SITE MANAGEMENT PLAN

for

SILVERCUP WEST – PARCEL A
Block 477, Lot 13 and p/o Lot 15
Long Island City, Queens County, New York
NYSDEC BCP No. C241099

Prepared For:

Terra Cotta, LLC
42-22 22nd Road
Long Island City, New York 11101

Prepared By:

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Revisions to Final Approved Site Management Plan:

Revision No.	Date Submitted	Summary of Revision	NYSDEC Approval Date

OCTOBER 2017

LANGAN

CERTIFICATION STATEMENT

I Jason J. Hayes certify that I am currently a NYS registered professional engineer as in defined in 6 NYCRR Part 375 and that this Site Management Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

P.E.]

DATE

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LIST OF ACRONYMS

AWQS	Ambient Water Quality Standards
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
BGS	Below Grade Surface
CAMP	Community Air Monitoring Plan
COC	Certificate of Completion
CP	Commissioner Policy
DER	Division of Environmental Remediation
EC	Engineering Control
ECL	Environmental Conservation Law
EL	Elevation
ELAP	Environmental Laboratory Approval Program
ERL	Effects Range Low
ERM	Effects Range Median
EWP	Excavation Work Plan
ESA	Environmental Site Assessment
HASP	Health and Safety Plan
IC	Institutional Control
IRM	Interim Remedial Measure
LBP	Lead-Based Paint
MDL	Method Detection Limit
MHW	Mean High Water
NAPL	Non-Aqueous Phase Liquid
NAVD88	North American Vertical Datum of 1988
NFA	No Further Action
NYPA	New York Power Authority
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYCRR	New York Codes, Rules and Regulations
PAH	Polycyclic Aromatic Hydrocarbon
PAOC	Potential Area of Concern
PID	Photoionization Detector
PPM	Parts Per Million
PRR	Periodic Review Report
QAPP	Quality Assurance Project Plan
RAO	Remedial Action Objective
RAWP	Remedial Action Work Plan
RCA	Recycled Concrete Aggregate
REC	Recognized Environmental Condition
RI	Remedial Investigation
RIWP	Remedial Investigation Work Plan
ROD	Record of Decision
RP	Responsible Party

RSCO	Recommended Soil Cleanup Objectives
RSO	Remedial System Optimization
RRSCO	Restricted Residential Soil Cleanup Objective
SCG	Standards, Criteria and Guidelines
SCO	Soil Cleanup Objective
SMP	Site Management Plan
SRI	Supplemental Remedial Investigation
SSD	Sub-slab Depressurization
STARS	Spill Technology and Remediation Series
SVE	Soil Vapor Extraction
SVI	Soil Vapor Intrusion
SVOC	Semivolatile Organic Compound
TAGM	Technical and Administrative Guidance Manual
TAL	Target Analyte List
TCL	Target Compound List
TCLP	Toxicity Characteristic Leachate Procedure
TOGS	Technical and Operational Guidance Series
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VOC	Volatile Organic Compound

EXECUTIVE SUMMARY

The following provides a brief summary of the controls implemented for the Site, as well as the inspections, monitoring, maintenance and reporting activities required by this Site Management Plan (SMP):

Site Identification: C241099 Silvercup West - Parcel A – 41-98 and 42-02 Vernon Blvd., Long Island City, NY 11101

Institutional Controls:	1. The property may be used for Restricted Residential, Commercial, and/or Industrial uses provided that the long-term Engineering Controls/ Institutional Controls (EC/IC) included in this SMP are employed.
	2. The property may not be used for a higher level of use, such as Residential (single family housing) or Unrestricted Use, without additional remediation and amendment of the Environmental Easement, as approved by the New York State Department of Environmental Conservation (NYSDEC or the "Department").
	3. All ECs must be operated and maintained as specified in this SMP.
	4. All ECs on the Controlled Property must be inspected at a frequency and in a manner defined in the SMP.
	5. The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the New York State Department of Health (NYSDOH) to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department.
	6. Groundwater and other environmental or public health monitoring must be performed as defined in this SMP.
	7. Data and information pertinent to site management the Controlled Property must be reported at the frequency and in a manner as defined in this SMP.

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Institutional Controls (continued):	8. All future activities that will disturb remaining contaminated material must be conducted in accordance with this SMP.
	9. Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in this SMP.
	10. Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical component of the remedy shall be performed as defined in this SMP.
	11. Access to the Site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by the Environmental Easement.
	12. Vegetable gardens and farming in remaining soil on the site are prohibited.
Engineering Controls:	1. Site Cover System
	2. Bulkhead Cutoff Wall

Inspections:	**Frequency:**
1. Site-Wide Inspection	Annually
2. Site Cover Inspection	Annually
3. Bulkhead Cutoff Wall Inspection	Annually
Monitoring:	
1. Gauge Groundwater Monitoring Wells MW-1, MW-2 MW-3, and MW-4.	Quarterly for first year, then annually thereafter

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Monitoring (continued):	**Frequency:**
2. Soil Vapor Intrusion Monitoring	For any new building(s) constructed on the Site.
Maintenance:	
1. Site Cover System	As needed
2. Bulkhead	As needed
Reporting:	
1. Groundwater Monitoring/ Gauging Data	Annually, Included in the Periodic Review Report
2. Site Management Report	Included in Periodic Review Report
3. Periodic Review Report	Annually

Further descriptions of the above requirements are provided in detail in the latter sections of this Site Management Plan.

1.0 INTRODUCTION

1.1 GENERAL

This Site Management Plan (SMP) is a required element of the remedial program for the Silvercup West – Parcel A located in Long Island City, New York (hereinafter referred to as the "Site"). See Figure 1. The Site is currently in the New York State (NYS) Brownfield Cleanup Program (BCP) as Site No. C241099, which is administered by New York State Department of Environmental Conservation (NYSDEC).

Terra Cotta, LLC (the "Volunteer") entered into a Brownfield Cleanup Agreement (BCA) on November 16, 2006 with the NYSDEC to remediate the Site. A figure showing the Site location and boundaries is provided as Figure 1. The boundaries of the Site are more fully described in the metes and bounds description that is part of the Environmental Easement provided in Appendix A.

After completion of the remedial work, some contamination was left at this Site, which is hereafter referred to as "remaining contamination". Institutional and Engineering Controls (IC and EC) have been incorporated into the Site remedy to control exposure to remaining contamination and to ensure protection of public health and the environment. An Environmental Easement granted to the NYSDEC, and recorded with the New York City Register's Office, requires compliance with this SMP and all engineering controls and institutional controls placed on the Site.

This SMP was prepared to manage remaining contamination at the Site until the Environmental Easement is extinguished in accordance with Environmental Conservation Law (ECL) Article 71, Title 36. This plan has been approved by the NYSDEC, and compliance with this plan is required by the grantor of the Environmental Easement and the grantor's successors and assigns. This SMP may only be revised with the approval of the NYSDEC.

It is important to note that:

- This SMP details the site-specific implementation procedures that are required by the Environmental Easement. Failure to properly implement the SMP is a violation of the Environmental Easement, which is grounds for revocation of the Certificate of Completion (COC); and
- Failure to comply with this SMP is also a violation of Environmental Conservation Law, Title 6 New York Codes, Rules and Regulations (NYCRR) Part 375 and the BCA (Index #A2-0560-0806; Site #C241099) for the Site, and thereby subject to applicable penalties.

All reports associated with the Site can be viewed by contacting the NYSDEC or its successor agency managing environmental issues in New York State. A list of contacts for persons involved with the Site is provided in Appendix B of this SMP.

This SMP was prepared by Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C (Langan), on behalf of Terra Cotta, LLC, in accordance with the requirements of the NYSDEC Division of Environmental Remediation ([DER-10] "Technical Guidance for Site Investigation and Remediation"), dated May 3, 2010, and the guidelines provided by the NYSDEC. This SMP addresses the means for implementing the ICs and/or ECs that are required by the Environmental Easement for the Site.

1.2 REVISIONS

Revisions to this plan will be proposed, as necessary, in writing to the NYSDEC's project manager. Revisions will be necessary upon, but not limited to, the following occurring: a change in media monitoring requirements upgrades to or shut-down of a remedial system, post-remedial removal of contaminated sediment or soil, or other significant change to the Site conditions. In accordance with the Environmental Easement for the Site, the NYSDEC will provide a notice of any approved changes to the SMP, and append these notices to the SMP that is retained in its files.

1.3 NOTIFICATIONS

Notifications will be submitted by the property owner to the NYSDEC, as needed, in accordance with NYSDEC's DER – 10 for the following reasons:

- 60-day advance notice of any proposed changes in Site use that are required under the terms of the BCA, 6 NYCRR Part 375 and/or Environmental Conservation Law
- 7-day advance notice of any field activity associated with the remedial program
- 15-day advance notice of any proposed ground-intrusive activity pursuant to the Excavation Work Plan (EWP)
- Notice within 48-hours of any damage or defect to the foundation, structures or EC that reduces or has the potential to reduce the effectiveness of an EC, and likewise, any action to be taken to mitigate the damage or defect
- Verbal notice by noon of the following day of any emergency, such as a fire; flood; or earthquake that reduces or has the potential to reduce the effectiveness of ECs in place at the Site, with written confirmation within 7

days that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public

- Follow-up status reports on actions taken to respond to any emergency event requiring ongoing responsive action submitted to the NYSDEC within 45 days describing and documenting actions taken to restore the effectiveness of the ECs

Any change in the ownership of the Site or the responsibility for implementing this SMP will include the following notifications:

- At least 60 days prior to the change, the NYSDEC will be notified in writing of the proposed change. This will include a certification that the prospective purchaser/Remedial Party has been provided with a copy of the BCA, and all approved work plans and reports, including this SMP.
- Within 15 days after the transfer of all or part of the Site, the new owner's name, contact representative, and contact information will be confirmed in writing to the NYSDEC.

The following table includes contact information for the above notification. The information on this table will be updated as necessary to provide accurate contact information. A full listing of site-related contact information is provided in Appendix B. Note that contract parties are subject to change and will be updated as necessary.

Notification Contact Information:

Name	**Contact Information**
Program Manager: Jason Hayes, P.E.	(212) 479-5427, jhayes@langan.com
Project Manager: Joseph Good, P.E.	(212) 479-5448, jgood@langan.com
NYSDOH Project Manager: Anthony Perretta	(518) 402-7860, BEEI@health.state.ny.gov
NYSDEC Project Manager: Shaun Bollers	(718) 482-4096, shaun.bollers@dec.ny.gov
Owner Representative: Mark Gold	(718) 906-2000, mgold@silvercupstudios.com

2.0 SUMMARY OF PREVIOUS INVESTIGATIONS AND REMEDIAL ACTIONS

2.1 SITE LOCATION AND DESCRIPTION

The Site is located in Long Island City, Queens County, New York and is identified as Block 477, Lot 13 and a portion of Lot 15 on the Queens Borough Tax Map (see Figure 2). The Site is an approximately 1.024-acre area and is bounded by the Ed Koch Queensboro Bridge to the north, the New York Power Authority Power Generation site (Silvercup West NYPA, BCP Site No. C241109) and the Silvercup West – Parcel B (BCP Site No. C241086) to the south, 42-02 and 42-16 Vernon Boulevard (Silvercup West - Parcel D - BCP Site No. C241101) and Vernon Boulevard to the east, and the East River to the west (see Figure 2 – Site Layout Map). The boundaries of the Site are more fully described in Appendix A – Environmental Easement. The owner of the Site at the time of issuance of this SMP is Terra Cotta, LLC.

2.2 PHYSICAL SETTING

2.2.1 Land Use

The Site consists of the following:

- A newly-constructed waterfront bulkhead cutoff wall along the East River; and
- A site-wide cap consisting of a combination of an impervious cover (e.g. concrete cap overlain by asphalt cover), two feet of gravel, recycled concrete aggregate (RCA) or clean material meeting the soil quality requirements in Part 375-6.7(d)(ii)(b) (i.e., lower of Protection of Groundwater Soil Cleanup Objectives [SCO] or Restricted Use Restricted-Residential SCOs).

The Site is zoned for mixed manufacturing (M1-5) with a residential overlay (R10) according to New York City Zoning Map 9b and is currently used for parking and storage.

The Site is located in an urban area of historical industrial usage that has recently undergone residential and commercial development. The properties adjoining the Site and in the neighborhood surrounding the Site primarily include industrial, commercial, residential and mixed used properties. The properties immediately south, north, and east of the Site include industrial and commercial uses.

2.2.2 Geology

The sidewalk elevation (el) along Vernon Boulevard (east side of the Site) is approximately el 16 North American Vertical Datum (NAVD88)[1]. Pre-development Site cover included discontinuous concrete slabs, asphalt, gravel and vegetation.

Urban fill extended from beneath the pre-development surface cover to depths of approximately 3 to 20 feet below grade surface (bgs), where it is underlain by native soil. Urban fill generally consisted of a brown to dark brown, fine to medium sand layer containing varying amounts of silt, gravel, brick, concrete fragments, coal, slag, wood, metal, glass, and ash. A natural sand deposit varying in thickness from 0 to 30 feet across the site containing silt and fine gravel is located below the fill. An up to 5 to 10 foot thick layer of decomposed rock is located in portions of the Site. Gneiss bedrock underlies the surficial fill and sand. The depth of competent rock ranges from about 45 to 60 feet bgs on the western edge and slopes up to about 10 to 25 bgs in the central portion and then slopes down to 20 to 25 feet bgs on the eastern edge of the Site.

Site specific boring logs from previous reports are provided in Appendix C.

2.2.3 Hydrogeology

During the Remedial Investigation (RI), performed by Langan from June 25, 2007 through August 2, 2007, groundwater at the Site was observed from about el -0.4 to el 8.6 NAVD88. Groundwater elevation observations during the Supplemental Remedial Investigation (SRI), performed by Langan on May 4, 2016, were consistent with the RI observations (groundwater between el 1.2 and 2.56 NAVD88). Based on groundwater depths recorded during the RI and SRI, groundwater elevations were generally higher in the eastern portion of the Site and lower in the western portion of the Site along the East River.

There are no wetlands on or immediately adjacent to the Site. Groundwater in this area of New York City is not used as a potable (drinking) water source. New York City residents receive their drinking water supply from surface reservoirs located in upstate New York.

A groundwater contour map is provided as Figure 3. Groundwater elevation data is provided in Table 1. Groundwater monitoring well construction logs for existing wells are provided in Appendix D.

[1] Elevations are in North American Vertical Datum of 1988 (NAVD88), which is 1.625 feet above the Borough President Queens Datum (BPQD).

2.3 INVESTIGATION AND REMEDIAL HISTORY

The following narrative provides a remedial history timeline and a brief summary of the available project records to document key investigative and remedial milestones for the Site. Full titles for each of the reports referenced below are provided in Section 8.0 - References.

2.3.1 Site History

The Site is located in an area of historical industrial usage and has been developed since as early as 1898. The area is still heavily populated with industrial uses with some commercial and residential properties. The Site was occupied by the New York Architectural Terra Cotta Company, from before 1898 (earliest records reviewed) to sometime after 1915, for the manufacture of terra cotta, a construction material consisting of cast and fired clay units. In 1932, the New York Architectural Terra Cotta company went bankrupt, and it was taken over by the Eastern Terra Cotta Company. By 1947, the Eastern Terra Cotta Company no longer existed but the Site was being used for "plastic products manufacture" and "electronics operations". Sanborn maps also indicate that, between 1947 and 1950, at least a portion of the Site may have been used for manufacture of wood products and wood posts, waste paper sorting and rag processing. Circa 1980, a Pepsi Cola Company facility occupied the Site (distribution warehouse). Sanborn maps after 1990 show that the Site is vacant. The Site was purchased by Terra Cotta, LLC in September 1999.

Adjacent and surrounding properties were historically used for industrial and manufacturing purposes. Sanborn maps indicate surrounding properties were used for light industrial buildings, warehouses, an ice cream company, and low-income housing complexes.

2.3.2 Previous Environmental Reports

The following narrative provides a remedial history timeline and a brief summary of the available project records to document key investigative and remedial milestones for the Site. Full titles for each of the reports referenced below are provided in Section 8.0 - References. Copies of these reports are provided in Appendix C.

2.3.2.1 May 1994, Environmental Liabilities Assessment, prepared by Roy F. Weston, Inc.

An Environmental Liabilities Assessment for 41-98 through 42-02 Vernon Boulevard was performed by Roy F. Weston, Inc. on behalf of Citibank. Roy F. Weston, Inc. generated this report based on document review and two site inspections conducted on February 18, 1994 and April 8, 1994. The report reviews and documents prior uses, petroleum use, storage tanks, hazardous waste storage, spills or releases, surface water and groundwater, fill and land disposal, enforcement and litigation, contamination, asbestos,

indoor air quality, and provides conclusions and recommendations based on an analysis of the data. Relevant findings and conclusions included the following:

A vacant building adjoins the Site on 42-16 Vernon Boulevard (Terra Cotta Parcel D BCP No. C241101). The building is estimated to be approximately 100 years old (the New York Architectural Terra Cotta Company building).

- Soil and groundwater contamination is likely present as a result of historic operations and spills on the adjacent property (the former Royal Petroleum Company oil terminal-NYPA site). An NYSDEC file review found that the former oil terminal contained an 80,000-barrel tank with four compartments, including two compartments containing 2,015,290 gallons of No.2 fuel oil, a 385,429-gallon No. 2 diesel fuel compartment, and a 572,451-gallon No. 6 Fuel Oil compartment. Approximately two-thirds of the tank was noted as being below ground. As a result of a three-foot subsurface crack in a tank wall, observed in 1980, 41 monitoring wells and three recovery wells were installed on the Terra Cotta Site and approximately 39 monitoring wells and one recovery well were installed on the NYPA site. Between the three Site recovery wells and one NYPA site recovery well, 1,200 gallons of spilled oil was recovered in 1980 and 1981. Groundwater monitoring in 1986 showed a presence of an oil film in some of the monitoring wells. Royal Petroleum ceased operations in 1986 or 1987, demolished the buildings, removed the tanks, and engaged in remedial activities.
- Piles of debris, believed to include tires, bricks, metals and bottles, were observed on the Site.
- A fill pipe and associated piping was observed in the northeast corner of the adjacent New York Architectural Terra Cotta Company building (Terra Cotta Parcel D BCP No. C241101), indicating a possible underground storage tank (UST).
- The report recommended that further subsurface soil and groundwater sampling be conducted to address the possibility of contamination on the Site migrating from the NYPA site.

2.3.2.2 September 1996, Summary of UST Closure Site Assessment, prepared by ERD Environmental, Inc.

A UST Closure Site Assessment was conducted at the Site by ERD Environmental, Inc. in September 1996. This report documents the closure of three adjacent USTs approximately three feet below grade in the northwestern portion of the Site. Two of the USTs each had a capacity of 10,000-gallons, apparently stored No.6 fuel oil, and were oriented parallel to the East River. The third UST had a capacity of 10,000 to

12,000 gallons, was vertically orientated, and located on the east side of the two other USTs. During the removal, petroleum-contaminated soil and free product in the groundwater were observed. A spill was reported to the NYSDEC on June 7, 1995 (Spill No. 95-02890). In total, 723 cubic yards of contaminated material, approximately 573 cubic yards of contaminated soil and 150 cubic yards of sawdust and sludge mixture (resulting from the free product cleanup) were removed and disposed.

Delineation of the contaminated soil was not completed because of complications due to the 1980 petroleum spill in the former Royal Petroleum Terminal on the NYPA Site. Endpoint soil samples were collected from the north, west and south sidewalls of the tank removal excavation. The samples contained semivolatile organic compounds (SVOC) and metals exceedances based on the NYSDEC Technical and Administrative Guidance Manual 4046 (TAGM 4046) Recommended Soil Cleanup Objectives (RSCO). Through gas chromatography fingerprinting of petroleum samples collected from the UST excavation, two types of petroleum were identified. One type was associated with the tanks removed, and the other was attributed to off-site petroleum product migration from the adjacent NYPA site. In light of the fingerprinting results, a meeting was held with the NYSDEC and the responsible party (RP) for the NYPA site spill; the former Royal Petroleum Terminal owner decided that the RP will continue the investigation by installing test pits, delineating the contaminated area, sampling, and removing free product where necessary.

2.3.2.3 September 1997, UST Closure Additional Soil Removal Report, prepared by ERD Environmental, Inc.

A UST Closure Additional Soil Removal Report was produced by ERD Environmental, Inc. in September 1997. This report provides an update of the remedial activities performed in response to the contaminated soil and groundwater observed during the closure of the three USTs in the northwest portion of the Site. The initial closure activities for the tanks are documented in the September 1996 Closure Site Assessment report previously summarized. The report documents activities since September 1996, which included the delineation and remediation of soil contaminated by the three previously removed tanks (two 10,000-gallon USTs and one 10,000-to 12,000-gallon UST). Between July 1, 1997 and August 2, 1997, the previous tank removal excavation, which was 7 feet deep, 25 feet wide and 37 feet long, was over-excavated on all sidewalls to 7 feet deep, 60 feet wide and 60 feet long. The total quantity of petroleum contaminated soil removed from the excavation was approximately 558 tons.

Soil and groundwater endpoint samples were collected on the bottom and sides of the final excavation. The report stated that NYSDEC Spill Technology and Remediation Series (STARS) regulatory guidelines were met at the limits of the current excavation.

Based on the sample results and excavation observations, the report concluded that no additional soil removal was required in the vicinity of the excavation and recommended that the NYSDEC issue a No Further Action (NFA) designation for the location and NYSDEC Spill No. 95-02890. The spill case was closed by the NYSDEC on March 25, 1999.

2.3.2.4 September 1997, 550-gallon Storage Tank Excavation Report, prepared by ERD Environmental, Inc.

This report by ERD Environmental, Inc. documented the removal of two adjacent 550-gallon gasoline USTs on June 30, 1997. The USTs were located in the southeast portion of the Site, to the southwest of the New York Architectural Terra Cotta Company building. Upon excavation, both tanks were found to be filled with concrete and located within a concrete vault. No evidence of a petroleum release was observed. The removal of the USTs and concrete vault was completed on July 1, 1997. Endpoint samples were collected from the base and sidewalls of the excavation and submitted for laboratory analysis of the NYSDEC STARS SVOCs and volatile organic compounds (VOC) parameters. Results indicated no exceedances of the NYSDEC STARS guidelines. The report considered the tanks properly closed with no further remedial action necessary. However, a review of the report finds that the appropriate endpoint samples were not collected per the requirements of NYSDEC Draft DER-10, Technical Guidance for Site Investigation and Remediation, December 25, 2002 and some analytical Method Detection Limits (MDL) were too high to evaluate exceedances of regulating limits on the soil. Therefore, the area of the former USTs location was considered a Potential Area of Concern (PAOC) during the RI and was included in the investigation program.

2.3.2.5 January 1999, Phase I Environmental Site Assessment, prepared by IVI Environmental, Inc.

A Phase I Environmental Site Assessment (Phase I ESA) was performed at the Site on January 11, 1999 by IVI Environmental, Inc. The Phase I ESA identified the following recognized environmental conditions (REC):

- Historical Site Use: Subsequent to the Site's use as a terra cotta manufacturing facility (until approximately 1947), portions of the Site were used for unidentified plastics manufacturing and electronics operations. The Phase I stated that a potential for VOCs, SVOCs and metals contamination at the Site as a result of these operations. The Phase I recommended that soil and groundwater be sampled for VOCs, SVOCs and metals and that groundwater samples be collected from the three existing wells and analyzed for VOCs, SVOCs, and metals.

