SENDERO VERDE REDEVELOPMENT PROJECT – PARCEL B

NEW YORK COUNTY

NEW YORK, NEW YORK

SITE MANAGEMENT PLAN

NYSDEC Site Number: C231128

USEPA ID # NYR000242388

Prepared for:

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Revisions to Final Approved Site Management Plan:

Revision No.	Date Submitted	Summary of Revision	NYSDEC Approval Date

DECEMBER 2020

CERTIFICATION STATEMENT

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

__________________________ P.E.

December 11, 2020 DATE

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LIST OF ACRONYMS

AS	Air Sparging
ASP	Analytical Services Protocol
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CAMP	Community Air Monitoring Plan
C/D	Construction and Demolition
CFR	Code of Federal Regulation
CLP	Contract Laboratory Program
COC	Certificate of Completion
CO2	Carbon Dioxide
CP	Commissioner Policy
CVOCs	Chlorinated Volatile Organic Compounds
DER	Division of Environmental Remediation
EC	Engineering Control
ECL	Environmental Conservation Law
ELAP	Environmental Laboratory Approval Program
ERP	Environmental Restoration Program
EWP	Excavation Work Plan
GHG	Green House Gas
GWE&T	Groundwater Extraction and Treatment
HASP	Health and Safety Plan
IC	Institutional Control
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYCRR	New York Codes, Rules and Regulations
O&M	Operation and Maintenance
OM&M	Operation, Maintenance and Monitoring
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
PCBs	Polychlorinated Biphenyls
PID	Photoionization Detector
PRP	Potentially Responsible Party
PRR	Periodic Review Report
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RAO	Remedial Action Objective
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RP	Remedial Party
RSO	Remedial System Optimization

SAC	State Assistance Contract
SCG	Standards, Criteria and Guidelines
SCO	Soil Cleanup Objective
SMP	Site Management Plan
SOP	Standard Operating Procedures
SOW	Statement of Work
SPDES	State Pollutant Discharge Elimination System
SSD	Sub-slab Depressurization
SVE	Soil Vapor Extraction
SVI	Soil Vapor Intrusion
SVOCs	Semivolatile Organic Compounds
TAL	Target Analyte List
TCL	Target Compound List
TCLP	Toxicity Characteristic Leachate Procedure
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VCA	Voluntary Cleanup Agreement
VCP	Voluntary Cleanup Program
VOCs	Volatile Organic Compounds

EXECUTIVE SUMMARY

The following provides a brief summary of the controls implemented on the portions of the site that achieved Track 2 or Track 4 remedial action objectives, as well as the inspections, monitoring, maintenance and reporting activities required by this Site Management Plan:

Site Identification:	C231128, Sendero Verde Redevelopment Project - Parcel B
Institutional Controls:	1. The property may be used for restricted residential, commercial, or industrial use.
	2. Compliance with the Environmental Easement by the Grantee and Grantee's successors and adherence to all elements of the SMP is required.
	3. All ECs must be operated and maintained as specified in this SMP.
	4. All ECs must be inspected and certified at a frequency and in a manner defined in the SMP.
	5. Data and information pertinent to Site Management must be reported at the frequency and in a manner defined in the SMP.
	6. The potential for vapor intrusion must be evaluated for any future buildings (excluding the buildings currently under construction at the time this SMP was issued) developed in the area within the IC boundaries noted on Figure 5, and appropriate actions to address exposures must be implemented;
	7. Vegetable gardens and farming are prohibited, with the exception of raised planting beds.
	8. 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.

Site Identification:	C231128, Sendero Verde Redevelopment Project - Parcel B	
	9. All future activities on the property that will disturb remaining contaminated material are prohibited unless they are conducted in accordance with the SMP.	
	10. 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.	
Engineering Controls:	Cover system	
Inspections:		Frequency
Cover inspection		Annually
Monitoring: Not applicable		Not applicable
Maintenance: Not applicable		Not applicable
Reporting:		
Periodic Review Report		First report 16 months after COC is issued, then annually, until completion and documentation of all development-related construction, then every 3 years thereafter.

Further descriptions of the above requirements are provided in detail in the latter sections of this site management plan.

1.0 Introduction

1.1 General

This Site Management Plan (SMP) is a required element of the remedial program for the Sendero Verde Redevelopment Project- Parcel B located in the Borough of Manhattan, City and State of New York (hereinafter referred to as the “Site”). See Figure 1. The Site is currently in the New York State (NYS) Brownfield Cleanup Program (BCP), Site No. C231128, which is administered by New York State Department of Environmental Conservation (NYSDEC).

SV-B Owners LLC entered into a Brownfield Cleanup Agreement (BCA) on February 27, 2019 with the NYSDEC to remediate the Site. BCA Amendment No. 1 was executed on September 5, 2019 to change the ownership, subdivide lots, and reduce the Site acreage by 0.07 acres. BCA Amendment No. 2 was executed on July 22, 2020 to remove Lots 125 and 140 from the Site, which together constituted a total reduction in Site acreage of approximately 0.27 acres, resulting in an amended Site acreage of approximately 1.16 acres. A figure showing the Site location and boundaries of this Site is provided in Figure 2. The boundaries of the Site are more fully described in the metes and bounds Site description that is part of the Environmental Easement provided in Appendix A.

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

This SMP was prepared to manage 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 Certificate of Completion (COC);
- Failure to comply with this SMP is also a violation of Environmental Conservation Law, 6NYCRR Part 375 and the BCA (Index #C231128-02-19; Site #231128) for the Site, and thereby subject to applicable penalties.

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

This SMP was prepared by Roux Environmental Engineering and Geology, D.P.C. (Roux), on behalf of SV-B Owners LLC, in accordance with the requirements of the NYSDEC's DER-10 ("Technical Guidance for Site Investigation and Remediation"), dated May, 2010 and the guidelines provided by the NYSDEC. This SMP addresses the means for implementing the ICs and/or EC that are required by the Environmental Easement for the Site.

1.2 Revisions

Revisions to this plan 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 shut-down of a remedial system, post-remedial removal of contaminated sediment or soil, or other significant change to the Site conditions. In accordance with the Environmental Easement for the Site, the NYSDEC will provide a notice of any approved changes to the SMP and append these notices to the SMP that is retained in its files.

1.3 Notifications

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

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

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

- 15-day advance notice of any proposed ground-intrusive activity pursuant to the Excavation Work Plan.

- Notice within 48-hours of any damage or defect to the foundation, structures or EC that reduces or has the potential to reduce the effectiveness of an EC, and likewise, any action to be taken to mitigate the damage or defect.

- Verbal notice by noon of the following day of any emergency, such as a fire; flood; or earthquake that reduces or has the potential to reduce the effectiveness of EC in place at the Site, with written confirmation within 7 days that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.

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

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

- At least 60 days prior to the change, the NYSDEC will be notified in writing of the proposed change. This will include a certification that the prospective purchaser/Remedial Party has been provided with a copy of the BCA, and all approved work plans and reports, including this SMP.

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

Table 1 on the following page includes contact information for the above notification. The information on this table will be updated as necessary to provide accurate contact information. A full listing of Site-related contact information is provided in Appendix B.

Table 1: Notifications*

Name	Contact Information
Nigel Crawford, P.E. NYSDEC Project Manager	Phone: 718-482-7778 email: nigel.crawford@dec.ny.gov
Jane O'Connell, NYSDEC Regional Hazardous Waste Remediation Engineer	phone: (718) 782-4599 email: jane.oconnell@dec.ny.gov
Kelly Lewandowski, NYSDEC Site Control Section Chief	phone: (518) 402-9569 email: kelly.lewandowski@dec.ny.gov
Mark Sergott, NYSDOH Project Manager	Phone: (518) 473-0771 Email: beei@health.ny.gov

* Note: Notifications are subject to change and will be updated as necessary.

2.0 SUMMARY OF PREVIOUS INVESTIGATIONS AND REMEDIAL ACTIONS

2.1 Site Location and Description

The Site is located in the Borough of Manhattan, City and State of New York and is identified as Section Manhattan Block 1617 and Lot 20 on the New York City Tax Map (see Figure 2). As described previously, BCA Amendment No. 1 was executed on September 5, 2019 to change the ownership, subdivide lots and reduce the Site acreage by 0.07 acres. BCA Amendment No. 2 was executed on July 22, 2020 to remove Lots 125 and 140 from the Site, which together constituted a total reduction in Site acreage of approximately 0.27 acres, resulting in an amended Site acreage of approximately 1.16 acres. The Site is bounded by East 112th Street to the north, East 111th Street to the south, Lots 34, 140 and Park Avenue to the east, and Lots 21, 120, 125 and Madison Avenue to the west (see Figure 2 – Site Layout Map). The boundaries of the Site are more fully described in Appendix A –Environmental Easement. The owners of the Site parcels at the time of issuance of this SMP is/are:

- Fee Owner - Acacia Sendero Verde II Housing Development Fund Company, Inc.
- Beneficial Owner - SV-B Owners LLC

2.2 Physical Setting

<u>2.2.1 Land Use</u>

The Site (after execution of the amendment to remove Lots 125 and 140) consisted of the following: an unpaved vacant lot surrounded by chain-link fence that was formerly used as a baseball field. The Site is zoned for commercial and residential use and was vacant prior to the start of remedial activities. Previous Site occupants include laundry (1911 to 1979), paint stores (at least 1939 to 1968), residential dwellings (1896 to 1980), dry cleaner (1968), printer (1920), furrier (1920), pharmacy (1947 to 1950) and a shoe sale/manufacturer (1920, 1923 and 1934).

The properties adjoining the Site and in the neighborhood surrounding the Site primarily include commercial and residential properties. The properties immediately south of the Site include commercial and residential properties; the properties immediately north of the Site include residential properties; the properties immediately east of the Site include a current vacant parcel(Lot 140) and elevated Metro North Railroad Tracks in Park Avenue, beyond which is a playground belonging to a public school; and the properties to the west of the Site include a currently vacant parcel (Lot 125) and residential properties.

2.2.2 Geology

The grade at the Site is relatively flat. The elevation of the Site and surrounding area is approximately 18 feet above mean sea level (msl).

Based on the investigations completed on-Site to date, the shallow deposits at the Site are typical of fill material found in urban environments (i.e., brick and concrete). The depth to the bottom of the fill layer extends to between 10 and 15 feet below current grade across the Site. This urban fill material overlies deeper native deposits consisting of mostly medium to coarse sands and gravel with varying amounts of fine sand, silt and clay. Bedrock was not encountered during the Roux Phase II Environmental Site Assessment (ESA) or the completed Remedial Investigation (RI).

A geologic cross section is shown in Figure 3. Site specific boring logs are provided in Appendix C.

2.2.3 Hydrogeology

According to water-level data collected during this RI, the elevation of the water table surface at the Site ranges from approximately 3.09 ft relative to the North American Vertical Datum 1988 (NAVD 88) at the southeast portion of the Site to 4.26 ft NAVD 88 in the northcentral portion of the Site. Groundwater depth at the Site varied from 9.15 ft bls to 12.23 ft bls. Groundwater flow is generally to the southeast towards the Harlem River which is located approximately 3,300 feet east of the Site.

A groundwater contour map is shown in Figure 4. Groundwater elevation data is provided in Table 2. Groundwater monitoring well construction logs are provided in Appendix C.

2.3 Investigation and Remedial History

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

The following environmental reports were available for review:

- Phase I Environmental Site Assessment (ESA), prepared by Roux, dated March 2018.
- Phase II ESA, prepared by Roux, dated June 2018.
- Amendment to the Phase II ESA, prepared by Roux, dated November 13, 2018.
- Phase I ESA, prepared by Roux, dated May 2019.
- Waste Characterization Report, prepared by Roux, dated May 2019.
- Remedial Investigation Report (RIR)/Remedial Action Work Plan (RAWP), prepared by Roux, dated September 2019.

Based on the 2018 and 2019 Phase I ESAs, prior to Site redevelopment, the Site (after the amendment to remove Lots 125 and 140) was a relatively flat vacant, unpaved lot surrounded by chain-link fence and was utilized as a baseball field. A portion of the Site was identified as a laundry from at least 1911 to 1979, and a portion of the Site contained paint stores from at least 1939 to 1968. Numerous residential dwellings existed on-Site between 1896 and 1980. Portions of the Site operated as a dry cleaner (1968), a printer (1920), a furrier (1920), a pharmacy (1947-1950), and a shoe sale/manufacturer (1920, 1923 and 1934).

Based on the 2018 Roux Phase II ESA, the Site (soil, groundwater, and soil gas) appeared to have been impacted by polycyclic aromatic hydrocarbons (PAHs), metals, and pesticides originating from prior Site operations most likely associated with historic urban fill. As part of the NYSDEC BCP, the Site underwent additional investigations to delineate the nature and extent of contamination.

Nature and Extent of Contamination Prior to Remediation

Soil and groundwater samples were analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), metals, polychlorinated biphenyls (PCBs), and pesticides. Groundwater samples were also analyzed for emerging contaminants. Soil vapor samples were analyzed for VOCs. Based upon investigations conducted to date, the primary contaminants of concern are SVOCs and metals.

Soil

Several SVOCs were detected in soil at concentrations exceeding both the unrestricted use soil cleanup objectives (UUSCOs) and the restricted residential soil cleanup objectives (RRSCOs), including: benzo(a)anthracene at a maximum concentration of 22 parts per million (ppm) (UUSCO and RRSCO is 1 ppm), benzo(a)pyrene at a maximum concentration of 21 ppm (UUSCO and RRSCO is 1 ppm), benzo(b)fluoranthene at a maximum concentration of 31 ppm (UUSCO and RRSCO is 1 ppm) and chrysene at a maximum concentration of 27 ppm (UUSCO is 1 ppm and RRSCO is 3.9 ppm). Metals including barium, lead and mercury were found in soil exceeding both the UUSCOs and the RRSCOs. Barium was found at a maximum concentration of 1,490 ppm (UUSCO is 350 ppm and RRSCO is 400 ppm). Lead was found at a maximum concentration of 3,540 ppm (UUSCO is 63ppm, RRSCO is 400 ppm). Mercury was found at a maximum concentration of 2.36 ppm (UUSCO is 0.18 ppm and RRSCO is 0.81 ppm). No VOCs, PCBs or pesticides were detected at concentrations exceeding the RRSCOs. The data does not indicate any off-Site impacts in soil related to this Site.

Groundwater:

Tetrachloroethene (PCE) was found at a maximum concentration of 9.7 parts per billion (ppb) as compared with the Ambient Water Quality Standards and Guidance Values

(AWQSGVs) of 5 ppb. Several SVOCs, including benzo(a)anthracene, benzo(a)pyrene, chrysene and benzo(b)fluoranthene, were also found at concentrations marginally exceeding the AWQSGVs in one well. No PCBs or pesticides were detected at concentrations exceeding the AWQSGVs. The data does not indicate any off-site impacts in groundwater related to this Site.

Soil Vapor:

PCE was detected at a maximum concentration of 22.8 micrograms per cubic meter (ug/m3). Several petroleum VOCs were also detected including mixed xylenes at a maximum concentration of 764 ug/m3, and toluene at a maximum concentration of 159 ug/m3. The data does not indicate any off-Site impacts in soil vapor related to this Site.

The data generated during the RI indicated the following about Site-wide conditions:

- The only VOC detected in soil exceeding NYSDEC UUSCO and PGWSCOs was acetone. In groundwater only Chloroform and Tetrachloroethene were detected at concentrations exceeding the NYSDEC AWQSGVs. Groundwater is not significantly impacted by VOCs and there is no indication that there is a source of groundwater contamination at the Site for VOCs.

- SVOCs, exclusively PAHs, were detected at elevated concentrations above NYSDEC UUSCOs and RRSCOs and PGWSCOs in most shallow soils across the Site, as well as detected in groundwater above the AWQSGVs in some samples. It is likely that SVOCs present in the unfiltered groundwater samples were a result of sediment present in the samples and are not representative of dissolved impacts in groundwater. This data indicates that SVOCs in soil are not a significant source of groundwater contamination at the Site.

- Metals were detected in soil at elevated concentrations above NYSDEC SCOs across the Site. Arsenic, barium, cadmium, trivalent chromium, copper, lead, mercury, nickel, silver and zinc were detected at concentrations above NYSDEC UUSCOs. Arsenic, barium, cadmium, lead and mercury were detected at concentrations exceeding NYSDEC RRSCOs. Metals contamination is related to the use of urban fill at the Site. Metals were detected at concentrations above NYSDEC PGWSCOs in soil but were not detected in dissolved groundwater, indicating that metals in soil are not a source of groundwater contamination at the Site.

- PCBs were detected in six of the soil sampling locations at concentrations exceeding NYSDEC UUSCOs, but only one sampling location in exceedance of their RRSCOs, and they were not detected in groundwater.

- Pesticides and herbicides were detected sporadically throughout Site soils at concentrations exceeding NYSDEC UUSCOs, but only two sampling locations in exceedance of their RRSCOs, and they were not detected in groundwater.

- Based on the Site-wide detections, soil vapor at the Site is impacted with VOCs, though at relatively low concentrations not indicative of an on-Site source. Soil vapor at the Site is impacted with petroleum related VOCs and one CVOC (tetrachloroethene), with the highest concentrations of petroleum related VOCs detected in SV-17 (northcentral portion of the Site), and the highest detection of CVOC identified in SV-12. Soil vapor impacts likely originate from off-Site sources as no on-Site source of VOCs was identified in soil.

- According to water-level data collected during this RI, the elevation of the water table surface at the Site ranges from 3.09 ft NAVD 88 at the southeast portion of the Site to 4.26 NAVD 88 in the northcentral portion of the Site. Groundwater depth at the Site varied from 9.15 ft bls to 12.23 ft bls and groundwater flow is generally to the southeast towards the Harlem River.

2.4 Remedial Action Objectives

The Remedial Action Objectives (RAOs) for the Site as listed in the Decision Document dated September 16, 2019 are as follows:

Groundwater

RAOs for Public Health Protection

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.

- Prevent contact with, or inhalation of, volatiles from contaminated groundwater.

RAOs for Environmental Protection

- Remove the source of ground or surface water contamination.

Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.

- Prevent inhalation of or exposure from contaminants volatilizing from contaminants in soil.

RAOs for Environmental Protection

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

Soil Vapor

RAOs for Public Health Protection

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

2.5 Remaining Contamination

The remaining contamination after the remedial action was completed is limited to soil in the areas where a Track 1 (Unrestricted Use SCOs) were not met (outside of the central portion and courtyard portion of Building B North). The western portion of Building B North met Track 2 RRSCOs. The remainder of the Site (Building B South) achieved a Track 4 Restricted Residential Use cleanup through the implementation of EC (Site Cover System) where RRSCOs were exceeded. Based on the endpoint samples collected during the remedial action, the remaining contamination is limited to SVOCs, metals, and some PCBs and pesticides. All remaining contamination is located under the building foundation slab or concrete ramps/stairs/walkways. For the areas where Track 1 UUSCOs were not achieved, long term management of the EC/ICs and residual contamination will be performed in accordance with this SMP. The areas of the Site that achieved Track 1, Track 2, and Track 4 are shown on Figure 5.

Tables 3 through 8 and Plate 1 summarize the results of all endpoint soil samples collected that exceed the UUSCOs and the RRSCOs at the Site after completion of remedial action.

3.0 INSTITUTIONAL AND ENGINEERING CONTROL PLAN

3.1 General

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

This plan provides:

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

3.2 Institutional Controls

A series of ICs is required by the RAWP to: (1) implement, maintain and monitor Engineering Control systems; (2) prevent future exposure to remaining contamination; and, (3) limit the use and development of the Site to restricted residential, commercial or industrial uses only. Adherence to these ICs on the Site is required by the Environmental Easement and will be implemented under this SMP. ICs identified in the Environmental

Easement may not be discontinued without an amendment to or extinguishment of the Environmental Easement. The IC boundaries are shown on Figure 5. These ICs are:

- The property may be used for restricted residential, commercial, or industrial use.
- Compliance with the Environmental Easement by the Grantee and Grantee's successors and adherence to all elements of the SMP is required.
- All ECs must be operated and maintained as specified in this SMP.
- All ECs must be inspected and certified at a frequency and in a manner defined in the SMP.
- Data and information pertinent to Site Management must be reported at the frequency and in a manner defined in the SMP.
- The potential for vapor intrusion must be evaluated for any future buildings (excluding the buildings currently under construction at the time this SMP was issued) developed in the area within the IC boundaries noted on Figure 5, and appropriate actions to address exposures must be implemented.
- Vegetable gardens and farming are prohibited, with the exception of raised planting beds.
- 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.
- All future activities on the property that will disturb remaining contaminated material are prohibited unless they are conducted in accordance with the 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.

3.3 Engineering Controls

3.3.1 Site Cover System

Exposure to remaining contamination in the Track 4 area of the Site (Plate 1) will be prevented by the engineered, Site Cover System constructed on the Site. This Site Cover System is comprised of concrete building foundations and ramps/stairways/walkways. Although not a required EC, to incorporate green remediation principles, a vapor barrier was installed as an element of construction throughout the area occupied by the footprint of the new buildings and up the foundation sidewalls and was installed in accordance with manufacturer specifications. The types of Cover System are the following:

- The Site Cover System for the concrete building foundation comprised of 4-inch crushed stone subbase, and 8-inch to 12-inch foundation slab.
- The Site Cover System for the concrete ramps/stairways/walkways comprised of 4-inch crushed stone subbase, demarcation layer (underside of concrete) and 4-inch concrete ramps/stairways/walkways.
- Site Cover System for the support of excavation (SOE) comprised of clean stone backfill from the terminal excavation depth extending up to one foot above the natural water table, additional clean stone or reused NYSDEC-approved on-Site soils above the water table, RCA subbase, and concrete slab (demarcation layer is the underside of the concrete).

Plate 2 presents the location of the cover system and applicable demarcation layers. The Excavation Work Plan (EWP) provided in Appendix D outlines the procedures required to be implemented in the event the cover system is breached, penetrated or temporarily removed, and any underlying remaining contamination is disturbed. Procedures for the inspection of this cover are provided in the Monitoring and Sampling Plan included in Section 4.0 of this SMP. Any work conducted pursuant to the EWP must also be conducted in accordance with the procedures defined in a Health and Safety Plan (HASP) and associated Community Air Monitoring Plan (CAMP) prepared for the Site and provided in Appendix E.

3.3.2 Criteria for Completion of Remediation/Termination of Remedial Systems

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

3.3.2.1 – Site Cover System

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

4.0 MONITORING PLAN

4.1 General

This Monitoring Plan describes the measures for evaluating the overall performance and effectiveness of the remedy. This Monitoring Plan may only be revised with the approval of the NYSDEC.

This Monitoring Plan describes the methods to be used for:

- Monitoring the EC; and
- Evaluating Site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment.

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

- Annual inspection and periodic certification.

Reporting requirements are provided in Section 7.0 of this SMP.

4.2 Site–wide Inspection

Site-wide inspections will be performed at a minimum of once per year. Modification to the frequency or duration of the inspections will require approval from the NYSDEC. Site-wide inspections will also be performed after all severe weather conditions that may affect the EC or monitoring devices. During these inspections, an inspection form will be completed as provided in Appendix G – Site Management Forms. The form will compile sufficient information to assess the following:

- Compliance with all ICs, including Site usage;
- An evaluation of the condition and continued effectiveness of the EC;
- General Site conditions at the time of the inspection;

- The Site management activities being conducted including, where appropriate, confirmation sampling and a health and safety inspection; and
- Confirm that Site records are up to date.

Inspections of all remedial components installed at the Site will be conducted. A comprehensive Site-wide inspection will be conducted and documented according to the SMP schedule, regardless of the frequency of the Periodic Review Report. The inspections will determine and document the following:

- Whether the EC continues to perform as designed;
- If these controls continue to be protective of human health and the environment;
- Compliance with requirements of this SMP and the Environmental Easement;
- Achievement of remedial performance criteria; and
- If Site records are complete and up to date.

Reporting requirements are outlined in Section 7.0 of this plan.

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

4.3 Treatment System Monitoring and Sampling

There are no active ECs; therefore, Treatment System Monitoring and Sampling is not included in this SMP.

4.4 Post-Remediation Media Monitoring and Sampling

There is no media to be monitored and sampled after the remediation is completed; therefore, it is not included in this SMP. The remedial elements including excavation and the Site Cover System addressed soil contamination. Based on the RI data, groundwater is not significantly impacted and is not used for drinking or other potable uses, and there is no direct contact with or ingestion by the general public. Based on an evaluation included in the FER of the soil vapor data from the RI, there was no soil vapor intrusion issue prior to the remedy, and there was no on-Site source identified during the remediation. Therefore, there is no current vapor intrusion risk for the buildings currently under construction at the time this SMP was issued.

The potential for vapor intrusion will be evaluated for any future buildings (excluding the buildings currently under construction at the time this SMP was issued) developed in the area within the IC boundaries noted on Figure 5, and appropriate actions to address exposures must be implemented.

5.0 OPERATION AND MAINTENANCE PLAN

5.1 General

The Site remedy does not rely on any mechanical systems, such as groundwater treatment systems, sub-slab depressurization systems or air sparge/soil vapor extraction systems to protect public health and the environment. Therefore, the operation and maintenance of such components is not included in this SMP.

6.0 PERIODIC ASSESSMENTS/EVALUATIONS

6.1 Climate Change Vulnerability Assessment

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

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

- Flood Plain: the Site is not located in a flood plain, low-lying or low-groundwater recharge area.
- Site Drainage and Storm Water Management: during construction, adequate storm management systems were constructed for the building and Site; therefore, flooding is not anticipated.
- Erosion: The Site is capped by buildings, walkways, stairways or ramps, therefore, erosion at the Site is not anticipated.
- High Wind: The Site is not susceptible to damage from the wind itself or from falling objects, such as trees or utility structures during periods of high wind.
- Spill/Contaminant Release: No areas of the Site have been identified that may be susceptible to a spill or other containment release due to storm-related damage caused by flooding, erosion, high winds, loss of power, etc.

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).

Green remediation principles and techniques were implemented to the extent feasible in the design, implementation, and Site management of the remedy as per DER 31. The major green remediation components incorporated into the remediation are as follows:

a. Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;

b. Reducing direct and indirect greenhouse gases and other emissions;

c. Increasing energy efficiency and minimizing use of non-renewable energy;

d. Conserving and efficiently managing resources and materials;

e. Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;

f. Maximizing habitat value and creating habitat when possible;

g. Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals;

h. Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.

i. Additionally, to incorporate green remediation principles and techniques to the extent feasible in the development at this Site, on-Site buildings included, at a minimum, a 20-mil vapor barrier on the foundation to improve energy efficiency and meet Passive House standards.

   Specifically, the buildings have been designed and constructed to meet Passive House standards. Once the project is completed, the Sendero Verde Redevelopment Project (Parcels A [BCP Site C231135] and Parcel B) will be the largest multifamily Passive House development in the United States and will be certified by both Passive House Institute and Enterprise Green Communities, ensuring superior levels of energy efficiency, indoor air quality, occupant comfort, and resiliency. Buildings meeting Passive House design standards can be up to 60 or 70 percent more energy efficient than a traditionally designed building of similar size.

During construction, the Volunteer sought and received approval for use of 2,448 cubic yards of recycled concrete aggregate from a registered New York State Construction and Demolition processing facility, which would otherwise have required use of virgin resources. In addition, the Volunteer exported approximately 1,580 cubic yards of clean concrete and bricks to a permitted Class B recycling facility in New Jersey for recycling.

6.3 Soil Vapor Intrusion Evaluation

An SVI evaluation must be performed upon a change in use of the property that will result in occupancy of a previously unoccupied building (excluding the buildings currently under construction at the time this SMP was issued) or initial occupancy of a new building (excluding the buildings currently under construction at the time this SMP was issued). This SVI evaluation has already been completed for the buildings currently under construction, as documented in the FER. The breadth of the SVI evaluation will be determined based upon discussion with the NYSDEC project manager and NYSDOH. Based upon this discussion and agency requirements, a work plan may need to be developed that requires that sampling be performed. At a minimum, a SVI sampling work plan would include the following information:

- A figure showing the soil vapor intrusion sample locations;
- Discussion of the depths of the soil vapor samples; and
- A table of sample locations and analytical parameters to be analyzed along with the minimum reporting limits to be achieved by the NYS ELAP-certified laboratory.

Upon completion of the evaluation, if an action is required, any actions taken or to be taken must be reflected in an updated SMP.

7.0 REPORTING REQUIREMENTS

7.1 Site Management Reports

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

All applicable inspection forms and other records generated for the Site during the reporting period will be provided in electronic format to the NYSDEC in accordance with the requirements of Table 10 and summarized in the Periodic Review Report.

Table 10: Schedule of Interim Inspection Reports

Task/Report	Reporting Frequency*
Inspection Report	Annually or as otherwise determined by the Department
Periodic Review Report	First report 16 months after COC is issued, then annually, until completion and documentation of all development-related construction, then every 3 years thereafter.
SVI Evaluation	Upon change of use/occupancy of a previously unoccupied building or initial occupancy of a new building (excluding the buildings currently under construction at the time this SMP was issued, as this evaluation has already been completed and is documented in the FER).

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

All interim inspections reports will include, at a minimum:

- Date of event or reporting period;
- Name, company, and position of person(s) conducting inspection activities;
- Description of the activities performed;

- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet);

- Any observations, conclusions, or recommendations; and

- A determination as to whether contaminant conditions have changed since the last reporting event.

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

- Date of event;

- Name, company, and position of person(s) conducting maintenance activities;

- Description of maintenance activities performed;

- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet); and

- Other documentation such as copies of invoices for maintenance work, receipts for replacement equipment, etc., (attached to the checklist/form).

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

- Date of event;

- Name, company, and position of person(s) conducting non-routine maintenance/repair activities;

- Description of non-routine activities performed;

- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents (included either on the form or on an attached sheet); and

- Other documentation such as copies of invoices for repair work, receipts for replacement equipment, etc. (attached to the checklist/form).

If any data is generated, it will be reported in digital format as determined by the NYSDEC. Currently, data is to be supplied electronically and submitted to the NYSDEC EQuIS™

database in accordance with the requirements found at this link http://www.dec.ny.gov/chemical/62440.html.

7.2 Periodic Review Report

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

- Identification, assessment and certification of all EC/ICs required by the remedy for the Site.
- Results of the required annual Site inspections and severe condition inspections, if applicable.
- All applicable Site management forms and other records generated for the Site during the reporting period in the NYSDEC-approved electronic format, if not previously submitted.
- If any data is collected, data summary tables and graphical representations of contaminants of concern by media (soil vapor), 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.
- If any data is collected, 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 in digital format as determined by the NYSDEC. Currently, data is supplied electronically and submitted to the NYSDEC EQuIS™ database in accordance with the requirements found at this link: http://www.dec.ny.gov/chemical/62440.html.
- A Site evaluation, which includes the following:
    - The compliance of the remedy with the requirements of the Site-specific RAWP;

- Any new conclusions or observations regarding Site contamination based on inspections or data (if any) generated by the Sampling Plan for the media being monitored;
- Recommendations regarding any necessary changes to the remedy and/or Sampling Plan; and
- The overall performance and effectiveness of the remedy.

7.2.1 Certification of Institutional and Engineering Controls

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

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

- *The inspection of the Site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under my direction;*
- *The institutional control and/or engineering control employed at this Site is unchanged from the date the control was put in place, or last approved by the Department;*
- *Nothing has occurred that would impair the ability of the control to protect the public health and environment;*
- *Nothing has occurred that would constitute a violation or failure to comply with any Site management plan for this control;*
- *Access to the Site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control;*
- *If a financial assurance mechanism is required under the oversight document for the Site, the mechanism remains valid and sufficient for the intended purpose under the document;*
- *Use of the Site is compliant with the environmental easement;*
- *The engineering control systems are performing as designed and are effective;*

- *To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the Site remedial program and generally accepted engineering practices; and*

- *The information presented in this report is accurate and complete.*

I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, Noelle Clarke, of Roux Environmental Engineering and Geology, D.P.C., am certifying as Owner's Designated Site Representative.

- *No new information has come to my attention, including groundwater monitoring data from wells located at the Site boundary, if any, to indicate that the assumptions made in the qualitative exposure assessment of off-Site contamination are no longer valid; and*

For BCP projects, every five years the following certification will be added:

- *The assumptions made in the qualitative exposure assessment remain valid.*

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

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

7.3 Corrective Measures 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 IC or EC, a Corrective Measures Work Plan will be submitted to the NYSDEC for approval. This plan will explain the failure and provide the details and schedule for performing work necessary to correct the failure. Unless an emergency condition exists, no work will be performed pursuant to the Corrective Measures Work Plan until it has been approved by the NYSDEC.

8.0 REFERENCES

6NYCRR Part 375, Environmental Remediation Programs. December 14, 2006.

NYSDEC DER-10 – "Technical Guidance for Site Investigation and Remediation".

NYSDEC, 1998. Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1. June 1998 (April 2000 addendum).

Phase I Environmental Site Assessment (ESA), prepared by Roux Environmental Engineering and Geology, D.P.C., dated March 30, 2018.

Phase II ESA, prepared by Roux Environmental Engineering and Geology, D.P.C., dated June 8, 2018.

Amendment to the Phase II ESA, prepared by Roux Environmental Engineering and Geology, D.P.C., dated November 13, 2018.

Phase I ESA, prepared by Roux Environmental Engineering and Geology, D.P.C., dated May 22, 2019.

Waste Characterization Report, prepared by Roux Environmental Engineering and Geology, D.P.C., dated May 24, 2019.

Remedial Investigation Report (RIR)/Remedial Action Work Plan (RAWP), prepared by Roux Environmental Engineering and Geology, D.P.C., dated September 2019.

TABLES

Notes Utilized Throughout Tables	
Soil Tables	
J -	Estimated value
U -	Indicates that the compound was analyzed for but not detected
R -	Sample results rejected by validator
UJ -	Analyte was not detected. The associated reported quantitation limit is an estimate
NJ -	Detection is tentative in identification and estimated in value
J+ -	Estimated value, high bias
J- -	Estimated value, low bias
NA -	Compound was not analyzed for by laboratory
ft bls -	Feet below land surface
DUP -	Duplicate sample
FD -	Duplicate sample
mg/kg -	Milligrams per kilogram
µg/kg -	Micrograms per kilogram
NYSDEC -	New York State Department of Environmental Conservation
SCO -	Soil Cleanup Objectives
--	No SCO available
Bold data indicates that parameter was detected above the NYSDEC Part 375 Unrestricted Use SCO	
Shaded data indicates that parameter was detected above the NYSDEC Part 375 Restricted Residential SCO	
For Per- and Polyfluoroalkyl Substances, bold data indicates that parameter was detected; undetected results reflect Minimum Detection Limits	

Table 2. Summary of Groundwater Gauging Data, Sendero Verde Redevelopment Project Parcel B, New York, New York

Monitoring Well Identification	Date	Measuring Point Elevation (ft. NAVD 88)	Depth to Water (ft-btoc)	Water Table Elevation (ft. NAVD 88)
SB-13/MW-1	4/26/2019	15.29	11.14	4.15
SB-24/MW-2	4/26/2019	16.63	12.84	3.79
SB-39/MW-3	4/26/2019	12.24	9.15	3.09
SB-31/MW-4	4/26/2019	16.49	12.23	4.26
SB-36/MW-5	4/26/2019	13.45	10.16	3.29

Notes:
ft= feet
NAVD 88= North American Vertical Datum of 1988
btoc= below top of casing

Table 3. Summary of Volatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	BDS-1	BDS-13	BDS-14	BDS-15	BDS-15	BDS-16_SDS-6
			Sample Date:	11/11/2019	05/05/2020	05/05/2020	05/05/2020	05/05/2020	01/15/2020
			Sample Depth (ft bls):	16 - 16	9.5 - 9.5	3 - 3	1.5 - 1.5	1 - 2	6.5 - 6.5
			Normal Sample or Field Duplicate:	N	N	N	N	FD	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
1,1,1,2-Tetrachloroethane	--	--	MG/KG	0.00046 U	0.00062 U	0.00052 U	0.00074 U	0.00057 U	0.00075 U
1,1,1-Trichloroethane (TCA)	0.68	100	MG/KG	0.00046 U	0.00062 U	0.00052 U	0.00074 U	0.00057 U	0.00075 U
1,1,2,2-Tetrachloroethane	--	--	MG/KG	0.00046 U	0.00062 U	0.00052 U	0.00074 U	0.00057 U	0.00075 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	--	--	MG/KG	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	--	--	MG/KG	0.00093 U	0.0012 U	0.001 U	0.0015 U	0.0011 U	0.0015 U
1,1-Dichloroethane	0.27	26	MG/KG	0.00093 U	0.0012 U	0.001 U	0.0015 U	0.0011 U	0.0015 U
1,1-Dichloroethene	0.33	100	MG/KG	0.00093 U	0.0012 U	0.001 U	0.0015 U	0.0011 U	0.0015 U
1,1-Dichloropropene	--	--	MG/KG	0.00046 U	0.00062 U	0.00052 U	0.00074 U	0.00057 U	0.00075 U
1,2,3-Trichlorobenzene	--	--	MG/KG	0.0019 U	0.0025 U	0.0021 U	0.003 U	0.0023 U	0.003 U
1,2,3-Trichloropropane	--	--	MG/KG	0.0019 U	0.0025 U	0.0021 U	0.003 U	0.0023 U	0.003 U
1,2,4,5-Tetramethylbenzene	--	--	MG/KG	0.0019 U	0.0025 U	0.0021 U	0.003 U	0.0023 U	0.003 U
1,2,4-Trichlorobenzene	--	--	MG/KG	0.0019 U	0.0025 U	0.0021 U	0.003 U	0.0023 U	0.003 U
1,2,4-Trimethylbenzene	3.6	52	MG/KG	0.0019 U	0.0025 U	0.0021 U	0.003 U	0.0023 U	0.003 U
1,2-Dibromo-3-Chloropropane	--	--	MG/KG	0.0028 U	0.0037 U	0.0031 U	0.0045 U	0.0034 U	0.0045 U
1,2-Dibromoethane (Ethylene Dibromide)	--	--	MG/KG	0.00093 U	0.0012 U	0.001 U	0.0015 U	0.0011 U	0.0015 U
1,2-Dichlorobenzene	1.1	100	MG/KG	0.0019 U	0.0025 U	0.0021 U	0.003 U	0.0023 U	0.003 U
1,2-Dichloroethane	0.02	3.1	MG/KG	0.00093 U	0.0012 U	0.001 U	0.0015 U	0.0011 U	0.0015 U
1,2-Dichloropropane	--	--	MG/KG	0.00093 U	0.0012 U	0.001 U	0.0015 U	0.0011 U	0.0015 U
1,3,5-Trimethylbenzene (Mesitylene)	8.4	52	MG/KG	0.0019 U	0.0025 U	0.0021 U	0.003 U	0.0023 U	0.003 U
1,3-Dichlorobenzene	2.4	49	MG/KG	0.0019 U	0.0025 U	0.0021 U	0.003 U	0.0023 U	0.003 U
1,3-Dichloropropane	--	--	MG/KG	0.0019 U	0.0025 U	0.0021 U	0.003 U	0.0023 U	0.003 U
1,4-Dichlorobenzene	1.8	13	MG/KG	0.0019 U	0.0025 U	0.0021 U	0.003 U	0.0023 U	0.003 U
1,4-Diethyl Benzene	--	--	MG/KG	0.0019 U	0.0025 U	0.0021 U	0.003 U	0.0023 U	0.003 U
1,4-Dioxane (P-Dioxane)	0.1	13	MG/KG	0.074 U	0.099 U	0.084 U	0.12 U	0.091 U	0.12 U
2,2-Dichloropropane	--	--	MG/KG	0.0019 U	0.0025 U	0.0021 U	0.003 U	0.0023 U	0.003 U
2-Chlorotoluene	--	--	MG/KG	0.0019 U	0.0025 U	0.0021 U	0.003 U	0.0023 U	0.003 U
2-Hexanone	--	--	MG/KG	0.0093 U	0.012 U	0.01 U	0.015 U	0.011 U	0.015 U
4-Chlorotoluene	--	--	MG/KG	0.0019 U	0.0025 U	0.0021 U	0.003 U	0.0023 U	0.003 U
4-Ethyltoluene	--	--	MG/KG	0.0019 U	0.0025 U	0.0021 U	0.003 U	0.0023 U	0.003 U
Acetone	**0.05**	100	MG/KG	0.0093 U	0.012 U	0.01 U	0.015 U	0.011 U	0.015 U
Acrolein	--	--	MG/KG	NA	NA	NA	NA	NA	NA

Table 3. Summary of Volatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	BDS-1	BDS-13	BDS-14	BDS-15	BDS-15	BDS-16_SDS-6
			Sample Date:	11/11/2019	05/05/2020	05/05/2020	05/05/2020	05/05/2020	01/15/2020
			Sample Depth (ft bls):	16 - 16	9.5 - 9.5	3 - 3	1.5 - 1.5	1 - 2	6.5 - 6.5
			Normal Sample or Field Duplicate:	N	N	N	N	FD	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
Acrylonitrile	--	--	MG/KG	0.0037 U	0.0049 U	0.0042 U	0.006 U	0.0045 U	0.006 U
Benzene	0.06	4.8	MG/KG	0.00046 U	0.00062 U	0.00052 U	0.00074 U	0.00057 U	0.00075 U
Bromobenzene	--	--	MG/KG	0.0019 U	0.0025 U	0.0021 U	0.003 U	0.0023 U	0.003 U
Bromochloromethane	--	--	MG/KG	0.0019 U	0.0025 U	0.0021 U	0.003 U	0.0023 U	0.003 U
Bromodichloromethane	--	--	MG/KG	0.00046 U	0.00062 U	0.00052 U	0.00074 U	0.00057 U	0.00075 U
Bromoform	--	--	MG/KG	0.0037 U	0.0049 U	0.0042 U	0.006 U	0.0045 U	0.006 U
Bromomethane	--	--	MG/KG	0.0019 U	0.0025 U	0.0021 U	0.003 U	0.0023 U	0.003 U
Carbon Disulfide	--	--	MG/KG	0.0093 U	0.012 U	0.01 U	0.015 U	0.011 U	0.015 U
Carbon Tetrachloride	0.76	2.4	MG/KG	0.00093 U	0.0012 U	0.001 U	0.0015 U	0.0011 U	0.0015 U
Chlorobenzene	1.1	100	MG/KG	0.00046 U	0.00062 U	0.00052 U	0.00074 U	0.00057 U	0.00075 U
Chloroethane	--	--	MG/KG	0.0019 U	0.0025 U	0.0021 U	0.003 U	0.0023 U	0.003 U
Chloroform	0.37	49	MG/KG	0.0002 J	0.0018 U	0.0016 U	0.0022 U	0.0017 U	0.0022 U
Chloromethane	--	--	MG/KG	0.0037 U	0.0049 U	0.0042 U	0.006 U	0.0045 U	0.006 U
Cis-1,2-Dichloroethylene	0.25	100	MG/KG	0.00093 U	0.0012 U	0.001 U	0.0015 U	0.0011 U	0.0015 U
Cis-1,3-Dichloropropene	--	--	MG/KG	0.00046 U	0.00062 U	0.00052 U	0.00074 U	0.00057 U	0.00075 U
Cyclohexane	--	--	MG/KG	NA	NA	NA	NA	NA	NA
Cymene	--	--	MG/KG	0.00093 U	0.0012 U	0.001 U	0.0015 U	0.0011 U	0.0015 U
Dibromochloromethane	--	--	MG/KG	0.00093 U	0.0012 U	0.001 U	0.0015 U	0.0011 U	0.0015 U
Dibromomethane	--	--	MG/KG	0.0019 U	0.0025 U	0.0021 U	0.003 U	0.0023 U	0.003 U
Dichlorodifluoromethane	--	--	MG/KG	0.0093 U	0.012 U	0.01 U	0.015 U	0.011 U	0.015 U
Dichloroethylenes	--	--	MG/KG	0.00093 U	0.00029 J	0.00018 J	0.00028 J	0.00018 J	0.0015 U
Diethyl Ether (Ethyl Ether)	--	--	MG/KG	0.0019 U	0.0025 U	0.0021 U	0.003 U	0.0023 U	0.003 U
Ethylbenzene	1	41	MG/KG	0.00093 U	0.0012 U	0.001 U	0.0015 U	0.0011 U	0.0015 U
Hexachlorobutadiene	--	--	MG/KG	0.0037 U	0.0049 U	0.0042 U	0.006 U	0.0045 U	0.006 U
Isopropylbenzene (Cumene)	--	--	MG/KG	0.00093 U	0.0012 U	0.001 U	0.0015 U	0.0011 U	0.0015 U
m,p-Xylene	--	--	MG/KG	0.0019 U	0.0025 U	0.0021 U	0.003 U	0.0023 U	0.003 U
Methyl Acetate	--	--	MG/KG	NA	NA	NA	NA	NA	NA
Methyl Ethyl Ketone (2-Butanone)	0.12	100	MG/KG	0.0093 U	0.012 U	0.01 U	0.015 U	0.011 U	0.015 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	MG/KG	0.0093 U	0.012 U	0.01 U	0.015 U	0.011 U	0.015 U
Methylcyclohexane	--	--	MG/KG	NA	NA	NA	NA	NA	NA
Methylene Chloride	0.05	100	MG/KG	0.0046 U	0.0062 U	0.0052 U	0.0074 U	0.0057 U	0.0075 U

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			Sample Designation:	BDS-1	BDS-13	BDS-14	BDS-15	BDS-15	BDS-16_SDS-6
			Sample Date:	11/11/2019	05/05/2020	05/05/2020	05/05/2020	05/05/2020	01/15/2020
			Sample Depth (ft bls):	16 - 16	9.5 - 9.5	3 - 3	1.5 - 1.5	1 - 2	6.5 - 6.5
			Normal Sample or Field Duplicate:	N	N	N	N	FD	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
Naphthalene	12	100	MG/KG	0.0037 U	0.0049 U	0.0042 U	0.006 U	0.0045 U	0.006 U
N-Butylbenzene	12	100	MG/KG	0.00093 U	0.0012 U	0.001 U	0.0015 U	0.0011 U	0.0015 U
N-Propylbenzene	3.9	100	MG/KG	0.00093 U	0.0012 U	0.001 U	0.0015 U	0.0011 U	0.0015 U
O-Xylene (1,2-Dimethylbenzene)	--	--	MG/KG	0.00093 U	0.0012 U	0.001 U	0.0015 U	0.0011 U	0.0015 U
Sec-Butylbenzene	11	100	MG/KG	0.00093 U	0.0012 U	0.001 U	0.0015 U	0.0011 U	0.0015 U
Styrene	--	--	MG/KG	0.00093 U	0.0012 U	0.001 U	0.0015 U	0.0011 U	0.0015 U
T-Butylbenzene	5.9	100	MG/KG	0.0019 U	0.0025 U	0.0021 U	0.003 U	0.0023 U	0.003 U
Tert-Butyl Alcohol	--	--	MG/KG	NA	NA	NA	NA	NA	NA
Tert-Butyl Methyl Ether	0.93	100	MG/KG	0.0019 U	0.0025 U	0.0021 U	0.003 U	0.0023 U	0.003 U
Tetrachloroethylene (PCE)	1.3	19	MG/KG	0.00046 U	0.00062 U	0.0002 J	0.00074 U	0.00057 U	0.00075 U
Toluene	0.7	100	MG/KG	0.00093 U	0.00079 J	0.001 U	0.0015 U	0.0011 U	0.0015 U
Total, 1,3-Dichloropropene (Cis And Trans)	--	--	MG/KG	0.00046 U	0.00062 U	0.00052 U	0.00074 U	0.00057 U	0.00075 U
Trans-1,2-Dichloroethene	0.19	100	MG/KG	0.0014 U	0.00029 J	0.00018 J	0.00028 J	0.00018 J	0.0022 U
Trans-1,3-Dichloropropene	--	--	MG/KG	0.00093 U	0.0012 U	0.001 U	0.0015 U	0.0011 U	0.0015 U
Trans-1,4-Dichloro-2-Butene	--	--	MG/KG	0.0046 U	0.0062 U	0.0052 U	0.0074 U	0.0057 U	0.0075 U
Trichloroethylene (TCE)	0.47	21	MG/KG	0.00046 U	0.00062 U	0.00052 U	0.00074 U	0.00057 U	0.00075 U
Trichlorofluoromethane	--	--	MG/KG	0.0037 U	0.0049 U	0.0042 U	0.006 U	0.0045 U	0.006 U
Vinyl Acetate	--	--	MG/KG	0.0093 U	0.012 U	0.01 U	0.015 U	0.011 U	0.015 U
Vinyl Chloride	0.02	0.9	MG/KG	0.00093 U	0.0012 U	0.001 U	0.0015 U	0.0011 U	0.0015 U
Xylenes	0.26	100	MG/KG	0.00093 U	0.0012 U	0.001 U	0.0015 U	0.0011 U	0.0015 U

Table 3. Summary of Volatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	BDS-17_SDS-7	BDS-2	BDS-21A	BDS-21B	BDS-22	BDS-23
			Sample Date:	01/15/2020	11/11/2019	01/06/2020	01/06/2020	11/11/2019	11/11/2019
			Sample Depth (ft bls):	6.5 - 6.5	13 - 13	7 - 7	7 - 7	13 - 13	13 - 13
			Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
1,1,1,2-Tetrachloroethane	--	--	MG/KG	0.00072 U	0.00044 U	0.00059 U	0.00065 U	0.00049 U	0.00061 U
1,1,1-Trichloroethane (TCA)	0.68	100	MG/KG	0.00072 U	0.00044 U	0.00059 U	0.00065 U	0.00049 U	0.00061 U
1,1,2,2-Tetrachloroethane	--	--	MG/KG	0.00072 U	0.00044 U	0.00059 U	0.00065 U	0.00049 U	0.00061 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	--	--	MG/KG	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	--	--	MG/KG	0.0014 U	0.00088 U	0.0012 U	0.0013 U	0.00097 U	0.0012 U
1,1-Dichloroethane	0.27	26	MG/KG	0.0014 U	0.00088 U	0.0012 U	0.0013 U	0.00097 U	0.0012 U
1,1-Dichloroethene	0.33	100	MG/KG	0.0014 U	0.00088 U	0.0012 U	0.0013 U	0.00097 U	0.0012 U
1,1-Dichloropropene	--	--	MG/KG	0.00072 U	0.00044 U	0.00059 U	0.00065 U	0.00049 U	0.00061 U
1,2,3-Trichlorobenzene	--	--	MG/KG	0.0029 U	0.0018 U	0.0024 U	0.0026 U	0.0019 U	0.0024 U
1,2,3-Trichloropropane	--	--	MG/KG	0.0029 U	0.0018 U	0.0024 U	0.0026 U	0.0019 U	0.0024 U
1,2,4,5-Tetramethylbenzene	--	--	MG/KG	0.0029 U	0.0018 U	0.0024 U	0.0026 U	0.0019 U	0.0024 U
1,2,4-Trichlorobenzene	--	--	MG/KG	0.0029 U	0.0018 U	0.0024 U	0.0026 U	0.0019 U	0.0024 U
1,2,4-Trimethylbenzene	3.6	52	MG/KG	0.0029 U	0.0018 U	0.0024 U	0.0026 U	0.0019 U	0.0024 U
1,2-Dibromo-3-Chloropropane	--	--	MG/KG	0.0043 U	0.0026 U	0.0035 U	0.0039 U	0.0029 U	0.0037 U
1,2-Dibromoethane (Ethylene Dibromide)	--	--	MG/KG	0.0014 U	0.00088 U	0.0012 U	0.0013 U	0.00097 U	0.0012 U
1,2-Dichlorobenzene	1.1	100	MG/KG	0.0029 U	0.0018 U	0.0024 U	0.0026 U	0.0019 U	0.0024 U
1,2-Dichloroethane	0.02	3.1	MG/KG	0.0014 U	0.00088 U	0.0012 U	0.0013 U	0.00097 U	0.0012 U
1,2-Dichloropropane	--	--	MG/KG	0.0014 U	0.00088 U	0.0012 U	0.0013 U	0.00097 U	0.0012 U
1,3,5-Trimethylbenzene (Mesitylene)	8.4	52	MG/KG	0.0029 U	0.0018 U	0.0024 U	0.0026 U	0.0019 U	0.0024 U
1,3-Dichlorobenzene	2.4	49	MG/KG	0.0029 U	0.0018 U	0.0024 U	0.0026 U	0.0019 U	0.0024 U
1,3-Dichloropropane	--	--	MG/KG	0.0029 U	0.0018 U	0.0024 U	0.0026 U	0.0019 U	0.0024 U
1,4-Dichlorobenzene	1.8	13	MG/KG	0.0029 U	0.0018 U	0.0024 U	0.0026 U	0.0019 U	0.0024 U
1,4-Diethyl Benzene	--	--	MG/KG	0.0029 U	0.0018 U	0.0024 U	0.0026 U	0.0019 U	0.0024 U
1,4-Dioxane (P-Dioxane)	0.1	13	MG/KG	0.12 U	0.07 U	0.094 U	0.1 U	0.078 U	0.098 U
2,2-Dichloropropane	--	--	MG/KG	0.0029 U	0.0018 U	0.0024 U	0.0026 U	0.0019 U	0.0024 U
2-Chlorotoluene	--	--	MG/KG	0.0029 U	0.0018 U	0.0024 U	0.0026 U	0.0019 U	0.0024 U
2-Hexanone	--	--	MG/KG	0.014 U	0.0088 U	0.012 U	0.013 U	0.0097 U	0.012 U
4-Chlorotoluene	--	--	MG/KG	0.0029 U	0.0018 U	0.0024 U	0.0026 U	0.0019 U	0.0024 U
4-Ethyltoluene	--	--	MG/KG	0.0029 U	0.0018 U	0.0024 U	0.0026 U	0.0019 U	0.0024 U
Acetone	**0.05**	100	MG/KG	0.014 U	0.005 J	0.012 U	0.013 U	0.0097 U	0.012 U
Acrolein	--	--	MG/KG	NA	NA	NA	NA	NA	NA

Table 3. Summary of Volatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	BDS-17_SDS-7	BDS-2	BDS-21A	BDS-21B	BDS-22	BDS-23
			Sample Date:	01/15/2020	11/11/2019	01/06/2020	01/06/2020	11/11/2019	11/11/2019
			Sample Depth (ft bls):	6.5 - 6.5	13 - 13	7 - 7	7 - 7	13 - 13	13 - 13
			Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
Acrylonitrile	--	--	MG/KG	0.0058 U	0.0035 U	0.0047 U	0.0052 U	0.0039 U	0.0049 U
Benzene	0.06	4.8	MG/KG	0.00072 U	0.00044 U	0.00059 U	0.00065 U	0.00049 U	0.00061 U
Bromobenzene	--	--	MG/KG	0.0029 U	0.0018 U	0.0024 U	0.0026 U	0.0019 U	0.0024 U
Bromochloromethane	--	--	MG/KG	0.0029 U	0.0018 U	0.0024 U	0.0026 U	0.0019 U	0.0024 U
Bromodichloromethane	--	--	MG/KG	0.00072 U	0.00044 U	0.00059 U	0.00065 U	0.00049 U	0.00061 U
Bromoform	--	--	MG/KG	0.0058 U	0.0035 U	0.0047 U	0.0052 U	0.0039 U	0.0049 U
Bromomethane	--	--	MG/KG	0.0029 U	0.0018 U	0.0024 U	0.0026 U	0.0019 U	0.0024 U
Carbon Disulfide	--	--	MG/KG	0.014 U	0.0088 U	0.012 U	0.013 U	0.0097 U	0.012 U
Carbon Tetrachloride	0.76	2.4	MG/KG	0.0014 U	0.00088 U	0.0012 U	0.0013 U	0.00097 U	0.0012 U
Chlorobenzene	1.1	100	MG/KG	0.00072 U	0.00044 U	0.00059 U	0.00065 U	0.00049 U	0.00061 U
Chloroethane	--	--	MG/KG	0.0029 U	0.0018 U	0.0024 U	0.0026 U	0.0019 U	0.0024 U
Chloroform	0.37	49	MG/KG	0.0022 U	0.0013 U	0.0018 U	0.0019 U	0.0014 U	0.00019 J
Chloromethane	--	--	MG/KG	0.0058 U	0.0035 U	0.0047 U	0.0052 U	0.0039 U	0.0049 U
Cis-1,2-Dichloroethylene	0.25	100	MG/KG	0.0014 U	0.00088 U	0.0012 U	0.0013 U	0.00097 U	0.0012 U
Cis-1,3-Dichloropropene	--	--	MG/KG	0.00072 U	0.00044 U	0.00059 U	0.00065 U	0.00049 U	0.00061 U
Cyclohexane	--	--	MG/KG	NA	NA	NA	NA	NA	NA
Cymene	--	--	MG/KG	0.0014 U	0.00088 U	0.0012 U	0.0013 U	0.00097 U	0.0012 U
Dibromochloromethane	--	--	MG/KG	0.0014 U	0.00088 U	0.0012 U	0.0013 U	0.00097 U	0.0012 U
Dibromomethane	--	--	MG/KG	0.0029 U	0.0018 U	0.0024 U	0.0026 U	0.0019 U	0.0024 U
Dichlorodifluoromethane	--	--	MG/KG	0.014 U	0.0088 U	0.012 U	0.013 U	0.0097 U	0.012 U
Dichloroethylenes	--	--	MG/KG	0.0014 U	0.00088 U	0.0012 U	0.0013 U	0.00097 U	0.0012 U
Diethyl Ether (Ethyl Ether)	--	--	MG/KG	0.0029 U	0.0018 U	0.0024 U	0.0026 U	0.0019 U	0.0024 U
Ethylbenzene	1	41	MG/KG	0.0014 U	0.00088 U	0.0012 U	0.0013 U	0.00097 U	0.0012 U
Hexachlorobutadiene	--	--	MG/KG	0.0058 U	0.0035 U	0.0047 U	0.0052 U	0.0039 U	0.0049 U
Isopropylbenzene (Cumene)	--	--	MG/KG	0.0014 U	0.00088 U	0.0012 U	0.0013 U	0.00097 U	0.0012 U
m,p-Xylene	--	--	MG/KG	0.0029 U	0.0018 U	0.0024 U	0.0026 U	0.0019 U	0.0024 U
Methyl Acetate	--	--	MG/KG	NA	NA	NA	NA	NA	NA
Methyl Ethyl Ketone (2-Butanone)	0.12	100	MG/KG	0.014 U	0.0088 U	0.012 U	0.013 U	0.0097 U	0.012 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	MG/KG	0.014 U	0.0088 U	0.012 U	0.013 U	0.0097 U	0.012 U
Methylcyclohexane	--	--	MG/KG	NA	NA	NA	NA	NA	NA
Methylene Chloride	0.05	100	MG/KG	0.0072 U	0.0044 U	0.0059 U	0.0065 U	0.0049 U	0.0061 U

Table 3. Summary of Volatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	BDS-17_SDS-7	BDS-2	BDS-21A	BDS-21B	BDS-22	BDS-23
			Sample Date:	01/15/2020	11/11/2019	01/06/2020	01/06/2020	11/11/2019	11/11/2019
			Sample Depth (ft bls):	6.5 - 6.5	13 - 13	7 - 7	7 - 7	13 - 13	13 - 13
			Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
Naphthalene	12	100	MG/KG	0.0058 U	0.0035 U	0.0047 U	0.0052 U	0.0039 U	0.0049 U
N-Butylbenzene	12	100	MG/KG	0.0014 U	0.00088 U	0.0012 U	0.0013 U	0.00097 U	0.0012 U
N-Propylbenzene	3.9	100	MG/KG	0.0014 U	0.00088 U	0.0012 U	0.0013 U	0.00097 U	0.0012 U
O-Xylene (1,2-Dimethylbenzene)	--	--	MG/KG	0.0014 U	0.00088 U	0.0012 U	0.0013 U	0.00097 U	0.0012 U
Sec-Butylbenzene	11	100	MG/KG	0.0014 U	0.00088 U	0.0012 U	0.0013 U	0.00097 U	0.0012 U
Styrene	--	--	MG/KG	0.0014 U	0.00088 U	0.0012 U	0.0013 U	0.00097 U	0.0012 U
T-Butylbenzene	5.9	100	MG/KG	0.0029 U	0.0018 U	0.0024 U	0.0026 U	0.0019 U	0.0024 U
Tert-Butyl Alcohol	--	--	MG/KG	NA	NA	NA	NA	NA	NA
Tert-Butyl Methyl Ether	0.93	100	MG/KG	0.0029 U	0.0018 U	0.0024 U	0.0026 U	0.0019 U	0.0024 U
Tetrachloroethylene (PCE)	1.3	19	MG/KG	0.00072 U	0.00044 U	0.00059 U	0.00065 U	0.00049 U	0.00061 U
Toluene	0.7	100	MG/KG	0.0014 U	0.00088 U	0.0012 U	0.0013 U	0.00097 U	0.0012 U
Total, 1,3-Dichloropropene (Cis And Trans)	--	--	MG/KG	0.00072 U	0.00044 U	0.00059 U	0.00065 U	0.00049 U	0.00061 U
Trans-1,2-Dichloroethene	0.19	100	MG/KG	0.0022 U	0.0013 U	0.0018 U	0.0019 U	0.0014 U	0.0018 U
Trans-1,3-Dichloropropene	--	--	MG/KG	0.0014 U	0.00088 U	0.0012 U	0.0013 U	0.00097 U	0.0012 U
Trans-1,4-Dichloro-2-Butene	--	--	MG/KG	0.0072 U	0.0044 U	0.0059 U	0.0065 U	0.0049 U	0.0061 U
Trichloroethylene (TCE)	0.47	21	MG/KG	0.00072 U	0.00044 U	0.00059 U	0.00065 U	0.00049 U	0.00061 U
Trichlorofluoromethane	--	--	MG/KG	0.0058 U	0.0035 U	0.0047 U	0.0052 U	0.0039 U	0.0049 U
Vinyl Acetate	--	--	MG/KG	0.014 U	0.0088 R	0.012 U	0.013 U	0.0097 U	0.012 U
Vinyl Chloride	0.02	0.9	MG/KG	0.0014 U	0.00088 U	0.0012 U	0.0013 U	0.00097 U	0.0012 U
Xylenes	0.26	100	MG/KG	0.0014 U	0.00088 U	0.0012 U	0.0013 U	0.00097 U	0.0012 U

