingdale, NY.
- 224 tons of 15-inch natural stone from Wingdale Materials in Wingdale, NY.

- 16 tons of 3/8-inch natural stone from Peckham Materials in Bedford, NY.
- 173 cubic yards of 3/4-inch natural crushed stone from Thalle Industries.
- 877 tons of natural heavy stone from Wingdale Materials in Wingdale, NY.
- 25 tons of 1/4-inch crushed stone from Wingdale Materials in Wingdale, NY.
- 283 tons of 3/4-inch crushed stone from Wingdale Materials in Wingdale, NY.
- 382 tons of 3 1/2-inch natural stone from Tilcon NY Inc. in West Nyack, NY.
- 30 cubic yards of 3/4-inch RCA from Tilcon NY Inc. in West Nyack, NY.
- 391 cubic yards of 3/4-inch RCA from Thalle Industries in Elmsford, NY.
- 75 cubic yards of 3/4-inch RCA from Quality Materials in Harrison, NY.

Since the above materials consist of natural stone aggregate and recycled concrete aggregate (RCA) from NYSDEC approved facilities, source testing of these materials was not required. Each of the above source facilities was approved by OER prior to importing. Source documentation for these facilities is included in Appendix M.

In addition, rock boulders and concrete encountered on the entire Site were processed through a crusher to create crushed stone and recycled concrete aggregate (RCA). These materials were later used as fill in areas below the composite cover system throughout the property. It is estimated that approximately 1,000 cubic yards of RCA has been generated on site since the start of construction. Air monitoring was performed during all crushing operations and dust suppression was performed as necessary by wetting the material.

In addition to the materials listed above, topsoil and clean soil were imported for use as cover soil throughout the entire Site and on-site virgin soil previously excavated from a borrow pit was used as cover soil primarily in the Phase I and Phase II portions of the Site but also along the shoreline areas in the Phase IV and Phase VI portions of the Site. The total quantities of the cover soil materials generated on the Site and imported to the Site through November 2019 are as follows:

- 1,800 cubic yards of on-site virgin soil.

- 955 cubic yards of topsoil from Premium Mulch in Coram, NY.
- 330 cubic yards of topsoil from Delea Sod Farms in East Northport, NY.
- 3,014 cubic yards of imported cover soil from Lawton Adams in Somers, NY.

The estimated quantities of these materials that were used in each area of the site development are summarized below. However, the area along the southern shoreline, which is part of Phase VI on the plan, was demarcated, filled with cover soil, and had vegetation planted during earlier phases of construction. All imported materials and materials reused on site were sampled in accordance with sampling frequencies outlined in the RAWP.

Phase I

- 730 cubic yards of on-site virgin soil.
- 215 cubic yards of topsoil from Premium Mulch in Coram, NY.

Phase II

- 550 cubic yards of on-site virgin soil.
- 190 cubic yards of topsoil from Premium Mulch in Coram, NY.
- 50 cubic yards of imported cover soil from Lawton Adams in Somers, NY.

Phase III

- 140 cubic yards of topsoil from Premium Mulch in Coram, NY.
- 452 cubic yards of imported cover soil from Lawton Adams in Somers, NY.

Phase IV

- 250 cubic yards of on-site virgin soil (placed during an earlier phase).
- 160 cubic yards of topsoil from Premium Mulch in Coram, NY.
- 150 cubic yards of topsoil from Delea Sod Farms in East Northport, NY.
- 990 cubic yards of imported cover soil from Lawton Adams in Somers, NY.

Phase V

- 30 cubic yards of topsoil from Delea Sod Farms in East Northport, NY.
- 95 cubic yards of imported cover soil from Lawton Adams in Somers, NY.

Phase VI

- 270 cubic yards of on-site virgin soil (placed during an earlier phase).
- 250 cubic yards of topsoil from Premium Mulch in Coram, NY.
- 50 cubic yards of topsoil from Delea Sod Farms in East Northport, NY.
- 1,007 cubic yards of imported cover soil from Lawton Adams in Somers, NY.

Phase VII

- 100 cubic yards of topsoil from Delea Sod Farms in East Northport, NY.
- 420 cubic yards of imported cover soil from Lawton Adams in Somers, NY.