- USTs: Two 10,000-gallon and one 10,000 to 12,000-gallon USTs containing No. 6 Fuel Oil and two 550-gallon gasoline USTs were reportedly removed from the Site in 1997. Soil and groundwater in the vicinity of the fuel oil USTs were visually observed to be impacted. Contaminated soil was removed until NYSDEC STARS regulatory guidelines at the limits of the excavation were met. A NFA Designation was requested from the NYSDEC Case Manager, and the Phase I recommended that a copy of the NFA letter be obtained when issued. There was no specific information pertaining to the presence of either a 15,000-gallon or a 30,000-gallon fuel oil UST, provided in the Phase I ESA. However, common indicators of USTs such as vent and fill pipes were observed on the north and east sides of the adjoining Terra Cotta building. The Phase I recommended inspection of the Terra Cotta building basement to confirm or deny the presence of a tank.
- Adjoining or Surrounding Properties with Recognized Environmental Conditions: Historic releases of petroleum products from the southern adjoining former Royal Petroleum Corp. site (NYPA site) have contaminated soil and groundwater on both the NYPA site and the subject Site. Although cleanup activities have been taking place, the Phase I recommended reviewing the NYSDEC files pertaining to the NYPA site to determine the extent of impact to the subject property and to evaluate the proposed plan for remediation.
- On-Site Fill: Based on the Site's variations in topography and Site observations, it appeared that fill has been imported onto the Site in order to fill in low-lying areas and wetlands. The Phase I recommended the fill be screened for contaminants.

Due to the proximity to Queensboro Bridge, there is a possibility that Site soils have been contaminated by lead based paint (LBP) peeling or flaking from the bridge or from historical sanding operations. The Phase I recommended the soils be sampled for lead.

2.3.2.6 August 9, 1999, Phase II Environmental Site Assessment, prepared by IVI Environmental, Inc.

This Phase II ESA dated August 9, 1999 was produced by IVI Environmental, Inc. The Phase II details work performed to investigate the findings of the Phase I dated January 11, 1999. The investigation was performed between July 20 and August 5, 1999 and included a geophysical survey, eight test pits, three groundwater samples, and an inspection of the adjoining New York Architectural Terra Cotta Company building (Parcel D).

A geophysical survey, comprised of a magnetometer survey, a metal detector survey and a ground penetrating radar survey, was performed on all accessible parts of the

Site. The Phase II concluded that no subsurface anomalies indicative of USTs were discovered in the surveyed areas. The completion of eight test pits found the following:

- Petroleum contaminated material was observed in two test pits on the western side of the Site, south of the 1995 UST grave. Petroleum contaminated material was observed at depths of 7 to 9 feet bgs in the test pit closest to the UST removal area and at 11 feet bgs in the test pit closer to the southern border of the Site. Analysis of soil samples from these test pits found no exceedance of the NYSDEC STARS parameters. Fingerprint analysis of the samples indicated that the petroleum was No. 4 or 6 fuel oil, similar to the sample results of material tested in the UST removal area. The report recommended that if future development required excavation of the petroleum-contaminated soil, the soil should be disposed as petroleum-contaminated waste.
- The remaining test pits were located across the eastern half of the Site. Analysis of soil samples collected from these pits, sometimes shallow due to underground obstructions, found SVOC and metal exceedances of the NYSDEC TAGM 4046 RSCOs. The report concluded that the exceedances were typical of the fill in the area and recommended proper testing for waste characterization purposes if the soils were to be disturbed. The report also recommended that the exceedances be reported to NYSDEC. No record of this reporting was located.
- Groundwater samples were collected from three existing wells: one in the western side of the Site, northeast of the New York Architectural Terra Cotta building (MW-1), and two in the southeast section of the Site (MW-2 and MW-3). MW-1 and MW-3 were found to contain metals exceedances of the NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards (AWQS). The metal exceedances were attributed to the fill constituents and a recommendation was made to report the exceedances to NYSDEC. No record of this reporting was located.

The Phase II further recommended that development of the property be monitored to document the condition of any excavated soil. It was also recommended that any future excavated soil be handled in accordance with applicable United States Environmental Protection Agency (USEPA) and NYSDEC regulations and guidelines.

2.3.2.7 December 19 2002, Preliminary Geotechnical Report, prepared by Langan

This preliminary geotechnical report dated December 19, 2002 was prepared by Langan. The subsurface investigation included four test borings completed between December 2 and 4, 2002. The investigation found the generalized stratigraphy underlying the Site

to be composed of a surficial layer of fill overlying natural sand deposits followed by gneiss bedrock. During the field investigation, petroleum odors and soil staining were detected in three of the four borings located in the center and western half of the Site. Photoionization Detector (PID) readings for petroleum-associated VOCs of 4 parts per million (ppm) to 80 ppm were recorded. The report recommended additional soil sampling and environmental testing to characterize the potential contamination.

2.3.2.8 September 5, 2007, Remedial Investigation Report, prepared by Langan

Langan conducted an RI throughout Parcels A, B, C, and D between June 25 and August 2, 2007. The subsurface investigation was conducted to obtain qualitative data on the potential areas of concern detailed in the January 2007 Remedial Investigation Work Plan (RIWP), which was approved by the NYSDEC on April 27, 2007. The investigation consisted of collecting samples from 35 soil borings, 15 test pits, 9 monitoring wells, and 13 soil vapor points across Parcels A, B, C, and D. Findings and conclusions are as follows:

- Overburden at the Site consists of a fill layer beneath the surface cover (asphalt, concrete, gravel, vegetation), with thicknesses ranging from approximately 5 to 20 feet. The fill layer is comprised of brown, dark brown, fine to medium sand containing silt, gravel, brick, concrete fragments, wood, metal, and ash. Underlying the fill are discontinuous natural formations. Nearly all samples of this fill layer contained concentrations of SVOCs and metals above Part 375 Track 1 SCOs.
- A fine to medium natural sand deposit ranging in thickness from approximately 0 to 30 feet is located below the fill. Gneiss bedrock underlies the surficial fill and natural sand. The depth to competent bedrock ranges from about 45 to 60 feet bgs on the eastern edge and slopes up to 10-25 feet bgs in the central portion and then slopes down to 20 to 25 feet bgs on the western edge. The native soils beneath the fill in the western portion of the Site appear to be the only significant mass of soil that meets the Part 375 Track 1 SCOs.
- An elevated concentration of lead was detected in one of the surface historic fill soil samples located along the northern boundary of the Site near the Queensboro Bridge.
- Petroleum staining and odor, and elevated organic vapor readings were observed throughout the western portion of the Site at varying depths, in most locations where samples could be collected and in two isolated locations on the eastern portion of the Site.
- A sheen and petroleum odor was observed on the groundwater table in monitoring well MW-10 located in the central portion of the Site (Parcel B). Free

No. 6 Fuel Oil product was observed at the groundwater table in MW-1, and a sheen was observed at MW-2. MW-1 and MW-2 are located in the northwestern portion of the Site.

- Soil vapor sampling results indicated the presence of VOCs in subsurface soil, the indoor air (basement) of the Terra Cotta Building and in the ambient outdoor air.
- Localized areas of soil impacted with VOCs, polycyclic aromatic hydrocarbons (PAH), pesticides, arsenic and lead were identified.
- Groundwater underlying the Site ranges from approximately el. -0.4 to el. 8.6 NAVD88. Groundwater elevations were generally higher along the eastern side of the Site (toward Vernon Boulevard) and lower to the west along the East River. Groundwater generally flows from east to west toward the East River. Groundwater on the western portion of the site is impacted with petroleum and VOCs.

Considering the planned development of the Site, sufficient analytical data was gathered during the RI to establish site-specific soil cleanup levels and to develop a remedy for the Site. The remedy for the Site will address free petroleum product, soil impacted with petroleum, metals, VOCs, SVOCs, PAHs, pesticides and the potential for vapor intrusion.

2.3.2.9 September 19, 2007, Geotechnical Investigation Report, prepared by Langan

Langan conducted a limited geotechnical investigation between September 13 and September 26, 2006 to obtain data related to the depth of rock and the character of the overburden in the 40 foot zone along the bulkhead line. Combined findings (Preliminary Geotechnical Report, December 2002 and Limited Geotechnical Report, September 2006) indicated that the rock generally dips west toward the East River. The depth to rock varies from about 15 feet in the center of the Site to roughly 45 to 55 feet along the westerly property line. The report suggested that borings will be needed along the bulkhead line (drilled from the water side) for use by the waterfront consultant. Additional borings will also be needed upland to satisfy the Building Code and facilitate the design development of the project. During the field investigation, petroleum odors were detected in two out of the three borings. PID readings did not exceed 34 ppm.

2.3.2.10 May 30, 2008, East River Sediment Sampling Report, prepared by Langan

The East River Sediment Sampling Report was prepared by Langan, dated May 30, 2008. The sediment sampling was conducted below the East River Mean High Water (MHW) Line at (el. -0.06 feet or 1.56 NAVD 88) between the MHW line and the Terra

Cotta Site boundary. The scope of the sampling included the collection and analysis of five sediment samples and comparison with the NYSDEC Technical Guidance for Screening Contaminated Sediments (1999).

Sediment samples were visually classified and screened for visual, olfactory, and anthropogenic and VOC impacts. Samples were composed of historic fill with brick and ash components. The fill was generally described as brown, fine to medium sand, with some silt, trace organic material, and brick and ash components. Petroleum odor and sheen was observed at each of the five sampling locations. PID readings ranged from 0 to 1.5 ppm.

Sample analytical results indicated SVOC and metal exceedances of the Effects Range Low (ERL) criteria used in evaluating contaminants in marine and estuarine sediments, which applies to East River Sediments. Three of the samples contained metals above the Effects Range Median (ERM) criteria. Petroleum hydrocarbons were detected in all five sediment samples.

2.3.2.11 May 20, 2013, Interim Remedial Measure Work Plan – For Silvercup West, prepared by Langan

In May 2013, Langan submitted an IRM Work Plan to the NYSDEC for the Silvercup West BCP site, including the Terra Cotta (Parcel A), and the NYPA site. The IRM Work Plan described the environmental need, design and installation procedures for a proposed waterfront cutoff wall to be constructed along the western perimeter of the NYPA and Terra Cotta sites. The purpose of the cutoff wall is to prevent the migration of petroleum product into the East River. In addition, the cutoff wall will allow the excavation and off-site disposal of petroleum product and petroleum-impacted soil landward of the cutoff wall, during implementation of the final Site remedy, by holding back the East River. On November 21, 2013, NYSDEC approved the IRM Work Plan. A detailed description of this supplemental investigation is provided in Section 2.7 of the October 2016 Remedial Action Work Plan (RAWP) provided in Appendix C.

2.3.2.12 December 8, 2015, Geotechnical Engineering Report, prepared by Langan

This report summarized a geotechnical engineering study conducted between September 15 and 24, 2015 to investigate the subsurface soil conditions and to develop recommendations for a new bulkhead. Subsurface exploration included six borings in the vicinity of the proposed bulkhead alignment. The borings were drilled to depths from 40 to 72 feet below the existing river mudline. The generalized subsurface profile consists of successive layers of uncontrolled fill, organic silt and clay, sand, weathered rock, and competent bedrock.

2.3.2.13 May 4, 2016, Remedial Investigation Report – Addendum 1, prepared by Langan

The SRI was implemented between September 21, 2015 and March 7, 2016 to: 1) evaluate the potential presence and extent of mobile grossly contaminated material/product along the west side of the shared border between the NYPA property and the Site; 2) delineate three elevated metals areas identified in the Terra Cotta RIR (centered on previous investigation locations TP-4, SB-23, SS-2); and further delineate the grossly contaminated material on the Site. A preliminary waste classification study was completed between March 8 and 10, 2016 to support future off-site disposal of impacted Site soil and fill; waste classification borings also assisted in further delineating grossly contaminated material. Findings and conclusions are as follows:

- Stratigraphy: Overburden at the Site consists of a historic fill layer beneath the Site surface cover (asphalt, concrete, building, gravel, and vegetation), extending to depths of approximately 3 to 20 feet below grade. The fill was composed of a brown, grayish brown, fine to medium sand layer containing some silt, gravel, brick, concrete fragments, coal, slag, wood, metal, glass, root fibers, and ash. Underlying the historic fill are native sand deposits.
- Groundwater underlying the Site ranges from approximately el. -0.4 to el. 8.6 NAVD88. Groundwater elevations were generally higher along the eastern side of the Site (toward Vernon Boulevard) and lower to the west along the East River. Groundwater generally flows from east to west toward the East River.
- Soil Impacts:
    - Petroleum-Impacted Soil: Grossly contaminated material was identified in the western portion of the Site along the East River and extends approximately 80 to 230 feet east of the shoreline with the greatest impacts along the northern and southern property boundaries. Vertically, the impacts ranged from approximately 8 to 24 feet bgs.
    - Metal-Impacted Soil: Lead and arsenic were identified as soil contaminants of concern. Elevated lead areas were delineated to approximately 10-foot diameter areas around investigation locations SS-2, TP-4 and SB-23 from surface grade to 2 to 3 feet bgs. Deep metals impacts at SB-2 (lead) and TP-1 (arsenic) are below the groundwater table; however, dissolved-phase lead and arsenic were not identified above regulatory standards in groundwater and additional delineation was not conducted. Hazardous lead was not detected in the vertical or horizontal delineation soil samples.

- Groundwater Impacts: Free product was observed in two of 14 monitoring wells, both located in the northwestern portion of the Site (MW-1 and MW-6) with product thickness ranging from 0.02 feet (MW-1) to 0.54 feet (MW-6). There are no dissolved-groundwater contaminants of concern.
- Vapor Impacts: VOCs were identified in subsurface soil vapor samples at concentrations above the ambient air sample.

2.4 REMEDIAL ACTION OBJECTIVES

The Remedial Action Objectives (RAO) for the Site as listed in the Decision Document dated October 28, 2016 are as follows:

2.4.1 Groundwater

RAOs for Public Health Protection

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

RAOs for Environmental Protection

- Restore ground water aquifer to pre-disposal/pre-release conditions, to the extent practicable.
- Prevent the discharge of contaminants to surface water.
- Remove the source of ground or surface water contamination.

2.4.2 Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of or exposure from contaminants volatilizing from contaminants in soil.

RAOs for Environmental Protection

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

2.4.3 Soil Vapor

RAOs for Public Health Protection

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion (SVI) into buildings at the Site.

2.5 REMAINING CONTAMINATION

2.5.1 Soil

Per the October 2016 RAWP, grossly contaminated media was excavated to about one foot below the observed water table. In areas throughout Parcel A with gross contamination, the remedial excavation extended to about el -1 NAVD88 to el -3. Hot spot metal excavation (SS-2 and SB-2) extended to about el 13.21 to el -3, respectively. After completion of soil removal remedial activities, a demarcation layer consisting of woven geotextile fabric was placed along the base of the remedial excavation to provide a visual reference, where the surface is capped with clean soil. This demarcation layer constitutes the top of the 'Residuals Management Zone', the zone that requires adherence to special conditions for disturbance of potentially contaminated residual soils defined in the SMP.

Following the placement of the filter fabric demarcation layer at the base of the remedial excavation, ¾-inch virgin crushed stone was used as backfill to bring the remedial excavation from below the water table to approximately one foot above the water table (minimum 2-foot-thick layer of ¾-inch stone). The filter fabric was wrapped around the ¾-inch stone to prevent future wash-out, and the excavation was backfilled with reused Site fill material. The upper two feet of the Site was backfilled with the 2-foot-thick (minimum) Site Cover System (or Cap) to final grade. The Site Cover System consists of impervious cover (e.g. concrete cap overlain by asphalt cover), two feet of gravel, RCA, and/or clean imported material meeting the soil quality requirements in Part 375-6.7(d)(ii)(b) (i.e., lower of Protection of Groundwater SCOs or RR SCOs). A land survey was performed by a New York State licensed surveyor to define the top elevation of residual contaminated soil on Site, and is provided in Appendix E.

Following excavation and disposal of approximately 4,529 tons of non-hazardous grossly-impacted and petroleum contaminated soil/ fill to one foot below the observed water table, 323 tons of non-hazardous historic fill, and removal of three USTs, documentation soil samples were collected from the base and sidewalls of the remedial excavation and from the three UST removal excavations at a frequency consistent with the requirements of DER-10 and the approved RAWP. In addition, approximately 75.5 tons of non-hazardous metals impacted soil/ fill were excavated to elevations between el 13.21 and el -3 in Parcel A as identified and delineated in previous investigations around borings SS-2 and SB-2. An excavation and documentation sample location plan is included as Figure 4. The locations of the removed USTs are also shown on Figure 4.

The USTs were registered with the NYSDEC, and the Site was assigned NYSDEC Petroleum Bulk Storage No. 2-62786.

Documentation soil samples collected from the remedial excavation and UST excavations were analyzed for NYSDEC CP-51 Table 3 VOCs and SVOCs by a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP)-certified laboratory. Results were compared to NYSDEC Part 375 Restricted Residential soil cleanup objectives (RR SCOs). Analytical results are shown in Figures 4, 6A and 6B. The remaining contamination is summarized as follows:

- The following constituents were detected in soil from post-remedy documentation samples and RI samples in areas outside of the remedial excavation extent at concentrations that exceed RR SCOs:
    - Seven SVOCs: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene.
    - Five metals: arsenic, barium, cadmium, lead, and mercury
- Limited residual contamination remains on Site below the base of the remedial excavation (deeper than one foot below the observed water table) within the western portion of Parcel A. Extents of remaining contamination are presented in Figures 4, 6A, and 6B. Four monitoring wells were installed in the western portion of the Site where limited residual contamination remained in place below the groundwater table.

The SVOCs detected at concentrations above the RR SCOs from the UST No. 1 and 2 excavations (eastern portion of Parcel A) are typical of historic fill throughout New York City, and the concentrations were consistent with the results of previous investigations. The SVOCs detected above the RR SCOs from the remedial excavation and UST No. 3 where grossly contaminated material was present one foot below the water table were consistent with results from previous investigations. Groundwater sampling conducted during previous investigations demonstrated that SVOCs in Site soil have not impacted groundwater. A documentation sample detection summary is shown in Table 2A, remaining contamination from RI samples collected is shown in Table 2B, and a map showing sample locations and results that exceeded the RR SCOs is presented as Figures 6A and 6B.

Exposure to remaining soil contamination is prevented by the Site Cover system, consisting of a combination of an impervious cover (e.g. concrete and asphalt cover), two feet of gravel, RCA, and/or clean imported material meeting the soil quality requirements in Part 375-6.7(d)(ii)(b) (i.e., lower of Protection of Groundwater SCOs or RR SCOs). In addition, as described above, a physical demarcation layer was placed

along the base of the remedial excavation and wrapped around ¾-inch crushed virgin stone backfilled to one foot above the water table. The engineering controls plan and cross-sections of cover type are provided as Figures 5A and 5B.

2.5.2 Groundwater

Groundwater was encountered during the remedial excavation in the western portion of Parcel A. Construction dewatering was not implemented during remedial excavation activities. As part of the remedy, grossly contaminated media was excavated to one foot below the observed water table. On December 7, 2016, free product was identified at the base of the remedial excavation during implementation of the remedy. The free product was skimmed using oil absorbent socks and collected into a vacuum truck by Brookside Environmental Inc. (Brookside) for off-site transport and disposal to Clean Water of New York located in Staten Island, New York. About 1,907 gallons of petroleum impacted liquid recovered from perched groundwater at the base of the remedial excavation was transported off-site by Brookside.

Following implementation of the remedy, four groundwater monitoring wells were installed along the western portion of Parcel A, where limited residual contamination remained in place below the groundwater table. Quarterly groundwater gauging will be conducted in the first year of Site Management, followed by annual gauging to determine the presence of free product accumulation into the wells.

- The following groundwater contaminants were identified above Class GA TOGS AWQS during the RI in areas outside of the remedial excavation extent:
    - Four metals: antimony, iron, manganese, and sodium

Table 3 identifies remaining groundwater contamination at the site after completion of the remedial action. Remaining groundwater analytical results are shown in Figure 7.

2.5.3 Soil Vapor

For all future buildings constructed at the Site, a SVI evaluation will be completed prior to construction. The evaluation will include a provision for implementing actions recommended to address exposures related to SVI, as required.

During the RI, five soil vapor samples were collected in Parcel A to evaluate the presence of volatile constituents on the Site.

- The following VOCs detected in soil vapor sample in areas outside of the remedial excavation included:
    - Twenty-one VOCs: Tetrachloroethene, acetone, isopropyl alcohol, hexane, ethanol, 4-ethyltoluene, xylenes, 1,2,4-Trimethylbenzene, chloroform, 2-hexanone, Freon 12, 1,3,5 Trimethylbenzene, benzene, n-

heptane, toluene, 2-butanone, carbon disulfide, propene, 4-hexanone (MBK), ethylbenzene, and tetrahydrofuran.

Table 4 identifies remaining soil vapor contamination at the site following completion of the remedial action. Remaining soil vapor analytical results are shown in Figure 8.

3.0 INSTITUTIONAL AND ENGINEERING CONTROL PLAN

3.1 GENERAL

Since remaining contamination exists at the Site, ICs and ECs are required to protect human health and the environment. This IC/EC Plan describes the procedures for the implementation and management of all IC/ECs at the Site. The IC/EC Plan is one component of the SMP and is subject to revision by the NYSDEC.

This plan provides:

- A description of all IC/ECs on the Site;
- The basic implementation and intended role of each IC/EC;
- A description of the key components of the ICs set forth in the Environmental Easement;
- A description of the controls to be evaluated during each required inspection and periodic review;
- A description of plans and procedures to be followed for implementation of IC/ECs, such as the implementation of the Excavation Work Plan (EWP) (as provided in Appendix F) for the proper handling of remaining contamination that may be disturbed during maintenance or redevelopment work on the Site; and
- Any other provisions necessary to identify or establish methods for implementing the IC/ECs required by the Site remedy, as determined by the NYSDEC.

3.2 INSTITUTIONAL CONTROLS

A series of ICs is required by the Decision Document to: (1) implement, maintain and monitor EC systems; (2) prevent future exposure to remaining contamination; and, (3) limit the use and development of the Site to Restricted Residential, Commercial or Industrial uses only. Adherence to these ICs on the Site is required by the Environmental Easement and will be implemented under this SMP. ICs identified in the Environmental Easement may not be discontinued without an amendment to or extinguishment of the Environmental Easement. The IC boundaries are presented in Appendix A. These ICs are:

- The property may be used for: Restricted Residential as described in 6 NYCRR Part 375-1.8(g)(2)(iii), Commercial as described in 6 NYCRR Part 375-1.8(g)(2)(iii) and Industrial as described in 6 NYCRR Part 375-1.8(g)(2)(iv), subject to applicable zoning restrictions;

- All ECs must be operated and maintained as specified in this SMP;
- All ECs must be inspected at a frequency and in a manner defined in the SMP;
- The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the New York City Department of Health to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department;
- Groundwater and other environmental or public health monitoring must be performed as defined in this SMP;
- Data and information pertinent to site management must be reported at the frequency and in a manner as defined in this SMP;
- All future activities that will disturb remaining contaminated material must be conducted in accordance with this SMP;
- Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in this SMP;
- Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical component of the remedy shall be performed as defined in this SMP;
- Access to the Site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by the Environmental Easement;
- The potential for vapor intrusion must be evaluated for any buildings developed in the area within the IC boundaries noted on Figure 5A, and any potential impacts that are identified must be monitored or mitigated.
- Vegetable gardens and farming in remaining soil on the Site are prohibited; and
- The Site shall not be used for Residential (single family housing) purposes as defined in 6 NYCRR 375-1.8(g)(2)(i), and the above-stated engineering controls may not be discontinued without an amendment or extinguishment of this Environmental Easement.