Table 3. Summary of Volatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	BDS-24	BDS-25	BDS-26	BDS-27	BDS-28	BDS-29
			Sample Date:	11/11/2019	01/15/2020	01/15/2020	01/15/2020	01/06/2020	01/06/2020
			Sample Depth (ft bls):	13 - 13	9 - 9	9 - 9	9 - 9	9 - 9	9 - 9
			Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
1,1,1,2-Tetrachloroethane	--	--	MG/KG	0.00044 U	0.00065 U	0.00072 U	0.00069 U	0.00063 U	0.00057 U
1,1,1-Trichloroethane (TCA)	0.68	100	MG/KG	0.00044 U	0.00065 U	0.00072 U	0.00069 U	0.00063 U	0.00057 U
1,1,2,2-Tetrachloroethane	--	--	MG/KG	0.00044 U	0.00065 U	0.00072 U	0.00069 U	0.00063 U	0.00057 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	--	--	MG/KG	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	--	--	MG/KG	0.00087 U	0.0013 U	0.0014 U	0.0014 U	0.0013 U	0.0011 U
1,1-Dichloroethane	0.27	26	MG/KG	0.00087 U	0.0013 U	0.0014 U	0.0014 U	0.0013 U	0.0011 U
1,1-Dichloroethene	0.33	100	MG/KG	0.00087 U	0.0013 U	0.0014 U	0.0014 U	0.0013 U	0.0011 U
1,1-Dichloropropene	--	--	MG/KG	0.00044 U	0.00065 U	0.00072 U	0.00069 U	0.00063 U	0.00057 U
1,2,3-Trichlorobenzene	--	--	MG/KG	0.0017 U	0.0026 U	0.0029 U	0.0028 U	0.0025 U	0.0023 U
1,2,3-Trichloropropane	--	--	MG/KG	0.0017 U	0.0026 U	0.0029 U	0.0028 U	0.0025 U	0.0023 U
1,2,4,5-Tetramethylbenzene	--	--	MG/KG	0.0017 U	0.0026 U	0.0029 U	0.0028 U	0.0025 U	0.0023 U
1,2,4-Trichlorobenzene	--	--	MG/KG	0.0017 U	0.0026 U	0.0029 U	0.0028 U	0.0025 U	0.0023 U
1,2,4-Trimethylbenzene	3.6	52	MG/KG	0.0017 U	0.0026 U	0.0029 U	0.0028 U	0.0025 U	0.0023 U
1,2-Dibromo-3-Chloropropane	--	--	MG/KG	0.0026 U	0.0039 U	0.0043 U	0.0041 U	0.0038 U	0.0034 U
1,2-Dibromoethane (Ethylene Dibromide)	--	--	MG/KG	0.00087 U	0.0013 U	0.0014 U	0.0014 U	0.0013 U	0.0011 U
1,2-Dichlorobenzene	1.1	100	MG/KG	0.0017 U	0.0026 U	0.0029 U	0.0028 U	0.0025 U	0.0023 U
1,2-Dichloroethane	0.02	3.1	MG/KG	0.00087 U	0.0013 U	0.0014 U	0.0014 U	0.0013 U	0.0011 U
1,2-Dichloropropane	--	--	MG/KG	0.00087 U	0.0013 U	0.0014 U	0.0014 U	0.0013 U	0.0011 U
1,3,5-Trimethylbenzene (Mesitylene)	8.4	52	MG/KG	0.0017 U	0.0026 U	0.0029 U	0.0028 U	0.0025 U	0.0023 U
1,3-Dichlorobenzene	2.4	49	MG/KG	0.0017 U	0.0026 U	0.0029 U	0.0028 U	0.0025 U	0.0023 U
1,3-Dichloropropane	--	--	MG/KG	0.0017 U	0.0026 U	0.0029 U	0.0028 U	0.0025 U	0.0023 U
1,4-Dichlorobenzene	1.8	13	MG/KG	0.0017 U	0.0026 U	0.0029 U	0.0028 U	0.0025 U	0.0023 U
1,4-Diethyl Benzene	--	--	MG/KG	0.0017 U	0.0026 U	0.0029 U	0.0028 U	0.0025 U	0.0023 U
1,4-Dioxane (P-Dioxane)	0.1	13	MG/KG	0.07 U	0.1 U	0.12 U	0.11 U	0.1 U	0.09 U
2,2-Dichloropropane	--	--	MG/KG	0.0017 U	0.0026 U	0.0029 U	0.0028 U	0.0025 U	0.0023 U
2-Chlorotoluene	--	--	MG/KG	0.0017 U	0.0026 U	0.0029 U	0.0028 U	0.0025 U	0.0023 U
2-Hexanone	--	--	MG/KG	0.0087 U	0.013 U	0.014 U	0.014 U	0.013 U	0.011 U
4-Chlorotoluene	--	--	MG/KG	0.0017 U	0.0026 U	0.0029 U	0.0028 U	0.0025 U	0.0023 U
4-Ethyltoluene	--	--	MG/KG	0.0017 U	0.0026 U	0.0029 U	0.0028 U	0.0025 U	0.0023 U
Acetone	**0.05**	100	MG/KG	0.0087 U	0.013 U	0.014 U	0.014 U	0.013 U	0.0072 J
Acrolein	--	--	MG/KG	NA	NA	NA	NA	NA	NA

Table 3. Summary of Volatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	BDS-24	BDS-25	BDS-26	BDS-27	BDS-28	BDS-29
			Sample Date:	11/11/2019	01/15/2020	01/15/2020	01/15/2020	01/06/2020	01/06/2020
			Sample Depth (ft bls):	13 - 13	9 - 9	9 - 9	9 - 9	9 - 9	9 - 9
			Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
Acrylonitrile	--	--	MG/KG	0.0035 U	0.0052 U	0.0058 U	0.0055 U	0.0051 U	0.0045 U
Benzene	0.06	4.8	MG/KG	0.00044 U	0.00065 U	0.00072 U	0.00069 U	0.00063 U	0.00057 U
Bromobenzene	--	--	MG/KG	0.0017 U	0.0026 U	0.0029 U	0.0028 U	0.0025 U	0.0023 U
Bromochloromethane	--	--	MG/KG	0.0017 U	0.0026 U	0.0029 U	0.0028 U	0.0025 U	0.0023 U
Bromodichloromethane	--	--	MG/KG	0.00044 U	0.00065 U	0.00072 U	0.00069 U	0.00063 U	0.00057 U
Bromoform	--	--	MG/KG	0.0035 U	0.0052 U	0.0058 U	0.0055 U	0.0051 U	0.0045 U
Bromomethane	--	--	MG/KG	0.0017 U	0.0026 U	0.0029 U	0.0028 U	0.0025 U	0.0023 U
Carbon Disulfide	--	--	MG/KG	0.0087 U	0.013 U	0.014 U	0.014 U	0.013 U	0.011 U
Carbon Tetrachloride	0.76	2.4	MG/KG	0.00087 U	0.0013 U	0.0014 U	0.0014 U	0.0013 U	0.0011 U
Chlorobenzene	1.1	100	MG/KG	0.00044 U	0.00065 U	0.00072 U	0.00069 U	0.00063 U	0.00057 U
Chloroethane	--	--	MG/KG	0.0017 U	0.0026 U	0.0029 U	0.0028 U	0.0025 U	0.0023 U
Chloroform	0.37	49	MG/KG	0.0013 U	0.0019 U	0.0022 U	0.0021 U	0.0019 U	0.0017 U
Chloromethane	--	--	MG/KG	0.0035 U	0.0052 U	0.0058 U	0.0055 U	0.0051 U	0.0045 U
Cis-1,2-Dichloroethylene	0.25	100	MG/KG	0.00087 U	0.0013 U	0.0014 U	0.0014 U	0.0013 U	0.0011 U
Cis-1,3-Dichloropropene	--	--	MG/KG	0.00044 U	0.00065 U	0.00072 U	0.00069 U	0.00063 U	0.00057 U
Cyclohexane	--	--	MG/KG	NA	NA	NA	NA	NA	NA
Cymene	--	--	MG/KG	0.00087 U	0.0013 U	0.0014 U	0.0014 U	0.0013 U	0.0011 U
Dibromochloromethane	--	--	MG/KG	0.00087 U	0.0013 U	0.0014 U	0.0014 U	0.0013 U	0.0011 U
Dibromomethane	--	--	MG/KG	0.0017 U	0.0026 U	0.0029 U	0.0028 U	0.0025 U	0.0023 U
Dichlorodifluoromethane	--	--	MG/KG	0.0087 U	0.013 U	0.014 U	0.014 U	0.013 U	0.011 U
Dichloroethylenes	--	--	MG/KG	0.00087 U	0.0013 U	0.0014 U	0.0014 U	0.0013 U	0.0011 U
Diethyl Ether (Ethyl Ether)	--	--	MG/KG	0.0017 U	0.0026 U	0.0029 U	0.0028 U	0.0025 U	0.0023 U
Ethylbenzene	1	41	MG/KG	0.00087 U	0.0013 U	0.0014 U	0.0014 U	0.0013 U	0.0011 U
Hexachlorobutadiene	--	--	MG/KG	0.0035 U	0.0052 U	0.0058 U	0.0055 U	0.0051 U	0.0045 U
Isopropylbenzene (Cumene)	--	--	MG/KG	0.00087 U	0.0013 U	0.0014 U	0.0014 U	0.0013 U	0.0011 U
m,p-Xylene	--	--	MG/KG	0.0017 U	0.0026 U	0.0029 U	0.0028 U	0.0025 U	0.0023 U
Methyl Acetate	--	--	MG/KG	NA	NA	NA	NA	NA	NA
Methyl Ethyl Ketone (2-Butanone)	0.12	100	MG/KG	0.0087 U	0.013 U	0.014 U	0.014 U	0.013 U	0.011 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	MG/KG	0.0087 U	0.013 U	0.014 U	0.014 U	0.013 U	0.011 U
Methylcyclohexane	--	--	MG/KG	NA	NA	NA	NA	NA	NA
Methylene Chloride	0.05	100	MG/KG	0.0044 U	0.0065 U	0.0072 U	0.0069 U	0.0063 U	0.0057 U

Table 3. Summary of Volatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	BDS-24	BDS-25	BDS-26	BDS-27	BDS-28	BDS-29
			Sample Date:	11/11/2019	01/15/2020	01/15/2020	01/15/2020	01/06/2020	01/06/2020
			Sample Depth (ft bls):	13 - 13	9 - 9	9 - 9	9 - 9	9 - 9	9 - 9
			Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
Naphthalene	12	100	MG/KG	0.0035 U	0.0052 U	0.0058 U	0.0055 U	0.0051 U	0.0045 U
N-Butylbenzene	12	100	MG/KG	0.00087 U	0.0013 U	0.0014 U	0.0014 U	0.0013 U	0.0011 U
N-Propylbenzene	3.9	100	MG/KG	0.00087 U	0.0013 U	0.0014 U	0.0014 U	0.0013 U	0.0011 U
O-Xylene (1,2-Dimethylbenzene)	--	--	MG/KG	0.00087 U	0.0013 U	0.0014 U	0.0014 U	0.0013 U	0.0011 U
Sec-Butylbenzene	11	100	MG/KG	0.00087 U	0.0013 U	0.0014 U	0.0014 U	0.0013 U	0.0011 U
Styrene	--	--	MG/KG	0.00087 U	0.0013 U	0.0014 U	0.0014 U	0.0013 U	0.0011 U
T-Butylbenzene	5.9	100	MG/KG	0.0017 U	0.0026 U	0.0029 U	0.0028 U	0.0025 U	0.0023 U
Tert-Butyl Alcohol	--	--	MG/KG	NA	NA	NA	NA	NA	NA
Tert-Butyl Methyl Ether	0.93	100	MG/KG	0.0017 U	0.0026 U	0.0029 U	0.0028 U	0.0025 U	0.0023 U
Tetrachloroethylene (PCE)	1.3	19	MG/KG	0.00044 U	0.00065 U	0.00048 J	0.00037 J	0.00087	0.00079
Toluene	0.7	100	MG/KG	0.00087 U	0.0013 U	0.0014 U	0.0014 U	0.0013 U	0.0011 U
Total, 1,3-Dichloropropene (Cis And Trans)	--	--	MG/KG	0.00044 U	0.00065 U	0.00072 U	0.00069 U	0.00063 U	0.00057 U
Trans-1,2-Dichloroethene	0.19	100	MG/KG	0.0013 U	0.0019 U	0.0022 U	0.0021 U	0.0019 U	0.0017 U
Trans-1,3-Dichloropropene	--	--	MG/KG	0.00087 U	0.0013 U	0.0014 U	0.0014 U	0.0013 U	0.0011 U
Trans-1,4-Dichloro-2-Butene	--	--	MG/KG	0.0044 U	0.0065 U	0.0072 U	0.0069 U	0.0063 U	0.0057 U
Trichloroethylene (TCE)	0.47	21	MG/KG	0.00044 U	0.00065 U	0.00072 U	0.00069 U	0.00063 U	0.00057 U
Trichlorofluoromethane	--	--	MG/KG	0.0035 U	0.0052 U	0.0058 U	0.0055 U	0.0051 U	0.0045 U
Vinyl Acetate	--	--	MG/KG	0.0087 U	0.013 U	0.014 U	0.014 U	0.013 U	0.011 U
Vinyl Chloride	0.02	0.9	MG/KG	0.00087 U	0.0013 U	0.0014 U	0.0014 U	0.0013 U	0.0011 U
Xylenes	0.26	100	MG/KG	0.00087 U	0.0013 U	0.0014 U	0.0014 U	0.0013 U	0.0011 U

Table 3. Summary of Volatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	BDS-3	BDS-3	BDS-30	BDS-3A	SB-18	SB-19
			Sample Date:	11/11/2019	11/11/2019	01/06/2020	05/05/2020	04/17/2019	04/18/2019
			Sample Depth (ft bls):	13 - 13	12 - 14	9 - 9	13.5 - 13.5	3 - 3	3 - 3
			Normal Sample or Field Duplicate:	N	FD	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
1,1,1,2-Tetrachloroethane	--	--	MG/KG	0.00044 U	0.00061 U	0.00055 U	0.00053 U	0.0007 U	0.00072 U
1,1,1-Trichloroethane (TCA)	0.68	100	MG/KG	0.00044 U	0.00061 U	0.00055 U	0.00053 U	0.0007 U	0.00072 U
1,1,2,2-Tetrachloroethane	--	--	MG/KG	0.00044 U	0.00061 U	0.00055 U	0.00053 U	0.0007 U	0.00072 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	--	--	MG/KG	NA	NA	NA	NA	0.0056 U	0.0058 U
1,1,2-Trichloroethane	--	--	MG/KG	0.00088 U	0.0012 U	0.0011 U	0.001 U	0.0014 U	0.0014 U
1,1-Dichloroethane	0.27	26	MG/KG	0.00088 U	0.0012 U	0.0011 U	0.001 U	0.0014 U	0.0014 U
1,1-Dichloroethene	0.33	100	MG/KG	0.00088 U	0.0012 U	0.0011 U	0.001 U	0.0014 U	0.0014 U
1,1-Dichloropropene	--	--	MG/KG	0.00044 U	0.00061 U	0.00055 U	0.00053 U	0.0007 U	0.00072 U
1,2,3-Trichlorobenzene	--	--	MG/KG	0.0018 U	0.0024 U	0.0022 U	0.0021 U	0.0028 U	0.0029 U
1,2,3-Trichloropropane	--	--	MG/KG	0.0018 U	0.0024 U	0.0022 U	0.0021 U	0.0028 U	0.0029 U
1,2,4,5-Tetramethylbenzene	--	--	MG/KG	0.0018 U	0.0024 U	0.0022 U	0.0021 U	0.0028 U	0.0029 U
1,2,4-Trichlorobenzene	--	--	MG/KG	0.0018 U	0.0024 U	0.0022 U	0.0021 U	0.0028 U	0.0029 U
1,2,4-Trimethylbenzene	3.6	52	MG/KG	0.0018 U	0.0024 U	0.0022 U	0.0021 U	0.0028 U	0.0029 U
1,2-Dibromo-3-Chloropropane	--	--	MG/KG	0.0026 U	0.0037 U	0.0033 U	0.0032 U	0.0042 U	0.0044 U
1,2-Dibromoethane (Ethylene Dibromide)	--	--	MG/KG	0.00088 U	0.0012 U	0.0011 U	0.001 U	0.0014 U	0.0014 U
1,2-Dichlorobenzene	1.1	100	MG/KG	0.0018 U	0.0024 U	0.0022 U	0.0021 U	0.0028 U	0.0029 U
1,2-Dichloroethane	0.02	3.1	MG/KG	0.00088 U	0.0012 U	0.0011 U	0.001 U	0.0014 U	0.0014 U
1,2-Dichloropropane	--	--	MG/KG	0.00088 U	0.0012 U	0.0011 U	0.001 U	0.0014 U	0.0014 U
1,3,5-Trimethylbenzene (Mesitylene)	8.4	52	MG/KG	0.0018 U	0.0024 U	0.0022 U	0.0021 U	0.0028 U	0.0029 U
1,3-Dichlorobenzene	2.4	49	MG/KG	0.0018 U	0.0024 U	0.0022 U	0.0021 U	0.0028 U	0.0029 U
1,3-Dichloropropane	--	--	MG/KG	0.0018 U	0.0024 U	0.0022 U	0.0021 U	0.0028 U	0.0029 U
1,4-Dichlorobenzene	1.8	13	MG/KG	0.0018 U	0.0024 U	0.0022 U	0.0021 U	0.0028 U	0.00038 J
1,4-Diethyl Benzene	--	--	MG/KG	0.0018 U	0.0024 U	0.0022 U	0.0021 U	0.0028 U	0.0029 U
1,4-Dioxane (P-Dioxane)	0.1	13	MG/KG	0.071 U	0.098 U	0.088 U	0.084 U	0.11 U	0.12 U
2,2-Dichloropropane	--	--	MG/KG	0.0018 U	0.0024 U	0.0022 U	0.0021 U	0.0028 U	0.0029 U
2-Chlorotoluene	--	--	MG/KG	0.0018 U	0.0024 U	0.0022 U	0.0021 U	0.0028 U	0.0029 U
2-Hexanone	--	--	MG/KG	0.0088 U	0.012 U	0.011 U	0.01 U	0.014 U	0.014 U
4-Chlorotoluene	--	--	MG/KG	0.0018 U	0.0024 U	0.0022 U	0.0021 U	0.0028 U	0.0029 U
4-Ethyltoluene	--	--	MG/KG	0.0018 U	0.0024 U	0.0022 U	0.0021 U	0.0028 U	0.0029 U
Acetone	**0.05**	100	MG/KG	0.0088 U	0.019	0.011 U	0.01 U	0.014 U	0.014 U
Acrolein	--	--	MG/KG	NA	NA	NA	NA	0.035 U	0.036 U

Table 3. Summary of Volatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	BDS-3	BDS-3	BDS-30	BDS-3A	SB-18	SB-19
			Sample Date:	11/11/2019	11/11/2019	01/06/2020	05/05/2020	04/17/2019	04/18/2019
			Sample Depth (ft bls):	13 - 13	12 - 14	9 - 9	13.5 - 13.5	3 - 3	3 - 3
			Normal Sample or Field Duplicate:	N	FD	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
Acrylonitrile	--	--	MG/KG	0.0035 U	0.0049 U	0.0044 U	0.0042 U	0.0056 U	0.0058 U
Benzene	0.06	4.8	MG/KG	0.00044 U	0.00061 U	0.00055 U	0.00053 U	0.0007 U	0.00072 U
Bromobenzene	--	--	MG/KG	0.0018 U	0.0024 U	0.0022 U	0.0021 U	0.0028 U	0.0029 U
Bromochloromethane	--	--	MG/KG	0.0018 U	0.0024 U	0.0022 U	0.0021 U	0.0028 U	0.0029 U
Bromodichloromethane	--	--	MG/KG	0.00044 U	0.00061 U	0.00055 U	0.00053 U	0.0007 U	0.00072 U
Bromoform	--	--	MG/KG	0.0035 U	0.0049 U	0.0044 U	0.0042 U	0.0056 U	0.0058 U
Bromomethane	--	--	MG/KG	0.0018 U	0.0024 U	0.0022 U	0.0021 U	0.0028 U	0.0029 U
Carbon Disulfide	--	--	MG/KG	0.0088 U	0.012 U	0.011 U	0.01 U	0.014 U	0.014 U
Carbon Tetrachloride	0.76	2.4	MG/KG	0.00088 U	0.0012 U	0.0011 U	0.001 U	0.0014 U	0.0014 U
Chlorobenzene	1.1	100	MG/KG	0.00044 U	0.00061 U	0.00055 U	0.00053 U	0.0007 U	0.00072 U
Chloroethane	--	--	MG/KG	0.0018 U	0.0024 U	0.0022 U	0.0021 U	0.0028 U	0.0029 U
Chloroform	0.37	49	MG/KG	0.00046 J	0.0018 U	0.0016 U	0.0016 U	0.0021 U	0.0022 U
Chloromethane	--	--	MG/KG	0.0035 U	0.0049 U	0.0044 U	0.0042 U	0.0056 U	0.0058 U
Cis-1,2-Dichloroethylene	0.25	100	MG/KG	0.00088 U	0.0012 U	0.0011 U	0.001 U	0.0014 U	0.0014 U
Cis-1,3-Dichloropropene	--	--	MG/KG	0.00044 U	0.00061 U	0.00055 U	0.00053 U	0.0007 U	0.00072 U
Cyclohexane	--	--	MG/KG	NA	NA	NA	NA	0.014 U	0.014 U
Cymene	--	--	MG/KG	0.00088 U	0.0012 U	0.0011 U	0.001 U	0.0014 U	0.0014 U
Dibromochloromethane	--	--	MG/KG	0.00088 U	0.0012 U	0.0011 U	0.001 U	0.0014 U	0.0014 U
Dibromomethane	--	--	MG/KG	0.0018 U	0.0024 U	0.0022 U	0.0021 U	0.0028 U	0.0029 U
Dichlorodifluoromethane	--	--	MG/KG	0.0088 U	0.012 U	0.011 U	0.01 U	0.014 U	0.014 U
Dichloroethylenes	--	--	MG/KG	0.00088 U	0.0012 U	0.0011 U	0.00016 J	0.0014 U	0.0014 U
Diethyl Ether (Ethyl Ether)	--	--	MG/KG	0.0018 U	0.0024 U	0.0022 U	0.0021 U	0.0028 U	0.0029 U
Ethylbenzene	1	41	MG/KG	0.00088 U	0.0012 U	0.0011 U	0.001 U	0.0014 U	0.0014 U
Hexachlorobutadiene	--	--	MG/KG	0.0035 U	0.0049 U	0.0044 U	0.0042 U	0.0056 U	0.0058 U
Isopropylbenzene (Cumene)	--	--	MG/KG	0.00088 U	0.0012 U	0.0011 U	0.001 U	0.0014 U	0.0014 U
m,p-Xylene	--	--	MG/KG	0.0018 U	0.0024 U	0.0022 U	0.0021 U	0.0028 U	0.0029 U
Methyl Acetate	--	--	MG/KG	NA	NA	NA	NA	0.0056 U	0.0058 U
Methyl Ethyl Ketone (2-Butanone)	0.12	100	MG/KG	0.0088 U	0.012 U	0.011 U	0.01 U	0.014 U	0.014 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	MG/KG	0.0088 U	0.012 U	0.011 U	0.01 U	0.014 U	0.014 U
Methylcyclohexane	--	--	MG/KG	NA	NA	NA	NA	0.0056 U	0.0058 U
Methylene Chloride	0.05	100	MG/KG	0.0044 U	0.0061 U	0.0055 U	0.0053 U	0.007 U	0.0072 U

Table 3. Summary of Volatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	BDS-3	BDS-3	BDS-30	BDS-3A	SB-18	SB-19
			Sample Date:	11/11/2019	11/11/2019	01/06/2020	05/05/2020	04/17/2019	04/18/2019
			Sample Depth (ft bls):	13 - 13	12 - 14	9 - 9	13.5 - 13.5	3 - 3	3 - 3
			Normal Sample or Field Duplicate:	N	FD	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
Naphthalene	12	100	MG/KG	0.0035 U	0.0049 U	0.0044 U	0.0042 U	0.0056 U	0.0058 U
N-Butylbenzene	12	100	MG/KG	0.00088 U	0.0012 U	0.0011 U	0.001 U	0.0014 U	0.0014 U
N-Propylbenzene	3.9	100	MG/KG	0.00088 U	0.0012 U	0.0011 U	0.001 U	0.0014 U	0.0014 U
O-Xylene (1,2-Dimethylbenzene)	--	--	MG/KG	0.00088 U	0.0012 U	0.0011 U	0.001 U	0.0014 U	0.0014 U
Sec-Butylbenzene	11	100	MG/KG	0.00088 U	0.0012 U	0.0011 U	0.001 U	0.0014 U	0.0014 U
Styrene	--	--	MG/KG	0.00088 U	0.0012 U	0.0011 U	0.001 U	0.0014 U	0.0014 U
T-Butylbenzene	5.9	100	MG/KG	0.0018 U	0.0024 U	0.0022 U	0.0021 U	0.0028 U	0.0029 U
Tert-Butyl Alcohol	--	--	MG/KG	NA	NA	NA	NA	0.028 U	0.029 U
Tert-Butyl Methyl Ether	0.93	100	MG/KG	0.0018 U	0.0024 U	0.0022 U	0.0021 U	0.0028 U	0.0029 U
Tetrachloroethylene (PCE)	1.3	19	MG/KG	0.00044 U	0.00061 U	0.00072	0.00053 U	0.00035 J	0.00072 U
Toluene	0.7	100	MG/KG	0.00088 U	0.0012 U	0.0011 U	0.001 U	0.0014 U	0.0014 U
Total, 1,3-Dichloropropene (Cis And Trans)	--	--	MG/KG	0.00044 U	0.00061 U	0.00055 U	0.00053 U	0.0007 U	0.00072 U
Trans-1,2-Dichloroethene	0.19	100	MG/KG	0.0013 U	0.0018 U	0.0016 U	0.00016 J	0.0021 U	0.0022 U
Trans-1,3-Dichloropropene	--	--	MG/KG	0.00088 U	0.0012 U	0.0011 U	0.001 U	0.0014 U	0.0014 U
Trans-1,4-Dichloro-2-Butene	--	--	MG/KG	0.0044 U	0.0061 U	0.0055 U	0.0053 U	0.007 U	0.0072 U
Trichloroethylene (TCE)	0.47	21	MG/KG	0.00044 U	0.00061 U	0.00055 U	0.00053 U	0.0007 U	0.00072 U
Trichlorofluoromethane	--	--	MG/KG	0.0035 U	0.0049 U	0.0044 U	0.0042 U	0.0056 U	0.0058 U
Vinyl Acetate	--	--	MG/KG	0.0088 U	0.012 U	0.011 U	0.01 U	0.014 U	0.014 U
Vinyl Chloride	0.02	0.9	MG/KG	0.00088 U	0.0012 U	0.0011 U	0.001 U	0.0014 U	0.0014 U
Xylenes	0.26	100	MG/KG	0.00088 U	0.0012 U	0.0011 U	0.001 U	0.0014 U	0.0014 U

Table 3. Summary of Volatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SB-20	SB-21	SB-22	SB-23	SB-24	SB-25
			Sample Date:	04/17/2019	04/17/2019	04/16/2019	04/18/2019	04/15/2019	04/18/2019
			Sample Depth (ft bls):	3 - 3	3 - 3	3 - 3	2 - 2	3 - 3	3 - 3
			Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
1,1,1,2-Tetrachloroethane	--	--	MG/KG	0.00089 U	0.00066 U	0.00077 U	0.00065 U	0.00074 U	0.00075 U
1,1,1-Trichloroethane (TCA)	0.68	100	MG/KG	0.00089 U	0.00066 U	0.00077 U	0.00065 U	0.00074 U	0.00075 U
1,1,2,2-Tetrachloroethane	--	--	MG/KG	0.00089 U	0.00066 U	0.00077 U	0.00065 U	0.00074 U	0.00075 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	--	--	MG/KG	0.0071 U	0.0053 U	0.0062 U	0.0052 U	0.0059 U	0.006 U
1,1,2-Trichloroethane	--	--	MG/KG	0.0018 U	0.0013 U	0.0015 U	0.0013 U	0.0015 U	0.0015 U
1,1-Dichloroethane	0.27	26	MG/KG	0.0018 U	0.0013 U	0.0015 U	0.0013 U	0.0015 U	0.0015 U
1,1-Dichloroethene	0.33	100	MG/KG	0.0018 U	0.0013 U	0.0015 U	0.0013 U	0.0015 U	0.0015 U
1,1-Dichloropropene	--	--	MG/KG	0.00089 U	0.00066 U	0.00077 U	0.00065 U	0.00074 U	0.00075 U
1,2,3-Trichlorobenzene	--	--	MG/KG	0.0035 U	0.0026 U	0.0031 U	0.0026 U	0.0029 U	0.003 U
1,2,3-Trichloropropane	--	--	MG/KG	0.0035 U	0.0026 U	0.0031 U	0.0026 U	0.0029 U	0.003 U
1,2,4,5-Tetramethylbenzene	--	--	MG/KG	0.0035 U	0.0026 U	0.0031 U	0.0026 U	0.0029 U	0.003 U
1,2,4-Trichlorobenzene	--	--	MG/KG	0.0035 U	0.0026 U	0.0031 U	0.0026 U	0.0029 U	0.003 U
1,2,4-Trimethylbenzene	3.6	52	MG/KG	0.0035 U	0.0026 U	0.0031 U	0.0026 U	0.0029 U	0.003 U
1,2-Dibromo-3-Chloropropane	--	--	MG/KG	0.0053 U	0.0039 U	0.0046 U	0.0039 U	0.0044 U	0.0045 U
1,2-Dibromoethane (Ethylene Dibromide)	--	--	MG/KG	0.0018 U	0.0013 U	0.0015 U	0.0013 U	0.0015 U	0.0015 U
1,2-Dichlorobenzene	1.1	100	MG/KG	0.0035 U	0.0026 U	0.0031 U	0.0026 U	0.0029 U	0.003 U
1,2-Dichloroethane	0.02	3.1	MG/KG	0.0018 U	0.0013 U	0.0015 U	0.0013 U	0.0015 U	0.0015 U
1,2-Dichloropropane	--	--	MG/KG	0.0018 U	0.0013 U	0.0015 U	0.0013 U	0.0015 U	0.0015 U
1,3,5-Trimethylbenzene (Mesitylene)	8.4	52	MG/KG	0.0035 U	0.0026 U	0.0031 U	0.0026 U	0.0029 U	0.003 U
1,3-Dichlorobenzene	2.4	49	MG/KG	0.0035 U	0.0026 U	0.0031 U	0.0026 U	0.0029 U	0.003 U
1,3-Dichloropropane	--	--	MG/KG	0.0035 U	0.0026 U	0.0031 U	0.0026 U	0.0029 U	0.003 U
1,4-Dichlorobenzene	1.8	13	MG/KG	0.0035 U	0.0026 U	0.0031 U	0.0026 U	0.0029 U	0.003 U
1,4-Diethyl Benzene	--	--	MG/KG	0.0035 U	0.0026 U	0.0031 U	0.0026 U	0.0029 U	0.003 U
1,4-Dioxane (P-Dioxane)	0.1	13	MG/KG	0.14 U	0.1 U	0.12 U	0.1 U	0.12 U	0.12 U
2,2-Dichloropropane	--	--	MG/KG	0.0035 U	0.0026 U	0.0031 U	0.0026 U	0.0029 U	0.003 U
2-Chlorotoluene	--	--	MG/KG	0.0035 U	0.0026 U	0.0031 U	0.0026 U	0.0029 U	0.003 U
2-Hexanone	--	--	MG/KG	0.018 U	0.013 U	0.015 U	0.013 U	0.015 U	0.015 U
4-Chlorotoluene	--	--	MG/KG	0.0035 U	0.0026 U	0.0031 U	0.0026 U	0.0029 U	0.003 U
4-Ethyltoluene	--	--	MG/KG	0.0035 U	0.0026 U	0.0031 U	0.0026 U	0.0029 U	0.003 U
Acetone	**0.05**	100	MG/KG	**0.12**	0.019	0.033	0.013 U	0.016	0.015 U
Acrolein	--	--	MG/KG	0.044 U	0.033 U	0.039 U	0.033 R	0.037 U	0.037 U

Table 3. Summary of Volatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SB-20	SB-21	SB-22	SB-23	SB-24	SB-25
			Sample Date:	04/17/2019	04/17/2019	04/16/2019	04/18/2019	04/15/2019	04/18/2019
			Sample Depth (ft bls):	3 - 3	3 - 3	3 - 3	2 - 2	3 - 3	3 - 3
			Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
Acrylonitrile	--	--	MG/KG	0.0071 U	0.0053 U	0.0062 U	0.0052 U	0.0059 U	0.006 U
Benzene	0.06	4.8	MG/KG	0.00089 U	0.00066 U	0.00077 U	0.00065 U	0.00074 U	0.00075 U
Bromobenzene	--	--	MG/KG	0.0035 U	0.0026 U	0.0031 U	0.0026 U	0.0029 U	0.003 U
Bromochloromethane	--	--	MG/KG	0.0035 U	0.0026 U	0.0031 U	0.0026 U	0.0029 U	0.003 U
Bromodichloromethane	--	--	MG/KG	0.00089 U	0.00066 U	0.00077 U	0.00065 U	0.00074 U	0.00075 U
Bromoform	--	--	MG/KG	0.0071 U	0.0053 U	0.0062 U	0.0052 U	0.0059 U	0.006 U
Bromomethane	--	--	MG/KG	0.0035 U	0.0026 U	0.0031 U	0.0026 U	0.0029 U	0.003 U
Carbon Disulfide	--	--	MG/KG	0.018 U	0.013 U	0.015 U	0.013 U	0.015 U	0.015 U
Carbon Tetrachloride	0.76	2.4	MG/KG	0.0018 U	0.0013 U	0.0015 U	0.0013 U	0.0015 U	0.0015 U
Chlorobenzene	1.1	100	MG/KG	0.00089 U	0.00066 U	0.00077 U	0.00065 U	0.00074 U	0.00075 U
Chloroethane	--	--	MG/KG	0.0035 U	0.0026 U	0.0031 U	0.0026 U	0.0029 U	0.003 U
Chloroform	0.37	49	MG/KG	0.0026 U	0.002 U	0.0023 U	0.002 U	0.0022 U	0.0022 U
Chloromethane	--	--	MG/KG	0.0071 U	0.0053 U	0.0062 U	0.0052 U	0.0059 U	0.006 U
Cis-1,2-Dichloroethylene	0.25	100	MG/KG	0.0018 U	0.0013 U	0.0015 U	0.0013 U	0.0015 U	0.0015 U
Cis-1,3-Dichloropropene	--	--	MG/KG	0.00089 U	0.00066 U	0.00077 U	0.00065 U	0.00074 U	0.00075 U
Cyclohexane	--	--	MG/KG	0.018 U	0.013 U	0.015 U	0.013 U	0.015 U	0.015 U
Cymene	--	--	MG/KG	0.0018 U	0.0013 U	0.0015 U	0.0013 U	0.0015 U	0.0015 U
Dibromochloromethane	--	--	MG/KG	0.0018 U	0.0013 U	0.0015 U	0.0013 U	0.0015 U	0.0015 U
Dibromomethane	--	--	MG/KG	0.0035 U	0.0026 U	0.0031 U	0.0026 U	0.0029 U	0.003 U
Dichlorodifluoromethane	--	--	MG/KG	0.018 U	0.013 U	0.015 U	0.013 U	0.015 U	0.015 U
Dichloroethylenes	--	--	MG/KG	0.0018 U	0.0013 U	0.0015 U	0.0013 U	0.0015 U	0.0015 U
Diethyl Ether (Ethyl Ether)	--	--	MG/KG	0.0035 U	0.0026 U	0.0031 U	0.0026 U	0.0029 U	0.003 U
Ethylbenzene	1	41	MG/KG	0.0018 U	0.0013 U	0.0015 U	0.0013 U	0.0015 U	0.0015 U
Hexachlorobutadiene	--	--	MG/KG	0.0071 U	0.0053 U	0.0062 U	0.0052 U	0.0059 U	0.006 U
Isopropylbenzene (Cumene)	--	--	MG/KG	0.0018 U	0.0013 U	0.0015 U	0.0013 U	0.0015 U	0.0015 U
m,p-Xylene	--	--	MG/KG	0.0035 U	0.0026 U	0.0031 U	0.0026 U	0.0029 U	0.003 U
Methyl Acetate	--	--	MG/KG	0.0071 U	0.0053 U	0.0062 U	0.0052 U	0.0059 U	0.006 U
Methyl Ethyl Ketone (2-Butanone)	0.12	100	MG/KG	0.018 U	0.013 U	0.015 U	0.013 U	0.015 U	0.015 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	MG/KG	0.018 U	0.013 U	0.015 U	0.013 U	0.015 U	0.015 U
Methylcyclohexane	--	--	MG/KG	0.0071 U	0.0053 U	0.0062 U	0.0052 U	0.0059 U	0.006 U
Methylene Chloride	0.05	100	MG/KG	0.0089 U	0.0066 U	0.0077 U	0.0065 U	0.0074 U	0.0075 U

Table 3. Summary of Volatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SB-20	SB-21	SB-22	SB-23	SB-24	SB-25
			Sample Date:	04/17/2019	04/17/2019	04/16/2019	04/18/2019	04/15/2019	04/18/2019
			Sample Depth (ft bls):	3 - 3	3 - 3	3 - 3	2 - 2	3 - 3	3 - 3
			Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
Naphthalene	12	100	MG/KG	0.0031 J	0.0053 U	0.0062 U	0.0052 U	0.0059 U	0.006 U
N-Butylbenzene	12	100	MG/KG	0.0018 U	0.0013 U	0.0015 U	0.0013 U	0.0015 U	0.0015 U
N-Propylbenzene	3.9	100	MG/KG	0.0018 U	0.0013 U	0.0015 U	0.0013 U	0.0015 U	0.0015 U
O-Xylene (1,2-Dimethylbenzene)	--	--	MG/KG	0.0018 U	0.0013 U	0.0015 U	0.0013 U	0.0015 U	0.0015 U
Sec-Butylbenzene	11	100	MG/KG	0.0018 U	0.0013 U	0.0015 U	0.0013 U	0.0015 U	0.0015 U
Styrene	--	--	MG/KG	0.0018 U	0.0013 U	0.0015 U	0.0013 U	0.0015 U	0.0015 U
T-Butylbenzene	5.9	100	MG/KG	0.0035 U	0.0026 U	0.0031 U	0.0026 U	0.0029 U	0.003 U
Tert-Butyl Alcohol	--	--	MG/KG	0.021 J	0.026 U	0.031 U	0.026 U	0.029 U	0.03 U
Tert-Butyl Methyl Ether	0.93	100	MG/KG	0.00079 J	0.00037 J	0.00041 J	0.0026 U	0.0029 U	0.003 U
Tetrachloroethylene (PCE)	1.3	19	MG/KG	0.00089 U	0.00042 J	0.00077 U	0.00065 U	0.00074 U	0.00075 U
Toluene	0.7	100	MG/KG	0.0018 U	0.0013 U	0.0015 U	0.0013 U	0.0015 U	0.0015 U
Total, 1,3-Dichloropropene (Cis And Trans)	--	--	MG/KG	0.00089 U	0.00066 U	0.00077 U	0.00065 U	0.00074 U	0.00075 U
Trans-1,2-Dichloroethene	0.19	100	MG/KG	0.0026 U	0.002 U	0.0023 U	0.002 U	0.0022 U	0.0022 U
Trans-1,3-Dichloropropene	--	--	MG/KG	0.0018 U	0.0013 U	0.0015 U	0.0013 U	0.0015 U	0.0015 U
Trans-1,4-Dichloro-2-Butene	--	--	MG/KG	0.0089 U	0.0066 U	0.0077 U	0.0065 U	0.0074 U	0.0075 U
Trichloroethylene (TCE)	0.47	21	MG/KG	0.00089 U	0.00066 U	0.00077 U	0.00065 U	0.00074 U	0.00075 U
Trichlorofluoromethane	--	--	MG/KG	0.0071 U	0.0053 U	0.0062 U	0.0052 U	0.0059 U	0.006 U
Vinyl Acetate	--	--	MG/KG	0.018 U	0.013 U	0.015 U	0.013 U	0.015 U	0.015 U
Vinyl Chloride	0.02	0.9	MG/KG	0.0018 U	0.0013 U	0.0015 U	0.0013 U	0.0015 U	0.0015 U
Xylenes	0.26	100	MG/KG	0.0018 U	0.0013 U	0.0015 U	0.0013 U	0.0015 U	0.0015 U

Table 3. Summary of Volatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SB-25	SB-34	SB-35	SDS-1	SDS-1	SDS-10
			Sample Date:	04/18/2019	04/17/2019	04/16/2019	01/07/2020	01/07/2020	01/06/2020
			Sample Depth (ft bls):	2 - 4	3 - 3	3 - 3	6 - 6	6 - 6	7.5 - 7.5
			Normal Sample or Field Duplicate:	FD	N	N	FD	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
1,1,1,2-Tetrachloroethane	--	--	MG/KG	0.00075 U	0.0006 U	0.00088 U	0.00055 U	0.00052 U	0.00075 U
1,1,1-Trichloroethane (TCA)	0.68	100	MG/KG	0.00075 U	0.0006 U	0.00088 U	0.00055 U	0.00052 U	0.00075 U
1,1,2,2-Tetrachloroethane	--	--	MG/KG	0.00075 U	0.0006 U	0.00088 U	0.00055 U	0.00052 U	0.00075 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	--	--	MG/KG	0.006 U	0.0048 U	0.0071 U	NA	NA	NA
1,1,2-Trichloroethane	--	--	MG/KG	0.0015 U	0.0012 U	0.0018 U	0.0011 U	0.001 U	0.0015 U
1,1-Dichloroethane	0.27	26	MG/KG	0.0015 U	0.0012 U	0.0018 U	0.0011 U	0.001 U	0.0015 U
1,1-Dichloroethene	0.33	100	MG/KG	0.0015 U	0.0012 U	0.0018 U	0.0011 U	0.001 U	0.0015 U
1,1-Dichloropropene	--	--	MG/KG	0.00075 U	0.0006 U	0.00088 U	0.00055 U	0.00052 U	0.00075 U
1,2,3-Trichlorobenzene	--	--	MG/KG	0.003 U	0.0024 U	0.0035 U	0.0022 U	0.0021 U	0.003 U
1,2,3-Trichloropropane	--	--	MG/KG	0.003 U	0.0024 U	0.0035 U	0.0022 U	0.0021 U	0.003 U
1,2,4,5-Tetramethylbenzene	--	--	MG/KG	0.003 U	0.0024 U	0.0035 U	0.0022 U	0.0021 U	0.003 U
1,2,4-Trichlorobenzene	--	--	MG/KG	0.003 U	0.0024 U	0.0035 U	0.0022 U	0.0021 U	0.003 U
1,2,4-Trimethylbenzene	3.6	52	MG/KG	0.003 U	0.0024 U	0.0035 U	0.0022 U	0.0021 U	0.003 U
1,2-Dibromo-3-Chloropropane	--	--	MG/KG	0.0045 U	0.0036 U	0.0053 U	0.0033 U	0.0031 U	0.0045 U
1,2-Dibromoethane (Ethylene Dibromide)	--	--	MG/KG	0.0015 U	0.0012 U	0.0018 U	0.0011 U	0.001 U	0.0015 U
1,2-Dichlorobenzene	1.1	100	MG/KG	0.003 U	0.0024 U	0.0035 U	0.0022 U	0.0021 U	0.003 U
1,2-Dichloroethane	0.02	3.1	MG/KG	0.0015 U	0.0012 U	0.0018 U	0.0011 U	0.001 U	0.0015 U
1,2-Dichloropropane	--	--	MG/KG	0.0015 U	0.0012 U	0.0018 U	0.0011 U	0.001 U	0.0015 U
1,3,5-Trimethylbenzene (Mesitylene)	8.4	52	MG/KG	0.003 U	0.0024 U	0.0035 U	0.0022 U	0.0021 U	0.003 U
1,3-Dichlorobenzene	2.4	49	MG/KG	0.003 U	0.0024 U	0.0035 U	0.0022 U	0.0021 U	0.003 U
1,3-Dichloropropane	--	--	MG/KG	0.003 U	0.0024 U	0.0035 U	0.0022 U	0.0021 U	0.003 U
1,4-Dichlorobenzene	1.8	13	MG/KG	0.003 U	0.0024 U	0.0035 U	0.0022 U	0.0021 U	0.003 U
1,4-Diethyl Benzene	--	--	MG/KG	0.003 U	0.0024 U	0.0035 U	0.0022 U	0.0021 U	0.003 U
1,4-Dioxane (P-Dioxane)	0.1	13	MG/KG	0.12 U	0.097 U	0.14 U	0.088 U	0.083 U	0.12 U
2,2-Dichloropropane	--	--	MG/KG	0.003 U	0.0024 U	0.0035 U	0.0022 U	0.0021 U	0.003 U
2-Chlorotoluene	--	--	MG/KG	0.003 U	0.0024 U	0.0035 U	0.0022 U	0.0021 U	0.003 U
2-Hexanone	--	--	MG/KG	0.015 U	0.012 U	0.018 U	0.011 U	0.01 U	0.015 U
4-Chlorotoluene	--	--	MG/KG	0.003 U	0.0024 U	0.0035 U	0.0022 U	0.0021 U	0.003 U
4-Ethyltoluene	--	--	MG/KG	0.003 U	0.0024 U	0.0035 U	0.0022 U	0.0021 U	0.003 U
Acetone	**0.05**	100	MG/KG	0.015 U	0.016	0.018	0.011 U	0.01 U	0.015 U
Acrolein	--	--	MG/KG	0.038 U	0.03 U	0.044 U	NA	NA	NA

Table 3. Summary of Volatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SB-25	SB-34	SB-35	SDS-1	SDS-1	SDS-10
			Sample Date:	04/18/2019	04/17/2019	04/16/2019	01/07/2020	01/07/2020	01/06/2020
			Sample Depth (ft bls):	2 - 4	3 - 3	3 - 3	6 - 6	6 - 6	7.5 - 7.5
			Normal Sample or Field Duplicate:	FD	N	N	FD	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
Acrylonitrile	--	--	MG/KG	0.006 U	0.0048 U	0.0071 U	0.0044 U	0.0042 U	0.006 U
Benzene	0.06	4.8	MG/KG	0.00075 U	0.0006 U	0.00088 U	0.00055 U	0.00052 U	0.00075 U
Bromobenzene	--	--	MG/KG	0.003 U	0.0024 U	0.0035 U	0.0022 U	0.0021 U	0.003 U
Bromochloromethane	--	--	MG/KG	0.003 U	0.0024 U	0.0035 U	0.0022 U	0.0021 U	0.003 U
Bromodichloromethane	--	--	MG/KG	0.00075 U	0.0006 U	0.00088 U	0.00055 U	0.00052 U	0.00075 U
Bromoform	--	--	MG/KG	0.006 U	0.0048 U	0.0071 U	0.0044 U	0.0042 U	0.006 U
Bromomethane	--	--	MG/KG	0.003 U	0.0024 U	0.0035 U	0.0022 U	0.0021 U	0.003 U
Carbon Disulfide	--	--	MG/KG	0.015 U	0.012 U	0.018 U	0.011 U	0.01 U	0.015 U
Carbon Tetrachloride	0.76	2.4	MG/KG	0.0015 U	0.0012 U	0.0018 U	0.0011 U	0.001 U	0.0015 U
Chlorobenzene	1.1	100	MG/KG	0.00075 U	0.0006 U	0.00088 U	0.00055 U	0.00052 U	0.00075 U
Chloroethane	--	--	MG/KG	0.003 U	0.0024 U	0.0035 U	0.0022 U	0.0021 U	0.003 U
Chloroform	0.37	49	MG/KG	0.0022 U	0.0018 U	0.0026 U	0.0017 U	0.0016 U	0.0022 U
Chloromethane	--	--	MG/KG	0.006 U	0.0048 U	0.0071 U	0.0044 U	0.0042 U	0.006 U
Cis-1,2-Dichloroethylene	0.25	100	MG/KG	0.0015 U	0.0012 U	0.0018 U	0.0011 U	0.001 U	0.0015 U
Cis-1,3-Dichloropropene	--	--	MG/KG	0.00075 U	0.0006 U	0.00088 U	0.00055 U	0.00052 U	0.00075 U
Cyclohexane	--	--	MG/KG	0.015 U	0.012 U	0.018 U	NA	NA	NA
Cymene	--	--	MG/KG	0.0015 U	0.0012 U	0.0018 U	0.0011 U	0.001 U	0.0015 U
Dibromochloromethane	--	--	MG/KG	0.0015 U	0.0012 U	0.0018 U	0.0011 U	0.001 U	0.0015 U
Dibromomethane	--	--	MG/KG	0.003 U	0.0024 U	0.0035 U	0.0022 U	0.0021 U	0.003 U
Dichlorodifluoromethane	--	--	MG/KG	0.015 U	0.012 U	0.018 U	0.011 U	0.01 U	0.015 U
Dichloroethylenes	--	--	MG/KG	0.0015 U	0.0012 U	0.0018 U	0.0011 U	0.001 U	0.0015 U
Diethyl Ether (Ethyl Ether)	--	--	MG/KG	0.003 U	0.0024 U	0.0035 U	0.0022 U	0.0021 U	0.003 U
Ethylbenzene	1	41	MG/KG	0.0015 U	0.0012 U	0.0018 U	0.0011 U	0.001 U	0.0015 U
Hexachlorobutadiene	--	--	MG/KG	0.006 U	0.0048 U	0.0071 U	0.0044 U	0.0042 U	0.006 U
Isopropylbenzene (Cumene)	--	--	MG/KG	0.0015 U	0.0012 U	0.0018 U	0.0011 U	0.001 U	0.0015 U
m,p-Xylene	--	--	MG/KG	0.003 U	0.0024 U	0.0035 U	0.0022 U	0.0021 U	0.003 U
Methyl Acetate	--	--	MG/KG	0.0044 J	0.0048 U	0.0071 U	NA	NA	NA
Methyl Ethyl Ketone (2-Butanone)	0.12	100	MG/KG	0.015 U	0.012 U	0.018 U	0.011 U	0.01 U	0.015 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	MG/KG	0.015 U	0.012 U	0.018 U	0.011 U	0.01 U	0.015 U
Methylcyclohexane	--	--	MG/KG	0.006 U	0.0048 U	0.0071 U	NA	NA	NA
Methylene Chloride	0.05	100	MG/KG	0.0075 U	0.006 U	0.0088 U	0.0055 U	0.0052 U	0.0075 U

Table 3. Summary of Volatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SB-25	SB-34	SB-35	SDS-1	SDS-1	SDS-10
			Sample Date:	04/18/2019	04/17/2019	04/16/2019	01/07/2020	01/07/2020	01/06/2020
			Sample Depth (ft bls):	2 - 4	3 - 3	3 - 3	6 - 6	6 - 6	7.5 - 7.5
			Normal Sample or Field Duplicate:	FD	N	N	FD	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
Naphthalene	12	100	MG/KG	0.006 U	0.0048 U	0.0071 U	0.0044 U	0.0042 U	0.006 U
N-Butylbenzene	12	100	MG/KG	0.0015 U	0.0012 U	0.0018 U	0.0011 U	0.001 U	0.0015 U
N-Propylbenzene	3.9	100	MG/KG	0.0015 U	0.0012 U	0.0018 U	0.0011 U	0.001 U	0.0015 U
O-Xylene (1,2-Dimethylbenzene)	--	--	MG/KG	0.0015 U	0.0012 U	0.0018 U	0.0011 U	0.001 U	0.0015 U
Sec-Butylbenzene	11	100	MG/KG	0.0015 U	0.0012 U	0.0018 U	0.0011 U	0.001 U	0.0015 U
Styrene	--	--	MG/KG	0.0015 U	0.0012 U	0.0018 U	0.0011 U	0.001 U	0.0015 U
T-Butylbenzene	5.9	100	MG/KG	0.003 U	0.0024 U	0.0035 U	0.0022 U	0.0021 U	0.003 U
Tert-Butyl Alcohol	--	--	MG/KG	0.03 U	0.024 U	0.035 U	NA	NA	NA
Tert-Butyl Methyl Ether	0.93	100	MG/KG	0.003 U	0.0024 U	0.0035 U	0.0022 U	0.0021 U	0.003 U
Tetrachloroethylene (PCE)	1.3	19	MG/KG	0.00075 U	0.00034 J	0.00088 U	0.0012	0.00085	0.00075 U
Toluene	0.7	100	MG/KG	0.0015 U	0.0012 U	0.0018 U	0.0011 U	0.001 U	0.0015 U
Total, 1,3-Dichloropropene (Cis And Trans)	--	--	MG/KG	0.00075 U	0.0006 U	0.00088 U	0.00055 U	0.00052 U	0.00075 U
Trans-1,2-Dichloroethene	0.19	100	MG/KG	0.0022 U	0.0018 U	0.0026 U	0.0017 U	0.0016 U	0.0022 U
Trans-1,3-Dichloropropene	--	--	MG/KG	0.0015 U	0.0012 U	0.0018 U	0.0011 U	0.001 U	0.0015 U
Trans-1,4-Dichloro-2-Butene	--	--	MG/KG	0.0075 U	0.006 U	0.0088 U	0.0055 U	0.0052 U	0.0075 U
Trichloroethylene (TCE)	0.47	21	MG/KG	0.00075 U	0.0006 U	0.00088 U	0.00055 U	0.00052 U	0.00075 U
Trichlorofluoromethane	--	--	MG/KG	0.006 U	0.0048 U	0.0071 U	0.0044 U	0.0042 U	0.006 U
Vinyl Acetate	--	--	MG/KG	0.015 U	0.012 U	0.018 U	0.011 U	0.01 U	0.015 U
Vinyl Chloride	0.02	0.9	MG/KG	0.0015 U	0.0012 U	0.0018 U	0.0011 U	0.001 U	0.0015 U
Xylenes	0.26	100	MG/KG	0.0015 U	0.0012 U	0.0018 U	0.0011 U	0.001 U	0.0015 U

Table 3. Summary of Volatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SDS-11	SDS-12	SDS-2	SDS-21E	SDS-21S	SDS-21W
			Sample Date:	01/06/2020	01/07/2020	01/07/2020	01/06/2020	01/06/2020	01/06/2020
			Sample Depth (ft bls):	7.5 - 7.5	7.5 - 7.5	6 - 6	7 - 7	7 - 7	7 - 7
			Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
1,1,1,2-Tetrachloroethane	--	--	MG/KG	0.00074 U	0.0007 U	0.00064 U	0.00069 U	0.0007 U	0.00069 U
1,1,1-Trichloroethane (TCA)	0.68	100	MG/KG	0.00074 U	0.0007 U	0.00064 U	0.00069 U	0.0007 U	0.00069 U
1,1,2,2-Tetrachloroethane	--	--	MG/KG	0.00074 U	0.0007 U	0.00064 U	0.00069 U	0.0007 U	0.00069 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	--	--	MG/KG	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	--	--	MG/KG	0.0015 U	0.0014 U	0.0013 U	0.0014 U	0.0014 U	0.0014 U
1,1-Dichloroethane	0.27	26	MG/KG	0.0015 U	0.0014 U	0.0013 U	0.0014 U	0.0014 U	0.0014 U
1,1-Dichloroethene	0.33	100	MG/KG	0.0015 U	0.0014 U	0.0013 U	0.0014 U	0.0014 U	0.0014 U
1,1-Dichloropropene	--	--	MG/KG	0.00074 U	0.0007 U	0.00064 U	0.00069 U	0.0007 U	0.00069 U
1,2,3-Trichlorobenzene	--	--	MG/KG	0.003 U	0.0028 U	0.0026 U	0.0028 U	0.0028 U	0.0028 U
1,2,3-Trichloropropane	--	--	MG/KG	0.003 U	0.0028 U	0.0026 U	0.0028 U	0.0028 U	0.0028 U
1,2,4,5-Tetramethylbenzene	--	--	MG/KG	0.003 U	0.0028 U	0.0026 U	0.0028 U	0.0028 U	0.0028 U
1,2,4-Trichlorobenzene	--	--	MG/KG	0.003 U	0.0028 U	0.0026 U	0.0028 U	0.0028 U	0.0028 U
1,2,4-Trimethylbenzene	3.6	52	MG/KG	0.003 U	0.0028 U	0.0026 U	0.0028 U	0.0028 U	0.0028 U
1,2-Dibromo-3-Chloropropane	--	--	MG/KG	0.0044 U	0.0042 U	0.0039 U	0.0042 U	0.0042 U	0.0041 U
1,2-Dibromoethane (Ethylene Dibromide)	--	--	MG/KG	0.0015 U	0.0014 U	0.0013 U	0.0014 U	0.0014 U	0.0014 U
1,2-Dichlorobenzene	1.1	100	MG/KG	0.003 U	0.0028 U	0.0026 U	0.0028 U	0.0028 U	0.0028 U
1,2-Dichloroethane	0.02	3.1	MG/KG	0.0015 U	0.0014 U	0.0013 U	0.0014 U	0.0014 U	0.0014 U
1,2-Dichloropropane	--	--	MG/KG	0.0015 U	0.0014 U	0.0013 U	0.0014 U	0.0014 U	0.0014 U
1,3,5-Trimethylbenzene (Mesitylene)	8.4	52	MG/KG	0.003 U	0.0028 U	0.0026 U	0.0028 U	0.0028 U	0.0028 U
1,3-Dichlorobenzene	2.4	49	MG/KG	0.003 U	0.0028 U	0.0026 U	0.0028 U	0.0028 U	0.0028 U
1,3-Dichloropropane	--	--	MG/KG	0.003 U	0.0028 U	0.0026 U	0.0028 U	0.0028 U	0.0028 U
1,4-Dichlorobenzene	1.8	13	MG/KG	0.003 U	0.0028 U	0.0026 U	0.0028 U	0.0028 U	0.0028 U
1,4-Diethyl Benzene	--	--	MG/KG	0.003 U	0.0028 U	0.0026 U	0.0028 U	0.0028 U	0.0028 U
1,4-Dioxane (P-Dioxane)	0.1	13	MG/KG	0.12 U	0.11 U	0.1 U	0.11 U	0.11 U	0.11 U
2,2-Dichloropropane	--	--	MG/KG	0.003 U	0.0028 U	0.0026 U	0.0028 U	0.0028 U	0.0028 U
2-Chlorotoluene	--	--	MG/KG	0.003 U	0.0028 U	0.0026 U	0.0028 U	0.0028 U	0.0028 U
2-Hexanone	--	--	MG/KG	0.015 U	0.014 U	0.013 U	0.014 U	0.014 U	0.014 U
4-Chlorotoluene	--	--	MG/KG	0.003 U	0.0028 U	0.0026 U	0.0028 U	0.0028 U	0.0028 U
4-Ethyltoluene	--	--	MG/KG	0.003 U	0.0028 U	0.0026 U	0.0028 U	0.0028 U	0.0028 U
Acetone	**0.05**	100	MG/KG	0.015 U	0.014 U	0.013 U	0.014 U	0.014 U	0.014 U
Acrolein	--	--	MG/KG	NA	NA	NA	NA	NA	NA

Table 3. Summary of Volatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SDS-11	SDS-12	SDS-2	SDS-21E	SDS-21S	SDS-21W
			Sample Date:	01/06/2020	01/07/2020	01/07/2020	01/06/2020	01/06/2020	01/06/2020
			Sample Depth (ft bls):	7.5 - 7.5	7.5 - 7.5	6 - 6	7 - 7	7 - 7	7 - 7
			Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
Acrylonitrile	--	--	MG/KG	0.0059 U	0.0056 U	0.0051 U	0.0056 U	0.0056 U	0.0055 U
Benzene	0.06	4.8	MG/KG	0.00074 U	0.0007 U	0.00064 U	0.00069 U	0.0007 U	0.00069 U
Bromobenzene	--	--	MG/KG	0.003 U	0.0028 U	0.0026 U	0.0028 U	0.0028 U	0.0028 U
Bromochloromethane	--	--	MG/KG	0.003 U	0.0028 U	0.0026 U	0.0028 U	0.0028 U	0.0028 U
Bromodichloromethane	--	--	MG/KG	0.00074 U	0.0007 U	0.00064 U	0.00069 U	0.0007 U	0.00069 U
Bromoform	--	--	MG/KG	0.0059 U	0.0056 U	0.0051 U	0.0056 U	0.0056 U	0.0055 U
Bromomethane	--	--	MG/KG	0.003 U	0.0028 U	0.0026 U	0.0028 U	0.0028 U	0.0028 U
Carbon Disulfide	--	--	MG/KG	0.015 U	0.014 U	0.013 U	0.014 U	0.014 U	0.014 U
Carbon Tetrachloride	0.76	2.4	MG/KG	0.0015 U	0.0014 U	0.0013 U	0.0014 U	0.0014 U	0.0014 U
Chlorobenzene	1.1	100	MG/KG	0.00074 U	0.0007 U	0.00064 U	0.00069 U	0.0007 U	0.00069 U
Chloroethane	--	--	MG/KG	0.003 U	0.0028 U	0.0026 U	0.0028 U	0.0028 U	0.0028 U
Chloroform	0.37	49	MG/KG	0.0022 U	0.0021 U	0.0019 U	0.0021 U	0.0021 U	0.0021 U
Chloromethane	--	--	MG/KG	0.0059 U	0.0056 U	0.0051 U	0.0056 U	0.0056 U	0.0055 U
Cis-1,2-Dichloroethylene	0.25	100	MG/KG	0.0015 U	0.0014 U	0.0013 U	0.0014 U	0.0014 U	0.0014 U
Cis-1,3-Dichloropropene	--	--	MG/KG	0.00074 U	0.0007 U	0.00064 U	0.00069 U	0.0007 U	0.00069 U
Cyclohexane	--	--	MG/KG	NA	NA	NA	NA	NA	NA
Cymene	--	--	MG/KG	0.0015 U	0.0014 U	0.0013 U	0.0014 U	0.0014 U	0.0014 U
Dibromochloromethane	--	--	MG/KG	0.0015 U	0.0014 U	0.0013 U	0.0014 U	0.0014 U	0.0014 U
Dibromomethane	--	--	MG/KG	0.003 U	0.0028 U	0.0026 U	0.0028 U	0.0028 U	0.0028 U
Dichlorodifluoromethane	--	--	MG/KG	0.015 U	0.014 U	0.013 U	0.014 U	0.014 U	0.014 U
Dichloroethylenes	--	--	MG/KG	0.0015 U	0.0014 U	0.0013 U	0.0014 U	0.0014 U	0.0014 U
Diethyl Ether (Ethyl Ether)	--	--	MG/KG	0.003 U	0.0028 U	0.0026 U	0.0028 U	0.0028 U	0.0028 U
Ethylbenzene	1	41	MG/KG	0.0015 U	0.0014 U	0.0013 U	0.0014 U	0.0014 U	0.0014 U
Hexachlorobutadiene	--	--	MG/KG	0.0059 U	0.0056 U	0.0051 U	0.0056 U	0.0056 U	0.0055 U
Isopropylbenzene (Cumene)	--	--	MG/KG	0.0015 U	0.0014 U	0.0013 U	0.0014 U	0.0014 U	0.0014 U
m,p-Xylene	--	--	MG/KG	0.003 U	0.0028 U	0.0026 U	0.0028 U	0.0028 U	0.0028 U
Methyl Acetate	--	--	MG/KG	NA	NA	NA	NA	NA	NA
Methyl Ethyl Ketone (2-Butanone)	0.12	100	MG/KG	0.015 U	0.014 U	0.013 U	0.014 U	0.014 U	0.014 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	MG/KG	0.015 U	0.014 U	0.013 U	0.014 U	0.014 U	0.014 U
Methylcyclohexane	--	--	MG/KG	NA	NA	NA	NA	NA	NA
Methylene Chloride	0.05	100	MG/KG	0.0074 U	0.007 U	0.0064 U	0.0069 U	0.007 U	0.0069 U