On-Site Soil as Cover Soil

On 13 April 2015, during the Phase I Remedial Action, four (4) five-point composite samples were collected from the on-site virgin soil stockpile. The analytical results are summarized in Table 4. The results indicate that the material meets the Restricted Residential Use Soil Cleanup Objectives. The data was incorporated into a Cover Soil Sampling Report dated 23 April 2015 and the material was subsequently approved by OER on 1 May 2015 for use as cover soil on the entire Site. This material has been placed as the lower 18 inches of cover soil in landscape and open space areas in various locations in the Phase I, Phase II, Phase IV, and Phase VI portions of the Site. The laboratory analytical data for on-site soil reused as cover soil backfill is included in Appendix K. A map showing cover soil backfill placement locations in the different areas of the Site is shown in Figure 5.

Imported Topsoil as Cover Soil

All imported topsoil for use as cover soil in the landscaped areas was imported from two

facilities; originally Premium Mulch and Materials located at 482 Mill Road in Coram, New York and later Delea Sod Farms located at 444 Elwood Road in East Northport, New York. Testing of topsoil was conducted on three (3) occasions with a total of three (3) composite samples.

On 10 November 2015, during the Phase I Remedial Action, one (1) five-point composite sample was collected from a segregated 500 cubic yard stockpile at the Premium Mulch and Materials facility in Coram, New York. This sampling event was identified as Imported Topsoil I. The analytical results are summarized in Table 5. The results indicated that the material meets the Unrestricted Use Soil Cleanup Objectives. The data was incorporated into a Cover Soil Sampling Report dated 20 November 2015 and the material was subsequently approved by OER on 4 December 2015 for use as cover soil on the entire site. This material has been placed as the upper 6 inches of cover soil in landscape and open space areas in various locations in the Phase I, Phase II, and Phase IV portions of the Site. The laboratory analytical data for imported topsoil is included in Appendix L. A map showing cover soil backfill placement locations in the different areas of the Site is shown in Figure 5.

On 14 April 2016, during the Phase II remedial action, one (1) additional five-point composite sample was collected from a segregated 500 cubic yard stockpile at the Premium Mulch and Materials facility in Coram, New York. This sampling event was identified as Imported Topsoil II. The analytical results are summarized in Table 6. The results indicated that the material meets the Unrestricted Use Soil Cleanup Objectives. The data was incorporated into a Cover Soil Sampling Report dated 25 April 2016 and the material was subsequently approved by OER on 28 April 2016 for use as cover soil on the entire site. This material has been placed as the upper 6 inches of cover soil in landscape and open space areas in various locations in the Phase II, Phase III, Phase IV, and Phase VI portions of the Site. The laboratory analytical data for imported topsoil is included in Appendix L. A map showing cover soil backfill placement locations in the different areas of the Site is shown in Figure 5.

On 28 September 2016, during the Phase III remedial action, one (1) five-point composite sample was collected from a segregated stockpile at the Delea Sod Farms facility located in

East Northport, New York. This sampling event was identified as Imported Topsoil III. The analytical results are summarized in Table 7. The results indicated that the material meets the Unrestricted Use Soil Cleanup Objectives and Protection of Groundwater Soil Cleanup Criteria, with two minor exceptions (iron and mercury). The data was incorporated into a Cover Soil Sampling Report dated 24 October 2016 and the material was subsequently approved by OER on 23 March 2017 for use as cover soil on the entire site. This material has been placed as the upper 6 inches of cover soil in landscape and open space areas in various locations in the Phase III through Phase VII portions of the Site. The laboratory analytical data for imported topsoil is included in Appendix L. A map showing cover soil backfill placement locations in the Phase III through Phase VII areas of the Site is shown in Figure 5.

Imported Soil as Cover Soil

All imported soil for use as cover soil in the landscaped areas was imported from the Lawton Adams facility located at 260 Route 100 in Somers, New York. Testing of Lawton Adams soil was conducted on five (5) occasions with a total of seven (7) composite samples.