3.3 ENGINEERING CONTROLS

Engineering controls installed at the Site include a Site Cover system to prevent contact with remaining subsurface soil contamination and a bulkhead cutoff wall to prevent potential migration of residual petroleum product from the Site into the East River. Locations of all ECs are shown on Figure 5A. Cross-sections of cover types are shown on Figure 5B.

3.3.1 Site Cover System (or Cap)

Exposure to remaining contamination at the Site is prevented by a Site Cover system placed over the Site. This cover system is comprised of a combination of impervious cover, a minimum of two feet of gravel, RCA, and/or clean imported material meeting the soil quality requirements in Part 375-6.7(d)(ii)(b) (i.e., lower of Protection of Groundwater SCOs or RR SCOs). Figure 5A presents the location of the cover system and applicable demarcation layers. The EWP provided in Appendix F outlines the procedures required to be implemented in the event the cover system is breached, penetrated or temporarily removed, and any underlying remaining contamination is disturbed. Procedures for the inspection of this cover are provided in the Monitoring Plan included in Section 4.0 of this SMP. Any work conducted pursuant to the EWP must also be conducted in accordance with the procedures defined in a Health and Safety Plan (HASP) and associated Community Air Monitoring Plan (CAMP) prepared for the Site and provided in Appendix G and H, respectively.

Procedures for operating and maintaining the Site Cover System are documented in the Monitoring Plan (Section 4.0 of this SMP). As built drawings, signed and sealed by a professional engineer, are included in Appendix E. Figure 5A shows the location of the ECs for the Site. Cross-sections of cover types are shown on Figure 5B.

3.3.2 Bulkhead Cutoff Wall

The remedy for Parcel A also included installation of a new bulkhead cutoff wall along the western boundary of Parcel A that is described in the NYSDEC-approved May 20, 2013 Interim Remedial Measure (IRM) Work Plan and its April 18, 2016 addendum. The objective of installing the proposed cutoff wall was to prevent potential migration of petroleum impacts from the Site into the East River. In addition, the cutoff wall allowed for the excavation and offsite disposal of petroleum product and petroleum-impacted soil landward of the cutoff wall, during implementation of the final Site remedy, by holding back the East River. The Cutoff Wall was installed along the Site waterfront at a location determined in coordination with NYSDEC. The cutoff wall was constructed of 40-foot long steel sheet piles with sealed seams and a sheet pile deadman. A structural concrete cap was placed at the top of the cutoff wall following installation of the sheet piles.

Procedures for operating and maintaining the Site Cover and Bulkhead Cutoff Wall systems are documented in the Monitoring Plan (Section 4.0 of this SMP). As built drawings, signed and sealed by a professional engineer, are included in Appendix E. Figure 5A shows the location of the ECs for the Site.

3.3.3 Criteria for Completion of Remediation/Termination of Remedial Systems

Generally, remedial processes are considered completed when monitoring indicates that the remedy has achieved the remedial action objectives identified by the decision document. The framework for determining when remedial processes are complete is provided in Section 6.4 of NYSDEC DER-10.

3.3.3.1 Site Cover System (or Cap)

The Site Cover system is a permanent control and the quality and integrity of this system will be inspected at defined, regular intervals in accordance with this SMP in perpetuity.

3.3.3.2 Bulkhead Cutoff Wall

The bulkhead cutoff wall is a permanent control and the quality and integrity of this system will be inspected at defined, regular intervals in accordance with this SMP in perpetuity.

3.3.3.3 Monitoring Wells

Periodic groundwater gauging and monitoring activities to assess the potential presence of free petroleum product accumulation as a result of remaining contamination will continue, as determined by the NYSDEC until residual groundwater concentrations are found to be consistently below ambient water quality standards, the site Standards, Criteria and Guidelines (SCG), or have become asymptotic at an acceptable level over an extended period. In the event that data indicates that monitoring may no longer be required, a proposal to discontinue the periodic monitoring will be submitted by the remedial party. Groundwater monitoring will continue until permission to discontinue is granted in writing by the NYSDEC. If groundwater contaminant levels become asymptotic at a level that is not acceptable to the NYSDEC, additional source removal, treatment and/or control measures will be evaluated.

4.0 MONITORING PLAN

4.1 GENERAL

This Monitoring Plan describes the measures for evaluating the overall performance and effectiveness of the remedy. This Monitoring Plan may only be revised with the approval of the NYSDEC. Details regarding the sampling/ monitoring procedures, data quality usability objectives, analytical methods, etc. for all samples collected, as necessary, as part of site management for the Site are included in the Quality Assurance Project Plan (QAPP) provided in Appendix I.

This Monitoring Plan describes the methods to be used for evaluating Site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment.

To adequately address these issues, this Monitoring Plan provides information on:

- Monitoring locations, protocol and frequency;
- Inspection and maintenance requirements for monitoring wells;
- Monitoring well decommissioning procedures; and
- Annual inspection and periodic certification.

Reporting requirements are provided in Section 7.0 of this SMP.

4.2 SITE-WIDE INSPECTION

Site-wide inspections will be performed annually. Modification to the frequency or duration of the inspections will require approval from the NYSDEC. Site-wide inspections will also be performed after all severe weather conditions that may affect ECs. During these inspections, an inspection form will be completed as provided in Appendix J – Site Management Forms. The form will compile sufficient information to assess the following:

- Compliance with all ICs, including Site usage;
- An evaluation of the condition and continued effectiveness of ECs;
- General Site conditions at the time of the inspection;
- The site management activities being conducted including, where appropriate, confirmation sampling and a health and safety inspection; and
- Confirm that Site records are up to date.

Inspections of all remedial components installed at the Site will be conducted. A comprehensive site-wide inspection will be conducted and documented according to

the SMP schedule, regardless of the frequency of the Periodic Review Report. The inspections will determine and document the following:

- Whether ECs continue to perform as designed;
- If these controls continue to be protective of human health and the environment;
- Compliance with requirements of this SMP and the Environmental Easement;
- Achievement of remedial performance criteria; and
- If site records are complete and up to date; and
- Reporting requirements are outlined in Section 7.0 of this plan.

Inspections will also be performed in the event of an emergency. If an emergency, such as a natural disaster or an unforeseen failure of any of the ECs occurs that reduces or has the potential to reduce the effectiveness of ECs in place at the Site, verbal notice to the NYSDEC must be given by noon of the following day. In addition, an inspection of the Site will be conducted within 5 days of the event to verify the effectiveness of the IC/ECs implemented at the Site by a qualified environmental professional, as determined by the NYSDEC. Written confirmation must be provided to the NYSDEC within 7 days of the event that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.

4.3 POST-REMEDIATION MONITORING

4.3.1 Groundwater Gauging and Monitoring

Groundwater gauging will be performed periodically to monitor for potential accumulation of petroleum product in monitoring wells installed in areas where limited residual contamination remained in place below the groundwater table. Modification to the frequency or sampling requirements will require approval from the NYSDEC. Monitoring well locations, required measurements and a schedule are provided in the Table below. Modification to the frequency or monitoring requirements will require approval from the NYSDEC.

Post Remediation Monitoring Requirements and Schedule

Sampling Location	Monitoring Requirements	Schedule
	Gauge Monitoring Well with Interface Probe	
Monitoring Well #1 (MW-1)	X	Quarterly for first year, then annually thereafter
Monitoring Well #2 (MW-2)	X	Quarterly for first year, then annually thereafter
Monitoring Well #3 (MW-3)	X	Quarterly for first year, then annually thereafter
Monitoring Well #4 (MW-4)	X	Quarterly for first year, then annually thereafter

Locations of the on-site monitoring wells installed on the site are shown in Figure 5A.

The network of monitoring wells has been installed to monitor for potential free product accumulation in groundwater at the Site following remedial excavation of grossly contaminated material to one foot below the observed water table. The network of on-site wells has been designed based on the following criteria:

- Proximity to the waterfront bulkhead cutoff wall along the East River waterfront; and,
- Presence of residual contamination below the remedial excavation depth of one foot below the observed water table.

Four monitoring wells were installed along the western portion of Parcel A, parallel to the East River waterfront, where limited residual contamination remained in place below the groundwater table. Monitoring wells will be gauged with an oil/ water interface probe by a professional engineer, or a qualified environmental professional under the direction of a professional engineer. Depth to water readings, and product thickness, if encountered, will be recorded. The table provided below summarizes the wells identification number, as well as the purpose, location, depths, diameter and screened intervals of the wells.

Monitoring Well Construction Details

Monitoring Well ID	Well Location	Coordinates (latitude/ longitude)	Well Diameter (inches)	Elevation (NAVD88)			
				Casing	Surface	Screen Top	Screen Bottom
MW-1	Parcel A Waterfront	40.7549971262/ -73.9509635157	4	[TBD]	[TBD]	[TBD]	[TBD]
MW-2	Parcel A Waterfront	40.7549003536/ -73.9510444272	4	[TBD]	[TBD]	[TBD]	[TBD]
MW-3	Parcel A Waterfront	40.7546155703/ -73.9512829968	4	[TBD]	[TBD]	[TBD]	[TBD]
MW-4	Parcel A Waterfront	40.7547401168/ -73.951180345	4	[TBD]	[TBD]	[TBD]	[TBD]

Monitoring well construction logs are included in Appendix D of this document.

If biofouling or silt accumulation occurs in the on-site and/or off-site monitoring wells, the wells will be physically agitated/surged and redeveloped. Additionally, monitoring wells will be properly decommissioned and replaced, if an event renders the wells unusable.

Repairs and/or replacement of wells in the monitoring well network will be performed based on assessments of structural integrity and overall performance.

The NYSDEC will be notified prior to any repair or decommissioning of any monitoring well for the purpose of replacement, and the repair or decommissioning and replacement process will be documented in the subsequent Periodic Review Report. Well decommissioning without replacement will be done only with the prior approval of the NYSDEC. Well abandonment will be performed in accordance with NYSDEC's guidance entitled "CP-43: Groundwater Monitoring Well Decommissioning Procedures." Monitoring wells that are decommissioned because they have been rendered unusable will be replaced in kind in the nearest available location, unless otherwise approved by the NYSDEC.

The monitoring frequency may only be modified with the approval of the NYSDEC. This SMP will be modified to reflect changes in monitoring plans approved by the NYSDEC.

Deliverables for the groundwater monitoring program are specified in Section 7.0 – Reporting Requirements.

4.3 POST-REMEDIATION MEDIA MONITORING AND SAMPLING

4.3.1 Soil Vapor Intrusion Evaluation

A soil vapor intrusion evaluation will be performed if buildings are constructed on the Site to assess the performance of the remedy. Modification to the frequency of sampling requirements, if needed, will require approval from the NYSDEC. The evaluation will include a provision for implementing actions recommended to address exposures related to SVI, as required. The network of on-site SVI sample locations will be designed based on the following criteria:

- Proximity to former soil vapor samples collected during the RI with elevated concentrations of VOCs,
- Presence of residual contamination below the remedial excavation depth of one foot below the observed water table.

Soil vapor samples will be collected in accordance with the Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York (NYSDOH October 2006). Sample points will be installed using a Geoprobe® direct-push drill rig to a depth comparable to the depth of foundation footings or at least two feet above the groundwater table, whichever is shallower. Sample collection points will consist of a stainless-steel-screened probe and inert sampling tubing (i.e. polyethylene or Teflon). The annulus around the probe will be backfilled with coarse sand to approximately six inches above the top of the probe. A three-foot hydrated bentonite seal will be installed above the sampling zone. The annulus around the inert sampling tube will be filled with sand or hydrated bentonite up to a cement-bentonite surface seal. Soil vapor samples will be analyzed for TO-15 VOCs.

The sampling frequency may only be modified with the approval of the NYSDEC. This SMP will be modified to reflect changes in sampling plans approved by the NYSDEC.

Deliverables for the SVI sampling program are specified in Section 7.0 – Reporting Requirements

4.3.3 Monitoring Protocol

All monitoring and well gauging activities will be recorded in a field book and associated monitoring log as provided in Appendix J - Site Management Forms. Other observations (e.g., groundwater monitoring well integrity, etc.) will be noted on the monitoring log. The monitoring log will serve as the inspection form for the groundwater monitoring network.

4.4 ENGINEERING CONTROL MONITORING

Monitoring programs are summarized in the following table and outlined in detail below.

Monitoring/Inspection Schedule

Monitoring Program	Frequency*	Analysis
Site Cover System Inspections	Annually	Visual inspection of Site Cover system components
Site-Wide Inspections	Annually	Visual inspection of general Site conditions and ECs
Bulkhead Inspections	Annually	Visual inspection of Bulkhead
Groundwater Gauging & Monitoring	Quarterly for first year, then annually thereafter	Visual inspection of monitoring wells, gauging wells for groundwater levels and potential presence of free product.
Soil Vapor Intrusion Evaluation	If buildings are constructed at the Site	Visual inspection of building foundation components

* The frequency of events will be conducted as specified until otherwise approved by NYSDEC and NYSDOH

4.4.1 Site Cover System Monitoring

A Site Cover system, comprised of the impervious cover, two feet of gravel, RCA, or clean imported material, serves as a protective barrier mitigating the risk of exposure to the remaining contamination. The Site Cover system plan is shown on Figure 5A, and cross-sections of each cover type are shown in Figure 5B. Inspection of the Site Cover system by an engineer, scientist or geologist under the direction of a professional engineer, is required on a regular schedule at a minimum of once per year and following any severe weather or other conditions that could affect the cover. During these inspections, a Site Cover inspection form will be completed (Appendix J). The inspection requires sufficient information to certify the integrity of all elements of the cover system described above and should document any cover system disturbances. Any damage to the Site Cover system identified during the inspection will be repaired in kind and in compliance with this SMP.

4.4.2 Site-Wide Inspections

Site-wide inspections will be performed annually and after all severe weather conditions that may affect ECs. Inspections of all remedial components installed at the Site will be

conducted. Results of the annual inspection will be reported in the annual Periodic Review Reports (PRR) reports. Additional details regarding the Site-wide inspections are provided in Section 4.2 of the SMP.

4.4.3 Bulkhead Cutoff Wall Monitoring

A new sheet pile bulkhead cutoff wall with a continuous concrete cap was installed along the western portion of the Site, to prevent potential migration of petroleum impacts from the Site into the East River. The bulkhead cutoff wall and outfall are shown on Figure 5A. Inspection of the bulkhead cutoff wall by an engineer, scientist or geologist under the direction of a professional engineer, is required on a regular schedule at a minimum of once per year and following any severe weather or other conditions that could affect the cover. During these inspections, a bulkhead cutoff wall inspection form will be completed (Appendix J). The inspection requires sufficient information to certify the integrity of all elements of the bulkhead cutoff wall described above and should document any cover system disturbances. Any damage to the bulkhead cutoff wall identified during the inspection will be repaired in kind and in compliance with this SMP.

4.4.4 Groundwater Gauging and Monitoring

Groundwater gauging will be performed periodically to monitor for potential accumulation of free product in monitoring wells installed where limited residual contamination remained in place below the groundwater table. Results of the periodic gauging events will be reported to NYSDEC and included in the annual PRR reports. Additional details regarding the groundwater gauging and monitoring are provided in Section 4.3 of the SMP. If non-aqueous phase liquid (NAPL) is identified in any well, the NYSDEC project manager identified in Section 1.3 – Notifications Contact Table will be notified within 2 hours of such discovery.

4.4.5 Soil Vapor Intrusion Evaluation

A soil vapor intrusion evaluation will be performed if buildings are constructed on the Site to assess the performance of the remedy. The evaluation will include a provision for implementing actions recommended to address exposures related to SVI, as required. As necessary, results of the SVI sampling events, if required based on the evaluation, will be reported to NYSDEC and included in the annual PRR reports. Additional details regarding the SVI sampling are provided in Section 4.3 of the SMP.

5.0 OPERATION AND MAINTENANCE PLAN

5.1 GENERAL

The Site remedy does not rely on any mechanical systems, such as groundwater treatment systems, sub-slab depressurization (SSD) systems or air sparge/soil vapor extraction (SVE) systems to protect public health and the environment. Therefore, the operation and maintenance of such components is not included in this SMP. The EWP provided in Appendix F outlines the procedure for handling, transport and disposal of soil excavated below the existing Site Cover system, which is to be implemented during future redevelopment of the Site.

6.0 PERIODIC ASSESSMENTS/EVALUATIONS

6.1 CLIMATE CHANGE VULNERABILITY ASSESSMENT

Increases in both the severity and frequency of storms/weather events, an increase in sea level elevations along with accompanying flooding impacts, shifting precipitation patterns and wide temperature fluctuation, resulting from global climactic change and instability, have the potential to significantly impact the performance, effectiveness and protectiveness of a given site and associated remedial systems. Vulnerability assessments provide information so that the Site and associated remedial systems are prepared for the impacts of the increasing frequency and intensity of severe storms/weather events and associated flooding.

This section provides a summary of vulnerability assessments that will be conducted for the Site during periodic assessments, and briefly summarizes the vulnerability of the Site and/or engineering controls to severe storms/weather events and associated flooding.

As stated in Section 4.2, site-wide inspections, including inspections of all ECs, will be performed after severe weather events. The Site is located within Zone AE special flood hazard areas subject to inundation by 1 percent annual chance flood (i.e., the 100-year storm). The bulkhead cutoff wall and concrete cap helps to protect the Site Cover system from flooding events.

6.2 GREEN REMEDIATION EVALUATION

NYSDEC's DER-31 Green Remediation requires that green remediation concepts and techniques be considered during all stages of the remedial program including site management, with the goal of improving the sustainability of the cleanup and summarizing the net environmental benefit of any implemented green technology. This section of the SMP provides a summary of any green remediation evaluations to be completed for the Site during site management, and as reported in the PRR.

As discussed in Section 3.3, the Site Cover system and bulkhead cutoff wall are permanent controls and will operate in perpetuity, and will not be removed without the approval of NYSDEC and NYSDOH.

6.2.1 Frequency of System Checks, Sampling and Other Periodic Activities

Transportation to and from the Site and use of consumables in relation to visiting the Site in order to conduct system checks and or conduct periodic groundwater monitoring/ annual inspections have direct and/or inherent energy costs. The schedule and/or means of these periodic activities have been prepared so that these tasks can be

accomplished in a manner that does not impact remedy protectiveness but reduces expenditure of energy or resources.

6.2.2 Metrics and Reporting

As discussed in Section 7.0 and as shown in Appendix J – Site Management Forms, information on energy usage, solid waste generation, transportation and shipping, water usage and land use and ecosystems will be recorded to facilitate and document consistent implementation of green remediation during site management and to identify corresponding benefits; a set of metrics has been developed.

6.3 REMEDIAL SYSTEM OPTOMIZATION

A Remedial Site Optimization (RSO) study will be conducted any time that the NYSDEC or the remedial party requests in writing that an in-depth evaluation of the remedy is needed. An RSO may be appropriate if any of the following occur:

- The remedial actions have not met or are not expected to meet RAOs in the time frame estimated in the Decision Document;
- The management and operation of the remedial system is exceeding the estimated costs;
- The remedial system is not performing as expected or as designed;
- Previously unidentified source material may be suspected;
- Plume shift has potentially occurred;
- Site conditions change due to development, change of use, change in groundwater use, etc.;
- There is an anticipated transfer of the site management to another remedial party or agency; and
- A new and applicable remedial technology becomes available.

An RSO will provide a critique of a Site's conceptual model, give a summary of past performance, document current cleanup practices, summarize progress made toward the Site's cleanup goals, gather additional performance or media specific data and information and provide recommendations for improvements to enhance the ability of the present system to reach RAOs or to provide a basis for changing the remedial strategy.

7.0. REPORTING REQUIREMENTS

7.1 SITE MANAGEMENT REPORT

All Site management inspection, maintenance and monitoring events will be recorded on the appropriate site management forms provided in Appendix J. These forms are subject to NYSDEC revision.

All applicable inspection forms and other records, including media sampling data and system maintenance reports, generated for the Site during the reporting period will be provided in electronic format to the NYSDEC in accordance with the requirements of the table below and summarized in the Periodic Review Report.

Schedule of Monitoring/Inspection Reports

Task/Report	Reporting Frequency*
Site Cover System and Bulkhead Cutoff Wall Inspections	Annually, included in Periodic Review Report
Groundwater Monitoring and Gauging	Quarterly for first year, then annually, included in the Periodic Review Report**
Site Management Report	Annually, included in the Periodic Review Report
Periodic Review Report	Annually, or as otherwise determined by the Department

* The frequency of events will be conducted as specified until otherwise approved by the NYSDEC.

** If NAPL is identified in any well, the NYSDEC project manager identified in Table 5 will be notified within 2 hours of such discovery.

All monitoring/inspections reports will include, at a minimum:

- Date of event or reporting period;
- Name, company, and position of person(s) conducting monitoring/inspection activities;
- Description of the activities performed;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet);
- Type of samples collected, as necessary (e.g., sub-slab vapor, indoor air, outdoor air, etc.);

- Copies of all field forms completed (e.g., well sampling logs, chain-of-custody documentation, etc.);
- Sampling results in comparison to appropriate standards/criteria (if applicable);
- A figure illustrating sample type and sampling locations (if applicable);
- Copies of all laboratory data sheets and the required laboratory data deliverables required for all points sampled (if applicable, to be submitted electronically in the NYSDEC-identified format);
- Any observations, conclusions, or recommendations; and
- A determination as to whether contaminant conditions have changed since the last reporting event.

Routine maintenance event reporting forms will include, at a minimum:

- Date of event;
- Name, company, and position of person(s) conducting maintenance activities;
- Description of maintenance activities performed;
- Any modifications to the system;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet); and
- Other documentation such as copies of invoices for maintenance work, receipts for replacement equipment, etc., (attached to the checklist/form).

Non-routine maintenance event reporting forms will include, at a minimum:

- Date of event;
- Name, company, and position of person(s) conducting non-routine maintenance/repair activities;
- Description of non-routine activities performed;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents (included either on the form or on an attached sheet); and
- Other documentation such as copies of invoices for repair work, receipts for replacement equipment, etc. (attached to the checklist/form).

