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New York State Department of Environmental Conservation

Division of Environmental Remediation

123 Post Avenue-OU1 Site Monitoring Program

Site No. 130088

Periodic Review Report

(February 2018 through December 2019)

D&B Engineers and Architects, P.C.

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EXECUTIVE SUMMARY	
Category	Summary/Results
Site Classification	The site is currently classified as a Class 2.
Site Management Plan	The Site Management Plan is dated January 2014
Site History	• Remedial Investigation 2000 • Record of Decision 2003 • Site Management Plan 2014
Engineering Controls	1. Soil Vapor Mitigation 2. Cover System
Institutional Controls	Environmental Easement which includes: • Compliance with the Environmental Easement and the SMP by the Granter and the Grantor's successors and assigns; • All ECs must be operated and maintained as specified in the SMP; • All ECs on the Controlled Property must be inspected at a frequency and in a manner specified in the SMP; • Data and information pertinent to Site Management of the Controlled Property must be reported at the frequency and in a manner defined in the SMP; • The property may only be used for commercial use provided that the long-term ECs and ICs included in the SMP are employed; • The property may not be used for a higher level of use, such as residential, restricted residential or commercial without additional remediation and amendment of the Environmental Easement; • All future activities on the property that will disturb remaining contaminated material must be conducted in accordance with the SMP; • The use of groundwater underlying this property is prohibited without treatment rendering it safe for its intended use; • The potential for vapor intrusion must be evaluated for any buildings developed in the area noted in Figure 7 of the SMP; • Vegetable gardens and farming are prohibited on this property; and • The site owner or remedial party will submit to NYSDEC a written certification statement annually.
Certification/Reporting Period	The Certification Period is every 5 years. This PRR covers the time frame from February 15, 2018 to December 31, 2019. The next Period Review Report is due October 2024, with a Site Management Report due first quarter 2021.
Prior PRR/SMR Recommendations	This is the first PRR completed for this Site.

Site Management Activities	Six rounds of groundwater level measurements were collected during this reporting period. Site inspections were conducted during groundwater sampling events. Six groundwater sampling events were conducted in September 2018, December 2018, March 2019, June 2019, September 2019 and December 2019, with samples collected from 3 well locations. Samples were analyzed for volatile organic compounds (VOCs) using USEPA Method 8260C. Four soil vapor sampling events were conducted in September 2018, June 2019, September 2019 and December 2019, with a sample collected from the soil vapor discharge point for laboratory analysis via United States Environmental Protection Agency (USEPA) Method TO-15. One soil vapor intrusion study was conducted in March 2019 with samples collected from two sub-slab vapor points, three soil vapor points, three indoor air and two ambient air locations. All air samples were collected for laboratory analysis of VOCs via United State Environmental Protection Agency (USEPA) Method TO-15. Indoor air monitoring was completed in December 2019.
Non-Routine Site Management Activities	Emerging Contaminant sampling was conducted in September 2019.
Significant Findings or Concerns	No significant findings or concerns were identified during this reporting period.
Cost Evaluation	The total cost of the site management activities during this reporting period was $114,827.55. This cost includes engineering and subcontractor costs (e.g., laboratory, equipment, rentals, etc.) expended by D&B. It does not include any costs incurred by the New York State Department of Environmental Conservation (NYSDEC) or other consultants in support of the project.
Recommendations	Continue groundwater monitoring and soil vapor extraction vapor sampling on a quarterly basis. Complete soil vapor intrusion sampling annually. Complete repairs to correct the SVE system non-routine shutdowns due to power failures or complete an installation of an autodial alarm system. An evaluation should be performed to determine if continued operation of the SVE system is necessary or if an alternate soil vapor mitigation measure, such as installation of a sub-slab depressurization system, should be implemented. While there is an SVE system in operation for the Site, there is insufficient data from the March 2019 SVI and December 2019 indoor air study to conclude whether or not the SVE system effectively mitigates soil vapor from the sub-slab of the apartment building.

	An evaluation should be performed to determine whether additional mitigation for the 135 Post Avenue apartment building is necessary. Update SMP to current NYSDEC template.