On 26 May 2016, during the Phase II remedial action, two (2) five-point composite samples were collected from two (2) segregated stockpiles at the Lawton Adams facility in Somers, New York. This sampling event was identified as Imported Cover Soil I. The analytical results are summarized in Table 8. The results indicated that the material meets the Unrestricted Use Soil Cleanup Objectives and Protection of Groundwater Soil Cleanup Criteria, with one exception (iron). The data was incorporated into a Cover Soil Sampling Report dated 8 June 2016 and the material was subsequently approved by OER on 21 June 2016 for use as cover soil on the entire site. This material has been placed as the lower 18 inches of cover soil in landscape and open space areas in various locations, including the Phase II, Phase III, and Phase IV portions of the Site. The laboratory analytical data for imported cover soil is included in Appendix M. A map showing cover soil backfill placement locations in the different areas of the Site is shown in Figure 5.

On 30 May 2017, during the Phase III remedial action, two (2) five-point composite samples were collected from a new segregated stockpile at the Lawton Adams facility in

Somers, New York. This sampling event was identified as Imported Cover Soil II. The analytical results are summarized in Table 9. The results indicated that the material meets the Unrestricted Use Soil Cleanup Objectives and Protection of Groundwater Soil Cleanup Criteria, with one exception, which is a slight exceedance of indeno(1,2,3-cd)pyrene in one of the samples. The data was incorporated into a Cover Soil Sampling Report dated 8 June 2017 and the material was subsequently approved by OER on 26 June 2017 for use as cover soil on the entire site. This material has been placed as the lower 18 inches of cover soil in landscape and open space areas in various locations, including the Phase III thru Phase V portions of the Site. The laboratory analytical data for imported cover soil is included in Appendix M. A map showing cover soil backfill placement locations in the Phase III through Phase V portions of the Site is shown in Figure 5.

On 25 April 2018, during the Phase V remedial action, one (1) five-point composite sample was collected from a new segregated stockpile at the Lawton Adams facility in Somers, New York. This sampling event was identified as Imported Cover Soil IIIA. The analytical results are summarized in Table 10. The results indicated that the material meets the Unrestricted Use Soil Cleanup Criteria and Protection of Groundwater Soil Cleanup Criteria, except for two pesticides (4,4'-DDE and 4,4'-DDT), which were detected at concentrations that were well below the Residential Use Soil Cleanup Criteria. The data was incorporated into a Cover Soil Sampling Report dated 24 May 2018 and the material was subsequently approved by OER on 19 June 2018 for use as cover soil on the entire Site. This material has been placed as the lower 18 inches of cover soil in landscape and open space areas in various locations, including the Phase V and Phase VI portions of the Site. The laboratory analytical data for imported cover soil is included in Appendix M. A map showing cover soil backfill placement locations in the Phase V and Phase VI portions of the Site is shown in Figure 5.

On 8 May 2019, during the Phase VI remedial action, two (2) additional five-point composite samples were collected from the screened stockpiles at the Lawton Adams facility in Somers, New York to verify that the material was consistent with the soil previously tested on 25 April 2018. This sampling event was identified as Imported Cover Soil IIIB. The analytical results are summarized in Table 11. The results indicated that a

few SVOCs, pesticides, and metals were detected in the samples but that the material meets the Residential Use Soil Cleanup Criteria and the Protection of Groundwater Soil Cleanup Criteria. Therefore, import continued under the previous approval. This material has been placed as the lower 18 inches of cover soil in landscape and open space areas in various locations in the Phase VI and Phase VII portions of the Site. The laboratory analytical data for imported cover soil is included in Appendix M. A map showing cover soil backfill placement locations in the different areas of the Site is shown in Figure 5.

4.6 DEMARCATION

After completion of all invasive remedial activities, a demarcation layer, consisting of orange construction fencing, was placed to create a line of delineation between the existing soil/fill and the clean cover soil in the landscape and open space areas. The locations where a demarcation layer has been installed for the entire Site is included on Figure 5.

5.0 ENGINEERING CONTROLS

Engineering Controls were employed in the Remedial Action to address residual soil remaining at the site. The full Site has two (2) primary Engineering Control Systems. These are: (1) Composite Cover System across the entire Site; and (2) Vapor Barrier System.

Composite Cover System

Exposure to residual soil/fill is prevented by an engineered Composite Cover System that has been built on the Site. This Composite Cover System is comprised of 5 inches of concrete and in the building areas, 4 inches of concrete and 6 inches of crushed stone sub-base in sidewalk areas, 2.5 to 3.5 inches of asphalt and 8 inches of recycled concrete aggregate (RCA) sub-base in the paved areas, 4 inches of concrete pavers over 12 inches of crushed stone in the patio and select road areas, and two (2) feet of clean soil with a demarcation layer in open space and landscape areas. The contractor for the Composite Cover System construction was Lawrence Construction Company, Inc.