Table 3. Summary of Volatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SDS-11	SDS-12	SDS-2	SDS-21E	SDS-21S	SDS-21W
			Sample Date:	01/06/2020	01/07/2020	01/07/2020	01/06/2020	01/06/2020	01/06/2020
			Sample Depth (ft bls):	7.5 - 7.5	7.5 - 7.5	6 - 6	7 - 7	7 - 7	7 - 7
			Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
Naphthalene	12	100	MG/KG	0.0059 U	0.0056 U	0.0051 U	0.0056 U	0.0056 U	0.0055 U
N-Butylbenzene	12	100	MG/KG	0.0015 U	0.0014 U	0.0013 U	0.0014 U	0.0014 U	0.0014 U
N-Propylbenzene	3.9	100	MG/KG	0.0015 U	0.0014 U	0.0013 U	0.0014 U	0.0014 U	0.0014 U
O-Xylene (1,2-Dimethylbenzene)	--	--	MG/KG	0.0015 U	0.0014 U	0.0013 U	0.0014 U	0.0014 U	0.0014 U
Sec-Butylbenzene	11	100	MG/KG	0.0015 U	0.0014 U	0.0013 U	0.0014 U	0.0014 U	0.0014 U
Styrene	--	--	MG/KG	0.0015 U	0.0014 U	0.0013 U	0.0014 U	0.0014 U	0.0014 U
T-Butylbenzene	5.9	100	MG/KG	0.003 U	0.0028 U	0.0026 U	0.0028 U	0.0028 U	0.0028 U
Tert-Butyl Alcohol	--	--	MG/KG	NA	NA	NA	NA	NA	NA
Tert-Butyl Methyl Ether	0.93	100	MG/KG	0.003 U	0.0028 U	0.0026 U	0.0028 U	0.0028 U	0.0028 U
Tetrachloroethylene (PCE)	1.3	19	MG/KG	0.00074 U	0.0007 U	0.00064 U	0.00069 U	0.0007 U	0.00069 U
Toluene	0.7	100	MG/KG	0.0015 U	0.0014 U	0.0013 U	0.0014 U	0.0014 U	0.0014 U
Total, 1,3-Dichloropropene (Cis And Trans)	--	--	MG/KG	0.00074 U	0.0007 U	0.00064 U	0.00069 U	0.0007 U	0.00069 U
Trans-1,2-Dichloroethene	0.19	100	MG/KG	0.0022 U	0.0021 U	0.0019 U	0.0021 U	0.0021 U	0.0021 U
Trans-1,3-Dichloropropene	--	--	MG/KG	0.0015 U	0.0014 U	0.0013 U	0.0014 U	0.0014 U	0.0014 U
Trans-1,4-Dichloro-2-Butene	--	--	MG/KG	0.0074 U	0.007 U	0.0064 U	0.0069 U	0.007 U	0.0069 U
Trichloroethylene (TCE)	0.47	21	MG/KG	0.00074 U	0.0007 U	0.00064 U	0.00069 U	0.0007 U	0.00069 U
Trichlorofluoromethane	--	--	MG/KG	0.0059 U	0.0056 U	0.0051 U	0.0056 U	0.0056 U	0.0055 U
Vinyl Acetate	--	--	MG/KG	0.015 U	0.014 U	0.013 U	0.014 U	0.014 U	0.014 U
Vinyl Chloride	0.02	0.9	MG/KG	0.0015 U	0.0014 U	0.0013 U	0.0014 U	0.0014 U	0.0014 U
Xylenes	0.26	100	MG/KG	0.0015 U	0.0014 U	0.0013 U	0.0014 U	0.0014 U	0.0014 U

Table 3. Summary of Volatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SDS-25_26_27E	SDS-25_26_27N	SDS-25_26_27S	SDS-25_26_27W
			Sample Date:	01/15/2020	01/15/2020	01/15/2020	01/15/2020
			Sample Depth (ft bls):	9 - 9	9 - 9	9 - 9	9 - 9
			Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units				
1,1,1,2-Tetrachloroethane	--	--	MG/KG	0.0007 U	0.00066 U	0.0008 U	0.00069 U
1,1,1-Trichloroethane (TCA)	0.68	100	MG/KG	0.0007 U	0.00066 U	0.0008 U	0.00069 U
1,1,2,2-Tetrachloroethane	--	--	MG/KG	0.0007 U	0.00066 U	0.0008 U	0.00069 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	--	--	MG/KG	NA	NA	NA	NA
1,1,2-Trichloroethane	--	--	MG/KG	0.0014 U	0.0013 U	0.0016 U	0.0014 U
1,1-Dichloroethane	0.27	26	MG/KG	0.0014 U	0.0013 U	0.0016 U	0.0014 U
1,1-Dichloroethene	0.33	100	MG/KG	0.0014 U	0.0013 U	0.0016 U	0.0014 U
1,1-Dichloropropene	--	--	MG/KG	0.0007 U	0.00066 U	0.0008 U	0.00069 U
1,2,3-Trichlorobenzene	--	--	MG/KG	0.0028 U	0.0027 U	0.0032 U	0.0028 U
1,2,3-Trichloropropane	--	--	MG/KG	0.0028 U	0.0027 U	0.0032 U	0.0028 U
1,2,4,5-Tetramethylbenzene	--	--	MG/KG	0.0028 U	0.0027 U	0.0032 U	0.0028 U
1,2,4-Trichlorobenzene	--	--	MG/KG	0.0028 U	0.0027 U	0.0032 U	0.0028 U
1,2,4-Trimethylbenzene	3.6	52	MG/KG	0.0028 U	0.0027 U	0.0032 U	0.0028 U
1,2-Dibromo-3-Chloropropane	--	--	MG/KG	0.0042 U	0.004 U	0.0048 U	0.0042 U
1,2-Dibromoethane (Ethylene Dibromide)	--	--	MG/KG	0.0014 U	0.0013 U	0.0016 U	0.0014 U
1,2-Dichlorobenzene	1.1	100	MG/KG	0.0028 U	0.0027 U	0.0032 U	0.0028 U
1,2-Dichloroethane	0.02	3.1	MG/KG	0.0014 U	0.0013 U	0.0016 U	0.0014 U
1,2-Dichloropropane	--	--	MG/KG	0.0014 U	0.0013 U	0.0016 U	0.0014 U
1,3,5-Trimethylbenzene (Mesitylene)	8.4	52	MG/KG	0.0028 U	0.0027 U	0.0032 U	0.0028 U
1,3-Dichlorobenzene	2.4	49	MG/KG	0.0028 U	0.0027 U	0.0032 U	0.0028 U
1,3-Dichloropropane	--	--	MG/KG	0.0028 U	0.0027 U	0.0032 U	0.0028 U
1,4-Dichlorobenzene	1.8	13	MG/KG	0.0028 U	0.0027 U	0.0032 U	0.0028 U
1,4-Diethyl Benzene	--	--	MG/KG	0.0028 U	0.0027 U	0.0032 U	0.0028 U
1,4-Dioxane (P-Dioxane)	0.1	13	MG/KG	0.11 U	0.11 U	0.13 U	0.11 U
2,2-Dichloropropane	--	--	MG/KG	0.0028 U	0.0027 U	0.0032 U	0.0028 U
2-Chlorotoluene	--	--	MG/KG	0.0028 U	0.0027 U	0.0032 U	0.0028 U
2-Hexanone	--	--	MG/KG	0.014 U	0.013 U	0.016 U	0.014 U
4-Chlorotoluene	--	--	MG/KG	0.0028 U	0.0027 U	0.0032 U	0.0028 U
4-Ethyltoluene	--	--	MG/KG	0.0028 U	0.0027 U	0.0032 U	0.0028 U
Acetone	**0.05**	100	MG/KG	0.014 U	0.013 U	0.016 U	0.014 U
Acrolein	--	--	MG/KG	NA	NA	NA	NA

Table 3. Summary of Volatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SDS-25_26_27E	SDS-25_26_27N	SDS-25_26_27S	SDS-25_26_27W
			Sample Date:	01/15/2020	01/15/2020	01/15/2020	01/15/2020
			Sample Depth (ft bls):	9 - 9	9 - 9	9 - 9	9 - 9
			Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units				
Acrylonitrile	--	--	MG/KG	0.0056 U	0.0053 U	0.0064 U	0.0055 U
Benzene	0.06	4.8	MG/KG	0.0007 U	0.00066 U	0.0008 U	0.00069 U
Bromobenzene	--	--	MG/KG	0.0028 U	0.0027 U	0.0032 U	0.0028 U
Bromochloromethane	--	--	MG/KG	0.0028 U	0.0027 U	0.0032 U	0.0028 U
Bromodichloromethane	--	--	MG/KG	0.0007 U	0.00066 U	0.0008 U	0.00069 U
Bromoform	--	--	MG/KG	0.0056 U	0.0053 U	0.0064 U	0.0055 U
Bromomethane	--	--	MG/KG	0.0028 U	0.0027 U	0.0032 U	0.0028 U
Carbon Disulfide	--	--	MG/KG	0.014 U	0.013 U	0.016 U	0.014 U
Carbon Tetrachloride	0.76	2.4	MG/KG	0.0014 U	0.0013 U	0.0016 U	0.0014 U
Chlorobenzene	1.1	100	MG/KG	0.0007 U	0.00066 U	0.0008 U	0.00069 U
Chloroethane	--	--	MG/KG	0.0028 U	0.0027 U	0.0032 U	0.0028 U
Chloroform	0.37	49	MG/KG	0.0021 U	0.002 U	0.0024 U	0.0021 U
Chloromethane	--	--	MG/KG	0.0056 U	0.0053 U	0.0064 U	0.0055 U
Cis-1,2-Dichloroethylene	0.25	100	MG/KG	0.0014 U	0.0013 U	0.0016 U	0.0014 U
Cis-1,3-Dichloropropene	--	--	MG/KG	0.0007 U	0.00066 U	0.0008 U	0.00069 U
Cyclohexane	--	--	MG/KG	NA	NA	NA	NA
Cymene	--	--	MG/KG	0.0014 U	0.0013 U	0.0016 U	0.0014 U
Dibromochloromethane	--	--	MG/KG	0.0014 U	0.0013 U	0.0016 U	0.0014 U
Dibromomethane	--	--	MG/KG	0.0028 U	0.0027 U	0.0032 U	0.0028 U
Dichlorodifluoromethane	--	--	MG/KG	0.014 U	0.013 U	0.016 U	0.014 U
Dichloroethylenes	--	--	MG/KG	0.0014 U	0.0013 U	0.0016 U	0.0014 U
Diethyl Ether (Ethyl Ether)	--	--	MG/KG	0.0028 U	0.0027 U	0.0032 U	0.0028 U
Ethylbenzene	1	41	MG/KG	0.0014 U	0.0013 U	0.0016 U	0.0014 U
Hexachlorobutadiene	--	--	MG/KG	0.0056 U	0.0053 U	0.0064 U	0.0055 U
Isopropylbenzene (Cumene)	--	--	MG/KG	0.0014 U	0.0013 U	0.0016 U	0.0014 U
m,p-Xylene	--	--	MG/KG	0.0028 U	0.0027 U	0.0032 U	0.0028 U
Methyl Acetate	--	--	MG/KG	NA	NA	NA	NA
Methyl Ethyl Ketone (2-Butanone)	0.12	100	MG/KG	0.014 U	0.013 U	0.016 U	0.014 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	MG/KG	0.014 U	0.013 U	0.016 U	0.014 U
Methylcyclohexane	--	--	MG/KG	NA	NA	NA	NA
Methylene Chloride	0.05	100	MG/KG	0.007 U	0.0066 U	0.008 U	0.0069 U

Table 3. Summary of Volatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SDS-25_26_27E	SDS-25_26_27N	SDS-25_26_27S	SDS-25_26_27W
			Sample Date:	01/15/2020	01/15/2020	01/15/2020	01/15/2020
			Sample Depth (ft bls):	9 - 9	9 - 9	9 - 9	9 - 9
			Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units				
Naphthalene	12	100	MG/KG	0.0056 U	0.00092 J	0.0064 U	0.0055 U
N-Butylbenzene	12	100	MG/KG	0.0014 U	0.0013 U	0.0016 U	0.0014 U
N-Propylbenzene	3.9	100	MG/KG	0.0014 U	0.0013 U	0.0016 U	0.0014 U
O-Xylene (1,2-Dimethylbenzene)	--	--	MG/KG	0.0014 U	0.0013 U	0.0016 U	0.0014 U
Sec-Butylbenzene	11	100	MG/KG	0.0014 U	0.0013 U	0.0016 U	0.0014 U
Styrene	--	--	MG/KG	0.0014 U	0.0013 U	0.0016 U	0.0014 U
T-Butylbenzene	5.9	100	MG/KG	0.0028 U	0.0027 U	0.0032 U	0.0028 U
Tert-Butyl Alcohol	--	--	MG/KG	NA	NA	NA	NA
Tert-Butyl Methyl Ether	0.93	100	MG/KG	0.0028 U	0.0027 U	0.0032 U	0.0028 U
Tetrachloroethylene (PCE)	1.3	19	MG/KG	0.00066 J	0.00036 J	0.0004 J	0.00033 J
Toluene	0.7	100	MG/KG	0.0014 U	0.0013 U	0.0016 U	0.0014 U
Total, 1,3-Dichloropropene (Cis And Trans)	--	--	MG/KG	0.0007 U	0.00066 U	0.0008 U	0.00069 U
Trans-1,2-Dichloroethene	0.19	100	MG/KG	0.0021 U	0.002 U	0.0024 U	0.0021 U
Trans-1,3-Dichloropropene	--	--	MG/KG	0.0014 U	0.0013 U	0.0016 U	0.0014 U
Trans-1,4-Dichloro-2-Butene	--	--	MG/KG	0.007 U	0.0066 U	0.008 U	0.0069 U
Trichloroethylene (TCE)	0.47	21	MG/KG	0.0007 U	0.00066 U	0.0008 U	0.00069 U
Trichlorofluoromethane	--	--	MG/KG	0.0056 U	0.0053 U	0.0064 U	0.0055 U
Vinyl Acetate	--	--	MG/KG	0.014 U	0.013 U	0.016 U	0.014 U
Vinyl Chloride	0.02	0.9	MG/KG	0.0014 U	0.0013 U	0.0016 U	0.0014 U
Xylenes	0.26	100	MG/KG	0.0014 U	0.0013 U	0.0016 U	0.0014 U

Table 3. Summary of Volatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SDS-28_29_30E	SDS-28_29_30N	SDS-28_29_30S	SDS-28_29_30W
			Sample Date:	01/06/2020	01/06/2020	01/06/2020	01/06/2020
			Sample Depth (ft bls):	9 - 9	9 - 9	9 - 9	9 - 9
			Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units				
1,1,1,2-Tetrachloroethane	--	--	MG/KG	0.0007 U	0.00053 U	0.0006 U	0.00054 U
1,1,1-Trichloroethane (TCA)	0.68	100	MG/KG	0.0007 U	0.00053 U	0.0006 U	0.00054 U
1,1,2,2-Tetrachloroethane	--	--	MG/KG	0.0007 U	0.00053 U	0.0006 U	0.00054 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	--	--	MG/KG	NA	NA	NA	NA
1,1,2-Trichloroethane	--	--	MG/KG	0.0014 U	0.001 U	0.0012 U	0.0011 U
1,1-Dichloroethane	0.27	26	MG/KG	0.0014 U	0.001 U	0.0012 U	0.0011 U
1,1-Dichloroethene	0.33	100	MG/KG	0.0014 U	0.001 U	0.0012 U	0.0011 U
1,1-Dichloropropene	--	--	MG/KG	0.0007 U	0.00053 U	0.0006 U	0.00054 U
1,2,3-Trichlorobenzene	--	--	MG/KG	0.0028 U	0.0021 U	0.0024 U	0.0022 U
1,2,3-Trichloropropane	--	--	MG/KG	0.0028 U	0.0021 U	0.0024 U	0.0022 U
1,2,4,5-Tetramethylbenzene	--	--	MG/KG	0.0028 U	0.0021 U	0.0024 U	0.0022 U
1,2,4-Trichlorobenzene	--	--	MG/KG	0.0028 U	0.0021 U	0.0024 U	0.0022 U
1,2,4-Trimethylbenzene	3.6	52	MG/KG	0.0028 U	0.0021 U	0.0024 U	0.0022 U
1,2-Dibromo-3-Chloropropane	--	--	MG/KG	0.0042 U	0.0032 U	0.0036 U	0.0033 U
1,2-Dibromoethane (Ethylene Dibromide)	--	--	MG/KG	0.0014 U	0.001 U	0.0012 U	0.0011 U
1,2-Dichlorobenzene	1.1	100	MG/KG	0.0028 U	0.0021 U	0.0024 U	0.0022 U
1,2-Dichloroethane	0.02	3.1	MG/KG	0.0014 U	0.001 U	0.0012 U	0.0011 U
1,2-Dichloropropane	--	--	MG/KG	0.0014 U	0.001 U	0.0012 U	0.0011 U
1,3,5-Trimethylbenzene (Mesitylene)	8.4	52	MG/KG	0.0028 U	0.0021 U	0.0024 U	0.0022 U
1,3-Dichlorobenzene	2.4	49	MG/KG	0.0028 U	0.0021 U	0.0024 U	0.0022 U
1,3-Dichloropropane	--	--	MG/KG	0.0028 U	0.0021 U	0.0024 U	0.0022 U
1,4-Dichlorobenzene	1.8	13	MG/KG	0.0028 U	0.0021 U	0.0024 U	0.0022 U
1,4-Diethyl Benzene	--	--	MG/KG	0.0028 U	0.0021 U	0.0024 U	0.0022 U
1,4-Dioxane (P-Dioxane)	0.1	13	MG/KG	0.11 U	0.084 U	0.096 U	0.087 U
2,2-Dichloropropane	--	--	MG/KG	0.0028 U	0.0021 U	0.0024 U	0.0022 U
2-Chlorotoluene	--	--	MG/KG	0.0028 U	0.0021 U	0.0024 U	0.0022 U
2-Hexanone	--	--	MG/KG	0.014 U	0.01 U	0.012 U	0.011 U
4-Chlorotoluene	--	--	MG/KG	0.0028 U	0.0021 U	0.0024 U	0.0022 U
4-Ethyltoluene	--	--	MG/KG	0.0028 U	0.0021 U	0.0024 U	0.0022 U
Acetone	**0.05**	100	MG/KG	0.014 U	0.01 U	0.012 U	0.011 U
Acrolein	--	--	MG/KG	NA	NA	NA	NA

Table 3. Summary of Volatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SDS-28_29_30E	SDS-28_29_30N	SDS-28_29_30S	SDS-28_29_30W
			Sample Date:	01/06/2020	01/06/2020	01/06/2020	01/06/2020
			Sample Depth (ft bls):	9 - 9	9 - 9	9 - 9	9 - 9
			Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units				
Acrylonitrile	--	--	MG/KG	0.0056 U	0.0042 U	0.0048 U	0.0043 U
Benzene	0.06	4.8	MG/KG	0.0007 U	0.00053 U	0.0006 U	0.00054 U
Bromobenzene	--	--	MG/KG	0.0028 U	0.0021 U	0.0024 U	0.0022 U
Bromochloromethane	--	--	MG/KG	0.0028 U	0.0021 U	0.0024 U	0.0022 U
Bromodichloromethane	--	--	MG/KG	0.0007 U	0.00053 U	0.0006 U	0.00054 U
Bromoform	--	--	MG/KG	0.0056 U	0.0042 U	0.0048 U	0.0043 U
Bromomethane	--	--	MG/KG	0.0028 U	0.0021 U	0.0024 U	0.0022 U
Carbon Disulfide	--	--	MG/KG	0.014 U	0.01 U	0.012 U	0.011 U
Carbon Tetrachloride	0.76	2.4	MG/KG	0.0014 U	0.001 U	0.0012 U	0.0011 U
Chlorobenzene	1.1	100	MG/KG	0.0007 U	0.00053 U	0.0006 U	0.00054 U
Chloroethane	--	--	MG/KG	0.0028 U	0.0021 U	0.0024 U	0.0022 U
Chloroform	0.37	49	MG/KG	0.0021 U	0.0016 U	0.0018 U	0.0016 U
Chloromethane	--	--	MG/KG	0.0056 U	0.0042 U	0.0048 U	0.0043 U
Cis-1,2-Dichloroethylene	0.25	100	MG/KG	0.0014 U	0.001 U	0.0012 U	0.0011 U
Cis-1,3-Dichloropropene	--	--	MG/KG	0.0007 U	0.00053 U	0.0006 U	0.00054 U
Cyclohexane	--	--	MG/KG	NA	NA	NA	NA
Cymene	--	--	MG/KG	0.0014 U	0.001 U	0.0012 U	0.0011 U
Dibromochloromethane	--	--	MG/KG	0.0014 U	0.001 U	0.0012 U	0.0011 U
Dibromomethane	--	--	MG/KG	0.0028 U	0.0021 U	0.0024 U	0.0022 U
Dichlorodifluoromethane	--	--	MG/KG	0.014 U	0.01 U	0.012 U	0.011 U
Dichloroethylenes	--	--	MG/KG	0.0014 U	0.001 U	0.0012 U	0.0011 U
Diethyl Ether (Ethyl Ether)	--	--	MG/KG	0.0028 U	0.0021 U	0.0024 U	0.0022 U
Ethylbenzene	1	41	MG/KG	0.0014 U	0.001 U	0.0012 U	0.0011 U
Hexachlorobutadiene	--	--	MG/KG	0.0056 U	0.0042 U	0.0048 U	0.0043 U
Isopropylbenzene (Cumene)	--	--	MG/KG	0.0014 U	0.001 U	0.0012 U	0.0011 U
m,p-Xylene	--	--	MG/KG	0.0028 U	0.0021 U	0.0024 U	0.0022 U
Methyl Acetate	--	--	MG/KG	NA	NA	NA	NA
Methyl Ethyl Ketone (2-Butanone)	0.12	100	MG/KG	0.014 U	0.01 U	0.012 U	0.011 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	MG/KG	0.014 U	0.01 U	0.012 U	0.011 U
Methylcyclohexane	--	--	MG/KG	NA	NA	NA	NA
Methylene Chloride	0.05	100	MG/KG	0.007 U	0.0053 U	0.006 U	0.0054 U

Table 3. Summary of Volatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SDS-28_29_30E	SDS-28_29_30N	SDS-28_29_30S	SDS-28_29_30W
			Sample Date:	01/06/2020	01/06/2020	01/06/2020	01/06/2020
			Sample Depth (ft bls):	9 - 9	9 - 9	9 - 9	9 - 9
			Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units				
Naphthalene	12	100	MG/KG	0.0056 U	0.0042 U	0.0011 J	0.0043 U
N-Butylbenzene	12	100	MG/KG	0.0014 U	0.001 U	0.0012 U	0.0011 U
N-Propylbenzene	3.9	100	MG/KG	0.0014 U	0.001 U	0.0012 U	0.0011 U
O-Xylene (1,2-Dimethylbenzene)	--	--	MG/KG	0.0014 U	0.001 U	0.0012 U	0.0011 U
Sec-Butylbenzene	11	100	MG/KG	0.0014 U	0.001 U	0.0012 U	0.0011 U
Styrene	--	--	MG/KG	0.0014 U	0.001 U	0.0012 U	0.0011 U
T-Butylbenzene	5.9	100	MG/KG	0.0028 U	0.0021 U	0.0024 U	0.0022 U
Tert-Butyl Alcohol	--	--	MG/KG	NA	NA	NA	NA
Tert-Butyl Methyl Ether	0.93	100	MG/KG	0.0028 U	0.0021 U	0.0024 U	0.0022 U
Tetrachloroethylene (PCE)	1.3	19	MG/KG	0.00087	0.00055	0.00065	0.00062
Toluene	0.7	100	MG/KG	0.0014 U	0.001 U	0.0012 U	0.0011 U
Total, 1,3-Dichloropropene (Cis And Trans)	--	--	MG/KG	0.0007 U	0.00053 U	0.0006 U	0.00054 U
Trans-1,2-Dichloroethene	0.19	100	MG/KG	0.0021 U	0.0016 U	0.0018 U	0.0016 U
Trans-1,3-Dichloropropene	--	--	MG/KG	0.0014 U	0.001 U	0.0012 U	0.0011 U
Trans-1,4-Dichloro-2-Butene	--	--	MG/KG	0.007 U	0.0053 U	0.006 U	0.0054 U
Trichloroethylene (TCE)	0.47	21	MG/KG	0.0007 U	0.00053 U	0.0006 U	0.00054 U
Trichlorofluoromethane	--	--	MG/KG	0.0056 U	0.0042 U	0.0048 U	0.0043 U
Vinyl Acetate	--	--	MG/KG	0.014 U	0.01 U	0.012 U	0.011 U
Vinyl Chloride	0.02	0.9	MG/KG	0.0014 U	0.001 U	0.0012 U	0.0011 U
Xylenes	0.26	100	MG/KG	0.0014 U	0.001 U	0.0012 U	0.0011 U

Table 3. Summary of Volatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SDS-4	SDS-5	SDS-8	SDS-9
			Sample Date:	01/07/2020	01/07/2020	10/22/2019	10/22/2019
			Sample Depth (ft bls):	7.5 - 7.5	7.5 - 7.5	6 - 6	6 - 6
			Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units				
1,1,1,2-Tetrachloroethane	--	--	MG/KG	0.0008 U	0.00066 U	0.0005 U	0.00052 U
1,1,1-Trichloroethane (TCA)	0.68	100	MG/KG	0.0008 U	0.00066 U	0.0005 U	0.00052 U
1,1,2,2-Tetrachloroethane	--	--	MG/KG	0.0008 U	0.00066 U	0.0005 U	0.00052 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	--	--	MG/KG	NA	NA	NA	NA
1,1,2-Trichloroethane	--	--	MG/KG	0.0016 U	0.0013 U	0.001 U	0.001 U
1,1-Dichloroethane	0.27	26	MG/KG	0.0016 U	0.0013 U	0.001 U	0.001 U
1,1-Dichloroethene	0.33	100	MG/KG	0.0016 U	0.0013 U	0.001 U	0.001 U
1,1-Dichloropropene	--	--	MG/KG	0.0008 U	0.00066 U	0.0005 U	0.00052 U
1,2,3-Trichlorobenzene	--	--	MG/KG	0.0032 U	0.0026 U	0.002 U	0.0021 U
1,2,3-Trichloropropane	--	--	MG/KG	0.0032 U	0.0026 U	0.002 U	0.0021 U
1,2,4,5-Tetramethylbenzene	--	--	MG/KG	0.0032 U	0.0026 U	0.002 U	0.0021 U
1,2,4-Trichlorobenzene	--	--	MG/KG	0.0032 U	0.0026 U	0.002 U	0.0021 U
1,2,4-Trimethylbenzene	3.6	52	MG/KG	0.0032 U	0.0026 U	0.002 U	0.0021 U
1,2-Dibromo-3-Chloropropane	--	--	MG/KG	0.0048 U	0.0039 U	0.003 U	0.0031 U
1,2-Dibromoethane (Ethylene Dibromide)	--	--	MG/KG	0.0016 U	0.0013 U	0.001 U	0.001 U
1,2-Dichlorobenzene	1.1	100	MG/KG	0.0032 U	0.0026 U	0.002 U	0.0021 U
1,2-Dichloroethane	0.02	3.1	MG/KG	0.0016 U	0.0013 U	0.001 U	0.001 U
1,2-Dichloropropane	--	--	MG/KG	0.0016 U	0.0013 U	0.001 U	0.001 U
1,3,5-Trimethylbenzene (Mesitylene)	8.4	52	MG/KG	0.0032 U	0.0026 U	0.002 U	0.0021 U
1,3-Dichlorobenzene	2.4	49	MG/KG	0.0032 U	0.0026 U	0.002 U	0.0021 U
1,3-Dichloropropane	--	--	MG/KG	0.0032 U	0.0026 U	0.002 U	0.0021 U
1,4-Dichlorobenzene	1.8	13	MG/KG	0.0032 U	0.0026 U	0.002 U	0.0021 U
1,4-Diethyl Benzene	--	--	MG/KG	0.0032 U	0.0026 U	0.002 U	0.0021 U
1,4-Dioxane (P-Dioxane)	0.1	13	MG/KG	0.13 U	0.1 U	0.08 U	0.083 U
2,2-Dichloropropane	--	--	MG/KG	0.0032 U	0.0026 U	0.002 U	0.0021 U
2-Chlorotoluene	--	--	MG/KG	0.0032 U	0.0026 U	0.002 U	0.0021 U
2-Hexanone	--	--	MG/KG	0.016 U	0.013 U	0.01 U	0.01 U
4-Chlorotoluene	--	--	MG/KG	0.0032 U	0.0026 U	0.002 U	0.0021 U
4-Ethyltoluene	--	--	MG/KG	0.0032 U	0.0026 U	0.002 U	0.0021 U
Acetone	**0.05**	100	MG/KG	0.016 U	0.013 U	0.01 U	0.01 U
Acrolein	--	--	MG/KG	NA	NA	NA	NA

Table 3. Summary of Volatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SDS-4	SDS-5	SDS-8	SDS-9
			Sample Date:	01/07/2020	01/07/2020	10/22/2019	10/22/2019
			Sample Depth (ft bls):	7.5 - 7.5	7.5 - 7.5	6 - 6	6 - 6
			Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units				
Acrylonitrile	--	--	MG/KG	0.0064 U	0.0053 U	0.004 U	0.0042 U
Benzene	0.06	4.8	MG/KG	0.0008 U	0.00066 U	0.0005 U	0.00052 U
Bromobenzene	--	--	MG/KG	0.0032 U	0.0026 U	0.002 U	0.0021 U
Bromochloromethane	--	--	MG/KG	0.0032 U	0.0026 U	0.002 U	0.0021 U
Bromodichloromethane	--	--	MG/KG	0.0008 U	0.00066 U	0.0005 U	0.00052 U
Bromoform	--	--	MG/KG	0.0064 U	0.0053 U	0.004 U	0.0042 U
Bromomethane	--	--	MG/KG	0.0032 U	0.0026 U	0.002 U	0.0021 U
Carbon Disulfide	--	--	MG/KG	0.016 U	0.013 U	0.01 U	0.01 U
Carbon Tetrachloride	0.76	2.4	MG/KG	0.0016 U	0.0013 U	0.001 U	0.001 U
Chlorobenzene	1.1	100	MG/KG	0.0008 U	0.00066 U	0.0005 U	0.00052 U
Chloroethane	--	--	MG/KG	0.0032 U	0.0026 U	0.002 U	0.0021 U
Chloroform	0.37	49	MG/KG	0.0024 U	0.002 U	0.00018 J	0.0016 U
Chloromethane	--	--	MG/KG	0.0064 U	0.0053 U	0.004 U	0.0042 U
Cis-1,2-Dichloroethylene	0.25	100	MG/KG	0.0016 U	0.0013 U	0.001 U	0.001 U
Cis-1,3-Dichloropropene	--	--	MG/KG	0.0008 U	0.00066 U	0.0005 U	0.00052 U
Cyclohexane	--	--	MG/KG	NA	NA	NA	NA
Cymene	--	--	MG/KG	0.0016 U	0.0013 U	0.001 U	0.001 U
Dibromochloromethane	--	--	MG/KG	0.0016 U	0.0013 U	0.001 U	0.001 U
Dibromomethane	--	--	MG/KG	0.0032 U	0.0026 U	0.002 U	0.0021 U
Dichlorodifluoromethane	--	--	MG/KG	0.016 U	0.013 U	0.01 U	0.01 U
Dichloroethylenes	--	--	MG/KG	0.0016 U	0.0013 U	0.001 U	0.001 U
Diethyl Ether (Ethyl Ether)	--	--	MG/KG	0.0032 U	0.0026 U	0.002 U	0.0021 U
Ethylbenzene	1	41	MG/KG	0.0016 U	0.0013 U	0.001 U	0.001 U
Hexachlorobutadiene	--	--	MG/KG	0.0064 U	0.0053 U	0.004 U	0.0042 U
Isopropylbenzene (Cumene)	--	--	MG/KG	0.0016 U	0.0013 U	0.001 U	0.001 U
m,p-Xylene	--	--	MG/KG	0.0032 U	0.0026 U	0.002 U	0.0021 U
Methyl Acetate	--	--	MG/KG	NA	NA	NA	NA
Methyl Ethyl Ketone (2-Butanone)	0.12	100	MG/KG	0.016 U	0.013 U	0.01 U	0.01 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	--	--	MG/KG	0.016 U	0.013 U	0.01 U	0.01 U
Methylcyclohexane	--	--	MG/KG	NA	NA	NA	NA
Methylene Chloride	0.05	100	MG/KG	0.008 U	0.0066 U	0.005 U	0.0052 U

Table 3. Summary of Volatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SDS-4	SDS-5	SDS-8	SDS-9
			Sample Date:	01/07/2020	01/07/2020	10/22/2019	10/22/2019
			Sample Depth (ft bls):	7.5 - 7.5	7.5 - 7.5	6 - 6	6 - 6
			Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units				
Naphthalene	12	100	MG/KG	0.0064 U	0.0053 U	0.004 U	0.0042 U
N-Butylbenzene	12	100	MG/KG	0.0016 U	0.0013 U	0.001 U	0.001 U
N-Propylbenzene	3.9	100	MG/KG	0.0016 U	0.0013 U	0.001 U	0.001 U
O-Xylene (1,2-Dimethylbenzene)	--	--	MG/KG	0.0016 U	0.0013 U	0.001 U	0.001 U
Sec-Butylbenzene	11	100	MG/KG	0.0016 U	0.0013 U	0.001 U	0.001 U
Styrene	--	--	MG/KG	0.0016 U	0.0013 U	0.001 U	0.001 U
T-Butylbenzene	5.9	100	MG/KG	0.0032 U	0.0026 U	0.002 U	0.0021 U
Tert-Butyl Alcohol	--	--	MG/KG	NA	NA	NA	NA
Tert-Butyl Methyl Ether	0.93	100	MG/KG	0.0032 U	0.0026 U	0.002 U	0.0021 U
Tetrachloroethylene (PCE)	1.3	19	MG/KG	0.0008 U	0.00066 U	0.0005 U	0.00052 U
Toluene	0.7	100	MG/KG	0.0016 U	0.0013 U	0.001 U	0.001 U
Total, 1,3-Dichloropropene (Cis And Trans)	--	--	MG/KG	0.0008 U	0.00066 U	0.0005 U	0.00052 U
Trans-1,2-Dichloroethene	0.19	100	MG/KG	0.0024 U	0.002 U	0.0015 U	0.0016 U
Trans-1,3-Dichloropropene	--	--	MG/KG	0.0016 U	0.0013 U	0.001 U	0.001 U
Trans-1,4-Dichloro-2-Butene	--	--	MG/KG	0.008 U	0.0066 U	0.005 U	0.0052 U
Trichloroethylene (TCE)	0.47	21	MG/KG	0.0008 U	0.00066 U	0.0005 U	0.00052 U
Trichlorofluoromethane	--	--	MG/KG	0.0064 U	0.0053 U	0.004 U	0.0042 U
Vinyl Acetate	--	--	MG/KG	0.016 U	0.013 U	0.01 U	0.01 U
Vinyl Chloride	0.02	0.9	MG/KG	0.0016 U	0.0013 U	0.001 U	0.001 U
Xylenes	0.26	100	MG/KG	0.0016 U	0.0013 U	0.001 U	0.001 U

Table 4. Summary of Semivolatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	BDS-1	BDS-13	BDS-14	BDS-15	BDS-15	BDS-16_SDS-6
			Sample Date:	11/11/2019	05/05/2020	05/05/2020	05/05/2020	05/05/2020	01/15/2020
			Sample Depth (ft bls):	15 - 17	9 - 10	2 - 4	1 - 2	1 - 2	6 - 7
			Normal Sample or Field Duplicate:	N	N	N	N	FD	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
1,2,4,5-Tetrachlorobenzene	--	--	MG/KG	0.18 U	0.17 U	0.18 U	0.37 U	0.18 U	2 U
1,2,4-Trichlorobenzene	--	--	MG/KG	0.18 U	0.17 U	0.18 U	0.37 U	0.18 U	2 U
1,2-Dichlorobenzene	1.1	100	MG/KG	0.18 U	0.17 U	0.18 U	0.37 U	0.18 U	2 U
1,3-Dichlorobenzene	2.4	49	MG/KG	0.18 U	0.17 U	0.18 U	0.37 U	0.18 U	2 U
1,4-Dichlorobenzene	1.8	13	MG/KG	0.18 U	0.17 U	0.18 U	0.37 U	0.18 U	2 U
1,4-Dioxane (P-Dioxane)	0.1	13	MG/KG	0.026 U	0.026 U	0.027 U	0.056 U	0.028 U	0.31 U
2,3,4,6-Tetrachlorophenol	--	--	MG/KG	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	--	--	MG/KG	0.18 U	0.17 U	0.18 U	0.37 U	0.18 U	2 U
2,4,6-Trichlorophenol	--	--	MG/KG	0.11 U	0.1 U	0.11 U	0.22 U	0.11 U	1.2 U
2,4-Dichlorophenol	--	--	MG/KG	0.16 U	0.16 U	0.16 U	0.34 U	0.16 U	1.8 U
2,4-Dimethylphenol	--	--	MG/KG	0.18 U	0.17 U	0.18 U	0.37 U	0.18 U	2 U
2,4-Dinitrophenol	--	--	MG/KG	0.85 U	0.84 U	0.87 U	1.8 U	0.88 U	9.8 U
2,4-Dinitrotoluene	--	--	MG/KG	0.18 U	0.17 U	0.18 U	0.37 U	0.18 U	2 U
2,6-Dinitrotoluene	--	--	MG/KG	0.18 U	0.17 U	0.18 U	0.37 U	0.18 U	2 U
2-Chloronaphthalene	--	--	MG/KG	0.18 U	0.17 U	0.18 U	0.37 U	0.18 U	2 U
2-Chlorophenol	--	--	MG/KG	0.18 U	0.17 U	0.18 U	0.37 U	0.18 U	2 U
2-Methylnaphthalene	--	--	MG/KG	0.21 U	0.21 U	0.028 J	0.098 J	0.048 J	2.4 U
2-Methylphenol (O-Cresol)	0.33	100	MG/KG	0.18 U	0.17 U	0.18 U	0.37 U	0.18 U	2 U
2-Nitroaniline	--	--	MG/KG	0.18 U	0.17 U	0.18 U	0.37 U	0.18 U	2 U
2-Nitrophenol	--	--	MG/KG	0.38 U	0.38 U	0.39 U	0.8 U	0.4 U	4.4 U
3- And 4- Methylphenol (Total)	**0.33**	100	MG/KG	0.25 U	NA	NA	NA	NA	2.9 U
3,3'-Dichlorobenzidine	--	--	MG/KG	0.18 U	0.17 U	0.18 U	0.37 U	0.18 U	2 U
3-Nitroaniline	--	--	MG/KG	0.18 U	0.17 U	0.18 U	0.37 U	0.18 U	2 U
4,6-Dinitro-2-Methylphenol	--	--	MG/KG	0.46 U	0.45 U	0.47 U	0.97 U	0.48 U	5.3 U
4-Bromophenyl Phenyl Ether	--	--	MG/KG	0.18 U	0.17 U	0.18 U	0.37 U	0.18 U	2 U
4-Chloro-3-Methylphenol	--	--	MG/KG	0.18 U	0.17 U	0.18 U	0.37 U	0.18 U	2 U
4-Chloroaniline	--	--	MG/KG	0.18 U	0.17 U	0.18 U	0.37 U	0.18 U	2 U
4-Chlorophenyl Phenyl Ether	--	--	MG/KG	0.18 U	0.17 U	0.18 U	0.37 U	0.18 U	2 U
4-Nitroaniline	--	--	MG/KG	0.18 U	0.17 U	0.18 U	0.37 U	0.18 U	2 U
4-Nitrophenol	--	--	MG/KG	0.25 U	0.24 U	0.25 U	0.52 U	0.26 U	2.9 U
Acenaphthene	20	100	MG/KG	0.14 U	0.14 U	0.042 J	0.15 J	0.046 J	1.6 U

Table 4. Summary of Semivolatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	BDS-1	BDS-13	BDS-14	BDS-15	BDS-15	BDS-16_SDS-6
			Sample Date:	11/11/2019	05/05/2020	05/05/2020	05/05/2020	05/05/2020	01/15/2020
			Sample Depth (ft bls):	15 - 17	9 - 10	2 - 4	1 - 2	1 - 2	6 - 7
			Normal Sample or Field Duplicate:	N	N	N	N	FD	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
Acenaphthylene	100	100	MG/KG	0.14 U	0.029 J	0.38	1.5	0.91	1.2 J
Acetophenone	--	--	MG/KG	0.18 U	0.17 U	0.18 U	0.37 U	0.031 J	2 U
Anthracene	100	100	MG/KG	0.11 U	0.1 U	0.24	1 J	0.49 J	0.67 J
Atrazine	--	--	MG/KG	NA	NA	NA	NA	NA	NA
Azobenzene	--	--	MG/KG	NA	NA	NA	NA	NA	NA
Benzaldehyde	--	--	MG/KG	NA	NA	NA	NA	NA	NA
Benzidine	--	--	MG/KG	NA	NA	NA	NA	NA	NA
Benzo(A)Anthracene	**1**	1	MG/KG	0.11 U	0.074 J	0.97	**4 J**	**1.5 J**	**2.4**
Benzo(A)Pyrene	**1**	1	MG/KG	0.14 U	0.09 J	0.96	**4.5 J**	**1.6 J**	**2.6**
Benzo(B)Fluoranthene	**1**	1	MG/KG	0.11 U	0.13	**1.4**	**6.2 J**	**2.4 J**	**4**
Benzo(G,H,I)Perylene	100	100	MG/KG	0.14 U	0.064 J	0.69	3.2 J	1.2 J	2.2
Benzo(K)Fluoranthene	**0.8**	3.9	MG/KG	0.11 U	0.034 J	0.35	**1.8 J**	0.7 J	**1.2**
Benzoic Acid	--	--	MG/KG	0.57 R	0.56 U	0.59 U	1.2 R	0.59 U	6.6 U
Benzyl Alcohol	--	--	MG/KG	0.18 U	0.17 U	0.18 U	0.37 U	0.18 U	2 U
Benzyl Butyl Phthalate	--	--	MG/KG	0.18 U	0.17 U	0.18 U	0.56	0.18 U	2 U
Biphenyl (Diphenyl)	--	--	MG/KG	0.4 U	0.4 U	0.41 U	0.85 U	0.42 U	4.7 U
Bis(2-Chloroethoxy) Methane	--	--	MG/KG	0.19 U	0.19 U	0.2 U	0.4 U	0.2 U	2.2 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	--	--	MG/KG	0.16 U	0.16 U	0.16 U	0.34 U	0.16 U	1.8 U
Bis(2-Chloroisopropyl) Ether	--	--	MG/KG	0.21 U	0.21 U	0.22 U	0.45 U	0.22 U	2.4 U
Bis(2-Ethylhexyl) Phthalate	--	--	MG/KG	0.18 U	0.17 U	0.33	3.3 J	1.1 J	2 U
Caprolactam	--	--	MG/KG	NA	NA	NA	NA	NA	NA
Carbazole	--	--	MG/KG	0.18 U	0.17 U	0.11 J	0.55	0.28	0.59 J
Chrysene	**1**	3.9	MG/KG	0.11 U	0.078 J	0.9	**4.3 J**	**1.5 J**	**2.8**
Dibenz(A,H)Anthracene	**0.33**	0.33	MG/KG	0.11 U	0.1 U	0.14	**0.7 J**	0.28 J	**0.61 J**
Dibenzofuran	7	59	MG/KG	0.18 U	0.17 U	0.046 J	0.16 J	0.08 J	2 U
Diethyl Phthalate	--	--	MG/KG	0.18 U	0.17 U	0.18 U	0.37 U	0.18 U	2 U
Dimethyl Phthalate	--	--	MG/KG	0.18 U	0.17 U	0.18 U	0.37 U	0.12 J	2 U
Di-N-Butyl Phthalate	--	--	MG/KG	0.18 U	0.17 U	0.18 U	0.37 U	0.18 U	2 U
Di-N-Octylphthalate	--	--	MG/KG	0.18 U	0.17 U	0.18 U	0.37 U	0.18 U	2 U
Fluoranthene	100	100	MG/KG	0.11 U	0.14	1.7	7 J	2.7 J	4.8
Fluorene	30	100	MG/KG	0.18 U	0.17 U	0.067 J	0.28 J	0.097 J	2 U

Table 4. Summary of Semivolatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	BDS-1	BDS-13	BDS-14	BDS-15	BDS-15	BDS-16_SDS-6
			Sample Date:	11/11/2019	05/05/2020	05/05/2020	05/05/2020	05/05/2020	01/15/2020
			Sample Depth (ft bls):	15 - 17	9 - 10	2 - 4	1 - 2	1 - 2	6 - 7
			Normal Sample or Field Duplicate:	N	N	N	N	FD	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
Hexachlorobenzene	0.33	1.2	MG/KG	0.11 U	0.1 U	0.11 U	0.22 U	0.11 U	1.2 U
Hexachlorobutadiene	--	--	MG/KG	0.18 U	0.17 U	0.18 U	0.37 U	0.18 U	2 U
Hexachlorocyclopentadiene	--	--	MG/KG	0.5 U	0.5 U	0.52 U	1.1 R	0.52 U	5.8 U
Hexachloroethane	--	--	MG/KG	0.14 U	0.14 U	0.14 U	0.3 U	0.15 U	1.6 U
Indeno(1,2,3-C,D)Pyrene	**0.5**	0.5	MG/KG	0.14 U	0.07 J	**0.72**	**3.6 J**	**1.3 J**	**2.1**
Isophorone	--	--	MG/KG	0.16 U	0.16 U	0.16 U	0.34 U	0.16 U	1.8 U
Naphthalene	12	100	MG/KG	0.18 U	0.17 U	0.07 J	0.19 J	0.1 J	2 U
Nitrobenzene	--	--	MG/KG	0.16 U	0.16 U	0.16 U	0.34 U	0.16 U	1.8 U
N-Nitrosodimethylamine	--	--	MG/KG	NA	NA	NA	NA	NA	NA
N-Nitrosodi-N-Propylamine	--	--	MG/KG	0.18 U	0.17 U	0.18 U	0.37 U	0.18 U	2 U
N-Nitrosodiphenylamine	--	--	MG/KG	0.14 U	0.14 U	0.14 U	0.3 U	0.15 U	1.6 U
Pentachlorophenol	0.8	6.7	MG/KG	0.14 U	0.14 U	0.14 U	0.3 U	0.15 U	1.6 U
Phenanthrene	100	100	MG/KG	0.021 J	0.06 J	0.88	3.9 J	1.5 J	2.6
Phenol	0.33	100	MG/KG	0.18 U	0.17 U	0.18 U	0.37 U	0.18 U	2 U
Pyrene	100	100	MG/KG	0.11 U	0.12	1.6	6.1 J	2.2 J	3.8

Table 4. Summary of Semivolatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	BDS-17_SDS-7	BDS-2	BDS-21A	BDS-21B	BDS-22	BDS-23
			Sample Date:	01/15/2020	11/11/2019	01/06/2020	01/06/2020	11/11/2019	11/11/2019
			Sample Depth (ft bls):	6 - 7	12 - 14	6 - 8	6 - 8	12 - 14	12 - 14
			Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
1,2,4,5-Tetrachlorobenzene	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U	0.19 U	0.18 U
1,2,4-Trichlorobenzene	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U	0.19 U	0.18 U
1,2-Dichlorobenzene	1.1	100	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U	0.19 U	0.18 U
1,3-Dichlorobenzene	2.4	49	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U	0.19 U	0.18 U
1,4-Dichlorobenzene	1.8	13	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U	0.19 U	0.18 U
1,4-Dioxane (P-Dioxane)	0.1	13	MG/KG	0.03 U	0.027 U	0.03 U	0.029 U	0.029 U	0.027 U
2,3,4,6-Tetrachlorophenol	--	--	MG/KG	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U	0.19 U	0.18 U
2,4,6-Trichlorophenol	--	--	MG/KG	0.12 U	0.11 U	0.12 U	0.12 U	0.12 U	0.11 U
2,4-Dichlorophenol	--	--	MG/KG	0.18 U	0.16 U	0.18 U	0.18 U	0.17 U	0.16 U
2,4-Dimethylphenol	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U	0.19 U	0.18 U
2,4-Dinitrophenol	--	--	MG/KG	0.96 U	0.87 U	0.97 U	0.93 U	0.93 U	0.87 U
2,4-Dinitrotoluene	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U	0.19 U	0.18 U
2,6-Dinitrotoluene	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U	0.19 U	0.18 U
2-Chloronaphthalene	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U	0.19 U	0.18 U
2-Chlorophenol	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U	0.19 U	0.18 U
2-Methylnaphthalene	--	--	MG/KG	0.065 J	0.22 U	0.031 J	0.032 J	0.23 U	0.22 U
2-Methylphenol (O-Cresol)	0.33	100	MG/KG	0.034 J	0.18 U	0.2 U	0.19 U	0.19 U	0.18 U
2-Nitroaniline	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U	0.19 U	0.18 U
2-Nitrophenol	--	--	MG/KG	0.43 U	0.39 U	0.43 U	0.42 U	0.42 U	0.39 U
3- And 4- Methylphenol (Total)	**0.33**	100	MG/KG	0.12 J	0.26 U	0.29 U	0.037 J	0.28 U	0.26 U
3,3'-Dichlorobenzidine	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U	0.19 U	0.18 U
3-Nitroaniline	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U	0.19 U	0.18 U
4,6-Dinitro-2-Methylphenol	--	--	MG/KG	0.52 U	0.47 U	0.52 U	0.5 U	0.5 U	0.47 U
4-Bromophenyl Phenyl Ether	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U	0.19 U	0.18 U
4-Chloro-3-Methylphenol	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U	0.19 U	0.18 U
4-Chloroaniline	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U	0.19 U	0.18 U
4-Chlorophenyl Phenyl Ether	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U	0.19 U	0.18 U
4-Nitroaniline	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U	0.19 U	0.18 U
4-Nitrophenol	--	--	MG/KG	0.28 U	0.25 U	0.28 U	0.27 U	0.27 U	0.25 U
Acenaphthene	20	100	MG/KG	0.06 J	0.14 U	0.034 J	0.028 J	0.15 U	0.14 U

Table 4. Summary of Semivolatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	BDS-17_SDS-7	BDS-2	BDS-21A	BDS-21B	BDS-22	BDS-23
			Sample Date:	01/15/2020	11/11/2019	01/06/2020	01/06/2020	11/11/2019	11/11/2019
			Sample Depth (ft bls):	6 - 7	12 - 14	6 - 8	6 - 8	12 - 14	12 - 14
			Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
Acenaphthylene	100	100	MG/KG	3	0.049 J	0.35	0.54	0.079 J	0.066 J
Acetophenone	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U	0.19 U	0.18 U
Anthracene	100	100	MG/KG	1.3	0.11 U	0.26	0.32	0.046 J	0.059 J
Atrazine	--	--	MG/KG	NA	NA	NA	NA	NA	NA
Azobenzene	--	--	MG/KG	NA	NA	NA	NA	NA	NA
Benzaldehyde	--	--	MG/KG	NA	NA	NA	NA	NA	NA
Benzidine	--	--	MG/KG	NA	NA	NA	NA	NA	NA
Benzo(A)Anthracene	**1**	1	MG/KG	**4.5**	0.14	**1.1**	**1.4**	0.21	0.19
Benzo(A)Pyrene	**1**	1	MG/KG	**6.4**	0.17	**1.1**	**1.5**	0.25	0.22
Benzo(B)Fluoranthene	**1**	1	MG/KG	**5.9**	0.23	**1.6**	**2**	0.33	0.29
Benzo(G,H,I)Perylene	100	100	MG/KG	5.8	0.13 J	0.94	1.4	0.18	0.16
Benzo(K)Fluoranthene	**0.8**	3.9	MG/KG	**2.6**	0.083 J	0.44	0.73	0.13	0.1 J
Benzoic Acid	--	--	MG/KG	0.64 U	0.59 R	0.65 R	0.63 R	0.63 R	0.59 R
Benzyl Alcohol	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U	0.19 U	0.18 U
Benzyl Butyl Phthalate	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U	0.19 U	0.18 U
Biphenyl (Diphenyl)	--	--	MG/KG	0.45 U	0.41 U	0.46 U	0.44 U	0.44 U	0.41 U
Bis(2-Chloroethoxy) Methane	--	--	MG/KG	0.22 U	0.2 U	0.22 U	0.21 U	0.21 U	0.2 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	--	--	MG/KG	0.18 U	0.16 U	0.18 U	0.18 U	0.17 U	0.16 U
Bis(2-Chloroisopropyl) Ether	--	--	MG/KG	0.24 U	0.22 U	0.24 U	0.23 U	0.23 U	0.22 U
Bis(2-Ethylhexyl) Phthalate	--	--	MG/KG	0.2 U	0.12 J	3.8	4.5	0.19 U	0.18
Caprolactam	--	--	MG/KG	NA	NA	NA	NA	NA	NA
Carbazole	--	--	MG/KG	0.89	0.18 U	0.12 J	0.15 J	0.036 J	0.033 J
Chrysene	**1**	3.9	MG/KG	**5**	0.14	0.97	**1.3**	0.22	0.18
Dibenz(A,H)Anthracene	**0.33**	0.33	MG/KG	**1.4**	0.043 J	0.18	0.23	0.052 J	0.048 J
Dibenzofuran	7	59	MG/KG	0.19 J	0.18 U	0.041 J	0.044 J	0.19 U	0.18 U
Diethyl Phthalate	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U	0.19 U	0.18 U
Dimethyl Phthalate	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U	0.19 U	0.18 U
Di-N-Butyl Phthalate	--	--	MG/KG	0.058 J	0.18 U	0.038 J	0.19 U	0.19 U	0.18 U
Di-N-Octylphthalate	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U	0.19 U	0.18 U
Fluoranthene	100	100	MG/KG	6.5	0.29	1.6	2.2	0.5	0.46
Fluorene	30	100	MG/KG	0.18 J	0.18 U	0.058 J	0.071 J	0.023 J	0.019 J

Table 4. Summary of Semivolatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	BDS-17_SDS-7	BDS-2	BDS-21A	BDS-21B	BDS-22	BDS-23
			Sample Date:	01/15/2020	11/11/2019	01/06/2020	01/06/2020	11/11/2019	11/11/2019
			Sample Depth (ft bls):	6 - 7	12 - 14	6 - 8	6 - 8	12 - 14	12 - 14
			Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
Hexachlorobenzene	0.33	1.2	MG/KG	0.12 U	0.11 U	0.12 U	0.12 U	0.12 U	0.11 U
Hexachlorobutadiene	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U	0.19 U	0.18 U
Hexachlorocyclopentadiene	--	--	MG/KG	0.57 U	0.52 U	0.58 U	0.56 U	0.55 U	0.52 U
Hexachloroethane	--	--	MG/KG	0.16 U	0.14 U	0.16 U	0.16 U	0.15 U	0.14 U
Indeno(1,2,3-C,D)Pyrene	**0.5**	0.5	MG/KG	**5.7**	0.16	**0.91**	**1.3**	0.22	0.19
Isophorone	--	--	MG/KG	0.18 U	0.16 U	0.18 U	0.18 U	0.17 U	0.16 U
Naphthalene	12	100	MG/KG	0.27	0.18 U	0.11 J	0.13 J	0.19 U	0.027 J
Nitrobenzene	--	--	MG/KG	0.18 U	0.16 U	0.18 U	0.18 U	0.17 U	0.16 U
N-Nitrosodimethylamine	--	--	MG/KG	NA	NA	NA	NA	NA	NA
N-Nitrosodi-N-Propylamine	--	--	MG/KG	0.2 U	0.18 U	0.2 U	0.19 U	0.19 U	0.18 U
N-Nitrosodiphenylamine	--	--	MG/KG	0.16 U	0.14 U	0.16 U	0.16 U	0.15 U	0.14 U
Pentachlorophenol	0.8	6.7	MG/KG	0.16 U	0.14 U	0.16 U	0.16 U	0.15 U	0.14 U
Phenanthrene	100	100	MG/KG	3.9	0.12	0.94	1.3	0.3	0.24
Phenol	0.33	100	MG/KG	0.086 J	0.18 U	0.2 U	0.19 U	0.19 U	0.18 U
Pyrene	100	100	MG/KG	6.6	0.24	1.6	2.2	0.39	0.37

Table 4. Summary of Semivolatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	BDS-24	BDS-25	BDS-26	BDS-27	BDS-28	BDS-29
			Sample Date:	11/11/2019	01/15/2020	01/15/2020	01/15/2020	01/06/2020	01/06/2020
			Sample Depth (ft bls):	12 - 14	8 - 10	8 - 10	8 - 10	8 - 10	8 - 10
			Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
1,2,4,5-Tetrachlorobenzene	--	--	MG/KG	0.19 U	2 U	2 U	2 U	0.2 U	0.19 U
1,2,4-Trichlorobenzene	--	--	MG/KG	0.19 U	2 U	2 U	2 U	0.2 U	0.19 U
1,2-Dichlorobenzene	1.1	100	MG/KG	0.19 U	2 U	2 U	2 U	0.2 U	0.19 U
1,3-Dichlorobenzene	2.4	49	MG/KG	0.19 U	2 U	2 U	2 U	0.2 U	0.19 U
1,4-Dichlorobenzene	1.8	13	MG/KG	0.19 U	2 U	2 U	2 U	0.2 U	0.19 U
1,4-Dioxane (P-Dioxane)	0.1	13	MG/KG	0.029 U	0.3 U	0.31 U	0.3 U	0.03 U	0.029 U
2,3,4,6-Tetrachlorophenol	--	--	MG/KG	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	--	--	MG/KG	0.19 U	2 U	2 U	2 U	0.2 U	0.19 U
2,4,6-Trichlorophenol	--	--	MG/KG	0.12 U	1.2 U	1.2 U	1.2 U	0.12 U	0.12 U
2,4-Dichlorophenol	--	--	MG/KG	0.17 U	1.8 U	1.8 U	1.8 U	0.18 U	0.18 U
2,4-Dimethylphenol	--	--	MG/KG	0.19 U	2 U	2 U	2 U	0.2 U	0.19 U
2,4-Dinitrophenol	--	--	MG/KG	0.92 U	9.7 U	9.9 U	9.8 U	0.95 U	0.93 U
2,4-Dinitrotoluene	--	--	MG/KG	0.19 U	2 U	2 U	2 U	0.2 U	0.19 U
2,6-Dinitrotoluene	--	--	MG/KG	0.19 U	2 U	2 U	2 U	0.2 U	0.19 U
2-Chloronaphthalene	--	--	MG/KG	0.19 U	2 U	2 U	2 U	0.2 U	0.19 U
2-Chlorophenol	--	--	MG/KG	0.19 U	2 U	2 U	2 U	0.2 U	0.19 U
2-Methylnaphthalene	--	--	MG/KG	0.23 U	0.38 J	2.5 U	0.33 J	0.13 J	0.069 J
2-Methylphenol (O-Cresol)	0.33	100	MG/KG	0.19 U	2 U	2 U	2 U	0.2 U	0.19 U
2-Nitroaniline	--	--	MG/KG	0.19 U	2 U	2 U	2 U	0.2 U	0.19 U
2-Nitrophenol	--	--	MG/KG	0.42 U	4.4 U	4.4 U	4.4 U	0.43 U	0.42 U
3- And 4- Methylphenol (Total)	**0.33**	100	MG/KG	0.28 U	2.9 U	3 U	2.9 U	0.069 J	0.041 J
3,3'-Dichlorobenzidine	--	--	MG/KG	0.19 U	2 U	2 U	2 U	0.2 U	0.19 U
3-Nitroaniline	--	--	MG/KG	0.19 U	2 U	2 U	2 U	0.2 U	0.19 U
4,6-Dinitro-2-Methylphenol	--	--	MG/KG	0.5 U	5.2 U	5.3 U	5.3 U	0.51 U	0.51 U
4-Bromophenyl Phenyl Ether	--	--	MG/KG	0.19 U	2 U	2 U	2 U	0.2 U	0.19 U
4-Chloro-3-Methylphenol	--	--	MG/KG	0.19 U	2 U	2 U	2 U	0.2 U	0.19 U
4-Chloroaniline	--	--	MG/KG	0.19 U	2 U	2 U	2 U	0.2 U	0.19 U
4-Chlorophenyl Phenyl Ether	--	--	MG/KG	0.19 U	2 U	2 U	2 U	0.2 U	0.19 U
4-Nitroaniline	--	--	MG/KG	0.19 U	2 U	2 U	2 U	0.2 U	0.19 U
4-Nitrophenol	--	--	MG/KG	0.27 U	2.8 U	2.9 U	2.8 U	0.28 U	0.27 U
Acenaphthene	20	100	MG/KG	0.15 U	0.74 J	0.26 J	0.56 J	0.17	0.1 J