1.0 INTRODUCTION

This report represents the first PRR for the 123 Post Avenue Site, which covers the period from February 2018 through December 31, 2019. However, portions of this report incorporate pertinent historical background information and monitoring data from the following reports:

- Record of Decision 2003 (**Appendix A**)
- Interim Site Management Plan, January 2014 (**Appendix B**)

The objectives of this PRR include:

- Presenting a summary of pertinent background information
- Identifying the cleanup goals established for the Site
- Presenting a brief description of the remedy and remaining contamination
- Identifying, reviewing and evaluating:
  - Site monitoring protocols, procedures and documentation
  - condition of the remedy
  - compliance with the ROD and the SMP
  - current institutional and engineering controls
  - remedy performance, effectiveness and protectiveness
  - Supporting decisions/providing justification to modify or end Site management activities, reclassify the Site, or delist the Site
- Determining the frequency and type of subsequent periodic reviews
- Providing an institutional control and engineering control (IC/EC) certification

1.1 Site Description and Project Background

The 123 Post Avenue site, located at 123 Post Avenue in the Village of Westbury, Nassau County (**Figure 1** – Site Location Map), consists of a 50-foot by 189-foot lot (approximately 0.2 acres) located in a densely populated commercial/residential area (**Figure 2** – Site Features Map). The site contains a one story, 3,500 square foot masonry building built in 1949. A strip mall consisting of three businesses (a delicatessen, a tailor and a chiropractor) at ground level and residences on the second floor, is located north of the site. In addition, a multi-story apartment complex is located northwest of the site. The Site building is situated on the northern property boundary of the Long Island Railroad and is located 20 feet from the concrete wall which supports the raised track. The area is serviced by municipal water and sewer.

The 123 Post Avenue site has operated as a dry-cleaning facility since the 1950s. The Nassau County Department of Health (NCDOH) performed a facility inspection in July 1995 and subsequent investigations by the NCDOH and the potential responsible party (PRP) showed elevated levels of site-related tetrachloroethene (PCE) contamination in soil and groundwater.

In response to a pending property transaction, additional environmental investigations were conducted in October 1997 at 117 Post Avenue, located directly south and downgradient of 123 Post Avenue (**Figure 1**). This groundwater investigation, which included the installation of seven wells, revealed shallow groundwater contamination (principally PCE) on this property at elevated levels. The source of contamination was suspected to be the 123 Post Avenue site.

In August 1998 (prior to the implementation of the remedial investigation/feasibility study (RI/FS)), excavation of contaminated soils beneath the 2 Floor Drains (FD#1 - boiler room and FD#2 - work room) was performed (**Figure 3** – Floor Drain Location Map). Following excavation, FD#2 remained contaminated with levels of PCE up to 270 parts per million (ppm). In December 1998 the NYSDEC listed the site as a Class 2 site in the Registry of Inactive Hazardous Waste Disposal Sites in New York. A Class 2 site is a site where hazardous waste presents a significant threat to the public health or the environment and action is required.

A Remedial Investigation (RI) was completed by Anson Environmental ltd. (Anson) in 1999. On-site investigation activities included one soil boring at the location of Floor Drain #2 with one soil sample collected for analysis and the installation of three groundwater monitoring wells. Monitoring well MW-1 was installed upgradient of the floor drains, and monitoring wells MW-2 and MW-3 were installed downgradient of each Floor Drain. Initial sampling results exhibited high concentrations of PCE in the downgradient monitoring wells.

Remedial activities completed following the RI included removal of all contaminated soils around Floor Drain #1 and the excavation of contaminated soils in the area of Floor Drain #2 to approximately six feet below grade. Further excavation could not be competed due to the structural integrity of the building.

On October 4, 2000, groundwater samples were collected at varying depths to determine vertical and horizontal extent of the groundwater contamination. Sampling determined that the plume appeared to be 40 feet wide and most concentrated between 30 and 50 feet below ground surface. Following indoor air sampling in February 2001, the NYSDOH approved the installation of a soil vapor extraction (SVE) system.

Between 2001 and 2006 routine operation and maintenance activated were completed by a call-out contactor to the SVE system on behalf of the NYSDEC. In April 2006 the system was shut down due to issues with the Building Owner, as indicated in the SMP. In 2008 the NYSDEC directed an environmental consultant to complete additional sampling for the Site. As a result, additional contamination was identified in the drywell to the rear of the building. Exposure to

remaining contamination in the rear drywell is minimized by the slotted cover. As the drywell is an active stormwater runoff location, there is percolation of rainwater into the sediment.

In August 2010 the Building Owner signed an Order of Consent with the NYSDEC to operate the SVE system and submit an SMP. The system was reactivated and made operational by a NYSDEC sub-contractor.

An interim SMP was completed in January 2014 approved by NYSDEC in January 2014 and includes an environmental easement (EE) and engineering and institutional controls to mitigate potential exposure pathways (i.e., direct contact, ingestion, or inhalation of VOCs from subsurface groundwater) during future construction work and/or ground intrusive actives. In addition, site management activities specified in the SMP include annual site inspections; quarterly groundwater monitoring; and non-routine inspections and/or maintenance, as needed.