Figure 6 shows the as-built design for each remedial cover type used on this Site. Figure 5 shows the location of each cover type built for the full Site. Photographs of construction of the Composite Cover System are included in Appendix D and in the daily reports in Appendix C.

Vapor Barrier System

Exposure to soil vapor is prevented by a Vapor Barrier System that has been built on the Site. This Vapor Barrier System consists of a 20-mil polyethylene vapor barrier liner (VaporBlock Plus 20 by Raven Industries, Inc.). The vapor barrier was installed beneath the entire surface area of the concrete slab for each of the residential buildings and the garages. The vapor barrier and all seals and welds were installed in accordance with the manufacturer's recommendations and specifications. Specifically, seams/joints were overlapped a minimum of 6 inches and sealed with VaporBond Plus 4-inch tape. Penetrations were sealed using fabricated pipe boots, overlapping seams, and VaporBond Plus 4-inch tape. The professional engineer for the Vapor Barrier System was Robert B.

Simpson, P.E. The contractors for the Vapor Barrier System construction was initially SCE Environmental Group and later Lawrence Construction Company, Inc.

Figure 4 shows the as-built locations for the Vapor Barrier System used on this Site (below all building and garage floor slabs). Photographs of installation of the Vapor Barrier System are included in Appendix D and in the daily reports in Appendix C.

6.0 INSTITUTIONAL CONTROLS

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

Institutional Controls for this property are:

- (1) The entire property will continue to be registered with a Restrictive Declaration by the NYC Department of Buildings. Property owner and property owner's successors and assigns are required to comply with the approved SMP;
- (2) A Declaration of Covenant and Restrictions for the full site that explains the ICs and ECs and site use prohibitions and provides information regarding the Site Management Plan and obligations for long-term site management will be established and approved by OER and recorded with the County Clerk. A copy of the Declaration of Covenant and Restrictions is included in Appendix U;
- (3) A single entity condominium association will be established to provide for management of all common land (open space, backyards, etc.) on the entire site to ensure that vegetable gardens and other prohibited activities are not performed and to ensure that Site Management inspections and certifications are performed. A copy of the condominium rules is attached in Appendix S;
- (4) Compliance with an OER-approved Site Management Plan 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;
- (5) Engineering Controls will not be discontinued without prior OER approval;

- (6) OER has the right to enter the entire Site upon notice for the purpose of evaluating the performance of ECs and ICs;
- (7) Vegetable gardens and farming on the entire Site are prohibited;
- (8) Use of groundwater underlying the entire Site without treatment rendering it safe for its intended use is prohibited;
- (9) All future activities on the entire 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;
- (10) An offering plan has been established that explains the remedial history of the full property and the requirement for continued implementation of engineering controls and institutional controls to protect public health, including prohibitions on vegetable gardening. A copy of the offering plan is attached in Appendix T;
- (11) The entire 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 Final Remedial Closure Report (RCR) and issuance of the Notice of Completion (NOC) by OER. It is the responsibility of the property owner to ensure that all Site Management responsibilities are performed. The penalty for failure to implement the Site Management Plan (SMP) includes revocation of the Notice of Completion and all associated certifications and liability protections.

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

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

ENGINEERING CONTROLS

Engineering Controls were employed in the remedial action to address residual materials remaining at the site. The full Site has two (2) Engineering Control Systems. Engineering Controls for this property are: (1) Composite Cover System across the entire Site; and (2) Vapor Barrier System.

Operation and Maintenance of Composite Cover System

The Composite Cover System is a permanent Engineering Control for the Site. The system will be inspected, and its performance certified at specified intervals defined in this SMP. A Soil/Materials Management Plan is included in this 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, the system will be rebuilt by reconstructing the system according to the original design and tying newly constructed cover layers into existing cover layers to form a continuous layer(s).

Operation and Maintenance of Vapor Barrier System

The Vapor Barrier System is a permanent Engineering Control for the Site. The system will be inspected, and its performance certified at specified intervals defined in this SMP.

