Former Sep's Cleaners Site
Kings County
250 Livonia Avenue, Brooklyn, NY

Site Management Plan

NYSDEC Site No. 224283

Prepared for:
Riverdale Osborne Towers Upper Management LLC

Prepared by:

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Revisions to Final Approved Site Management Plan:

Revision #	Submitted Date	Summary of Revision	DEC Approval Date

February, 2024

CERTIFICATION

I, Dr. Ravi Korlipara, P.E., certify that I am currently a New York State registered professional engineer 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).

_____ _____

Signature Date

NYS Professional License # 070038

Note: Include PE stamp

LIST OF ACRONYMS

AS	Air Sparging
CO	Order on Consent
D	Deep
DER	Division of Environmental Remediation
EC	Engineering Control
ELAP	Environmental Laboratory Approval Program
IC	Institutional Control
MW	Monitoring Well
NYCRR	New York Codes, Rules, and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PCE	Tetrachloroethene
PID	Photoionization Detector
PRR	Periodic Review Report
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control
RAWP	Remedial Action Work Plan
S	Shallow
SIM	Select Ion Monitoring
SMP	Site Management Plan
SVE	Soil Vapor Extraction
SVI	Soil Vapor Intrusion
TCE	Trichloroethene
TO	Toxic Organics
VOC	Volatile Organic Compound

TABLE OF CONTENTS

Section	Title	Page No.
	EXECUTIVE SUMMARY	i
1.0	**INTRODUCTION**	1
1.1	Introduction	1
1.2	Purpose	2
1.3	Revisions	2
1.4	Notifications	3
2.0	**SUMMARY OF PREVIOUS INVESTIGATIONS AND REMEDIAL ACTIONS**	5
2.1	Site Location	5
2.2	Site History	5
2.3	Geologic and Hydrogeologic Conditions	5
2.4	Summary of Remedial Investigation Findings	6
2.5	Summary of Remedial Actions	8
2.5.1	Removal of Contaminated Materials	8
2.5.2	Treatment Systems	9
2.5.3	Remaining Contamination	9
3.0	**ENGINEERING AND INSTITUTIONAL CONTROL PLAN**	11
3.1	General	11
3.2	Institutional Controls	11
3.3	Engineering Controls	13
3.3.1	Site Cover	13
3.3.2	SSDS Installation and Operation	14
3.4	Criteria for Completion of Remediation/ Termination of the SSDS	14
3.4.1	Site Cover Inspections	14
3.4.2	SSDS Operation	14
3.4.3	Soil Vapor Intrusion Investigation	15
3.4.4	Inspections and Notifications	15
3.4.5	Directions to the Nearest Health Facility	17

TABLE OF CONTENTS *(continued)*

4.0	**SITE MONITORING PLAN**	19
4.1	Soil Vapor Monitoring	20
4.2	Indoor Air Monitoring	20
4.3	Site-Wide Inspections	20
4.4	Quality Assurance Project Plan	21
4.4.1	Labeling, Chain-of-Custody, and Transportation Procedures	22
4.4.2	Calibration	22
4.4.3	Sample Analysis	22
4.4.4	Miscellaneous	22
4.4.5	Monitoring/Inspection Reports	22
5.0	**OPERATIONS AND MAINTENANCE MANUAL**	23
5.1	Introduction	23
5.2	Engineering Control System Operations & Maintenance	23
5.2.1	SSDS System	23
5.2.2	SSDS Monitoring	23
5.2.3	Equipment Monitoring	24
5.2.4	Sampling Event Protocol	24
5.3	Maintenance and Performance Monitoring Report Requirements	24
5.3.1	Routine Maintenance Reports	25
5.3.2	Non-Routine Maintenance Reports	25
5.3.3	Evaluation of Records and Reporting	26
5.4	Certification of ECs/ICs	27
5.5	Periodic Review Report	27
5.6	Corrective Measures Work Plan	29
6.0	**PERIODIC ASSESSMENTS/EVALUATIONS**	29
6.1	Climate Change Vulnerability Assessment	29
6.2	Green Remediation Evaluation	30
6.2.1	Timing of Green Remediation Evaluations	30
6.2.2	SSDS	30
6.2.3	Building Operations	30
6.2.4	Frequency of System Checks, Sampling, and Other Periodic Activities	30
6.2.5	Metrics and Reporting	31
6.3	SSDS Optimization	31

TABLE OF CONTENTS *(continued)*

List of Figures

Figure 1	Site Location and Boundaries
Figure 2	Geologic Cross-Section
Figure 3	Site -Specific Groundwater Flow Direction
Figure 4	Summary of External Soil Sampling and Approximate Area of Contamination
Figure 5	Summary of Groundwater Sampling and Estimated Plume Configuration
Figure 6	Area of Excavation and End Point Sampling Locations
Figure 7	Layout of the SSDS and Vacuum Monitoring Points

Appendices

Appendix A	Environmental Easement
Appendix B	No-Further-Action Letter for Verizon Building
Appendix C	Health and Safety Plan/Community Air Monitoring Plan
Appendix D	O&M Checklist

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: NYSDEC Site No. 224282,
250 Livonia Ave. Brooklyn, NY

Institutional Controls (ICs):

ICs will include:

- The property may be used for commercial and industrial use.
- All Engineering Controls (ECs) must be operated and maintained as specified in this SMP.
- All ECs on the Site area must be inspected at a frequency and in a manner defined in this SMP.
- System monitoring and other environmental or public health monitoring will be performed as defined in this 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 and Mental Hygiene 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.
- Data and information pertinent to Site management must be reported at the frequency and in a manner as defined in 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 (see Appendix A for Environmental Easement);

- The potential for soil vapor intrusion must be evaluated for any buildings developed in the area within the IC boundaries, and any potential impacts that are identified must be monitored or mitigated; and

- Vegetable gardens and farming on the Site are prohibited.

Engineering Controls (ECs):

ECs will include:

- The remaining contamination at the Site has been addressed by the remedial system that included Air Sparging (AS) and Soil Vapor Extraction (SVE) [which acted to both remediate the vadose zone soil and function as a Sub-Slab Depressurization System (SSDS)].

- The potential remaining contamination creates the potential for soil vapor intrusion and is currently being addressed by a Sub-Slab Depressurization System (SSDS).