Table 4. Summary of Semivolatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	BDS-24	BDS-25	BDS-26	BDS-27	BDS-28	BDS-29
			Sample Date:	11/11/2019	01/15/2020	01/15/2020	01/15/2020	01/06/2020	01/06/2020
			Sample Depth (ft bls):	12 - 14	8 - 10	8 - 10	8 - 10	8 - 10	8 - 10
			Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
Acenaphthylene	100	100	MG/KG	0.15 U	2.6	1.4 J	3.3	0.56	0.53
Acetophenone	--	--	MG/KG	0.19 U	2 U	2 U	2 U	0.2 U	0.19 U
Anthracene	100	100	MG/KG	0.12 U	3	1.2	2.9	0.75	0.52
Atrazine	--	--	MG/KG	NA	NA	NA	NA	NA	NA
Azobenzene	--	--	MG/KG	NA	NA	NA	NA	NA	NA
Benzaldehyde	--	--	MG/KG	NA	NA	NA	NA	NA	NA
Benzidine	--	--	MG/KG	NA	NA	NA	NA	NA	NA
Benzo(A)Anthracene	**1**	1	MG/KG	0.028 J	**7.8**	**3.5**	**6.7**	**1.7**	**1.5**
Benzo(A)Pyrene	**1**	1	MG/KG	0.15 U	**7.3**	**3.2**	**6.8**	**1.5**	**1.4**
Benzo(B)Fluoranthene	**1**	1	MG/KG	0.038 J	**8.5**	**4.1**	**8.2**	**2**	**1.8**
Benzo(G,H,I)Perylene	100	100	MG/KG	0.041 J	5.2	2.6	5.1	1.1	1.2
Benzo(K)Fluoranthene	**0.8**	3.9	MG/KG	0.12 U	**2.4**	**1.2**	**2.6**	0.61	0.63
Benzoic Acid	--	--	MG/KG	0.62 R	6.5 R	6.7 R	6.6 R	0.64 R	0.63 R
Benzyl Alcohol	--	--	MG/KG	0.19 U	2 U	2 U	2 U	0.2 U	0.19 U
Benzyl Butyl Phthalate	--	--	MG/KG	0.19 U	2 U	2 U	2 U	0.057 J	1.2
Biphenyl (Diphenyl)	--	--	MG/KG	0.44 U	4.6 U	4.7 U	4.6 U	0.45 U	0.44 U
Bis(2-Chloroethoxy) Methane	--	--	MG/KG	0.21 U	2.2 U	2.2 U	2.2 U	0.21 U	0.21 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	--	--	MG/KG	0.17 U	1.8 U	1.8 U	1.8 U	0.18 U	0.18 U
Bis(2-Chloroisopropyl) Ether	--	--	MG/KG	0.23 U	2.4 U	2.5 U	2.4 U	0.24 U	0.23 U
Bis(2-Ethylhexyl) Phthalate	--	--	MG/KG	0.19 U	2 U	2 U	2 U	0.6	2.4
Caprolactam	--	--	MG/KG	NA	NA	NA	NA	NA	NA
Carbazole	--	--	MG/KG	0.19 U	1.1 J	0.45 J	1.3 J	0.36	0.24
Chrysene	**1**	3.9	MG/KG	0.029 J	**8**	**3.5**	**6.8**	**1.7**	**1.5**
Dibenz(A,H)Anthracene	**0.33**	0.33	MG/KG	0.12 U	**1.3**	**0.53 J**	**1.4**	0.26	0.26
Dibenzofuran	7	59	MG/KG	0.19 U	0.46 J	0.2 J	0.57 J	0.22	0.099 J
Diethyl Phthalate	--	--	MG/KG	0.19 U	2 U	2 U	2 U	0.2 U	0.19 U
Dimethyl Phthalate	--	--	MG/KG	0.19 U	2 U	2 U	2 U	0.2 U	0.19 U
Di-N-Butyl Phthalate	--	--	MG/KG	0.19 U	2 U	2 U	2 U	0.2 U	0.19 U
Di-N-Octylphthalate	--	--	MG/KG	0.19 U	2 U	2 U	2 U	0.2 U	0.19 U
Fluoranthene	100	100	MG/KG	0.059 J	12	5.2	12	3.8	2.8
Fluorene	30	100	MG/KG	0.19 U	1.1 J	0.4 J	1.2 J	0.32	0.18 J

Table 4. Summary of Semivolatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	BDS-24	BDS-25	BDS-26	BDS-27	BDS-28	BDS-29
			Sample Date:	11/11/2019	01/15/2020	01/15/2020	01/15/2020	01/06/2020	01/06/2020
			Sample Depth (ft bls):	12 - 14	8 - 10	8 - 10	8 - 10	8 - 10	8 - 10
			Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
Hexachlorobenzene	0.33	1.2	MG/KG	0.12 U	1.2 U	1.2 U	1.2 U	0.12 U	0.12 U
Hexachlorobutadiene	--	--	MG/KG	0.19 U	2 U	2 U	2 U	0.2 U	0.19 U
Hexachlorocyclopentadiene	--	--	MG/KG	0.55 U	5.8 U	5.9 U	5.8 U	0.56 U	0.56 U
Hexachloroethane	--	--	MG/KG	0.15 U	1.6 U	1.6 U	1.6 U	0.16 U	0.16 U
Indeno(1,2,3-C,D)Pyrene	**0.5**	0.5	MG/KG	0.074 J	**4.9**	**2.4**	**5**	**1.2**	**1.2**
Isophorone	--	--	MG/KG	0.17 U	1.8 U	1.8 U	1.8 U	0.18 U	0.18 U
Naphthalene	12	100	MG/KG	0.19 U	0.72 J	0.44 J	0.74 J	0.4	0.17 J
Nitrobenzene	--	--	MG/KG	0.17 U	1.8 U	1.8 U	1.8 U	0.18 U	0.18 U
N-Nitrosodimethylamine	--	--	MG/KG	NA	NA	NA	NA	NA	NA
N-Nitrosodi-N-Propylamine	--	--	MG/KG	0.19 U	2 U	2 U	2 U	0.2 U	0.19 U
N-Nitrosodiphenylamine	--	--	MG/KG	0.15 U	1.6 U	1.6 U	1.6 U	0.16 U	0.16 U
Pentachlorophenol	0.8	6.7	MG/KG	0.15 U	1.6 U	1.6 U	1.6 U	0.16 U	0.16 U
Phenanthrene	100	100	MG/KG	0.036 J	11	3.9	11	3.2	1.7
Phenol	0.33	100	MG/KG	0.19 U	2 U	2 U	2 U	0.042 J	0.19 U
Pyrene	100	100	MG/KG	0.051 J	14	5.5	12	3.2	2.6

Table 4. Summary of Semivolatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	BDS-3	BDS-3	BDS-30	BDS-3A	SB-18	SB-19
			Sample Date:	11/11/2019	11/11/2019	01/06/2020	05/05/2020	04/17/2019	04/18/2019
			Sample Depth (ft bls):	12 - 14	12 - 14	8 - 10	13 - 14	2 - 4	2 - 4
			Normal Sample or Field Duplicate:	N	FD	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
1,2,4,5-Tetrachlorobenzene	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.17 U	0.19 U	0.98 U
1,2,4-Trichlorobenzene	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.17 U	0.19 U	0.98 U
1,2-Dichlorobenzene	1.1	100	MG/KG	0.18 U	0.18 U	0.19 U	0.17 U	NA	NA
1,3-Dichlorobenzene	2.4	49	MG/KG	0.18 U	0.18 U	0.19 U	0.17 U	NA	NA
1,4-Dichlorobenzene	1.8	13	MG/KG	0.18 U	0.18 U	0.19 U	0.17 U	NA	NA
1,4-Dioxane (P-Dioxane)	0.1	13	MG/KG	0.028 U	0.028 U	0.029 U	0.026 U	0.00837 U	0.00819 U
2,3,4,6-Tetrachlorophenol	--	--	MG/KG	NA	NA	NA	NA	0.19 U	0.98 U
2,4,5-Trichlorophenol	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.17 U	0.19 U	0.98 U
2,4,6-Trichlorophenol	--	--	MG/KG	0.11 U	0.11 U	0.12 U	0.1 U	0.12 U	0.59 U
2,4-Dichlorophenol	--	--	MG/KG	0.17 U	0.17 U	0.17 U	0.15 U	0.17 U	0.88 U
2,4-Dimethylphenol	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.17 U	0.19 U	0.98 U
2,4-Dinitrophenol	--	--	MG/KG	0.89 U	0.89 U	0.93 U	0.82 U	0.93 U	4.7 U
2,4-Dinitrotoluene	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.17 U	0.19 U	0.98 U
2,6-Dinitrotoluene	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.17 U	0.19 U	0.98 U
2-Chloronaphthalene	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.17 U	0.19 U	0.98 U
2-Chlorophenol	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.17 U	0.19 U	0.98 U
2-Methylnaphthalene	--	--	MG/KG	0.22 U	0.22 U	0.16 J	0.2 U	0.23 U	1.2 U
2-Methylphenol (O-Cresol)	0.33	100	MG/KG	0.18 U	0.18 U	0.19 U	0.17 U	0.19 U	0.98 U
2-Nitroaniline	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.17 U	0.19 U	0.98 U
2-Nitrophenol	--	--	MG/KG	0.4 U	0.4 U	0.42 U	0.37 U	0.42 U	2.1 U
3- And 4- Methylphenol (Total)	**0.33**	100	MG/KG	0.27 U	0.27 U	0.066 J	NA	0.28 U	1.4 U
3,3'-Dichlorobenzidine	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.17 U	0.19 U	0.98 U
3-Nitroaniline	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.17 U	0.19 U	0.98 U
4,6-Dinitro-2-Methylphenol	--	--	MG/KG	0.48 U	0.48 U	0.5 U	0.44 U	0.5 U	2.5 U
4-Bromophenyl Phenyl Ether	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.17 U	0.19 U	0.98 U
4-Chloro-3-Methylphenol	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.17 U	0.19 U	0.98 U
4-Chloroaniline	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.17 U	0.19 U	0.98 U
4-Chlorophenyl Phenyl Ether	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.17 U	0.19 U	0.98 U
4-Nitroaniline	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.17 U	0.19 U	0.98 U
4-Nitrophenol	--	--	MG/KG	0.26 U	0.26 U	0.27 U	0.24 U	0.27 U	1.4 U
Acenaphthene	20	100	MG/KG	0.15 U	0.15 U	0.24	0.14 U	0.16 U	0.78 U

Table 4. Summary of Semivolatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	BDS-3	BDS-3	BDS-30	BDS-3A	SB-18	SB-19
			Sample Date:	11/11/2019	11/11/2019	01/06/2020	05/05/2020	04/17/2019	04/18/2019
			Sample Depth (ft bls):	12 - 14	12 - 14	8 - 10	13 - 14	2 - 4	2 - 4
			Normal Sample or Field Duplicate:	N	FD	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
Acenaphthylene	100	100	MG/KG	0.15 U	0.086 J	0.7	0.042 J	0.036 J	0.79
Acetophenone	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.17 U	0.19 U	0.98 U
Anthracene	100	100	MG/KG	0.11 U	0.072 J	0.84	0.1 U	0.046 J	0.31 J
Atrazine	--	--	MG/KG	NA	NA	NA	NA	0.16 U	0.78 U
Azobenzene	--	--	MG/KG	NA	NA	NA	NA	0.19 U	0.98 U
Benzaldehyde	--	--	MG/KG	NA	NA	NA	NA	0.26 U	1.3 U
Benzidine	--	--	MG/KG	NA	NA	NA	NA	0.64 U	3.2 U
Benzo(A)Anthracene	**1**	1	MG/KG	0.072 J	0.27	**2**	0.091 J	0.28	**1.8**
Benzo(A)Pyrene	**1**	1	MG/KG	0.092 J	0.32	**1.9**	0.11 J	0.26	**1.7**
Benzo(B)Fluoranthene	**1**	1	MG/KG	0.13	0.4	**2.5**	0.15	0.34	**2.4**
Benzo(G,H,I)Perylene	100	100	MG/KG	0.08 J	0.22	1.5	0.082 J	0.17	1.5
Benzo(K)Fluoranthene	**0.8**	3.9	MG/KG	0.052 J	0.17	**0.89**	0.047 J	0.13	0.76
Benzoic Acid	--	--	MG/KG	0.6 R	0.6 R	0.63 R	0.55 U	0.63 U	3.2 U
Benzyl Alcohol	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.17 U	0.19 U	0.98 U
Benzyl Butyl Phthalate	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.17 U	0.19 U	0.67 J
Biphenyl (Diphenyl)	--	--	MG/KG	0.42 U	0.42 U	0.44 U	0.39 U	0.44 U	2.2 U
Bis(2-Chloroethoxy) Methane	--	--	MG/KG	0.2 U	0.2 U	0.21 U	0.18 U	0.21 U	1 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	--	--	MG/KG	0.17 U	0.17 U	0.17 U	0.15 U	0.17 U	0.88 U
Bis(2-Chloroisopropyl) Ether	--	--	MG/KG	0.22 U	0.22 U	0.23 U	0.2 U	0.23 U	1.2 U
Bis(2-Ethylhexyl) Phthalate	--	--	MG/KG	0.29	0.18 U	5.4	0.17 U	0.19 U	4
Caprolactam	--	--	MG/KG	NA	NA	NA	NA	0.19 U	0.98 U
Carbazole	--	--	MG/KG	0.18 U	0.034 J	0.39	0.17 U	0.022 J	0.22 J
Chrysene	**1**	3.9	MG/KG	0.08 J	0.26	**2**	0.096 J	0.26	**1.5**
Dibenz(A,H)Anthracene	**0.33**	0.33	MG/KG	0.032 J	0.064 J	**0.36**	0.1 U	0.038 J	0.29 J
Dibenzofuran	7	59	MG/KG	0.18 U	0.18 U	0.21	0.17 U	0.19 U	0.98 U
Diethyl Phthalate	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.17 U	0.19 U	0.98 U
Dimethyl Phthalate	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.17 U	0.19 U	0.98 U
Di-N-Butyl Phthalate	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.17 U	0.19 U	0.29 J
Di-N-Octylphthalate	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.17 U	0.75	0.98 U
Fluoranthene	100	100	MG/KG	0.19	0.59	4.1	0.2	0.42	2.5
Fluorene	30	100	MG/KG	0.18 U	0.18 U	0.34	0.17 U	0.19 U	0.98 U

Table 4. Summary of Semivolatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	BDS-3	BDS-3	BDS-30	BDS-3A	SB-18	SB-19
			Sample Date:	11/11/2019	11/11/2019	01/06/2020	05/05/2020	04/17/2019	04/18/2019
			Sample Depth (ft bls):	12 - 14	12 - 14	8 - 10	13 - 14	2 - 4	2 - 4
			Normal Sample or Field Duplicate:	N	FD	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
Hexachlorobenzene	0.33	1.2	MG/KG	0.11 U	0.11 U	0.12 U	0.1 U	0.12 U	0.59 U
Hexachlorobutadiene	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.17 U	0.19 U	0.98 U
Hexachlorocyclopentadiene	--	--	MG/KG	0.53 U	0.53 U	0.55 U	0.49 U	0.56 U	2.8 U
Hexachloroethane	--	--	MG/KG	0.15 U	0.15 U	0.16 U	0.14 U	0.16 U	0.78 U
Indeno(1,2,3-C,D)Pyrene	**0.5**	0.5	MG/KG	0.11 J	0.25	**1.6**	0.086 J	0.18	**1.4**
Isophorone	--	--	MG/KG	0.17 U	0.17 U	0.17 U	0.15 U	0.17 U	0.88 U
Naphthalene	12	100	MG/KG	0.18 U	0.18 U	0.44	0.17 U	0.19 U	0.98 U
Nitrobenzene	--	--	MG/KG	0.17 U	0.17 U	0.17 U	0.15 U	0.17 U	0.88 U
N-Nitrosodimethylamine	--	--	MG/KG	NA	NA	NA	NA	0.39 U	2 U
N-Nitrosodi-N-Propylamine	--	--	MG/KG	0.18 U	0.18 U	0.19 U	0.17 U	0.19 U	0.98 U
N-Nitrosodiphenylamine	--	--	MG/KG	0.15 U	0.15 U	0.16 U	0.14 U	0.16 U	0.78 U
Pentachlorophenol	0.8	6.7	MG/KG	0.15 U	0.15 U	0.16 U	0.14 U	0.16 U	0.78 U
Phenanthrene	100	100	MG/KG	0.1 J	0.28	3.3	0.082 J	0.18	1.2
Phenol	0.33	100	MG/KG	0.18 U	0.18 U	0.19 U	0.17 U	0.19 U	0.98 U
Pyrene	100	100	MG/KG	0.15	0.49	3.5	0.17	0.4	2.2

Table 4. Summary of Semivolatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SB-19	SB-19	SB-20	SB-20	SB-20	SB-20
			Sample Date:	04/22/2019	04/22/2019	04/17/2019	04/22/2019	04/22/2019	04/22/2019
			Sample Depth (ft bls):	4 - 6	6 - 8	2 - 4	4 - 6	6 - 8	15 - 17
			Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
1,2,4,5-Tetrachlorobenzene	--	--	MG/KG	0.19 U	0.19 U	2 U	1 U	0.21 U	0.22 U
1,2,4-Trichlorobenzene	--	--	MG/KG	0.19 U	0.025 J	2 U	1 U	0.21 U	0.22 U
1,2-Dichlorobenzene	1.1	100	MG/KG	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	2.4	49	MG/KG	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	1.8	13	MG/KG	NA	NA	NA	NA	NA	NA
1,4-Dioxane (P-Dioxane)	0.1	13	MG/KG	NA	NA	0.00932 U	NA	NA	NA
2,3,4,6-Tetrachlorophenol	--	--	MG/KG	0.19 U	0.19 U	2 U	1 U	0.21 U	0.22 U
2,4,5-Trichlorophenol	--	--	MG/KG	0.19 U	0.19 U	2 U	1 U	0.21 U	0.22 U
2,4,6-Trichlorophenol	--	--	MG/KG	0.12 U	0.12 U	1.2 U	0.6 U	0.12 U	0.13 U
2,4-Dichlorophenol	--	--	MG/KG	0.17 U	0.17 U	1.8 U	0.9 U	0.19 U	0.2 U
2,4-Dimethylphenol	--	--	MG/KG	0.19 U	0.19 U	2 U	1 U	0.21 U	0.22 U
2,4-Dinitrophenol	--	--	MG/KG	0.92 U	0.93 U	9.8 U	4.8 U	0.99 U	1 U
2,4-Dinitrotoluene	--	--	MG/KG	0.19 U	0.19 U	2 U	1 U	0.21 U	0.22 U
2,6-Dinitrotoluene	--	--	MG/KG	0.19 U	0.19 U	2 U	1 U	0.21 U	0.22 U
2-Chloronaphthalene	--	--	MG/KG	0.19 U	0.023 J	2 U	1 U	0.21 U	0.22 U
2-Chlorophenol	--	--	MG/KG	0.19 U	0.19 U	2 U	1 U	0.21 U	0.22 U
2-Methylnaphthalene	--	--	MG/KG	0.059 J	0.23 U	0.81 J	0.34 J	0.26	0.26 U
2-Methylphenol (O-Cresol)	0.33	100	MG/KG	0.19 U	0.19 U	2 U	1 U	0.04 J	0.22 U
2-Nitroaniline	--	--	MG/KG	0.19 U	0.19 U	2 U	1 U	0.21 U	0.22 U
2-Nitrophenol	--	--	MG/KG	0.41 U	0.42 U	4.4 U	2.2 U	0.45 U	0.47 U
3- And 4- Methylphenol (Total)	**0.33**	100	MG/KG	0.28 U	0.28 U	2.9 U	1.4 U	0.13 J	0.32 U
3,3'-Dichlorobenzidine	--	--	MG/KG	0.19 U	0.19 U	2 U	1 U	0.21 U	0.22 U
3-Nitroaniline	--	--	MG/KG	0.19 U	0.19 U	2 U	1 U	0.21 U	0.22 U
4,6-Dinitro-2-Methylphenol	--	--	MG/KG	0.5 U	0.5 U	5.3 U	2.6 U	0.54 U	0.57 U
4-Bromophenyl Phenyl Ether	--	--	MG/KG	0.19 U	0.19 U	2 U	1 U	0.21 U	0.22 U
4-Chloro-3-Methylphenol	--	--	MG/KG	0.19 U	0.19 U	2 U	1 U	0.21 U	0.22 U
4-Chloroaniline	--	--	MG/KG	0.19 U	0.19 U	2 U	1 U	0.21 U	0.22 U
4-Chlorophenyl Phenyl Ether	--	--	MG/KG	0.19 U	0.19 U	2 U	1 U	0.21 U	0.22 U
4-Nitroaniline	--	--	MG/KG	0.19 U	0.19 U	2 U	1 U	0.21 U	0.22 U
4-Nitrophenol	--	--	MG/KG	0.27 U	0.27 U	2.9 U	1.4 U	0.29 U	0.31 U
Acenaphthene	20	100	MG/KG	0.044 J	0.15 U	1.7	0.71 J	0.41	0.18 U

Table 4. Summary of Semivolatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SB-19	SB-19	SB-20	SB-20	SB-20	SB-20
			Sample Date:	04/22/2019	04/22/2019	04/17/2019	04/22/2019	04/22/2019	04/22/2019
			Sample Depth (ft bls):	4 - 6	6 - 8	2 - 4	4 - 6	6 - 8	15 - 17
			Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
Acenaphthylene	100	100	MG/KG	0.75	0.18	3	1.6	2	0.18 U
Acetophenone	--	--	MG/KG	0.19 U	0.19 U	2 U	1 U	0.046 J	0.22 U
Anthracene	100	100	MG/KG	0.4	0.087 J	5.7	2.5	1.9	0.13 U
Atrazine	--	--	MG/KG	0.15 U	0.15 U	1.6 U	0.8 U	0.16 U	0.18 U
Azobenzene	--	--	MG/KG	0.19 U	0.19 U	2 U	1 U	0.21 U	0.22 U
Benzaldehyde	--	--	MG/KG	0.25 U	0.26 U	2.7 U	1.3 U	0.26 J	0.29 U
Benzidine	--	--	MG/KG	0.63 U	0.64 R	6.7 U	3.3 U	0.68 U	0.72 U
Benzo(A)Anthracene	**1**	1	MG/KG	**1.5**	0.24	**18**	**8.8**	**4.5**	0.13 U
Benzo(A)Pyrene	**1**	1	MG/KG	**1.7**	0.3	**12**	**7.2**	**4.1**	0.18 U
Benzo(B)Fluoranthene	**1**	1	MG/KG	**2.4**	0.4	**15**	**8.5**	**5**	0.13 U
Benzo(G,H,I)Perylene	100	100	MG/KG	1.5	0.29	7.1	3.8	2.9	0.18 U
Benzo(K)Fluoranthene	**0.8**	3.9	MG/KG	0.71	0.13	**4.7**	**2.6**	**1.6**	0.13 U
Benzoic Acid	--	--	MG/KG	0.62 R	0.63 U	6.6 U	3.2 U	0.67 R	0.71 R
Benzyl Alcohol	--	--	MG/KG	0.19 U	0.19 U	2 U	1 U	0.21 U	0.22 U
Benzyl Butyl Phthalate	--	--	MG/KG	0.19 U	0.19 U	2 U	1 U	0.21 U	0.22 U
Biphenyl (Diphenyl)	--	--	MG/KG	0.44 U	0.44 U	4.7 U	2.3 U	0.068 J	0.5 U
Bis(2-Chloroethoxy) Methane	--	--	MG/KG	0.21 U	0.21 U	2.2 U	1.1 U	0.22 U	0.24 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	--	--	MG/KG	0.17 U	0.17 U	1.8 U	0.9 U	0.19 U	0.2 U
Bis(2-Chloroisopropyl) Ether	--	--	MG/KG	0.23 U	0.23 U	2.4 U	1.2 U	0.25 U	0.26 U
Bis(2-Ethylhexyl) Phthalate	--	--	MG/KG	0.38	0.12 J	3.6	1 U	0.21 U	0.22 U
Caprolactam	--	--	MG/KG	0.19 U	0.19 U	2 U	1 U	0.21 U	0.22 U
Carbazole	--	--	MG/KG	0.28	0.039 J	1.6 J	0.78 J	0.64	0.22 U
Chrysene	**1**	3.9	MG/KG	**1.4**	0.24	**17**	**8.1**	**4.2**	0.13 U
Dibenz(A,H)Anthracene	**0.33**	0.33	MG/KG	0.29	0.059 J	**1.7**	**0.9**	**0.66**	0.13 U
Dibenzofuran	7	59	MG/KG	0.14 J	0.19 U	0.85 J	0.37 J	0.27	0.22 U
Diethyl Phthalate	--	--	MG/KG	0.19 U	0.19 U	2 U	1 U	0.21 U	0.22 U
Dimethyl Phthalate	--	--	MG/KG	0.19 U	0.19 U	2 U	1 U	0.21 U	0.22 U
Di-N-Butyl Phthalate	--	--	MG/KG	0.19 U	0.19 U	2 U	1 U	0.21 U	0.22 U
Di-N-Octylphthalate	--	--	MG/KG	0.19 U	0.19 U	2 U	1 U	0.21 U	0.22 U
Fluoranthene	100	100	MG/KG	2.6	0.33	27	12	6.5	0.13 U
Fluorene	30	100	MG/KG	0.094 J	0.19 U	2.2	1.1	0.67	0.22 U

Table 4. Summary of Semivolatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SB-19	SB-19	SB-20	SB-20	SB-20	SB-20
			Sample Date:	04/22/2019	04/22/2019	04/17/2019	04/22/2019	04/22/2019	04/22/2019
			Sample Depth (ft bls):	4 - 6	6 - 8	2 - 4	4 - 6	6 - 8	15 - 17
			Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
Hexachlorobenzene	0.33	1.2	MG/KG	0.12 U	0.12 U	1.2 U	0.6 U	0.12 U	0.13 U
Hexachlorobutadiene	--	--	MG/KG	0.19 U	0.19 U	2 U	1 U	0.21 U	0.22 U
Hexachlorocyclopentadiene	--	--	MG/KG	0.55 U	0.55 U	5.8 U	2.9 U	0.59 U	0.63 U
Hexachloroethane	--	--	MG/KG	0.15 U	0.15 U	1.6 U	0.8 U	0.16 U	0.18 U
Indeno(1,2,3-C,D)Pyrene	**0.5**	0.5	MG/KG	**1.5**	0.28	**7**	**4**	**2.3**	0.18 U
Isophorone	--	--	MG/KG	0.17 U	0.17 U	1.8 U	0.9 U	0.19 U	0.2 U
Naphthalene	12	100	MG/KG	0.19	0.097 J	1.8 J	0.62 J	0.62	0.22 U
Nitrobenzene	--	--	MG/KG	0.17 U	0.17 U	1.8 U	0.9 U	0.19 U	0.2 U
N-Nitrosodimethylamine	--	--	MG/KG	0.38 U	0.39 U	4.1 U	2 U	0.41 U	0.44 U
N-Nitrosodi-N-Propylamine	--	--	MG/KG	0.19 U	0.19 U	2 U	1 U	0.21 U	0.22 U
N-Nitrosodiphenylamine	--	--	MG/KG	0.15 U	0.15 U	1.6 U	0.8 U	0.16 U	0.18 U
Pentachlorophenol	0.8	6.7	MG/KG	0.15 U	0.15 U	1.6 U	0.8 U	0.16 U	0.18 U
Phenanthrene	100	100	MG/KG	1.7	0.16	27	11	5.5	0.13 U
Phenol	0.33	100	MG/KG	0.19 U	0.19 U	2 U	1 U	0.11 J	0.22 U
Pyrene	100	100	MG/KG	2.2	0.35	31	13	6.8	0.13 U

Table 4. Summary of Semivolatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SB-21	SB-21	SB-22	SB-22	SB-22	SB-22
			Sample Date:	04/17/2019	04/19/2019	04/16/2019	04/22/2019	04/22/2019	04/22/2019
			Sample Depth (ft bls):	2 - 4	4 - 6	2 - 4	4 - 6	6 - 8	15 - 17
			Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
1,2,4,5-Tetrachlorobenzene	--	--	MG/KG	1 U	0.2 U	0.19 U	1 U	2 U	0.21 U
1,2,4-Trichlorobenzene	--	--	MG/KG	1 U	0.2 U	0.19 U	1 U	2 U	0.21 U
1,2-Dichlorobenzene	1.1	100	MG/KG	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	2.4	49	MG/KG	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	1.8	13	MG/KG	NA	NA	NA	NA	NA	NA
1,4-Dioxane (P-Dioxane)	0.1	13	MG/KG	0.0094 U	NA	0.00818 U	NA	NA	NA
2,3,4,6-Tetrachlorophenol	--	--	MG/KG	1 U	0.2 U	0.19 U	1 U	2 UJ	0.21 U
2,4,5-Trichlorophenol	--	--	MG/KG	1 U	0.2 U	0.19 U	1 U	2 UJ	0.21 U
2,4,6-Trichlorophenol	--	--	MG/KG	0.6 U	0.12 U	0.12 U	0.61 U	1.2 UJ	0.12 U
2,4-Dichlorophenol	--	--	MG/KG	0.9 U	0.18 U	0.17 U	0.92 U	1.8 UJ	0.19 U
2,4-Dimethylphenol	--	--	MG/KG	1 U	0.2 U	0.19 U	1 U	2 UJ	0.21 U
2,4-Dinitrophenol	--	--	MG/KG	4.8 U	0.96 U	0.93 U	4.9 U	9.4 UJ	1 U
2,4-Dinitrotoluene	--	--	MG/KG	1 U	0.2 U	0.19 U	1 U	2 U	0.21 U
2,6-Dinitrotoluene	--	--	MG/KG	1 U	0.2 U	0.19 U	1 U	2 U	0.21 U
2-Chloronaphthalene	--	--	MG/KG	1 U	0.2 U	0.19 U	1 U	2 U	0.21 U
2-Chlorophenol	--	--	MG/KG	1 U	0.2 U	0.19 U	1 U	2 UJ	0.21 U
2-Methylnaphthalene	--	--	MG/KG	1.2 U	0.24 U	0.23 U	1.2 U	3.6	0.25 U
2-Methylphenol (O-Cresol)	0.33	100	MG/KG	1 U	0.2 U	0.19 U	1 U	2 UJ	0.21 U
2-Nitroaniline	--	--	MG/KG	1 U	0.2 U	0.19 U	1 U	2 U	0.21 U
2-Nitrophenol	--	--	MG/KG	2.2 U	0.43 U	0.42 U	2.2 U	4.2 UJ	0.45 U
3- And 4- Methylphenol (Total)	**0.33**	100	MG/KG	1.4 U	0.29 U	0.28 U	1.5 U	2.8 UJ	0.3 U
3,3'-Dichlorobenzidine	--	--	MG/KG	1 U	0.2 U	0.19 U	1 U	2 U	0.21 U
3-Nitroaniline	--	--	MG/KG	1 U	0.2 U	0.19 U	1 U	2 U	0.21 U
4,6-Dinitro-2-Methylphenol	--	--	MG/KG	2.6 U	0.52 U	0.5 U	2.6 U	5.1 U	0.54 U
4-Bromophenyl Phenyl Ether	--	--	MG/KG	1 U	0.2 U	0.19 U	1 U	2 U	0.21 U
4-Chloro-3-Methylphenol	--	--	MG/KG	1 U	0.2 U	0.19 U	1 U	2 U	0.21 U
4-Chloroaniline	--	--	MG/KG	1 U	0.2 U	0.19 U	1 U	2 U	0.21 U
4-Chlorophenyl Phenyl Ether	--	--	MG/KG	1 U	0.2 U	0.19 U	1 U	2 U	0.21 U
4-Nitroaniline	--	--	MG/KG	1 U	0.2 U	0.19 U	1 U	2 U	0.21 U
4-Nitrophenol	--	--	MG/KG	1.4 U	0.28 U	0.27 U	1.4 U	2.8 UJ	0.29 U
Acenaphthene	20	100	MG/KG	0.8 U	0.16 U	0.028 J	0.13 J	1.9	0.17 U

Table 4. Summary of Semivolatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SB-21	SB-21	SB-22	SB-22	SB-22	SB-22
			Sample Date:	04/17/2019	04/19/2019	04/16/2019	04/22/2019	04/22/2019	04/22/2019
			Sample Depth (ft bls):	2 - 4	4 - 6	2 - 4	4 - 6	6 - 8	15 - 17
			Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
Acenaphthylene	100	100	MG/KG	0.22 J	0.16	0.16	0.81 U	8.6	0.17 U
Acetophenone	--	--	MG/KG	1 U	0.2 U	0.19 U	1 U	2 U	0.21 U
Anthracene	100	100	MG/KG	0.6 U	0.086 J	0.13	0.32 J	7.2	0.12 U
Atrazine	--	--	MG/KG	0.8 U	0.16 U	0.15 U	0.81 U	1.6 U	0.17 U
Azobenzene	--	--	MG/KG	1 U	0.2 U	0.19 U	1 U	2 U	0.21 U
Benzaldehyde	--	--	MG/KG	1.3 U	0.26 U	0.26 U	1.3 U	2.6 U	0.28 U
Benzidine	--	--	MG/KG	3.3 U	0.66 U	0.64 U	3.4 U	6.5 R	0.69 U
Benzo(A)Anthracene	**1**	1	MG/KG	0.98	0.54	0.82	**1.2**	**22**	0.12 U
Benzo(A)Pyrene	**1**	1	MG/KG	0.68 J	0.57	0.76	**1.1**	**21**	0.17 U
Benzo(B)Fluoranthene	**1**	1	MG/KG	0.97	0.76	1	**1.5**	**31**	0.12 U
Benzo(G,H,I)Perylene	100	100	MG/KG	0.55 J	0.38	0.45	0.57 J	12	0.17 U
Benzo(K)Fluoranthene	**0.8**	3.9	MG/KG	0.36 J	0.23	0.3	0.32 J	**11**	0.12 U
Benzoic Acid	--	--	MG/KG	3.2 U	0.65 U	0.63 U	3.3 R	6.4 U	0.68 U
Benzyl Alcohol	--	--	MG/KG	1 U	0.2 U	0.19 U	1 U	2 U	0.21 U
Benzyl Butyl Phthalate	--	--	MG/KG	1 U	0.2 U	0.19 U	0.33 J	5.4	0.21 U
Biphenyl (Diphenyl)	--	--	MG/KG	2.3 U	0.46 U	0.44 U	2.3 U	2.2 J	0.48 U
Bis(2-Chloroethoxy) Methane	--	--	MG/KG	1.1 U	0.22 U	0.21 U	1.1 U	2.1 U	0.22 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	--	--	MG/KG	0.9 U	0.18 U	0.17 U	0.92 U	1.8 U	0.19 U
Bis(2-Chloroisopropyl) Ether	--	--	MG/KG	1.2 U	0.24 U	0.23 U	1.2 U	2.4 U	0.25 U
Bis(2-Ethylhexyl) Phthalate	--	--	MG/KG	1 U	0.2 U	0.08 J	1 U	2.1	0.21 U
Caprolactam	--	--	MG/KG	1 U	0.2 U	0.19 U	1 U	2 U	0.21 U
Carbazole	--	--	MG/KG	1 U	0.059 J	0.065 J	1 U	7.3	0.21 U
Chrysene	**1**	3.9	MG/KG	0.9	0.54	0.78	**1.1**	**27**	0.12 U
Dibenz(A,H)Anthracene	**0.33**	0.33	MG/KG	0.12 J	0.084 J	0.12	0.14 J	**2.9**	0.12 U
Dibenzofuran	7	59	MG/KG	1 U	0.2 U	0.023 J	1 U	**12**	0.21 U
Diethyl Phthalate	--	--	MG/KG	1 U	0.2 U	0.19 U	1 U	2 U	0.21 U
Dimethyl Phthalate	--	--	MG/KG	1 U	0.2 U	0.19 U	1 U	2 U	0.21 U
Di-N-Butyl Phthalate	--	--	MG/KG	1 U	0.2 U	0.19 U	1 U	2 U	0.21 U
Di-N-Octylphthalate	--	--	MG/KG	1 U	0.2 U	0.19 U	1 U	2 U	0.21 U
Fluoranthene	100	100	MG/KG	1	0.79	1.2	2.4	92	0.12 U
Fluorene	30	100	MG/KG	1 U	0.026 J	0.033 J	1 U	9.4	0.21 U

Table 4. Summary of Semivolatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SB-21	SB-21	SB-22	SB-22	SB-22	SB-22
			Sample Date:	04/17/2019	04/19/2019	04/16/2019	04/22/2019	04/22/2019	04/22/2019
			Sample Depth (ft bls):	2 - 4	4 - 6	2 - 4	4 - 6	6 - 8	15 - 17
			Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
Hexachlorobenzene	0.33	1.2	MG/KG	0.6 U	0.12 U	0.12 U	0.61 U	1.2 U	0.12 U
Hexachlorobutadiene	--	--	MG/KG	1 U	0.2 U	0.19 U	1 U	2 U	0.21 U
Hexachlorocyclopentadiene	--	--	MG/KG	2.8 U	0.57 U	0.55 U	2.9 U	5.6 U	0.6 U
Hexachloroethane	--	--	MG/KG	0.8 U	0.16 U	0.15 U	0.81 U	1.6 U	0.17 U
Indeno(1,2,3-C,D)Pyrene	**0.5**	0.5	MG/KG	0.5 J	0.38	0.48	**0.64 J**	**14**	0.17 U
Isophorone	--	--	MG/KG	0.9 U	0.18 U	0.17 U	0.92 U	1.8 U	0.19 U
Naphthalene	12	100	MG/KG	1 U	0.2 U	0.03 J	1 U	6.2	0.21 U
Nitrobenzene	--	--	MG/KG	0.9 U	0.18 U	0.17 U	0.92 U	1.8 U	0.19 U
N-Nitrosodimethylamine	--	--	MG/KG	2 U	0.4 U	0.39 U	2 U	3.9 U	0.42 U
N-Nitrosodi-N-Propylamine	--	--	MG/KG	1 U	0.2 U	0.19 U	1 U	2 U	0.21 U
N-Nitrosodiphenylamine	--	--	MG/KG	0.8 U	0.16 U	0.15 U	0.81 U	1.6 U	0.17 U
Pentachlorophenol	0.8	6.7	MG/KG	0.8 U	0.16 U	0.15 U	0.81 U	1.6 UJ	0.17 U
Phenanthrene	100	100	MG/KG	0.46 J	0.39	0.57	1.4	**110**	0.12 U
Phenol	0.33	100	MG/KG	1 U	0.2 U	0.19 U	1 U	2 UJ	0.21 U
Pyrene	100	100	MG/KG	1.1	0.74	1.2	2	64	0.12 U

Table 4. Summary of Semivolatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SB-23	SB-23	SB-24	SB-24	SB-24	SB-25
			Sample Date:	04/18/2019	04/22/2019	04/15/2019	04/16/2019	04/16/2019	04/18/2019
			Sample Depth (ft bls):	2 - 4	4 - 6	2 - 4	4 - 6	6 - 8	2 - 4
			Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
1,2,4,5-Tetrachlorobenzene	--	--	MG/KG	1 U	0.2 U	0.42 U	0.97 U	0.2 UJ	0.41 U
1,2,4-Trichlorobenzene	--	--	MG/KG	1 U	0.2 U	0.42 U	0.97 U	0.2 UJ	0.41 U
1,2-Dichlorobenzene	1.1	100	MG/KG	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	2.4	49	MG/KG	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	1.8	13	MG/KG	NA	NA	NA	NA	NA	NA
1,4-Dioxane (P-Dioxane)	0.1	13	MG/KG	0.00893 U	NA	0.0105 U	NA	NA	0.00956 U
2,3,4,6-Tetrachlorophenol	--	--	MG/KG	1 U	0.2 U	0.42 U	0.97 U	0.2 UJ	0.41 U
2,4,5-Trichlorophenol	--	--	MG/KG	1 U	0.2 U	0.42 U	0.97 U	0.2 UJ	0.41 U
2,4,6-Trichlorophenol	--	--	MG/KG	0.62 U	0.12 U	0.26 U	0.58 U	0.12 UJ	0.24 U
2,4-Dichlorophenol	--	--	MG/KG	0.92 U	0.18 U	0.38 U	0.87 U	0.18 UJ	0.37 U
2,4-Dimethylphenol	--	--	MG/KG	1 U	0.2 U	0.42 U	0.97 U	0.2 UJ	0.41 U
2,4-Dinitrophenol	--	--	MG/KG	4.9 U	0.97 U	2 U	4.6 U	0.96 UJ	2 R
2,4-Dinitrotoluene	--	--	MG/KG	1 U	0.2 U	0.42 U	0.97 U	0.2 UJ	0.41 U
2,6-Dinitrotoluene	--	--	MG/KG	1 U	0.2 U	0.42 U	0.97 U	0.2 UJ	0.41 U
2-Chloronaphthalene	--	--	MG/KG	1 U	0.2 U	0.42 U	0.97 U	0.2 UJ	0.41 U
2-Chlorophenol	--	--	MG/KG	1 U	0.2 U	0.42 U	0.97 U	0.2 UJ	0.41 U
2-Methylnaphthalene	--	--	MG/KG	1.2 U	0.24 U	0.51 U	0.12 J	0.076 J	0.063 J
2-Methylphenol (O-Cresol)	0.33	100	MG/KG	1 U	0.2 U	0.42 U	0.97 U	0.2 UJ	0.41 U
2-Nitroaniline	--	--	MG/KG	1 U	0.2 U	0.42 U	0.97 U	0.2 UJ	0.41 U
2-Nitrophenol	--	--	MG/KG	2.2 U	0.44 U	0.92 U	2.1 U	0.43 UJ	0.88 U
3- And 4- Methylphenol (Total)	**0.33**	100	MG/KG	1.5 U	0.29 U	0.61 U	0.15 J	0.079 J	0.59 U
3,3'-Dichlorobenzidine	--	--	MG/KG	1 U	0.2 U	0.42 U	0.97 U	0.2 UJ	0.41 U
3-Nitroaniline	--	--	MG/KG	1 U	0.2 U	0.42 U	0.97 U	0.2 UJ	0.41 U
4,6-Dinitro-2-Methylphenol	--	--	MG/KG	2.7 U	0.52 U	1.1 U	2.5 U	0.52 UJ	1.1 R
4-Bromophenyl Phenyl Ether	--	--	MG/KG	1 U	0.2 U	0.42 U	0.97 U	0.2 UJ	0.41 U
4-Chloro-3-Methylphenol	--	--	MG/KG	1 U	0.2 U	0.42 U	0.97 U	0.2 UJ	0.41 U
4-Chloroaniline	--	--	MG/KG	1 U	0.2 U	0.42 U	0.97 U	0.2 UJ	0.41 U
4-Chlorophenyl Phenyl Ether	--	--	MG/KG	1 U	0.2 U	0.42 U	0.97 U	0.2 UJ	0.41 U
4-Nitroaniline	--	--	MG/KG	1 U	0.2 U	0.42 U	0.97 U	0.2 UJ	0.41 U
4-Nitrophenol	--	--	MG/KG	1.4 U	0.28 U	0.6 U	1.4 U	0.28 UJ	0.57 U
Acenaphthene	20	100	MG/KG	0.12 J	0.026 J	0.28 J	0.36 J	0.2 J	0.079 J

Table 4. Summary of Semivolatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SB-23	SB-23	SB-24	SB-24	SB-24	SB-25
			Sample Date:	04/18/2019	04/22/2019	04/15/2019	04/16/2019	04/16/2019	04/18/2019
			Sample Depth (ft bls):	2 - 4	4 - 6	2 - 4	4 - 6	6 - 8	2 - 4
			Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
Acenaphthylene	100	100	MG/KG	0.89	0.15 J	2.7	5.9	3.4 J	1.2
Acetophenone	--	--	MG/KG	1 U	0.2 U	0.42 U	0.97 U	0.2 UJ	0.41 U
Anthracene	100	100	MG/KG	0.52 J	0.12	2	5.5	2 J	0.61
Atrazine	--	--	MG/KG	0.82 U	0.16 U	0.34 U	0.78 U	0.16 UJ	0.33 U
Azobenzene	--	--	MG/KG	1 U	0.2 U	0.42 U	0.97 U	0.2 UJ	0.41 U
Benzaldehyde	--	--	MG/KG	1.4 U	0.27 U	0.56 U	1.3 U	0.26 UJ	0.54 U
Benzidine	--	--	MG/KG	3.4 U	0.67 U	1.4 U	3.2 U	0.66 UJ	1.4 R
Benzo(A)Anthracene	**1**	1	MG/KG	**3.3**	0.67	**9.7**	**16**	**7.2 J**	**3.4**
Benzo(A)Pyrene	**1**	1	MG/KG	**3**	0.72	**9.4**	**15**	**7.4 J**	**3.3**
Benzo(B)Fluoranthene	**1**	1	MG/KG	**4.1**	1	**13**	**21**	**12 J**	**4.6**
Benzo(G,H,I)Perylene	100	100	MG/KG	1.9	0.44	5.1	9.7	5.5 J	1.9
Benzo(K)Fluoranthene	**0.8**	3.9	MG/KG	**1.4**	0.32	**3.5**	**7.6**	**3.2 J**	**1.5 J**
Benzoic Acid	--	--	MG/KG	3.3 U	0.65 U	1.4 U	3.1 U	0.65 UJ	1.3 R
Benzyl Alcohol	--	--	MG/KG	1 U	0.2 U	0.42 U	0.97 U	0.2 UJ	0.41 U
Benzyl Butyl Phthalate	--	--	MG/KG	1 U	0.73	0.42 U	0.97 U	0.7 J	0.41 U
Biphenyl (Diphenyl)	--	--	MG/KG	2.3 U	0.46 U	0.97 U	2.2 U	0.46 UJ	0.93 U
Bis(2-Chloroethoxy) Methane	--	--	MG/KG	1.1 U	0.22 U	0.46 U	1 U	0.22 UJ	0.44 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	--	--	MG/KG	0.92 U	0.18 U	0.38 U	0.87 U	0.18 UJ	0.37 U
Bis(2-Chloroisopropyl) Ether	--	--	MG/KG	1.2 U	0.24 U	0.51 U	1.2 U	0.24 UJ	0.49 U
Bis(2-Ethylhexyl) Phthalate	--	--	MG/KG	2.4	30	0.22 J	0.97 U	1.7 J	3.2 J
Caprolactam	--	--	MG/KG	1 U	0.2 U	0.42 U	0.97 U	0.2 UJ	0.41 U
Carbazole	--	--	MG/KG	0.29 J	0.08 J	0.36 J	1.2	0.54 J	0.29 J
Chrysene	**1**	3.9	MG/KG	**3.2**	0.72	**9.2**	**17**	**7.1 J**	**3.5**
Dibenz(A,H)Anthracene	**0.33**	0.33	MG/KG	**0.43 J**	0.1 J	**1.3**	**2.4**	**1.3 J**	**0.42**
Dibenzofuran	7	59	MG/KG	0.11 J	0.028 J	0.21 J	0.4 J	0.14 J	0.17 J
Diethyl Phthalate	--	--	MG/KG	1 U	0.2 U	0.42 U	0.97 U	0.2 UJ	0.41 U
Dimethyl Phthalate	--	--	MG/KG	1 U	0.2 U	0.42 U	0.97 U	0.2 UJ	0.41 U
Di-N-Butyl Phthalate	--	--	MG/KG	1 U	0.2 U	0.42 U	0.97 U	0.2 UJ	0.13 J
Di-N-Octylphthalate	--	--	MG/KG	1 U	0.2 U	0.42 U	0.97 U	0.2 UJ	0.41 U
Fluoranthene	100	100	MG/KG	4.7	1.2	16	30	12 J	5.7
Fluorene	30	100	MG/KG	0.22 J	0.038 J	0.56	0.98	0.35 J	0.2 J

Table 4. Summary of Semivolatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SB-23	SB-23	SB-24	SB-24	SB-24	SB-25
			Sample Date:	04/18/2019	04/22/2019	04/15/2019	04/16/2019	04/16/2019	04/18/2019
			Sample Depth (ft bls):	2 - 4	4 - 6	2 - 4	4 - 6	6 - 8	2 - 4
			Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
Hexachlorobenzene	0.33	1.2	MG/KG	0.62 U	0.12 U	0.26 U	0.58 U	0.12 UJ	0.24 U
Hexachlorobutadiene	--	--	MG/KG	1 U	0.2 U	0.42 U	0.97 U	0.2 UJ	0.41 U
Hexachlorocyclopentadiene	--	--	MG/KG	2.9 U	0.58 U	1.2 U	2.8 U	0.57 UJ	1.2 U
Hexachloroethane	--	--	MG/KG	0.82 U	0.16 U	0.34 U	0.78 U	0.16 UJ	0.33 U
Indeno(1,2,3-C,D)Pyrene	**0.5**	0.5	MG/KG	**1.9**	0.48	**5.3**	**11**	**5.7 J**	**2**
Isophorone	--	--	MG/KG	0.92 U	0.18 U	0.38 U	0.87 U	0.18 UJ	0.37 U
Naphthalene	12	100	MG/KG	1 U	0.029 J	0.065 J	0.3 J	0.22 J	0.16 J
Nitrobenzene	--	--	MG/KG	0.92 U	0.18 U	0.38 U	0.87 U	0.18 UJ	0.37 U
N-Nitrosodimethylamine	--	--	MG/KG	2 U	0.4 U	0.85 U	1.9 U	0.4 UJ	0.82 U
N-Nitrosodi-N-Propylamine	--	--	MG/KG	1 U	0.2 U	0.42 U	0.97 U	0.2 UJ	0.41 U
N-Nitrosodiphenylamine	--	--	MG/KG	0.82 U	0.16 U	0.34 U	0.78 U	0.16 UJ	0.33 U
Pentachlorophenol	0.8	6.7	MG/KG	0.82 U	0.16 U	0.34 U	0.78 U	0.16 UJ	0.33 U
Phenanthrene	100	100	MG/KG	2.4	0.57	6.6	13	4.3 J	3.4 J
Phenol	0.33	100	MG/KG	1 U	0.2 U	0.42 U	0.97 U	0.2 UJ	0.41 U
Pyrene	100	100	MG/KG	4.5	1	16	28	11 J	5

Table 4. Summary of Semivolatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SB-25	SB-25	SB-25	SB-34	SB-35	SDS-1
			Sample Date:	04/18/2019	04/23/2019	04/23/2019	04/17/2019	04/16/2019	01/07/2020
			Sample Depth (ft bls):	2 - 4	4 - 6	6 - 8	2 - 4	2 - 4	6 - 6
			Normal Sample or Field Duplicate:	FD	N	N	N	N	FD
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
1,2,4,5-Tetrachlorobenzene	--	--	MG/KG	1 U	0.94 U	0.18 U	0.18 U	0.2 U	0.19 U
1,2,4-Trichlorobenzene	--	--	MG/KG	1 U	0.94 U	0.18 U	0.18 U	0.2 U	0.19 U
1,2-Dichlorobenzene	1.1	100	MG/KG	NA	NA	NA	NA	NA	0.19 U
1,3-Dichlorobenzene	2.4	49	MG/KG	NA	NA	NA	NA	NA	0.19 U
1,4-Dichlorobenzene	1.8	13	MG/KG	NA	NA	NA	NA	NA	0.19 U
1,4-Dioxane (P-Dioxane)	0.1	13	MG/KG	0.00851 U	NA	NA	0.00798 U	0.00846 U	0.028 U
2,3,4,6-Tetrachlorophenol	--	--	MG/KG	1 U	0.94 U	0.18 U	0.18 U	0.2 U	NA
2,4,5-Trichlorophenol	--	--	MG/KG	1 U	0.94 U	0.18 U	0.18 U	0.2 U	0.19 U
2,4,6-Trichlorophenol	--	--	MG/KG	0.61 U	0.57 U	0.11 U	0.11 U	0.12 U	0.11 U
2,4-Dichlorophenol	--	--	MG/KG	0.91 U	0.85 U	0.16 U	0.16 U	0.18 U	0.17 U
2,4-Dimethylphenol	--	--	MG/KG	1 U	0.94 U	0.18 U	0.18 U	0.2 U	0.19 U
2,4-Dinitrophenol	--	--	MG/KG	4.9 U	4.5 U	0.86 U	0.88 U	0.94 U	0.91 U
2,4-Dinitrotoluene	--	--	MG/KG	1 U	0.94 U	0.18 U	0.18 U	0.2 U	0.19 U
2,6-Dinitrotoluene	--	--	MG/KG	1 U	0.94 U	0.18 U	0.18 U	0.2 U	0.19 U
2-Chloronaphthalene	--	--	MG/KG	1 U	0.94 U	0.18 U	0.18 U	0.2 U	0.19 U
2-Chlorophenol	--	--	MG/KG	1 U	0.94 U	0.18 U	0.18 U	0.2 U	0.19 U
2-Methylnaphthalene	--	--	MG/KG	1.2 U	0.13 J	0.029 J	0.22 U	0.026 J	0.026 J
2-Methylphenol (O-Cresol)	0.33	100	MG/KG	1 U	0.94 U	0.18 U	0.18 U	0.2 U	0.19 U
2-Nitroaniline	--	--	MG/KG	1 U	0.94 U	0.18 U	0.18 U	0.2 U	0.19 U
2-Nitrophenol	--	--	MG/KG	2.2 U	2 U	0.39 U	0.4 U	0.42 U	0.41 U
3- And 4- Methylphenol (Total)	**0.33**	100	MG/KG	1.4 U	1.4 U	0.26 U	0.26 U	0.28 U	0.27 U
3,3'-Dichlorobenzidine	--	--	MG/KG	1 U	0.94 U	0.18 U	0.18 U	0.2 U	0.19 U
3-Nitroaniline	--	--	MG/KG	1 U	0.94 U	0.18 U	0.18 U	0.2 U	0.19 U
4,6-Dinitro-2-Methylphenol	--	--	MG/KG	2.6 U	2.4 U	0.46 U	0.48 U	0.51 U	0.49 U
4-Bromophenyl Phenyl Ether	--	--	MG/KG	1 U	0.94 U	0.18 U	0.18 U	0.2 U	0.19 U
4-Chloro-3-Methylphenol	--	--	MG/KG	1 U	0.94 U	0.18 U	0.18 U	0.2 U	0.19 U
4-Chloroaniline	--	--	MG/KG	1 U	0.94 U	0.18 U	0.18 U	0.2 U	0.19 U
4-Chlorophenyl Phenyl Ether	--	--	MG/KG	1 U	0.94 U	0.18 U	0.18 U	0.2 U	0.19 U
4-Nitroaniline	--	--	MG/KG	1 U	0.94 U	0.18 U	0.18 U	0.2 U	0.19 U
4-Nitrophenol	--	--	MG/KG	1.4 U	1.3 U	0.25 U	0.26 U	0.27 U	0.26 U
Acenaphthene	20	100	MG/KG	0.81 U	0.37 J	0.036 J	0.15 U	0.092 J	0.15 U

Table 4. Summary of Semivolatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SB-25	SB-25	SB-25	SB-34	SB-35	SDS-1
			Sample Date:	04/18/2019	04/23/2019	04/23/2019	04/17/2019	04/16/2019	01/07/2020
			Sample Depth (ft bls):	2 - 4	4 - 6	6 - 8	2 - 4	2 - 4	6 - 6
			Normal Sample or Field Duplicate:	FD	N	N	N	N	FD
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
Acenaphthylene	100	100	MG/KG	0.8 J	3	0.16	0.061 J	0.16	0.21
Acetophenone	--	--	MG/KG	1 U	0.94 U	0.18 U	0.18 U	0.2 U	0.19 U
Anthracene	100	100	MG/KG	0.54 J	4.2	0.18	0.048 J	0.33	0.12
Atrazine	--	--	MG/KG	0.81 U	0.76 U	0.14 U	0.15 U	0.16 U	NA
Azobenzene	--	--	MG/KG	1 U	0.94 U	0.18 U	0.18 U	0.2 U	NA
Benzaldehyde	--	--	MG/KG	1.3 U	1.2 U	0.24 U	0.24 U	0.26 U	NA
Benzidine	--	--	MG/KG	3.3 U	3.1 U	0.59 R	0.6 U	0.64 U	NA
Benzo(A)Anthracene	**1**	1	MG/KG	**3**	**18**	0.42	0.26	0.71	0.51
Benzo(A)Pyrene	**1**	1	MG/KG	**2.7**	**15**	0.38	0.23	0.58	0.63
Benzo(B)Fluoranthene	**1**	1	MG/KG	**4**	**21**	0.54	0.31	0.73	0.83
Benzo(G,H,I)Perylene	100	100	MG/KG	1.9	7.2	0.25	0.16	0.39	0.52
Benzo(K)Fluoranthene	**0.8**	3.9	MG/KG	**0.97 J**	**6.1**	0.15	0.11	0.29	0.26
Benzoic Acid	--	--	MG/KG	3.3 U	3.1 U	0.58 U	0.59 U	0.63 U	0.61 R
Benzyl Alcohol	--	--	MG/KG	1 U	0.94 U	0.18 U	0.18 U	0.2 U	0.19 U
Benzyl Butyl Phthalate	--	--	MG/KG	0.41 J	0.94 U	2.2	0.18 U	0.091 J	0.19 U
Biphenyl (Diphenyl)	--	--	MG/KG	2.3 U	2.2 U	0.41 U	0.42 U	0.44 U	0.43 U
Bis(2-Chloroethoxy) Methane	--	--	MG/KG	1.1 U	1 U	0.19 U	0.2 U	0.21 U	0.2 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	--	--	MG/KG	0.91 U	0.85 U	0.16 U	0.16 U	0.18 U	0.17 U
Bis(2-Chloroisopropyl) Ether	--	--	MG/KG	1.2 U	1.1 U	0.21 U	0.22 U	0.23 U	0.23 U
Bis(2-Ethylhexyl) Phthalate	--	--	MG/KG	1.8	0.44 J	400	0.15 J	0.26	0.37
Caprolactam	--	--	MG/KG	1 U	0.94 U	0.18 U	0.18 U	0.2 U	NA
Carbazole	--	--	MG/KG	0.24 J	2	0.08 J	0.018 J	0.15 J	0.064 J
Chrysene	**1**	3.9	MG/KG	**2.8**	**16**	0.36	0.25	0.59	0.54
Dibenz(A,H)Anthracene	**0.33**	0.33	MG/KG	**0.4 J**	**2**	0.058 J	0.036 J	0.09 J	0.11
Dibenzofuran	7	59	MG/KG	1 U	1	0.057 J	0.18 U	0.053 J	0.026 J
Diethyl Phthalate	--	--	MG/KG	1 U	0.94 U	0.18 U	0.18 U	0.2 U	0.19 U
Dimethyl Phthalate	--	--	MG/KG	1 U	0.94 U	0.18 U	0.18 U	0.2 U	0.19 U
Di-N-Butyl Phthalate	--	--	MG/KG	1 U	0.94 U	0.36	0.18 U	0.2 U	0.19 U
Di-N-Octylphthalate	--	--	MG/KG	1 U	0.94 U	0.18 U	0.18 U	0.2 U	0.31
Fluoranthene	100	100	MG/KG	4.3	33	1	0.36	1.3	1
Fluorene	30	100	MG/KG	0.14 J	1.4	0.084 J	0.18 U	0.12 J	0.037 J

Table 4. Summary of Semivolatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SB-25	SB-25	SB-25	SB-34	SB-35	SDS-1
			Sample Date:	04/18/2019	04/23/2019	04/23/2019	04/17/2019	04/16/2019	01/07/2020
			Sample Depth (ft bls):	2 - 4	4 - 6	6 - 8	2 - 4	2 - 4	6 - 6
			Normal Sample or Field Duplicate:	FD	N	N	N	N	FD
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
Hexachlorobenzene	0.33	1.2	MG/KG	0.61 U	0.57 U	0.11 U	0.11 U	0.12 U	0.11 U
Hexachlorobutadiene	--	--	MG/KG	1 U	0.94 U	0.18 U	0.18 U	0.2 U	0.19 U
Hexachlorocyclopentadiene	--	--	MG/KG	2.9 U	2.7 U	0.51 U	0.52 U	0.56 U	0.54 U
Hexachloroethane	--	--	MG/KG	0.81 U	0.76 U	0.14 U	0.15 U	0.16 U	0.15 U
Indeno(1,2,3-C,D)Pyrene	**0.5**	0.5	MG/KG	**1.9**	**8.6**	0.27	0.16	0.42	**0.53**
Isophorone	--	--	MG/KG	0.91 U	0.85 U	0.16 U	0.16 U	0.18 U	0.17 U
Naphthalene	12	100	MG/KG	1 U	0.19 J	0.069 J	0.18 U	0.041 J	0.042 J
Nitrobenzene	--	--	MG/KG	0.91 U	0.85 U	0.16 U	0.16 U	0.18 U	0.17 U
N-Nitrosodimethylamine	--	--	MG/KG	2 U	1.9 U	0.36 U	0.37 U	0.39 U	NA
N-Nitrosodi-N-Propylamine	--	--	MG/KG	1 U	0.94 U	0.18 U	0.18 U	0.2 U	0.19 U
N-Nitrosodiphenylamine	--	--	MG/KG	0.81 U	0.76 U	0.14 U	0.15 U	0.16 U	0.15 U
Pentachlorophenol	0.8	6.7	MG/KG	0.81 U	0.76 U	0.14 U	0.15 U	0.16 U	0.15 U
Phenanthrene	100	100	MG/KG	2 J	24	0.76	0.14	0.92	0.55
Phenol	0.33	100	MG/KG	1 U	0.94 U	0.18 U	0.18 U	0.2 U	0.19 U
Pyrene	100	100	MG/KG	3.9	26	0.82	0.35	1	0.85