To monitor and ensure continued performance of the remedy presented in the ROD, the NYSDEC issued a work assignment to D&B Engineers and Architects, P.C. (D&B) in February 2018 under D&B's State Superfund Standby Contract with the NYSDEC. Site management activities for the Site were transferred to D&B in the third quarter of 2018. Since approval of the work assignment in February 2018 the following has been completed: the installation and development of two groundwater monitoring wells, installation of three soil vapor points and two sub-slab soil vapor points, performance of non-routine maintenance repairs to the SVE system, groundwater monitoring events conducted during each quarter, completion of a soil vapor intrusion (SVI) study, an indoor air study, and vapor sampling from the SVE system.

1.2 Summary of Remedial Activities

Remedial activities were conducted at the Site between 1991 and 2010 in accordance with the March 2003 ROD. The following is a summary of the Remedial Actions performed at the Site as presented in the SMP:

- Contaminated Soil Removal: Contaminated soils identified around the two Floor Drains have been excavated to the extent possible, including removal of all contaminated soils around Floor Drain #1 and the excavation of contaminated soils in the area of Floor Drain #2 to approximately 6 feet below grade. Further excavation could not be competed due to the structural integrity of the building.

- Sanitary Sewer Sampling: The on-site sanitary system was sampled to determine the integrity of the soil/sediment and determined to be clean.

- Soil Borings: Installation of three soil borings and the collection of nine discrete groundwater samples were completed on-site to determine the extent of the contamination during the RI/FS.

- Soil Cover: Following excavation activities at the Floor Drains, the area was back filled with clean material and covered with concrete flooring. The Floor Drains were closed and sealed. Exposure to remaining contamination in the rear drywell is minimized by the slotted cover. As the drywell is an active stormwater runoff location, there is percolation of rainwater into the sediment.

- SVE Treatment System: Remedial activities included the installation of one SVE treatment system in the metal shed on the east side of the property. The SVE treatment system consists of a blower, PVC piping, manometers, an insulated condensate bypass mounted on the exterior of the shed, a PVC pipe stack and a vent cap. Selected areas of the asphalt driveway were removed to facilitate the installation of subsurface piping for the SVE treatment system and the four SVE wells (RW-1S, RW-2S, RW-3S and RW-4S). The SVE system was installed in May 2001; however, it is not clear how long the system operated prior to D&B's involvement.

- Deed Restrictions: - Execution and recording of an Environmental Notice to restrict land use and prevent future exposure to any contamination remaining at the Site.

Institutional Controls and Monitoring - Development and implementation of a Site Management Plan (SMP) for long term management of remaining contamination as required by the Environmental Easement, which includes plans for: (1) Institutional control; (2) monitoring, and (3) reporting.

As indicated above, the remedial actions were performed at the Site between 1995 and 2010 in accordance with the March 2003 ROD and the January 2014 SMP. **Figure 2** presents the remedial features present on-site.

1.3 Regulatory Requirements/Cleanup Goals

As specified in the ROD and referenced in the SMP, the remediation goals for this Site are to eliminate or reduce to the extent practicable:

- exposures of persons to PCE which has impacted indoor air through volatilization from on-site subsurface soil and groundwater contamination; and
- the release of contaminants from on-site soils into on-site and off-site groundwater that may create exceedances of groundwater quality standards.

Further, the remediation goals for the Site include attaining to the extent practicable:

- ambient groundwater quality standards for impacted on-site groundwater; and

- Recommended Soil Cleanup Objectives for contaminated on-site soils.

1.4 Residual Contamination

Based on the data obtained from the groundwater monitoring conducted throughout this reporting period, residual chlorinated VOC contamination has exhibited increasing levels above NYSDEC Class GA Groundwater Standards in monitoring well MW-3. Monitoring wells MW-1A and MW-2A have exhibited concentrations below the standards throughout this reporting period. Groundwater analytical data is present in **Appendix C – Table 1**.

It should be noted that residual contamination was identified in the rear drywell in 2008. Sampling completed by an engineering consultant on behalf of the NYSDEC identified contamination; however, no remedial activities have been completed to address the remaining soil contamination that is present.

2.0 MONITORING PLAN COMPLIANCE

Upon acquiring the Post Avenue OU-1 work assignment from the NYSDEC, D&B completed the following activities: the installation of a new electrical service to power the existing SVE system; completion of a geophysical survey; groundwater monitoring well installation and development; soil vapor point and sub-slab vapor point installation; completion of a site survey to survey the locations and elevations of the newly installed monitoring wells and vapor points; and non-routine system maintenance activities to enable successful SVE system start-up.

The monitoring scope for the 123 Post Avenue Site as presented in the SMP for this reporting period included weekly Site inspections; quarterly soil vapor and groundwater sampling and analysis, one indoor air study and one soil vapor intrusion study (SMP, 2014). D&B completed six quarterly groundwater monitoring events, four vapor air sampling events, one SVI study, one indoor air study and a Site inspection, as detailed in the SMP. One vapor air sampling event was not completed this reporting period as the SVE system was shut down from October 11, 2018 through April 18, 2019 to allow for the March 2019 SVI study to be completed.