Data will be reported in digital format as determined by the NYSDEC. Currently, data is to be supplied electronically and submitted to the NYSDEC EQuIS™ database in accordance with the requirements found at this link http://www.dec.ny.gov/chemical/62440.html

7.2 PERIODIC REVIEW REPORT

A PRR will be submitted to the Department beginning sixteen (16) months after the Certificate of Completion is issued. After submittal of the initial Periodic Review Report, the next PRR shall be submitted annually to the Department or at another frequency as may be required by the Department. In the event that the Site is subdivided into separate parcels with different ownership, a single Periodic Review Report will be prepared that addresses the Site described in Appendix A - Environmental Easement. The report will be prepared in accordance with NYSDEC's DER-10 and submitted within 30 days of the end of each certification period. If applicable, media sampling results will also be incorporated into the Periodic Review Report. The report will include:

- Identification, assessment and certification of all ECs/ICs required by the remedy for the Site;
- Results of the required annual site inspections and severe condition inspections, if applicable;
- All applicable site management forms and other records generated for the Site during the reporting period in the NYSDEC-approved electronic format, if not previously submitted;
- A summary of any discharge monitoring data and/or information generated during the reporting period, with comments and conclusions;
- If applicable, data summary tables and graphical representations of contaminants of concern by media (groundwater, soil vapor, etc.), which include a listing of all compounds analyzed, along with the applicable standards, with all exceedances highlighted - These will include a presentation of past data as part of an evaluation of contaminant concentration trends;
- Results of all analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for all samples collected during the reporting period, if applicable, will be submitted in digital format as determined by the NYSDEC - Currently, data is supplied electronically and submitted to the NYSDEC EQuIS™ database in accordance with the requirements found at this link: http://www.dec.ny.gov/chemical/62440.html; and
- A site evaluation, which includes the following:

- The compliance of the remedy with the requirements of the site-specific RAWP, Record of Decision (ROD) or Decision Document;
- The operation and the effectiveness of all treatment units, etc., including identification of any needed repairs or modifications;
- Any new conclusions or observations regarding Site contamination based on inspections or data generated by the Monitoring Plan for the media being monitored;
- Recommendations regarding any necessary changes to the remedy and/or Monitoring Plan; and
- Trends in contaminant levels in the affected media will be evaluated to determine if the remedy continues to be effective in achieving remedial goals as specified by the Decision Document.
- The overall performance and effectiveness of the remedy.

7.2.1 Certification of Institutional and Engineering Controls

Following the last inspection of the reporting period, a Professional Engineer licensed to practice in New York State will prepare, and include in the Periodic Review Report, the following certification as per the requirements of NYSDEC DER-10:

"*For each institutional or engineering control identified for the Site, I certify that all of the following statements are true:*

- *The inspection of the Site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under my direction;*
- *The institutional control and/or engineering control employed at this Site is unchanged from the date the control was put in place, or last approved by the Department;*
- *Nothing has occurred that would impair the ability of the control to protect the public health and environment;*
- *Nothing has occurred that would constitute a violation or failure to comply with any site management plan for this control;*
- *Access to the Site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control;*

- *If a financial assurance mechanism is required under the oversight document for the Site, the mechanism remains valid and sufficient for the intended purpose under the document;*
- *Use of the Site is compliant with the environmental easement;*
- *The engineering control systems are performing as designed and are effective;*
- *To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the Site remedial program and generally accepted engineering practices; and*
- *The information presented in this report is accurate and complete.*

I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

I, Jason Hayes, P.E., of Langan, have been authorized and designated by the Site owner to sign this certification for the Site."

Every five years the following certification will be added:

- *"The assumptions made in the qualitative exposure assessment remain valid.*
- *The information presented in this report is accurate and complete."*

The signed certification will be included in the Periodic Review Report. The Periodic Review Report will be submitted, in electronic format, to the NYSDEC Central Office, Regional Office in which the Site is located and the NYSDOH Bureau of Environmental Exposure Investigation. The Periodic Review Report may need to be submitted in hard-copy format, as requested by the NYSDEC project manager.

7.3 CORRECTIVE MEASURES PLAN

If any component of the remedy is found to have failed, or if the periodic certification cannot be provided due to the failure of an institutional or engineering control, a Corrective Measures Work Plan will be submitted to the NYSDEC for approval. This plan will explain the failure and provide the details and schedule for performing work necessary to correct the failure. Unless an emergency condition exists, no work will be performed pursuant to the Corrective Measures Work Plan until it has been approved by the NYSDEC.

7.4 REMEDIAL SITE OPTOMIZATION REPORT

In the event that an RSO is to be performed (see Section 6.3), upon completion of an RSO, an RSO report must be submitted to the Department for approval. The RSO report will document the research/ investigation and data gathering that was conducted, evaluate the results and facts obtained, present a revised conceptual site model and present recommendations. RSO recommendations are to be implemented upon approval from the NYSDEC. Additional work plans, design documents, HASPs etc., may still be required to implement the recommendations, based upon the actions that need to be taken. A final engineering report and update to the SMP may also be required.

The RSO report will be submitted, in electronic format, to the NYSDEC Central Office, Regional Office in which the Site is located, Site Control and the NYSDOH Bureau of Environmental Exposure Investigation.

8.0 REFERENCES

1. 6NYCRR Part 375, Environmental Remediation Programs. December 14, 2006.
2. NYSDEC DER-10 – "Technical Guidance for Site Investigation and Remediation".
3. NYSDEC, 1998. Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations Division of Water TOGS 1.1.1. June 1998 (April 2000 addendum).
4. Roy F. Weston, Inc., "Environmental Liabilities Assessment for 41-98 and 42-02 through 42-16 Vernon Boulevard", dated May 1994.
5. ERD Environmental Inc., "Summary of UST Closure Site Assessment – Terra Cotta Facility", dated September 1996.
6. ERD Environmental Inc., "550-gallon Storage Tank Excavation Report", dated September 1997.
7. ERD Environmental Inc., "UST Closure Additional Soil Removal Report", dated September 1997.
8. IVI Environmental, Inc., "Phase I Environmental Site Assessment – Former New York Terra Cotta Architectural Terra Cotta Company", dated January 1999.
9. IVI Environmental, Inc., "Phase II Environmental Site Assessment – Former Terra Cotta Company", dated August 9, 1999.
10. Langan Engineering, Environmental, Surveying, and Landscape Architecture, D.P.C., "Preliminary Geotechnical Report – Silvercup Studios West", dated December 19, 2002.
11. Langan Engineering, Environmental, Surveying, and Landscape Architecture, D.P.C., "Geotechnical Investigation Report", dated September 19, 2007.
12. Langan Engineering, Environmental, Surveying, and Landscape Architecture, D.P.C., "Remedial Investigation Report – For Silvercup West Terra Cotta Site Parcels A, B, C, and D", dated September 2007.
13. Langan Engineering, Environmental, Surveying, and Landscape Architecture, D.P.C., "East River Sediment Sampling Report", dated May 30, 2008.
14. Langan Engineering, Environmental, Surveying, and Landscape Architecture, D.P.C., "Interim Remedial Measure Work Plan – For Silvercup West", dated May 20, 2013.
15. Langan Engineering, Environmental, Surveying, and Landscape Architecture, D.P.C., "Geotechnical Engineering Report", dated December 8, 2015.

16. Langan Engineering, Environmental, Surveying, and Landscape Architecture, D.P.C., "Remedial Investigation Report – Addendum 1", dated May 4, 2016.

17. Langan Engineering, Environmental, Surveying, and Landscape Architecture, D.P.C., "Remedial Action Work Plan", dated October, 2016.

TABLES

Table 1
Groundwater Elevation Data Summary
Silvercup West Parcel A
Long Island City, New York
Langan Project No. 5635005

Well ID	Date	Depth to Water (feet bgs)	Top of Casing Elevation[(1)] (NAVD88)	Water Elevation[(1)] (NAVD88)
MW-1	7/9/2007	8.31	8.32	0.00
	7/10/2007	7.57		0.75
	7/11/2007	9.14		-0.83
	7/12/2007	8.46		-0.15
	7/13/2007	8.18		0.14
	7/17/2007	8.31		0.00
	7/18/2007	8.03		0.29
	7/19/2007	8.91		-0.60
	7/20/2007	8.81		-0.50
	7/24/2007	8.39		-0.08
MW-2	7/9/2007	7.81	8.99	1.18
	7/10/2007	8.41		0.58
	7/11/2007	10.45		-1.47
	7/12/2007	9.92		-0.94
	7/13/2007	9.61		-0.63
	7/17/2007	8.95		0.03
	7/18/2007	8.61		0.38
	7/19/2007	10.46		-1.48
	7/20/2007	10.42		-1.44
	7/24/2007	8.91		0.08
MW-2D	7/11/2007	9.91	8.85	-1.07
	7/12/2007	9.25		-0.41
	7/13/2007	8.79		0.05
	7/17/2007	8.66		0.19
	7/18/2007	8.38		0.47
	7/19/2007	9.86		-1.02
	7/20/2007	9.78		-0.94
	7/24/2007	8.61		0.24
MW-6	7/17/2007	15.33	16.43	1.10
	7/18/2007	14.89		1.54
	7/19/2007	14.84		1.59
	7/20/2007	14.78		1.65
	7/24/2007	14.34		2.09
	9/21/2015	14.73		1.70
	11/13/2015	14.75		1.68
	8/2/2007	14.79		1.64
MW-8	7/9/2007	12.40	19.41	7.01
	7/10/2007	12.42		6.99
	7/11/2007	12.48		6.93
	7/12/2007	12.21		7.20
	7/13/2007	12.29		7.12
	7/17/2007	12.51		6.90
	7/18/2007	10.95		8.46
	7/19/2007	11.55		7.86
	7/20/2007	11.84		7.57
	7/24/2007	11.26		8.15
PMB-MW-01	10/9/2015	6.91	8.5*	1.59
	11/13/2015	7.3		1.20

Notes:
1. Elevations are relative to the North American Vertical Datum of 1988 (NAVD88).
2. Water Elevation = Top of Casing Elevation - Depth to Water.
3. bgs = Below ground surface
4. Monitoring Wells MW-1, MW-2, MW-2D,MW-6,and MW-8 installed by Langan in July 2007.
5. Monitoring Well PMB-MW-01 installed by Langan in August 2015.
6. * = Top of well casing was not surveyed; therefore the elevation is approximate.

Table 2A
Documentation Sample Results Summary
Silvercup West Parcel A
Long Island City, New York
Langan Project No. 005635005

Sample ID	NYSDEC Part 375 Unrestricted Use Soil Cleanup Objectives	NYSDEC Part 375 Restricted Use Restricted-Residential Soil Cleanup Objectives	BEP01_011817	BEP02_021017	BEP-03_012017	DUPLICATES BEP04	DUPLICATES DUP01_032317	SW01_032817	EPB03_7	EPB04_7	DUPLICATES EPB01_7	DUPLICATES DUP01	EPB02_7	EPB01_10	EPB02_10	EPB03_10	EPB04_10	DUPLICATES EPB05_10	DUPLICATES DUP01_021517
Parent Location			BEP01	BEP02	BEP03	BEP04	BEP04	SW01	UST No. 1	UST No. 1	UST No. 2	UST No. 2	UST No. 2	UST No. 3	UST No. 3	UST No. 3	UST No. 3	UST No. 3	UST No. 3
Laboratory ID			L1701730-01	L1704340-01	L1702054-01	L1708819-01	L1708819-02	L1709351-01	L1639015-03	L1639015-04	L1639015-01	L1639015-05	L1639015-02	L1704946-01	L1704946-02	L1704946-03	L1704946-04	L1704946-05	L1704946-06
Sampling Date			1/18/2017	2/10/2017	1/20/2017	3/23/207	3/23/2017	3/28/2017	12/1/2016	12/1/2016	12/1/2016	12/1/2016	12/1/2016	2/15/2017	2/15/2017	2/15/2017	2/15/2017	2/15/2017	2/15/2017
Sample Elevation (NAVD 88)			-1	-2	-2	-2	-2	-1	13.5	13.5	13.5	13.5	13.5	0.5	0.5	0.5	0.5	0.5	0.5
Volatile Organic Compounds (mg/kg)																			
1,2,4-Trimethylbenzene	3.6	52	0.0088 U	1.6 U	0.018 J	0.019 J	0.029 J	0.00062 J	0.0056 U	0.0045 U	0.0038 U	0.0045 U	0.0036 U	2.3	**3.8**	1.6	0.74 J	1.3	1.7
1,3,5-Trimethylbenzene	8.4	52	0.0088 U	1.6 U	0.38 U	0.39 U	0.33 U	0.0022 J	0.0056 U	0.0045 U	0.0038 U	0.0045 U	0.0036 U	0.3 J	0.63 J	0.3 J	0.15 J	0.24 J	0.26 J
Benzene	0.06	4.8	0.0018 U	**0.067** J	0.022 J	*0.078* U	*0.066* U	0.00043 J	0.0011 U	0.0009 U	0.00076 U	0.00091 U	0.00072 U	**0.61**	**1.3**	**0.36**	**0.45**	**0.38**	**0.18**
Ethylbenzene	1	41	0.0018 U	0.32 U	0.076 U	0.013 J	0.021 J	0.00069 J	0.0011 U	0.0009 U	0.00076 U	0.00091 U	0.00072 U	**6.2**	**7.9**	**3.5**	**9.9**	**2.6**	**2.7**
Isopropylbenzene	~	~	0.0018 U	0.32 U	0.076 U	0.078 U	0.066 U	0.0012 U	0.0011 U	0.0009 U	0.00076 U	0.00091 U	0.00072 U	1.6	1.4	0.84	3.2	0.64	0.78
n-Butylbenzene	12	100	0.0018 U	0.32 U	0.076 U	0.078 U	0.066 U	0.0012 U	0.0011 U	0.0009 U	0.00076 U	0.00091 U	0.00072 U	0.43	0.48	0.27	0.68	0.2	0.28
n-Propylbenzene	3.9	100	0.0018 U	0.32 U	0.076 U	0.078 U	0.066 U	0.0012 U	0.0011 U	0.0009 U	0.0038 U	0.00091 U	0.00072 U	1	0.95	0.59	2	0.42	0.54
o-Xylene	~	~	0.0035 U	0.65 U	0.15 U	0.16 U	0.13 U	0.0015 J	0.0022 U	0.0018 U	0.0015 U	0.0018 U	0.0014 U	2.1	3	1.3	2.8	1	1.1
p-Isopropyltoluene	~	~	0.0018 U	0.32 U	0.076 U	0.078 U	0.066 U	0.0015	0.0011 U	0.0009 U	0.00013 J	0.00091 U	0.00072 U	0.32	0.33 J	0.12 J	0.085 J	0.12 J	0.13
p/m-Xylene	~	~	0.0035 U	0.65 U	0.15 U	0.16 U	0.13 U	0.00053 J	0.0022 U	0.0018 U	0.0015 U	0.0018 U	0.0014 U	1.4	2.1	0.92	1.3	0.73	0.69
sec-Butylbenzene	11	100	0.0018 U	0.32 U	0.076 U	0.078 U	0.066 U	0.0012 U	0.0011 U	0.0009 U	0.00076 U	0.00091 U	0.00072 U	0.4	0.39	0.23	0.69	0.17	0.23
tert-Butylbenzene	5.9	100	0.0088 U	1.6 U	0.38 U	0.39 U	0.33 U	0.0062 U	0.0056 U	0.0045 U	0.0038 U	0.0045 U	0.0036 U	0.84 U	1.8 U	0.88 U	0.078 J	0.78 U	0.02 J
Toluene	0.7	100	0.0026 U	0.48 U	0.035 J	0.12 U	0.018 J	0.0013 J	0.0017 U	0.0013 U	0.0011 U	0.0014 U	0.0011 U	0.38	0.68	0.3	0.25 J	0.24	0.17
Xylenes, Total	0.26	100	0.0035 U	*0.65* U	0.15 U	0.16 U	0.13 U	0.002 J	0.0022 U	0.0018 U	0.0015 U	0.0018 U	0.0014 U	**3.5**	**5.1**	**2.2**	**4.1**	**1.7**	**1.8**
Semivolatile Organic Compounds (mg/kg)																			
Acenaphthene	20	100	0.18 U	3.4	0.76 J	0.058 J	0.13 J	0.87	0.66	0.83	0.22	0.4	0.56	8.8	0.83	11	12	8.6	8.9
Acenaphthylene	100	100	0.18 U	56	9.4	0.16 U	0.096 J	0.91	0.19 U	0.4 J	0.18 U	0.19 U	0.18 U	12	0.91	14	8.4	13	11
Anthracene	100	100	0.14 U	8.8	1.2	0.054 J	0.14	2.4	2	4.8	0.73	1.2	1.8	12	0.99	14	12	13	12
Benzo(a)anthracene	1	1	0.14 U	**41**	**8.1**	0.05 J	0.18	**4.6**	**5**	**13**	**2.2**	**3.4**	**5.1**	**7.2**	0.57	**6.7**	**5.5**	**8.6**	**6.2**
Benzo(a)pyrene	1	1	0.18 U	**36**	**6.8**	0.16 U	0.14 J	**3.8**	**3.4**	**12**	**1.5**	**2.3**	**3.4**	**5.5**	0.42	**5.8**	**3.7**	**7.8**	**5.3**
Benzo(b)fluoranthene	1	1	0.14 U	**26**	**5.5**	0.037 J	0.15	**4.5**	**5.1**	**19**	**2.2**	**3.4**	**5**	**4.8**	0.37	**4.2**	**2.9**	**5.8**	**4.1**
Benzo(ghi)perylene	100	100	0.18 U	12	2.9	0.16 U	0.089 J	2.1	1.9	6.4	0.93	1.4	2	2.4	0.22	1.8	1.3	2.8	2.1
Benzo(k)fluoranthene	0.8	3.9	0.14 U	**7**	**1.5**	0.12 U	0.048 J	**1.7**	**1.6**	**4.5**	0.74	**1.2**	**1.7**	**1.1**	0.094 J	**1.4**	0.75	**1.9**	**1.2**
Chrysene	1	3.9	0.14 U	**33**	**6.1**	0.043 J	0.17	**4.4**	**5.5**	**11**	**2.3**	**3.6**	**5.4**	**6.7**	0.55	**5.2**	**5**	**7.3**	**5.5**
Dibenzo(a,h)anthracene	0.33	0.33	0.14 U	**3.6**	**0.49** J	0.12 U	0.12 U	**0.59**	**0.57**	**1.7**	0.25	**0.39**	**0.54**	**0.6**	0.05 J	**0.49**	**0.41**	**0.68**	**0.57**
Fluoranthene	100	100	0.14 U	65	16	0.075 J	0.32	10	9.5	30	4.2	6.7	11	12	0.92	11	10	13	9.6
Fluorene	30	100	0.23 U	2.1 U	0.77 J	0.2 U	0.056 J	1	0.86	1.7	0.25	0.46	0.57	1.6	0.38	5.1	1	3.6	4.8
Indeno(1,2,3-cd)pyrene	0.5	0.5	0.18 U	**12**	**2.5**	0.16 U	0.088 J	**2.3**	**2.1**	**8.2**	**1**	**1.6**	**2.3**	**2.2**	0.2	**1.8**	**1.2**	**2.8**	**2**
Naphthalene	12	100	0.23 U	2.4	0.51 J	0.074 J	0.17 J	0.42 J	0.25	0.29 J	0.069 J	0.16 J	0.11 J	4.7	1.5	**17**	1.2	**14**	**17**
Phenanthrene	100	100	0.14 U	1.2 U	0.59 J	0.059 J	0.27	7.5	8.2	17	3.1	5.2	7	8.7	1.8	32	4.1	24	24
Pyrene	100	100	0.14 U	94	27	0.12	0.42	8.9	8.1	22	3.6	5.6	8.5	17	1.4	19	17	21	16

Notes and Qualifiers:

1. Soil sample analytical results are compared to the New York State Department of Environmental Conservation (NYSDEC) Part 375 Unrestricted Use Soil Cleanup Objectives (SCO) and Restricted Use Restricted-Residential SCOs.
2 Analytes detected above NYSDEC Part 375 Unrestricted Use SCOs are bolded.
3. Analytes detected above NYSDEC Part 375 Restricted Use Restricted-Residential SCOs are shaded and bolded.
4. Only analytes with detections are shown.
5. mg/kg = milligram per kilogram
6. ~ = Criterion does not exist
7. J = The analyte was detected above the Method Detection Limit (MDL), but below the Reporting Limit (RL); therefore, the result is an estimated concentration.
8. U = The analyte was analyzed for, but was not detected at a level greater than or equal to the RL; the value shown in the table is the RL.
9. UST = Underground Storage Tank
10. All elevations are shown in the North American Vertican Datum of 1988 (NAVD88). All elevations are approximate.
11. DUP01 is a duplicate sample of EPB01_7.
12. DUP01_021517 is a duplicate sample of EPB05_10.
13. DUP01_032317 is a duplicate sample of BEP04.

Table 2B
Remaining RIR Soil Analytical Results Summary
VOCs and SVOCs
Silvercup West Parcel A
Long Island City, New York
Langan Project No. 5635005

Sample ID Laboratory ID Sampling Date Sample Depth (feet)	NYSDEC Part 375 Unrestricted Use Soil Cleanup Objectives	NYSDEC Part 375 Restricted Use Restricted-Residential Soil Cleanup Objectives	SB-1-15-17 SA64173-20 25-Jun-07 15-17		SB-4A-13-15 SA64548-19 3-Jul-07 13-15		SB-4A-21-23 SA64679-03 3-Jul-07 21-23		SB-26-15-17 SA64173-11 26-Jun-07 15-17	
Volatile Organic Compounds (mg/kg)										
Benzene	0.06	4.8	**0.0867**	JD^{100}	0.021	UD^{200}	0.0008	U	0.0193	UD^{100}
Methylene chloride	0.05	100	0.0757	UD^{100}	0.0916	UD^{200}	0.0099	J	0.0841	UD^{100}
Toluene	0.7	100	0.132	JD^{100}	0.0305	UD^{200}	0.0012	U	0.028	UD^{100}
Total Xylenes	0.26	100	BRL		BRL		BRL		BRL	
Total VOCs	~	~	0.2187		BRL		0.0099		BRL	
Semivolatile Organic Compounds (mg/kg)										
Acenaphthene	20	100	1.49	J	0.707	U	0.0136	U	0.0817	U
Acenaphthylene	100	100	6.54		6.78	J	0.234	J	4.08	
Anthracene	100	100	4.88		0.884	U	0.017	U	0.102	U
Benzo (a) anthracene	1	1	**5.17**		1.88	U	0.0568	J	**4.06**	
Benzo (a) pyrene	1	1	**5.25**		**2.21**	J	0.0949	J	**6.13**	
Benzo (b) fluoranthene	1	1	**2.73**	J	3.89	U	0.075	U	**3.60**	
Benzo (g,h,i) perylene	100	100	1.82	J	0.822	U	0.0158	U	1.91	J
Benzo (k) fluoranthene	0.8	3.9	**2.26**	J	**1.47**	J	0.0579	J	**3.03**	J
Chrysene	1	3.9	**5.52**		**1.59**	J	0.075	J	**2.31**	J
Dibenzo (a,h) anthracene	0.33	0.33	0.0497	U	0.469	U	0.00903	U	**0.453**	J
Fluoranthene	100	100	9.17		0.707	U	0.0466	J	2.550	J
Indeno (1,2,3-cd) pyrene	0.5	0.5	**1.45**	J	1.35	U	0.0261	U	**1.610**	J
Phenanthrene	100	100	9.68		1.35	U	0.0261	U	0.156	U
Pyrene	100	100	17.9		14.5	J	0.578		15.0	
Total SVOCs	~	~	73.86		26.55		1.1432		44.733	
Total PAHs	~	~	22.38		5.27		0.28		21.193	

Notes and Qualifiers:

1. Soil sample analytical results are compared to the New York State Department of Environmental Conservation (NYSDEC) Part 375 Unrestricted Use Soil Cleanup Objectives (SCO) and Restricted Use Restricted-Residential SCOs.
2. Analytes detected above NYSDEC Part 375 Unestricted Use SCOs are bolded.
3. Analytes detected above NYSDEC Part 375 Restricted Use Restricted-Residential SCOs are shaded and bolded.
4 mg/kg = Milligram per Kilogram
5. ~ = Criterion does not exist
6. U = The analyte was analyzed for, but was not detected at a level greater than or equal to the Reporting Limit (RL); the value shown in the table is the RL.
7. J = The analyte was detected above the Method Detection Limit (MDL), but below the RL; therefore, the result is an estimated concentration.
8. D^{x}= Indicates Dilution (dilution factor indicated by ^{x})
9. BRL= Below Reporting Limit
10. PAH = Polycyclic Aromatic Hydrocarbon
11. VOC = Volatile Organic Compound
12. SVOC = Semivolatile Organic Compound
13. Only analytes with detections are shown.