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

INSTITUTIONAL CONTROLS

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

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

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

- (2) A Declaration of Covenant and Restrictions for the full site that explains the ICs and ECs and site use prohibitions and provides information regarding the Site Management Plan and obligations for long-term site management will be established and approved by OER and recorded with the County Clerk;
- (3) A single entity condominium association will be established to provide for management of all common land (open space, backyards, etc.) on the full site to ensure that vegetable gardens and other prohibited activities are not performed and to ensure that Site Management inspections and certifications are performed;
- (4) Compliance with an OER-approved Site Management Plan 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;
- (5) Engineering Controls will not be discontinued without prior OER approval;
- (6) OER has the right to enter the entire Site upon notice for the purpose of evaluating the performance of ECs and ICs;
- (7) Vegetable gardens and farming in residual soil/fill on the entire Site are prohibited;
- (8) Use of groundwater underlying the entire Site without treatment rendering it safe for its intended use is prohibited;
- (9) 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;
- (10) An offering plan has been established that explains the remedial history of the full property and the requirement for continued implementation of engineering controls and institutional controls to protect public health, including prohibitions on vegetable gardening. A copy of the offering plan is attached in Appendix T;

- (11) The entire 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.

INSPECTIONS

Engineering Controls and Institutional Controls for the entire Site will be inspected every 3 years by the QEP beginning in June or July 2021, and certification of inspection shall be submitted by July 30, 2022 (for the reporting period 2021) and every 3 years thereafter. Inspections should be performed during the late spring or summer months to evaluate prohibitions on vegetable gardening and inspection and certification reports are due by July 30 of the following calendar year. A copy of the Site Inspection Form is included in Appendix V. The QEP inspections will evaluate the following:

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

In addition, if an emergency occurs, such as a natural disaster, or if an unforeseen failure of any of the Engineering Controls occurs, an inspection of the Site will be performed within 30 days to evaluate the Engineering Controls and a letter report of findings will be submitted to OER.

Inspection of Composite Cover System

The composite cover system will be inspected for signs of splitting, cracking, caving or upheaval that might compromise the performance of the cover in preventing exposures to underlying historic fill material.

Inspection of Vapor Barrier System

The vapor barrier is not exposed and cannot be directly inspected. Instead, the cover will be inspected for signs of splitting, cracking, caving or upheaval that might indicate a compromise of the performance of the underlying vapor barrier.

Site Use Prohibitions

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

INSPECTION AND CERTIFICATION LETTER REPORT

Results of inspections performed during a reporting period and certification of performance of all Engineering Controls and Institutional Controls will be included in an Inspection and Certification Letter Report. Inspections will be performed by the QEP in 2021, 2024, and every 3 years thereafter. Inspection and Certification Letter Reports will be submitted by July 30, 2022 (for the reporting period 2021) and every 3 years thereafter (for the reporting period consisting of the prior calendar year). Inspection and Certification Letter Reports will be submitted to OER in digital format. The letter report will include, at a minimum:

- Date of inspections;
- Personnel conducting inspections;
- Description of the inspection activities performed;
- Any observations, conclusions, or recommendations;
- Copy of any inspection forms; and

- Certification of the performance of Engineering Controls and Institutional Controls, as discussed below.

The certification of the performance of ECs and ICs will establish:

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

OER may enter the Site upon notice for the purpose of evaluating the performance of ECs and ICs.

NOTIFICATIONS

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

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

SOIL/MATERIALS MANAGEMENT PLAN

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

Soil Screening Methods

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

Stockpile Methods

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

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

Characterization of Excavated Materials

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

Materials Excavation, Load-Out and Departure

The PE/QEP overseeing the remedial action will:

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

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

clean condition with respect to Site-derived materials.

Off-Site Materials Transport

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

Outbound truck transport routes are as follows:

- 1) Exit Site via Fordham Place and turn left onto Fordham Street (heading west).
- 2) Turn right onto City Island Avenue (heading north).
- 3) City Island Avenue turns into City Island Road (heading northwest).
- 4) Turn left onto Shore Road (heading south-southwest).
- 5) Follow signs for I-95 (north or south).