Table 4. Summary of Semivolatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SDS-1	SDS-10	SDS-11	SDS-12	SDS-2	SDS-21E
			Sample Date:	01/07/2020	01/06/2020	01/06/2020	01/07/2020	01/07/2020	01/06/2020
			Sample Depth (ft bls):	6 - 6	7.5 - 7.5	7.5 - 7.5	7.5 - 7.5	6 - 6	7 - 7
			Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
1,2,4,5-Tetrachlorobenzene	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.37 U	0.18 U	0.19 U
1,2,4-Trichlorobenzene	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.37 U	0.18 U	0.19 U
1,2-Dichlorobenzene	1.1	100	MG/KG	0.19 U	0.2 U	0.2 U	0.37 U	0.18 U	0.19 U
1,3-Dichlorobenzene	2.4	49	MG/KG	0.19 U	0.2 U	0.2 U	0.37 U	0.18 U	0.19 U
1,4-Dichlorobenzene	1.8	13	MG/KG	0.19 U	0.2 U	0.2 U	0.37 U	0.18 U	0.19 U
1,4-Dioxane (P-Dioxane)	0.1	13	MG/KG	0.028 U	0.029 U	0.03 U	0.056 U	0.027 U	0.029 U
2,3,4,6-Tetrachlorophenol	--	--	MG/KG	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.37 U	0.18 U	0.19 U
2,4,6-Trichlorophenol	--	--	MG/KG	0.11 U	0.12 U	0.12 U	0.22 U	0.11 U	0.12 U
2,4-Dichlorophenol	--	--	MG/KG	0.17 U	0.18 U	0.18 U	0.34 U	0.16 U	0.17 U
2,4-Dimethylphenol	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.37 U	0.18 U	0.19 U
2,4-Dinitrophenol	--	--	MG/KG	0.9 U	0.94 U	0.96 U	1.8 U	0.87 U	0.92 U
2,4-Dinitrotoluene	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.37 U	0.18 U	0.19 U
2,6-Dinitrotoluene	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.37 U	0.18 U	0.19 U
2-Chloronaphthalene	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.37 U	0.18 U	0.19 U
2-Chlorophenol	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.37 U	0.18 U	0.19 U
2-Methylnaphthalene	--	--	MG/KG	0.029 J	0.12 J	0.064 J	0.45 U	0.22 U	0.066 J
2-Methylphenol (O-Cresol)	0.33	100	MG/KG	0.19 U	0.2 U	0.2 U	0.37 U	0.18 U	0.19 U
2-Nitroaniline	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.37 U	0.18 U	0.19 U
2-Nitrophenol	--	--	MG/KG	0.41 U	0.42 U	0.43 U	0.81 U	0.39 U	0.42 U
3- And 4- Methylphenol (Total)	**0.33**	100	MG/KG	0.27 U	0.076 J	0.29 U	0.54 U	0.26 U	0.076 J
3,3'-Dichlorobenzidine	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.37 U	0.18 U	0.19 U
3-Nitroaniline	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.37 U	0.18 U	0.19 U
4,6-Dinitro-2-Methylphenol	--	--	MG/KG	0.49 U	0.51 U	0.52 U	0.97 U	0.47 U	0.5 U
4-Bromophenyl Phenyl Ether	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.37 U	0.18 U	0.19 U
4-Chloro-3-Methylphenol	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.37 U	0.18 U	0.19 U
4-Chloroaniline	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.37 U	0.18 U	0.19 U
4-Chlorophenyl Phenyl Ether	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.37 U	0.18 U	0.19 U
4-Nitroaniline	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.37 U	0.18 U	0.15 J
4-Nitrophenol	--	--	MG/KG	0.26 U	0.27 U	0.28 U	0.52 U	0.25 U	0.27 U
Acenaphthene	20	100	MG/KG	0.15 U	0.29	0.029 J	0.05 J	0.029 J	0.075 J

Table 4. Summary of Semivolatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SDS-1	SDS-10	SDS-11	SDS-12	SDS-2	SDS-21E
			Sample Date:	01/07/2020	01/06/2020	01/06/2020	01/07/2020	01/07/2020	01/06/2020
			Sample Depth (ft bls):	6 - 6	7.5 - 7.5	7.5 - 7.5	7.5 - 7.5	6 - 6	7 - 7
			Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
Acenaphthylene	100	100	MG/KG	0.2	1.5	0.71	0.49	0.31	2.2
Acetophenone	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.37 U	0.18 U	0.19 U
Anthracene	100	100	MG/KG	0.11	1.3	0.28	0.39	0.21	1.2
Atrazine	--	--	MG/KG	NA	NA	NA	NA	NA	NA
Azobenzene	--	--	MG/KG	NA	NA	NA	NA	NA	NA
Benzaldehyde	--	--	MG/KG	NA	NA	NA	NA	NA	NA
Benzidine	--	--	MG/KG	NA	NA	NA	NA	NA	NA
Benzo(A)Anthracene	**1**	1	MG/KG	0.41	**3.6**	**1.2**	**1.2**	0.75	**3.7**
Benzo(A)Pyrene	**1**	1	MG/KG	0.51	**3.9**	**1.6**	**1.3**	0.92	**4.4**
Benzo(B)Fluoranthene	**1**	1	MG/KG	0.7	**5**	**2.4**	**1.7**	**1.2**	**7**
Benzo(G,H,I)Perylene	100	100	MG/KG	0.44	3.2	1.5	1.1	0.67	4.3
Benzo(K)Fluoranthene	**0.8**	3.9	MG/KG	0.23	**1.5**	0.64	0.58	0.43	**1.7**
Benzoic Acid	--	--	MG/KG	0.61 R	0.64 R	0.65 R	1.2 R	0.59 R	0.62 R
Benzyl Alcohol	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.37 U	0.18 U	0.19 U
Benzyl Butyl Phthalate	--	--	MG/KG	0.19 U	0.2 U	0.068 J	0.23 J	0.18 U	0.19 U
Biphenyl (Diphenyl)	--	--	MG/KG	0.43 U	0.45 U	0.46 U	0.85 U	0.42 U	0.44 U
Bis(2-Chloroethoxy) Methane	--	--	MG/KG	0.2 U	0.21 U	0.22 U	0.4 U	0.2 U	0.21 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	--	--	MG/KG	0.17 U	0.18 U	0.18 U	0.34 U	0.16 U	0.17 U
Bis(2-Chloroisopropyl) Ether	--	--	MG/KG	0.22 U	0.24 U	0.24 U	0.45 U	0.22 U	0.23 U
Bis(2-Ethylhexyl) Phthalate	--	--	MG/KG	0.078 J	0.13 J	0.31	0.29 J	2.4	0.22
Caprolactam	--	--	MG/KG	NA	NA	NA	NA	NA	NA
Carbazole	--	--	MG/KG	0.071 J	0.54	0.11 J	0.19 J	0.11 J	0.66
Chrysene	**1**	3.9	MG/KG	0.42	**3.2**	**1.1**	**1.2**	0.74	**3.5**
Dibenz(A,H)Anthracene	**0.33**	0.33	MG/KG	0.099 J	**0.59**	0.26	0.25	0.16	**0.68**
Dibenzofuran	7	59	MG/KG	0.024 J	0.23	0.053 J	0.073 J	0.043 J	0.18 J
Diethyl Phthalate	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.37 U	0.18 U	0.19 U
Dimethyl Phthalate	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.37 U	0.18 U	0.19 U
Di-N-Butyl Phthalate	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.37 U	0.18 U	0.19 U
Di-N-Octylphthalate	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.37 U	0.18 U	0.19 U
Fluoranthene	100	100	MG/KG	0.72	6.4	1.5	2.3	1.4	6.2
Fluorene	30	100	MG/KG	0.028 J	0.45	0.056 J	0.1 J	0.062 J	0.25

Table 4. Summary of Semivolatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SDS-1	SDS-10	SDS-11	SDS-12	SDS-2	SDS-21E
			Sample Date:	01/07/2020	01/06/2020	01/06/2020	01/07/2020	01/07/2020	01/06/2020
			Sample Depth (ft bls):	6 - 6	7.5 - 7.5	7.5 - 7.5	7.5 - 7.5	6 - 6	7 - 7
			Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
Hexachlorobenzene	0.33	1.2	MG/KG	0.11 U	0.12 U	0.12 U	0.22 U	0.11 U	0.12 U
Hexachlorobutadiene	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.37 U	0.18 U	0.19 U
Hexachlorocyclopentadiene	--	--	MG/KG	0.54 U	0.56 U	0.57 U	1.1 U	0.52 U	0.55 U
Hexachloroethane	--	--	MG/KG	0.15 U	0.16 U	0.16 U	0.3 U	0.14 U	0.15 U
Indeno(1,2,3-C,D)Pyrene	**0.5**	0.5	MG/KG	0.44	**3.5**	**1.5**	**1.2**	**0.71**	**4.5**
Isophorone	--	--	MG/KG	0.17 U	0.18 U	0.18 U	0.34 U	0.16 U	0.17 U
Naphthalene	12	100	MG/KG	0.049 J	0.33	0.15 J	0.11 J	0.057 J	0.24
Nitrobenzene	--	--	MG/KG	0.17 U	0.18 U	0.18 U	0.34 U	0.16 U	0.17 U
N-Nitrosodimethylamine	--	--	MG/KG	NA	NA	NA	NA	NA	NA
N-Nitrosodi-N-Propylamine	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.37 U	0.18 U	0.19 U
N-Nitrosodiphenylamine	--	--	MG/KG	0.15 U	0.16 U	0.16 U	0.3 U	0.14 U	0.15 U
Pentachlorophenol	0.8	6.7	MG/KG	0.15 U	0.16 U	0.16 U	0.3 U	0.14 U	0.15 U
Phenanthrene	100	100	MG/KG	0.36	4.7	0.61	1.3	0.71	4.3
Phenol	0.33	100	MG/KG	0.19 U	0.047 J	0.032 J	0.37 U	0.18 U	0.063 J
Pyrene	100	100	MG/KG	0.63	5.8	1.5	1.9	1.2	5.5

Table 4. Summary of Semivolatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SDS-21S	SDS-21W	SDS-25_26_27E	SDS-25_26_27N	SDS-25_26_27S
			Sample Date:	01/06/2020	01/06/2020	01/15/2020	01/15/2020	01/15/2020
			Sample Depth (ft bls):	7 - 7	7 - 7	9 - 9	9 - 9	9 - 9
			Normal Sample or Field Duplicate:	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units					
1,2,4,5-Tetrachlorobenzene	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2,4-Trichlorobenzene	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichlorobenzene	1.1	100	MG/KG	0.19 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3-Dichlorobenzene	2.4	49	MG/KG	0.19 U	0.2 U	0.2 U	0.2 U	0.2 U
1,4-Dichlorobenzene	1.8	13	MG/KG	0.19 U	0.2 U	0.2 U	0.2 U	0.2 U
1,4-Dioxane (P-Dioxane)	0.1	13	MG/KG	0.028 U	0.029 U	0.03 U	0.03 U	0.03 U
2,3,4,6-Tetrachlorophenol	--	--	MG/KG	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.2 U	0.2 U
2,4,6-Trichlorophenol	--	--	MG/KG	0.11 U	0.12 U	0.12 U	0.12 U	0.12 U
2,4-Dichlorophenol	--	--	MG/KG	0.17 U	0.18 U	0.18 U	0.18 U	0.18 U
2,4-Dimethylphenol	--	--	MG/KG	0.19 U	0.2 U	0.094 J	0.2 U	0.2 U
2,4-Dinitrophenol	--	--	MG/KG	0.91 U	0.94 U	0.96 U	0.97 U	0.97 U
2,4-Dinitrotoluene	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.2 U	0.2 U
2,6-Dinitrotoluene	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.2 U	0.2 U
2-Chloronaphthalene	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.2 U	0.2 U
2-Chlorophenol	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.2 U	0.2 U
2-Methylnaphthalene	--	--	MG/KG	0.046 J	0.048 J	0.35	0.24	0.38
2-Methylphenol (O-Cresol)	0.33	100	MG/KG	0.19 U	0.2 U	0.068 J	0.046 J	0.037 J
2-Nitroaniline	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.2 U	0.2 U
2-Nitrophenol	--	--	MG/KG	0.41 U	0.42 U	0.43 U	0.44 U	0.44 U
3- And 4- Methylphenol (Total)	**0.33**	100	MG/KG	0.05 J	0.033 J	0.24 J	0.14 J	0.11 J
3,3'-Dichlorobenzidine	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.2 U	0.2 U
3-Nitroaniline	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.2 U	0.2 U
4,6-Dinitro-2-Methylphenol	--	--	MG/KG	0.49 U	0.51 U	0.52 U	0.52 U	0.52 U
4-Bromophenyl Phenyl Ether	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.2 U	0.2 U
4-Chloro-3-Methylphenol	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.2 U	0.2 U
4-Chloroaniline	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.2 U	0.2 U
4-Chlorophenyl Phenyl Ether	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.2 U	0.2 U
4-Nitroaniline	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.2 U	0.2 U
4-Nitrophenol	--	--	MG/KG	0.26 U	0.27 U	0.28 U	0.28 U	0.28 U
Acenaphthene	20	100	MG/KG	0.052 J	0.037 J	0.27	0.35	0.44

Table 4. Summary of Semivolatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SDS-21S	SDS-21W	SDS-25_26_27E	SDS-25_26_27N	SDS-25_26_27S
			Sample Date:	01/06/2020	01/06/2020	01/15/2020	01/15/2020	01/15/2020
			Sample Depth (ft bls):	7 - 7	7 - 7	9 - 9	9 - 9	9 - 9
			Normal Sample or Field Duplicate:	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units					
Acenaphthylene	100	100	MG/KG	0.91	0.62	3.3	2.2	1.7
Acetophenone	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.2 U	0.03 J
Anthracene	100	100	MG/KG	0.68	0.41	2.7	2.2	2.1
Atrazine	--	--	MG/KG	NA	NA	NA	NA	NA
Azobenzene	--	--	MG/KG	NA	NA	NA	NA	NA
Benzaldehyde	--	--	MG/KG	NA	NA	NA	NA	NA
Benzidine	--	--	MG/KG	NA	NA	NA	NA	NA
Benzo(A)Anthracene	**1**	1	MG/KG	**2**	**1.7**	**6.4**	**5.6**	**5.2**
Benzo(A)Pyrene	**1**	1	MG/KG	**2.2**	**1.8**	**6.6**	**5.4**	**5.3**
Benzo(B)Fluoranthene	**1**	1	MG/KG	**3.3**	**2.7**	**5.6**	**6.6**	**5.8**
Benzo(G,H,I)Perylene	100	100	MG/KG	1.8	1.6	4.3	3.7	3.4
Benzo(K)Fluoranthene	**0.8**	3.9	MG/KG	**0.84**	0.7	**2.6**	**2.4**	**1.9**
Benzoic Acid	--	--	MG/KG	0.62 R	0.63 R	0.65 U	0.66 U	0.65 U
Benzyl Alcohol	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.2 U	0.2 U
Benzyl Butyl Phthalate	--	--	MG/KG	0.19 U	0.2 U	1.5	0.07 J	0.23
Biphenyl (Diphenyl)	--	--	MG/KG	0.43 U	0.45 U	0.094 J	0.069 J	0.098 J
Bis(2-Chloroethoxy) Methane	--	--	MG/KG	0.2 U	0.21 U	0.22 U	0.22 U	0.22 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	--	--	MG/KG	0.17 U	0.18 U	0.18 U	0.18 U	0.18 U
Bis(2-Chloroisopropyl) Ether	--	--	MG/KG	0.23 U	0.23 U	0.24 U	0.24 U	0.24 U
Bis(2-Ethylhexyl) Phthalate	--	--	MG/KG	0.098 J	0.34	0.5	0.33	2.1
Caprolactam	--	--	MG/KG	NA	NA	NA	NA	NA
Carbazole	--	--	MG/KG	0.3	0.22	1.6	1	0.69
Chrysene	**1**	3.9	MG/KG	**1.8**	**1.5**	**6.6**	**5.6**	**5.1**
Dibenz(A,H)Anthracene	**0.33**	0.33	MG/KG	**0.34**	0.29	**1.2**	**0.97**	**0.87**
Dibenzofuran	7	59	MG/KG	0.095 J	0.059 J	0.52	0.48	0.4
Diethyl Phthalate	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.2 U	0.2 U
Dimethyl Phthalate	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.2 U	0.2 U
Di-N-Butyl Phthalate	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.2 U	0.2 U
Di-N-Octylphthalate	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.2 U	0.15 J
Fluoranthene	100	100	MG/KG	3.3	2.6	8.5	9.4	7.4
Fluorene	30	100	MG/KG	0.18 J	0.088 J	0.79	0.7	0.83

Table 4. Summary of Semivolatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SDS-21S	SDS-21W	SDS-25_26_27E	SDS-25_26_27N	SDS-25_26_27S
			Sample Date:	01/06/2020	01/06/2020	01/15/2020	01/15/2020	01/15/2020
			Sample Depth (ft bls):	7 - 7	7 - 7	9 - 9	9 - 9	9 - 9
			Normal Sample or Field Duplicate:	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units					
Hexachlorobenzene	0.33	1.2	MG/KG	0.11 U	0.12 U	0.12 U	0.12 U	0.12 U
Hexachlorobutadiene	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.2 U	0.2 U
Hexachlorocyclopentadiene	--	--	MG/KG	0.54 U	0.56 U	0.57 U	0.58 U	0.58 U
Hexachloroethane	--	--	MG/KG	0.15 U	0.16 U	0.16 U	0.16 U	0.16 U
Indeno(1,2,3-C,D)Pyrene	**0.5**	0.5	MG/KG	**1.9**	**1.6**	**4.4**	**3.8**	**3.4**
Isophorone	--	--	MG/KG	0.17 U	0.18 U	0.18 U	0.18 U	0.18 U
Naphthalene	12	100	MG/KG	0.14 J	0.16 J	0.66	0.54	1.1
Nitrobenzene	--	--	MG/KG	0.17 U	0.18 U	0.18 U	0.18 U	0.18 U
N-Nitrosodimethylamine	--	--	MG/KG	NA	NA	NA	NA	NA
N-Nitrosodi-N-Propylamine	--	--	MG/KG	0.19 U	0.2 U	0.2 U	0.2 U	0.2 U
N-Nitrosodiphenylamine	--	--	MG/KG	0.15 U	0.16 U	0.16 U	0.16 U	0.16 U
Pentachlorophenol	0.8	6.7	MG/KG	0.15 U	0.16 U	0.16 U	0.16 U	0.16 U
Phenanthrene	100	100	MG/KG	2.2	1.5	6.5	7.2	6.6
Phenol	0.33	100	MG/KG	0.19 U	0.2 U	0.16 J	0.1 J	0.077 J
Pyrene	100	100	MG/KG	3.2	2.6	7.5	8.3	7.9

Table 4. Summary of Semivolatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SDS-25_26_27W	SDS-28_29_30E	SDS-28_29_30N	SDS-28_29_30S
			Sample Date:	01/15/2020	01/06/2020	01/06/2020	01/06/2020
			Sample Depth (ft bls):	9 - 9	9 - 9	9 - 9	9 - 9
			Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units				
1,2,4,5-Tetrachlorobenzene	--	--	MG/KG	2 U	0.2 U	0.2 U	0.19 U
1,2,4-Trichlorobenzene	--	--	MG/KG	2 U	0.2 U	0.2 U	0.19 U
1,2-Dichlorobenzene	1.1	100	MG/KG	2 U	0.2 U	0.2 U	0.19 U
1,3-Dichlorobenzene	2.4	49	MG/KG	2 U	0.2 U	0.2 U	0.19 U
1,4-Dichlorobenzene	1.8	13	MG/KG	2 U	0.2 U	0.2 U	0.19 U
1,4-Dioxane (P-Dioxane)	0.1	13	MG/KG	0.3 U	0.029 U	0.03 U	0.029 U
2,3,4,6-Tetrachlorophenol	--	--	MG/KG	NA	NA	NA	NA
2,4,5-Trichlorophenol	--	--	MG/KG	2 U	0.2 U	0.2 U	0.19 U
2,4,6-Trichlorophenol	--	--	MG/KG	1.2 U	0.12 U	0.12 U	0.12 U
2,4-Dichlorophenol	--	--	MG/KG	1.8 U	0.18 U	0.18 U	0.18 U
2,4-Dimethylphenol	--	--	MG/KG	2 U	0.2 U	0.2 U	0.19 U
2,4-Dinitrophenol	--	--	MG/KG	9.7 U	0.94 U	0.94 U	0.94 U
2,4-Dinitrotoluene	--	--	MG/KG	2 U	0.2 U	0.2 U	0.19 U
2,6-Dinitrotoluene	--	--	MG/KG	2 U	0.2 U	0.2 U	0.19 U
2-Chloronaphthalene	--	--	MG/KG	2 U	0.2 U	0.2 U	0.19 U
2-Chlorophenol	--	--	MG/KG	2 U	0.2 U	0.2 U	0.19 U
2-Methylnaphthalene	--	--	MG/KG	2.4 U	0.1 J	0.052 J	0.14 J
2-Methylphenol (O-Cresol)	0.33	100	MG/KG	2 U	0.2 U	0.2 U	0.19 U
2-Nitroaniline	--	--	MG/KG	2 U	0.2 U	0.2 U	0.19 U
2-Nitrophenol	--	--	MG/KG	4.4 U	0.42 U	0.42 U	0.42 U
3- And 4- Methylphenol (Total)	**0.33**	100	MG/KG	2.9 U	0.054 J	0.28 U	0.049 J
3,3'-Dichlorobenzidine	--	--	MG/KG	2 U	0.2 U	0.2 U	0.19 U
3-Nitroaniline	--	--	MG/KG	2 U	0.2 U	0.2 U	0.19 U
4,6-Dinitro-2-Methylphenol	--	--	MG/KG	5.2 U	0.51 U	0.51 U	0.51 U
4-Bromophenyl Phenyl Ether	--	--	MG/KG	2 U	0.2 U	0.2 U	0.19 U
4-Chloro-3-Methylphenol	--	--	MG/KG	2 U	0.2 U	0.2 U	0.19 U
4-Chloroaniline	--	--	MG/KG	2 U	0.2 U	0.2 U	0.19 U
4-Chlorophenyl Phenyl Ether	--	--	MG/KG	2 U	0.2 U	0.2 U	0.19 U
4-Nitroaniline	--	--	MG/KG	2 U	0.2 U	0.2 U	0.19 U
4-Nitrophenol	--	--	MG/KG	2.8 U	0.27 U	0.28 U	0.27 U
Acenaphthene	20	100	MG/KG	0.31 J	0.14 J	0.097 J	0.17

Table 4. Summary of Semivolatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SDS-25_26_27W	SDS-28_29_30E	SDS-28_29_30N	SDS-28_29_30S
			Sample Date:	01/15/2020	01/06/2020	01/06/2020	01/06/2020
			Sample Depth (ft bls):	9 - 9	9 - 9	9 - 9	9 - 9
			Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units				
Acenaphthylene	100	100	MG/KG	1.1 J	0.64	0.42	0.7
Acetophenone	--	--	MG/KG	2 U	0.2 U	0.2 U	0.19 U
Anthracene	100	100	MG/KG	1.3	0.71	0.43	0.68
Atrazine	--	--	MG/KG	NA	NA	NA	NA
Azobenzene	--	--	MG/KG	NA	NA	NA	NA
Benzaldehyde	--	--	MG/KG	NA	NA	NA	NA
Benzidine	--	--	MG/KG	NA	NA	NA	NA
Benzo(A)Anthracene	**1**	1	MG/KG	**3.5**	**1.9**	**1.2**	**1.6**
Benzo(A)Pyrene	**1**	1	MG/KG	**3.4**	**1.7**	**1.1**	**1.5**
Benzo(B)Fluoranthene	**1**	1	MG/KG	**3.9**	**2.3**	**1.4**	**1.9**
Benzo(G,H,I)Perylene	100	100	MG/KG	2.3	1.3	0.88	1.1
Benzo(K)Fluoranthene	**0.8**	3.9	MG/KG	**1.4**	0.73	0.52	0.63
Benzoic Acid	--	--	MG/KG	6.5 R	0.63 R	0.64 R	0.63 R
Benzyl Alcohol	--	--	MG/KG	2 U	0.2 U	0.2 U	0.19 U
Benzyl Butyl Phthalate	--	--	MG/KG	2 U	0.2 U	0.2 U	0.19 U
Biphenyl (Diphenyl)	--	--	MG/KG	4.6 U	0.44 U	0.45 U	0.44 U
Bis(2-Chloroethoxy) Methane	--	--	MG/KG	2.2 U	0.21 U	0.21 U	0.21 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	--	--	MG/KG	1.8 U	0.18 U	0.18 U	0.18 U
Bis(2-Chloroisopropyl) Ether	--	--	MG/KG	2.4 U	0.23 U	0.24 U	0.23 U
Bis(2-Ethylhexyl) Phthalate	--	--	MG/KG	2 U	0.32	0.27	0.44
Caprolactam	--	--	MG/KG	NA	NA	NA	NA
Carbazole	--	--	MG/KG	0.48 J	0.32	0.19 J	0.27
Chrysene	**1**	3.9	MG/KG	**3.6**	**1.9**	**1.2**	**1.6**
Dibenz(A,H)Anthracene	**0.33**	0.33	MG/KG	**0.58 J**	0.31	0.21	0.26
Dibenzofuran	7	59	MG/KG	0.2 J	0.15 J	0.09 J	0.15 J
Diethyl Phthalate	--	--	MG/KG	2 U	0.2 U	0.2 U	0.19 U
Dimethyl Phthalate	--	--	MG/KG	2 U	0.2 U	0.2 U	0.19 U
Di-N-Butyl Phthalate	--	--	MG/KG	2 U	0.2 U	0.2 U	0.19 U
Di-N-Octylphthalate	--	--	MG/KG	2 U	0.2 U	0.2 U	0.19 U
Fluoranthene	100	100	MG/KG	6	4	2.4	3
Fluorene	30	100	MG/KG	0.5 J	0.23	0.16 J	0.28

Table 4. Summary of Semivolatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SDS-25_26_27W	SDS-28_29_30E	SDS-28_29_30N	SDS-28_29_30S
			Sample Date:	01/15/2020	01/06/2020	01/06/2020	01/06/2020
			Sample Depth (ft bls):	9 - 9	9 - 9	9 - 9	9 - 9
			Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units				
Hexachlorobenzene	0.33	1.2	MG/KG	1.2 U	0.12 U	0.12 U	0.12 U
Hexachlorobutadiene	--	--	MG/KG	2 U	0.2 U	0.2 U	0.19 U
Hexachlorocyclopentadiene	--	--	MG/KG	5.8 U	0.56 U	0.56 U	0.56 U
Hexachloroethane	--	--	MG/KG	1.6 U	0.16 U	0.16 U	0.16 U
Indeno(1,2,3-C,D)Pyrene	**0.5**	0.5	MG/KG	**2.2**	**1.4**	**0.92**	**1.2**
Isophorone	--	--	MG/KG	1.8 U	0.18 U	0.18 U	0.18 U
Naphthalene	12	100	MG/KG	0.28 J	0.26	0.13 J	0.24
Nitrobenzene	--	--	MG/KG	1.8 U	0.18 U	0.18 U	0.18 U
N-Nitrosodimethylamine	--	--	MG/KG	NA	NA	NA	NA
N-Nitrosodi-N-Propylamine	--	--	MG/KG	2 U	0.2 U	0.2 U	0.19 U
N-Nitrosodiphenylamine	--	--	MG/KG	1.6 U	0.16 U	0.16 U	0.16 U
Pentachlorophenol	0.8	6.7	MG/KG	1.6 U	0.16 U	0.16 U	0.16 U
Phenanthrene	100	100	MG/KG	5.2	2.9	1.6	2.4
Phenol	0.33	100	MG/KG	2 U	0.2 U	0.2 U	0.19 U
Pyrene	100	100	MG/KG	6.1	3.5	2.1	2.7

Table 4. Summary of Semivolatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SDS-28_29_30W	SDS-4	SDS-5	SDS-8	SDS-9
			Sample Date:	01/06/2020	01/07/2020	01/07/2020	10/22/2019	10/22/2019
			Sample Depth (ft bls):	9 - 9	7.5 - 7.5	7.5 - 7.5	6 - 6	6 - 6
			Normal Sample or Field Duplicate:	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units					
1,2,4,5-Tetrachlorobenzene	--	--	MG/KG	0.19 U	1 U	0.39 U	1 U	0.18 U
1,2,4-Trichlorobenzene	--	--	MG/KG	0.19 U	1 U	0.39 U	1 U	0.18 U
1,2-Dichlorobenzene	1.1	100	MG/KG	0.19 U	1 U	0.39 U	1 U	0.18 U
1,3-Dichlorobenzene	2.4	49	MG/KG	0.19 U	1 U	0.39 U	1 U	0.18 U
1,4-Dichlorobenzene	1.8	13	MG/KG	0.19 U	1 U	0.39 U	1 U	0.18 U
1,4-Dioxane (P-Dioxane)	0.1	13	MG/KG	0.028 U	0.15 U	0.058 U	0.16 U	0.027 U
2,3,4,6-Tetrachlorophenol	--	--	MG/KG	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	--	--	MG/KG	0.19 U	1 U	0.39 U	1 U	0.18 U
2,4,6-Trichlorophenol	--	--	MG/KG	0.11 U	0.61 U	0.23 U	0.62 U	0.11 U
2,4-Dichlorophenol	--	--	MG/KG	0.17 U	0.92 U	0.35 U	0.93 U	0.16 U
2,4-Dimethylphenol	--	--	MG/KG	0.19 U	1 U	0.39 U	1 U	0.18 U
2,4-Dinitrophenol	--	--	MG/KG	0.91 U	4.9 U	1.9 U	5 U	0.86 U
2,4-Dinitrotoluene	--	--	MG/KG	0.19 U	1 U	0.39 U	1 U	0.18 U
2,6-Dinitrotoluene	--	--	MG/KG	0.19 U	1 U	0.39 U	1 U	0.18 U
2-Chloronaphthalene	--	--	MG/KG	0.19 U	1 U	0.39 U	1 U	0.18 U
2-Chlorophenol	--	--	MG/KG	0.19 U	1 U	0.39 U	1 U	0.18 U
2-Methylnaphthalene	--	--	MG/KG	0.086 J	0.22 J	0.16 J	0.34 J	0.22 U
2-Methylphenol (O-Cresol)	0.33	100	MG/KG	0.19 U	1 U	0.39 U	1 U	0.18 U
2-Nitroaniline	--	--	MG/KG	0.19 U	1 U	0.39 U	1 U	0.18 U
2-Nitrophenol	--	--	MG/KG	0.41 U	2.2 U	0.84 U	2.2 U	0.39 U
3- And 4- Methylphenol (Total)	**0.33**	100	MG/KG	0.035 J	**0.42 J**	0.11 J	0.16 J	0.26 U
3,3'-Dichlorobenzidine	--	--	MG/KG	0.19 U	1 U	0.39 U	1 U	0.18 U
3-Nitroaniline	--	--	MG/KG	0.19 U	1 U	0.39 U	1 U	0.18 U
4,6-Dinitro-2-Methylphenol	--	--	MG/KG	0.49 U	2.7 U	1 U	2.7 U	0.47 U
4-Bromophenyl Phenyl Ether	--	--	MG/KG	0.19 U	1 U	0.39 U	1 U	0.18 U
4-Chloro-3-Methylphenol	--	--	MG/KG	0.19 U	1 U	0.39 U	1 U	0.18 U
4-Chloroaniline	--	--	MG/KG	0.19 U	1 U	0.39 U	1 U	0.18 U
4-Chlorophenyl Phenyl Ether	--	--	MG/KG	0.19 U	1 U	0.39 U	1 U	0.18 U
4-Nitroaniline	--	--	MG/KG	0.19 U	1 U	0.39 U	1 U	0.18 U
4-Nitrophenol	--	--	MG/KG	0.27 U	1.4 U	0.54 U	1.4 U	0.25 U
Acenaphthene	20	100	MG/KG	0.11 J	0.23 J	0.1 J	0.45 J	0.14 U

Table 4. Summary of Semivolatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SDS-28_29_30W	SDS-4	SDS-5	SDS-8	SDS-9
			Sample Date:	01/06/2020	01/07/2020	01/07/2020	10/22/2019	10/22/2019
			Sample Depth (ft bls):	9 - 9	7.5 - 7.5	7.5 - 7.5	6 - 6	6 - 6
			Normal Sample or Field Duplicate:	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units					
Acenaphthylene	100	100	MG/KG	0.5	6	2.2	5	0.035 J
Acetophenone	--	--	MG/KG	0.19 U	1 U	0.39 U	1 U	0.18 U
Anthracene	100	100	MG/KG	0.52	4.6	1.5	4	0.037 J
Atrazine	--	--	MG/KG	NA	NA	NA	NA	NA
Azobenzene	--	--	MG/KG	NA	NA	NA	NA	NA
Benzaldehyde	--	--	MG/KG	NA	NA	NA	NA	NA
Benzidine	--	--	MG/KG	NA	NA	NA	NA	NA
Benzo(A)Anthracene	**1**	1	MG/KG	**1.3**	**14**	**4.7**	**14**	0.12
Benzo(A)Pyrene	**1**	1	MG/KG	**1.2**	**12**	**4.5**	**13**	0.11 J
Benzo(B)Fluoranthene	**1**	1	MG/KG	**1.6**	**20**	**6.7**	**18**	0.15
Benzo(G,H,I)Perylene	100	100	MG/KG	0.91	10	3.1	7	0.082 J
Benzo(K)Fluoranthene	**0.8**	3.9	MG/KG	0.51	**6.6**	**2.3**	**5.1**	0.052 J
Benzoic Acid	--	--	MG/KG	0.62 R	3.3 R	1.2 R	3.4 R	0.58 R
Benzyl Alcohol	--	--	MG/KG	0.19 U	1 U	0.39 U	1 U	0.18 U
Benzyl Butyl Phthalate	--	--	MG/KG	0.19 U	1 U	0.39 U	1 U	0.18 U
Biphenyl (Diphenyl)	--	--	MG/KG	0.43 U	2.3 U	0.89 U	2.4 U	0.41 U
Bis(2-Chloroethoxy) Methane	--	--	MG/KG	0.2 U	1.1 U	0.42 U	1.1 U	0.19 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	--	--	MG/KG	0.17 U	0.92 U	0.35 U	0.93 U	0.16 U
Bis(2-Chloroisopropyl) Ether	--	--	MG/KG	0.23 U	1.2 U	0.47 U	1.2 U	0.22 U
Bis(2-Ethylhexyl) Phthalate	--	--	MG/KG	0.32	0.37 J	0.14 J	1 U	0.18 U
Caprolactam	--	--	MG/KG	NA	NA	NA	NA	NA
Carbazole	--	--	MG/KG	0.26	2.4	1	1.6	0.02 J
Chrysene	**1**	3.9	MG/KG	**1.3**	**14**	**5.2**	**12**	0.11
Dibenz(A,H)Anthracene	**0.33**	0.33	MG/KG	0.22	**2.7**	**0.81**	**1.7**	0.11 U
Dibenzofuran	7	59	MG/KG	0.13 J	0.91 J	0.58	1.2	0.18 U
Diethyl Phthalate	--	--	MG/KG	0.19 U	1 U	0.39 U	1 U	0.18 U
Dimethyl Phthalate	--	--	MG/KG	0.19 U	1 U	0.39 U	1 U	0.18 U
Di-N-Butyl Phthalate	--	--	MG/KG	0.19 U	1 U	0.39 U	1 U	0.18 U
Di-N-Octylphthalate	--	--	MG/KG	0.19 U	1 U	0.39 U	1 U	0.18 U
Fluoranthene	100	100	MG/KG	2.7	31	12	23	0.2
Fluorene	30	100	MG/KG	0.21	0.78 J	0.39	1.7	0.18 U

Table 4. Summary of Semivolatile Organic Compounds in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SDS-28_29_30W	SDS-4	SDS-5	SDS-8	SDS-9
			Sample Date:	01/06/2020	01/07/2020	01/07/2020	10/22/2019	10/22/2019
			Sample Depth (ft bls):	9 - 9	7.5 - 7.5	7.5 - 7.5	6 - 6	6 - 6
			Normal Sample or Field Duplicate:	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units					
Hexachlorobenzene	0.33	1.2	MG/KG	0.11 U	0.61 U	0.23 U	0.62 U	0.11 U
Hexachlorobutadiene	--	--	MG/KG	0.19 U	1 U	0.39 U	1 U	0.18 U
Hexachlorocyclopentadiene	--	--	MG/KG	0.54 U	2.9 U	1.1 U	3 U	0.51 U
Hexachloroethane	--	--	MG/KG	0.15 U	0.82 U	0.31 U	0.83 U	0.14 U
Indeno(1,2,3-C,D)Pyrene	**0.5**	0.5	MG/KG	**0.97**	**12**	**3.6**	**7.8**	0.079 J
Isophorone	--	--	MG/KG	0.17 U	0.92 U	0.35 U	0.93 U	0.16 U
Naphthalene	12	100	MG/KG	0.19	0.64 J	0.29 J	0.8 J	0.18 U
Nitrobenzene	--	--	MG/KG	0.17 U	0.92 U	0.35 U	0.93 U	0.16 U
N-Nitrosodimethylamine	--	--	MG/KG	NA	NA	NA	NA	NA
N-Nitrosodi-N-Propylamine	--	--	MG/KG	0.19 U	1 U	0.39 U	1 U	0.18 U
N-Nitrosodiphenylamine	--	--	MG/KG	0.15 U	0.82 U	0.31 U	0.83 U	0.14 U
Pentachlorophenol	0.8	6.7	MG/KG	0.15 U	0.82 U	0.31 U	0.83 U	0.14 U
Phenanthrene	100	100	MG/KG	2.1	20	8.6	17	0.14
Phenol	0.33	100	MG/KG	0.19 U	0.22 J	0.064 J	1 U	0.18 U
Pyrene	100	100	MG/KG	2.4	23	8.6	18	0.18

Table 5. Summary of Metals in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	BDS-1	BDS-13	BDS-14	BDS-15	BDS-15	BDS-16_SDS-6	BDS-17_SDS-7
			Sample Date:	11/11/2019	05/05/2020	05/05/2020	05/05/2020	05/05/2020	01/15/2020	01/15/2020
			Sample Depth (ft bls):	15 - 17	9 - 10	2 - 4	1 - 2	1 - 2	6 - 7	6 - 7
			Normal Sample or Field Duplicate:	N	N	N	N	FD	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units							
Aluminum	--	--	MG/KG	5120	2070	3990	5410	4580	3470	3340
Antimony	--	--	MG/KG	4.26 U	0.787 J	1 J	1.94 J	1.4 J	10.2	1.02 J
Arsenic	**13**	16	MG/KG	3.74	1.97	3.35	10 J	8.78	4.63	7.02
Barium	**350**	400	MG/KG	98.8	**582**	**372**	**494 J**	303	**1220**	**1260**
Beryllium	7.2	72	MG/KG	0.119 J	0.166 J	0.209 J	0.259 J	0.225 J	0.178 J	0.175 J
Cadmium	2.5	4.3	MG/KG	0.375 J	0.215 J	0.192 J	1.19	1.22	0.673 J	0.34 J
Calcium	--	--	MG/KG	2770	5970	23100	36700	33800	73100	57900
Chromium, Hexavalent	**1**	110	MG/KG	0.207 J	0.843 U	0.886 U	0.912 U	0.885 U	0.99 U	0.958 U
Chromium, Total	30	180	MG/KG	2.91	13	11.3	18.2 J	14.9	19.4	25.1
Cobalt	--	--	MG/KG	9.98	2.91	4.53	5.43	4.83	5.42	5.94
Copper	**50**	270	MG/KG	**247**	10.9	24.3	41.8 J	34.7	42.7	18.2
Cyanide	27	27	MG/KG	0.99 UJ	0.97 UJ	0.28 J-	0.77 J-	1 J-	1.5	0.86 J
Iron	--	--	MG/KG	24400	5520	14500	12900	10700	10300	9230
Lead	**63**	400	MG/KG	19.7	**131**	**147**	**742**	**692**	**1190**	**390**
Magnesium	--	--	MG/KG	1890	1430	2620	2940 J	2280	2050	1520
Manganese	**1600**	2000	MG/KG	232	148	291	281	285	226	191
Mercury	**0.18**	0.81	MG/KG	0.075 U	0.07 U	0.134	**0.58 J**	**0.498**	**0.709**	**0.949**
Nickel	**30**	310	MG/KG	1.98 J	6.55	11.2	12.3	14.8	8.58	21.6
Potassium	--	--	MG/KG	1550	338	605	616	498	560	529
Selenium	3.9	180	MG/KG	0.417 J	1.66 U	1.67 U	0.527 J	0.744 J	0.57 J	1.06 J
Silver	2	180	MG/KG	0.852 U	0.828 U	0.835 U	0.295 J	0.866 U	0.935 U	0.92 U
Sodium	--	--	MG/KG	124 J	33 J	122 J	167 J	151 J	156 J	174 J
Thallium	--	--	MG/KG	1.7 U	1.66 U	0.292 J	1.78 U	0.286 J	1.87 U	1.84 U
Vanadium	--	--	MG/KG	17.2	9.52	14.4	26.1	18.7	22.2	19.7
Zinc	**109**	10000	MG/KG	44.3	**241**	**254**	**868 J**	**809**	**994**	**765**

Table 5. Summary of Metals in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	BDS-2	BDS-21A	BDS-21B	BDS-22	BDS-23	BDS-24	BDS-25	BDS-26
			Sample Date:	11/11/2019	01/06/2020	01/06/2020	11/11/2019	11/11/2019	11/11/2019	01/15/2020	01/15/2020
			Sample Depth (ft bls):	12 - 14	6 - 8	6 - 8	12 - 14	12 - 14	12 - 14	8 - 10	8 - 10
			Normal Sample or Field Duplicate:	N	N	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units								
Aluminum	--	--	MG/KG	4550 J	4280	5190	7860	7220	5380	4050	3480
Antimony	--	--	MG/KG	4.16 U	1.81 J	1.01 J	4.56 U	0.489 J	4.51 U	4.28 J	5.04
Arsenic	**13**	16	MG/KG	1.75	5.61	4.44	1.75	3.22	1.48	**39.5**	12.9
Barium	**350**	400	MG/KG	74	**896**	**962**	85.1	272	63.1	**803**	**1820**
Beryllium	7.2	72	MG/KG	0.116 J	0.077 J	0.164 J	0.456 U	0.189 J	0.171 J	0.79	0.16 J
Cadmium	2.5	4.3	MG/KG	0.208 J	0.95 J	0.894 J	0.182 J	0.42 J	0.135 J	0.941 U	0.939 U
Calcium	--	--	MG/KG	3330 J	62300	49200	1570	8890	1010	26800	58100
Chromium, Hexavalent	**1**	110	MG/KG	0.329 J	0.973 U	0.238 J	0.934 U	0.198 J	0.286 J	0.984 U	0.998 U
Chromium, Total	30	180	MG/KG	11.9 J	12.8	11.7	15.7	24.8	11.4	24.2	25.6
Cobalt	--	--	MG/KG	4.94	4.04	3.79	9.01	8.83	6.83	20.3	8.22
Copper	**50**	270	MG/KG	25.6	30.3	15.2	27.4	39	28.9	**134**	48.1
Cyanide	27	27	MG/KG	1.1 UJ	0.34 J-	0.49 J-	1.1 UJ	1 UJ	1.1 UJ	1.9	1.5
Iron	--	--	MG/KG	7950	9930	8010	12200	12400	7520	46400	46100
Lead	**63**	400	MG/KG	16.6	**179**	**216**	6.7	**89.6**	6.42	**517**	**513**
Magnesium	--	--	MG/KG	2040 J	4890	4370	3890	3460	1800	2080	4230
Manganese	**1600**	2000	MG/KG	140 J	403	339	415	573	426	628	605
Mercury	**0.18**	0.81	MG/KG	0.083 U	**0.224**	**0.294**	0.065 J	0.12	0.085 U	**0.78**	**0.65**
Nickel	**30**	310	MG/KG	10.8	8.71	8.25	14.1	18.1	13.1	**37.1**	14.6
Potassium	--	--	MG/KG	670	838	870	2460	1180	695	539	690
Selenium	3.9	180	MG/KG	1.66 U	0.556 J	0.502 J	0.237 J	0.454 J	1.8 U	1.4 J	0.817 J
Silver	2	180	MG/KG	0.832 U	0.959 U	0.912 U	0.912 U	0.858 U	0.902 U	0.941 U	0.939 U
Sodium	--	--	MG/KG	138 J	169 J	312	316	255	154 J	132 J	198
Thallium	--	--	MG/KG	1.66 U	1.92 U	1.82 U	1.82 U	0.36 J	1.8 U	0.574 J	0.404 J
Vanadium	--	--	MG/KG	17	20.8	18.9	24.6	21.6	12.8	13.6	15.1
Zinc	**109**	10000	MG/KG	50.1	**547**	**539**	36.6	**156**	17.6	**642**	**1480**

Table 5. Summary of Metals in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	BDS-27	BDS-28	BDS-29	BDS-3	BDS-3	BDS-30	BDS-3A	SB-18
			Sample Date:	01/15/2020	01/06/2020	01/06/2020	11/11/2019	11/11/2019	01/06/2020	05/05/2020	04/17/2019
			Sample Depth (ft bls):	8 - 10	8 - 10	8 - 10	12 - 14	12 - 14	8 - 10	13 - 14	2 - 4
			Normal Sample or Field Duplicate:	N	N	N	N	FD	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units								
Aluminum	--	--	MG/KG	3660	5220	5370	7360	4630	4760	3910	5900
Antimony	--	--	MG/KG	2.71 J	1.07 J	3.72 J	4.52 U	4.38 U	0.995 J	3.96 U	4.72 U
Arsenic	**13**	16	MG/KG	6.14	5.42	4.6	1.84	2.11	6.19	1.46	4.88
Barium	**350**	400	MG/KG	**1640**	**809 J**	**592**	48.7	56.1	**623**	84.1	87.8
Beryllium	7.2	72	MG/KG	0.164 J	0.459 U	0.066 J	0.054 J	0.298 J	0.46 U	0.238 J	0.208 J
Cadmium	2.5	4.3	MG/KG	0.433 J	1.29	1.1	0.199 J	0.263 J	1.27	0.793 U	0.945 U
Calcium	--	--	MG/KG	60200	48000	37400	1360	916	45800	2740	2110
Chromium, Hexavalent	**1**	110	MG/KG	1.01 U	0.955 U	0.957 U	0.918 U	0.905 U	0.951 U	0.836 U	0.954 U
Chromium, Total	30	180	MG/KG	25	14.8	13.3	29.5	10.8	13.5	11.1	11.5
Cobalt	--	--	MG/KG	4.85	5.24	4.83	5.97	8.12	4.8	4.42	4.2
Copper	**50**	270	MG/KG	30.9	38.6 J	32	35.5	39.5	32	19.9	27.3
Cyanide	27	27	MG/KG	1.1 J	1 J-	0.87 J-	1.1 UJ	1.1 UJ	0.62 J-	0.97 UJ	1.1 U
Iron	--	--	MG/KG	12600	13700	11000	11700	11400	14500	7900	11400
Lead	**63**	400	MG/KG	**529**	**252**	**370**	3.86 J	7.09	**1180**	23	**82.5**
Magnesium	--	--	MG/KG	4580	4790	4670	4650	1900	5260	1760	1530
Manganese	**1600**	2000	MG/KG	302	320	302	94.7	284	342	226	157
Mercury	**0.18**	0.81	MG/KG	**0.732**	**0.304 J**	**0.359**	0.093 U	0.057 J	**0.559**	0.073 U	0.102
Nickel	**30**	310	MG/KG	9.31	11.1	10.2	18.4	13.1	10.5	9.9	9.36
Potassium	--	--	MG/KG	725	1130	1010	3060	666	898	577	686
Selenium	3.9	180	MG/KG	0.798 J	0.89 J	0.876 J	1.81 U	0.246 J	0.884 J	1.58 U	0.51 J
Silver	2	180	MG/KG	0.962 U	0.917 U	0.565 J	0.904 U	0.877 U	0.921 U	0.793 U	0.945 U
Sodium	--	--	MG/KG	184 J	270 J	313	175 J	95.6 J	238	61.1 J	40.4 J
Thallium	--	--	MG/KG	0.51 J	1.83 U	1.88 U	1.81 U	1.75 U	1.84 U	0.349 J	1.89 U
Vanadium	--	--	MG/KG	14.2	19.7	18.5	34.2	16.2	19.1	15.1	24.5
Zinc	**109**	10000	MG/KG	**1390**	**607**	**539**	21	21.2	**690**	37.8	86.5

Table 5. Summary of Metals in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SB-18	SB-18	SB-18	SB-19	SB-19	SB-19	SB-19	SB-20
			Sample Date:	04/22/2019	04/22/2019	04/22/2019	04/18/2019	04/22/2019	04/22/2019	04/22/2019	04/17/2019
			Sample Depth (ft bls):	4 - 6	6 - 8	15 - 17	2 - 4	4 - 6	6 - 8	15 - 17	2 - 4
			Normal Sample or Field Duplicate:	N	N	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units								
Aluminum	--	--	MG/KG	4910	4640	3630	5090	6930	3060	2840	4290
Antimony	--	--	MG/KG	3.7 J	7.84	4.83 U	1.32 J	1.97 J	1.38 J	4.58 U	2.08 J
Arsenic	**13**	16	MG/KG	8.59	5.65	1.85	5.37	6.83	5.64	1.03	5.81
Barium	**350**	400	MG/KG	**1180**	**1430**	28.2	**572**	**636**	125	71.8	**833**
Beryllium	7.2	72	MG/KG	0.124 J	0.214 J	0.184 J	0.189 J	0.192 J	0.15 J	0.147 J	0.105 J
Cadmium	2.5	4.3	MG/KG	0.884 U	1.31	0.329 J	0.633 J	0.156 J	0.469 J	0.385 J	1.13
Calcium	--	--	MG/KG	35000	48200	942 J	23200	22700	36200	2190	57900
Chromium, Hexavalent	**1**	110	MG/KG	NA	NA	NA	0.192 J	NA	NA	NA	0.992 U
Chromium, Total	30	180	MG/KG	17.2	16.9	13.7	12.4	15.7	6.11	11	25.3
Cobalt	--	--	MG/KG	5.86	6.93	2.96	3.65	4.9	3.6	2.44	4.88
Copper	**50**	270	MG/KG	**51.1**	42.6	13.7	31.6	49.5	28.1	9.89	**85.1**
Cyanide	27	27	MG/KG	NA	NA	NA	1.2 U	NA	NA	NA	1.3 J
Iron	--	--	MG/KG	22200	10300	5760	9120	12700	7590	5720	10300
Lead	**63**	400	MG/KG	**376**	**367**	3.14 J	**165**	**234**	**740**	9.77	**416**
Magnesium	--	--	MG/KG	3280	3660	1330 J	2730	3450	2740	1290	3860
Manganese	**1600**	2000	MG/KG	304	382	40.6	207	242	252	229	284
Mercury	**0.18**	0.81	MG/KG	**0.348**	**0.842**	0.077 U	**0.397**	**0.399**	**0.336**	0.076 U	**0.331**
Nickel	**30**	310	MG/KG	12.2	11.1	9.01	11	10.4	9.55	5.78	9.77
Potassium	--	--	MG/KG	974	703	306	693	1000	473	487	663
Selenium	3.9	180	MG/KG	1.47 J	0.993 J	1.93 U	0.416 J	1.22 J	1.77 U	1.83 U	0.924 J
Silver	2	180	MG/KG	0.884 U	0.973 U	0.967 U	0.944 U	0.915 U	0.283 J	0.917 U	0.952 U
Sodium	--	--	MG/KG	233	360	109 J	155 J	444	93.5 J	61.9 J	230
Thallium	--	--	MG/KG	0.309 J	1.95 U	1.93 U	1.89 U	1.83 U	1.77 U	1.83 U	1.9 U
Vanadium	--	--	MG/KG	29	20.2	12.7	18.3	31.7	16.7	7.64	17.1
Zinc	**109**	10000	MG/KG	**708**	**1230**	12.2	**361**	**444**	**325**	33.8	**1810**

Table 5. Summary of Metals in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SB-20	SB-20	SB-20	SB-21	SB-21	SB-21	SB-22	SB-22
			Sample Date:	04/22/2019	04/22/2019	04/22/2019	04/17/2019	04/19/2019	04/19/2019	04/16/2019	04/22/2019
			Sample Depth (ft bls):	4 - 6	6 - 8	15 - 17	2 - 4	4 - 6	6 - 8	2 - 4	4 - 6
			Normal Sample or Field Duplicate:	N	N	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units								
Aluminum	--	--	MG/KG	3980	5440	3920	6750	3550	11600	6370	4770
Antimony	--	--	MG/KG	2.45 J	2.14 J	5.32 U	0.438 J	0.553 J	5.78 U	1.52 J	1.07 J
Arsenic	**13**	16	MG/KG	4.63	5.05	0.712 J	12	3.42	2.02	6.55	4.32
Barium	**350**	400	MG/KG	**1340**	**1490**	26.5	253	78.5	168	297	103
Beryllium	7.2	72	MG/KG	0.075 J	0.284 J	0.223 J	0.205 J	0.15 J	0.277 J	0.223 J	0.136 J
Cadmium	2.5	4.3	MG/KG	0.534 J	1.28	0.17 J	0.932 U	0.937 U	1.16 U	1.64	1.99
Calcium	--	--	MG/KG	36700	70800	740	32000	2390	38800	24100	42000
Chromium, Hexavalent	**1**	110	MG/KG	NA	NA	NA	0.966 U	NA	NA	0.936 U	NA
Chromium, Total	30	180	MG/KG	16.1	25.4	14.3	26.4	7.58	24.1	13.2	11
Cobalt	--	--	MG/KG	3.88	6.17	3.03	3.73	2.5	11.6	4.81	4.63
Copper	**50**	270	MG/KG	24.4	14.9	6.74	23.4	12.3	13	44.9	**113**
Cyanide	27	27	MG/KG	NA	NA	NA	1.2 U	NA	NA	1.2 U	NA
Iron	--	--	MG/KG	11200	7780	8450	13200	6460	19600	12900	9630
Lead	**63**	400	MG/KG	**480**	**647**	3.54 J	**180**	52	19.3	**267**	**871**
Magnesium	--	--	MG/KG	3110	3850	1330	4080	1080	17300	3380	9450
Manganese	**1600**	2000	MG/KG	223	240	187	290	102	978	271	437
Mercury	**0.18**	0.81	MG/KG	**0.288**	0.136	0.086 U	**1.49**	**0.355**	0.035 J	**0.781**	**2.36 J**
Nickel	**30**	310	MG/KG	7.75	15.9	7.1	8.98	5.38	22.8	12.1	17.3
Potassium	--	--	MG/KG	425	949	557	583	279	5300	858	777
Selenium	3.9	180	MG/KG	1.07 J	0.806 J	2.13 U	1.15 J	0.384 J	1 J	1.86 U	1.22 J
Silver	2	180	MG/KG	0.937 U	0.948 U	1.06 U	0.932 U	0.937 U	1.16 U	0.288 J	0.973 U
Sodium	--	--	MG/KG	128 J	207	71.7 J	403	52.9 J	222 J	227	107 J
Thallium	--	--	MG/KG	1.87 U	1.9 U	2.13 U	1.86 U	1.87 U	2.31 U	1.86 U	1.94 U
Vanadium	--	--	MG/KG	15.4	13.1	11.6	20	12.7	54.7	26.2	20.6
Zinc	**109**	10000	MG/KG	**1200**	**1860**	13	**175**	68.4	48.8	**305**	**520**

Table 5. Summary of Metals in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SB-22	SB-22	SB-23	SB-23	SB-23	SB-24	SB-24	SB-24
			Sample Date:	04/22/2019	04/22/2019	04/18/2019	04/22/2019	04/22/2019	04/15/2019	04/16/2019	04/16/2019
			Sample Depth (ft bls):	6 - 8	15 - 17	2 - 4	4 - 6	6 - 8	2 - 4	4 - 6	6 - 8
			Normal Sample or Field Duplicate:	N	N	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units								
Aluminum	--	--	MG/KG	855	4600	5400	5140	5790	4740	7220	6900
Antimony	--	--	MG/KG	1.77 J	1.34 J	2.82 J	0.844 J	5.9	3.71 J	1.85 J	1.9 J
Arsenic	**13**	16	MG/KG	3.46	1.48	7.63	4.32	10.6	7.49	**19.9**	6.09
Barium	**350**	400	MG/KG	72.6	35.7	**812 J**	299	**736**	**750**	**657**	**674**
Beryllium	7.2	72	MG/KG	0.479 U	0.236 J	0.241 J	0.136 J	0.2 J	0.231 J	0.288 J	0.308 J
Cadmium	2.5	4.3	MG/KG	0.862 J	0.558 J	1.85	0.97 U	1.3	**6.71**	1.01	1.06
Calcium	--	--	MG/KG	68700	1140	55200	45200	38600	54100	27200	46800
Chromium, Hexavalent	**1**	110	MG/KG	NA	NA	0.994 U	NA	NA	1.05 U	NA	NA
Chromium, Total	30	180	MG/KG	25	8.85	19.8 J	10.1	15	**41.2**	23	13.5
Cobalt	--	--	MG/KG	6.24	4.86	5.86	2.65	7.76	7.81	6.7	4.45
Copper	**50**	270	MG/KG	49.7	9.58	47.4 J	11	**92**	42.6	21.8	14.2
Cyanide	27	27	MG/KG	NA	NA	0.31 J	NA	NA	0.86 J	NA	NA
Iron	--	--	MG/KG	16500	10800	12500	7310	59800	14000	17000	11800
Lead	**63**	400	MG/KG	**319**	5.46 J	**569 J**	**73.3**	**575**	**716**	**464**	**198**
Magnesium	--	--	MG/KG	3560	1630	3410 J	3540	3550	3920	4030	4260
Manganese	**1600**	2000	MG/KG	119	373	281	290	388	362	249	375
Mercury	**0.18**	0.81	MG/KG	**0.755**	0.086 U	**0.369 J**	0.057 J	0.149	**0.469**	0.166	**0.217**
Nickel	**30**	310	MG/KG	9.63	10.1	9.65	6.13	15	13.5	12.8	9.44
Potassium	--	--	MG/KG	227 J	835	557 J	585	912	578	2190	945
Selenium	3.9	180	MG/KG	1.92 U	2.48 U	0.772 J	0.96 J	0.495 J	1.41 J	1.92	0.681 J
Silver	2	180	MG/KG	0.738 J	1.24 U	0.964 U	0.97 U	0.4 J	0.352 J	0.93 U	0.933 U
Sodium	--	--	MG/KG	213	117 J	366	379	533	432	541	708
Thallium	--	--	MG/KG	1.92 U	2.48 U	1.93 U	1.94 U	1.9 U	2.01 U	1.86 U	1.87 U
Vanadium	--	--	MG/KG	14.7	14.4	19.8	15.4	28.6	17.7	24	19.5
Zinc	**109**	10000	MG/KG	**755**	16.2	**964**	**194**	**1270**	**3570**	**405**	**422**

Table 5. Summary of Metals in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SB-25	SB-25	SB-25	SB-25	SB-34	SB-35	SB-35	SB-35
			Sample Date:	04/18/2019	04/18/2019	04/23/2019	04/23/2019	04/17/2019	04/16/2019	04/18/2019	04/18/2019
			Sample Depth (ft bls):	2 - 4	2 - 4	4 - 6	6 - 8	2 - 4	2 - 4	4 - 6	6 - 8
			Normal Sample or Field Duplicate:	N	FD	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units								
Aluminum	--	--	MG/KG	5700	6150	5100	2570	9080	6980	3200	3620
Antimony	--	--	MG/KG	3.51 J	2.49 J	1.4 J	0.695 J	4.23 U	0.896 J	4.23	3.13 J
Arsenic	**13**	16	MG/KG	5.99	6.3	3.82	1.92	2.76	5.15	7.63	6.45
Barium	**350**	400	MG/KG	**899**	**729**	**829**	81.8	24.5	218	**381**	**638**
Beryllium	7.2	72	MG/KG	0.164 J	0.248 J	0.124 J	0.078 J	0.211 J	0.238 J	0.126 J	0.182 J
Cadmium	2.5	4.3	MG/KG	1.13 J	1.27	0.444 J	0.868 U	0.845 U	1.13	0.841 U	1.01
Calcium	--	--	MG/KG	31500	33300	51600	39600	2930	33800	11500	25100
Chromium, Hexavalent	**1**	110	MG/KG	0.321 J	0.338 J	NA	NA	0.899 U	0.958 U	NA	NA
Chromium, Total	30	180	MG/KG	15.2	16.1	12.1	3.92	10.1	10.7	28.6	21.1
Cobalt	--	--	MG/KG	4.63	4.29	3.73	1.77	3.33	4.1	5.05	5.45
Copper	**50**	270	MG/KG	33.1 J	32	13	7.45	5.57	21.6	**59.3**	**55.4**
Cyanide	27	27	MG/KG	1.1 U	0.99 J	NA	NA	1.1 U	1.1 U	NA	NA
Iron	--	--	MG/KG	15000	13100	7700	4030	10100	9590	29400	17900
Lead	**63**	400	MG/KG	**364**	**358**	**272**	16	15.8	**158**	**1760**	**1430**
Magnesium	--	--	MG/KG	3400 J	3480	4120	2730	1360	1750	2290	1920
Manganese	**1600**	2000	MG/KG	258	268	264	204	94.6	266	292	267
Mercury	**0.18**	0.81	MG/KG	**0.316**	**0.259**	0.15	0.031 J	0.07 U	**0.41**	**1.07**	**0.677**
Nickel	**30**	310	MG/KG	9.22	10.2	6.86	3.84	5.33	8.85	15.8	13.6
Potassium	--	--	MG/KG	697	610	716	495	308	636	370	384
Selenium	3.9	180	MG/KG	0.558 J	0.466 J	0.967 J	1.74 U	0.499 J	1.9 U	1.08 J	1.06 J
Silver	2	180	MG/KG	0.963 U	0.991 U	0.888 U	0.868 U	0.845 U	0.953 U	0.841 U	0.866 U
Sodium	--	--	MG/KG	321 J	319	417	111 J	32.1 J	250	93.5 J	135 J
Thallium	--	--	MG/KG	1.93 U	1.98 U	1.78 U	1.74 U	1.69 U	1.9 U	1.68 U	1.73 U
Vanadium	--	--	MG/KG	19.3	20.6	15.6	7.23	18.4	18.2	23.5	21.2
Zinc	**109**	10000	MG/KG	**783**	**736**	**587**	74.9	22.5	**166**	**495**	**726**