Table 2B
Remaining RIR Soil Analytical Results Summary
Metals, PCBs, Herbicides and Pesticides
Silvercup West Parcel A
Long Island City, New York
Langan Project No. 5635005

Sample ID Laboratory ID Sampling Date Sample Depth (feet)	NYSDEC Part 375 Unrestricted Use Soil Cleanup Objectives	NYSDEC Part 375 Restricted Use Restricted-Residential Soil Cleanup Objectives	SB-1-15-17 SA64173-20 25-Jun-07 15-17	SB-2-12-14 SA64173-13 26-Jun-07 12-14	SB-2-25-27 SA64173-16 26-Jun-07 25-27	SB-4-9-11 SA64173-14 26-Jun-07 9-11	SB-4A-13-15 SA64548-19 03-Jul-07 13-15	SB-4A-21-23 SA64679-03 03-Jul-07 21-23
Metals (mg/kg)								
Mercury	0.18	0.81	0.149	0.101	0.0077 U	0.135	0.128	0.0082 U
Aluminum	~	~	4,510	2,580	6,820	4,520	6,540	4,540
Antimony	~	~	1.42 J	0.501 U	0.504 J	1.31 J	4.85 UD[10]	0.357 U
Arsenic	13	16	11.9	**54**	0.813 J	**26.1**	12.7	1.1 J
Barium	350	400	341	**513**	22.5	141	239	19.7
Beryllium	7.2	72	0.309 J	0.473 J	0.21 J	0.265 J	0.266 J	0.181 J
Cadmium	3	4.3	2.29	0.638 J	0.231 J	0.714	0.665	0.083 J
Calcium	~	~	1,250	975	522	1,290	7,280	1,260
Chromium	30	180	12.6	17.9	18	22.9	11.3	8.51
Cobalt	~	~	7.52	8.59	5.87	5.76	4.59	3.79
Copper	50	270	17.4	20.8	16.3	27.1	20.2	11.9
Iron	~	~	12,500	16,400	10,200	25,100	14,500 D[10]	7,300
Lead	63	400	58.3	**4,420**	4.43	**109**	52.4	4.49
Magnesium	~	~	1510	1,370	2,250	2,330	5,600 D[10]	1,440
Manganese	1,600	2,000	80.7	182	143	140	293	247
Nickel	30	310	7.97	5.51	10.3	10.2	9.7	8.92
Potassium	~	~	831	1130	1,470	1,710	1,070	617
Selenium	3.9	180	1.65 J	2.01 J	1.22 J	2.63	0.43 U	0.513 J
Silver	2	180	0.415 U	0.48 U	0.367 U	0.442 U	0.466 U	0.342 U
Sodium	~	~	1,770	2,780	155 J	2,430	2,970	121
Thallium	~	~	0.556 U	0.643 U	0.492 U	0.593 U	0.791 J	0.458 U
Vanadium	~	~	20.2	22.1	20.2	28	14.6	9.72
Zinc	109	10,000	**605**	69.1	16.6	36	**150**	13
PCBs (µg/kg)								
PCBs	~	~	BRL	BRL	BRL	BRL	BRL	BRL
Herbicides (µg/kg)								
Total Herbicides	~	~	BRL	BRL	BRL	BRL	BRL	BRL
Pesticides (µg/kg)								
Total Pesticides	~	~	NA	NA	NA	NA	NA	NA

Notes and Qualifiers:

1. Soil sample analytical results are compared to the New York State Department of Environmental Conservation (NYSDEC) Part 375 Unrestricted Use Soil Cleanup Objectives (SCO) and Restricted Use Restricted-Residential SCOs.
2. Analytes detected above NYSDEC Part 375 Unestricted Use SCOs are bolded.
3. Analytes detected above NYSDEC Part 375 Restricted Use Restricted - Residential SCOs are shaded and bolded.
4. µg/kg = Microgram per Kilogram
5. ~ = Criterion does not exist
6. U = The analyte was analyzed for, but was not detected at a level greater than or equal to the Reporting Limit (RL); the value shown in the table is the RL.
7. J = The analyte was detected above the Method Detection Limit (MDL), but below the RL; therefore, the result is an estimated concentration.
8. D^x= Indicates Dilution (dilution factor indicated by ^{x})
9. Only analytes with detections are shown.
10. BRL= Below Reporting Limit
11. mg/kg = Milligram per Kilogram
12. NA = Not Analyzed
13. PCB = Polychlorinated Biphenyl

Table 2B
Remaining RIR Soil Analytical Results Summary
Metals, PCBs, Herbicides and Pesticides
Silvercup West Parcel A
Long Island City, New York
Langan Project No. 5635005

Sample ID Laboratory ID Sampling Date Sample Depth (feet)	NYSDEC Part 375 Unrestricted Use Soil Cleanup Objectives	NYSDEC Part 375 Restricted Use Restricted-Residential Soil Cleanup Objectives	SB-6-12-14 SA64173-03 25-Jun-07 12-14	SB-6-22-24 SA64173-04 25-Jun-07 22-24	SB-26-15-17 SA64173-11 26-Jun-07 15-17	SB-27-10-12 SA64548-16 28-Jun-07 10-12	SB-30-12-14 SA64967-04 11-Jul-07 12-14	TP-5-9-11 SA65239-12 12-Jul-07 9-11	TP-12-12-14 SA64845-06 09-Jul-07 12-14
Metals (mg/kg)									
Mercury	0.18	0.81	0.0398	0.0077 U	**1.27**	0.0074 U	0.0079 U	0.0678	0.225
Aluminum	~	~	4,480	5,930	5,730	14,300	19,000	13,400	8450
Antimony	~	~	1.26 J	0.423 J	3.01 J	3.57 JD[10]	3.03 J	0.601 J	0.445 U
Arsenic	13	16	6.7	0.611 J	**14.4**	4.22	0.91 J	12.8	**48**
Barium	350	350	54.1	21.3	**431**	212	165	315	294
Beryllium	7.2	72	0.215 J	0.198 J	0.198 J	0.109 U	0.37 J	0.3 J	0.354 J
Cadmium	3	4.3	1.65	0.236 J	**5**	0.983	0.465 J	0.662	0.781
Calcium	~	~	11,600	534	2,360	2,480	2,430	2,360	2410
Chromium	30	180	10.9	15	**40.7**	19.3	**40**	19.9	13.7
Cobalt	~	~	4.48	11.6	13	8.52	12.1	11	4.94
Copper	50	270	**68.3**	18.3	**104**	**78**	43.5	31.3	47.2
Iron	~	~	8,650	9,820	15,600	41,400 D[10]	23,300	20,100	20000
Lead	63	400	**123**	4.52	**343**	3.73	10.9	**88.8**	**448**
Magnesium	~	~	3,550	1,770	3,860	9,780 D[10]	8,330	4,800	7430
Manganese	1,600	2,000	204	485	201	245	666	381	330
Nickel	30	310	8.98	9.43	18.7	9.71	19.8	12.7	11.2
Potassium	~	~	685	1,040	2,390	2,360	3,320	2,570	1220
Selenium	3.9	180	2.31 J	1.41 J	2.07 J	0.592 J	1.63	1.77 J	0.598 J
Silver	2	180	417 U	0.375 U	0.432 U	3.42 UD[10]	0.37 U	0.429 U	**32.7**
Sodium	~	~	1,730	198 J	2,430	728	896	316	3570
Thallium	~	~	0.559 U	0.503 U	0.579 U	0.465 J	0.496 U	0.575 U	0.572 U
Vanadium	~	~	15.3	15.5	26.2	54.8	55.4	36.5	27.5
Zinc	109	10,000	**198**	19.1	**344**	39.2	57.3	107	108
PCBs (µg/kg)									
PCBs	~	~	BRL	BRL	BRL	BRL	BRL	BRL	BRL
Herbicides (µg/kg)									
Total Herbicides	~	~	BRL	BRL	BRL	BRL	BRL	BRL	BRL
Pesticides (µg/kg)									
4,4-DDD (p,p')	3.3	13,000	NA	NA	NA	NA	NA	NA	0.456 U
4,4-DDE (p,p')	3.3	8,900	NA	NA	NA	NA	NA	NA	0.454 U
4,4-DDT (p,p')	3.3	7,900	NA	NA	NA	NA	NA	NA	0.418 U
a-BHC	20	480	NA	NA	NA	NA	NA	NA	0.312 U
a-Chlordane	94	4,200	NA	NA	NA	NA	NA	NA	0.297 U
b-BHC	36	360	NA	NA	NA	NA	NA	NA	0.243 U
Endosulfan II	2,400	24,000	NA	NA	NA	NA	NA	NA	**0.704 U**
Endrin	14	11,000	NA	NA	NA	NA	NA	NA	**0.669 U**

Notes and Qualifiers:

1. Soil sample analytical results are compared to the New York State Department of Environmental Conservation (NYSDEC) Part 375 Unrestricted Use Soil Cleanup Objectives (SCO) and Restricted Use Restricted-Residential
2. Analytes detected above NYSDEC Part 375 Unestricted Use SCOs are bolded.
3. Analytes detected above NYSDEC Part 375 Restricted Use Restricted - Residential SCOs are shaded and bolded.
4. µg/kg = Microgram per kilogram
5. ~ = Criterion does not exist
6. U = The analyte was analyzed for, but was not detected at a level greater than or equal to the RL; the value shown in the table is the RL.
7. J = The analyte was detected above the Method Detection Limit (MDL), but below the Reporting Limit (RL); therefore, the result is an estimated concentration.
8. D^x= Indicates Dilution (dilution factor indicated by ^{x})
9. Only analytes with detections are shown.
10. BRL= Below Reporting Limit
11. mg/kg = Milligram Per Kilogram
12. NA = Not Analyzed
13. PCB = Polychlorinated Biphenyl

Table 3
Remaining Groundwater Analytical Results Summary
Silvercup West Parcel A
Long Island City, New York
Langan Project No. 5635005

Sample ID	NYSDEC	MW-8	
Laboratory ID	TOGS 1.1.1	SA65231-01	
Sampling Date	AWQS	17-Jul-07	
Volatile Organic Compounds (µg/L)			
Carbon disulfide	~	0.8	J
Total Xylenes	~	BRL	
Total VOCs	~	0.8	
Semivolatile Organic Compounds (µg/L)			
Total SVOCs	~	BRL	
Metals (mg/L)			
Aluminum	~	3.66	
Antimony	0.003	**0.0058**	J
Barium	1	0.11	
Cadmium	0.005	0.0006	J
Calcium	~	229	
Chromium	0.05	0.0069	
Cobalt	~	0.0046	J
Copper	0.2	0.0101	
Iron	0.3	**12.7**	
Lead	0.025	0.0154	
Magnesium	35	20.7	
Manganese	0.3	**3.41**	
Nickel	0.1	0.0024	J
Potassium	~	7.62	
Sodium	20	**44.5**	
Vanadium	~	0.0098	J
Zinc	2	0.0208	
Polychlorinated Biphenyls (µg/L)			
Total PCBs	0.09	BRL	

Notes and Qualifiers:

1. Groundwater analytical results are compared to the New York State Department of Environmental Conservation (NYSDEC) Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values (SGVs) for Class GA Water.
2. Compounds detected above their respective NYSDEC TOGS 1.1.1 SGVs are bolded and highlighted.
3. J = The analyte was detected above the Method Detection Limit (MDL), but below the Reporting Limit (RL); therefore, the result is an estimated concentration.
4. BRL = Below Reporting Limit
5. ~ = Criterion does not exist.
6. PCB = Polychlorinated Biphenyl
7. µg/L = Microgram per Liter
8. VOC = Volatile Organic Compound
9. SVOC = Semivolatile Organic Compound
10. Only detected compounds are shown in the table.

Table 4
Remaining Soil Vapor Analytical Results Summary
Silvercup West Parcel A
Long Island City, New York
Langan Project No. 5635005

Sample ID	SG-6		SG-12	
Laboratory ID	SA65213-03		SA65213-04	
Sampling date	17-Jul-07		17-Jul-07	
Matrix	Soil Vapor		Soil Vapor	
Volatile Organic Compounds ($\mu g/m^3$)				
1,2,4-Trimethylbenzene	49.2	D[2]	134.1	D[8]
1,3,5-Trimethylbenzene	11.4	D[2]	42.1	D[8]
2-Butanone (MEK)	26.2	D[2]	16.7	D[8]
2-Hexanone (MBK)	9.5	D[2]	16.4	UD[8]
4-Ethyltoluene	13.6	D[2]	40.1	D[8]
Acetone	409	D[2]	1,036.1	D[8]
Benzene	1.9	JD[2]	12.8	UD[8]
Chloroform	7.9	D[2]	19.5	UD[8]
Dichlorodifluoromethane (Freon12)	10.6	D[2]	19.8	UD[8]
Ethanol	43.8	D[2]	56.1	D[8]
Ethylbenzene	14.2	D[2]	55.1	D[8]
Hexane	3.5	D[2]	13	JD[8]
Isopropyl alcohol	11.9	D[2]	23.8	D[8]
m,p-Xylene	47.1	D[2]	194.6	D[8]
n-Heptane	5.5	D[2]	14.4	JD[8]
o-Xylene	23.2	D[2]	82.2	D[8]
Propene	5.8	D[2]	16.1	D[8]
Tetrachloroethene	4.9	JD[2]	27.1	UD[8]
Tetrahydrofuran	1.8	JD[2]	8.5	JD[8]
Toluene	27.1	D[2]	117.4	D[8]
Trichlorofluoromethane (Freon 11)	6.1	D[2]	22.5	UD[8]
Total Xylenes	70.3		276.8	
Total VOCs	325.2		814.2	

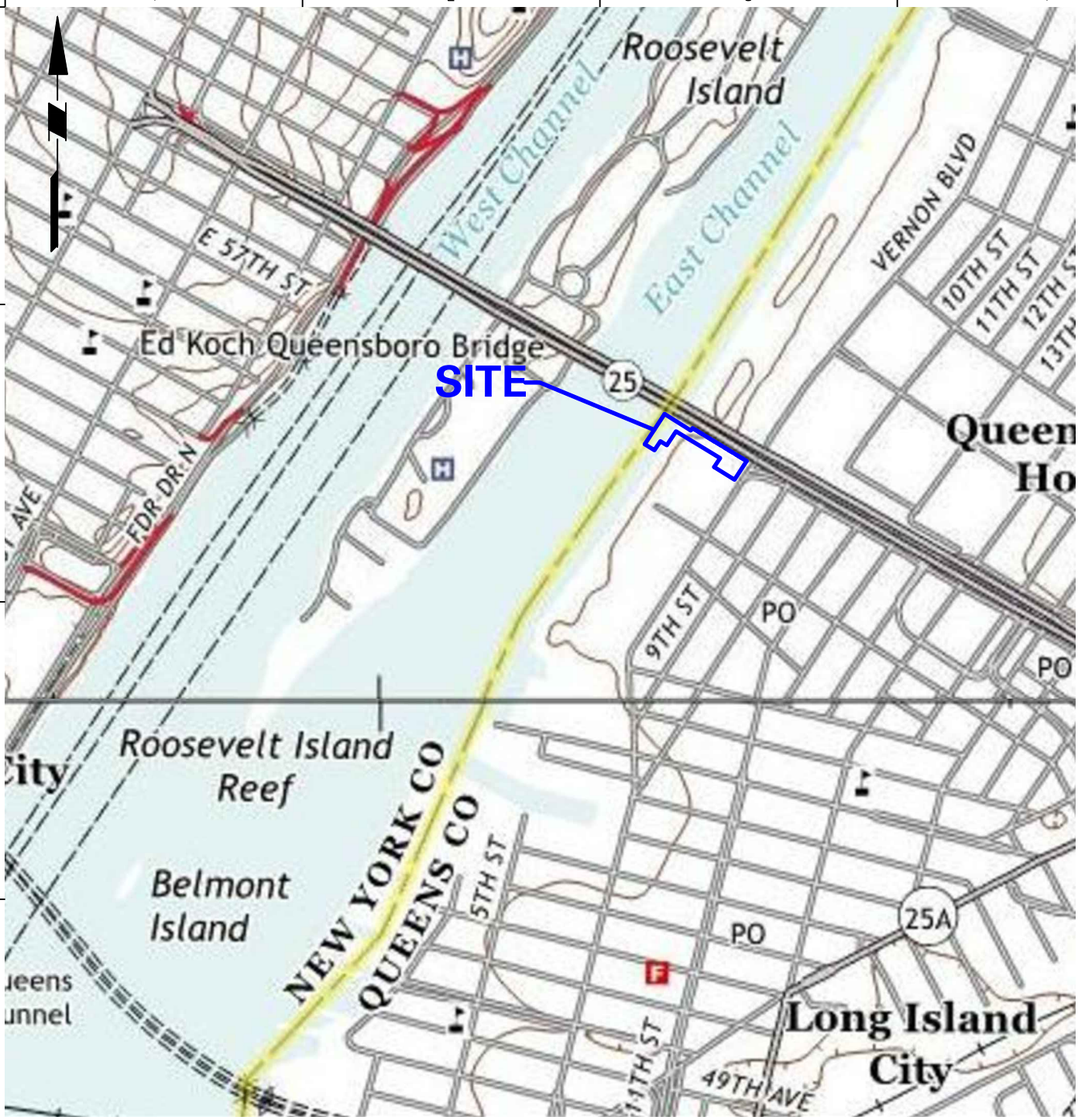
Notes and Qualifiers:

1. U= The compound was analyzed for, but was not detected at a level greater than or equal to the reporting limit (RL), the value shown on the table is the RL.
2. J=The analyte was detected above the Method Detection Limit (MDL), but below the Reporting Limit (RL); therefore, the result is an estimated concentration.
3. D^x= Indicates Dilution (dilution factor indicated by ^{x})
4. VOC = Volatile Organic Compound
5. $\mu g/m^3$ = Microgram Per Cubic Meter
6. No criteria currently exists for soil vapor quality in New York State.
7. Acetone was not included when calculating total detected VOCs since it is a common lab contaminant.

Table 5
Contact List
Silvercup West Parcel A
Long Island City, New York
Langan Project No. 5635005

Title	Name	Phone Contact	Email Contact
Program Manager	Jason Hayes, P.E.	(212) 479-5427	jhayes@langan.com
Project Manager	Joseph Good, P.E.	(212) 479-5448	jgood@langan.com
NYSDOH Project Manager	Anthony Perretta	(518) 402-7860	BEEI@health.state.ny.gov
NYSDEC Project Manager	Shaun Bollers	(718) 482-4096	shaun.bollers@dec.ny.gov
Owner Representative	Mark Gold	(718) 906-2000	mgold@silvercupstudios.com

FIGURES



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NOTES:

1. BASE MAP TAKEN FROM UNITED STATES GEOLOGICAL SURVEY 7.5-MINUTE SERIES CENTRAL PARK AND BROOKLYN QUADRANGLE, DATED JULY 2011.
2. SITE BOUNDARY IS APPROXIMATE.

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Project

SILVERCUP WEST
PARCEL A

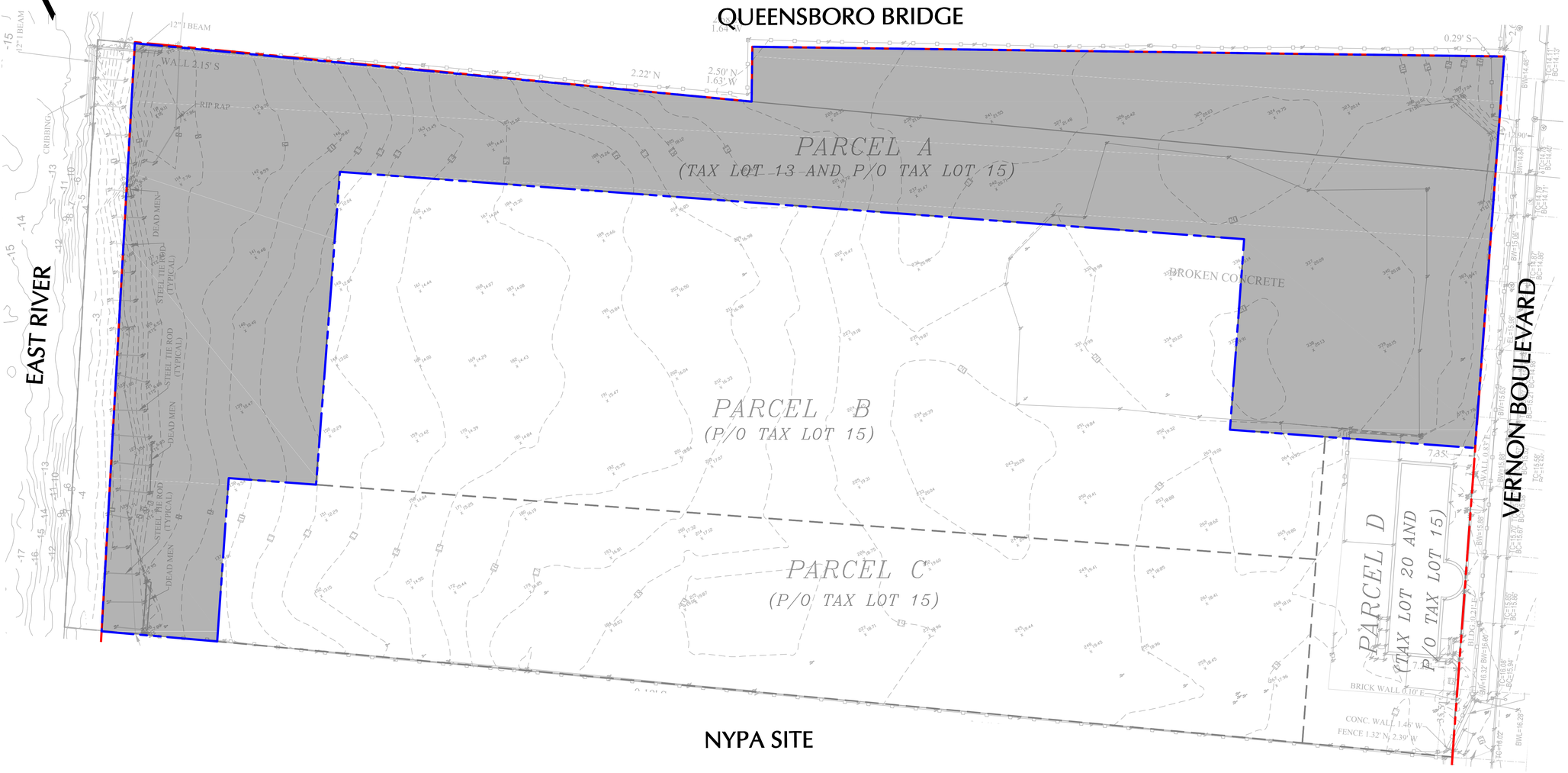
BLOCK 477 LOT 13 & P/O 15
LONG ISLAND CITY
QUEENS NEW YORK

Figure Title

SITE LOCATION MAP

Project No. 5635005	Figure No. 1
Date 04/25/2017	
Scale NTS	
Drawn By NEK	
Submission Date 09/18/2017	Sheet 1 of 8

Filename: \\langan.com\data\NYC\data0\5635005\Cadd Data - 5635005\Dwg\SMP\Parcel A\Figure 1 - Site Location Map.dwg Date: 10/17/2017 Time: 13:57 User: nkung Style Table: Langan.stb Layout: FER_Figure 1_Parcel A



NOTES:

1. SILVERCUP WEST – TERRA COTTA SITE BASE PLAN TAKEN FROM '41–98 VERNON BOULEVARD SURVEY' DATED DECEMBER 22, 2015, REVISED FEBRUARY 10, 2016, CERTIFIED BY ROBERT FEHRINGER, NYS LAND SURVEYOR.
2. ALL ELEVATIONS SHOWN ARE IN THE USGS NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) AND REPRESENT PRE–REMEDIATION CONDITIONS.
3. GRADE SURFACE ELEVATION SHOWN BY GRAY CONTOUR LINES.