- The asphalt cover in the rear driveway prevents contact with potentially-impacted soil and the foundation concrete slab within the building inhibits contaminant vapors from entering the building.

Monitoring:

- The groundwater monitoring is considered complete.
- The AS/SVE remedial system was shut down in November, 2022 and the remediation is considered to be complete by the NYSDEC.
- The indoor air will be sampled annually. The sub-slab vacuum beneath the building's basement will be monitored annually. These tasks will be performed during the heating season.
- The Site will be inspected annually to include the Site cover and the SSDS at a minimum to assure that all SSDS suction wells are operating properly.

Maintenance:

- Site maintenance will include, at a minimum, an annual inspection to include the Site cover and SSDS to assure that the Site cover remains in place and in good condition and that the SSDS system is operating properly. Any repairs to the SSDS or site cover will be made as needed.

Reporting:

Reporting will include:

- Annual Periodic Review Reports (PRR) that will include the results and evaluation of the annual indoor air sampling, system inspections, and sub-slab vacuum readings.

Further descriptions of the above requirements are provided in the later sections of this SMP.

SECTION 1.0
INTRODUCTION AND DESCRIPTION OF THE REMEDIAL PROGRAM

1.1 Introduction

This Site Management Plan (SMP) is a required element of the remedial program for the Former Sep's Cleaners (the "Site") located at 250 Livonia Ave., Brooklyn, New York, which is located within a strip mall building that contains a rear driveway (see Figure 1 for Site layout and boundaries). The Site is approximately 0.57 acres in size and is being administered by the New York State Department of Environmental Conservation (NYSDEC). The Site was initially remediated in accordance with a Stipulation Agreement R2-20081016-500 that was executed on October 17, 2008. This Stipulation required the Remedial Party, Riverdale Osborne Towers Upper Manager LLC, to investigate and remediate contaminated media at the Site. Following the initial remediation, the Remedial Party entered into an Order on Consent (CO) Index No. R2-20081016-500, with Site number 224283, on January 14, 2023 with the NYSDEC to provide management for the Site's existing engineering controls and remaining contamination. After completion of the remedial work described in the approved Remedial Action Work Plan (RAWP), some contamination was left in the subsurface at the Site, which is referred to as "remaining contamination." Institutional and Engineering Controls (ICs and ECs) have been incorporated into the Site management to control exposure to remaining contamination to ensure protection of public health and the environment. The Environmental Easement granted to the NYSDEC and recorded with the Office of the City Register of the City of New York, requires compliance with this SMP and all ECs and ICs placed on the site. This SMP was prepared as a requirement of the CO to manage the remaining contamination at the Site until the Environmental Easement is extinguished in accordance with 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 No Further Action/Satisfactory Completion Letter;
- Failure to comply with this SMP is also a violation of Environmental Conservation Law, 6 NYCRR Part 375 and the CO Index #R2-20081016-500; Site #224283 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.

1.2 Purpose

The Site contained soil, soil vapor, and groundwater contamination. ECs were incorporated into the Site remedy to control exposure to remaining contamination to ensure the protection of public health and the environment during the period of remediation.

This SMP has been prepared to describe the remedial program that was undertaken at the Site and provides a description of all procedures required to manage remaining contamination at the Site including:

- Implementation and management of all ECs and ICs.
- Media monitoring.
- Operation and maintenance of systems.
- Performance of periodic inspections, sampling, and reporting.
- Determining the criteria for termination of the system operation.

This SMP was prepared by Dr. Ravi Korlipara P.E. and Peter Dermody C.P.G. , on behalf of Riverdale Osborne Towers Upper Manager LLC, in accordance with the requirements of the NYSDEC's 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.

1.3 Revisions

Revisions to this SMP, as may be required in the future, will be proposed 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

shutdown of the existing EC (the SSDS), post-remedial removal of contaminated sediment or soil, or other significant changes 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.

1.4 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:

1. 60-day advance notice of any proposed changes in Site use that are required under 6NYCRR Part 375 and/or Environmental Conservation Law.

2. 7-day advance notice of any field activity associated with the remedial program.

3. 15-day advance notice of any proposed ground-intrusive activity.

4. 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.

5. Notice within 48 hours of any non-routine maintenance activity.

6. 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.

7. 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:

8. 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 CO, and all approved work plans and reports, including this SMP.
9. 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 Table below includes contact information for the above notifications. The information on this table will be updated as necessary to provide accurate contact information.

Name	**Contact Information**	**Required Notification****
Marlen Salazar, Project Manager	**Phone: 718-482-7129** **Marlen.Salazar@dec.ny.gov**	**All Notifications**
Jane O'Connell, P.G., NYSDEC Regional Remediation Engineer	**Phone: (718) 482-4599** **Jane.oconnell@dec.ny.gov**	**All Notifications**
Kelly Lewandowski, Site Control	**Phone: (518) 402-9569** **kelly.lewandowski@dec.ny.gov**	**Notifications 1 and 6**
Arunesh Ghosh, NYSDOH Project Manager	**Phone: (518) 402-7873** **beei@health.state.ny.us**	**Notifications 3, 5 and 6**
Peter Dermody CPG **Dermody Consulting**	**Phone: 631 905-4868** **pdermody@dm-consulting.net**	**All Notifications**
Barry Cohen **Certilman Balin**	**Phone: 516 296-7044** **bcohen@certilmanbalin.com**	**All Notifications**

Notes:

- Notifications are subject to change and will be updated as necessary.
- Numbers in this column reference the numbered bullets in the notification list in this subsection.

SECTION 2.0
SUMMARY OF PREVIOUS INVESTIGATIONS AND REMEDIAL ACTIONS

2.1 Site Location

The Site is located in Brooklyn, Kings County, New York and is identified as Block 3590, Lot 16 on the New York City Tax Map. The Site is an approximately 0.57-acre area property bounded by Livonia Ave. to the north, a private parking lot to the south, an office building to the east, and Rockaway Ave. to the west.

2.2 Site History

The former Sep's Cleaners unit is currently occupied by the Brownsville Gourmet Deli. The deli is the westernmost unit located within a larger building that contains, west to east, the deli, a Chinese take-out restaurant, a pizza restaurant, a check cashing business, and a supermarket. The building contains a basement below the units with individual basement areas for each business, however, the check-cashing business does not have a basement beneath it (the pizza restaurant basement area extends under the check-cashing business).