Table 5. Summary of Metals in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SDS-1	SDS-1	SDS-10	SDS-11	SDS-12	SDS-2	SDS-21E	SDS-21S
			Sample Date:	01/07/2020	01/07/2020	01/06/2020	01/06/2020	01/07/2020	01/07/2020	01/06/2020	01/06/2020
			Sample Depth (ft bls):	6 - 6	6 - 6	7.5 - 7.5	7.5 - 7.5	7.5 - 7.5	6 - 6	7 - 7	7 - 7
			Normal Sample or Field Duplicate:	FD	N	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units								
Aluminum	--	--	MG/KG	5160	4480	5110	5120	5000	4530	4920	4580
Antimony	--	--	MG/KG	2.09 J	1.52 J	0.67 J	1.92 J	1.84 J	0.776 J	2.89 J	2.88 J
Arsenic	**13**	16	MG/KG	7.96	6.61	4.68	7.68	5.69	3.29	5.8	7.61
Barium	**350**	400	MG/KG	**425**	**398 J**	**530**	**790**	**435**	328	**870**	**756**
Beryllium	7.2	72	MG/KG	0.237 J	0.194 J	0.065 J	0.056 J	0.206 J	0.201 J	0.124 J	0.093 J
Cadmium	2.5	4.3	MG/KG	0.84 J	0.656 J	1.26	1.92	0.717 J	0.236 J	1.5	1.53
Calcium	--	--	MG/KG	26700	26500 J	35200	66600	32400	22200	43600	49800
Chromium, Hexavalent	**1**	110	MG/KG	0.928 U	0.927 U	0.951 U	0.798 J	0.917 U	0.877 U	0.305 J	0.563 J
Chromium, Total	30	180	MG/KG	13.8	12	14.1	15.2	17.3	13.6	13.2	14.9
Cobalt	--	--	MG/KG	5.42	4.92	5.28	6.39	5.65	5.56	4.62	5.14
Copper	**50**	270	MG/KG	**50.6**	39.8	**69.7**	49.7	36	32.3	25.1	29.8
Cyanide	27	27	MG/KG	0.72 J	0.33 J	0.44 J-	1.4 J-	0.68 J	0.88 J	0.57 J-	0.65 J-
Iron	--	--	MG/KG	9770	9420	16700	14500	12400	9900	15900	20700
Lead	**63**	400	MG/KG	**460**	**289**	**317**	**769**	**266**	**120**	**256**	**315**
Magnesium	--	--	MG/KG	4360	3360 J	5340	5390	4550	3720	4450	4860
Manganese	**1600**	2000	MG/KG	329	308	347	360	323	328	370	451
Mercury	**0.18**	0.81	MG/KG	**0.57**	**0.304 J**	**0.483**	**0.493**	**0.406**	0.11	**0.321**	**0.589**
Nickel	**30**	310	MG/KG	12.5	10.5	12.3	10.4	11.9	10.4	11.1	10.8
Potassium	--	--	MG/KG	637	483	856	812	1080	679	786	819
Selenium	3.9	180	MG/KG	0.932 J	0.536 J	0.791 J	1.23 J	1 J	0.567 J	1.06 J	1.09 J
Silver	2	180	MG/KG	0.913 U	0.925 U	0.298 J	0.31 J	0.896 U	0.872 U	0.293 J	0.383 J
Sodium	--	--	MG/KG	130 J	101 J	212	214	145 J	117 J	203	195
Thallium	--	--	MG/KG	1.83 U	0.324 J	1.86 U	1.88 U	1.79 U	1.74 U	1.77 U	1.87 U
Vanadium	--	--	MG/KG	18.7	16.9	19.3	19.3	23.3	18	21.8	26.8
Zinc	**109**	10000	MG/KG	**607**	**507**	**446**	**1460**	**509**	**222**	**782**	**620**

Table 5. Summary of Metals in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SDS-21W	SDS-25_26_27E	SDS-25_26_27N	SDS-25_26_27S	SDS-25_26_27W
			Sample Date:	01/06/2020	01/15/2020	01/15/2020	01/15/2020	01/15/2020
			Sample Depth (ft bls):	7 - 7	9 - 9	9 - 9	9 - 9	9 - 9
			Normal Sample or Field Duplicate:	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units					
Aluminum	--	--	MG/KG	4160	5720	4760	4390	3880
Antimony	--	--	MG/KG	1.76 J	1.88 J	2.92 J	2.44 J	1.26 J
Arsenic	**13**	16	MG/KG	5.83	5.12	6.67	7.79	4.14
Barium	**350**	400	MG/KG	**1140**	**1440**	**1500**	**2160**	**880**
Beryllium	7.2	72	MG/KG	0.123 J	0.21 J	0.182 J	0.27 J	0.344 J
Cadmium	2.5	4.3	MG/KG	1.15	0.391 J	0.422 J	0.84 J	0.955 U
Calcium	--	--	MG/KG	42700	39100	58800	37900	29000
Chromium, Hexavalent	**1**	110	MG/KG	0.58 J	0.971 U	0.976 U	0.985 U	0.984 U
Chromium, Total	30	180	MG/KG	12.8	15.5	20	17.9	9.74
Cobalt	--	--	MG/KG	4.15	5.48	5.25	6.18	6.19
Copper	**50**	270	MG/KG	18.1	43.8	30.8	42.9	44.8
Cyanide	27	27	MG/KG	4.3 J-	0.88 J	1.8	0.62 J	0.87 J
Iron	--	--	MG/KG	11400	10400	12400	15700	13400
Lead	**63**	400	MG/KG	**438**	**374**	**473**	**379**	**246**
Magnesium	--	--	MG/KG	4280	4250	6830	3950	3170
Manganese	**1600**	2000	MG/KG	346	314	374	364	339
Mercury	**0.18**	0.81	MG/KG	**0.257**	**0.683**	**0.381**	**0.907**	**0.57**
Nickel	**30**	310	MG/KG	8.38	13	11.3	12.4	10.9
Potassium	--	--	MG/KG	758	769	918	873	541
Selenium	3.9	180	MG/KG	0.83 J	0.487 J	0.902 J	0.681 J	0.334 J
Silver	2	180	MG/KG	0.944 U	0.955 U	0.959 U	0.933 U	0.955 U
Sodium	--	--	MG/KG	154 J	189 J	220	183 J	120 J
Thallium	--	--	MG/KG	1.89 U	1.91 U	1.92 U	1.86 U	1.91 U
Vanadium	--	--	MG/KG	22.2	15	21.4	18.4	38
Zinc	**109**	10000	MG/KG	**891**	**1050**	**1910**	**1730**	**584**

Table 5. Summary of Metals in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SDS-28_29_30E	SDS-28_29_30N	SDS-28_29_30S	SDS-28_29_30W	SDS-4	SDS-5
			Sample Date:	01/06/2020	01/06/2020	01/06/2020	01/06/2020	01/07/2020	01/07/2020
			Sample Depth (ft bls):	9 - 9	9 - 9	9 - 9	9 - 9	7.5 - 7.5	7.5 - 7.5
			Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
Aluminum	--	--	MG/KG	6110	4620	4760	4850	2620	3330
Antimony	--	--	MG/KG	0.983 J	1.13 J	0.764 J	1.19 J	1.6 J	1.32 J
Arsenic	**13**	16	MG/KG	5.47	5.61	4.9	5.81	8.67	5.88
Barium	**350**	400	MG/KG	**696**	**714**	**715**	**674**	**640**	**475**
Beryllium	7.2	72	MG/KG	0.451 U	0.047 J	0.064 J	0.453 U	0.115 J	0.116 J
Cadmium	2.5	4.3	MG/KG	1.24	1.31	1.16	1.42	1.35	0.743 J
Calcium	--	--	MG/KG	33700	72700	37600	35000	74700	50000
Chromium, Hexavalent	**1**	110	MG/KG	0.943 U	0.958 U	0.94 U	0.927 U	1 U	0.941 U
Chromium, Total	30	180	MG/KG	13.9	14.7	14.6	15.9	13.5	9.53
Cobalt	--	--	MG/KG	5.23	5.43	4.92	5.32	3.94	3.66
Copper	**50**	270	MG/KG	39.3	32.7	39.1	38.9	17.4	31.4
Cyanide	27	27	MG/KG	0.7 J-	0.66 J-	0.4 J-	0.83 J	1.2	0.47 J
Iron	--	--	MG/KG	14500	12100	13500	18600	10100	10000
Lead	**63**	400	MG/KG	**248**	**253**	**235**	**238**	**464**	**249**
Magnesium	--	--	MG/KG	4230	5260	5000	5130	4190	5370
Manganese	**1600**	2000	MG/KG	364	323	315	330	241	243
Mercury	**0.18**	0.81	MG/KG	**0.432**	**0.402**	**2.38**	**0.513**	**0.311**	**0.384**
Nickel	**30**	310	MG/KG	11	10.6	10.3	13.9	6.15	14.7
Potassium	--	--	MG/KG	953	930	897	970	428	520
Selenium	3.9	180	MG/KG	0.874 J	0.884 J	0.883 J	0.951 J	1 J	1.01 J
Silver	2	180	MG/KG	0.279 J	0.94 U	0.92 U	0.344 J	0.962 U	0.895 U
Sodium	--	--	MG/KG	274	274	246	212	163 J	193
Thallium	--	--	MG/KG	1.8 U	1.88 U	1.84 U	1.81 U	1.92 U	0.358 J
Vanadium	--	--	MG/KG	18.5	17.5	19.3	19.2	17.4	66
Zinc	**109**	10000	MG/KG	**535**	**872**	**503**	**534**	**979**	**588**

Table 5. Summary of Metals in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SDS-8	SDS-9
			Sample Date:	10/22/2019	10/22/2019
			Sample Depth (ft bls):	6 - 6	6 - 6
			Normal Sample or Field Duplicate:	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units		
Aluminum	--	--	MG/KG	6340	4850
Antimony	--	--	MG/KG	0.834 J	0.467 J
Arsenic	**13**	16	MG/KG	9.22	3.27
Barium	**350**	400	MG/KG	87.3	148
Beryllium	7.2	72	MG/KG	0.291 J	0.278 J
Cadmium	2.5	4.3	MG/KG	0.894 J	0.549 J
Calcium	--	--	MG/KG	3510	4330
Chromium, Hexavalent	**1**	110	MG/KG	1 U	0.871 U
Chromium, Total	30	180	MG/KG	9.93	9.57
Cobalt	--	--	MG/KG	6.23	4.78
Copper	**50**	270	MG/KG	26.4	29.3
Cyanide	27	27	MG/KG	0.48 J-	1 UJ
Iron	--	--	MG/KG	13600	10100
Lead	**63**	400	MG/KG	**74.4**	**235**
Magnesium	--	--	MG/KG	2560	2260
Manganese	**1600**	2000	MG/KG	275	1200
Mercury	**0.18**	0.81	MG/KG	**0.692**	0.065 J
Nickel	**30**	310	MG/KG	16	15.8
Potassium	--	--	MG/KG	389	419
Selenium	3.9	180	MG/KG	0.764 J	0.598 J
Silver	2	180	MG/KG	1 U	0.819 U
Sodium	--	--	MG/KG	68.1 J	53.9 J
Thallium	--	--	MG/KG	0.332 J	0.336 J
Vanadium	--	--	MG/KG	21.3	18.5
Zinc	**109**	10000	MG/KG	**394**	95.6

Table 6. Summary of Polychlorinated Biphenyls in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	BDS-1	BDS-13	BDS-14	BDS-15	BDS-15	BDS-16_SDS-6
			Sample Date:	11/11/2019	05/05/2020	05/05/2020	05/05/2020	05/05/2020	01/15/2020
			Sample Depth (ft bls):	15 - 17	9 - 10	2 - 4	1 - 2	1 - 2	6 - 7
			Normal Sample or Field Duplicate:	N	N	N	N	FD	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
PCB-1016 (Aroclor 1016)	--	--	MG/KG	0.035 U	0.0339 U	0.0349 U	0.0372 U	0.0349 U	0.0408 U
PCB-1221 (Aroclor 1221)	--	--	MG/KG	0.035 U	0.0339 U	0.0349 U	0.0372 U	0.0349 U	0.0408 U
PCB-1232 (Aroclor 1232)	--	--	MG/KG	0.035 U	0.0339 U	0.0349 U	0.0372 U	0.0349 U	0.0408 U
PCB-1242 (Aroclor 1242)	--	--	MG/KG	0.035 U	0.0339 U	0.0349 U	0.0372 U	0.0349 U	0.0408 U
PCB-1248 (Aroclor 1248)	--	--	MG/KG	0.035 U	0.0339 U	0.0349 U	0.0372 U	0.0349 U	0.0408 U
PCB-1254 (Aroclor 1254)	--	--	MG/KG	0.035 U	0.00891 J	0.0488	0.572 J	0.0786 J	0.0408 U
PCB-1260 (Aroclor 1260)	--	--	MG/KG	0.035 U	0.0073 J	0.0591	0.0372 U	0.0596	0.0385 J
PCB-1262 (Aroclor 1262)	--	--	MG/KG	0.035 U	0.0339 U	0.0349 U	0.0372 U	0.0349 U	0.0408 U
PCB-1268 (Aroclor 1268)	--	--	MG/KG	0.035 U	0.0339 U	0.0349 U	0.0372 U	0.0349 U	0.0153 J
Polychlorinated Biphenyl (PCBs)	**0.1**	1	MG/KG	0.035 U	0.0162 J	**0.108**	**0.572 J**	**0.138 J**	0.0538 J

Table 6. Summary of Polychlorinated Biphenyls in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	BDS-17_SDS-7	BDS-2	BDS-21A	BDS-21B	BDS-22	BDS-23
			Sample Date:	01/15/2020	11/11/2019	01/06/2020	01/06/2020	11/11/2019	11/11/2019
			Sample Depth (ft bls):	6 - 7	12 - 14	6 - 8	6 - 8	12 - 14	12 - 14
			Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
PCB-1016 (Aroclor 1016)	--	--	MG/KG	0.0396 U	0.0365 U	0.0386 U	0.0383 U	0.0388 U	0.036 U
PCB-1221 (Aroclor 1221)	--	--	MG/KG	0.0396 U	0.0365 U	0.0386 U	0.0383 U	0.0388 U	0.036 U
PCB-1232 (Aroclor 1232)	--	--	MG/KG	0.0396 U	0.0365 U	0.0386 U	0.0383 U	0.0388 U	0.036 U
PCB-1242 (Aroclor 1242)	--	--	MG/KG	0.0396 U	0.0365 U	0.0386 U	0.0383 U	0.0388 U	0.036 U
PCB-1248 (Aroclor 1248)	--	--	MG/KG	0.0396 U	0.0365 U	0.0386 U	0.0383 U	0.0388 U	0.036 U
PCB-1254 (Aroclor 1254)	--	--	MG/KG	0.0396 U	0.00853 J	0.0479	0.0383 U	0.00923 J	0.036 U
PCB-1260 (Aroclor 1260)	--	--	MG/KG	0.0185 J	0.0365 U	0.0342 J	0.0288 J	0.0388 U	0.0103 J
PCB-1262 (Aroclor 1262)	--	--	MG/KG	0.0396 U	0.0365 U	0.0386 U	0.0383 U	0.0388 U	0.036 U
PCB-1268 (Aroclor 1268)	--	--	MG/KG	0.0158 J	0.0365 U	0.0386 U	0.0383 U	0.0388 U	0.036 U
Polychlorinated Biphenyl (PCBs)	**0.1**	1	MG/KG	0.0343 J	0.00853 J	0.0821 J	0.0288 J	0.00923 J	0.0103 J

Table 6. Summary of Polychlorinated Biphenyls in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	BDS-24	BDS-25	BDS-26	BDS-27	BDS-28	BDS-29	BDS-3
			Sample Date:	11/11/2019	01/15/2020	01/15/2020	01/15/2020	01/06/2020	01/06/2020	11/11/2019
			Sample Depth (ft bls):	12 - 14	8 - 10	8 - 10	8 - 10	8 - 10	8 - 10	12 - 14
			Normal Sample or Field Duplicate:	N	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units							
PCB-1016 (Aroclor 1016)	--	--	MG/KG	0.0386 U	0.0401 U	0.0395 U	0.0402 U	0.0377 U	0.0394 U	0.037 U
PCB-1221 (Aroclor 1221)	--	--	MG/KG	0.0386 U	0.0401 U	0.0395 U	0.0402 U	0.0377 U	0.0394 U	0.037 U
PCB-1232 (Aroclor 1232)	--	--	MG/KG	0.0386 U	0.0401 U	0.0395 U	0.0402 U	0.0377 U	0.0394 U	0.037 U
PCB-1242 (Aroclor 1242)	--	--	MG/KG	0.0386 U	0.0401 U	0.0395 U	0.0402 U	0.0377 U	0.0394 U	0.037 U
PCB-1248 (Aroclor 1248)	--	--	MG/KG	0.0386 U	0.0401 U	0.0395 U	0.0402 U	0.0377 U	0.0394 U	0.037 U
PCB-1254 (Aroclor 1254)	--	--	MG/KG	0.0386 U	0.0401 U	0.0395 U	0.0402 U	0.0563 J	0.0987	0.037 U
PCB-1260 (Aroclor 1260)	--	--	MG/KG	0.0386 U	0.0223 J	0.0295 J	0.0251 J	0.0368 J	0.0669	0.037 U
PCB-1262 (Aroclor 1262)	--	--	MG/KG	0.0386 U	0.0401 U	0.0395 U	0.0402 U	0.0377 U	0.0394 U	0.037 U
PCB-1268 (Aroclor 1268)	--	--	MG/KG	0.0386 U	0.0401 U	0.0158 J	0.0158 J	0.017 J	0.0189 J	0.037 U
Polychlorinated Biphenyl (PCBs)	**0.1**	1	MG/KG	0.0386 U	0.0223 J	0.0453 J	0.0409 J	**0.11 J**	**0.185 J**	0.037 U

Table 6. Summary of Polychlorinated Biphenyls in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	**BDS-3**	**BDS-30**	**BDS-3A**	**SB-18**	**SB-19**	**SB-20**	**SB-21**
			Sample Date:	**11/11/2019**	**01/06/2020**	**05/05/2020**	**04/17/2019**	**04/18/2019**	**04/17/2019**	**04/17/2019**
			Sample Depth (ft bls):	**12 - 14**	**8 - 10**	**13 - 14**	**2 - 4**	**2 - 4**	**2 - 4**	**2 - 4**
			Normal Sample or Field Duplicate:	**FD**	**N**	**N**	**N**	**N**	**N**	**N**
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units							
PCB-1016 (Aroclor 1016)	--	--	MG/KG	0.0368 U	0.0386 U	0.0333 U	0.039 U	0.0385 U	0.0411 U	0.0394 U
PCB-1221 (Aroclor 1221)	--	--	MG/KG	0.0368 U	0.0386 U	0.0333 U	0.039 U	0.0385 U	0.0411 U	0.0394 U
PCB-1232 (Aroclor 1232)	--	--	MG/KG	0.0368 U	0.0386 U	0.0333 U	0.039 U	0.0385 U	0.0411 U	0.0394 U
PCB-1242 (Aroclor 1242)	--	--	MG/KG	0.0368 U	0.0386 U	0.0333 U	0.039 U	0.0385 U	0.0411 U	0.0394 U
PCB-1248 (Aroclor 1248)	--	--	MG/KG	0.0368 U	0.0386 U	0.0333 U	0.039 U	0.0385 U	0.0411 U	0.0394 U
PCB-1254 (Aroclor 1254)	--	--	MG/KG	0.0368 U	0.0946	0.00554 J	0.039 U	0.0385 U	0.0411 U	0.0394 U
PCB-1260 (Aroclor 1260)	--	--	MG/KG	0.0368 U	0.0449	0.0333 U	0.043	0.0514	0.0411 U	0.0115 J
PCB-1262 (Aroclor 1262)	--	--	MG/KG	0.0368 U	0.0386 U	0.0333 U	0.039 U	0.0385 U	0.0411 U	0.0394 U
PCB-1268 (Aroclor 1268)	--	--	MG/KG	0.0368 U	0.0153 J	0.0333 U	0.039 U	0.0385 U	0.0241 J	0.0394 U
Polychlorinated Biphenyl (PCBs)	**0.1**	1	MG/KG	0.0368 U	**0.155 J**	0.00554 J	0.043	0.0514	0.0241 J	0.0115 J

Table 6. Summary of Polychlorinated Biphenyls in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SB-22	SB-23	SB-24	SB-25	SB-25	SB-25	SB-34
			Sample Date:	04/16/2019	04/18/2019	04/15/2019	04/18/2019	04/18/2019	04/23/2019	04/17/2019
			Sample Depth (ft bls):	2 - 4	2 - 4	2 - 4	2 - 4	2 - 4	4 - 6	2 - 4
			Normal Sample or Field Duplicate:	N	N	N	N	FD	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units							
PCB-1016 (Aroclor 1016)	--	--	MG/KG	0.037 U	0.0396 U	0.0436 U	0.0407 U	0.0408 U	0.0371 U	0.0358 U
PCB-1221 (Aroclor 1221)	--	--	MG/KG	0.037 U	0.0396 U	0.0436 U	0.0407 U	0.0408 U	0.0371 U	0.0358 U
PCB-1232 (Aroclor 1232)	--	--	MG/KG	0.037 U	0.0396 U	0.0436 U	0.0407 U	0.0408 U	0.0371 U	0.0358 U
PCB-1242 (Aroclor 1242)	--	--	MG/KG	0.037 U	0.0396 U	0.0436 U	0.0407 U	0.0408 U	0.0371 U	0.0358 U
PCB-1248 (Aroclor 1248)	--	--	MG/KG	0.037 U	0.0396 U	0.0436 U	0.0407 U	0.0408 U	0.0371 U	0.0358 U
PCB-1254 (Aroclor 1254)	--	--	MG/KG	0.037 U	0.0396 U	0.0436 U	0.0407 U	0.0408 U	0.0371 U	0.14
PCB-1260 (Aroclor 1260)	--	--	MG/KG	0.0506	0.0484 J	0.0436 U	0.0492	0.115	0.0378	0.0552
PCB-1262 (Aroclor 1262)	--	--	MG/KG	0.037 U	0.0396 U	0.0436 U	0.0407 U	0.0408 U	0.0371 U	0.0358 U
PCB-1268 (Aroclor 1268)	--	--	MG/KG	0.037 U	0.0396 U	0.0214 J	0.0407 U	0.0408 U	0.0106 J	0.0358 U
Polychlorinated Biphenyl (PCBs)	**0.1**	1	MG/KG	0.0506	0.0484	0.0214 J	0.0492	**0.115**	0.0484 J	**0.195**

Table 6. Summary of Polychlorinated Biphenyls in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SB-34	SB-35	SDS-1	SDS-1	SDS-10	SDS-11	SDS-12
			Sample Date:	04/18/2019	04/16/2019	01/07/2020	01/07/2020	01/06/2020	01/06/2020	01/07/2020
			Sample Depth (ft bls):	4 - 6	2 - 4	6 - 6	6 - 6	7.5 - 7.5	7.5 - 7.5	7.5 - 7.5
			Normal Sample or Field Duplicate:	N	N	FD	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units							
PCB-1016 (Aroclor 1016)	--	--	MG/KG	0.0414 U	0.0392 U	0.0372 U	0.0376 U	0.038 U	0.0391 U	0.0371 U
PCB-1221 (Aroclor 1221)	--	--	MG/KG	0.0414 U	0.0392 U	0.0372 U	0.0376 U	0.038 U	0.0391 U	0.0371 U
PCB-1232 (Aroclor 1232)	--	--	MG/KG	0.0414 U	0.0392 U	0.0372 U	0.0376 U	0.038 U	0.0391 U	0.0371 U
PCB-1242 (Aroclor 1242)	--	--	MG/KG	0.0414 U	0.0392 U	0.0372 U	0.0376 U	0.038 U	0.0391 U	0.0371 U
PCB-1248 (Aroclor 1248)	--	--	MG/KG	0.0414 U	0.0392 U	0.0372 U	0.0376 U	0.038 U	0.0391 U	0.0371 U
PCB-1254 (Aroclor 1254)	--	--	MG/KG	0.0414 U	0.028 J	0.0372 U	0.0466	0.038 U	0.0391 U	0.0371 U
PCB-1260 (Aroclor 1260)	--	--	MG/KG	0.0414 U	0.0182 J	0.0248 J	0.0227 J	0.0372 J	0.0391 U	0.0728
PCB-1262 (Aroclor 1262)	--	--	MG/KG	0.0414 U	0.0392 U	0.0372 U	0.0376 U	0.038 U	0.0391 U	0.0371 U
PCB-1268 (Aroclor 1268)	--	--	MG/KG	0.0414 U	0.0392 U	0.0372 U	0.0154 J	0.038 U	0.0391 U	0.0371 U
Polychlorinated Biphenyl (PCBs)	**0.1**	1	MG/KG	0.0414 U	0.0462 J	0.0248 J	0.0847 J	0.0372 J	0.0391 U	0.0728

Table 6. Summary of Polychlorinated Biphenyls in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SDS-2	SDS-21E	SDS-21S	SDS-21W	SDS-25_26_27E	SDS-25_26_27N
			Sample Date:	01/07/2020	01/06/2020	01/06/2020	01/06/2020	01/15/2020	01/15/2020
			Sample Depth (ft bls):	6 - 6	7 - 7	7 - 7	7 - 7	9 - 9	9 - 9
			Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
PCB-1016 (Aroclor 1016)	--	--	MG/KG	0.0356 U	0.038 U	0.0384 U	0.0396 U	0.0392 U	0.0394 U
PCB-1221 (Aroclor 1221)	--	--	MG/KG	0.0356 U	0.038 U	0.0384 U	0.0396 U	0.0392 U	0.0394 U
PCB-1232 (Aroclor 1232)	--	--	MG/KG	0.0356 U	0.038 U	0.0384 U	0.0396 U	0.0392 U	0.0394 U
PCB-1242 (Aroclor 1242)	--	--	MG/KG	0.0356 U	0.038 U	0.0384 U	0.0396 U	0.225 NJ	0.0394 U
PCB-1248 (Aroclor 1248)	--	--	MG/KG	0.0356 U	0.038 U	0.0384 U	0.0396 U	0.0392 U	0.0394 U
PCB-1254 (Aroclor 1254)	--	--	MG/KG	0.0358	0.038 U	0.0384 U	0.0396 U	0.0392 U	0.0394 U
PCB-1260 (Aroclor 1260)	--	--	MG/KG	0.0479	0.0167 J	0.0155 J	0.0237 J	0.0286 J	0.0327 J
PCB-1262 (Aroclor 1262)	--	--	MG/KG	0.0356 U	0.038 U	0.0384 U	0.0396 U	0.0392 U	0.0394 U
PCB-1268 (Aroclor 1268)	--	--	MG/KG	0.0356 U	0.038 U	0.0384 U	0.0396 U	0.0154 J	0.017 J
Polychlorinated Biphenyl (PCBs)	**0.1**	1	MG/KG	0.0837	0.0167 J	0.0155 J	0.0237 J	**0.269 J**	0.0497 J

Table 6. Summary of Polychlorinated Biphenyls in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SDS-25_26_27S	SDS-25_26_27W	SDS-28_29_30E	SDS-28_29_30N	SDS-28_29_30S
			Sample Date:	01/15/2020	01/15/2020	01/06/2020	01/06/2020	01/06/2020
			Sample Depth (ft bls):	9 - 9	9 - 9	9 - 9	9 - 9	9 - 9
			Normal Sample or Field Duplicate:	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units					
PCB-1016 (Aroclor 1016)	--	--	MG/KG	0.0395 U	0.0395 U	0.0382 U	0.0378 U	0.0373 U
PCB-1221 (Aroclor 1221)	--	--	MG/KG	0.0395 U	0.0395 U	0.0382 U	0.0378 U	0.0373 U
PCB-1232 (Aroclor 1232)	--	--	MG/KG	0.0395 U	0.0395 U	0.0382 U	0.0378 U	0.0373 U
PCB-1242 (Aroclor 1242)	--	--	MG/KG	0.0395 U	0.0395 U	0.0382 U	0.0378 U	0.0373 U
PCB-1248 (Aroclor 1248)	--	--	MG/KG	0.0395 U	0.0395 U	0.0382 U	0.0378 U	0.243
PCB-1254 (Aroclor 1254)	--	--	MG/KG	0.0395 U	0.0395 U	0.0852	0.101	0.19 J
PCB-1260 (Aroclor 1260)	--	--	MG/KG	0.0173 J	0.0202 J	0.0509	0.0432	0.0846
PCB-1262 (Aroclor 1262)	--	--	MG/KG	0.0395 U	0.0395 U	0.0382 U	0.0378 U	0.0373 U
PCB-1268 (Aroclor 1268)	--	--	MG/KG	0.00886 J	0.0148 J	0.0182 J	0.016 J	0.021 J
Polychlorinated Biphenyl (PCBs)	**0.1**	1	MG/KG	0.0262 J	0.035 J	**0.154 J**	**0.16 J**	**0.539 J**

Table 6. Summary of Polychlorinated Biphenyls in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SDS-28_29_30W	SDS-4	SDS-5	SDS-8	SDS-9
			Sample Date:	01/06/2020	01/07/2020	01/07/2020	10/22/2019	10/22/2019
			Sample Depth (ft bls):	9 - 9	7.5 - 7.5	7.5 - 7.5	6 - 6	6 - 6
			Normal Sample or Field Duplicate:	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units					
PCB-1016 (Aroclor 1016)	--	--	MG/KG	0.0385 U	0.0394 U	0.0384 U	0.0397 U	0.036 U
PCB-1221 (Aroclor 1221)	--	--	MG/KG	0.0385 U	0.0394 U	0.0384 U	0.0397 U	0.036 U
PCB-1232 (Aroclor 1232)	--	--	MG/KG	0.0385 U	0.0394 U	0.0384 U	0.0397 U	0.036 U
PCB-1242 (Aroclor 1242)	--	--	MG/KG	0.0385 U	0.0394 U	0.0384 U	0.0397 U	0.036 U
PCB-1248 (Aroclor 1248)	--	--	MG/KG	0.0385 U	0.0394 U	0.0384 U	0.0397 U	0.036 U
PCB-1254 (Aroclor 1254)	--	--	MG/KG	0.0904	0.101	0.0277 J	0.0371 J	0.00509 J
PCB-1260 (Aroclor 1260)	--	--	MG/KG	0.0388	0.142	0.0351 J	0.0397 U	0.036 U
PCB-1262 (Aroclor 1262)	--	--	MG/KG	0.0385 U	0.0394 U	0.0384 U	0.0397 U	0.036 U
PCB-1268 (Aroclor 1268)	--	--	MG/KG	0.0149 J	0.0394 U	0.0384 U	0.0397 U	0.036 U
Polychlorinated Biphenyl (PCBs)	**0.1**	1	MG/KG	**0.144 J**	**0.243**	0.0628 J	0.0371 J	0.00509 J

Table 7. Summary of Pesticides and Herbicides in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	**BDS-1**	**BDS-13**	**BDS-14**	**BDS-15**	**BDS-15**	**BDS-16_SDS-6**
			Sample Date:	**11/11/2019**	**05/05/2020**	**05/05/2020**	**05/05/2020**	**05/05/2020**	**01/15/2020**
			Sample Depth (ft bls):	**15 - 17**	**9 - 10**	**2 - 4**	**1 - 2**	**1 - 2**	**6 - 7**
			Normal Sample or Field Duplicate:	**N**	**N**	**N**	**N**	**FD**	**N**
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
2,4-D (Dichlorophenoxyacetic Acid)	--	--	MG/KG	0.179 U	0.173 U	0.18 U	0.188 U	0.18 U	0.204 U
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	MG/KG	0.179 U	0.173 U	0.18 U	0.188 U	0.18 U	0.204 U
Aldrin	0.005	0.097	MG/KG	0.00168 U	0.00163 U	0.00169 U	0.0018 U	0.00172 U	0.00194 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	MG/KG	0.000698 U	0.000678 U	0.000706 U	0.00075 U	0.000718 U	0.000809 U
Alpha Endosulfan	2.4	24	MG/KG	0.00168 U	0.00163 U	0.00169 U	0.0018 U	0.00172 U	0.00194 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	MG/KG	0.00168 U	0.00163 U	0.00169 U	0.0018 U	0.00172 U	0.00194 U
Beta Endosulfan	2.4	24	MG/KG	0.00168 U	0.00163 U	0.00169 U	0.0018 U	0.00172 U	0.00194 U
Chlordane	--	--	MG/KG	0.0136 U	0.0106 J	0.174	0.302 J	0.325	0.492 J
cis-Chlordane	**0.094**	4.2	MG/KG	0.00209 U	0.00178 J	0.0321	0.04 J	0.0444 J	0.0781
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	MG/KG	0.00168 U	0.00163 U	0.00169 U	0.00109 J	0.00172 U	0.00194 U
Dieldrin	**0.005**	0.2	MG/KG	0.00105 U	0.00105	**0.0343**	**0.0232 J**	**0.0229**	**0.0479**
Endosulfan Sulfate	2.4	24	MG/KG	0.000698 U	0.000678 U	0.000706 U	0.00075 UJ	0.000718 U	0.000809 U
Endrin	0.014	11	MG/KG	0.000698 U	0.000678 U	0.000706 U	0.00075 U	0.000718 U	0.000809 U
Endrin Aldehyde	--	--	MG/KG	0.00209 U	0.00203 U	0.00212 U	0.00225 U	0.00215 U	0.00243 U
Endrin Ketone	--	--	MG/KG	0.00168 U	0.00163 U	0.00169 U	0.0018 U	0.0216	0.00194 U
Gamma Bhc (Lindane)	0.1	1.3	MG/KG	0.000698 U	0.000678 U	0.000706 U	0.00075 U	0.000718 U	0.000809 U
Heptachlor	0.042	2.1	MG/KG	0.000838 U	0.000813 U	0.00113	0.00142 J	0.00231	0.000971 U
Heptachlor Epoxide	--	--	MG/KG	0.00314 U	0.00305 U	0.00313 J	0.00391 J	0.00323 U	0.00477 J
Methoxychlor	--	--	MG/KG	0.00314 U	0.00305 U	0.00318 U	0.00338 U	0.00323 U	0.00364 U
P,P'-DDD	**0.0033**	13	MG/KG	0.00168 U	0.000979 J	**0.0207**	**0.0211 J**	**0.0247**	**0.0383**
P,P'-DDE	**0.0033**	8.9	MG/KG	0.000387 J	0.003	**0.0671**	**0.0811 J**	**0.0985**	**0.271**
P,P'-DDT	**0.0033**	7.9	MG/KG	0.00314 U	**0.0135**	**0.229**	**0.507 J**	**0.48**	**0.923**
Silvex (2,4,5-TP)	3.8	100	MG/KG	0.179 U	0.173 U	0.18 U	0.188 U	0.18 U	0.204 U
Toxaphene	--	--	MG/KG	0.0314 U	0.0305 U	0.0318 U	0.0338 U	0.0323 U	0.0364 U
trans-Chlordane	--	--	MG/KG	0.00209 U	0.00141 J	0.0203 J	0.0397 J	0.0455	0.053 J

Table 7. Summary of Pesticides and Herbicides in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	BDS-17_SDS-7	BDS-2	BDS-21A	BDS-21B	BDS-22	BDS-23
			Sample Date:	01/15/2020	11/11/2019	01/06/2020	01/06/2020	11/11/2019	11/11/2019
			Sample Depth (ft bls):	6 - 7	12 - 14	6 - 8	6 - 8	12 - 14	12 - 14
			Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
2,4-D (Dichlorophenoxyacetic Acid)	--	--	MG/KG	0.198 U	0.181 U	0.199 U	0.198 U	0.19 U	0.179 U
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	MG/KG	0.198 U	0.181 U	0.199 U	0.198 U	0.19 U	0.179 U
Aldrin	0.005	0.097	MG/KG	0.00186 U	0.00167 U	0.0188 U	0.00181 U	0.00178 U	0.00167 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	MG/KG	0.000777 U	0.000695 U	0.00784 U	0.000754 U	0.000744 U	0.000697 U
Alpha Endosulfan	2.4	24	MG/KG	0.00186 U	0.00167 U	0.0188 U	0.00181 U	0.00178 U	0.00167 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	MG/KG	0.00186 U	0.00167 U	0.0188 U	0.00181 U	0.00178 U	0.00167 U
Beta Endosulfan	2.4	24	MG/KG	0.00186 U	0.00167 U	0.0188 U	0.00181 U	0.00178 U	0.00167 U
Chlordane	--	--	MG/KG	0.395 J	0.0289	0.884 J	0.765	0.0401 J	0.0478 J
cis-Chlordane	**0.094**	4.2	MG/KG	0.0645	0.00485	0.0928	**0.146**	0.00564	0.00666
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	MG/KG	0.00186 U	0.00167 U	0.0188 U	0.00181 U	0.00178 U	0.00167 U
Dieldrin	**0.005**	0.2	MG/KG	**0.0162**	0.00495	**0.104**	**0.0942**	0.00433	0.00462
Endosulfan Sulfate	2.4	24	MG/KG	0.000777 U	0.000695 U	0.00784 U	0.000754 U	0.000744 U	0.000697 U
Endrin	0.014	11	MG/KG	0.000777 U	0.000695 U	0.00784 U	0.000754 U	0.000744 U	0.000697 U
Endrin Aldehyde	--	--	MG/KG	0.00233 U	0.00208 U	0.0235 U	0.00226 U	0.00223 U	0.00209 U
Endrin Ketone	--	--	MG/KG	0.00186 U	0.00167 U	0.0188 U	0.00181 U	0.00178 U	0.00167 U
Gamma Bhc (Lindane)	0.1	1.3	MG/KG	0.000777 U	0.000695 U	0.00784 U	0.000754 U	0.000744 U	0.000697 U
Heptachlor	0.042	2.1	MG/KG	0.000932 U	0.000834 U	0.00941 U	0.00328 J	0.000892 U	0.000836 U
Heptachlor Epoxide	--	--	MG/KG	0.00453 J	0.00313 U	0.0353 U	0.0034 U	0.00335 U	0.00314 U
Methoxychlor	--	--	MG/KG	0.0035 U	0.00313 U	0.0353 U	0.0034 U	0.00335 U	0.00314 U
P,P'-DDD	**0.0033**	13	MG/KG	**0.0251 J**	0.00298	**0.034 J**	**0.0289**	0.0032 J	**0.00507**
P,P'-DDE	**0.0033**	8.9	MG/KG	**0.188**	**0.0108**	**0.205**	**0.169**	**0.0112**	**0.0152**
P,P'-DDT	**0.0033**	7.9	MG/KG	**1.04**	**0.0492**	**0.574**	**0.505**	**0.059**	**0.0758**
Silvex (2,4,5-TP)	3.8	100	MG/KG	0.198 U	0.181 U	0.199 U	0.198 U	0.19 U	0.179 U
Toxaphene	--	--	MG/KG	0.035 U	0.0313 U	0.353 U	0.034 U	0.0335 U	0.0314 U
trans-Chlordane	--	--	MG/KG	0.0449 J	0.00388 J	0.0616 J	0.108 J	0.00436 J	0.00432 J

Table 7. Summary of Pesticides and Herbicides in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	BDS-24	BDS-25	BDS-26	BDS-27	BDS-28	BDS-29
			Sample Date:	11/11/2019	01/15/2020	01/15/2020	01/15/2020	01/06/2020	01/06/2020
			Sample Depth (ft bls):	12 - 14	8 - 10	8 - 10	8 - 10	8 - 10	8 - 10
			Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
2,4-D (Dichlorophenoxyacetic Acid)	--	--	MG/KG	0.193 U	0.2 U	0.206 U	0.207 U	0.196 U	0.194 U
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	MG/KG	0.193 U	0.2 U	0.206 U	0.207 U	0.196 U	0.194 U
Aldrin	0.005	0.097	MG/KG	0.00185 U	0.0019 U	0.00191 U	0.00201 U	0.00186 U	0.00186 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	MG/KG	0.00077 U	0.000792 U	0.000796 U	0.000838 U	0.000775 U	0.000776 U
Alpha Endosulfan	2.4	24	MG/KG	0.00185 U	0.0019 U	0.00191 U	0.00201 U	0.00186 U	0.00186 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	MG/KG	0.00185 U	0.0019 U	0.00191 U	0.00201 U	0.00186 U	0.00186 U
Beta Endosulfan	2.4	24	MG/KG	0.00185 U	0.0019 U	0.00191 U	0.00201 U	0.00186 U	0.00186 U
Chlordane	--	--	MG/KG	0.0139 J	0.632 J	0.529 J	0.48	0.363	0.286
cis-Chlordane	**0.094**	4.2	MG/KG	0.00114 J	0.0851	0.0664	0.084	0.0648	0.0347 J
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	MG/KG	0.00185 U	0.0019 U	0.000915 J	0.00201 U	0.00186 U	0.00186 U
Dieldrin	**0.005**	0.2	MG/KG	0.00115 U	**0.0612 J**	**0.0642 J**	**0.106**	**0.0502**	**0.0415**
Endosulfan Sulfate	2.4	24	MG/KG	0.00077 U	0.000792 U	0.000796 U	0.000838 U	0.000775 U	0.000776 U
Endrin	0.014	11	MG/KG	0.00077 U	0.000792 U	0.000796 U	0.000838 U	0.000775 U	0.000776 U
Endrin Aldehyde	--	--	MG/KG	0.00231 U	0.00238 U	0.00239 U	0.00252 U	0.00232 U	0.00233 U
Endrin Ketone	--	--	MG/KG	0.00185 U	0.0019 U	0.00191 U	0.00201 U	0.00186 U	0.00186 U
Gamma Bhc (Lindane)	0.1	1.3	MG/KG	0.00077 U	0.000792 U	0.000796 U	0.000838 U	0.000775 U	0.000776 U
Heptachlor	0.042	2.1	MG/KG	0.000923 U	0.00308 J	0.00468	0.00382	0.00274	0.00139
Heptachlor Epoxide	--	--	MG/KG	0.00346 U	0.00388 J	0.00234 J	0.00268 J	0.00543	0.00246 J
Methoxychlor	--	--	MG/KG	0.00346 U	0.00356 U	0.00358 U	0.00377 U	0.00349 U	0.00349 U
P,P'-DDD	**0.0033**	13	MG/KG	0.000862 J	**0.0272 J**	**0.0281 J**	**0.0531**	**0.0277**	**0.0278**
P,P'-DDE	**0.0033**	8.9	MG/KG	0.00168 J	**0.187**	**0.184**	**0.244**	**0.12**	**0.0953**
P,P'-DDT	**0.0033**	7.9	MG/KG	**0.00876**	**1.08**	**0.862**	**1.22**	**0.399**	**0.357**
Silvex (2,4,5-TP)	3.8	100	MG/KG	0.193 U	0.2 U	0.206 U	0.207 U	0.196 U	0.194 U
Toxaphene	--	--	MG/KG	0.0346 U	0.0356 U	0.0358 U	0.0377 U	0.0349 U	0.0349 U
trans-Chlordane	--	--	MG/KG	0.00168 J	0.0613	0.0471	0.0582	0.0428 J	0.0337 J

Table 7. Summary of Pesticides and Herbicides in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	BDS-3	BDS-3	BDS-30	BDS-3A	SB-18	SB-18
			Sample Date:	11/11/2019	11/11/2019	01/06/2020	05/05/2020	04/17/2019	04/22/2019
			Sample Depth (ft bls):	12 - 14	12 - 14	8 - 10	13 - 14	2 - 4	4 - 6
			Normal Sample or Field Duplicate:	N	FD	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
2,4-D (Dichlorophenoxyacetic Acid)	--	--	MG/KG	0.188 U	0.188 U	0.198 U	0.174 U	0.194 U	NA
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	MG/KG	0.188 U	0.188 U	0.198 U	0.174 U	0.194 U	NA
Aldrin	0.005	0.097	MG/KG	0.00174 U	0.00178 U	0.00183 U	0.00164 U	0.00183 U	0.00174 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	MG/KG	0.000727 U	0.000742 U	0.000762 U	0.000684 U	0.000762 U	0.000726 U
Alpha Endosulfan	2.4	24	MG/KG	0.00174 U	0.00178 U	0.00183 U	0.00164 U	0.00183 U	0.00174 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	MG/KG	0.00174 U	0.00178 U	0.00183 U	0.00164 U	0.00183 U	0.00174 U
Beta Endosulfan	2.4	24	MG/KG	0.00174 U	0.00178 U	0.00183 U	0.00164 U	0.00183 U	0.00174 U
Chlordane	--	--	MG/KG	0.0198	0.031 J	0.335	0.0226	0.431	0.422 J
cis-Chlordane	**0.094**	4.2	MG/KG	0.00378	0.00553	0.0602	0.00301 J	0.0587 J	0.0326 J
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	MG/KG	0.00174 U	0.00178 U	0.00183 U	0.00164 U	0.00183 U	0.00174 U
Dieldrin	**0.005**	0.2	MG/KG	0.00324	0.00401	**0.0474**	0.00203	**0.012**	**0.00778**
Endosulfan Sulfate	2.4	24	MG/KG	0.000727 U	0.000742 U	0.000762 U	0.000684 U	0.00165	0.000726 U
Endrin	0.014	11	MG/KG	0.000727 U	0.000742 U	0.000762 U	0.000684 U	0.000762 U	0.000726 U
Endrin Aldehyde	--	--	MG/KG	0.00218 U	0.00223 U	0.00229 U	0.00205 U	0.00229 U	0.00218 U
Endrin Ketone	--	--	MG/KG	0.00174 U	0.00178 U	0.00183 U	0.00164 U	0.00183 U	0.00174 U
Gamma Bhc (Lindane)	0.1	1.3	MG/KG	0.000727 U	0.000742 U	0.000762 U	0.000684 U	0.000762 U	0.000726 U
Heptachlor	0.042	2.1	MG/KG	0.000872 U	0.000891 U	0.00193	0.000821 U	0.000915 U	0.000872 U
Heptachlor Epoxide	--	--	MG/KG	0.00327 U	0.00334 U	0.00539	0.00308 U	0.0135 J	0.0126
Methoxychlor	--	--	MG/KG	0.00327 U	0.00334 U	0.00343 U	0.00308 U	0.00343 U	0.00327 U
P,P'-DDD	**0.0033**	13	MG/KG	0.00311	0.00193 J	**0.0247 J**	0.00295	**0.0205 J**	**0.017**
P,P'-DDE	**0.0033**	8.9	MG/KG	**0.0142**	**0.0242**	**0.104**	**0.00588**	**0.0672**	**0.0397**
P,P'-DDT	**0.0033**	7.9	MG/KG	**0.0622**	**0.122**	**0.461**	**0.0376**	**0.061**	**0.0696**
Silvex (2,4,5-TP)	3.8	100	MG/KG	0.188 U	0.188 U	0.198 U	0.174 U	0.194 U	NA
Toxaphene	--	--	MG/KG	0.0327 U	0.0334 U	0.0343 U	0.0308 U	0.0343 U	0.0327 U
trans-Chlordane	--	--	MG/KG	0.00355 J	0.00427 J	0.041 J	0.00249 J	0.051	0.0252

Table 7. Summary of Pesticides and Herbicides in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SB-18	SB-18	SB-19	SB-19	SB-19	SB-19
			Sample Date:	04/22/2019	04/22/2019	04/18/2019	04/22/2019	04/22/2019	04/22/2019
			Sample Depth (ft bls):	6 - 8	15 - 17	2 - 4	4 - 6	6 - 8	15 - 17
			Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
2,4-D (Dichlorophenoxyacetic Acid)	--	--	MG/KG	NA	NA	0.2 U	NA	NA	NA
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	MG/KG	NA	NA	0.2 U	NA	NA	NA
Aldrin	0.005	0.097	MG/KG	0.0019 U	0.0019 U	0.00186 U	0.00182 U	0.0018 U	0.00188 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	MG/KG	0.000793 U	0.000794 U	0.000775 U	0.000758 U	0.000749 U	0.000784 U
Alpha Endosulfan	2.4	24	MG/KG	0.0019 U	0.0019 U	0.00186 U	0.00182 U	0.0018 U	0.00188 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	MG/KG	0.0019 U	0.0019 U	0.00186 U	0.00182 U	0.0018 U	0.00188 U
Beta Endosulfan	2.4	24	MG/KG	0.0019 U	0.0019 U	0.00174 J	0.00182 U	0.0018 U	0.00188 U
Chlordane	--	--	MG/KG	0.46	0.0155 U	0.532	0.304	0.0146 U	0.0153 U
cis-Chlordane	**0.094**	4.2	MG/KG	0.0591 J	0.00148 J	0.056 J	0.0297 J	0.0114	0.00235 U
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	MG/KG	0.0019 U	0.0019 U	0.00186 U	0.00182 U	0.0018 U	0.00188 U
Dieldrin	**0.005**	0.2	MG/KG	**0.0984**	0.00115 J	**0.0387**	**0.0243**	**0.00665**	0.00118 U
Endosulfan Sulfate	2.4	24	MG/KG	0.000793 U	0.000794 U	0.000775 U	0.000758 U	0.000526 J	0.000784 U
Endrin	0.014	11	MG/KG	0.000793 U	0.000794 U	0.000775 U	0.000758 U	0.000749 U	0.000784 U
Endrin Aldehyde	--	--	MG/KG	0.00238 U	0.00238 U	0.00233 U	0.00227 U	0.00225 U	0.00235 U
Endrin Ketone	--	--	MG/KG	0.0019 U	0.0019 U	0.00186 U	0.00182 U	0.0018 U	0.00188 U
Gamma Bhc (Lindane)	0.1	1.3	MG/KG	0.000793 U	0.000794 U	0.000775 U	0.000758 U	0.000749 U	0.000784 U
Heptachlor	0.042	2.1	MG/KG	0.000951 U	0.000953 U	0.00129	0.000909 U	0.000899 U	0.00094 U
Heptachlor Epoxide	--	--	MG/KG	0.00885 J	0.00357 U	0.00764	0.00586	0.00337 U	0.00352 U
Methoxychlor	--	--	MG/KG	0.00357 U	0.00357 U	0.00349 U	0.00341 U	0.00337 U	0.00352 U
P,P'-DDD	**0.0033**	13	MG/KG	**0.0295 J**	0.0019 U	**0.021**	**0.00812**	**0.00386**	0.00188 U
P,P'-DDE	**0.0033**	8.9	MG/KG	**0.238**	**0.00357**	**0.0583**	**0.0379**	**0.0261**	0.0022
P,P'-DDT	**0.0033**	7.9	MG/KG	**0.66**	**0.0216**	**0.364**	**0.253**	**0.0914**	**0.0117**
Silvex (2,4,5-TP)	3.8	100	MG/KG	NA	NA	0.2 U	NA	NA	NA
Toxaphene	--	--	MG/KG	0.0357 U	0.0357 U	0.0349 U	0.0341 U	0.0337 U	0.0352 U
trans-Chlordane	--	--	MG/KG	0.0566	0.00104 J	0.0594	0.0313	0.00992	0.00169 J

Table 7. Summary of Pesticides and Herbicides in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SB-20	SB-20	SB-20	SB-20	SB-21	SB-21
			Sample Date:	04/17/2019	04/22/2019	04/22/2019	04/22/2019	04/17/2019	04/19/2019
			Sample Depth (ft bls):	2 - 4	4 - 6	6 - 8	15 - 17	2 - 4	4 - 6
			Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
2,4-D (Dichlorophenoxyacetic Acid)	--	--	MG/KG	0.202 U	NA	NA	NA	0.201 U	NA
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	MG/KG	0.202 U	NA	NA	NA	0.201 U	NA
Aldrin	0.005	0.097	MG/KG	0.00194 U	0.00186 U	0.002 U	0.0021 U	0.0019 U	0.00187 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	MG/KG	0.000809 U	0.000776 U	0.000836 U	0.000873 U	0.000792 U	0.000781 U
Alpha Endosulfan	2.4	24	MG/KG	0.00194 U	0.00186 U	0.002 U	0.0021 U	0.0019 U	0.00187 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	MG/KG	0.00194 U	0.00186 U	0.002 U	0.0021 U	0.0019 U	0.00187 U
Beta Endosulfan	2.4	24	MG/KG	0.00194 U	0.00637 J	0.00826 J	0.0021 U	0.00228 J	0.00187 U
Chlordane	--	--	MG/KG	0.575	0.436 J	0.17 J	0.017 U	0.104 J	0.096
cis-Chlordane	**0.094**	4.2	MG/KG	0.0764 J	0.0434	0.0327	0.00262 U	0.0121 J	0.00904 J
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	MG/KG	0.00194 U	0.00186 U	0.002 U	0.0021 U	0.0019 U	0.00187 U
Dieldrin	**0.005**	0.2	MG/KG	**0.144**	**0.0322**	**0.036**	0.00131 U	**0.0133**	**0.0148**
Endosulfan Sulfate	2.4	24	MG/KG	0.000809 U	0.000776 U	0.000836 U	0.000873 U	0.00283 J	0.000781 U
Endrin	0.014	11	MG/KG	0.000809 U	0.000776 U	0.000836 U	0.000873 U	0.000792 U	0.000781 U
Endrin Aldehyde	--	--	MG/KG	0.00243 U	0.00233 U	0.00251 U	0.00262 U	0.00238 U	0.00234 U
Endrin Ketone	--	--	MG/KG	0.00194 U	0.00186 U	0.002 U	0.0021 U	0.0019 U	0.00187 U
Gamma Bhc (Lindane)	0.1	1.3	MG/KG	0.000809 U	0.000776 U	0.000836 U	0.000873 U	0.000792 U	0.000781 U
Heptachlor	0.042	2.1	MG/KG	0.00242 J	0.00255	0.001 U	0.00105 U	0.000773 J	0.000937 U
Heptachlor Epoxide	--	--	MG/KG	0.00484 J	0.00162 J	0.00129 J	0.00393 U	0.00416	0.00146 J
Methoxychlor	--	--	MG/KG	0.00364 U	0.00349 U	0.00376 U	0.00393 U	0.00357 U	0.00351 U
P,P'-DDD	**0.0033**	13	MG/KG	**0.106**	**0.0137**	**0.0214**	0.0021 U	**0.00331 J**	**0.00432 J**
P,P'-DDE	**0.0033**	8.9	MG/KG	**0.244**	**0.0467**	**0.0636**	0.0021 U	**0.0261**	**0.0367**
P,P'-DDT	**0.0033**	7.9	MG/KG	**0.866**	**0.419**	**0.55**	0.00393 U	**0.1**	**0.238**
Silvex (2,4,5-TP)	3.8	100	MG/KG	0.202 U	NA	NA	NA	0.201 U	NA
Toxaphene	--	--	MG/KG	0.0364 U	0.0349 U	0.0376 U	0.0393 U	0.0357 U	0.0351 U
trans-Chlordane	--	--	MG/KG	0.0889	0.046	0.0338 J	0.00262 U	0.0135 J	0.00884

Table 7. Summary of Pesticides and Herbicides in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SB-21	SB-21	SB-22	SB-22	SB-22	SB-22
			Sample Date:	04/19/2019	04/19/2019	04/16/2019	04/22/2019	04/22/2019	04/22/2019
			Sample Depth (ft bls):	6 - 8	15 - 17	2 - 4	4 - 6	6 - 8	15 - 17
			Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
2,4-D (Dichlorophenoxyacetic Acid)	--	--	MG/KG	NA	NA	0.192 U	NA	NA	NA
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	MG/KG	NA	NA	0.192 U	NA	NA	NA
Aldrin	0.005	0.097	MG/KG	0.00232 U	0.00189 U	0.00182 U	0.00197 U	0.00188 U	0.00197 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	MG/KG	0.000969 U	0.000789 U	0.000756 U	0.000821 U	0.000786 U	0.000823 U
Alpha Endosulfan	2.4	24	MG/KG	0.00232 U	0.00189 U	0.00182 U	0.00197 U	0.00188 U	0.00197 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	MG/KG	0.00232 U	0.00189 U	0.00182 U	0.00197 U	0.00188 U	0.00197 U
Beta Endosulfan	2.4	24	MG/KG	0.00232 U	0.00189 U	0.00326 J	0.000775 J	0.00268 J	0.00197 U
Chlordane	--	--	MG/KG	0.0706	0.0154 U	0.352 J	0.384	0.0153 U	0.016 U
cis-Chlordane	**0.094**	4.2	MG/KG	0.00916	0.00237 U	0.0232 J	0.0352 J	0.00236 U	0.00247 U
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	MG/KG	0.00232 U	0.00189 U	0.00182 U	0.00197 U	0.00188 U	0.00197 U
Dieldrin	**0.005**	0.2	MG/KG	**0.0131**	0.00118 U	**0.0381**	**0.0118**	**0.0213**	0.00123 U
Endosulfan Sulfate	2.4	24	MG/KG	0.000969 U	0.000789 U	0.000756 U	0.000821 U	0.000786 U	0.000823 U
Endrin	0.014	11	MG/KG	0.000969 U	0.000789 U	0.000756 U	0.000821 U	0.000786 U	0.000823 U
Endrin Aldehyde	--	--	MG/KG	0.00291 U	0.00237 U	0.00227 U	0.00246 U	0.00236 U	0.00247 U
Endrin Ketone	--	--	MG/KG	0.00232 U	0.00189 U	0.00182 U	0.00197 U	0.00188 U	0.00197 U
Gamma Bhc (Lindane)	0.1	1.3	MG/KG	0.000969 U	0.000789 U	0.000756 U	0.000821 U	0.000786 U	0.000823 U
Heptachlor	0.042	2.1	MG/KG	0.00114 J	0.000947 U	0.000908 U	0.000986 U	0.000943 U	0.000987 U
Heptachlor Epoxide	--	--	MG/KG	0.0014 J	0.00355 U	0.00665	0.00873	0.00354 U	0.0037 U
Methoxychlor	--	--	MG/KG	0.00436 U	0.00355 U	0.0034 U	0.0037 U	0.00354 U	0.0037 U
P,P'-DDD	**0.0033**	13	MG/KG	0.0025 J	0.00189 U	**0.0108**	**0.00614**	**0.0174**	0.00197 U
P,P'-DDE	**0.0033**	8.9	MG/KG	**0.0283**	0.00189 U	**0.0185**	**0.0265**	**0.0273**	0.00197 U
P,P'-DDT	**0.0033**	7.9	MG/KG	**0.214**	0.00355 U	**0.117**	**0.048**	**0.121**	0.0037 U
Silvex (2,4,5-TP)	3.8	100	MG/KG	NA	NA	0.192 U	NA	NA	NA
Toxaphene	--	--	MG/KG	0.0436 U	0.0355 U	0.034 U	0.037 U	0.0354 U	0.037 U
trans-Chlordane	--	--	MG/KG	0.00662	0.00237 U	0.0284	0.0148 J	0.00236 U	0.00247 U

Table 7. Summary of Pesticides and Herbicides in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SB-23	SB-23	SB-23	SB-24	SB-24	SB-24
			Sample Date:	04/18/2019	04/22/2019	04/22/2019	04/15/2019	04/16/2019	04/16/2019
			Sample Depth (ft bls):	2 - 4	4 - 6	6 - 8	2 - 4	4 - 6	6 - 8
			Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
2,4-D (Dichlorophenoxyacetic Acid)	--	--	MG/KG	0.202 U	NA	NA	0.217 U	NA	NA
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	MG/KG	0.202 U	NA	NA	0.217 U	NA	NA
Aldrin	0.005	0.097	MG/KG	0.00176 J	0.0019 U	0.00184 U	0.00203 U	0.00188 U	0.0019 UJ
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	MG/KG	0.000779 U	0.00079 U	0.000766 U	0.000846 U	0.000782 U	0.000791 UJ
Alpha Endosulfan	2.4	24	MG/KG	0.00187 U	0.0019 U	0.00184 U	0.00203 U	0.00188 U	0.0019 UJ
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	MG/KG	0.00187 U	0.0019 U	0.00184 U	0.00203 U	0.00188 U	0.0019 UJ
Beta Endosulfan	2.4	24	MG/KG	0.00708 J	0.0019 U	0.000858 J	0.00658 J	0.00188 U	0.0019 UJ
Chlordane	--	--	MG/KG	0.609	0.241	0.0149 U	0.0165 U	0.125 J	0.291 J
cis-Chlordane	**0.094**	4.2	MG/KG	0.0568 J	0.0281 J	0.0362 J	0.073 J	0.0308	0.066 J
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	MG/KG	0.00187 U	0.0019 U	0.00184 U	0.00203 U	0.00188 U	0.0019 UJ
Dieldrin	**0.005**	0.2	MG/KG	**0.153**	**0.0891**	**0.0264**	**0.0607 J**	**0.0335 J**	**0.0444 J**
Endosulfan Sulfate	2.4	24	MG/KG	0.000779 U	0.00079 U	0.000766 U	0.000846 U	0.000782 U	0.000791 UJ
Endrin	0.014	11	MG/KG	0.000779 U	0.00079 U	0.000766 U	0.000846 U	0.000782 U	0.000791 UJ
Endrin Aldehyde	--	--	MG/KG	0.00234 U	0.00237 U	0.0023 U	0.00254 U	0.00234 U	0.00237 UJ
Endrin Ketone	--	--	MG/KG	0.00187 U	0.0019 U	0.00184 U	0.00203 U	0.00188 U	0.0019 UJ
Gamma Bhc (Lindane)	0.1	1.3	MG/KG	0.000779 U	0.00079 U	0.000766 U	0.000846 U	0.000782 U	0.000791 UJ
Heptachlor	0.042	2.1	MG/KG	0.00109	0.000948 U	0.00092 U	0.00102 U	0.000938 U	0.00136 J
Heptachlor Epoxide	--	--	MG/KG	0.00351 U	0.00356 U	0.00539 J	0.00381 U	0.0029 J	0.00109 J
Methoxychlor	--	--	MG/KG	0.00351 U	0.00356 U	0.00345 U	0.00381 U	0.00352 U	0.00356 UJ
P,P'-DDD	**0.0033**	13	MG/KG	**0.152**	**0.108**	**0.0213**	**0.123 J**	**0.0261 J**	**0.232 J**
P,P'-DDE	**0.0033**	8.9	MG/KG	**0.17**	**0.119**	**0.104**	**0.106 J**	**0.0627**	**0.0716 J**
P,P'-DDT	**0.0033**	7.9	MG/KG	**0.354**	**0.0805**	**0.283**	**0.421 J**	**0.456**	**0.199 J**
Silvex (2,4,5-TP)	3.8	100	MG/KG	0.202 U	NA	NA	0.217 U	NA	NA
Toxaphene	--	--	MG/KG	0.0351 U	0.0356 U	0.0345 U	0.0381 U	0.0352 U	0.0356 UJ
trans-Chlordane	--	--	MG/KG	0.0552	0.0314	0.0463	0.0588 J	0.0239 J	0.0424 J