LEGEND:

- SILVERCUP WEST PROPERTY LINE
- SILVERCUP WEST PARCEL A BOUNDARY
- TERRA COTTA PARCEL BOUNDARY
- SITE AREA – PARCEL A

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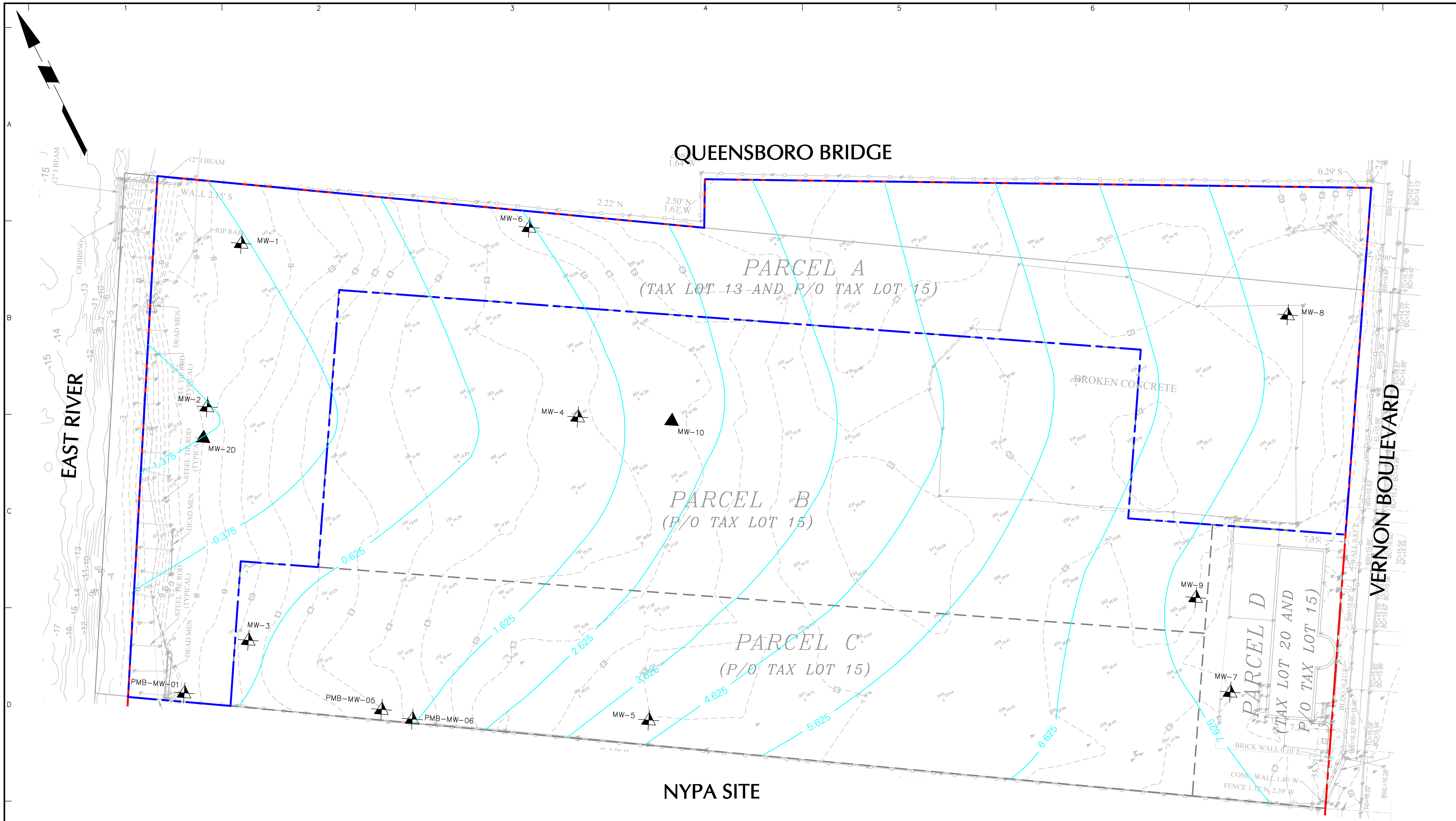
Project	SILVERCUP WEST PARCEL A BLOCK 477, LOT 13 & P/O 15 QUEENS NEW YORK
Figure Title	SITE LAYOUT PLAN
Project No.	5635005
Figure No.	2
Date	04/25/2017
Scale	1" = 20'
Drawn By	NEK
Checked By	ELS
Submission Date	09/18/2017
Sheet	2 of 8

Filename: \\langan.com\data\NYC\data0\5635005\Cadd Data – 5635005\Dwg\SMP\Figure 2 – Site Layout Plan [BY PARCEL].dwg Date: 10/17/2017 Time: 13:58 User: nkung Style Table: Langan.stb Layout: Figure 1A – Site Plan



NOTES:

1. SILVERCUP WEST – TERRA COTTA SITE BASE PLAN TAKEN FROM '41–98 VERNON BOULEVARD SURVEY' DATED DECEMBER 22, 2015, REVISED FEBRUARY 10, 2016, CERTIFIED BY ROBERT FEHRINGER, NYS LAND SURVEYOR.
2. ALL ELEVATIONS SHOWN ARE IN THE USGS NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
3. GRADE SURFACE ELEVATION SHOWN BY GRAY CONTOUR LINES.
4. GROUNDWATER ELEVATION CONTOURS WERE PREPARED USING A SOFTWARE AND ENGINEERING INTERPOLATION OF THE GROUNDWATER MEASUREMENTS MADE DURING FIELD INVESTIGATIONS ON JUNE 1 AND JULY 19, 2007.
5. MONITORING WELLS PMB–MW–01, PMB–MW–05, AND PMB–MW–06 WERE NOT INCLUDED IN THE GROUNDWATER CONTOUR MAP.

LEGEND:

- SILVERCUP WEST PROPERTY LINE
- SILVERCUP WEST PARCEL A BOUNDARY
- TERRA COTTA PARCEL BOUNDARY
- 1.625 — GROUNDWATER ELEVATION CONTOUR (NAVD88)
- MW–1 — LOCATION OF PREVIOUSLY INSTALLED SHALLOW OVERBURDEN MONITORING WELL
- MW–10 — LOCATION OF PREVIOUSLY INSTALLED DEEP OVERBURDEN MONITORING WELL

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Project	Figure Title	Project No. / Date / Scale	Figure No.
SILVERCUP WEST PARCEL A BLOCK 477, LOT 13 & P/O 15 QUEENS NEW YORK	GROUNDWATER CONTOUR MAP	Project No. 5635005 Date 04/25/2017 Scale 1" = 20' Drawn By NEK Checked By ELS Submission Date 9/18/2017	3 Sheet 3 of 8

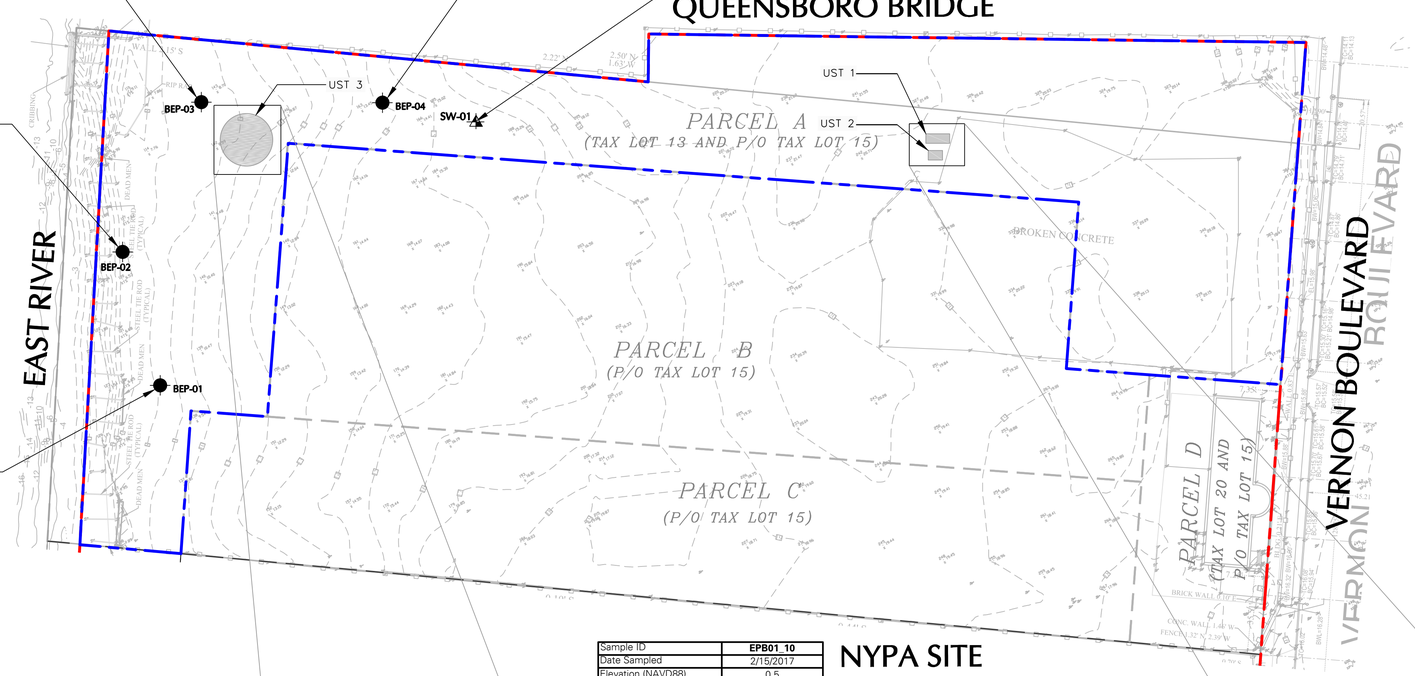
Sample ID	BEP03_012017
Date Sampled	1/20/2017
Elevation (NAVD88)	-2
VOCs (mg/kg)	NE
SVOCs (mg/kg)	Conc.
Benzo(a)anthracene	8.1
Benzo(a)pyrene	6.8
Benzo(b)fluoranthene	5.5
Chrysene	6.1
Dibenzo(a,h)anthracene	0.49
Indeno(1,2,3-cd)pyrene	2.5

Sample ID	BEP04	DUP01_032317
Date Sampled	3/23/2017	
Elevation (NAVD88)	-2	-2
VOCs (mg/kg)	NE	NE
SVOCs (mg/kg)	NE	NE

Sample ID	SW01_032817
Date Sampled	3/28/2017
Elevation (NAVD88)	-1
VOCs (mg/kg)	NE
SVOCs (mg/kg)	Conc.
Benzo(a)anthracene	4.6
Benzo(a)pyrene	3.8
Benzo(b)fluoranthene	4.5
Chrysene	4.4
Dibenzo(a,h)anthracene	0.59
Indeno(1,2,3-cd)pyrene	2.3

Sample ID	BEP02_021017
Date Sampled	2/10/2017
Elevation (NAVD88)	-2
VOCs (mg/kg)	NE
SVOCs (mg/kg)	Conc.
Benzo(a)anthracene	41
Benzo(a)pyrene	36
Benzo(b)fluoranthene	26
Benzo(k)fluoranthene	7
Chrysene	33
Dibenzo(a,h)anthracene	3.6
Indeno(1,2,3-cd)pyrene	12

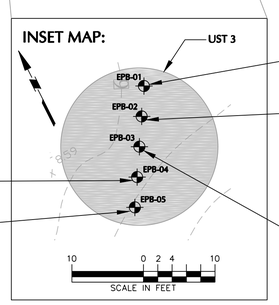
Sample ID	BEP01_011817
Date Sampled	1/18/2017
Elevation (NAVD88)	-1
VOCs (mg/kg)	ND
SVOCs (mg/kg)	ND



Sample ID	EPB04_10
Date Sampled	2/15/2017
Elevation (NAVD88)	0.5
VOCs (mg/kg)	NE
SVOCs (mg/kg)	Conc.
Benzo(a)anthracene	5.5
Benzo(a)pyrene	3.7
Benzo(b)fluoranthene	2.9
Chrysene	5
Dibenzo(a,h)anthracene	0.41
Indeno(1,2,3-cd)pyrene	1.2

Sample ID	EPB05_10	DUP01_021517
Date Sampled	2/15/2017	2/15/2017
Elevation (NAVD88)	0.5	0.5
VOCs (mg/kg)	NE	NE
SVOCs (mg/kg)	Conc.	Conc.
Benzo(a)anthracene	8.6	6.2
Benzo(a)pyrene	7.8	5.3
Benzo(b)fluoranthene	5.8	4.1
Chrysene	7.3	5.5
Dibenzo(a,h)anthracene	0.68	0.57
Indeno(1,2,3-cd)pyrene	2.8	2

INSET MAP:



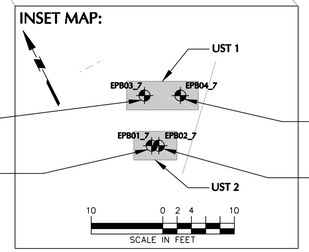
Sample ID	EPB01_10
Date Sampled	2/15/2017
Elevation (NAVD88)	0.5
VOCs (mg/kg)	NE
SVOCs (mg/kg)	Conc.
Benzo(a)anthracene	7.2
Benzo(a)pyrene	5.5
Benzo(b)fluoranthene	4.8
Chrysene	6.7
Dibenzo(a,h)anthracene	0.6
Indeno(1,2,3-cd)pyrene	2.2

Sample ID	EPB02_10
Date Sampled	2/15/2017
Elevation (NAVD88)	0.5
VOCs (mg/kg)	NE
SVOCs (mg/kg)	NE

Sample ID	EPB03_10
Date Sampled	2/15/2017
Elevation (NAVD88)	0.5
VOCs (mg/kg)	NE
SVOCs (mg/kg)	Conc.
Benzo(a)anthracene	6.7
Benzo(a)pyrene	5.8
Benzo(b)fluoranthene	4.2
Chrysene	5.2
Dibenzo(a,h)anthracene	0.49
Indeno(1,2,3-cd)pyrene	1.8

Sample ID	EPB03_7
Date Sampled	12/1/2016
Elevation (NAVD88)	13.5
VOCs (mg/kg)	ND
SVOCs (mg/kg)	Conc.
Benzo(a)anthracene	5
Benzo(a)pyrene	3.4
Benzo(b)fluoranthene	5.1
Chrysene	5.5
Dibenzo(a,h)anthracene	0.57
Indeno(1,2,3-cd)pyrene	2.1

INSET MAP:



Sample ID	EPB01_7	DUP01
Date Sampled	12/1/2016	
Elevation (NAVD88)	13.5	13.5
VOCs (mg/kg)	NE	ND
SVOCs (mg/kg)	Conc.	Conc.
Benzo(a)anthracene	2.2	3.4
Benzo(a)pyrene	1.5	2.3
Benzo(b)fluoranthene	2.2	3.4
Dibenzo(a,h)anthracene	NE	0.39
Indeno(1,2,3-cd)pyrene	1	1.6

Sample ID	EPB04_7
Date Sampled	12/1/2016
Elevation (NAVD88)	13.5
VOCs (mg/kg)	ND
SVOCs (mg/kg)	Conc.
Benzo(a)anthracene	13
Benzo(a)pyrene	12
Benzo(b)fluoranthene	19
Benzo(k)fluoranthene	4.5
Chrysene	11
Dibenzo(a,h)anthracene	1.7
Indeno(1,2,3-cd)pyrene	8.2

Sample ID	EPB02_7
Date Sampled	12/1/2016
Elevation (NAVD88)	13.5
VOCs (mg/kg)	ND
SVOCs (mg/kg)	Conc.
Benzo(a)anthracene	5.1
Benzo(a)pyrene	3.4
Benzo(b)fluoranthene	5
Chrysene	5.4
Dibenzo(a,h)anthracene	0.54
Indeno(1,2,3-cd)pyrene	2.3

NOTES:

1. SILVERCUP WEST – TERRA COTTA SITE BASE PLAN TAKEN FROM '41–98 VERNON BOULEVARD SURVEY' DATED DECEMBER 22, 2015, REVISED FEBRUARY 10, 2016, CERTIFIED BY ROBERT FEHRINGER, NYS LAND SURVEYOR.
2. ALL ELEVATIONS SHOWN ARE IN THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) AND REPRESENT PRE–REMEDIATION CONDITIONS.
3. GRADE SURFACE ELEVATION SHOWN BY GRAY CONTOUR LINES.
4. THE DEMARCATION LAYER PLACED AT THE BASE OF THE REMEDIAL EXCAVATION CONSTITUTES THE TOP OF THE "RESIDUALS MANAGEMENT ZONE", THE ZONE THAT REQUIRES ADHERENCE TO SPECIAL CONDITIONS FOR DISTURBANCE OF POTENTIALLY CONTAMINATED RESIDUAL SOILS DEFINED IN THE SITE MANAGEMENT PLAN (SMP).
5. DOCUMENTATION SOIL SAMPLE RESULTS WERE COMPARED TO THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) TITLE 6 OF THE COMPILATION OF NEW YORK CODES, RULES, AND REGULATIONS (NYCRR) PART 375 RESTRICTED USE RESTRICTED–RESIDENTIAL SOIL CLEANUP OBJECTIVES (SCO).
6. ONLY DOCUMENTATION SAMPLE RESULTS THAT EXCEEDED THE RESTRICTED USE RESTRICTED–RESIDENTIAL SCOs ARE SHOWN.
7. VOC = VOLATILE ORGANIC COMPOUND
8. SVOC = SEMIVOLATILE ORGANIC COMPOUND
9. mg/kg = MILLIGRAM PER KILOGRAM
10. NE = NO EXCEEDANCE OF CRITERIA
11. ND = NO DETECTION OF ANALYTE
12. Conc. = CONCENTRATION

LEGEND:

- SILVERCUP WEST PROPERTY LINE
- SILVERCUP WEST PARCEL A BOUNDARY
- TERRA COTTA PARCEL BOUNDARY
- APPROXIMATE LOCATION OF UNDERGROUND STORAGE TANK (UST) – CLOSED AND REMOVED
- BEP-01 BOTTOM DOCUMENTATION SAMPLE LOCATION
- EPB-01 DOCUMENTATION SAMPLE LOCATION BENEATH UST
- SW-01 SIDEWALL DOCUMENTATION SAMPLE LOCATION

Compound	NYSDEC Part 375 Restricted Use Restricted-Residential Soil Cleanup Objectives
Semivolatile Organic Compounds (mg/kg)	
Benzo(a)anthracene	1
Benzo(a)pyrene	1
Benzo(b)fluoranthene	1
Benzo(k)fluoranthene	3.9
Chrysene	3.9
Dibenzo(a,h)anthracene	0.33
Indeno(1,2,3-cd)pyrene	0.5

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Project: SILVERCUP WEST
PARCEL A
BLOCK 477, LOT 13 & P/O 15
QUEENS NEW YORK

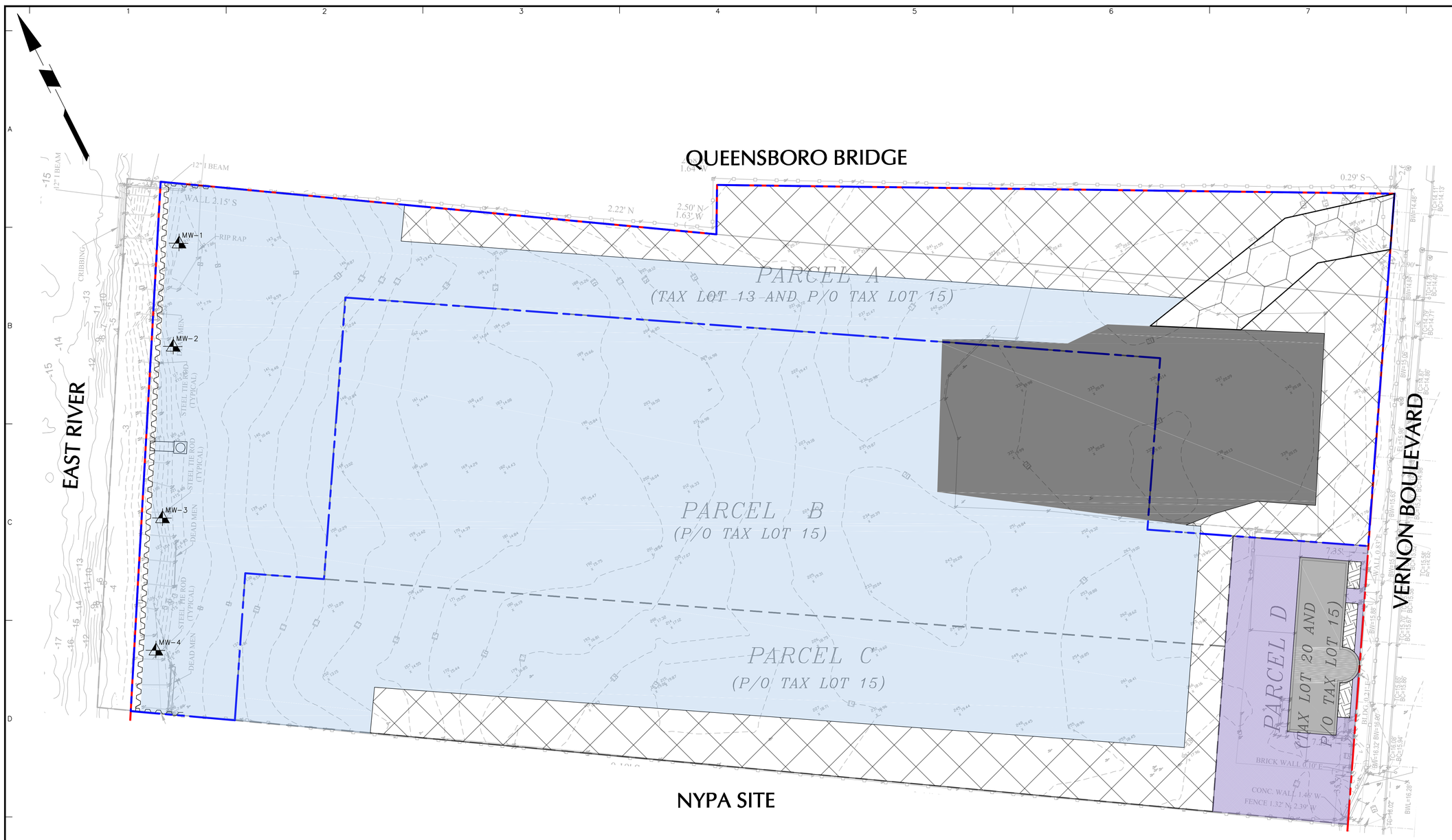
Figure Title: DOCUMENTATION SAMPLE LOCATION AND RESULTS MAP