Presented below is a summary of the monitoring and maintenance activities performed throughout this reporting period, as well as an evaluation of Site-related data relative to remedy performance, effectiveness and protectiveness, as appropriate.

2.1 Site Inspection

As presented above, one Site inspection, as detailed in the SMP, was conducted as part of the December 2019 sampling event. **Appendix D** presents the site inspection log completed.

2.2 Groundwater Monitoring Well Installation

Following an initial Site inspection in July 2018, D&B identified monitoring well MW-1 was missing and MW-2 was dry. As such, two groundwater monitoring wells (MW-1A and MW-2A) were

installed in the vicinity of the original wells as replacements on August 13, 2018 by Land Air Water Environmental Services, Inc. (LAWES). The monitoring well locations are provided in Figure 2.

The monitoring wells were installed utilizing a hollow stem auger (HSA) drill rig to depths of approximately 40 feet. Each well was constructed utilizing 2-inch diameter (I.D.) Schedule 40 polyvinyl chloride (PVC) riser and 10 feet of 0.010-inch slotted well screen. A No. 1 well gravel pack was placed around each well screen. A bentonite seal was placed above the sand pack and the remainder of the borehole was grouted to grade. Protective, flush mount casings with locking covers were installed at each well location. Monitoring well construction logs are provided in Appendix E. A summary of the depth of each well and construction details are presented in Table 2-1 below.

Table 2-1 - Monitoring Well Construction Summary

Well ID	Depth of Well (Feet bgs)	Depth of Screened Interval (Feet bgs)	Well Inner Diameter (inches)	Ground Surface Elev. (U.S. Survey Feet)	PVC Elev. (U.S. Survey Feet)	Screened Interval Elev. (U.S. Survey Feet)	Northing (U.S. Survey Feet)	Easting (U.S. Survey Feet)
MW-1A	40	30 – 40	2.0	96.07	95.73	65.73-55.73	192449.03	2113998.69
MW-2A	42	32 - 42	2.0	98.49	98.27	66.27-56.27	192388.2	2113928.94

Notes:
- ID: Identification
- bgs: below ground surface
- Elev.: Elevation
- U.S.: United States
- PVC: Polyvinyl chloride
- Vertical Datum: North American Vertical Datum 88
- Horizontal Datum: North American Datum of 1983 (NAD83) Projected on the Universal Transverse Mercator (Zone 18N)

Following the installation of monitoring wells MW-1A and MW-2A, D&B completed well development activities for the three monitoring wells on-site. Monitoring well development logs are presented in Appendix F.

2.3 Soil Vapor and Sub-Slab Vapor Point Installation

Three soil vapor points (SV-1 through SV-3) were installed in paved areas surrounding the on-site building on August 14, 2018 by LAWES. The soil vapor points were set at approximately 10 feet bgs utilizing direct push techniques. The subsurface soil vapor points were constructed using stainless steel screens and Teflon® lined polyethylene tubing. The vapor point screens are approximately 6-inches long and constructed of double-woven stainless-steel wire. Filter glass beads were placed around the screened portion of each vapor point extending from the bottom of the borehole to approximately 1-foot above the screen. Approximately 6 inches of washed sand were placed directly above the filter glass beads, followed by a bentonite seal above the washed sand to a depth of approximately 1-foot bgs.

Two sub-slab vapor points (SS-1 and SS-2) were installed within the on-site building on August 14, 2018 by LAWES. The concrete slab was cored at each sub-slab sample location. The sub-slab

vapor points were constructed to approximately 1.5 feet below grade, using stainless steel screens and polyethylene tubing. The point screens were approximately 6-inches long and constructed of double-woven stainless-steel wire. Filter glass beads were placed around the screened portion of each vapor point extending from the bottom of the borehole to approximately 4-inches above the screen followed by a washed sand and a bentonite seal.

After construction, each vapor point was purged using a low-flow sample pump to evacuate 3 volumes of soil vapor. A PID was utilized to record volatile organic compound (VOC) concentrations from the soil vapor probes in ppb. Helium was used as a tracer gas to ensure that an adequate surface seal was created during construction. Flush mount protective casings with covers were installed at all soil vapor and sub-slab vapor point locations. Locations of the soil vapor points and sub-slab vapor points are provided in **Figure 2**. Construction logs for the soil vapor points and the sub-slab soil vapor points are provided in **Appendix E**.