This routing takes into account the following factors: (a) limiting transport through residential areas and past sensitive sites; (b) use of mapped truck routes; (c) minimizing off-Site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport. To the extent possible, all trucks loaded with Site materials will travel from the Site using these truck routes. Trucks will not stop or idle in the neighborhood after leaving the project Site.

Materials Disposal Off-Site

The following documentation will be established and reported by the PE/QEP for each disposal destination used in this project to document that the disposal of regulated material exported from the Site conforms with applicable laws and regulations: (1) a letter from the PE/QEP or Enrollee to each disposal facility describing the material to be disposed and requesting written acceptance of the material. This letter will state that material to be disposed is regulated material generated at an environmental remediation Site in Brooklyn, New York under a governmental remediation program. The letter will provide the project

identity and the name and phone number of the PE/QEP or Enrollee. The letter will include as an attachment a summary of all chemical data for the material being transported; and (2) a letter from each disposal facility stating it is in receipt of the correspondence (1, above) and is approved to accept the material.

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

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

Materials Reuse On-Site

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

Repair of Remedial Systems

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

Import of Backfill Soil from Off-Site Sources

In the event that soil importation is needed for the backfilling purposes, this Section presents the requirements for imported fill materials. All imported soils will meet OER-

approved backfill and cover soil quality objectives for this Site. The backfill and cover soil quality objectives including NYSDEC Part 375 Track 2 Residential SCOs and groundwater protections standards. A process will be established to evaluate sources of backfill and cover soil to be imported to the Site, and will include an examination of source location, current and historical use(s), and any applicable documentation. Material from industrial sites, spill sites, environmental remediation sites or other potentially contaminated sites will not be imported to the Site.

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

- Clean soil from construction projects at non-industrial sites in compliance with applicable laws and regulations;
- Clean soil from roadway or other transportation-related projects in compliance with applicable laws and regulations;
- Clean recycled concrete aggregate (RCA) from facilities permitted or registered by the regulations of 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 Report will report the source of the fill, evidence that an inspection was performed on the source, chemical sampling results, frequency of testing, and a Site map indicating the locations where backfill or soil cover was placed.

Source Screening and Testing

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

- Trucks with imported fill material will be in compliance with applicable laws and regulations and will enter the Site at designated locations;

- The PE/QEP is responsible to ensure that every truck load of imported material is inspected for evidence of contamination; and
- Fill material will be free of solid waste including pavement materials, debris, stumps, roots, and other organic matter, as well as ashes, oil, perishables or foreign matter.

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

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

Fluids Management

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

Storm-water Pollution Prevention

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

Odor Control

All necessary means will be employed to prevent on- and off-Site odor nuisances. At a minimum, procedures will include: (a) limiting the area of open excavations; (b) shrouding open excavations with tarps and other covers; and (c) use of foams to cover exposed odorous soils. If odors develop and cannot otherwise be controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-Site disposal; and (e) use of chemical odorants in spray or misting systems.

This odor control plan is capable of controlling emissions of nuisance odors. If nuisance odors are identified, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. OER will be notified of all odor complaint events. Implementation of all odor controls, including halt of work, will be the responsibility of the PE/QEPs.

Dust Control

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

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

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

controls, including halt of work, will be the responsibility of the PE/QEPs.

Noise

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

COMMUNITY AIR MONITORING PLAN

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

Periodic monitoring for VOCs will be performed during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. Periodic monitoring during sample collection, for instance, will consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. Depending upon the proximity of potentially exposed individuals, continuous monitoring may be performed during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence. Exceedances of action levels observed during performance of the Community Air Monitoring Plan (CAMP) will be reported to the OER Project Manager and included in the Daily Report.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) will be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis during invasive work. Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work will be performed

using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment will be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment will be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities will be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities will resume with continued monitoring.
- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities will resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.
- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities will be shutdown.

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

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations will be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring will be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of

integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment will be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work will continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed $150 \text{ mcg}/\text{m}^3$ 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 $150 \text{ mcg}/\text{m}^3$ 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 $150 \text{ mcg}/\text{m}^3$ of the upwind level and in preventing visible dust migration.