The Site is connected to the New York City municipal water supply system and sewage is discharged to the municipal sewer system. The Site building was constructed in 1972.

Sep's Cleaners performed dry cleaning operations and was listed as a Resource Conservation and Recovery Act Small Quantity Generator of spent halogenated wastes.

2.3 Geologic and Hydrogeologic Conditions

The geology of the Site was evaluated during previous investigations that included continuous soil borings performed in the rear driveway to the south of the building from grade to the water table (which occurs at approximately 20 feet below grade). Additional geologic borings were performed prior to installing AS wells to determine the geology of the saturated zone from 20 to 45 feet below grade.

The Site-specific vadose zone geology (as shown in the cross-section in Figure 2) generally consists of brown to dark brown medium-grained sand with occasional silt, minor and sporadic clay, and, in the shallower soil, some fill materials including brick and wood fragments. The Site-specific geology in the saturated zone generally consists of brown medium-grained sand with occasional silt and gravel.

Based on U.S. Geological Survey reports, the Site area is underlain by unconsolidated deposits of sand, clay, and gravel of Cretaceous and Pleistocene ages. In the Site area, the upper sand and gravel deposits comprise the Upper Glacial Formation, which has a thickness of approximately 200 feet. Beneath the Upper Glacial Formation, the Gardiners Clay unit appears to be present.

Based on this information, there was no evidence of significant areas of low permeability materials in the area of concern.

The groundwater at the Site occurs at a depth of approximately 20 feet below grade. The Site-specific groundwater flow direction was calculated and the flow was determined to be generally to the south-southeast (see Figure 3 for the Site-specific groundwater elevation contour map). Based on the March, 1997 water table configuration for Kings and Queens County prepared by the U.S. Geological Survey, the groundwater flow direction in the area of the Site is also generally to the south-southeast and the water table elevation is approximately 7 feet above mean sea level. Based on U.S. Geological Survey topographic quadrangle maps, the elevation at the Site is approximately 26 feet above mean sea level and is generally flat.

Based on the U.S. Geological Survey Report entitled "Simulation of Ground-Water Flow and Pumpage in Kings and Queens Counties, Long Island, New York" (1999), the hydraulic conductivity in the area of the Site was reported to be approximately 200 to 300 feet per day.

The New York City Department of Environmental Protection website showed no public water supply wells within one mile of the Site and the Site area is supplied with drinking water from the Catskill/Delaware/Croton watershed distribution system.

2.4 Summary of Remedial Investigation Findings

A Site Investigation (SI) was performed to characterize the nature and extent of contamination at the Site. The results of the SI are described in the following reports:

- Site Investigation Report for the Former Sep's Cleaners Site" (Dermody Consulting, December, 2008)
- Supplemental SI reports by Dermody Consulting dated March 10, March 23, and May 1, 2009.

Generally, the SIs determined that soil contamination consisting primarily of tetrachloroethylene was present in the soil in the driveway at the rear of the building. The vadose zone column in this area is approximately 20 feet.

Soil

Figure 4 shows the Site layout and a summary of previous soil sampling results and the delineated areas of soil contamination. The figure shows that, prior to remediation, the primary area of vadose zone soil contamination was present in the rear driveway from the area from the building to the former concrete dumpster platform. The concentration of tetrachloroethylene adjacent to the platform was 370,000 micrograms per kilogram (mcg/kg) at SB-15 (0-2'). The second highest concentration of tetrachloroethylene was detected and 57 mcg/kg at SB-8 (16-20') feet below grade. A secondary, less contaminated area of contamination was present from approximately 20 to 40 lateral feet to the east of the primary area. The concentration at this location, SB-22 (0-1'), was 4,200 mcg/kg.

Also, the SI included information about shallow soil sampling performed at 12 locations below the concrete basement floor beneath the former Sep's Cleaners unit (now Brownsville Gourmet Deli). The results showed low concentrations of tetrachloroethylene and other VOCs in the soil that were all below the NYSDEC Part 375 Soil Cleanup Objectives.

Groundwater

Groundwater samples were obtained, prior to remediation, during the SIs from groundwater monitoring wells and Geoprobe sampling locations. Groundwater contamination was found to be present primarily beneath the rear driveway, and was migrating generally to the south-southeast (see Figure 5 for SI groundwater sampling results and plume configuration).

The highest concentrations of tetrachloroethylene and its degradation products [39,000 micrograms per liter (mcg/l)] were detected in the shallow groundwater at GW-5, which was located adjacent to the former concrete dumpster platform (this area also contained the highest tetrachloroethylene concentrations in the soil). The deeper groundwater at this location showed tetrachloroethylene concentrations of 2,500 mcg/l).

Soil Vapor

Soil vapor sampling was performed at 5 locations during the SIs beneath the concrete basement floor in the deli, the former beauty shop (now occupied by the deli), and the Chinese restaurant. The vapor sampling results primarily showed elevated concentrations of tetrachloroethylene (which ranged from 658 mcg/m3 to 140,000 mcg/m3) as well as elevated concentrations of tetrachloroethylene degradation products. Indoor air samples were obtained from the deli (tetrachloroethylene was not detected), the beauty shop (tetrachloroethylene was detected at 83 mcg/m3), the Chinese restaurant

(tetrachloroethylene was detected at 57 mcg/m3), the basement beneath the deli and beauty shop (tetrachloroethylene was detected at 62 mcg/m3), and the basement below the Chinese restaurant (tetrachloroethylene was detected at 76 mcg/m3). These samples were obtained in 2008 and the New York State Department of Health air guideline level at that time was 100 mcg/m3. It has since been reduced to 30 mcg/m3.

It was also found that upgradient wells showed the presence of tetrachloroethylene and its degradation products in the groundwater (the documentation for the apparent source of the upgradient contamination was previously provided to the NYSDEC). Therefore, there is or was an off-Site contribution of contamination in the groundwater at the Site.

Also, soil vapor was detected beneath the downgradient building occupied by Verizon. Soil vapor intrusion (SVI) monitoring was performed for three years at the Verizon building and NYSDEC then determined that no further action was required (see Appendix B for No-Further-Action Letter for the Verizon Building).

2.5 Summary of Remedial Actions

The Site was remediated in accordance with the NYSDEC-approved RAWP (2009) and the subsequent Final Design Report (2013).