2.4 Soil Vapor Extraction System Operations and Maintenance

2.4.1 Non-Routine Maintenance Activities

- On September 9, 2018, Clean Globe Environmental (Clean Globe) was on-site to complete a SVE system inspection, to enable the successful restart of the system. Following the system inspection Clean Globe recommended repair or replacement of the system flow meters, vacuum gauges, effluent piping and gripper plugs at the well heads, as well as installation of a temperature gauge for the effluent piping. Clean Globe returned on September 17, 2018 to complete the above-mentioned maintenance activities to enable the system to be restarted. Clean Globe attempted to fix the flow meters at the on-site recovery wells (RW-1S, RW-2S, RW-3S and RW-4S); however, due to the configuration of the flow meters and housing Clean Globe recommended the use of a hand-held meter to obtain accurate system flow rate readings at the recovery wells through an access point in the PVC piping. Clean Globe replaced the broken vacuum gauges at the on-site recovery wells (RW-1S, RW-2S, RW-3S and RW-4S), at the blower and moisture separator and installed a new temperature gauge on the blower effluent line. Additionally, Clean Globe installed new CPVC piping to the effluent line and removed the granular activated carbon adsorbers, as the previous piping was compromised. Based on vapor samples collected from the SVE system at the start up in September 2018 it was determined that the carbon adsorbers were no longer necessary. Following the above completed maintenance activities, Clean Globe restarted the system on September 17, 2018, of this reporting period.

- On September 27, 2019, D&B was on-site to complete groundwater sampling activities and to assess the issues at RW-1S. It was noted that the vacuum readings for RW-1S were 0.0 inches from April 18, 2019 through September 30, 2019, indicating a potential blockage in the SVE piping or an issue with the valve. While on-site D&B observed that all above grade piping for RW-1S was intact and competent. The SVE

system was operational and RW-2S, RW-3S and RW-4S had adequate vacuum and airflow. Based on the inspection, it appeared that the in-line ball valve on RW-1S may be damaged.

- Clean Globe and D&B returned to the Site on October 2, 2019 to complete the repairs to bring RW-1S to acceptable operating levels. While on-site, Clean Globe completed the re-piping of RW-1S to existing unused PVC pipe.

2.4.2 System Performance Summary

Following the initial startup of the SVE system on September 17, 2018 D&B conducted weekly site visits to complete routine operation and maintenance activities. The SVE system operated for the majority of this reporting period with the exception of some downtime due to electrical malfunctions, non-routine maintenance repairs and SVI studies. System monitoring logs are provided in **Appendix G**. The performance of the SVE system during this reporting period is summarized in **Table 2-2** below.

Table 2-2 - SVE System Performance Summary

Parameter	Totals to Date [3]
SVE System Average Flow Rate (cfm)[1]	172.50
VOC Removal Summary (lbs.)[2]	24.52

1. SVE System flow rates are monitored on a weekly basis.
2. SVE discharge vapor sampling is conducted on a quarterly basis; as such, total VOC removal is calculated based on the discharge vapor samples collected in September 2018, June 2019 and December 2019.
3. Totals are based on SVE System start-up on September 17, 2018 through the end of this reporting period.

2.4.3 Soil Vapor Extraction System Runtime/Downtime Summary

The total elapsed time for this reporting period from September 17, 2018 through December 31, 2019 was 11,216 hours. Of this amount, the SVE system operated for 5,592 hours or 50 percent of the total elapsed time. It should be noted that the SVE system experienced several periods of downtime due to suspected electrical malfunctions, non-routine maintenance activities and one soil vapor intrusion study. A detailed system downtime summary, which identifies specific information regarding alarm conditions, downtime, system restart time, repairs, etc. is provided as **Table 1**. System runtime/downtime summary for the SVE system is summarized below.

Table 2-3 - SVE Runtime/Downtime Summary[1]

	(Hours)	(Percentage)
Total SVE System Runtime	5,592	50%
Total SVE System Downtime	5,624	50%

1. Total SVE System runtime and downtime to date are based the system being restarted on September 17, 2018.

2.5 Groundwater Sampling and Analysis

Six groundwater sampling events were completed at the Site between September 2018 and December 2019. Analytical results from these sampling events are discussed in the sections below. A summary of the groundwater analytical data collected throughout this reporting period is presented in **Appendix C - Table 1**.

Groundwater samples were collected from all three Site monitoring wells (MW-1A, MW-2A and MW-3) using USEPA Low Flow-Low Purge Sampling Protocol in accordance with the Work Assignment. Prior to sampling, water levels were recorded and are presented on **Table 2** and **Figure 4**, as a groundwater elevation map for the most recent sampling event in December 2019. Field parameters including pH, specific conductivity, temperature, turbidity, oxidation-reduction potential (ORP), and dissolved oxygen were measured during well purging using a flow-through cell system and recorded on the individual field purge logs. **Appendix H** presents groundwater monitoring wells field observation logs for all six groundwater sampling events.