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

CONTINGENCY PLAN

This contingency plan is developed for the remedial construction or repair work to address the discovery of unknown structures or contaminated media during excavation. Identification of unknown contamination source areas during invasive Site work will be promptly communicated to OER's Project Manager. Petroleum spills will be reported to the NYSDEC Spill Hotline. If previously unidentified contaminant sources are found during on-Site remedial excavation or development-related excavation, sampling will be performed on contaminated source material and surrounding soils and reported to OER. Chemical analytical testing will be performed for TAL metals, TCL volatiles and semi-volatiles, TCL pesticides and PCBs, as appropriate.

Emergency Telephone Numbers

In the event of any emergency condition pertaining to these remedial systems, the Owner's representative(s) should contact the appropriate parties from the contact list below. Prompt contact should also be made to Meredith R. Anke, P.E. of Carlin-Simpson & Associates. These emergency contact lists must be maintained in an easily accessible location at the Site.

Emergency Contact Numbers

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

Contact Numbers

Meredith R. Anke, P.E.	(732) 432-5757, x22
James Triano	(917) 472-2760
NYC Office of Environmental Remediation	(212) 788-8841; 311

8.0 SUSTAINABILITY REPORT

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

Reuse of Clean, Recyclable Materials. Reuse of clean, recyclable materials reduces consumption of non-renewable virgin resources and can provide energy savings and greenhouse gas reduction since these materials can be locally-derived.

An estimate of the recycled material reused on the entire project to date is 1,496 cubic yards of recycled concrete aggregate (RCA), with approximately 496 cubic yards imported to the site and approximately 1,000 cubic yards generated from on-site concrete. Approximately 1,800 cubic yards of clean virgin soil was reused on the entire site for clean fill cover. Other than the soil excavated from three (3) isolated hotspot areas and excess soil/fill at the end of the project totaling about 529 cubic yards, all remaining excavated historic fill material and virgin soil was reused on the site.

Conservation of Non-Renewable Resources. Reduced consumption of non-renewable resources such as soil and topsoil lowers the overall environmental impact of the project on the region by conserving these resources.

Conservation of non-renewable resources was achieved by using RCA and reusing on-Site virgin soil as backfill where feasible. An estimate of the tonnage of non-renewable resources, the use of which has been avoided under this plan, is 3,296 cubic yards for the entire Site through December 2019.

Paperless Brownfield Cleanup Program. City Island Reserve LLC participated in OER's Paperless Brownfield Cleanup Program. Under this program, submission of electronic documents replaced submission of hard copies for the review of project documents, communications and milestone reports. A best estimate of the mass (pounds) of paper saved under this plan is 200 pounds for the entire project through December 2019.

Low-Energy Project Management Program. City Island Reserve LLC participated in OER's low-energy project management program. Under this program, whenever possible, meetings were held using remote communication technologies, such as videoconferencing

and teleconferencing to reduce energy consumption and traffic congestion associated with personal transportation. An estimate of the number of miles of personal transportation that was conserved in this process is approximately 800 miles for the entire project through December 2019.

Trees and Plantings. Trees and other plantings provide habitat and add to NYC's environmental quality in a wide variety of ways. Native plant species and native habitat provide optimal support to local fauna, promote local biodiversity, and require less maintenance. The Phase I portion of the site consisted of approximately 12,000 square feet of landscaped areas and 80 new trees, which includes 56 arborvitaes for screening along the fence, 16 trees along the sidewalks inside the property, and 8 trees along the sidewalk outside the property. The Phase II portion of the site consisted of approximately 10,432 square feet of landscaped areas and 47 new trees, which includes 21 trees along the pedestrian esplanade area, 14 trees along the sidewalks and around the buildings inside the property, and 12 trees along the sidewalk outside the property. The Phase III portion of the site consisted of approximately 7,777 square feet of landscaped areas and 15 new trees, which includes 9 trees in the yards around the buildings and 6 trees along the sidewalks inside the property. The Phase IV portion of the site consisted of approximately 7,777 square feet of landscaped areas and 22 new trees, which includes 9 trees in the yards around the buildings and 13 trees along the sidewalks inside the property. The Phase V portion of the site consisted of approximately 1,690 square feet of landscaped area and 2 new trees. The Phase VI portion of the site consists of approximately 18,126 square feet of landscaped area and 40 new trees. The Phase VII portion of the site consists of approximately 6,733 square feet of landscaped area and 29 new trees.