Table 7. Summary of Pesticides and Herbicides in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SB-25	SB-25	SB-25	SB-25	SB-34	SB-35
			Sample Date:	04/18/2019	04/18/2019	04/23/2019	04/23/2019	04/17/2019	04/16/2019
			Sample Depth (ft bls):	2 - 4	2 - 4	4 - 6	6 - 8	2 - 4	2 - 4
			Normal Sample or Field Duplicate:	N	FD	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
2,4-D (Dichlorophenoxyacetic Acid)	--	--	MG/KG	0.205 U	0.206 U	NA	NA	0.186 U	0.196 U
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	MG/KG	0.205 U	0.206 U	NA	NA	0.186 U	0.196 U
Aldrin	0.005	0.097	MG/KG	0.00154 J	0.00188 U	0.00185 U	0.00168 U	0.00177 U	0.00187 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	MG/KG	0.000819 U	0.000785 U	0.000772 U	0.000701 U	0.000737 U	0.000781 U
Alpha Endosulfan	2.4	24	MG/KG	0.00196 U	0.00188 U	0.00185 U	0.00168 U	0.00177 U	0.00187 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	MG/KG	0.00196 U	0.00188 U	0.00185 U	0.00168 U	0.00177 U	0.00187 U
Beta Endosulfan	2.4	24	MG/KG	0.00437 J	0.00188 U	0.00148 J	0.00168 U	0.00177 U	0.00187 U
Chlordane	--	--	MG/KG	0.335 J	0.35	0.279	0.0137 U	0.228	0.0237 J
cis-Chlordane	**0.094**	4.2	MG/KG	0.0498	0.0579	0.0284 J	0.0105	0.0257 J	0.0192
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	MG/KG	0.00196 U	0.00188 U	0.00185 U	0.00168 U	0.00177 U	0.00187 U
Dieldrin	**0.005**	0.2	MG/KG	**0.0283 J**	**0.0409 J**	**0.0236**	**0.0122**	0.0011 U	**0.0068**
Endosulfan Sulfate	2.4	24	MG/KG	0.000819 U	0.000785 U	0.000772 U	0.000701 U	0.000737 U	0.000781 U
Endrin	0.014	11	MG/KG	0.000819 U	0.000785 U	0.000772 U	0.000701 U	0.000737 U	0.000781 U
Endrin Aldehyde	--	--	MG/KG	0.00246 U	0.00236 U	0.00232 U	0.0021 U	0.00132 J	0.00234 U
Endrin Ketone	--	--	MG/KG	0.00196 U	0.00188 U	0.00185 U	0.00168 U	0.00177 U	0.00187 U
Gamma Bhc (Lindane)	0.1	1.3	MG/KG	0.000819 U	0.000785 U	0.000772 U	0.000701 U	0.000737 U	0.000781 U
Heptachlor	0.042	2.1	MG/KG	0.000982 U	0.00114	0.000926 U	0.000841 U	0.00135	0.000937 U
Heptachlor Epoxide	--	--	MG/KG	0.00356 J	0.00443	0.00566	0.00315 U	0.00332 U	0.00352 U
Methoxychlor	--	--	MG/KG	0.00368 U	0.00353 U	0.00347 U	0.00315 U	0.00332 U	0.00352 U
P,P'-DDD	**0.0033**	13	MG/KG	**0.0599**	**0.0591**	**0.0162**	**0.00912**	0.00177 U	0.00217
P,P'-DDE	**0.0033**	8.9	MG/KG	**0.0822**	**0.0918**	**0.047**	**0.0228**	0.00177 U	**0.0274**
P,P'-DDT	**0.0033**	7.9	MG/KG	**0.37**	**0.291**	**0.193**	**0.122**	0.00332 U	**0.0754**
Silvex (2,4,5-TP)	3.8	100	MG/KG	0.205 U	0.206 U	NA	NA	0.186 U	0.196 U
Toxaphene	--	--	MG/KG	0.0368 U	0.0353 U	0.0347 U	0.0315 U	0.0332 U	0.0352 U
trans-Chlordane	--	--	MG/KG	0.0344	0.0387	0.0248 J	0.00522 J	0.0286	0.0113 J

Table 7. Summary of Pesticides and Herbicides in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SB-35	SB-35	SDS-1	SDS-1	SDS-10	SDS-11
			Sample Date:	04/18/2019	04/18/2019	01/07/2020	01/07/2020	01/06/2020	01/06/2020
			Sample Depth (ft bls):	4 - 6	6 - 8	6 - 6	6 - 6	7.5 - 7.5	7.5 - 7.5
			Normal Sample or Field Duplicate:	N	N	FD	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
2,4-D (Dichlorophenoxyacetic Acid)	--	--	MG/KG	NA	NA	0.191 U	0.188 U	0.194 U	0.203 U
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	MG/KG	NA	NA	0.191 U	0.188 U	0.194 U	0.203 U
Aldrin	0.005	0.097	MG/KG	0.00166 U	0.00174 U	0.0018 U	0.00184 U	0.00187 U	0.00185 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	MG/KG	0.00069 U	0.000726 U	0.000751 U	0.000768 U	0.000781 U	0.000772 U
Alpha Endosulfan	2.4	24	MG/KG	0.00166 U	0.00174 U	0.0018 U	0.00184 U	0.00187 U	0.00185 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	MG/KG	0.00166 U	0.00174 U	0.0018 U	0.00184 U	0.00187 U	0.00185 U
Beta Endosulfan	2.4	24	MG/KG	0.00166 U	0.00174 U	0.0018 U	0.00184 U	0.00187 U	0.00185 U
Chlordane	--	--	MG/KG	0.116 J	0.109 J	0.285	0.354	0.445	1.15 J
cis-Chlordane	**0.094**	4.2	MG/KG	0.0159	0.0101 J	0.058	0.0491 J	0.0718	**0.154**
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	MG/KG	0.00166 U	0.00174 U	0.0018 U	0.00184 U	0.00187 U	0.00185 U
Dieldrin	**0.005**	0.2	MG/KG	**0.0108 J**	**0.0193 J**	**0.0495**	**0.0549**	**0.054**	**0.0782 J**
Endosulfan Sulfate	2.4	24	MG/KG	0.00069 U	0.000726 U	0.000751 U	0.000768 U	0.000781 U	0.000772 U
Endrin	0.014	11	MG/KG	0.00069 U	0.000726 U	0.000751 U	0.000768 U	0.000781 U	0.000772 U
Endrin Aldehyde	--	--	MG/KG	0.00207 U	0.00218 U	0.00225 U	0.0023 U	0.00234 U	0.00232 U
Endrin Ketone	--	--	MG/KG	0.00166 U	0.00174 U	0.0018 U	0.00184 U	0.00187 U	0.00185 U
Gamma Bhc (Lindane)	0.1	1.3	MG/KG	0.00069 U	0.000726 U	0.000751 U	0.000768 U	0.000781 U	0.000772 U
Heptachlor	0.042	2.1	MG/KG	0.000828 U	0.000977	0.00145 J	0.00271 J	0.00196	0.00435 J
Heptachlor Epoxide	--	--	MG/KG	0.00565 J	0.00302 J	0.0025 J	0.00232 J	0.0044 J	0.00469 J
Methoxychlor	--	--	MG/KG	0.0031 U	0.00327 U	0.00338 U	0.00346 U	0.00351 U	0.00347 U
P,P'-DDD	**0.0033**	13	MG/KG	**0.0728**	**0.0365**	**0.0383 J**	**0.075 J**	**0.0204**	**0.0499 J**
P,P'-DDE	**0.0033**	8.9	MG/KG	**0.0246**	**0.0246**	**0.298**	**0.32**	**0.153**	**0.766**
P,P'-DDT	**0.0033**	7.9	MG/KG	**0.112 J**	**0.133 J**	**0.598**	**0.679**	**0.485**	**6.03**
Silvex (2,4,5-TP)	3.8	100	MG/KG	NA	NA	0.191 U	0.188 U	0.194 U	0.203 U
Toxaphene	--	--	MG/KG	0.031 U	0.0327 U	0.0338 U	0.0346 U	0.0351 U	0.0347 U
trans-Chlordane	--	--	MG/KG	0.0117	0.00967 J	0.0339 J	0.0488 J	0.0474 J	0.113 J

Table 7. Summary of Pesticides and Herbicides in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SDS-12	SDS-2	SDS-21E	SDS-21S	SDS-21W	SDS-25_26_27E
			Sample Date:	01/07/2020	01/07/2020	01/06/2020	01/06/2020	01/06/2020	01/15/2020
			Sample Depth (ft bls):	7.5 - 7.5	6 - 6	7 - 7	7 - 7	7 - 7	9 - 9
			Normal Sample or Field Duplicate:	N	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units						
2,4-D (Dichlorophenoxyacetic Acid)	--	--	MG/KG	0.189 U	0.182 U	0.192 U	0.191 U	0.199 U	0.2 U
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	MG/KG	0.189 U	0.182 U	0.192 U	0.191 U	0.199 U	0.2 U
Aldrin	0.005	0.097	MG/KG	0.00177 U	0.0017 U	0.00185 U	0.0018 U	0.00184 U	0.00192 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	MG/KG	0.000736 U	0.00071 U	0.000772 U	0.00075 U	0.000766 U	0.000799 U
Alpha Endosulfan	2.4	24	MG/KG	0.00177 U	0.0017 U	0.00185 U	0.0018 U	0.00184 U	0.00192 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	MG/KG	0.00177 U	0.0017 U	0.00185 U	0.0018 U	0.00184 U	0.00192 U
Beta Endosulfan	2.4	24	MG/KG	0.00177 U	0.0017 U	0.00185 U	0.0018 U	0.00184 U	0.00192 U
Chlordane	--	--	MG/KG	0.453	0.085	0.644	0.714	0.882	0.537 J
cis-Chlordane	**0.094**	4.2	MG/KG	0.06 J	0.0189	**0.116**	**0.124**	**0.135**	0.0723
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	MG/KG	0.00177 U	0.0017 U	0.00185 U	0.0018 U	0.00184 U	0.00192 U
Dieldrin	**0.005**	0.2	MG/KG	**0.129**	**0.0119**	**0.073**	**0.0874**	**0.105**	**0.084 J**
Endosulfan Sulfate	2.4	24	MG/KG	0.000736 U	0.00071 U	0.000772 U	0.00075 U	0.000766 U	0.000799 U
Endrin	0.014	11	MG/KG	0.000736 U	0.00071 U	0.000772 U	0.00075 U	0.000766 U	0.000799 U
Endrin Aldehyde	--	--	MG/KG	0.00221 U	0.00213 U	0.00232 U	0.00225 U	0.0023 U	0.0024 U
Endrin Ketone	--	--	MG/KG	0.00177 U	0.0017 U	0.00185 U	0.0018 U	0.00184 U	0.00192 U
Gamma Bhc (Lindane)	0.1	1.3	MG/KG	0.000736 U	0.00071 U	0.000772 U	0.00075 U	0.000766 U	0.000799 U
Heptachlor	0.042	2.1	MG/KG	0.0052	0.000652 J	0.00199 J	0.00381 J	0.00381 J	0.00359
Heptachlor Epoxide	--	--	MG/KG	0.00478 J	0.0017 J	0.00348 U	0.00338 U	0.00345 U	0.00342 J
Methoxychlor	--	--	MG/KG	0.00331 U	0.00319 U	0.00348 U	0.00338 U	0.00345 U	0.0036 U
P,P'-DDD	**0.0033**	13	MG/KG	**0.0943**	**0.0237**	**0.107**	**0.0362**	**0.0355**	**0.0308 J**
P,P'-DDE	**0.0033**	8.9	MG/KG	**0.162**	**0.0523**	**0.176**	**0.134**	**0.21**	**0.134 J**
P,P'-DDT	**0.0033**	7.9	MG/KG	**0.728**	**0.208**	**0.509**	**0.374**	**0.516**	**0.925**
Silvex (2,4,5-TP)	3.8	100	MG/KG	0.189 U	0.182 U	0.192 U	0.191 U	0.199 U	0.2 U
Toxaphene	--	--	MG/KG	0.0331 U	0.0319 U	0.0348 U	0.0338 U	0.0345 U	0.036 U
trans-Chlordane	--	--	MG/KG	0.0541 J	0.0115 J	0.0802 J	0.0878 J	0.0979 J	0.049 J

Table 7. Summary of Pesticides and Herbicides in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SDS-25_26_27N	SDS-25_26_27S	SDS-25_26_27W	SDS-28_29_30E
			Sample Date:	01/15/2020	01/15/2020	01/15/2020	01/06/2020
			Sample Depth (ft bls):	9 - 9	9 - 9	9 - 9	9 - 9
			Normal Sample or Field Duplicate:	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units				
2,4-D (Dichlorophenoxyacetic Acid)	--	--	MG/KG	0.197 U	0.202 U	0.204 U	0.192 U
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	MG/KG	0.197 U	0.202 U	0.204 U	0.192 U
Aldrin	0.005	0.097	MG/KG	0.00192 U	0.00192 U	0.00193 U	0.00184 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	MG/KG	0.000802 U	0.000799 U	0.000806 U	0.000768 U
Alpha Endosulfan	2.4	24	MG/KG	0.00192 U	0.00192 U	0.00193 U	0.00184 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	MG/KG	0.00192 U	0.00192 U	0.00193 U	0.00184 U
Beta Endosulfan	2.4	24	MG/KG	0.00192 U	0.00192 U	0.00193 U	0.00184 U
Chlordane	--	--	MG/KG	0.684	0.288	0.627	0.296
cis-Chlordane	**0.094**	4.2	MG/KG	**0.108**	0.0491	**0.0955**	0.0526
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	MG/KG	0.00192 U	0.00192 U	0.00193 U	0.00184 U
Dieldrin	**0.005**	0.2	MG/KG	**0.142**	**0.0544**	**0.104**	**0.0379**
Endosulfan Sulfate	2.4	24	MG/KG	0.000802 U	0.000799 U	0.000806 U	0.000768 U
Endrin	0.014	11	MG/KG	0.000802 U	0.000799 U	0.000806 U	0.000768 U
Endrin Aldehyde	--	--	MG/KG	0.00241 U	0.0024 U	0.00242 U	0.0023 U
Endrin Ketone	--	--	MG/KG	0.00192 U	0.00192 U	0.00193 U	0.00184 U
Gamma Bhc (Lindane)	0.1	1.3	MG/KG	0.000802 U	0.000799 U	0.000806 U	0.000768 U
Heptachlor	0.042	2.1	MG/KG	0.00432	0.00324	0.0089	0.00114
Heptachlor Epoxide	--	--	MG/KG	0.00312 J	0.00206 J	0.00444 J	0.00386
Methoxychlor	--	--	MG/KG	0.00361 U	0.00359 U	0.00363 U	0.00345 U
P,P'-DDD	**0.0033**	13	MG/KG	**0.0593**	**0.0268**	**0.0499**	**0.0235**
P,P'-DDE	**0.0033**	8.9	MG/KG	**0.274**	**0.109**	**0.209**	**0.091**
P,P'-DDT	**0.0033**	7.9	MG/KG	**1.2**	**0.524**	**0.988**	**0.362**
Silvex (2,4,5-TP)	3.8	100	MG/KG	0.197 U	0.202 U	0.204 U	0.192 U
Toxaphene	--	--	MG/KG	0.0361 U	0.0359 U	0.0363 U	0.0345 U
trans-Chlordane	--	--	MG/KG	0.073 J	0.0335	0.0662	0.0336 J

Table 7. Summary of Pesticides and Herbicides in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SDS-28_29_30N	SDS-28_29_30S	SDS-28_29_30W	SDS-4	SDS-5
			Sample Date:	01/06/2020	01/06/2020	01/06/2020	01/07/2020	01/07/2020
			Sample Depth (ft bls):	9 - 9	9 - 9	9 - 9	7.5 - 7.5	7.5 - 7.5
			Normal Sample or Field Duplicate:	N	N	N	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units					
2,4-D (Dichlorophenoxyacetic Acid)	--	--	MG/KG	0.197 U	0.192 U	0.192 U	0.206 U	0.192 U
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	MG/KG	0.197 U	0.192 U	0.192 U	0.206 U	0.192 U
Aldrin	0.005	0.097	MG/KG	0.00181 U	0.0018 U	0.0018 U	0.00194 U	0.00177 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	MG/KG	0.000756 U	0.000752 U	0.00075 U	0.00081 U	0.000739 U
Alpha Endosulfan	2.4	24	MG/KG	0.00181 U	0.0018 U	0.0018 U	0.00194 U	0.00177 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	MG/KG	0.00181 U	0.0018 U	0.0018 U	0.00194 U	0.00177 U
Beta Endosulfan	2.4	24	MG/KG	0.00181 U	0.0018 U	0.0018 U	0.00194 U	0.00177 U
Chlordane	--	--	MG/KG	0.321	0.411	0.385 J	0.302 J	0.385
cis-Chlordane	**0.094**	4.2	MG/KG	0.056	0.0726	0.0555	0.0556 J	0.0624 J
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	MG/KG	0.00181 U	0.0018 U	0.0018 U	0.00194 U	0.00177 U
Dieldrin	**0.005**	0.2	MG/KG	**0.0413**	**0.0593**	**0.0419**	**0.05 J**	**0.0432**
Endosulfan Sulfate	2.4	24	MG/KG	0.000756 U	0.000752 U	0.00075 U	0.00081 U	0.000739 U
Endrin	0.014	11	MG/KG	0.000756 U	0.000752 U	0.00075 U	0.00081 U	0.000739 U
Endrin Aldehyde	--	--	MG/KG	0.00227 U	0.00226 U	0.00225 U	0.00243 U	0.00222 U
Endrin Ketone	--	--	MG/KG	0.00181 U	0.0018 U	0.0018 U	0.00194 U	0.00177 U
Gamma Bhc (Lindane)	0.1	1.3	MG/KG	0.000756 U	0.000752 U	0.00075 U	0.00081 U	0.000739 U
Heptachlor	0.042	2.1	MG/KG	0.00142	0.00283	0.00155	0.00242 J	0.00303
Heptachlor Epoxide	--	--	MG/KG	0.00536 J	0.0034 J	0.00528	0.00829 J	0.0034 J
Methoxychlor	--	--	MG/KG	0.0034 U	0.00338 U	0.00338 U	0.00364 U	0.00333 U
P,P'-DDD	**0.0033**	13	MG/KG	**0.0251 J**	**0.0291 J**	**0.0326 J**	**0.0725 J**	**0.0654**
P,P'-DDE	**0.0033**	8.9	MG/KG	**0.104**	**0.128**	**0.105**	**0.164 J**	**0.296**
P,P'-DDT	**0.0033**	7.9	MG/KG	**0.426**	**0.455**	**0.396**	**0.871 J**	**1.08**
Silvex (2,4,5-TP)	3.8	100	MG/KG	0.197 U	0.192 U	0.192 U	0.206 U	0.192 U
Toxaphene	--	--	MG/KG	0.034 U	0.0338 U	0.0338 U	0.0364 U	0.0333 U
trans-Chlordane	--	--	MG/KG	0.0366 J	0.0476 J	0.0356 J	0.0373 J	0.0597 J

Table 7. Summary of Pesticides and Herbicides in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

			Sample Designation:	SDS-8	SDS-9
			Sample Date:	10/22/2019	10/22/2019
			Sample Depth (ft bls):	6 - 6	6 - 6
			Normal Sample or Field Duplicate:	N	N
Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO	Units		
2,4-D (Dichlorophenoxyacetic Acid)	--	--	MG/KG	0.207 U	0.176 U
Acetic acid, (2,4,5-trichlorophenoxy)-	--	--	MG/KG	0.207 U	0.176 U
Aldrin	0.005	0.097	MG/KG	0.00195 U	0.00171 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	0.02	0.48	MG/KG	0.000811 U	0.000712 U
Alpha Endosulfan	2.4	24	MG/KG	0.00195 U	0.00171 U
Beta Bhc (Beta Hexachlorocyclohexane)	0.036	0.36	MG/KG	0.00195 U	0.00171 U
Beta Endosulfan	2.4	24	MG/KG	0.00195 U	0.00171 U
Chlordane	--	--	MG/KG	0.0158 U	0.0139 U
cis-Chlordane	**0.094**	4.2	MG/KG	0.0485	0.00368
Delta BHC (Delta Hexachlorocyclohexane)	0.04	100	MG/KG	0.00195 U	0.00171 U
Dieldrin	**0.005**	0.2	MG/KG	**0.0557**	0.00417
Endosulfan Sulfate	2.4	24	MG/KG	0.000811 U	0.000712 U
Endrin	0.014	11	MG/KG	0.000811 U	0.000712 U
Endrin Aldehyde	--	--	MG/KG	0.00243 U	0.00214 U
Endrin Ketone	--	--	MG/KG	0.00195 U	0.00171 U
Gamma Bhc (Lindane)	0.1	1.3	MG/KG	0.000811 U	0.000712 U
Heptachlor	0.042	2.1	MG/KG	0.000973 U	0.000855 U
Heptachlor Epoxide	--	--	MG/KG	0.00441	0.00161 J
Methoxychlor	--	--	MG/KG	0.00365 U	0.0032 U
P,P'-DDD	**0.0033**	13	MG/KG	**0.0157**	**0.00754**
P,P'-DDE	**0.0033**	8.9	MG/KG	**0.0674**	**0.0113**
P,P'-DDT	**0.0033**	7.9	MG/KG	**0.33**	**0.253**
Silvex (2,4,5-TP)	3.8	100	MG/KG	0.207 U	0.176 U
Toxaphene	--	--	MG/KG	0.0365 U	0.032 U
trans-Chlordane	--	--	MG/KG	0.0249 J	0.00248 J

Table 8. Summary of Per- and Polyfluoroalkyl Substances in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

	Sample Designation:	**BDS-1**	**BDS-13**	**BDS-14**	**BDS-15**	**BDS-15**	**BDS-16_SDS-6**
	Sample Date:	**11/11/2019**	**05/05/2020**	**05/05/2020**	**05/05/2020**	**05/05/2020**	**01/15/2020**
	Sample Depth (ft bls):	**15 - 17**	**9 - 10**	**2 - 4**	**1 - 2**	**1 - 2**	**6 - 7**
	Normal Sample or Field Duplicate:	**N**	**N**	**N**	**N**	**FD**	**N**
Parameter	Units						
2-(N-methyl perfluorooctanesulfonamido) acetic acid	UG/KG	0.202 U	0.203 UJ	0.21 U	0.215 U	0.21 U	0.216 U
N-ethyl perfluorooctanesulfonamidoacetic acid	UG/KG	0.085 U	0.085 UJ	0.088 UJ	0.09 UJ	0.088 UJ	0.091 U
Perfluorobutanesulfonic acid (PFBS)	UG/KG	0.039 U	0.039 U	0.041 U	0.042 U	0.041 U	0.042 UJ
Perfluorobutanoic Acid	UG/KG	0.023 U	0.023 U	0.024 U	**0.032 J**	**0.041 J**	0.024 U
Perfluorodecane Sulfonic Acid	UG/KG	0.153 U	0.154 U	0.159 U	0.163 U	0.16 U	0.164 U
Perfluorodecanoic acid (PFDA)	UG/KG	0.067 U	0.067 U	0.07 U	**1.34**	**0.833 J**	0.072 U
Perfluorododecanoic acid (PFDoA)	UG/KG	0.07 U	0.07 U	0.073 U	**0.906 J**	**0.422 J**	0.075 U
Perfluoroheptane Sulfonate (PFHPS)	UG/KG	0.137 U	0.137 U	0.142 U	0.146 U	0.142 U	0.146 U
Perfluoroheptanoic acid (PFHpA)	UG/KG	0.045 U	0.045 U	0.047 U	**0.053 J**	0.047 U	0.048 U
Perfluorohexanesulfonic acid (PFHxS)	UG/KG	0.061 U	0.061 U	0.063 U	0.065 U	0.063 U	0.065 U
Perfluorohexanoic acid (PFHxA)	UG/KG	0.053 U	0.053 U	0.055 U	0.056 U	0.055 U	**0.056 J**
Perfluorononanoic acid (PFNA)	UG/KG	0.075 U	0.075 U	0.078 U	**0.418 J**	**0.227 J**	**0.091 J**
Perfluorooctane Sulfonamide (FOSA)	UG/KG	0.098 U	0.099 UJ	0.102 UJ	0.105 UJ	0.102 UJ	0.105 U
Perfluorooctanesulfonic acid (PFOS)	UG/KG	0.13 U	**0.239 J**	**1.18**	**3.54**	**3.38**	**5.97**
Perfluorooctanoic acid (PFOA)	UG/KG	0.042 U	0.042 U	**0.125 J**	**0.486 J**	**0.398 J**	**0.229 J**
Perfluoropentanoic Acid (PFPeA)	UG/KG	0.046 U	0.046 U	0.048 U	**0.094 J**	**0.132 J**	0.049 U
Perfluorotetradecanoic acid (PFTA)	UG/KG	0.054 U	0.054 U	0.056 U	**0.346 J**	**0.152 J**	0.058 U
Perfluorotridecanoic Acid (PFTriA)	UG/KG	0.205 U	0.206 U	0.213 U	0.218 U	0.213 U	0.22 U
Perfluoroundecanoic Acid (PFUnA)	UG/KG	0.047 U	0.047 U	0.049 U	**0.288 J**	**0.188 J**	0.05 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	UG/KG	0.288 U	0.289 U	0.299 U	0.306 U	0.3 U	0.308 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	UG/KG	0.18 U	0.18 UJ	0.187 UJ	0.192 UJ	0.187 UJ	0.193 U
TOTAL PFOA AND PFOS	UG/KG	0.042 U	**0.239 J**	**1.31 J**	**4.03 J**	**3.78 J**	**6.2 J**

Table 8. Summary of Per- and Polyfluoroalkyl Substances in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

	Sample Designation:	BDS-17_SDS-7	BDS-2	BDS-21A	BDS-21B	BDS-22	BDS-23	BDS-24
	Sample Date:	01/15/2020	11/11/2019	01/06/2020	01/06/2020	11/11/2019	11/11/2019	11/11/2019
	Sample Depth (ft bls):	6 - 7	12 - 14	6 - 8	6 - 8	12 - 14	12 - 14	12 - 14
	Normal Sample or Field Duplicate:	N	N	N	N	N	N	N
Parameter	Units							
2-(N-methyl perfluorooctanesulfonamido) acetic acid	UG/KG	0.216 U	0.213 U	0.237 U	0.216 U	0.219 U	0.214 U	0.227 U
N-ethyl perfluorooctanesulfonamidoacetic acid	UG/KG	0.091 U	**0.179 J**	**0.145 J**	0.091 U	0.092 U	0.09 U	0.095 U
Perfluorobutanesulfonic acid (PFBS)	UG/KG	0.042 U	0.041 U	0.046 U	0.042 U	0.043 U	0.041 U	0.044 U
Perfluorobutanoic Acid	UG/KG	0.024 U	0.024 U	0.027 U	0.024 U	0.025 U	0.024 U	0.026 U
Perfluorodecane Sulfonic Acid	UG/KG	0.164 U	0.162 U	0.18 U	0.164 U	0.167 U	0.162 U	0.173 U
Perfluorodecanoic acid (PFDA)	UG/KG	0.072 U	0.071 U	0.079 U	0.072 U	0.073 U	0.071 U	0.076 U
Perfluorododecanoic acid (PFDoA)	UG/KG	0.075 U	0.074 U	0.083 U	0.075 U	0.076 U	0.074 U	0.079 U
Perfluoroheptane Sulfonate (PFHPS)	UG/KG	0.146 U	0.144 U	0.161 U	0.146 U	0.149 U	0.145 U	0.154 U
Perfluoroheptanoic acid (PFHpA)	UG/KG	0.048 U	0.048 U	0.053 U	0.048 U	0.049 U	0.048 U	0.051 U
Perfluorohexanesulfonic acid (PFHxS)	UG/KG	0.065 U	0.064 U	0.071 U	0.065 U	0.066 U	0.064 U	0.068 U
Perfluorohexanoic acid (PFHxA)	UG/KG	0.056 U	0.056 U	0.062 U	0.056 U	0.057 U	0.056 U	**0.064 J**
Perfluorononanoic acid (PFNA)	UG/KG	0.08 U	0.079 U	0.088 U	0.081 U	0.082 U	0.08 U	0.085 U
Perfluorooctane Sulfonamide (FOSA)	UG/KG	0.105 U	0.104 U	0.115 U	0.105 U	0.107 UJ	0.104 UJ	0.11 UJ
Perfluorooctanesulfonic acid (PFOS)	UG/KG	**1.67**	**0.338 J**	**2.14**	**3.21**	0.142 U	**0.2 J**	0.147 U
Perfluorooctanoic acid (PFOA)	UG/KG	**0.081 J**	**0.052 J**	**0.167 J**	**0.554 J**	**0.052 J**	**0.071 J**	**0.061 J**
Perfluoropentanoic Acid (PFPeA)	UG/KG	0.049 U	0.049 U	0.054 U	0.049 U	0.05 U	0.049 U	0.052 U
Perfluorotetradecanoic acid (PFTA)	UG/KG	0.058 U	0.057 U	0.064 U	0.058 U	0.059 U	0.057 U	0.061 U
Perfluorotridecanoic Acid (PFTriA)	UG/KG	0.219 U	0.216 U	0.241 U	0.22 U	0.223 U	0.217 U	0.231 U
Perfluoroundecanoic Acid (PFUnA)	UG/KG	0.05 U	0.05 U	0.055 U	0.05 U	0.051 U	0.05 U	0.053 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	UG/KG	0.308 U	0.304 U	0.338 U	0.308 U	0.313 U	0.304 U	0.324 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	UG/KG	0.192 U	0.19 U	0.211 U	0.193 U	0.196 U	0.19 U	0.202 U
TOTAL PFOA AND PFOS	UG/KG	**1.75 J**	**0.39 J**	**2.31 J**	**3.76 J**	**0.052 J**	**0.271 J**	**0.061 J**

Table 8. Summary of Per- and Polyfluoroalkyl Substances in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

	Sample Designation:	BDS-25	BDS-26	BDS-27	BDS-28	BDS-29	BDS-3	BDS-3
	Sample Date:	01/15/2020	01/15/2020	01/15/2020	01/06/2020	01/06/2020	11/11/2019	11/11/2019
	Sample Depth (ft bls):	8 - 10	8 - 10	8 - 10	8 - 10	8 - 10	12 - 14	12 - 14
	Normal Sample or Field Duplicate:	N	N	N	N	N	N	FD
Parameter	Units							
2-(N-methyl perfluorooctanesulfonamido) acetic acid	UG/KG	0.222 U	0.229 U	0.227 U	0.223 U	0.217 U	0.206 U	0.222 U
N-ethyl perfluorooctanesulfonamidoacetic acid	UG/KG	0.093 U	0.096 U	**0.189 J**	**0.122 J**	0.091 U	0.086 U	0.093 U
Perfluorobutanesulfonic acid (PFBS)	UG/KG	0.043 U	0.044 U	0.044 U	0.043 U	0.042 U	0.04 U	0.043 U
Perfluorobutanoic Acid	UG/KG	**0.041 J**	**0.038 J**	**0.056 J**	**0.027 J**	**0.033 J**	0.023 U	0.025 U
Perfluorodecane Sulfonic Acid	UG/KG	0.169 U	0.174 U	0.172 U	0.169 U	0.164 U	0.156 U	0.168 U
Perfluorodecanoic acid (PFDA)	UG/KG	0.074 U	0.076 U	0.075 U	**0.095 J**	**0.121 J**	0.069 U	0.074 U
Perfluorododecanoic acid (PFDoA)	UG/KG	0.077 U	0.08 U	0.079 U	0.078 U	0.075 U	0.072 U	0.077 U
Perfluoroheptane Sulfonate (PFHPS)	UG/KG	0.15 U	0.155 U	0.154 U	0.151 U	0.147 U	0.14 U	0.15 U
Perfluoroheptanoic acid (PFHpA)	UG/KG	**0.066 J**	**0.078 J**	**0.104 J**	**0.063 J**	**0.07 J**	0.046 U	0.05 U
Perfluorohexanesulfonic acid (PFHxS)	UG/KG	0.067 U	0.069 U	0.068 U	0.067 U	0.065 U	0.062 U	0.067 U
Perfluorohexanoic acid (PFHxA)	UG/KG	**0.141 J**	**0.164 J**	**0.194 J**	**0.102 J**	**0.11 J**	0.054 U	0.058 U
Perfluorononanoic acid (PFNA)	UG/KG	0.083 U	**0.108 J**	0.084 U	**0.144 J**	**0.132 J**	0.077 U	0.083 U
Perfluorooctane Sulfonamide (FOSA)	UG/KG	0.108 U	0.111 U	0.11 U	**0.128 J**	0.105 U	0.1 U	0.108 U
Perfluorooctanesulfonic acid (PFOS)	UG/KG	**2.69**	**2.9**	**2.82**	**2.02**	**2.42**	0.133 U	**0.171 J**
Perfluorooctanoic acid (PFOA)	UG/KG	**0.488 J**	**0.573 J**	**0.548 J**	**0.356 J**	**0.3 J**	**0.051 J**	**0.056 J**
Perfluoropentanoic Acid (PFPeA)	UG/KG	**0.137 J**	**0.137 J**	**0.174 J**	**0.065 J**	**0.069 J**	0.047 U	0.051 U
Perfluorotetradecanoic acid (PFTA)	UG/KG	0.06 U	0.061 U	0.061 U	0.06 U	0.058 U	0.055 U	0.059 U
Perfluorotridecanoic Acid (PFTriA)	UG/KG	0.226 U	0.232 U	0.23 U	0.226 U	0.22 U	0.209 U	0.225 U
Perfluoroundecanoic Acid (PFUnA)	UG/KG	0.052 U	0.053 U	0.053 U	0.052 U	0.05 U	0.048 U	0.052 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	UG/KG	0.317 U	0.326 U	0.323 U	0.318 U	0.308 U	0.294 U	0.316 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	UG/KG	0.198 U	0.204 U	0.202 U	0.199 U	0.193 U	0.184 U	0.198 U
TOTAL PFOA AND PFOS	UG/KG	**3.18 J**	**3.47 J**	**3.37 J**	**2.38 J**	**2.72 J**	**0.051 J**	**0.227 J**

Table 8. Summary of Per- and Polyfluoroalkyl Substances in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

Sample Designation:		BDS-30	BDS-3A	SB-18	SB-19	SB-20	SB-21	SB-22
Sample Date:		01/06/2020	05/05/2020	04/17/2019	04/18/2019	04/17/2019	04/17/2019	04/16/2019
Sample Depth (ft bls):		8 - 10	13 - 14	2 - 4	2 - 4	2 - 4	2 - 4	2 - 4
Normal Sample or Field Duplicate:		N	N	N	N	N	N	N
Parameter	Units							
2-(N-methyl perfluorooctanesulfonamido) acetic acid	UG/KG	0.219 U	0.201 UJ	0.12 U	0.118 U	0.118 U	0.124 U	0.108 U
N-ethyl perfluorooctanesulfonamidoacetic acid	UG/KG	0.092 U	0.085 UJ	**0.123 J**	**0.113 J**	0.103 U	0.109 U	0.094 U
Perfluorobutanesulfonic acid (PFBS)	UG/KG	0.042 U	0.039 U	0.074 U	0.073 U	0.073 U	0.077 U	0.067 U
Perfluorobutanoic Acid	UG/KG	**0.027 J**	0.023 U	**0.149 J**	**0.104 J**	**0.062 J**	**0.125 J**	**0.101 J**
Perfluorodecane Sulfonic Acid	UG/KG	0.166 U	0.153 U	**0.151 J**	0.111 U	0.111 U	0.117 U	0.102 U
Perfluorodecanoic acid (PFDA)	UG/KG	**0.098 J**	0.067 U	**0.336 J**	**0.284 J**	**0.188 J**	**0.159 J**	**0.167 J**
Perfluorododecanoic acid (PFDoA)	UG/KG	0.076 U	0.07 U	**0.218 J**	**0.13 J**	0.098 U	0.104 U	**0.114 J**
Perfluoroheptane Sulfonate (PFHPS)	UG/KG	0.148 U	0.136 U	0.159 U	0.156 U	0.156 U	0.164 U	0.143 U
Perfluoroheptanoic acid (PFHpA)	UG/KG	**0.05 J**	0.045 U	**0.127 J**	**0.11 J**	**0.216 J**	**0.122 J**	**0.114 J**
Perfluorohexanesulfonic acid (PFHxS)	UG/KG	0.066 U	0.061 U	0.067 U	0.065 U	**0.105 J**	0.069 U	0.06 U
Perfluorohexanoic acid (PFHxA)	UG/KG	**0.092 J**	0.053 U	**0.172 J**	**0.134 J**	**0.178 J**	**0.158 J**	**0.165 J**
Perfluorononanoic acid (PFNA)	UG/KG	**0.11 J**	0.075 U	**0.265 J**	**0.224 J**	**0.298 J**	**0.176 J**	**0.149 J**
Perfluorooctane Sulfonamide (FOSA)	UG/KG	0.107 U	0.098 UJ	0.12 U	0.117 U	0.117 U	0.124 U	0.108 U
Perfluorooctanesulfonic acid (PFOS)	UG/KG	**2.36**	0.13 U	**1.68**	**2.39**	**6.77**	**0.973 J**	**2.06**
Perfluorooctanoic acid (PFOA)	UG/KG	**0.292 J**	0.042 U	**0.401 J**	**0.494 J**	**1.17**	**0.446 J**	**0.5 J**
Perfluoropentanoic Acid (PFPeA)	UG/KG	**0.064 J**	0.046 U	**0.206 J**	**0.171 J**	**0.184 J**	**0.165 J**	**0.175 J**
Perfluorotetradecanoic acid (PFTA)	UG/KG	0.059 U	0.054 U	**0.104 J**	0.08 U	0.08 U	0.085 U	0.073 U
Perfluorotridecanoic Acid (PFTriA)	UG/KG	0.222 U	0.204 U	**0.115 J**	**0.08 J**	0.071 U	0.075 U	0.065 U
Perfluoroundecanoic Acid (PFUnA)	UG/KG	0.051 U	0.047 U	**0.237 J**	**0.154 J**	**0.08 J**	**0.11 J**	**0.114 J**
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	UG/KG	0.312 U	0.287 U	0.321 U	0.315 U	0.314 U	0.332 U	0.288 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	UG/KG	0.195 U	0.179 UJ	0.231 U	**0.343 J**	0.226 U	0.239 U	0.208 U
TOTAL PFOA AND PFOS	UG/KG	**2.65 J**	0.042 U	**2.08 J**	**2.88 J**	**7.94**	**1.42 J**	**2.56 J**

Table 8. Summary of Per- and Polyfluoroalkyl Substances in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

Sample Designation:		SB-23	SB-24	SB-25	SB-25	SB-34	SB-35	SDS-1
Sample Date:		04/18/2019	04/15/2019	04/18/2019	04/18/2019	04/17/2019	04/16/2019	01/07/2020
Sample Depth (ft bls):		2 - 4	2 - 4	2 - 4	2 - 4	2 - 4	2 - 4	6 - 6
Normal Sample or Field Duplicate:		N	N	N	FD	N	N	N
Parameter	Units							
2-(N-methyl perfluorooctanesulfonamido) acetic acid	UG/KG	0.108 U	0.117 U	0.108 U	0.104 U	0.086 U	0.109 U	0.215 U
N-ethyl perfluorooctanesulfonamidoacetic acid	UG/KG	**0.13 J**	0.102 U	0.095 U	0.091 U	0.076 U	0.095 U	0.09 U
Perfluorobutanesulfonic acid (PFBS)	UG/KG	0.067 U	0.072 U	0.067 U	0.064 U	0.053 U	**0.832 J**	0.042 U
Perfluorobutanoic Acid	UG/KG	**0.126 J**	**0.149 J**	**0.111 J**	**0.099 J**	**0.021 J**	**0.09 J**	0.024 U
Perfluorodecane Sulfonic Acid	UG/KG	**0.136 J**	0.11 U	0.102 U	0.098 U	0.081 U	**0.638 J**	0.163 U
Perfluorodecanoic acid (PFDA)	UG/KG	**0.385 J**	0.082 U	**0.158 J**	**0.192 J**	**0.15 J**	**8.84**	0.071 U
Perfluorododecanoic acid (PFDoA)	UG/KG	**0.294 J**	0.098 U	0.09 U	**0.101 J**	**0.091 J**	**4.48**	0.075 U
Perfluoroheptane Sulfonate (PFHPS)	UG/KG	0.142 U	0.154 U	0.143 U	0.137 U	0.114 U	0.144 U	0.145 U
Perfluoroheptanoic acid (PFHpA)	UG/KG	**0.14 J**	**0.27 J**	**0.146 J**	**0.144 J**	0.054 U	**0.417 J**	0.048 U
Perfluorohexanesulfonic acid (PFHxS)	UG/KG	0.06 U	**0.076 J**	0.06 U	0.058 U	0.048 U	**0.063 J**	0.065 U
Perfluorohexanoic acid (PFHxA)	UG/KG	**0.813 J**	**0.279 J**	**0.211 J**	**0.177 J**	**0.058 J**	**0.334 J**	0.056 U
Perfluorononanoic acid (PFNA)	UG/KG	**0.276 J**	**0.358 J**	**0.314 J**	**0.22 J**	**0.133 J**	**0.846 J**	0.08 U
Perfluorooctane Sulfonamide (FOSA)	UG/KG	0.107 U	0.116 U	0.108 U	0.103 U	0.086 U	**0.196 J**	0.104 U
Perfluorooctanesulfonic acid (PFOS)	UG/KG	**2.92**	**5.46**	**4.25**	**3.19**	**0.868**	**12.6**	**0.828 J**
Perfluorooctanoic acid (PFOA)	UG/KG	**0.483 J**	**0.92 J**	**0.704 J**	**0.525 J**	**0.104 J**	**1.04 J**	0.045 U
Perfluoropentanoic Acid (PFPeA)	UG/KG	**0.551 J**	**0.3 J**	**0.203 J**	**0.186 J**	**0.082 J**	**0.35 J**	0.049 U
Perfluorotetradecanoic acid (PFTA)	UG/KG	**0.138 J**	0.08 U	0.074 U	0.071 U	0.059 U	**0.702 J**	0.058 U
Perfluorotridecanoic Acid (PFTriA)	UG/KG	**0.189 J**	0.07 U	0.065 U	0.063 U	0.052 U	**0.318 J**	0.218 U
Perfluoroundecanoic Acid (PFUnA)	UG/KG	**0.38 J**	0.064 U	**0.098 J**	**0.122 J**	**0.07 J**	**3.24**	0.05 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	UG/KG	0.288 U	0.312 U	0.289 U	0.278 U	0.23 U	0.29 U	0.306 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	UG/KG	**0.735 J**	0.225 U	**0.275 J**	**0.322 J**	0.166 U	0.209 U	0.191 U
TOTAL PFOA AND PFOS	UG/KG	**3.4 J**	**6.38 J**	**4.95 J**	**3.72 J**	**0.972 J**	**13.6 J**	**0.828 J**

Table 8. Summary of Per- and Polyfluoroalkyl Substances in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

	Sample Designation:	SDS-1	SDS-10	SDS-11	SDS-12	SDS-2	SDS-21E	SDS-21S
	Sample Date:	01/07/2020	01/06/2020	01/06/2020	01/07/2020	01/07/2020	01/06/2020	01/06/2020
	Sample Depth (ft bls):	6 - 6	7.5 - 7.5	7.5 - 7.5	7.5 - 7.5	6 - 6	7 - 7	7 - 7
	Normal Sample or Field Duplicate:	FD	N	N	N	N	N	N
Parameter	Units							
2-(N-methyl perfluorooctanesulfonamido) acetic acid	UG/KG	0.227 U	0.217 U	0.22 U	0.21 U	0.206 U	0.223 U	0.219 U
N-ethyl perfluorooctanesulfonamidoacetic acid	UG/KG	0.095 U	0.091 U	**0.238 J**	0.088 U	**0.087 J**	0.094 U	0.092 U
Perfluorobutanesulfonic acid (PFBS)	UG/KG	0.044 U	0.042 U	0.043 U	0.041 U	0.04 U	0.043 U	0.043 U
Perfluorobutanoic Acid	UG/KG	0.026 U	0.025 U	0.025 U	0.024 U	0.023 U	0.025 U	0.025 U
Perfluorodecane Sulfonic Acid	UG/KG	0.172 U	0.165 U	0.167 U	0.16 U	0.156 U	0.17 U	0.167 U
Perfluorodecanoic acid (PFDA)	UG/KG	0.076 U	**0.074 J**	0.073 U	**0.075 J**	0.069 U	**0.111 J**	0.073 U
Perfluorododecanoic acid (PFDoA)	UG/KG	0.079 U	0.076 U	0.077 U	0.073 U	0.072 U	0.078 U	0.076 U
Perfluoroheptane Sulfonate (PFHPS)	UG/KG	0.154 U	0.147 U	0.149 U	0.143 U	0.14 U	0.151 U	0.149 U
Perfluoroheptanoic acid (PFHpA)	UG/KG	0.051 U	0.049 U	0.049 U	0.047 U	0.046 U	0.05 U	0.049 U
Perfluorohexanesulfonic acid (PFHxS)	UG/KG	0.068 U	0.065 U	0.066 U	0.063 U	0.062 U	0.067 U	0.066 U
Perfluorohexanoic acid (PFHxA)	UG/KG	0.059 U	0.057 U	0.057 U	0.055 U	0.054 U	**0.058 J**	0.057 U
Perfluorononanoic acid (PFNA)	UG/KG	0.085 U	0.081 U	**0.123 J**	**0.371 J**	0.077 U	**0.095 J**	0.082 U
Perfluorooctane Sulfonamide (FOSA)	UG/KG	0.11 U	0.106 U	0.107 U	0.102 U	0.1 U	0.109 U	0.107 U
Perfluorooctanesulfonic acid (PFOS)	UG/KG	**1.55**	**1.64**	**10.4**	**2.5**	**0.303 J**	**8.76**	**2**
Perfluorooctanoic acid (PFOA)	UG/KG	**0.077 J**	**0.059 J**	**0.449 J**	**0.344 J**	0.043 U	**0.397 J**	**0.11 J**
Perfluoropentanoic Acid (PFPeA)	UG/KG	0.052 U	0.05 U	0.05 U	0.048 U	0.047 U	0.051 U	0.05 U
Perfluorotetradecanoic acid (PFTA)	UG/KG	0.061 U	0.058 U	0.059 U	0.056 U	0.055 U	0.06 U	0.059 U
Perfluorotridecanoic Acid (PFTriA)	UG/KG	0.23 U	0.22 U	0.224 U	0.214 U	0.209 U	0.227 U	0.223 U
Perfluoroundecanoic Acid (PFUnA)	UG/KG	0.053 U	0.051 U	0.051 U	0.049 U	0.048 U	0.052 U	0.051 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	UG/KG	0.323 U	0.31 U	0.314 U	0.3 U	0.293 U	0.318 U	0.313 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	UG/KG	0.202 U	0.194 U	0.196 U	0.188 U	0.184 U	0.199 U	0.196 U
TOTAL PFOA AND PFOS	UG/KG	**1.63 J**	**1.7 J**	**10.8 J**	**2.84 J**	**0.303 J**	**9.16 J**	**2.11 J**

Table 8. Summary of Per- and Polyfluoroalkyl Substances in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

	Sample Designation:	SDS-21W	SDS-25_26_27E	SDS-25_26_27N	SDS-25_26_27S	SDS-25_26_27W
	Sample Date:	01/06/2020	01/15/2020	01/15/2020	01/15/2020	01/15/2020
	Sample Depth (ft bls):	7 - 7	9 - 9	9 - 9	9 - 9	9 - 9
	Normal Sample or Field Duplicate:	N	N	N	N	N
Parameter	Units					
2-(N-methyl perfluorooctanesulfonamido) acetic acid	UG/KG	0.226 U	0.238 U	0.23 U	0.227 U	0.228 U
N-ethyl perfluorooctanesulfonamidoacetic acid	UG/KG	0.095 U	0.1 U	0.097 U	0.095 U	0.096 U
Perfluorobutanesulfonic acid (PFBS)	UG/KG	0.044 U	0.046 U	0.045 U	0.044 U	0.044 U
Perfluorobutanoic Acid	UG/KG	0.026 U	**0.036 J**	**0.034 J**	0.026 U	**0.029 J**
Perfluorodecane Sulfonic Acid	UG/KG	0.172 U	0.181 U	0.175 U	0.172 U	0.173 U
Perfluorodecanoic acid (PFDA)	UG/KG	0.075 U	0.079 U	0.077 U	0.076 U	0.076 U
Perfluorododecanoic acid (PFDoA)	UG/KG	0.079 U	0.083 U	0.08 U	0.079 U	0.079 U
Perfluoroheptane Sulfonate (PFHPS)	UG/KG	0.153 U	0.162 U	0.156 U	0.154 U	0.154 U
Perfluoroheptanoic acid (PFHpA)	UG/KG	0.051 U	**0.066 J**	**0.059 J**	0.051 U	0.051 U
Perfluorohexanesulfonic acid (PFHxS)	UG/KG	0.068 U	0.072 U	0.069 U	0.068 U	0.068 U
Perfluorohexanoic acid (PFHxA)	UG/KG	0.059 U	**0.119 J**	**0.123 J**	**0.09 J**	**0.107 J**
Perfluorononanoic acid (PFNA)	UG/KG	0.084 U	**0.098 J**	**0.104 J**	0.085 U	0.085 U
Perfluorooctane Sulfonamide (FOSA)	UG/KG	0.11 U	0.116 U	0.112 U	0.11 U	0.111 U
Perfluorooctanesulfonic acid (PFOS)	UG/KG	**1.75**	**2.64**	**2.97**	**1.76**	**2.04**
Perfluorooctanoic acid (PFOA)	UG/KG	**0.138 J**	**0.436 J**	**0.472 J**	**0.285 J**	**0.338 J**
Perfluoropentanoic Acid (PFPeA)	UG/KG	0.052 U	**0.101 J**	**0.103 J**	**0.062 J**	**0.081 J**
Perfluorotetradecanoic acid (PFTA)	UG/KG	0.061 U	0.064 U	0.062 U	0.061 U	0.061 U
Perfluorotridecanoic Acid (PFTriA)	UG/KG	0.23 U	0.242 U	0.234 U	0.23 U	0.231 U
Perfluoroundecanoic Acid (PFUnA)	UG/KG	0.053 U	0.055 U	0.054 U	0.053 U	0.053 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	UG/KG	0.322 U	0.34 U	0.328 U	0.324 U	0.325 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	UG/KG	0.202 U	0.212 U	0.205 U	0.202 U	0.203 U
TOTAL PFOA AND PFOS	UG/KG	**1.89 J**	**3.08 J**	**3.44 J**	**2.05 J**	**2.38 J**

Table 8. Summary of Per- and Polyfluoroalkyl Substances in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

Sample Designation:		SDS-28_29_30E	SDS-28_29_30N	SDS-28_29_30S	SDS-28_29_30W	SDS-4
Sample Date:		01/06/2020	01/06/2020	01/06/2020	01/06/2020	01/07/2020
Sample Depth (ft bls):		9 - 9	9 - 9	9 - 9	9 - 9	7.5 - 7.5
Normal Sample or Field Duplicate:		N	N	N	N	N
Parameter	Units					
2-(N-methyl perfluorooctanesulfonamido) acetic acid	UG/KG	0.226 U	0.229 U	0.213 U	0.228 U	0.238 U
N-ethyl perfluorooctanesulfonamidoacetic acid	UG/KG	**0.115 J**	0.096 U	**0.121 J**	0.096 U	0.1 U
Perfluorobutanesulfonic acid (PFBS)	UG/KG	0.044 U	0.044 U	0.041 U	0.044 U	0.046 U
Perfluorobutanoic Acid	UG/KG	**0.026 J**	**0.029 J**	0.024 U	0.026 U	0.027 U
Perfluorodecane Sulfonic Acid	UG/KG	0.171 U	0.174 U	0.162 U	0.173 U	0.18 U
Perfluorodecanoic acid (PFDA)	UG/KG	**0.084 J**	**0.091 J**	**0.09 J**	**0.111 J**	**0.086 J**
Perfluorododecanoic acid (PFDoA)	UG/KG	0.078 U	0.08 U	0.074 U	0.079 U	0.083 U
Perfluoroheptane Sulfonate (PFHPS)	UG/KG	0.153 U	0.155 U	0.144 U	0.154 U	0.161 U
Perfluoroheptanoic acid (PFHpA)	UG/KG	**0.056 J**	**0.069 J**	**0.059 J**	**0.064 J**	0.053 U
Perfluorohexanesulfonic acid (PFHxS)	UG/KG	0.068 U	0.069 U	0.064 U	0.068 U	0.071 U
Perfluorohexanoic acid (PFHxA)	UG/KG	**0.096 J**	**0.112 J**	**0.096 J**	**0.1 J**	0.062 U
Perfluorononanoic acid (PFNA)	UG/KG	**0.107 J**	**0.14 J**	**0.134 J**	**0.125 J**	0.088 U
Perfluorooctane Sulfonamide (FOSA)	UG/KG	0.11 U	0.111 U	0.104 U	0.111 U	0.116 U
Perfluorooctanesulfonic acid (PFOS)	UG/KG	**2.22**	**2.33**	**2.26**	**2.26**	**4.63**
Perfluorooctanoic acid (PFOA)	UG/KG	**0.309 J**	**0.333 J**	**0.335 J**	**0.309 J**	**0.219 J**
Perfluoropentanoic Acid (PFPeA)	UG/KG	**0.058 J**	**0.076 J**	**0.056 J**	**0.063 J**	0.054 U
Perfluorotetradecanoic acid (PFTA)	UG/KG	0.061 U	0.061 U	0.057 U	0.061 U	0.064 U
Perfluorotridecanoic Acid (PFTriA)	UG/KG	0.229 U	0.232 U	0.216 U	0.231 U	0.241 U
Perfluoroundecanoic Acid (PFUnA)	UG/KG	0.052 U	0.053 U	0.05 U	0.053 U	0.055 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	UG/KG	0.322 U	0.326 U	0.304 U	0.324 U	0.338 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	UG/KG	0.201 U	0.204 U	0.19 U	0.203 U	0.212 U
TOTAL PFOA AND PFOS	UG/KG	**2.53 J**	**2.66 J**	**2.6 J**	**2.57 J**	**4.85 J**

Table 8. Summary of Per- and Polyfluoroalkyl Substances in Documentation Soil Samples in Track 2 and 4 areas, 75 East 111th Street, New York, New York

	Sample Designation:	SDS-5	SDS-8	SDS-9
	Sample Date:	01/07/2020	10/22/2019	10/22/2019
	Sample Depth (ft bls):	7.5 - 7.5	6 - 6	6 - 6
	Normal Sample or Field Duplicate:	N	N	N
Parameter	Units			
2-(N-methyl perfluorooctanesulfonamido) acetic acid	UG/KG	0.221 U	0.236 U	0.196 U
N-ethyl perfluorooctanesulfonamidoacetic acid	UG/KG	0.093 U	0.099 R	0.082 U
Perfluorobutanesulfonic acid (PFBS)	UG/KG	0.043 U	0.046 U	0.038 U
Perfluorobutanoic Acid	UG/KG	0.025 U	0.027 U	0.022 U
Perfluorodecane Sulfonic Acid	UG/KG	0.168 U	0.179 U	0.149 U
Perfluorodecanoic acid (PFDA)	UG/KG	**0.197 J**	**0.526 J**	0.065 U
Perfluorododecanoic acid (PFDoA)	UG/KG	**0.13 J**	**0.27 J**	0.068 U
Perfluoroheptane Sulfonate (PFHPS)	UG/KG	0.15 U	0.16 U	0.133 U
Perfluoroheptanoic acid (PFHpA)	UG/KG	0.05 U	0.053 U	0.044 U
Perfluorohexanesulfonic acid (PFHxS)	UG/KG	0.066 U	0.071 U	0.059 U
Perfluorohexanoic acid (PFHxA)	UG/KG	0.058 U	**0.125 J**	0.051 UJ
Perfluorononanoic acid (PFNA)	UG/KG	0.082 U	**0.208 J**	0.073 U
Perfluorooctane Sulfonamide (FOSA)	UG/KG	0.108 U	0.115 U	0.096 U
Perfluorooctanesulfonic acid (PFOS)	UG/KG	**1.27**	**5.72**	**1.38**
Perfluorooctanoic acid (PFOA)	UG/KG	**0.061 J**	**0.237 J**	**0.172 J**
Perfluoropentanoic Acid (PFPeA)	UG/KG	0.05 U	**0.074 J**	0.045 UJ
Perfluorotetradecanoic acid (PFTA)	UG/KG	**0.064 J**	**0.105 J**	0.053 U
Perfluorotridecanoic Acid (PFTriA)	UG/KG	0.224 U	0.24 U	0.199 U
Perfluoroundecanoic Acid (PFUnA)	UG/KG	**0.096 J**	**0.155 J**	0.046 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)	UG/KG	0.315 U	0.336 U	0.28 U
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)	UG/KG	0.197 U	**0.478 J**	**0.883 J**
TOTAL PFOA AND PFOS	UG/KG	**1.33 J**	**5.96 J**	**1.55 J**

Table 9. Backfill/On-Site Soil Reuse Soil Cleanup Objectives
Sendero Verde Redevelopment Project- Parcel B, New York, New York

Parameter	Track 1 Backfill/Soil Reuse Soil Cleanup Objectives*	Track 4 Backfill/Soil Reuse Soil Cleanup Objectives**
Volatile Organic Compounds (Concentrations in µg/kg)		
1,1,1-Trichloroethane	680	680
1,1-Dichloroethane	270	270
1,1-Dichloroethene	330	330
1,2,4-Trimethylbenzene	3600	3600
1,3,5-Trimethylbenzene	8400	8400
1,2-Dichlorobenzene	1100	1100
1,2-Dichloroethane	20	20
1,3-Dichlorobenzene	2400	2400
1,4-Dichlorobenzene	1800	1800
1,4-Dioxane	100	100
2-Butanone (MEK)	120	120
Acetone	50	50
Benzene	60	60
n-Butylbenzene	12000	12000
Carbon tetrachloride	760	760
Chlorobenzene	1100	1100
Chloroform	370	370
cis-1,2-Dichloroethene	250	250
Ethylbenzene	1000	1000
Methylene chloride	50	50
MTBE	930	930
n-Propylbenzene	3900	3900
sec-Butylbenzene	11000	11000
tert-Butylbenzene	5900	5900
Tetrachloroethene	1300	1300
Toluene	700	700
trans-1,2-Dichloroethene	190	190
Trichloroethene	470	470
Vinyl chloride	20	20
Xylenes (total)	260	1600
Semivolatile Organic Compounds (Concentrations in µg/kg)		
1,4-Dioxane	100	100
2-Methylphenol	330	330
3&4-Methylphenol	330	330
Acenaphthene	20000	98000
Acenaphthylene	100000	100000
Anthracene	100000	100000
Benzo[a]anthracene	1000	1000
Benzo[a]pyrene	1000	1000
Benzo[b]fluoranthene	1000	1000
Benzo[g,h,i]perylene	100000	100000
Benzo[k]fluoranthene	800	1700
Chrysene	1000	1000
Dibenzo[a,h]anthracene	330	330
Dibenzofuran	7000	59000
Fluoranthene	100000	100000
Fluorene	3000	100000
Hexachlorobenzene	330	1200
Indeno[1,2,3-cd]pyrene	500	500
Naphthalene	12000	12000
Pentachlorophenol	800	800
Phenanthrene	100000	100000
Phenol	330	330
Pyrene	100000	100000

Table 9. Backfill/On-Site Soil Reuse Soil Cleanup Objectives
Sendero Verde Redevelopment Project- Parcel B, New York, New York

Parameter	Track 1 Backfill/Soil Reuse Soil Cleanup Objectives*	Track 4 Backfill/Soil Reuse Soil Cleanup Objectives**
Metals (Concentrations in mg/kg)		
Arsenic	13	16
Barium	350	400
Beryllium	7.2	47
Cadmium	2.5	4.3
Chromium, Hexavalent	1	19
Chromium	30	180
Copper	50	270
Cyanide, Total	27	27
Lead	63	400
Manganese	1600	2000
Mercury	0.18	0.73
Nickel	30	130
Selenium	3.9	4
Silver	2	8.3
Zinc	109	2480
Pesticides (Concentrations in µg/kg)		
2,4,5-TP	3800	3800
4,4'-DDD	3.3	13000
4,4'-DDE	3.3	8900
4,4'-DDT	3.3	7900
Aldrin	5	97
alpha-BHC	20	20
alpha-Chlordane	94	2900
beta-BHC	36	90
delta-BHC	40	250
Dieldrin	5	100
Endosulfan I	2400	24000
Endosulfan II	2400	24000
Endosulfan sulfate	2400	24000
Endrin	14	60
gamma-BHC (Lindane)	100	100
Heptachlor	42	380
Pentachlorophenol	800	800
Total Polychlorinated Biphenyls (Concentrations in µg/kg)		
Total Polychlorinated Biphenyls	100	100
Perfluorinated Alkyl Acids (Concentrations in µg/kg)		
1H,1H,2H,2H-PERFLUORODECANESULFONIC ACID (8:2FTS)	--	--
1H,1H,2H,2H-PERFLUOROOCTANESULFONIC ACID (6:2FTS)	--	--
N-ETHYL PERFLUOROOCTANESULFONAMIDOACETIC ACID (NETFOSAA)	--	--
N-METHYL PERFLUOROOCTANESULFONAMIDOACETIC ACID (NMEFOSA	--	--
PERFLUOROBUTANESULFONIC ACID (PFBS)	--	--
PERFLUOROBUTANOIC ACID (PFBA)	--	--
PERFLUORODECANESULFONIC ACID (PFDS)	--	--
PERFLUORODECANOIC ACID (PFDA)	--	--
PERFLUORODODECANOIC ACID (PFDOA)	--	--
PERFLUOROHEPTANESULFONIC ACID (PFHPS)	--	--
PERFLUOROHEPTANOIC ACID (PFHPA)	--	--
PERFLUOROHEXANESULFONIC ACID (PFHXS)	--	--
PERFLUOROHEXANOIC ACID (PFHXA)	--	--
PERFLUORONONANOIC ACID (PFNA)	--	--