2.5.1 Removal of Contaminated Materials

The primary area of soil contamination was located in the rear driveway from the back door of the common access for the deli and Chinese restaurant, to the area of the former concrete dumpster platform (as shown in Figure 4). An Interim Remedial Measures (IRM) action was performed in 2009 (and reported in the Remedial Action Work Plan (2009) that resulted in two phases of excavation and disposal of a total of 33 tons of soil from the area adjacent and west and northwest of the concrete platform (see Figure 6 for areas of excavation). The purpose of this action was to remove soil containing the most significant concentrations of tetrachloroethylene. An initial shallow soil sample from the area of the dumpster platform showed a tetrachloroethylene concentration of 370,000 mcg/kg. Approximately 15 cubic yards of soil was excavated and an end point sample from the north wall of the excavation showed a tetrachloroethylene concentration of 1,900,000 mcg/kg. Therefore, a second phase of excavation was performed and approximately 7 cubic yards of soil was excavated and the end point samples from the north wall of the second area of excavation showed a tetrachloroethylene concentration of 31,000 mcg/kg. A sample from the base of the excavation showed 65,000 mcg/kg. This remaining contamination was addressed by the SVE system. The excavated area was backfilled with clean sand.

2.5.2 Treatment Systems

As per the approved RAWP, the installation of a remedial system was proposed to address the soil, soil vapor, and groundwater contamination at the Site. A Pilot Study was then performed to demonstrate its effectiveness and determine design parameters of the AS/SVE remedial systems proposed in the RAWP and the results were provided in the Pilot Test Report for the Former Sep's Cleaners (2011). The remedial design details were then documented in the Final Design Report (2013).

The remedial system that was installed at the Site consisted of SVE to address the soil and soil vapor contamination, and AS to address the groundwater contamination. The system was in operation from July, 2014 to October, 2022. Section 3.0 provides additional details on the remedial systems at the Site.

2.5.3 Remaining Contamination

The remedial system operated for approximately eight years. Based on quarterly groundwater sampling results and remedial system monitoring, there was a significant decrease in the concentrations of contaminants over time.

For the groundwater, baseline groundwater sampling was performed on July 8, 2014, just prior to the remedial system startup. Shallow (20 to 25 feet) and deep (40 to 45 feet) groundwater monitoring well pairs were installed at three locations (MW-4S/D, MW-5S/D, and MW-6S/D as shown on Figure 5 (the depth to groundwater was 20 feet). The highest initial concentration of tetrachloroethylene was detected at MW-4S 530 mcg/l). The June, 2017 concentration at this well had been reduced to 6.9 mcg/l. The highest initial downgradient concentrations of tetrachloroethylene were detected at well MW-6S (250 mcg/l). The June, 2017 concentration at this location was 7.0 mcg/l. For the sampling round performed in March, 2019, all VOCs were reduced to concentrations below the groundwater standards.

Based on this information, the concentrations of groundwater contamination were significantly reduced by the remediation system. The last round of groundwater samples were obtained in January, 2021 and the results showed continued low concentrations and so the NYSDEC determined that the groundwater remediation was complete and no further monitoring was required.

For the soil contamination, the soil excavation IRM addressed the area of soil containing the highest concentrations of contaminants. The Soil Vapor Extraction (SVE) operated to remove remaining VOCs from the vadose zone soil. During system operation,

monitoring of the concentrations of volatile organic compounds (VOCs) from the SVE exhaust was performed with a photoionization detector (PID). The PID readings during the first few months of system operation showed vapor concentrations that in some instances exceeded 500 parts per million (ppm). For readings from 2017 and thereafter, concentrations of soil vapor had been generally below 5 ppm. The IRM and SVE had the effect of both removing soil contamination (as discussed above) and removing soil vapor contamination, which reduced the potential for SVI.

In March, 2019, two soil samples were obtained to determine the efficacy of the remediation. The results showed that the VOC concentrations at both sampling locations decreased significantly. The concentration of tetrachloroethylene prior to remediation was 370,000 mcg/kg at SB-15 in the shallow soil. 2019 sample SB-15A was obtained approximately two feet from SB-15 due to the installation of subsurface system piping adjacent and west of the concrete platform). The tetrachloroethylene concentration at SB-15A was 170 mcg/kg is significantly below the Part 375-6.8 commercial guideline concentration of 150,000 mcg/kg. Other VOCs are also present at this location at trace to very low concentrations.

For sample SB-22A, the shallow soil tetrachloroethylene concentration was 4,200 mcg/kg prior to the commencement of remediation. The tetrachloroethylene concentration during the subsequent March, 2019 sampling was reduced to 20 mcg/kg. Other VOCs were present in the soil at trace concentrations.

The SVE system continued to operate as a sub-slab depressurization system (SSDS) as well as a soil remediation system until October, 2022 when a separate SSDS was installed within the on-Site building.

The soil vapor is currently being addressed by the SSDS.

SECTION 3.0
ENGINEERING AND INSTITUTIONAL CONTROL PLAN

3.1 General

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

This plan provides:

- A description of the EC/ICs at the Site;
- The basic implementation and intended role of the EC/ICs;
- A description of the key components of the ICs;
- A description of the features to be evaluated during each required inspection and periodic review;
- A description of plans and procedures to be followed for implementation of the EC/ICs;
- Any other provisions necessary to identify or establish methods for maintaining the EC/ICs, as determined by the NYSDEC.

Soil vapors may be present beneath the on-Site building as the result of remaining contamination from the completed remediation or the off-gassing of tetrachloroethylene and other related compounds emanating from an upgradient source.

3.2 Institutional Controls

A series of ICs are required 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 commercial and industrial uses. 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.

These ICs include:

- The property may be used for commercial and industrial use.
- All ECs must be operated and maintained as specified in this SMP.
- All ECs on the Site area must be inspected at a frequency and in a manner defined in this SMP.
- Environmental sampling and monitoring will be performed as defined in this 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 and Mental Hygiene 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.
- 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 ECs must be performed as defined in this SMP;
- Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical component of the ECs 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 soil vapor intrusion must be evaluated for any additional buildings developed in the area within the IC boundaries, and any potential impacts that are identified must be monitored or mitigated.
- Vegetable gardens and farming on the Site are prohibited.
- An evaluation shall be performed to determine the need for further investigation and remediation should large scale redevelopment occur, if any of the existing structures are demolished, or if the subsurface is otherwise made accessible.