Groundwater samples were sent to a NYSDEC-approved analytical laboratory under chain-of-custody procedures for analysis of TCL VOCs using USEPA Method 8260B. At the request of the NYSDEC, all three monitoring wells were analyzed for emerging contaminants: 1,4-Dioxane by USEPA Method 8270 and perfluorinated alkylated substances (PFAS) by Modified USEPA Method 537 in September 2018 of this reporting period and is presented in **Appendix C - Table 2**. The analytical data was validated, and **Appendix I** presents the data validation checklists.

2.5.1 VOC Results in Groundwater

VOCs were not detected in excess of SCG values in monitoring well MW-2A throughout this reporting period. Tetrachloroethene (PCE) was detected in excess of its SCG value of 5 ug/l in monitoring well MW-1A at concentrations ranging from 1.4 ug/l in September 2018 to 1.3 ug/l in March 2019 and in monitoring well MW-3 at concentrations ranging from 5.8 ug/l in December 2018 to 340 ug/l in the December 2019 sampling event. As indicated in **Figure 5,** MW-3 has experienced an increasing trend in PCE concentrations from the beginning of this reporting period. Additionally, Cis-1,2-Dichloroethylene was detected in excess of its SCG value of 5 ug/l in monitoring well MW-3 at a concentration of 6.6 ug/l in June 2019. Concentration trend graphs for all three monitoring wells (MW-1A, MW-2A and MW-3) from September 2018 through the end of this reporting period are presented as **Figure 5**.

2.5.2 1,4-Dioxane Results in Groundwater

1,4-Dioxane was not detected in monitoring well MW-2S; however, slight detections were exhibited in MW-1A and MW-3 in the September 2018 groundwater sampling event.

2.5.3 PFAS Results in Groundwater

PFAS sampling was completed as part of the September 2018 groundwater sampling event.

2.6 SVE Discharge Sampling and Analysis

Four vapor-phase effluent samples were collected for laboratory analysis via United States Environmental Protection Agency (USEPA) Method TO-15. The samples were collected from the SVE effluent system on September 17, 2018, June 29, September 27, and December 13, 2019 as part of the routine system sampling. The total volatile organic compound (VOC) emissions rates for this reporting period ranged from 2.16E-02 to 3.65E-03 pounds per hour (lbs/hr) where the SVE blower average flow rate ranged from 170.91 to 203.85 CFM. Since the system start-up through the end of this reporting period, the SVE system removed approximately 24.52 pounds of VOCs. The emissions rate is below the site-specific effluent limit of 0.5 lbs/hr, which was developed in consultation with the NYSDEC as a means of monitoring VOC emissions associated with the SVE System. The SVE effluent vapor sampling data is presented in **Appendix C - Table 3**.

2.7 Soil Vapor Intrusion Sampling and Analysis

2.7.1 123 Post Avenue Cleaners:

In accordance with the SMP, an annual SVI study was completed for the Site on March 27, 2019 in which two sub-slab soil vapor samples (SS-1 and SS-2) were collected within 123 Post Avenue Cleaners building; three soil vapor samples (SV-1 through SV-3) were collected from soil vapor points surrounding 123 Post Avenue Cleaners; one indoor air sample was collected within the Cleaners (Indoor-123 Cleaners); and one outdoor ambient air sample was collected (Ambient-123 Cleaners). The samples were collected to evaluate the potential for soil vapor intrusion at the property. Additionally, an indoor air sample was collected from the basement of the adjacent property to the north (Indoor-125 Basement). The sample locations are presented in **Figure 6**.

Prior to sampling, each vapor point was purged using a low-flow sample pump to evacuate 3 volumes of soil vapor. A photoionization detector was utilized to record volatile organic compound (VOC) concentrations from the soil vapor probes in parts per billion (ppb) and helium was used as a tracer gas to ensure that the surface seal was intact at each vapor point. Additionally, an indoor air quality questionnaire and building inventory was completed by D&B to evaluate the type of structure, floor layout and physical conditions of the building, as well as identify and minimize conditions that may have affected or interfered with testing. A ppb range PID was used to evaluate potential interferences. The indoor air quality questionnaire and building inventory are presented in **Appendix J**.

The vapor samples were collected utilizing batch certified clean 6-liter SUMMA canisters fitted with laboratory calibrated low-flow regulators. The samples were collected over an 8-hour period with the regulator calibrated at a flow rate that did not exceed 0.2 liters per minute. The sub-slab

and soil vapor samples were connected through tubing directly to the SUMMA canisters and the canisters for the indoor and outdoor samples were placed at a height of approximately 3 feet above grade. Additionally, the outdoor sample was collected in an observed upwind direction. All of the samples were collected for laboratory analysis of VOCs via USEPA Method TO-15.