Project No.	5635005
Date	04/25/2017
Scale	AS SHOWN
Drawn By	NEK
Checked By	ELS
Submission Date	05/01/2017

Figure No. 4

Sheet 4 of 8

Filename: \\langan.com\data\NYC\data0\5635005\Cadd Data – 5635005\Dwg\SMP\Figure 4 – Endpoint Sample Results and Remaining Contamination Plan.dwg Date: 10/17/2017 Time: 13:49 User: nkung Style Table: Langan.stb Layout: PARCEL A



NOTES:

1. SILVERCUP WEST – TERRA COTTA SITE BASE PLAN TAKEN FROM '41–98 VERNON BOULEVARD SURVEY' DATED DECEMBER 22, 2015, REVISED FEBRUARY 10, 2016, CERTIFIED BY ROBERT FEHRINGER, NYS LAND SURVEYOR.
2. ALL ELEVATIONS SHOWN ARE IN THE USGS NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) AND REPRESENT PRE–REMEDIATION CONDITIONS.
3. GRADE SURFACE ELEVATION SHOWN BY GRAY CONTOUR LINES.
4. RCA = RECYCLED CONCRETE AGGREGATE
5. NYSDEC = NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

LEGEND:

- SILVERCUP WEST PROPERTY LINE
- TERRA COTTA PARCEL A BOUNDARY
- TERRA COTTA PARCEL BOUNDARY
- CONCRETE OVERLAIN WITH 3 INCHES OF ASPHALT BINDER
- CONCRETE
- ENGINEERED GRAVEL DRIVEWAY (COMPACTED SUBGRADE, OVERLAIN BY NONWOVEN GEOTEXTILE FABRIC, OVERLAIN BY 10 INCHES OF RCA, OVERLAIN BY TENSAR GEOGRID TX5, OVERLAID BY 8 INCHES OF #3 STONE, AND COVERED WITH 6 INCHES OF ⅜ INCH CLEAN STONE)
- PERMANENT STABILIZED SLOPE (COMPACTED SUBGRADE, OVERLAID BY NONWOVEN GEOTEXTILE FABRIC, OVERLAID BY 2 FEET OF RCA, OVERLAID BY 6 INCHES OF TOPSOIL)
- GRAVEL COVER (COMPACTED SUBGRADE, OVERLAID BY NONWOVEN GEOTEXTILE FABRIC, OVERLAID BY 1.5 FEET OF RCA, OVERLAID BY 6 INCHES OF COMPACTED ⅜ INCH CLEAN STONE)
- IMPERVIOUS COVER (IMPERVIOUS PAVERS SET IN CONCRETE)
- TOPSOIL LANDSCAPED AREA (MINIMUM 12 INCHES OF TOPSOIL UNDERLAIN BY 24 INCHES OF RCA UNERLAIN BY NON–WOVEN GEOTEXTILE FABRIC AND COMPACTED SUBGRADE)
- OUTFALL
- SHEETPILE BULKHEAD
- MW–1 LOCATION OF SHALLOW OVERBURDEN POST–REMEDY MONITORING WELL

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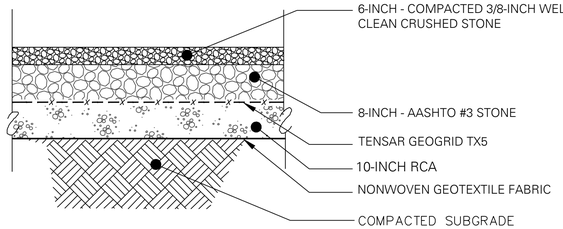
Collectively known as Langan

Project: SILVERCUP WEST
PARCEL A
BLOCK 477, LOT 13 & P/O 15
QUEENS NEW YORK

Figure Title: ENGINEERING CONTROLS PLAN WITH MONITORING WELL NETWORK

Project No. 5635005	Figure No. 5A
Date 04/25/2017	
Scale 1" = 20'	
Drawn By NEK / Checked By ELS	
Submission Date 09/18/2017	Sheet 5A of 8

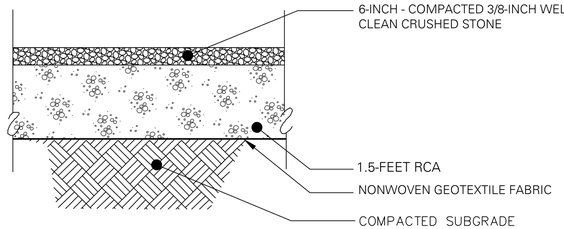
Filename: \\langan.com\data\NYC\data0\5635005\Cadd Data – 5635005\Dwg\SMP\Figure 5 – Engineering Controls Plan.dwg Date: 10/17/2017 Time: 13:48 User: nkung Style Table: Langan.stb Layout: A



NOTES:

1. RCA CLEAN STRUCTURAL FILL CONTAINS LESS THAT 10% BY WEIGHT MATERIAL WHICH WOULD PASS THROUGH A SIZE 80 SIEVE.

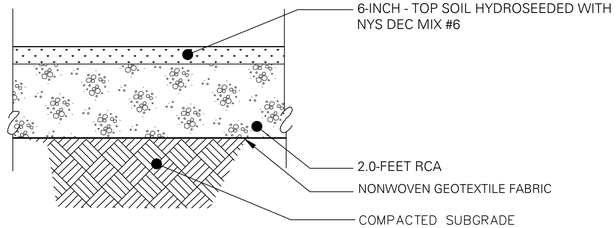
1 ENGINEERED GRAVEL DRIVEWAY
N.T.S.



NOTES:

1. RCA CLEAN STRUCTURAL FILL CONTAINS LESS THAT 10% BY WEIGHT MATERIAL WHICH WOULD PASS THROUGH A SIZE 80 SIEVE.

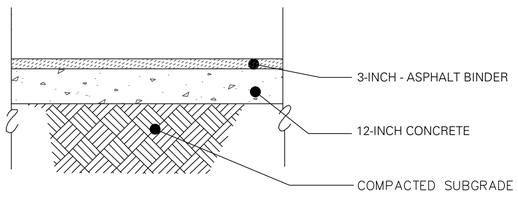
2 GRAVEL COVER
N.T.S.



NOTES:

1. RCA CLEAN STRUCTURAL FILL CONTAINS LESS THAT 10% BY WEIGHT MATERIAL WHICH WOULD PASS THROUGH A SIZE 80 SIEVE.

3 PERMANENT STABILIZED SLOPE
N.T.S.



NOTES:

1. ASPHALT BINDER PLACED ON EXISTING CONCRETE CAP.

4 CONCRETE CAP WITH ASPHALT BINDER
N.T.S.

NOTES:
1. DETAILS ARE REFERENCED FROM DRAWING C-501.00 – SITE DETAILS FROM THE SILVERCUP WEST DEVELOPMENT BULKHEAD DRAWING SET, PREPARED BY LANGAN, DATED 04/19/2016.
2. REFER TO DRAWING C-200.00 OF THE SILVERCUP WEST DEVELOPMENT BULKHEAD DRAWING SET FOR SITE PLAN.
3. RCA = RECYCLED CONCRETE AGGREGATE
4. N.T.S. = NOT TO SCALE

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Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C.
Langan Engineering and Environmental Services, Inc.
Langan UK Ltd.
Langan International LLC
Collectively known as Langan

Project
SILVERCUP WEST
PARCEL A
BLOCK 477, LOT 13 & P/O 15
QUEENS NEW YORK

Figure Title
ENGINEERING CONTROLS CROSS-SECTIONS

Project No.	005635005
Date	06/30/2017
Scale	N.T.S.
Drawn By	NEK
Checked By	ELS
Submission Date	09/18/2017

Figure No. 5B

Sheet 5B of 8

Filename: \\langan.com\data\NY\Cidata0\5635005\Cadd Data - 5635005\Dwg\SMP\Figure 5B - Engineering Controls Cross Sections.dwg Date: 10/17/2017 Time: 13:57 User: nkung Style Table: Langan.stb Layout: Parcel A

Sample ID	SB-26-15-17
Date Sampled	6/26/2007
VOCs (mg/kg)	NE
SVOCs (mg/kg)	Conc.
Benzo (a) anthracene	**4.06**
Benzo (a) pyrene	**6.13**
Benzo (b) fluoranthene	**3.6**
Benzo (k) fluoranthene	**3.03**
Chrysene	**2.31**
Dibenzo(a,h)fluoranthene	**0.453**
Ideno(1,2,3-cd)pyrene	**1.61**

Sample ID	BEP03_012017
Date Sampled	1/20/2017
Elevation (NAVD88)	-2
VOCs (mg/kg)	NE
SVOCs (mg/kg)	Conc.
Benzo(a)anthracene	**8.1**
Benzo(a)pyrene	**6.8**
Benzo(b)fluoranthene	**5.5**
Benzo(k)fluoranthene	**1.5**
Chrysene	**6.1**
Dibenzo(a,h)anthracene	**0.49**
Indeno(1,2,3-cd)pyrene	**2.5**

Sample ID	BEP04	DUP01_032317
Date Sampled	3/23/2017	
Elevation (NAVD88)	-2	-2
VOCs (mg/kg)	NE	NE
SVOCs (mg/kg)	NE	NE

Sample ID	SW01_032817
Date Sampled	3/28/2017
Elevation (NAVD88)	-1
VOCs (mg/kg)	NE
SVOCs (mg/kg)	Conc.
Benzo(a)anthracene	**4.6**
Benzo(a)pyrene	**3.8**
Benzo(b)fluoranthene	**4.5**
Benzo(k)fluoranthene	**1.7**
Chrysene	**4.4**
Dibenzo(a,h)anthracene	**0.59**
Indeno(1,2,3-cd)pyrene	**2.3**

Sample Compound	Part 375 Unrestricted Use Soil Cleanup Objectives	Part 375 Restricted-Residential Restricted Use Soil Cleanup Objectives
VOCs (mg/kg)		
1,2,4-Trimethylbenzene	3.6	52
Benzene	0.06	4.8
Ethylbenzene	1	41
Total Xylenes	0.26	100
SVOCs (mg/kg)		
Benzo (a) anthracene	1	1
Benzo (a) pyrene	1	1
Benzo (b) fluoranthene	1	1
Benzo (k) fluoranthene	0.8	3.9
Chrysene	1	3.9
Dibenzo (a,h) anthracene	0.33	0.33
Ideno (1,2,3-cd) pyrene	0.5	0.5
Napthalene	12	100

NE = No Exceedances
ND = Not Detected

Sample ID	SB-1-15-17
Date Sampled	6/25/2007
VOCs (mg/kg)	Conc.
Benzene	**0.0867**
SVOCs (mg/kg)	Conc.
Benzo (a) anthracene	**5.17**
Benzo (a) pyrene	**5.25**
Benzo (b) fluoranthene	**2.73**
Benzo (k) fluoranthene	**2.26**
Chrysene	**5.52**
Ideno (1,2,3-cd) pyrene	**1.45**

Sample ID	BEP02_021017
Date Sampled	2/10/2017
Elevation (NAVD88)	-2
VOCs (mg/kg)	Conc.
Benzene	**0.067**
SVOCs (mg/kg)	Conc.
Benzo(a)anthracene	**41**
Benzo(a)pyrene	**36**
Benzo(b)fluoranthene	**26**
Benzo(k)fluoranthene	**7**
Chrysene	**33**
Dibenzo(a,h)anthracene	**3.6**
Indeno(1,2,3-cd)pyrene	**12**

Sample ID	SB-4A-13-15
Date Sampled	6/3/2007
VOCs (mg/kg)	NE
SVOCs (mg/kg)	Conc.
Benzo (a) pyrene	**2.21**
Benzo (k) fluoranthene	**1.47**
Chrysene	**1.59**

Sample ID	BEP01_011817
Date Sampled	1/18/2017
Elevation (NAVD88)	-1
VOCs (mg/kg)	ND
SVOCs (mg/kg)	ND

QUEENSBORO BRIDGE

EAST RIVER

VERNON BOULEVARD

PARCEL A
(TAX LOT 13 AND P/O TAX LOT 15)

PARCEL B
(P/O TAX LOT 15)

PARCEL C
(P/O TAX LOT 15)

PARCEL D
(TAX LOT 20 AND P/O TAX LOT 15)

UST 1

UST 2

UST 3

BROKEN CONCRETE

NYPA SITE

Sample ID	EPB01_10
Date Sampled	2/15/2017
Elevation (NAVD88)	0.5
VOCs (mg/kg)	Conc.
Benzene	**0.61**
Ethylbenzene	**6.2**
Total Xylenes	**3.5**
SVOCs (mg/kg)	Conc.
Benzo(a)anthracene	**7.2**
Benzo(a)pyrene	**5.5**
Benzo(b)fluoranthene	**4.8**
Benzo(k)fluoranthene	**1.1**
Chrysene	**6.7**
Dibenzo(a,h)anthracene	**0.6**
Indeno(1,2,3-cd)pyrene	**2.2**

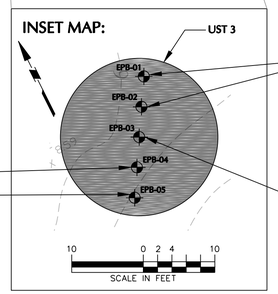
Sample ID	EPB04_10
Date Sampled	2/15/2017
Elevation (NAVD88)	0.5
VOCs (mg/kg)	Conc.
Benzene	**0.45**
Ethylbenzene	**9.9**
Total Xylenes	**4.1**
SVOCs (mg/kg)	Conc.
Benzo(a)anthracene	**5.5**
Benzo(a)pyrene	**3.7**
Benzo(b)fluoranthene	**2.9**
Chrysene	**5**
Dibenzo(a,h)anthracene	**0.41**
Indeno(1,2,3-cd)pyrene	**1.2**

Sample ID	EPB02_10
Date Sampled	2/15/2017
Elevation (NAVD88)	0.5
VOCs (mg/kg)	Conc.
1,2,4-Trimethylbenzene	**3.8**
Benzene	**1.3**
Ethylbenzene	**7.9**
Total Xylenes	**5.1**
SVOCs (mg/kg)	NE

Sample ID	EPB05_10	DUP01_021517
Date Sampled	2/15/2017	2/15/2017
Elevation (NAVD88)	0.5	
VOCs (mg/kg)	Conc.	Conc.
Benzene	**0.38**	**0.18**
Ethylbenzene	**2.6**	**2.7**
Total Xylenes	**1.7**	**1.8**
SVOCs (mg/kg)	Conc.	Conc.
Benzo(a)anthracene	**8.6**	**6.2**
Benzo(a)pyrene	**7.8**	**5.3**
Benzo(b)fluoranthene	**5.8**	**4.1**
Benzo(k)fluoranthene	**1.9**	**1.2**
Chrysene	**7.3**	**5.5**
Dibenzo(a,h)anthracene	**0.68**	**0.57**
Indeno(1,2,3-cd)pyrene	**2.8**	**2**
Napthalene	**14**	**17**

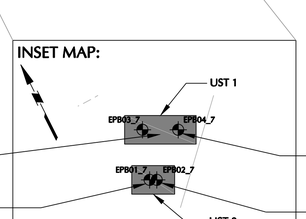
Sample ID	EPB03_10
Date Sampled	2/15/2017
Elevation (NAVD88)	0.5
VOCs (mg/kg)	Conc.
Benzene	**0.36**
Ethylbenzene	**3.5**
Total Xylenes	**2.2**
SVOCs (mg/kg)	Conc.
Benzo(a)anthracene	**6.7**
Benzo(a)pyrene	**5.8**
Benzo(b)fluoranthene	**4.2**
Benzo(k)fluoranthene	**1.4**
Chrysene	**5.2**
Dibenzo(a,h)anthracene	**0.49**
Indeno(1,2,3-cd)pyrene	**1.8**
Napthalene	**17**

INSET MAP:



Sample ID	EPB03_7
Date Sampled	12/1/2016
Elevation (NAVD88)	13.5
VOCs (mg/kg)	ND
SVOCs (mg/kg)	Conc.
Benzo(a)anthracene	**5**
Benzo(a)pyrene	**3.4**
Benzo(b)fluoranthene	**5.1**
Benzo(k)fluoranthene	**1.6**
Chrysene	**5.5**
Dibenzo(a,h)anthracene	**0.57**
Indeno(1,2,3-cd)pyrene	**2.1**

INSET MAP:



Sample ID	EPB04_7
Date Sampled	12/1/2016
Elevation (NAVD88)	13.5
VOCs (mg/kg)	ND
SVOCs (mg/kg)	Conc.
Benzo(a)anthracene	**13**
Benzo(a)pyrene	**12**
Benzo(b)fluoranthene	**19**
Benzo(k)fluoranthene	**4.5**
Chrysene	**11**
Dibenzo(a,h)anthracene	**1.7**
Indeno(1,2,3-cd)pyrene	**8.2**

Sample ID	EPB01_7	DUP01
Date Sampled	12/1/2016	
Elevation (NAVD88)	13.5	13.5
VOCs (mg/kg)	NE	ND
SVOCs (mg/kg)	Conc.	Conc.
Benzo(a)anthracene	**2.2**	**3.4**
Benzo(a)pyrene	**1.5**	**2.3**
Benzo(b)fluoranthene	**2.2**	**3.4**
Benzo(k)fluoranthene	NE	**1.2**
Chrysene	**2.3**	**3.6**
Dibenzo(a,h)anthracene	NE	**0.39**
Indeno(1,2,3-cd)pyrene	**1**	**1.6**

Sample ID	EPB02_7
Date Sampled	12/1/2016
Elevation (NAVD88)	13.5
VOCs (mg/kg)	ND
SVOCs (mg/kg)	Conc.
Benzo(a)anthracene	**5.1**
Benzo(a)pyrene	**3.4**
Benzo(b)fluoranthene	**5**
Benzo(k)fluoranthene	**1.7**
Chrysene	**5.4**
Dibenzo(a,h)anthracene	**0.54**
Indeno(1,2,3-cd)pyrene	**2.3**

NOTES:

1. BASE PLAN TAKEN FROM '41-98 VERNON BOULEVARD SURVEY' DATED DECEMBER 22, 2015, CERTIFIED BY ROBERT FEHRINGER, NYS LAND SURVEYOR.
2. ALL ELEVATIONS SHOWN ARE IN THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) AND REPRESENT PRE-REMEDIATION CONDITIONS.
3. GRADE SURFACE ELEVATION SHOWN BY GRAY CONTOUR LINES.
4. SOIL SAMPLE ANALYTICAL RESULTS ARE COMPARED TO NYDEC PART 375 UNRESTRICTED USE SCOs (UU SCOs) AND RESTRICTED USE RESTRICTED-RESIDENTIAL SCOs (RURR USCOs).
5. ANALYTE DETECTIONS BELOW UUSCOs ARE DENOTED AS NON-EXCEEDANCE (NE).
5. RESULTS THAT EXCEED UU SCOs ARE BOLDED. RESULTS THAT EXCEED RURR SCOs ARE BOLDED AND SHADED GRAY.
6. ALL ANALYTICAL RESULTS ARE PRESENTED IN MILLIGRAMS PER KILOGRAM (mg/kg).
7. VOC = VOLATILE ORGANIC COMPOUND
8. SVOC = SEMIVOLATILE ORGANIC COMPOUND
9. SOIL ANALYTICAL RESULTS SHOWN ARE REFERENCED FROM THE OCTOBER 2016 NYSDEC APPROVED REMEDIAL ACTION WORK PLAN (RAWP) FIGURE 4 - SOIL ANALYTICAL RESULTS MAP - VOCs AND SVOCs.

LEGEND:

- SILVERCUP WEST PROPERTY LINE
- TERRA COTTA PARCEL A BOUNDARY
- TERRA COTTA PARCEL BOUNDARY
- MW-1: LOCATION OF FORMER SHALLOW OVERBURDEN MONITORING WELL
- MW-1: LOCATION OF FORMER DEEP OVERBURDEN OR BEDROCK MONITORING WELL
- SB-1: LOCATION OF FORMER SOIL BORING
- SG-1: LOCATION OF FORMER SOIL VAPOR PROBE
- SS-1: LOCATION OF FORMER SURFACE SOIL SAMPLE
- TP-1: LOCATION OF FORMER TEST PIT
- B-301: LOCATION OF FORMER MUD ROTARY BORING
- TP-4A: LOCATION OF ELEVATED METALS VERTICAL DELINEATION SOIL BORING (MARCH 2016)
- TP-4.1: LOCATION OF ELEVATED METALS HORIZONTAL DELINEATION SOIL BORING (MARCH 2016)
- PMB-08: LOCATION OF PETROLEUM DELINEATION SOIL BORING (SEPTEMBER 2015)
- PMB-OW-01: LOCATION OF PETROLEUM DELINEATION SOIL BORING AND MONITORING WELL (SEPTEMBER 2015)
- EB-01: LOCATION OF WASTE CHARACTERIZATION SOIL BORING (MARCH 2016)
- APPROXIMATE LOCATION OF UNDERGROUND STORAGE TANK (UST) - CLOSED AND REMOVED
- BEP-01: BOTTOM DOCUMENTATION SAMPLE LOCATION
- EPB-01: DOCUMENTATION SAMPLE LOCATION BENEATH UST
- SW-01: SIDEWALL DOCUMENTATION SAMPLE LOCATION

WARNING: IT IS A VIOLATION OF THE NYS EDUCATION LAW ARTICLE 145 FOR ANY PERSON, UNLESS HE IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS ITEM IN ANY WAY.