3.3 Engineering Controls

3.3.1 Site Cover

Exposure to remaining contamination in soil at the Site is prevented by an approximately four-inch layer of asphalt in the driveway at the rear of the on-Site building as well as the building foundation's concrete slab. In addition, there are no known underground utilities in the area of the layout of the system or the area where the high levels of soil contamination had existed. Therefore, there are no reasonable expectations that a planned breach will be required. However, in the event of a breach of the asphalt for any reason, an Excavation Work Plan will be prepared that will describe the work to be performed and will include the following procedures:

- The driveway entrance will be barricaded along Rockaway Avenue with plywood to prevent access to the area of the breach. A vehicle may be used to seal access to the driveway until the plywood can be affixed along the access point of the driveway. In addition, the workers in each of the units will be instructed to refrain from using their back doors that exit to the driveway.
- The Site owners and NYSDEC will be notified.
- The Health and Safety Plan and Community Air Monitoring Plan (see Appendix C) will be implemented during all activities associated with the repair of the breach.
- Clean sand will be used to fill the breach as necessary.
- The asphalt breach will be performed with either asphalt patch or hot asphalt, dependent upon the size of the breach.
- Upon completion of the repairs to the asphalt, an inspection will be performed weekly for one month to assure that there is no evidence that the asphalt repair has failed and soil is again exposed.
- Following the completion of the repair and weekly inspections, a written report will be submitted to NYSDEC that documents the repairs and provides monitoring readings and photographs.

3.3.2 SSDS Installation and Operation

The layout and locations of the SSDS system is shown in Figure 7. The SSDS was installed at the Site during the period from June to October, 2022. After its completion and commencement of operation, the system was inspected by the NYSDEC Project Manager. The system consists of 12 suction wells installed in the Site building's basement. Each suction well consists of two-inch PVC pipe with a two-foot screened section of pipe installed below the basement's concrete floor and a RadonAway suction fan installed at each location. The vapors are discharged, through piping, to the exterior of the building and above the building's roofline. In addition, vacuum monitoring points were installed at 16 locations to assure that adequate vacuum exists beneath the entire building to address the potential for soil vapor intrusion to the basement. Based on the SSDS installation and subsequent vacuum monitoring, it was determined that there is adequate vacuum throughout the basement floorspace and that the system was operating properly.

The SSDS installation and vacuum monitoring report was completed and submitted to NYSDEC on January 3, 2023 and approved on April 10, 2023. Procedures for operating and maintaining the SSDS are documented in the Operation and Maintenance Manual (Section 5.0 of this SMP).

3.4 Criteria for Completion of Remediation/Termination of the SSDS

Generally, remedial processes are considered complete when monitoring indicates that the remedy has achieved the remedial goals defined in the approved RAWP. The SSDS is expected to be required for a period of 10 to 20 years or until such goals are met.

3.4.1 Site Cover Inspections

The Site cover system is a permanent control and the quality and integrity of this system will be inspected annually at defined, regular intervals in accordance with this SMP. The remedial party will also conduct any needed Site restoration activities, such as asphalt patching and filling cracks in the on-Site building slab.

3.4.2 SSDS Operation

The SSDS operation will not be discontinued unless prior written approval is granted by the NYSDEC. In the event that monitoring data indicates that the SSDS system is no longer required, a proposal to discontinue the system will be submitted to the NYSDEC on behalf of the property owner. Conditions that warrant discontinuing the SSDS include contaminant concentrations in the sub-slab soil vapor that are minimal or non-existent followed by a temporary shutdown of the SSDS for 30 days. The sub-slab vapor

concentrations of contamination will again be sampled and evaluated to determine if the contaminant concentrations remain sufficiently low to warrant the removal of the SSDS.

In the event that monitoring data indicates that the system is no longer required, a proposal to discontinue the system will be submitted to the NYSDEC and the NYSDOH to include the sampling procedures and results.

3.4.3 Soil Vapor Intrusion Evaluation

The construction of additional enclosed structures at the Site is unlikely. However, in the event that structures are constructed at the Site, an evaluation will be performed to determine whether any mitigation measures are necessary to eliminate potential exposure to soil vapor intrusion. Alternatively, a vapor mitigation system may be installed as an element of the building foundation without first conducting an investigation. This mitigation system would include a vapor barrier and a passive SSDS system that is capable of being converted to an active system, if necessary.

Prior to conducting an SVI investigation or installing a mitigation system, a work plan will be developed and submitted to the NYSDEC and NYSDOH for approval. This work plan will be developed in accordance with the NYSDOH "Guidance for Evaluating Soil Vapor Intrusion in the State of New York" (2006, plus updates). Measures to be employed to mitigate potential vapor intrusion will be evaluated, selected, designed, installed, and maintained based on the evaluation, the NYSDOH guidance, and construction details of the proposed structure.

SVI and indoor air sampling results, evaluations, and follow-up actions will also be summarized in the Periodic Review Report. If any indoor air analytical results exceed NYSDOH guidelines, relevant NYSDOH fact sheets will be provided to all tenants and occupants of the new building within 15 days of receipt of analytical data.

3.4.4 Inspections and Notifications

Inspections of all remedial components installed at the Site will be conducted at a frequency specified in the monitoring plan schedule. Also, a comprehensive Site-wide inspection will be conducted annually. The inspections will determine and document the following:

- Whether ECs continue to perform as designed.
- Determine if the controls continue to be protective of human health and the environment.

- Compliance with requirements of this SMP.
- Achievement of performance criteria.
- Sampling and analysis of appropriate media during monitoring events.
- Determine if Site records are complete and up to date.
- Changes, or needed changes, to the SSDS or monitoring system.

Inspections will be conducted in accordance with the procedures set forth in the monitoring plan.

If an emergency, such as a natural disaster or an unforeseen failure of any of the ECs occurs, an inspection of the Site will be performed within 5 days of the event to verify that the EC/ICs are operating properly.