Several VOCs were detected in the samples collected. The indoor air and sub-slab soil vapor samples were compared to the decision matrices and air guideline values (AGV) provided by the NYSDOH. The comparison to the decision matrices indicates that mitigation is recommended to minimize current or potential exposures associated with soil vapor intrusion due to trichloroethylene (TCE) and PCE contamination. No contaminants were detected in excess of their AGVs in the indoor air sample collected from the basement of 125 Post Avenue; however, both TCE and PCE exceeded their respective AGVs in the indoor air sample collected from 123 Post Avenue Cleaners. It should be noted that 123 Post Avenue Cleaners is currently operated as a dry cleaners and high levels of TCE and PCE may be attributed to the dry-cleaning activities that occur on site. Analytical data summary tables are presented in **Appendix C – Table 4**.

2.7.2 135 Post Avenue Apartment Building:

As part of the March 27, 2019 SVI, one sub-slab soil vapor sample (SV-Apartment Office) and one indoor air sample (Indoor-Apartment Office) were collected within the superintendent's office of the 135 Post Avenue apartment building. Additionally, one outdoor ambient air sample was collected (Ambient Apartment). The samples were collected to evaluate the potential for soil vapor intrusion at the property. The sample locations are presented in **Figure 6**.

Prior to sampling, each vapor point was purged using a low-flow sample pump to evacuate 3 volumes of soil vapor. A PID was utilized to record VOC concentrations from the soil vapor probes in ppb and helium was used as a tracer gas to ensure that the surface seal was intact at each vapor point. Additionally, an indoor air quality questionnaire and building inventory was completed by D&B to evaluate the type of structure, floor layout and physical conditions of the building, as well as identify and minimize conditions that may have affected or interfered with testing. A ppb range PID was used to evaluate potential interferences. The indoor air quality questionnaire and building inventory are presented in **Appendix J**.

The vapor samples were collected utilizing batch certified clean 6-liter SUMMA canisters fitted with laboratory calibrated low-flow regulators. The samples were collected over an 8-hour period with the regulator calibrated at a flow rate that did not exceed 0.2 liters per minute. The sub-slab soil vapor sample was connected through tubing directly to the SUMMA canister and the canisters for the indoor and outdoor vapor samples were placed at a height of approximately 3 feet above grade. Additionally, the outdoor vapor sample was collected in an observed upwind direction. All of the vapor samples were collected for laboratory analysis of VOCs via USEPA Method TO-15.

Several VOCs were detected in the vapor samples collected. The indoor air and sub-slab soil vapor samples were compared to the decision matrices and AGV provided by the NYSDOH. The comparison to the decision matrices indicates that mitigation is recommended to minimize current or potential exposures associated with soil vapor intrusion due to TCE and PCE contamination; however, no contaminants were detected in excess of their AGVs in the indoor air sample collected from within the superintendent's office. Analytical data summary tables are presented in **Appendix C - Table 5**.

2.8 Indoor and Ambient Air Sampling and Analysis

D&B completed an indoor air sampling study on December 12, 2019 as directed by the NYSDEC to evaluate the indoor air quality while the SVE system was in operation. Three indoor air samples were collected from 123 Post Avenue Cleaners (Indoor Air – 123 Cleaners), the adjacent property (Indoor Air – 125 Basement) and the surrounding apartment building (Indoor – Apartment Office) and two ambient air samples (Ambient - 123 Cleaners and Ambient - Apartment) were collected on December 12, 2019. The samples were collected utilizing batch certified clean 6-liter SUMMA canisters fitted with laboratory calibrated low-flow regulators. The samples were collected over a 2-hour period with the regulator calibrated at a flow rate that did not exceed 0.2 liters per minute. The indoor and ambient samples were placed at a height of approximately 3 feet above grade. Additionally, the ambient outdoor sample was collected in an observed upwind direction. All of the samples were collected for laboratory analysis of VOCs via United State Environmental Protection Agency (USEPA) Method TO-15. A sample location map is presented as **Figure 7**.

Indoor air samples (Indoor Air–123 Cleaners, Indoor Air-125 Basement and Indoor Apartment Office) exhibited several contaminants of concern; however, both the Indoor Air-125 Basement and Indoor Apartment Office sample results did not have any exceedances. TCE and PCE exceeded their respective AGVs in the indoor air sample collected from 123 Post Avenue Cleaners. It should be noted that 123 Post Avenue Cleaners is currently operated as a dry cleaners and high levels of TCE and PCE may be attributed to the dry-cleaning activities that occur on site. Analytical data summary tables are presented in **Appendix C - Table 6**.

3.0 INSTITUTIONAL AND ENGINEERING CONTROL PLAN COMPLIANCE

3.1 Institutional Controls

The 123 Post Avenue Site is managed as part of New York State's Superfund Program. The Site's inclusion in the Registry as a Class 2 Inactive Hazardous Waste Site acts as an Institutional Control for the Site.