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Project: SILVERCUP WEST
PARCEL A
BLOCK 477, LOT 13 & P/O 15
QUEENS NEW YORK

Figure Title: REMAINING SOIL ANALYTICAL RESULTS MAP - VOCs & SVOCs

Project No.	Figure No.
5635005	6A
Date: 07/12/2017	
Scale: 1" = 30'	
Drawn By: ELS / Checked By: JG	
Submission Date: 9/18/2017	Sheet 6A of 8

Filename: \\langan.com\data\NYC\data0\5635005\Cadd Data - 5635005\Dwg\Terra Cotta RAWP Figures\REVISED RAWP Parcels A, B, C\07.12.2017 - SCW SMP Figure 6A - Remaining Soil Analytical Results Map - VOCs and SVOCs.dwg Date: 10/17/2017 Time: 13:52 User: nkung Style Table: Langan.stb Layout: Parcel A

SB-1	15-17 ft
Metals	**Conc.**
Zinc	**605**
Pesticides	NA

SB-26	15-17 ft
Metals	**Conc.**
Mercury	**1.27**
Arsenic	**14.4**
Barium	**431**
Cadmium	**5**
Chromium	**40.7**
Copper	**104**
Lead	**343**
Zinc	**344**
Pesticides	NA

SB-2	12-14 ft
Metals	**Conc.**
Arsenic	**54**
Barium	**513**
Lead	**4420**
Pesticides	NA

SB-30	12-14 ft
Metals	**Conc.**
Chromium	**40**
Pesticides	NA

SB-27	10-12 ft
Metals	**Conc.**
Copper	**78**
Pesticides	NA

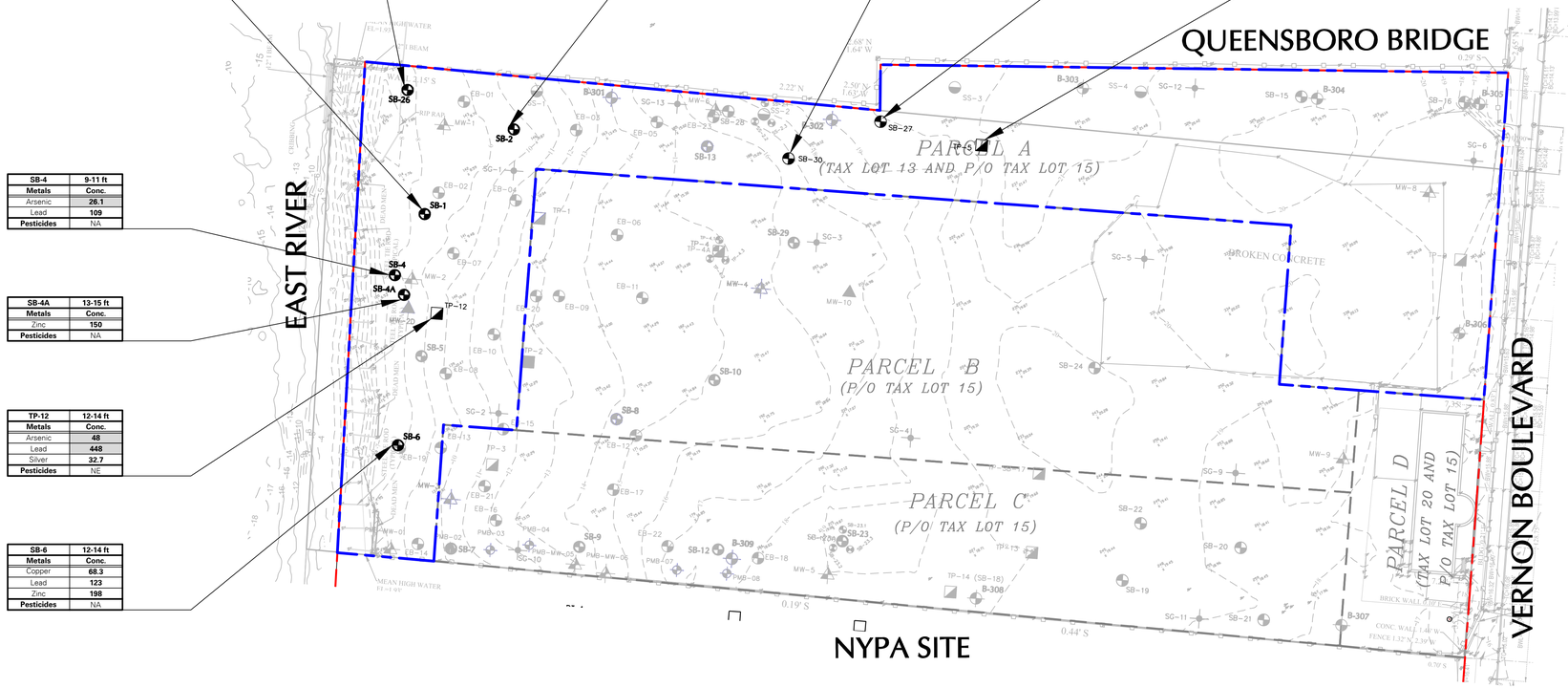
TP-5	9-11 ft
Metals	**Conc.**
Lead	**88.8**
Pesticides	NA

SB-4	9-11 ft
Metals	**Conc.**
Arsenic	**26.1**
Lead	**109**
Pesticides	NA

SB-4A	13-15 ft
Metals	**Conc.**
Zinc	**150**
Pesticides	NA

TP-12	12-14 ft
Metals	**Conc.**
Arsenic	**48**
Lead	**448**
Silver	**32.7**
Pesticides	NE

SB-6	12-14 ft
Metals	**Conc.**
Copper	**68.3**
Lead	**123**
Zinc	**198**
Pesticides	NA



NOTES:

1. BASE PLAN TAKEN FROM '41–98 VERNON BOULEVARD SURVEY' DATED DECEMBER 22, 2015, CERTIFIED BY ROBERT FEHRINGER, NYS LAND SURVEYOR.
2. ALL ELEVATIONS SHOWN ARE IN THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) AND REPRESENT PRE–EXACATION CONDITIONS.
3. GRADE SURFACE ELEVATION SHOWN BY GRAY CONTOUR LINES.
4. SOIL SAMPLE ANALYTICAL RESULTS ARE COMPARED TO NYDEC PART 375 UNRESTRICTED USE SCOs (UU SCOs) AND RESTRICTED USE RESTRICTED–RESIDENTIAL SCOs (RURR SCOs). ANALYTE DETECTIONS BELOW UU SCOs ARE DENOTED AS NON–EXCEEDANCE (NE). ANALYTES NOT SAMPLED ARE DENOTED AS NOT–ANALYZED (NA).
5. RESULTS THAT EXCEED UU SCOs ARE BOLDED. RESULTS THAT EXCEED RURR SCOs ARE BOLDED AND SHADED GRAY.
6. ALL ANALYTICAL RESULTS ARE PRESENTED IN MILLIGRAMS PER KILOGRAM (mg/kg).
7. SOIL ANALYTICAL RESULTS SHOWN ARE REFERENCED FROM THE OCTOBER 2016 NYSDEC APPROVED REMEDIAL ACTION WORK PLAN (RAWP) FIGURE 5 – SOIL ANALYTICAL RESULTS MAP – METALS AND PESTICIDES.

LEGEND:

- SILVERCUP WEST PROPERTY LINE
- TERRA COTTA PARCEL A BOUNDARY
- TERRA COTTA PARCEL BOUNDARY
- MW–1 — LOCATION OF FORMER SHALLOW OVERBURDEN MONITORING WELL
- MW–1 — LOCATION OF FORMER DEEP OVERBURDEN OR BEDROCK MONITORING WELL
- SB–1 — LOCATION OF FORMER SOIL BORING
- SG–1 — LOCATION OF FORMER SOIL VAPOR PROBE
- SS–1 — LOCATION OF FORMER SURFACE SOIL SAMPLE
- TP–12 — LOCATION OF FORMER TEST PIT
- B-301 — LOCATION OF FORMER MUD ROTARY BORING
- SS–2A — LOCATION OF ELEVATED METALS VERTICAL DELINEATION SOIL BORING (MARCH 2016)
- SS–2A.1 — LOCATION OF ELEVATED METALS HORIZONTAL DELINEATION SOIL BORING (MARCH 2016)
- PMB–08 — LOCATION OF PETROLEUM DELINEATION SOIL BORING (SEPTEMBER 2015)
- PMB–0W–01 — LOCATION OF PETROLEUM DELINEATION SOIL BORING AND MONITORING WELL (SEPTEMBER 2015)
- EB–01 — LOCATION OF WASTE CHARACTERIZATION SOIL BORING (MARCH 2016)

Sample Compound	Part 375 Unrestricted Use Soil Cleanup Objectives	Part 375 Restricted Use Restricted-Residential Soil Cleanup Objectives
Metals	mg/kg	mg/kg
Arsenic	13	16
Barium	350	400
Cadmium	2.5	4.3
Chromium	1	110
Copper	50	270
Lead	63	400
Mercury	0.18	0.81
Silver	2	180
Zinc	109	10,000

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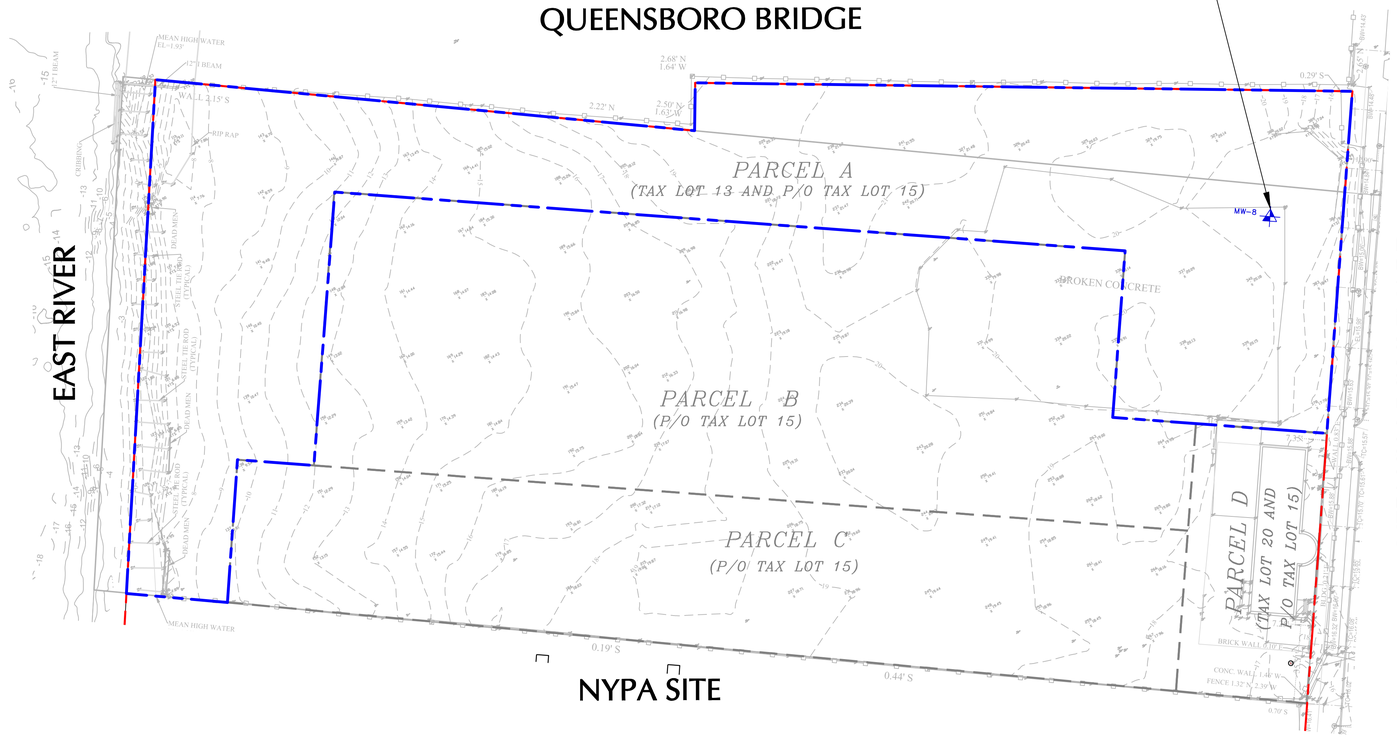
QUEENS NEW YORK

Figure Title
REMAINING SOIL ANALYTICAL RESULTS MAP - METALS & PESTICIDES

Project No.	Figure No.
5635005	6B
Date: 07/13/2017	
Scale: 1" = 30'	
Drawn By: ELS / Checked By: JG	
Submission Date: 9/18/2017	Sheet 6B of 8

Filename: \\langan.com\data\NYC\data0\5635005\Cadd Data – 5635005\Dwg\Terra Cotta RAWP Figures\REVISED RAWP Parcels A, B, C\07.13.2017 – SCW SMP Figure 6B – Remaining Soil Analytical Results Map – Metals and Pesticides.dwg Date: 10/17/2017 Time: 13:53 User: nkung Style Table: Langan.stb Layout: Parcel A

MW-8	
SVOCs	**Concentration (µg/L)**
	NE
VOCs	**Concentration (µg/L)**
	NE
Metals	**Concentration (mg/L)**
Antimony	0.0058
Iron	12.7
Manganese	3.41
Sodium	44.5
PCBs	**Concentration (µg/L)**
	NE



NOTES:

1. BASE PLAN TAKEN FROM '41–98 VERNON BOULEVARD SURVEY' DATED DECEMBER 22, 2015, CERTIFIED BY ROBERT FEHRINGER, NYS LAND SURVEYOR.
2. ALL ELEVATIONS SHOWN ARE IN THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) AND REPRESENT PRE–REMEDIATION CONDITIONS.
3. GRADE SURFACE SHOWN BY GRAY CONTOUR LINES.
4. GROUNDWATER ANALYTICAL RESULTS ARE REFERENCED FROM THE REMEDIAL INVESTIGATION REPORT, DATED SEPTEMBER 2007, PREPARED BY LANGAN.
5. GROUNDWATER MONITORING WELL MW–8 WAS DECOMMISSIONED PER THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) POLICY CP–43 DURING IMPLEMENTATION OF THE NYSDEC APPROVED REMEDIAL ACTION WORK PLAN, DATED OCTOBER 2016.
6. GROUNDWATER ANALYTICAL RESULTS ARE COMPARED TO NYSDEC TECHNICAL AND OPERATIONAL GUIDANCE SERIES (TOGS) 1.1.1 AMBIENT WATER QUALITY STANDARDS AND GUIDANCE VALUES (SGVs) FOR CLASS GA WATER.
7. COMPOUNDS DETECTED ABOVE THEIR RESPECTIVE NYSDEC TOGS 1.1.1 SGVs ARE SHOWN.
8. mg/L = MILLIGRAMS PER LITER
9. µg/L = MICROGRAMS PER LITER
10. VOC = VOLATILE ORGANIC COMPOUND
11. SVOC = SEMIVOLATILE ORGANIC COMPOUND
12. NE = NO EXCEEDANCE

LEGEND:

MW–8 — LOCATION OF SHALLOW OVERBURDEN MONITORING WELL INSTALLED DURING 2007 REMEDIAL INVESTIGATION

PROPERTY BOUNDARY

TERRA COTTA PARCEL A BOUNDARY

TERRA COTTA PARCEL BOUNDARY

NYSDEC REFERENCE STANDARD FOR GROUNDWATER	
NYSDEC TOGs 1.1.1 AWQS for Metals	
Metals	**Concentration (mg/L)**
Antimony	0.003
Iron	0.3
Manganese	0.3
Sodium	20

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Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C.
Langan Engineering and Environmental Services, Inc.
Langan CT, Inc.
Langan International LLC
Collectively known as Langan

Project
SILVERCUP WEST
PARCEL A
BLOCK 477, LOT 13 & P/O 15
QUEENS NEW YORK

Figure Title
REMAINING GROUNDWATER ANALYTICAL RESULTS MAP

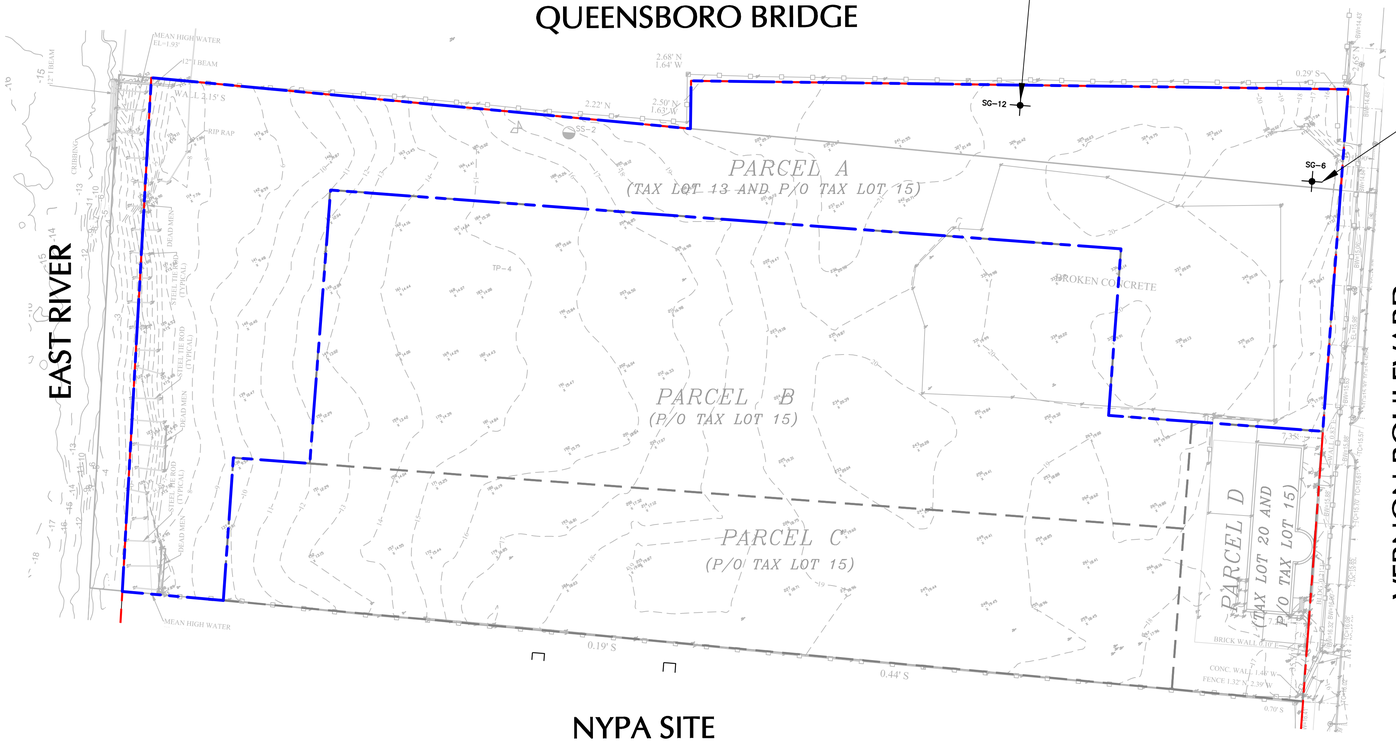
Project No.	Figure No.
5635005	7
Date: 07/12/2017	
Scale: 1" = 30'	
Drawn By: ELS / Checked By: JG	
Submission Date: 9/18/2017	
Sheet 7 of 8	

Filename: \\langan.com\data\NYC\data0\5635005\Cadd Data – 5635005\Dwg\Terra Cotta RAWP Figures\REVISED RAWP Parcels A, B, C\07.28.2017 – SCW SMP Figure 7 – Remaining Groundwater Analytical Results Map.dwg Date: 10/17/2017 Time: 13:54 User: nkung Style Table: Langan.stb Layout: Parcel A

SG-12	
Volatile Organic Compounds (µg/m³)	**Conc.**
1,2,4-Trimethylbenzene	134.1
1,3,5-Trimethylbenzene	42.1
2-Butanone (MEK)	16.7
4-Ethyltoluene	40.1
Acetone	1,036.1
Ethanol	56.1
Ethylbenzene	55.1
Hexane	13
Isopropyl alcohol	23.8
m,p-Xylene	194.6
n-Heptane	14.4
o-Xylene	82.2
Propene	16.1
Tetrahydrofuran	8.5
Toluene	117.4

SG-6	
Volatile Organic Compounds (µg/m³)	**Conc.**
1,2,4-Trimethylbenzene	49.2
1,3,5-Trimethylbenzene	11.4
2-Butanone (MEK)	26.2
2-Hexanone (MBK)	9.5
4-Ethyltoluene	13.6
Acetone	409
Benzene	1.9
Chloroform	7.9
Dichlorodifluoromethane (Freon12)	10.6
Ethanol	43.8
Ethylbenzene	14.2
Hexane	3.5
Isopropyl alcohol	11.9
m,p-Xylene	47.1
n-Heptane	5.5
o-Xylene	23.2
Propene	5.8
Tetrachloroethene	4.9
Tetrahydrofuran	1.8
Toluene	27.1
Trichlorofluoromethane (Freon 11)	6.1

QUEENSBORO BRIDGE



NYPA SITE

NOTES:

1. BASE PLAN TAKEN FROM '41–98 VERNON BOULEVARD SURVEY' DATED DECEMBER 22, 2015, CERTIFIED BY ROBERT FEHRINGER, NYS LAND SURVEYOR.
2. ALL ELEVATIONS SHOWN ARE IN THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) AND REPRESENT PRE–REMEDIATION CONDITIONS.
3. GRADE SURFACE SHOWN BY GRAY CONTOUR LINES.
4. SOIL VAPOR ANALYTICAL RESULTS ARE REFERENCED FROM THE REMEDIAL INVESTIGATION REPORT, DATED SEPTEMBER 2007, PREPARED BY LANGAN.
5. RESULTS SHOWN ARE DETECTIONS AND DO NOT REPRESENT EXCEEDANCES OF ANY REGULATORY REQUIREMENTS. NO REGULATORY REQUIREMENTS EXIST FOR SOIL VAPOR SAMPLES.
6. $\mu g/m^3$ = MICROGRAMS PER CUBIC METER
7. VOC = VOLATILE ORGANIC COMPOUND
8. Conc. = CONCENTRATION

LEGEND:

SG–6 — FORMER SOIL VAPOR SAMPLING LOCATION

PROPERTY BOUNDARY

TERRA COTTA PARCEL A BOUNDARY

TERRA COTTA PARCEL BOUNDARY

WARNING: IT IS A VIOLATION OF THE NYS EDUCATION LAW ARTICLE 145 FOR ANY PERSON, UNLESS HE IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS ITEM IN ANY WAY.

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SCALE IN FEET

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Project	SILVERCUP WEST PARCEL A BLOCK 477, LOT 13 & P/O 15 QUEENS NEW YORK
Figure Title	REMAINING SOIL VAPOR ANALYTICAL RESULTS MAP
Project No.	5635005
Figure No.	8
Date	07/12/2017
Scale	1" = 30'
Drawn By	ELS
Checked By	JG
Submission Date	9/18/2017
Sheet	8 of 8

Filename: \\langan.com\data\NYC\data0\5635005\Cadd Data – 5635005\Dwg\Terra Cotta RAWP Figures\REVISED RAWP Parcels A, B, C\08.02.2017 – SCW SMP Figure 8 – Remaining Soil Vapor Analytical Results Map.dwg Date: 10/17/2017 Time: 13:55 User: nkung Style Table: Langan.stb Layout: Parcel A