Notifications will be submitted to the NYSDEC as needed for the following reasons:

- 60-day advance notice of any proposed changes in Site use.
- Notice within 48-hours of any damage or defect to the structure's foundations that reduces or has the potential to reduce the effectiveness of other ECs and likewise any action to be taken to mitigate the damage or defect.
- Notice within 48 hours 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, including 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 will be submitted to the NYSDEC within 45 days and will describe and document 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 has been provided all approved work plans and reports, including this SMP.

- Within 15 days following the transfer of all or part of the Site, the new owner's name, contact representative, and contact information will be provided to the NYSDEC in writing.

Emergencies may include injury to personnel, fire or explosion, environmental release, or serious weather conditions.

For emergencies, appropriate emergency response personnel should be contacted. These emergency contact lists will be maintained in the remediation compound.

Emergency Contact Numbers

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

Contact Numbers

Peter Dermody, C.P.G. Dermody Consulting	(631) 905-4868

3.4.5 Directions to Nearest Health Facility

The nearest medical facility to the Site is Brookdale Medical Center (1 Brookdale Plaza, Brooklyn, NY). The directions to the hospital are: exit the Site and turn left (south) onto Rockaway Avenue and continue for 0.4 miles. Turn right (west) on Hegeman Avenue and proceed for 0.3 miles. Turn left (south) onto East 98th Street and continue for 75 feet. The hospital entrance is on the right side (west) of the street. The travel time is approximately three minutes. Follow the signs to the Emergency Room. The route to the hospital will be placed in the Mapquest App on the cell phones of all field personnel.

A map showing the route to Brookdale Medical Center is provided on the last page of the Health and Safety Plan in Appendix C.

SECTION 4.0
SITE MONITORING PLAN

The Monitoring Plan describes the measures for evaluating the performance and effectiveness of the SSDS to reduce or mitigate impacts at the Site. This Monitoring and Sampling Plan may only be revised with the approval of the NYSDEC project manager. Details regarding the sampling procedures, data quality usability objectives, analytical methods, etc. for all samples collected as part of site management for the Site are included in the Quality Assurance Project Plan provided in Subsection 4.4.

This Monitoring Plan describes the methods for:

- Sampling and analysis of indoor air and sub-slab soil vapor.
- Assessing compliance with applicable NYSDEC and NYSDOH standards, criteria, and guidance.
- Evaluating Site information to confirm that the remedy continues to be effective in protecting public health and the environment.
- Preparing the necessary reports for the various monitoring activities.

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

- Sampling locations, protocol, and frequency.
- Information on all designed monitoring systems.
- Analytical sampling program requirements.
- Reporting requirements.
- Quality Assurance/Quality Control (QA/QC) requirements.
- Annual inspection and reporting.

Monitoring and sampling of the indoor air and monitoring of the sub-slab soil vapor will be performed. Contaminant levels will be evaluated to determine if the SSDS continues to be effective in achieving its goals. The monitoring programs and schedule are provided as follows:

Monitoring Schedule

Monitoring Program	Frequency	Matrix	Analysis
Sub-slab Soil Vapor	Annually	Air	Total VOCs by PID
Indoor Air	Annually	Air	VOCs by Method TO-15
Site-Wide Inspection	Annually	Not Applicable	Not Applicable

4.1 Soil Vapor Monitoring

Soil vapor monitoring will continue to be performed annually at a minimum. The monitoring will be performed to determine the concentrations of total VOCs present in the vadose zone soil vapor. This information will be used to evaluate trends in VOC concentrations over time.

The monitoring will be performed with a photoionization detector (PID). The PID readings will be obtained from each of the sampling ports at each suction well. The sampling ports will be located on the discharge side of the suction fan and from a valved sampling port. The PID readings will be recorded in the field notebook.

4.2 Indoor Air Monitoring

Indoor air monitoring will be performed annually to assess the performance of the SSDS within each of the four basements: Brownsville Deli, the Chinese Restaurant, the Pizza Restaurant, and the Supermarket. The samples will be obtained with 6-liter Summa Canisters with 8-hour flow restrictors. The samples will be placed with the sample intake at a height of approximately 3-5 feet above floor level. The samples will be laboratory analysis for VOCS by Method TO-15.

The purpose of the indoor air sampling is to confirm that the SSDS is adequately preventing soil vapor intrusion into the building.

4.3 Site-Wide Inspections

Site-wide inspections will be performed annually and, if necessary, following severe weather events that may affect ECs or monitoring devices. Following these inspections, an inspection report will be prepared for submittal to the NYSDEC. The report will 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, a health and safety inspection.
- Compliance with the schedules included in the Operation and Maintenance Plan (as presented in Section 5.0).

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 project manager 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 defined in 6 NYCCR Part 375. Written confirmation must be provided to the NYSDEC project manager 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. The remedial party will submit follow-up status reports to the NYSDEC within 45 days of the event on actions taken to respond to any emergency event requiring ongoing responsive action, describing and documenting actions taken to restore the effectiveness of the ECs.

4.4 Quality Assurance Project Plan

All sampling and analyses will be performed in accordance with the requirements of this Quality Assurance Project Plan (QAPP). QA/QC procedures will be followed during the performance of the Site monitoring to ensure that the resulting data accurately represent the Site conditions. Data collection will include indoor air sampling and PID monitoring.

The annual indoor air sampling will be performed during the heating season (November 15th to March 31st). The samples will be collected using six-liter Summa Canisters equipped with eight-hour flow controllers and analyzed for VOCs by Method TO-15 with select ion monitoring (SIM). The samples will be obtained at a height of 3 to 5 feet above floor level.

Soil vapor monitoring will be performed by connecting a PID to the SSDS sample ports at each suction well using polyvinyl vinyl tubing. Prior to its use, the PID will be calibrated according to its manufacturer's instructions using background, outdoor ambient air to represent the zero parts per million (ppm) span gas and 100 ppm isobutylene gas. The ball valves in the sampling ports will be opened once the PID is connected and the peak reading for each SSDS well will be recorded in the field book.

4.4.1 Labeling, Chain-of-Custody, and Transportation Procedures

The indoor air samples will be collected in Summa Canisters.

For each day of sampling, chain-of-custody forms will be completed and submitted to the laboratory (NYSDOH ELAP certified) with the samples. Each form will include the project name, the sampler's signature, the sampling locations and sample identifiers, and the analytical parameters requested.

4.4.2 Calibration

All field monitoring equipment will be calibrated according to the manufacturer's instructions prior to use in the field. Field monitoring equipment calibration results will be recorded in the field sampler's notebook and appropriate notations of the results will be made in appropriate reports.