An additional IC for the Site in the form of an Environmental Easement (EE) was granted to the NYSDEC. The EE was filed with the Nassau County Clerk's office and places the following restrictions on the Site:

- Compliance with the Environmental Easement and the SMP by the Granter and the Grantor's successors and assigns;
- All ECs must be operated and maintained as specified in the SMP;
- All ECs on the Controlled Property must be inspected at a frequency and in a manner specified in the SMP;
- Data and information pertinent to Site Management of the Controlled Property must be reported at the frequency and in a manner defined in the SMP.
- The property may only be used for commercial use provided that the long-term ECs and ICs included in the SMP are employed.
- The property may not be used for a higher level of use, such as residential, restricted residential or commercial without additional remediation and amendment of the Environmental Easement;
- All future activities on the property that will disturb remaining contaminated material must be conducted in accordance with the SMP;
- The use of groundwater underlying this property is prohibited without treatment rendering it safe for its intended use;
- The potential for vapor intrusion must be evaluated for any buildings developed in the area noted in Figure 7 of the SMP;
- Vegetable gardens and farming are prohibited on this property; and
- The site owner or remedial party will submit to NYSDEC a written certification statement annually.
- Institutional controls will be imposed in the form of existing use and development restrictions, preventing the use of groundwater as a source of potable or process water without necessary water quality treatment as determined by the Nassau County Department of Health (NCDOH).

3.2 Engineering Control

The engineering controls (EC) established for this Site consists of one SVE treatment system and the soil vapor cover system. The SVE removes soil vapors from below the concrete floor of the building and vent them through the blower system above the SVE shed. The system is designed to mitigate exposure to contaminated indoor air resulting from the soil vapor. The SVE treatment systems consists of a blower, PVC piping, manometers, a PVC pipe stack, and a vent cap. Selected

areas of the asphalt were removed to facilitate the installation of subsurface piping for the SVE treatment systems.

The ECs also include a system of groundwater monitoring wells and vapor point sampling locations. The analytical results of samples collected from these locations will be used to evaluate the natural attenuation of contaminants from the site.

4.0 COST EVALUATION

The total cost of the site management activities during this reporting period was $114,827.55. This total includes engineering and Site management costs associated with the project. It should be noted that this total does not include any administrative costs incurred by the NYSDEC in support of the project. A review of the Site management costs for this reporting period is provided below.

COST SUMMARY		
Cost Item	**Expended**	**Percent of Total**
Engineering Support	$69,804.09	61%
Expenses	$5,130.20	4%
Sub-total	$74,934.29	65%
Sub-Contractors	$27,511.54	24%
Laboratory	$8,336.57	7%
Utilities	$4,045.15	4%
Sub-total	$39,893.26	35%
TOTALS	**$114,827.55**	100%

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

- The SMP was in effect for the period February 9, 2018 through December 31, 2019. The IC operated as intended this reporting period.
- The ECs operated as intended throughout this reporting period.
- Site and groundwater use are consistent with the restrictions set forth in the SMP.
- The remedy is protective of human health and the environment.

- Per the SMP, sampling events are conducted every quarter. Therefore, the next groundwater and SVE vapor sampling and analysis event should be conducted in March 2020, the first quarter of 2020. It should be noted that a SVI study shall be completed in January 2020 of the next reporting period.

- Remediation goals, which pertains to attaining to the extent practicable ambient groundwater quality standards, have not been achieved.

5.2 Recommendations

- Sub-slab soil vapor sampling should continue for VOCS, as specified in the SMP, with a frequency of annually during heating season.

- Based on the concentrations of VOCs detected in groundwater, groundwater sampling should be continued to be completed every quarter for VOCs.

- An evaluation of the remaining contamination in the dry well identified at the rear of the building should be completed.

- An evaluation of the SVE system should be complete for causes of equipment malfunctions and non-routine downtime. In addition, consider installation of an autodial alarm notification system.

- An evaluation should be performed after completion of the SVI study to determine if continued operation of the SVE system is necessary or if an alternate remedial measure such as installation of a sub-slab depressurization system should be implemented.

- An evaluation should be performed to determine whether additional mitigation for the 135 Post Avenue apartment building is necessary. While there is an SVE system in operation for the Site, there is insufficient data from the March 2019 SVI and December 2019 indoor air study to conclude whether or not the SVE system effectively mitigates soil vapor from the sub-slab of the apartment building.

- The SMP should be updated and consistent with the most up to date template.

- It is recommended that the PRRs continue to be completed every five (5) years to certify the ICs and ECs are in-place, effective and protective of human health and the environment.

6.0 RECLASSIFICATION/DELISTING EVALUATION

The Site's inclusion in the Registry as a Class 2 Inactive Hazardous Waste Site acts as an Institutional Control for the Site. Reclassification is not feasible at this time.

7.0 CERTIFICATION

IC/EC Certification for the reporting period ending February 3, 2019 is presented in **Appendix K**.