4.4.3 Sample Analysis

All samples will be submitted to a NYSDOH ELAP-approved laboratory. Laboratory testing and data reporting will be performed by York Analytical Laboratories.

All air and soil vapor samples will be analyzed for VOCs by Method TO-15. All samples will be delivered to the laboratory within 48 hours.

4.4.4 Miscellaneous

The project manager for this project is Peter Dermody, C.P.G., Principal Hydrogeologist. The project engineer is Dr. Ravi Korlipara, P.E.

4.4.5 Monitoring/Inspection Reports

Reports will be generated following monitoring events and will contain the following:

- Date of event.
- Description of the activities performed.
- Type of samples collected.
- Sampling results in comparison to appropriate standards/criteria.
- A figure showing the sampling locations.
- Laboratory data reports.
- Observations, conclusions, or recommendations.
- Comparison of the results to previous monitoring rounds.

SECTION 5.0
OPERATIONS AND MAINTENANCE MANUAL

5.1 Introduction

This O&M Plan describes the measures necessary to operate, monitor and maintain the mechanical components of the remedy selected for the Site. This O&M Plan:

- Includes the steps necessary to allow individuals unfamiliar with the Site to operate and maintain the SSDS;
- Includes an O&M contingency plan; and,
- Will be updated periodically to reflect changes in Site conditions or the manner in which the SSDS is operated and maintained.

A copy of this O&M Plan, along with the complete SMP, will be kept at the Site. This O&M Plan is not to be used as a stand-alone document, but as a component of the SMP.

5.2 Engineering Control System Operation and Maintenance

Operations and maintenance of the SSDS will be performed to ensure that all process equipment is operating according to manufacturer and design specifications, and that the remedy is effective in mitigating groundwater contamination.

5.2.1 SSDS System

Operation and maintenance of the SSDS will be performed to ensure that all process equipment is operating according to manufacturer and design specifications, and that the system remains effective in eliminating the vapor intrusion pathway into the Site building.

5.2.2 SSDS Monitoring

An SSDS was installed to eliminate all potential pathways of direct human contact with soil vapor contaminants through vapor intrusion into the on-Site building. This EC is being implemented until the potential for soil vapor intrusion is fully mitigated and meets NYSDOH guidelines. The SSDS creates a negative pressure gradient across the building basement's slab (i.e., a lower pressure beneath the slab than above the slab). Long-term monitoring will be performed to support EC efforts, providing an understanding of changes in contaminant concentrations, degradation, and distribution over time.

To monitor the vacuum pressure beneath the building basement's concrete slab, 16 soil vapor monitoring points were installed at various locations. Vacuum monitoring

will be performed annually to assure vacuum levels at all locations are equal to or exceed the New York State Department of Health guideline requirement of a minimum vacuum of 0.004 inches of water. The monitoring will be performed using Summa Canisters with eight-hour flow controllers. Food-grade polyethylene tubing will be connected to the Summa Canister and to the existing, valved sampling ports.

5.2.3 Equipment Monitoring

During annual O&M, system parameters (sub-slab vacuum) will be recorded in the operator field data sheets. A visual inspection of the complete system will be conducted during the monitoring event.

5.2.4 Sampling Event Protocol

During the initial annual inspection (February, 2023), air sampling was performed at suction well points to determine the concentrations of each VOC and the results will be used to assure that there are no exceedances of the NYSDEC air discharge limits. The samples were obtained as grab samples with Summa Canisters from the discharge of the suction wells.

5.3 Maintenance and Performance Monitoring Reporting Requirements

Maintenance reports and any other information generated during regular operations at the Site will be kept in hard copy and electronic files off Site. All reports, forms, and other relevant information generated will be available upon request to the NYSDEC and submitted as part of the Periodic Review Report.

5.3.1 Routine Maintenance Reports

A checklist (see Appendix D) will be completed during each routine maintenance event. The checklist will include, but not be limited to the following information:

- Date;
- Name, company, and position of person(s) conducting maintenance activities;
- Maintenance activities conducted;
- 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).

5.3.2 Non-Routine Maintenance Reports

During each non-routine maintenance event, a report will be completed which will include, but not be limited to, the following information:

- Date;
- Name, company, and position of person(s) conducting non-routine maintenance/repair activities;
- Presence of leaks;
- Date of leak repair;
- Other repairs or adjustments made to the system;
- 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).

The results of the Site monitoring data will be evaluated as part of the EC/IC certification to confirm that the:

- EC/ICs are in place, are performing properly, and remain effective.
- The Monitoring Plan is being implemented.
- Operations and maintenance activities are being conducted properly.
- The Site remedy continues to be protective of public health and the environment and is performing as designed.

As part of the annual Site-wide inspection report, the following certification will be prepared for submittal to the NYSDEC annually:

For each EC/IC for the Site, it will be certified that:

- The inspection of the Site to confirm the effectiveness of the EC/ICs.
- The EC/ICs employed at the Site are unchanged from the date the control was put in place, or last approved by the NYSDEC.

- Nothing has occurred that would impair the ability of the control to protect public health and the environment.
- The EC systems are performing as designed and are effective.

If any component of the SSDS is found to have failed, a corrective measures 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 plan until it is approved by the NYSDEC.

The SSDS system has a warning device to indicate that the system is not operating properly. In the event that warning device is activated, applicable maintenance and repairs will be conducted, as specified in the Operation and Maintenance Plan, and the SSDS will be restarted. Operational problems will be noted in the Periodic Review Report to be prepared for that reporting period.

5.3.3 Evaluation of Records and Reporting

The results of the inspection and Site monitoring data will be evaluated as part of the EC/IC certification to confirm that the:

- EC/ICs are in place, are performing properly, and remain effective;
- The Monitoring Plan is being implemented;
- Operation and maintenance activities are being conducted properly; and, based on the above items,
- The Site remedy continues to be protective of public health and the environment and is performing as designed in the RAWP.

5.4 Certification of ECs/ICs

After the last inspection of the reporting period, a Professional Engineer licensed to practice in New York State will prepare the following certification:

For each ECs or ICs identified for the Site, the engineer will certify the following tasks:

- The inspection of the Site to confirm the effectiveness of the ECs or ICs required by the remedial program.

- The ECs and ICs employed at this Site are 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.
- 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.
- The EC systems are performing as designed and are effective.
- To the best of my knowledge, the work and conclusions described in this certification are in accordance with the requirements of the Site remedial program.
- The information presented in this report is accurate and complete.
- The certification will include the statement, "I certify that all the information presented in this report is accurate and complete. 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, [name], of [business address], am certifying as [Owner or Owner's Designated Site Representative]. [I have been authorized and designated by all site owners to sign this certification] for the Site."

The signed certification will be included in the Periodic Review Report described below.

5.5 Periodic Review Report

A Periodic Review Report will be submitted to the Department every year beginning 16 months after the Satisfactory Completion Letter is issued and until a no-further-action letter is issued by the NYSDEC.

. The report will be prepared in accordance with NYSDEC DER-10 and submitted within 30 days of the end of each certification period. Media sampling results will also 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 inspection forms and other records generated for the Site during the reporting period in electronic format;

- A summary of any discharge monitoring data and/or information generated during the reporting period with comments and conclusions;
- Data summary tables and graphical representations of contaminants of concern by media, 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 will be submitted electronically in a NYSDEC-approved format. 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.
- A Site evaluation, which includes the following:

  -The compliance of the remedy with the requirements of the Site-specific RAWP;

  -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 SSDS and/or Monitoring Plan; and

  −The overall performance and effectiveness of the remedy.

The Periodic Review Report will be submitted, in hardcopy format, to the NYSDEC Central Office and Regional Office in which the Site is located, and in electronic format to NYSDEC Central Office, Regional Office and the NYSDOH Bureau of Environmental Exposure Investigation.

5.6 Corrective Measures Work 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 EC or IC, a corrective measures 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 plan until it is approved by the NYSDEC.

SECTION 6.0
PERIODIC ASSESSMENTS/ EVALUATIONS

6.1 Climate Change Vulnerability Assessment

Climate change is not expected to have a significant impact on the remedial system or ECs/ICs at the Site. With the exception of the discharge piping, all components of the SSDS are within or below the Site building.

The primary threat from climate change is likely to be associated with sea level rise. However, since sea level rise is estimated to be approximately 1.4 inches per decade, and the Site is located at an elevation of 27 feet above mean sea level, flooding does not appear to be likely. Also, there are no streams or tidal creeks located within one mile of the Site.

If the frequency and intensity of storm events increase due to climate change, it is possible that heavy rains could occur more frequently at the Site. However, the Site and its surrounding area are generally level and significant amounts of surface water are not known to have accumulated on the ground surface at the Site.

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 Periodic Review Report (PRR). This assessment will include, but not be limited to, a discussion of items listed below, in relation to the implementation and operation and maintenance of the selected remedy. Where appropriate, quantification of these items should be provided:

- Waste Generation (describe the management of waste associated with the site and any waste reduction projects implemented).

- Energy usage (electrical usage for operation of remedial systems, site lighting, security systems, etc.).

- Emissions (vapor-phase system emissions, fuel usage for transportation to and from the site for inspections and/or sampling, operation of gas-powered generators, etc.).

- Water usage (identify sources of decontamination water, irrigation water, etc.).

- Land and/or ecosystems (describe any disturbances and restoration of land and/or ecosystems as part of implementation/operation of the remedy). Methods proposed to reduce energy consumption, resource usage, waste generation, water usage, etc. should be included in the PRR.

6.2.1 Timing of Green Remediation Evaluations

For major remedial system components, green remediation evaluations and corresponding modifications will be undertaken as part of a formal Remedial System Optimization (RSO), or at any time that the Project Manager feels appropriate, e.g. during significant maintenance events or in conjunction with storm recovery activities. Modifications resulting from green remediation evaluations will be routinely implemented and scheduled to occur during planned/routine operation and maintenance activities. Reporting of these modifications will be presented in the PRR. Include the following sections, as appropriate:

6.2.2 SSDS

The SSDS at the Site uses minimal electricity (approximately 150 watts per suction well) and will be operated properly considering the current site conditions to conserve materials and resources to the greatest extent possible. Spent materials will be sent for recycling, as appropriate.

6.2.3 Building Operations

The building at the Site will be operated and maintained to provide for the most efficient operation of the remedy.

6.2.4 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 to conduct system checks and or collect samples and shipping samples to a laboratory for analyses 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 project protectiveness but reduces expenditure of energy or resources. Consideration shall be given to:

- Reduced sampling frequencies;
- Reduced site visits and system checks;
- Coordination/consolidation of activities to maximize foreman/labor time; and
- Use of mass transit for site visits, where available.

6.2.5 Metrics and Reporting

Metrics reporting for green remediation is required for state-funded projects however it is strongly recommended for all other sites by NYSDEC. Site Management Forms, information on energy usage, solid waste generation, transportation and shipping, water usage and land use and ecosystems may be recorded to facilitate and document consistent implementation of green remediation during site management and to identify corresponding benefits.

6.3 SSDS Optimization

A Site Optimization study may be conducted any time that the NYSDEC or the remedial party requests in writing that an in-depth evaluation of the system is needed. This study 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 RAWP;
- 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.

The report may 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. The study may focus on overall Site cleanup strategy, process optimization and management with the intent of identifying impediments to cleanup and improvements to site operations to increase efficiency, cost effectiveness and remedial time frames. Green remediation technology and principals are to be considered when performing the study. The study is not a PRR but is complementary to the PRR. While the PRR focuses on the protectiveness of the remedy and compliance with the SMP, and reports on the remedial progress, the study focuses on optimization of and improvements to the remedy. The study is a thorough evaluation of and implementation of actions that will move the Site to closure in a shorter time frame and/or provide cost savings in the long term.

Some recommendations developed in the study process may address concepts such as:

- Improvements that will make the system more efficient and effectively target the contamination;

- Modification or optimization of a treatment system process;

- Application of a new technology or remedial approach;

- Improvements that will reduce energy cost or frequency of site visits;

- Evaluation of vendors and disposal arrangements for cost savings SMP

- Consideration of alternate Site management techniques; and

- Implementation of green remediation concepts.

The phases of the study may include:

- Work plan development;

- Work plan implementation (usually includes data gathering and conceptual site model verification);

- A report; and
- Implementation of recommended actions and final report.