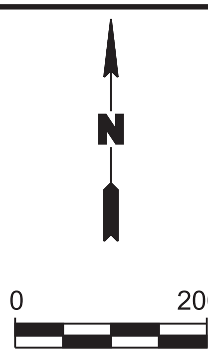
Table 9. Backfill/On-Site Soil Reuse Soil Cleanup Objectives
Sendero Verde Redevelopment Project- Parcel B, New York, New York

Parameter	Track 1 Backfill/Soil Reuse Soil Cleanup Objectives*	Track 4 Backfill/Soil Reuse Soil Cleanup Objectives**
PERFLUOROOCTANESULFONAMIDE (FOSA)	--	--
PERFLUOROOCTANESULFONIC ACID (PFOS)	--	--
PERFLUOROOCTANOIC ACID (PFOA)	--	--
PERFLUOROPENTANOIC ACID (PFPEA)	--	--
PERFLUOROTETRADECANOIC ACID (PFTA)	--	--
PERFLUOROTRIDECANOIC ACID (PFTRDA)	--	--
PERFLUOROUNDECANOIC ACID (PFUNA)	--	--
PFOA/PFOS, TOTAL	--	--

* Backfill soil cleanup objectives for the Track 1 remedy are the NYSDEC Part 375 Unrestricted Residential Use SCOs.
** Backfill soil cleanup objectives for the Track 4 remedy are the lower of the NYSDEC Part 375 Protection of Groundwater or Restricted Residential Use SCOs.
µg/kg - Micrograms per kilogram
mg/kg - Milligrams per kilogram
NYSDEC - New York State Department of Environmental Conservation
SCOs - Soil Cleanup Objectives
--Standards not yet determined

FIGURES

QUADRANGLE LOCATION



SOURCE:
USGS; 2013, Central Park, NY
7.5 Minute Topographic Quadrangle

Title:

SITE LOCATION MAP

SENDERO VERDE
REDEVELOPMENT PROJECT - PARCEL B

Prepared for:

SV-B OWNERS LLC

ROUX	Compiled by: W.S.	Date: 017JUL20	FIGURE
	Prepared by: G.M.	Scale: AS SHOWN	1
	Project Mgr: N.C.	Project: 2984.0003Y000	
	File: 2984.0003Y137.01.CDR		

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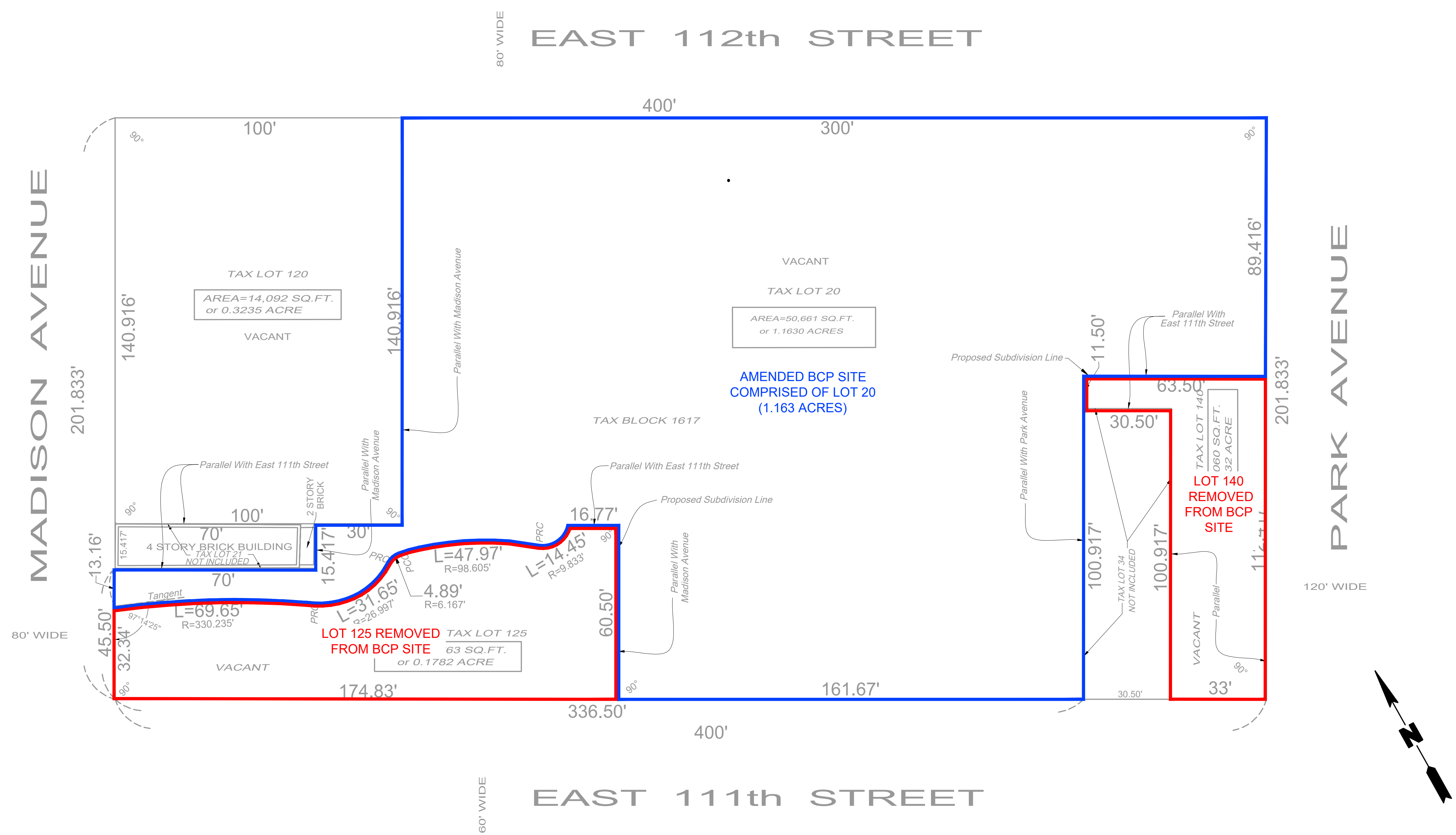

LEGEND

BCP SITE BOUNDARY

Title:

SITE PLAN

SENDERO VERDE
REDEVELOPMENT PROJECT - PARCEL B

Prepared for:

SV-B OWNERS LLC

ROUX

Compiled by: W.S.	Date: 17JUL20	FIGURE
Prepared by: G.M.	Scale: AS SHOWN	2
Project Mgr: W.S.	Project: 2984.0003Y000	
File: 2984.0003Y137.05.DWG		

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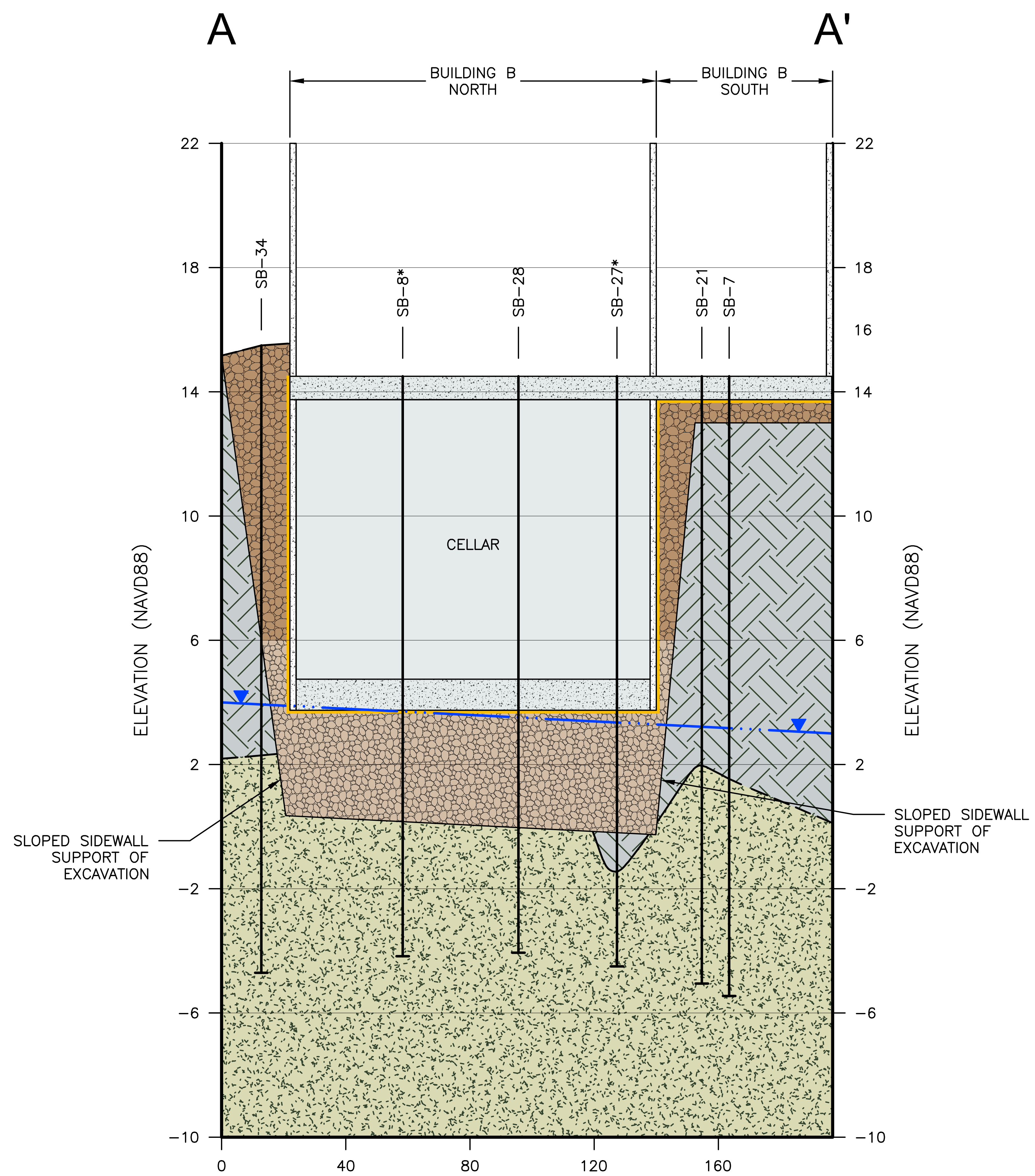
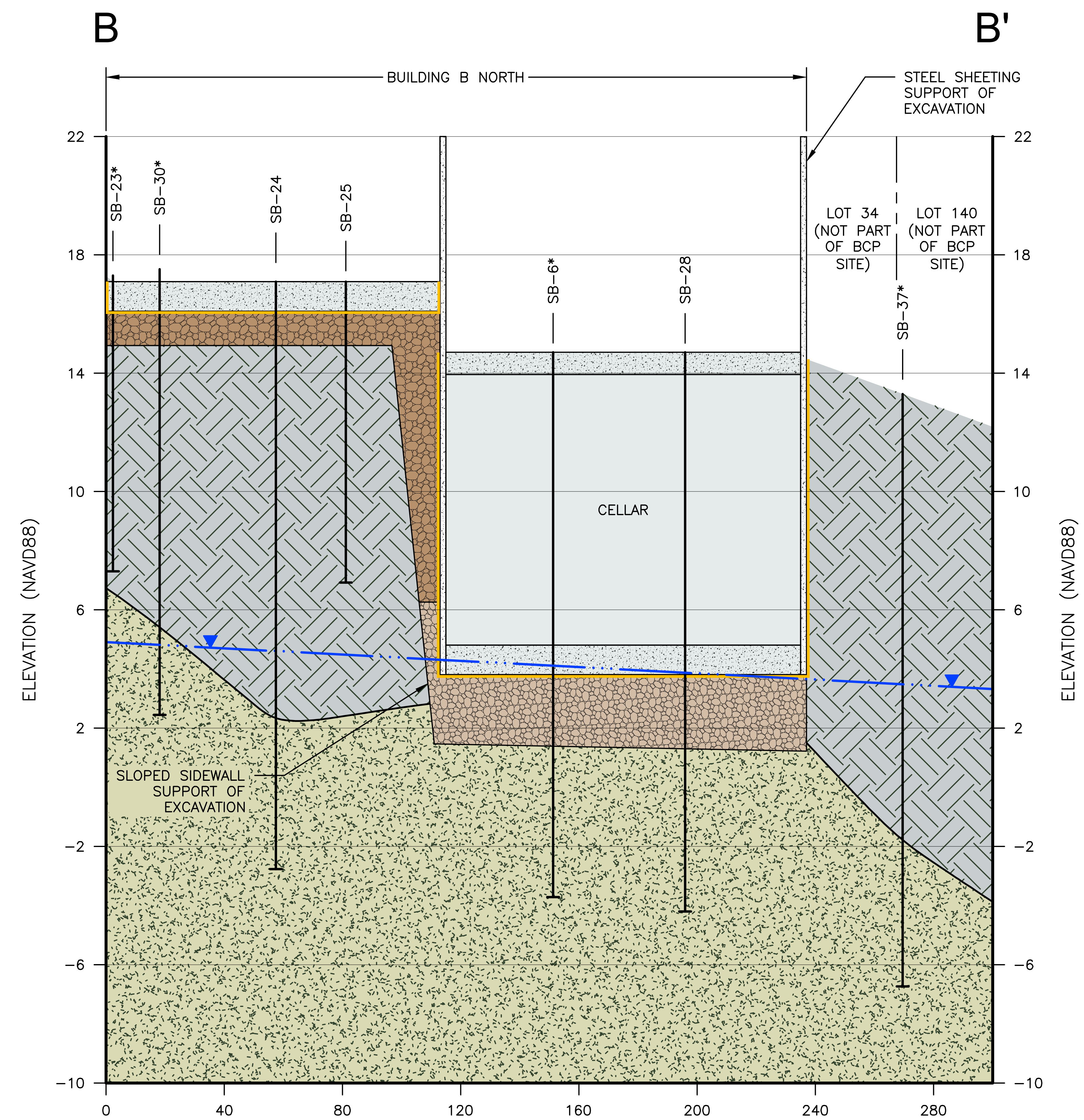


SECTION A–A'

HORIZONTAL SCALE: 1" = 40'
VERTICAL SCALE: 1" = 4'



SECTION B–B'

HORIZONTAL SCALE: 1" = 40'
VERTICAL SCALE: 1" = 4'

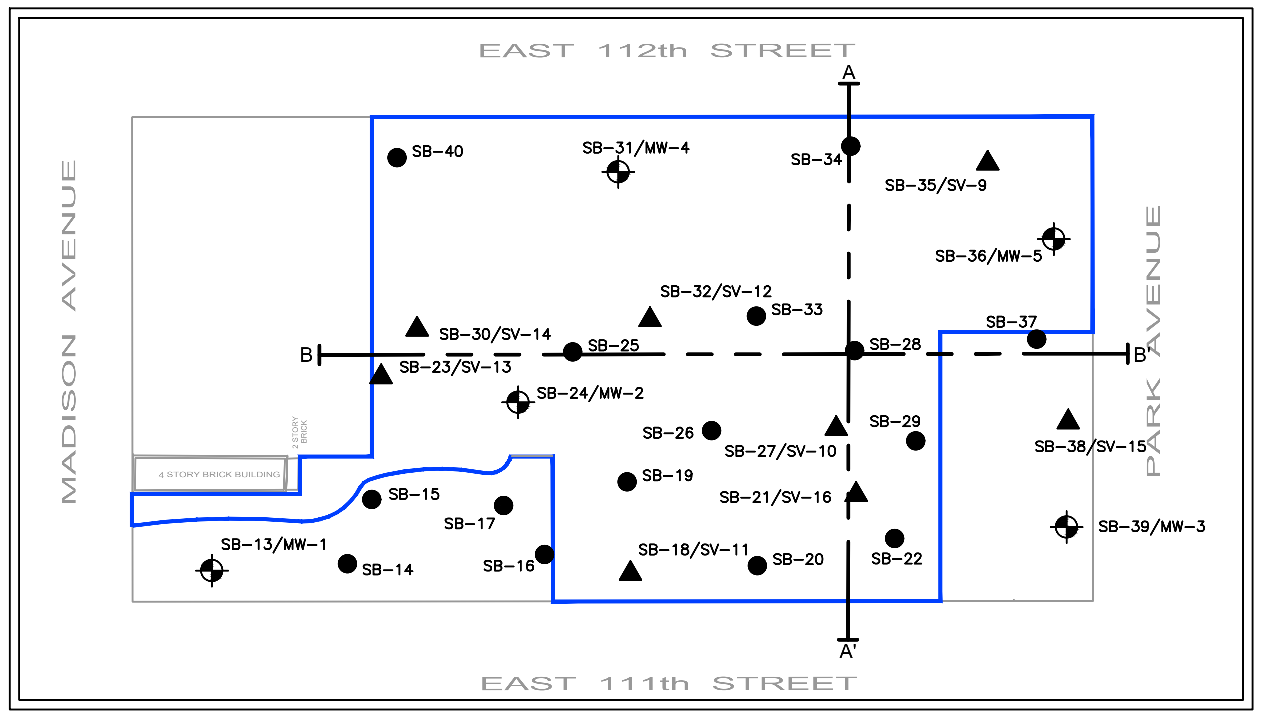
LEGEND

- BCP SITE BOUNDARTY
- URBAN FILL
- SAND WITH VARYING AMOUNTS OF SILT AND GRAVEL
- CONCRETE FOUNDATION (UNDERSIDE OF THE CONCRETE IS THE DEMARCATION LAYER)
- AREA EXCAVATED AND BACKFILLED WITH APPROVED VIRGIN STONE TO APPROXIMATELY TWO FEET ABOVE THE WATER TABLE
- AREA EXCAVATED AND BACKFILLED WITH APPROVED VIRGIN STONE OR RECYCLED CONCRETE AGGREGATE
- WATERPROOFING/VAPOR BARRIER
- APPROXIMATE WATER TABLE ELEVATION

NOTES

* – PROJECTED LOCATION

NAVD88 – NORTH AMERICAN VERTICAL DATUM 1988



SITE PLAN

SCALE: 1" = 80'

Title:
HYDROGEOLOGIC CROSS SECTIONS/ GENERALIZED CUT AND FILL MAP

SENDERO VERDE
REDEVELOPMENT PROJECT - PARCEL B

Prepared for:

SV-B OWNERS LLC

ROUX

Compiled by: W.S.	Date: 17JUL20	FIGURE
Prepared by: G.M.	Scale: AS SHOWN	3
Project Mgr: W.S.	Project: 2984.0003Y000	
File: 2984.0003Y137.05.DWG		

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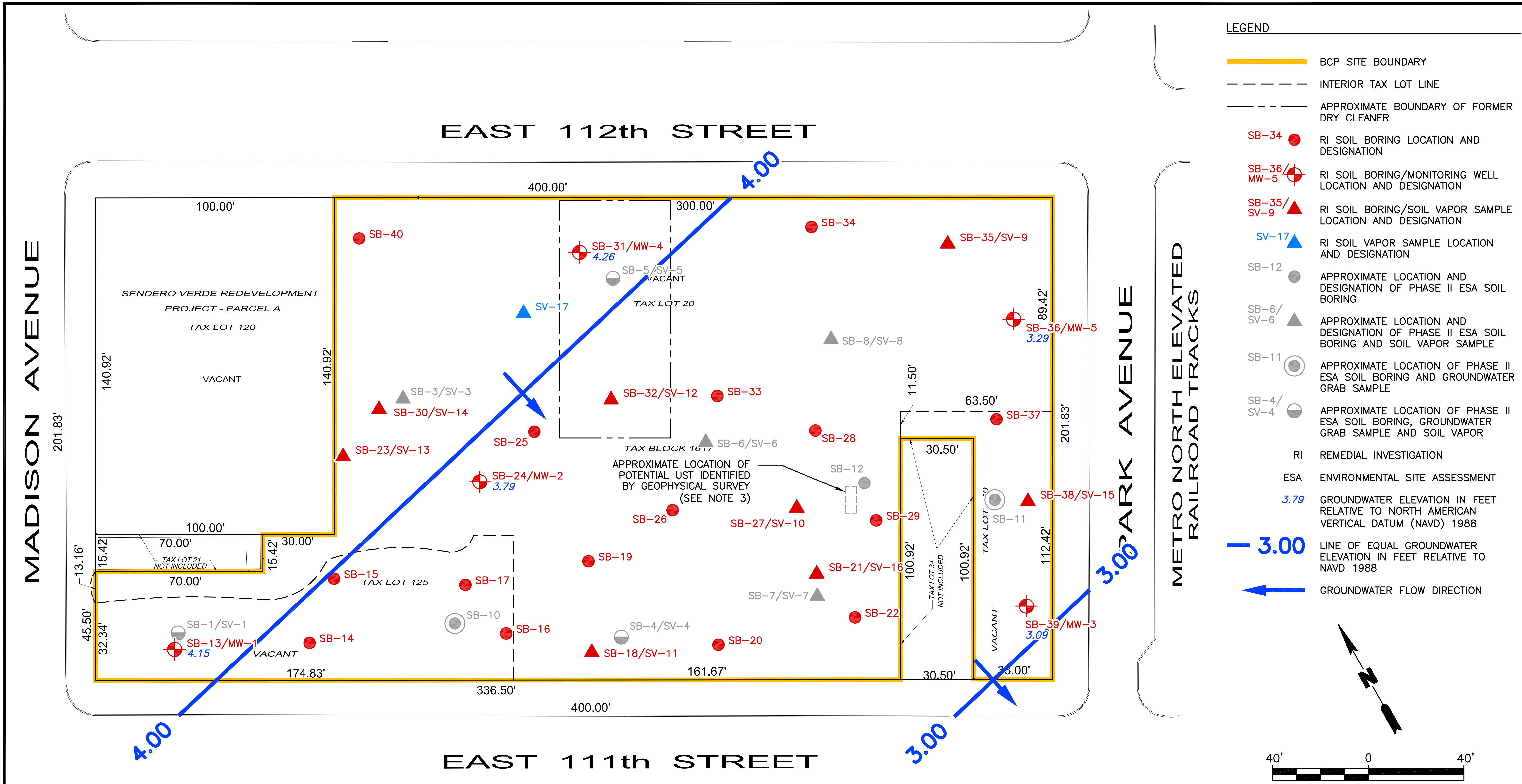


V:\CAD\PROJECTS\2984Y\0003Y\137\2984.0003Y137.03.DWG

NOTES

1. BASEMAP ADAPTED FROM SURVEY NO. 65967-2 PREPARED BY MONTROSE SURVEYING CO., LLP, DATED FEBRUARY 1, 2019.

2. RI SAMPLING LOCATIONS WERE SURVEYED ON APRIL 26, 2019. HORIZONTAL COORDINATES BASED UPON NY STATE PLANE COORDINATE SYSTEM, LONG ISLAND ZONE, NORTH AMERICAN DATUM (NAD) 83.

3. EXPLORATORY BORINGS WERE PERFORMED AND NO UNDERGROUND STORAGE TANK (UST) WAS LOCATED DURING THE RI.

Title:

GROUNDWATER CONTOUR MAP
APRIL 26, 2019

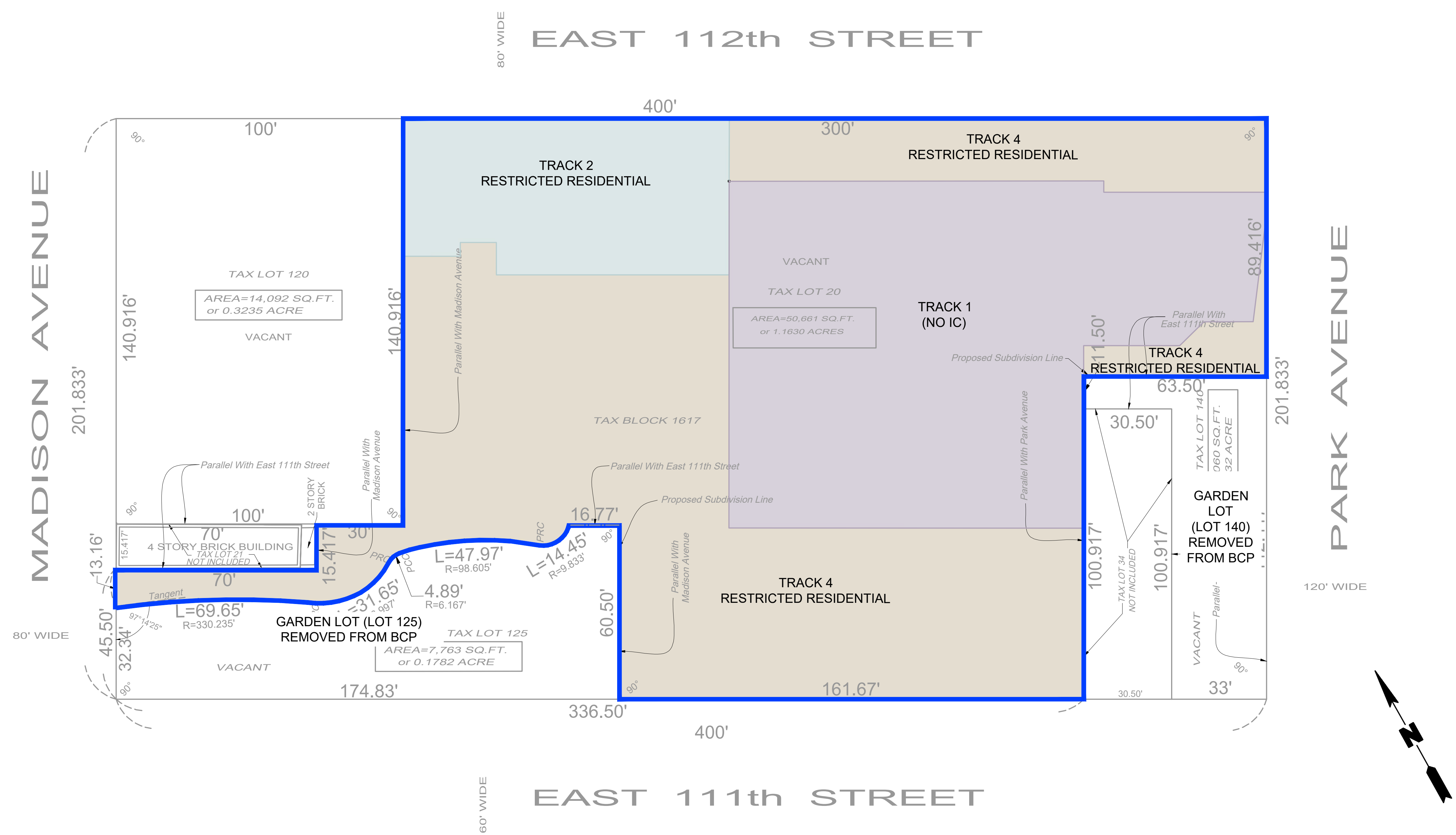
SENDERO VERDE
REDEVELOPMENT PROJECT - PARCEL B

Prepared for:

SV-B OWNERS LLC

ROUX

Compiled by: W.S.	Date: 17JUL20	FIGURE
Prepared by: G.M.	Scale: AS SHOWN	4
Project Mgr: W.S.	Project: 2984.0003Y000	
File: 2984.0003Y137.03.DWG		



LEGEND

BCP SITE BOUNDARY

40' 0 40'

Title:

INSTITUTIONAL CONTROL (IC) BOUNDARIES IN TRACK 2 AND TRACK 4 AREAS

SENDERO VERDE
REDEVELOPMENT PROJECT - PARCEL B

Prepared for:

SV-B OWNERS LLC

ROUX

Compiled by: W.S.	Date: 17JUL20	FIGURE
Prepared by: G.M.	Scale: AS SHOWN	5
Project Mgr: W.S.	Project: 2984.0003Y000	
File: 2984.0003Y137.05 NEW.DWG		

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APPENDICES

APPENDIX A

Environmental Easement

NYC DEPARTMENT OF FINANCE
OFFICE OF THE CITY REGISTER

This page is part of the instrument. The City Register will rely on the information provided by you on this page for purposes of indexing this instrument.The information on this page will control for indexing purposes in the event of any conflict with the rest of the document.

2020102101259002001E4439

RECORDING AND ENDORSEMENT COVER PAGE

Document ID: 2020102101259002 Document Date: 10-13-2020 Preparation Date: 10-22-2020
Document Type: EASEMENT
Document Page Count: 11

PRESENTER:
ROYAL REGISTERED PROPERTY REPORTS
(183266)MB
125 PARK AVENUE, SUITE 1610
NEW YORK, NY 10017
212-376-0900
MBASALATAN@ROYALABSTRACT.COM

RETURN TO:
ROYAL REGISTERED PROPERTY REPORTS
(183266)MB
125 PARK AVENUE, SUITE 1610
NEW YORK, NY 10017
212-376-0900
MBASALATAN@ROYALABSTRACT.COM

PROPERTY DATA

Borough	Block	Lot	Unit	Address
MANHATTAN	1617	20 Entire Lot		60 EAST 112 STREET

Property Type: NON-RESIDENTIAL VACANT LAND

CROSS REFERENCE DATA

CRFN_______ *or* DocumentID________ *or* ________ Year_____ Reel____ Page_____ *or* File Number__________

PARTIES

GRANTOR/SELLER:
ACACIA SENDERO VERDE II HOUSING DEVELOPMENT FUND COMPANY, INC., 300 EAST 175TH STREET
BRONX, NY 10457

☒ Additional Parties Listed on Continuation Page

GRANTEE/BUYER:
THE PEOPLE OF THE STATE OF NEW YORK
625 BROADWAY
ALBANY, NY 12233

FEES AND TAXES

Mortgage :

Mortgage Amount:	$	0.00
Taxable Mortgage Amount:	$	0.00
Exemption:		
TAXES: County (Basic):	$	0.00
City (Additional):	$	0.00
Spec (Additional):	$	0.00
TASF:	$	0.00
MTA:	$	0.00
NYCTA:	$	0.00
Additional MRT:	$	0.00
TOTAL:	$	0.00
Recording Fee:	$	92.00
Affidavit Fee:	$	0.00

Filing Fee:	$	0.00
NYC Real Property Transfer Tax:	$	0.00
NYS Real Estate Transfer Tax:	$	0.00

RECORDED OR FILED IN THE OFFICE OF THE CITY REGISTER OF THE CITY OF NEW YORK

Recorded/Filed 10-26-2020 11:57
City Register File No.(CRFN):
2020000297521

Annette M Hill

City Register Official Signature

NYC DEPARTMENT OF FINANCE
OFFICE OF THE CITY REGISTER

2020102101259002001C46B9

RECORDING AND ENDORSEMENT COVER PAGE (CONTINUATION)

Document ID: 2020102101259002 Document Date: 10-13-2020 Preparation Date: 10-22-2020
Document Type: EASEMENT

PARTIES

GRANTOR/SELLER:
SV-B OWNERS LLC
1865 PALMER AVENU, SUITE 203
LARCHMONT, NY 10538

ENVIRONMENTAL EASEMENT GRANTED PURSUANT TO ARTICLE 71, TITLE 36 OF THE NEW YORK STATE ENVIRONMENTAL CONSERVATION LAW

THIS INDENTURE made as of this 13th day of October, 2020 between Owner(s), Acacia Sendero Verde II Housing Development Fund Company, Inc., (the "Grantor Fee Owner") having an office at 300 East 175th Street, Bronx, New York 10457, and SV-B Owners LLC, (the "Grantor Beneficial Owner), having an office at 1865 Palmer Avenue, Suite 203, Larchmont, New York 10538, (collectively, the "Grantor"), and The People of the State of New York (the "Grantee."), acting through their Commissioner of the Department of Environmental Conservation (the "Commissioner", or "NYSDEC" or "Department" as the context requires) with its headquarters located at 625 Broadway, Albany, New York 12233,

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to encourage the remediation of abandoned and likely contaminated properties ("sites") that threaten the health and vitality of the communities they burden while at the same time ensuring the protection of public health and the environment; and

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to establish within the Department a statutory environmental remediation program that includes the use of Environmental Easements as an enforceable means of ensuring the performance of operation, maintenance, and/or monitoring requirements and the restriction of future uses of the land, when an environmental remediation project leaves residual contamination at levels that have been determined to be safe for a specific use, but not all uses, or which includes engineered structures that must be maintained or protected against damage to perform properly and be effective, or which requires groundwater use or soil management restrictions; and

WHEREAS, the Legislature of the State of New York has declared that Environmental Easement shall mean an interest in real property, created under and subject to the provisions of Article 71, Title 36 of the New York State Environmental Conservation Law ("ECL") which contains a use restriction and/or a prohibition on the use of land in a manner inconsistent with engineering controls which are intended to ensure the long term effectiveness of a site remedial program or eliminate potential exposure pathways to hazardous waste or petroleum; and

WHEREAS, Grantor Fee Owner, is the owner of real property having addresses known as 67-89 East 11th Street, 56-74 East 112th Street and 1675 Madison Avenue in the City of New York, County of New York and State of New York, known and designated on the tax map of the New York City Department of Finance as tax map parcel number: Block 1617 Lot 20, being a portion of that property conveyed to Grantor by deed dated June 27, 2019 and recorded in the City Register of the City of New York as CRFN # 2019000208938. The property subject to this Environmental Easement (the "Controlled Property") comprises approximately 0.7496 +/- acres, and is hereinafter more fully described as "Environmental Easement Area 1" and "Environmental Easement Area 2" in the Land Title Survey dated August 26, 2020 prepared by Saeid Jalilvand, L.L.S. of Montrose Surveying Co., LLP, which will be attached to the Site Management Plan. The Controlled Property description is set forth in and attached hereto as Schedule A; and

WHEREAS, Grantor Beneficial Owner, is the owner of the beneficial interest in the Controlled Property being the same as a portion of that beneficial interest conveyed to Grantor

Beneficial Owner by means of a Declaration of Interest and Nominee Agreement dated June 25, 2019 and recorded in City Register of the City of New York as CRFN # 2019000208939; and

WHEREAS, the Department accepts this Environmental Easement in order to ensure the protection of public health and the environment and to achieve the requirements for remediation established for the Controlled Property until such time as this Environmental Easement is extinguished pursuant to ECL Article 71, Title 36; and

NOW THEREFORE, in consideration of the mutual covenants contained herein and the terms and conditions of Brownfield Cleanup Agreement IndexNumber: C231128-02-19, Grantor conveys to Grantee a permanent Environmental Easement pursuant to ECL Article 71, Title 36 in, on, over, under, and upon the Controlled Property as more fully described herein ("Environmental Easement").

1. Purposes. Grantor and Grantee acknowledge that the Purposes of this Environmental Easement are: to convey to Grantee real property rights and interests that will run with the land in perpetuity in order to provide an effective and enforceable means of encouraging the reuse and redevelopment of this Controlled Property at a level that has been determined to be safe for a specific use while ensuring the performance of operation, maintenance, and/or monitoring requirements; and to ensure the restriction of future uses of the land that are inconsistent with the above-stated purpose.

2. Institutional and Engineering Controls. The controls and requirements listed in the Department approved Site Management Plan ("SMP") including any and all Department approved amendments to the SMP are incorporated into and made part of this Environmental Easement. These controls and requirements apply to the use of the Controlled Property, run with the land, are binding on the Grantor and the Grantor's successors and assigns, and are enforceable in law or equity against any owner of the Controlled Property, any lessees and any person using the Controlled Property.

A. (1) The Controlled Property may be used for:

Restricted Residential as described in 6 NYCRR Part 375-1.8(g)(2)(ii), Commercial as described in 6 NYCRR Part 375-1.8(g)(2)(iii) and Industrial as described in 6 NYCRR Part 375-1.8(g)(2)(iv)

(2) All Engineering Controls must be operated and maintained as specified in the Site Management Plan (SMP);

(3) All Engineering Controls must be inspected at a frequency and in a manner defined in the SMP;

(4) 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;

(5) Groundwater and other environmental or public health monitoring must be performed as defined in the SMP;

(6) 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;

(7) All future activities on the property that will disturb remaining contaminated material must be conducted in accordance with the SMP;

(8) Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in the SMP;

(9) Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical components of the remedy shall be performed as defined in the SMP;

(10) 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 this Environmental Easement.

B. The Controlled Property shall not be used for Residential purposes as defined in 6NYCRR 375-1.8(g)(2)(i), and the above-stated engineering controls may not be discontinued without an amendment or extinguishment of this Environmental Easement.

C. The SMP describes obligations that the Grantor assumes on behalf of Grantor, its successors and assigns. The Grantor's assumption of the obligations contained in the SMP which may include sampling, monitoring, and/or operating a treatment system, and providing certified reports to the NYSDEC, is and remains a fundamental element of the Department's determination that the Controlled Property is safe for a specific use, but not all uses. The SMP may be modified in accordance with the Department's statutory and regulatory authority. The Grantor and all successors and assigns, assume the burden of complying with the SMP and obtaining an up-to-date version of the SMP from:

Site Control Section
Division of Environmental Remediation
NYSDEC
625 Broadway
Albany, New York 12233
Phone: (518) 402-9553

D. Grantor must provide all persons who acquire any interest in the Controlled Property a true and complete copy of the SMP that the Department approves for the Controlled Property and all Department-approved amendments to that SMP.

E. Grantor covenants and agrees that until such time as the Environmental Easement is extinguished in accordance with the requirements of ECL Article 71, Title 36 of the ECL, the property deed and all subsequent instruments of conveyance relating to the Controlled Property shall state in at least fifteen-point bold-faced type:

This property is subject to an Environmental Easement held by the New York State Department of Environmental Conservation pursuant to Title 36 of Article 71 of the Environmental Conservation Law.

F. Grantor covenants and agrees that this Environmental Easement shall be incorporated in full or by reference in any leases, licenses, or other instruments granting a right to use the Controlled Property.

G. Grantor covenants and agrees that it shall, at such time as NYSDEC may require, submit to NYSDEC a written statement by an expert the NYSDEC may find acceptable certifying under penalty of perjury, in such form and manner as the Department may require, that:

(1) the inspection of the site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under the direction of the individual set forth at 6 NYCRR Part 375-1.8(h)(3).

(2) the institutional controls and/or engineering controls employed at such site:

(i) are in-place;

(ii) are unchanged from the previous certification, or that any identified changes to the controls employed were approved by the NYSDEC and that all controls are in the Department-approved format; and

(iii) that nothing has occurred that would impair the ability of such control to protect the public health and environment;

(3) the owner will continue to allow access to such real property to evaluate the continued maintenance of such controls;

(4) nothing has occurred that would constitute a violation or failure to comply with any site management plan for such controls;

(5) the report and all attachments were prepared under the direction of, and reviewed by, the party making the certification;

(6) to the best of his/her knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program, and generally accepted engineering practices; and

(7) the information presented is accurate and complete.

3. Right to Enter and Inspect. Grantee, its agents, employees, or other representatives of the State may enter and inspect the Controlled Property in a reasonable manner and at reasonable times to assure compliance with the above-stated restrictions.

4. Reserved Grantor's Rights. Grantor reserves for itself, its assigns, representatives, and successors in interest with respect to the Property, all rights as fee owner of the Property, including:

A. Use of the Controlled Property for all purposes not inconsistent with, or limited by the terms of this Environmental Easement;

B. The right to give, sell, assign, or otherwise transfer part or all of the underlying fee interest to the Controlled Property, subject and subordinate to this Environmental Easement;

5. Enforcement

A. This Environmental Easement is enforceable in law or equity in perpetuity by Grantor, Grantee, or any affected local government, as defined in ECL Section 71-3603, against the owner of the Property, any lessees, and any person using the land. Enforcement shall not be defeated because of any subsequent adverse possession, laches, estoppel, or waiver. It is not a defense in any action to enforce this Environmental Easement that: it is not appurtenant to an interest in real property; it is not of a character that has been recognized traditionally at common law; it imposes a negative burden; it imposes affirmative obligations upon the owner of any interest in the burdened property; the benefit does not touch or concern real property; there is no privity of estate or of contract; or it imposes an unreasonable restraint on alienation.

B. If any person violates this Environmental Easement, the Grantee may revoke the Certificate of Completion with respect to the Controlled Property.

C. Grantee shall notify Grantor of a breach or suspected breach of any of the terms of this Environmental Easement. Such notice shall set forth how Grantor can cure such breach or suspected breach and give Grantor a reasonable amount of time from the date of receipt of notice in which to cure. At the expiration of such period of time to cure, or any extensions granted by Grantee, the Grantee shall notify Grantor of any failure to adequately cure the breach or suspected breach, and Grantee may take any other appropriate action reasonably necessary to remedy any breach of this Environmental Easement, including the commencement of any proceedings in accordance with applicable law.

D. The failure of Grantee to enforce any of the terms contained herein shall not be deemed a waiver of any such term nor bar any enforcement rights.

6. Notice. Whenever notice to the Grantee (other than the annual certification) or approval from the Grantee is required, the Party providing such notice or seeking such approval shall identify the Controlled Property by referencing the following information:

County, NYSDEC Site Number, NYSDEC Brownfield Cleanup Agreement, State Assistance Contract or Order Number, and the County tax map number or the Liber and Page or computerized system identification number.

Parties shall address correspondence to:

Site Number: C231128
Office of General Counsel
NYSDEC
625 Broadway
Albany New York 12233-5500

With a copy to:

Site Control Section
Division of Environmental Remediation
NYSDEC
625 Broadway
Albany, NY 12233

All notices and correspondence shall be delivered by hand, by registered mail or by Certified mail and return receipt requested. The Parties may provide for other means of receiving and communicating notices and responses to requests for approval.

7. Recordation. Grantor shall record this instrument, within thirty (30) days of execution of this instrument by the Commissioner or her/his authorized representative in the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

8. Amendment. Any amendment to this Environmental Easement may only be executed by the Commissioner of the New York State Department of Environmental Conservation or the Commissioner's Designee, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

9. Extinguishment. This Environmental Easement may be extinguished only by a release by the Commissioner of the New York State Department of Environmental Conservation, or the Commissioner's Designee, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

10. Joint Obligation. If there are two or more parties identified as Grantor herein, the obligations imposed by this instrument upon them shall be joint and several.

11. Consistency with the SMP. To the extent there is any conflict or inconsistency between the terms of this Environmental Easement and the SMP, regarding matters specifically addressed by the SMP, the terms of the SMP will control.

Remainder of Page Intentionally Left Blank

IN WITNESS WHEREOF, Grantor Fee Owner has caused this instrument to be signed in its name.

Acacia Sendero Verde II Housing Development Fund Company, Inc.:

By: ______________________

Print Name: Raul Russi

Title: President/CEO Date: 9/30/2020

Grantor's Acknowledgment

STATE OF NEW YORK)
) ss:
COUNTY OF Bronx)

On the 30th day of Sept, in the year 20 20 before me, the undersigned, personally appeared Raul Russi, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

____
Notary Public - State of New York

GIAMARA M. ROSADO
Notary Public, State of New York
Registration #02RO6305162
Qualified In Bronx County
Commission Expires June 2, 2022

183266
Royal Registered Property Reports, Inc.
125 Park Avenue, Suite 1610
New York, N.Y 10017
(212) 376-0900

IN WITNESS WHEREOF, Grantor Beneficial Owner has caused this instrument to be signed in its name.

SV-B Owners LLC:

By: ______________________

Print Name: David Dishy

Title: Authorized Signatory Date: 9/29/20

Grantor's Acknowledgment

STATE OF NEW YORK)
) ss:
COUNTY OF)

On the 29 day of September in the year 20 20, before me, the undersigned, personally appeared David Dishy, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

Andria Johnson
Notary Public - State of New York

Andria Johnson
NOTARY PUBLIC, STATE OF NEW YORK
Registration No. 01JO6407805
Qulaified in New York
Commission Expires July 13, 2024

THIS ENVIRONMENTAL EASEMENT IS HEREBY ACCEPTED BY THE PEOPLE OF THE STATE OF NEW YORK, Acting By and Through the Department of Environmental Conservation as Designee of the Commissioner,

By: ______________________
Michael J. Ryan, Director
Division of Environmental Remediation

Grantee's Acknowledgment

STATE OF NEW YORK)
) ss:
COUNTY OF ALBANY)

On the 13th day of October in the year 2020 before me, the undersigned, personally appeared Michael J. Ryan, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/ executed the same in his/her/ capacity as Designee of the Commissioner of the State of New York Department of Environmental Conservation, and that by his/her/ signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument.

____
Notary Public - State of New York

MONICA KRESHIK, ESQ.
Notary Public, State of New York
No. 02KR6314859
Qualified in Rensselaer County
Commission Expires 11/17/2022

SCHEDULE "A" PROPERTY DESCRIPTION
ENVIRONMENTAL EASEMENT LEGAL DESCRIPTION

SENDERO VERDE PARCEL B – BLOCK 1617, LOT 20

ENVIRONMENTAL EASEMENT AREA 1

ALL that certain plot piece or parcel of land situate lying and being in the Borough of Manhattan, City, County and State of New York bounded and described as follows:

BEGINNING at a point on the easterly side of Madison Avenue (80 feed wide) distant 32.34 feet northerly from the corner formed by the intersection of the northerly side of East 111th Street (60 feet wide) with the easterly side of Madison Avenue;

RUNNING THENCE easterly along a curve bearing to the right having a radius of 330.235 feet its tangent forming an angle 97 degrees 14 minutes 25 seconds on the southeast an arc length of 69.65 feet to a point of reverse curvature;

RUNNING THENCE easterly and northeasterly along a curve bearing to the left having a radius of 26.997 feet an arc length of 31.65 feet to a point of reverse curvature;

RUNNING THENCE northeasterly along a curve bearing to the right having a radius of 6.167 feet an arc length of 4.89 feet to a point of compound curvature;

RUNNING THENCE easterly along a curve bearing to the right having a radius of 98.605 feet an arc length of 47.97 feet to a point of reverse curvature;

RUNNING THENCE northeasterly along a curve bearing to the left having a radius of 9.833 feet an arc length of 14.45 feet to a point;

RUNNING THENCE easterly parallel with the northerly side of East 111th Street, 16.77 feet to a point;

RUNNING THENCE southerly parallel with the easterly side of Madison Avenue, 60.50 feet to the northerly side of East 111th Street;

RUNNING THENCE easterly along the northerly side of EAST 111th Street, 161.67 feet to a point;

RUNNING THENCE northerly parallel with the westerly side of Park Avenue (120 feet wide), 59.333 feet to a point;

RUNNING THENCE westerly parallel with the northerly side of East 111th Street, 123.40 feet to a point;

RUNNING THENCE northerly at right angles to the last mentioned course, 120.70 feet to a point;

RUNNING THENCE easterly at right angles to the last mentioned course, 130.35 feet to a point;

RUNNING THENCE southerly at right angles to the last mentioned course, 3.80 feet to a point;

RUNNING THENCE easterly at right angles to the last mentioned course, 56.55 feet to the westerly side of Park Avenue;

RUNNING THENCE northerly along the westerly side of Park Avenue, 25.60 feet to the southerly side of East 112th Street (80 feet wide);

RUNNING THENCE westerly along the southerly side of East 112th Street, 300.00 feet to a point;

RUNNING THENCE southerly parallel with the easterly side of Madison Avenue, 140.916 feet to a point;

RUNNING THENCE westerly parallel with the northerly side of East 111th Street, 30.00 feet to a point;

RUNNING THENCE southerly parallel with the easterly side of Madison Avenue, 15.417 feet to a point;

RUNNING THENCE westerly parallel with the easterly side of East 111th Street, 70.00 feet to the easterly side of Madison Avenue;

RUNNING THENCE southerly along the easterly side of Madison Avenue, 13.16 feet to the point or place of BEGINNING.

The above described easement has an area of 31,688 square feet or 0.7275 acre.

ENVIRONMENTAL EASEMENT AREA 2

ALL that certain plot piece or parcel of land situate lying and being in the Borough of Manhattan, City, County and State of New York bounded and described as follows:

BEGINNING at a point on the westerly side of Park Avenue (140 feet wide) distant 112.417 feet northerly from the corner formed by the intersection of the northerly side of East 111th Street (60 feet wide) with the westerly side of Park Avenue;

RUNNING THENCE westerly parallel with the northerly side of East 111th Street, 63.50 feet to a point;

RUNNING THENCE northerly parallel with the westerly side of Park Avenue, 10.45 feet to a point;

RUNNING THENCE easterly at right angles to the last mentioned course, 33.35 feet to a point;

RUNNING THENCE northeasterly along a line forming an angle of 135 degrees 19 minutes 47 seconds on the northwest with the last mentioned course, 11.82 feet to a point;

RUNNING THENCE easterly along a line forming an angle of 135 degrees 19 minutes 04 seconds on the southeast with the last mentioned course, 17.10 feet to a point;

RUNNING THENCE northerly along a line forming an angle of 97 degrees 14 minutes 10 seconds on the northwest with the last mentioned course, 36.85 feet to the westerly side of Park Avenue;

RUNNING THENCE southerly along the westerly side of Park Avenue, 55.316 feet to the point or place of BEGINNING.

The above described easement has an area of 964 square feet or 0.0221 acre.

The two (2) easement areas, when taken together, have an area of 32,652 square feet or 0.7496 acre.

APPENDIX B

List of Site Contacts

APPENDIX B – LIST OF SITE CONTACTS

Name	Phone/Email Address
Jessica Yoon, L+M Development Partners Inc., Site Owner	Phone: (212) 233-0495 Email: jyoon@lmdevpartners.com
Noelle M. Clarke, P.E., Roux, Environmental Consultant and Remedial Engineer	Phone: (631) 232-2600 Email: nclarke@rouxinc.com
Nigel Crawford, P.E., NYSDEC Region 2 Project Manager	Phone: (718) 482-7778 Email: nigel.crawford@dec.ny.gov
Jane O'Connell, NYSDEC Regional Hazardous Waste Remediation Engineer	Phone: (718) 782-4599 Email: jane.oconnell@dec.ny.gov
Kelly Lewandowski, NYSDEC Site Control Section	Phone: (518) 402-9569 Email: kelly.lewandowski@dec.ny.gov
Michael Bogin, Remedial Party Attorney	Phone: (646) 378-7210 Email: mbogin@sprlaw.com
Mark Sergott, NYSDOH Project Manager	Phone: (518) 473-0771 Email: beei@health.ny.gov

APPENDIX C

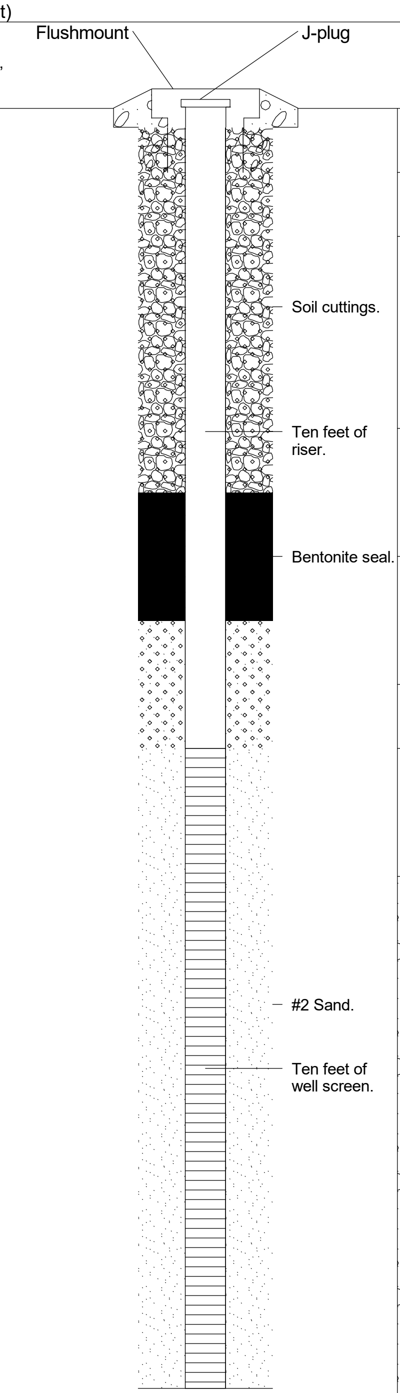
Soil Boring and Monitoring Well Logs

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

209 Shafter Street
Islandia, NY 11749
Telephone: (631) 232-2600
Fax: (631) 232-9898

WELL CONSTRUCTION LOG

WELL NO. **SB-13/MW-1/WC-13**	NORTHING **Not Measured**	EASTING **Not Measured**		
PROJECT NO./NAME **2984.0003Y000 / Sendero Verde - Parcel B**		LOCATION **75 East 111th Street and 60 East 112th Street New York, New York**		
APPROVED BY **V. Sabatasso**	LOGGED BY **A. Paccadolmi**			
DRILLING CONTRACTOR/DRILLER **AARCO / A. Hutchinson**		GEOGRAPHIC AREA **Manhattan, Block 1617, Lots 20, 125, and 140**		
DRILL BIT DIAMETER/TYPE **2-in. / Drive Sampler**	BOREHOLE DIAMETER **2-inches**	DRILLING EQUIPMENT/METHOD **7720DT / Geoprobe**	SAMPLING METHOD **2" Macro-Core**	START-FINISH DATE **4/15/19-4/16/19**
CASING MAT./DIA. **PVC / 2-inch**	SCREEN: TYPE **Slotted** MAT. **PVC**	TOTAL LENGTH **10.0**ft	DIA. **2-inch**	SLOT SIZE **40-Slot**
ELEVATION OF: (Feet)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN /	GRAVEL PACK SIZES **#2**



Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	Brown, fine to medium SAND, some Silt, trace brick and organics (FILL); moist.			Hand cleared to 5 feet bls.
1	Reddish brown, fine to medium SAND, some Brick (FILL); moist.			
2	Reddish brown, SILT, some fine to medium SAND and Brick (FILL); moist.			Collect sample for Part 375 full list and emerging contaminants at SB-13 (2-4).
5	Brown, fine to medium SAND, trace peat (FILL); moist.			
7	Reddish brown, BRICK, some fine to medium Sand, trace wood (FILL); moist.			
9	Light grey, fine to medium SAND and BRICK, trace concrete (FILL); moist.			Collect sample for Part 375 full list and emerging contaminants at SB-13 (8-10).
10	Brown, fine to medium SAND, some Brick, trace concrete (FILL); moist.			
12	Light brown, medium to coarse SAND, some Cobble; wet.			Collect sample WC-13 (2-21).
				Collect sample for Part 375 full list and emerging contaminants at SB-13 (15-17).
21				End of boring at 21 ft bls.

BORING/FEET 2984.0001Y000 UPDATE - COPY.GPJ ROUX.GDT 5/24/19

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING
SB-14/WC-14	Not Measured	Not Measured

PROJECT NO./NAME: 2984.0003Y000 / Sendero Verde - Parcel B	LOCATION: 75 East 111th Street and 60 East 112th Street, New York, New York
APPROVED BY: V. Sabatasso	LOGGED BY: A. Paccadolmi
DRILLING CONTRACTOR/DRILLER: AARCO / A. Hutchinson	GEOGRAPHIC AREA: Manhattan, Block 1617, Lots 20, 125, and 140

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
2-in. / Drive Sampler	2-inches	7720DT / Geoprobe	2" Macro-Core	4/15/19-4/23/19

LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL
Not Measured	Not Measured	Clean cuttings

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0		Brown to light brown, fine to medium SAND, some Silt (FILL); moist.			Hand cleared to 5 feet bls.
		Brown, fine to medium SAND, some Silt, trace brick (FILL); moist.			
		Brown, fine to medium SAND, trace brick and glass (FILL); moist.		G	Collect sample for Part 375 full list and emerging contaminants at SB-14 (2-4).
5		Brown, BRICK and ASPHALT, little fine to medium Sand (FILL); moist.			Collect sample for Part 375 full list and emerging contaminants at SB-14 (8-10).
10					Collect sample WC-14 (2-21).
		Brown, medium to coarse SAND, some fine to coarse Gravel; wet.			
15					Collect sample for Part 375 full list and emerging contaminants at SB-14 (15-17).
					Collect sample for Part 375 full list at SB-14 (17-19).
		Brown, fine SAND, little Silt; wet.			
20					End of boring at 21 ft bls.

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SOIL BORING LOG

WELL NO. SB-15/WC-15	NORTHING Not Measured	EASTING Not Measured		
PROJECT NO./NAME 2984.0003Y000 / Sendero Verde - Parcel B		LOCATION 75 East 111th Street and 60 East 112th Street New York, New York		
APPROVED BY V. Sabatasso	LOGGED BY A. Paccadolmi			
DRILLING CONTRACTOR/DRILLER AARCO / A. Hutchinson		GEOGRAPHIC AREA Manhattan, Block 1617, Lots 20, 125, and 140		
DRILL BIT DIAMETER/TYPE 2-in. / Drive Sampler	BOREHOLE DIAMETER 2-inches	DRILLING EQUIPMENT/METHOD 7720DT / Geoprobe	SAMPLING METHOD 2" Macro-Core	START-FINISH DATE 4/15/19-4/23/19
LAND SURFACE ELEVATION Not Measured	DEPTH TO WATER Not Measured	BACKFILL Clean cuttings		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0-5		Brown, fine to medium SAND, some Brick (FILL); moist.			Hand cleared to 5 feet bls. Collect sample WC-13/14/15 (0-2). Collect sample for Part 375 full list and emerging contaminants at SB-15 (2-4).
5-13		BRICK, ASPHALT, and CONCRETE, little fine to medium Sand and Gravel (FILL); dry.			Collect sample for Part 375 full list and emerging contaminants at SB-15 (8-10). Collect sample WC-15 (2-21).
13-15		Brown, medium to coarse SAND, some fine to coarse Gravel, little Cobble; moist.			
15-18		Brown, medium to coarse SAND, some Gravel; wet.			Collect sample for Part 375 full list and emerging contaminants at SB-15 (15-17).
18-21		Brown, fine to coarse SAND, little Silt; wet.			End of boring at 21 ft bls.

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SOIL BORING LOG

WELL NO. **SB-16/WC-16**	NORTHING **Not Measured**	EASTING **Not Measured**		
PROJECT NO./NAME **2984.0003Y000 / Sendero Verde - Parcel B**		LOCATION **75 East 111th Street and 60 East 112th Street New York, New York**		
APPROVED BY **V. Sabatasso**	LOGGED BY **A. Paccadolmi**			
DRILLING CONTRACTOR/DRILLER **AARCO / A. Hutchinson**		GEOGRAPHIC AREA **Manhattan, Block 1617, Lots 20, 125, and 140**		
DRILL BIT DIAMETER/TYPE **2-in. / Drive Sampler**	BOREHOLE DIAMETER **2-inches**	DRILLING EQUIPMENT/METHOD **7720DT / Geoprobe**	SAMPLING METHOD **2" Macro-Core**	START-FINISH DATE **4/15/19-4/23/19**
LAND SURFACE ELEVATION **Not Measured**	DEPTH TO WATER **Not Measured**	BACKFILL **Clean cuttings**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0		Brown, fine to medium SAND, trace organics (FILL); moist.			Hand cleared to 5 feet bls.
1		Brown, fine to medium SAND, trace brick (FILL); moist			
2		Brown, fine to medium SAND, trace gravel and brick (FILL); moist.			Collect sample WC-16/17 (0-2).
3		Brown, fine to medium SAND, some brick (FILL); moist.			Collect sample for Part 375 full list and emerging contaminants at SB-16 (2-4).
5		BRICK, little fine to medium Sand (FILL); dry.			Collect sample for Part 375 full list and emerging contaminants at SB-16 (8-10).
12		Brown, medium to coarse SAND, little Gravel, trace silt; moist.			Collect sample WC-16 (2-21).
13		Brown, medium to coarse SAND, little Gravel, trace silt; wet.			
15		Brown, coarse SAND, trace fine gravel and silt; wet.			Collect sample for Part 375 full list and emerging contaminants at SB-16 (15-17).
18		Brown, coarse SAND, some Cobble; wet.			End of boring at 21 ft bls.

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SOIL BORING LOG

WELL NO. **SB-17/WC-17**	NORTHING **Not Measured**	EASTING **Not Measured**		
PROJECT NO./NAME **2984.0003Y000 / Sendero Verde - Parcel B**		LOCATION **75 East 111th Street and 60 East 112th Street New York, New York**		
APPROVED BY **V. Sabatasso**	LOGGED BY **A. Paccadolmi**			
DRILLING CONTRACTOR/DRILLER **AARCO / A. Hutchinson**		GEOGRAPHIC AREA **Manhattan, Block 1617, Lots 20, 125, and 140**		
DRILL BIT DIAMETER/TYPE **2-in. / Drive Sampler**	BOREHOLE DIAMETER **2-inches**	DRILLING EQUIPMENT/METHOD **7720DT / Geoprobe**	SAMPLING METHOD **2" Macro-Core**	START-FINISH DATE **4/15/19-4/23/19**
LAND SURFACE ELEVATION **Not Measured**	DEPTH TO WATER **Not Measured**	BACKFILL **Clean cuttings**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0		Brown to reddish brown, fine to medium SAND, some Brick, trace organics (FILL); moist.			Hand cleared to 5 feet bls.
1		Brown to reddish brown, fine to medium SAND, some Brick (FILL); moist.			
3					Collect sample for Part 375 full list and emerging contaminants at SB-17 (2-4).
5		BRICK and CONCRETE, little fine to coarse Sand and Cobble (FILL); dry.			
9					Collect sample for Part 375 full list and emerging contaminants at SB-17 (8-10).
10		BRICK and CONCRETE, some fine to medium Sand and Cobble, little fine to coarse Gravel (FILL); moist.			
12					Collect sample WC-17 (2-21).
13		Brown, fine to medium SAND, some fine to coarse Gravel and Cobble; moist.			
15		Brown, medium to coarse Sand, some fine to coarse Gravel and Cobble; wet.			
16					Collect sample for Part 375 full list and emerging contaminants at SB-17 (15-17).
18		Brown, medium to coarse SAND, some Cobble and little Silt; wet.			
21					End of boring at 21 ft bls.

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SOIL BORING LOG

WELL NO. **SB-18/WC-18**	NORTHING **Not Measured**	EASTING **Not Measured**		
PROJECT NO./NAME **2984.0003Y000 / Sendero Verde - Parcel B**		LOCATION **75 East 111th Street and 60 East 112th Street New York, New York**		
APPROVED BY **V. Sabatasso**	LOGGED BY **A. Paccadolmi**			
DRILLING CONTRACTOR/DRILLER **AARCO / A. Hutchinson**		GEOGRAPHIC AREA **Manhattan, Block 1617, Lots 20, 125, and 140**		
DRILL BIT DIAMETER/TYPE **2-in. / Drive Sampler**	BOREHOLE DIAMETER **2-inches**	DRILLING EQUIPMENT/METHOD **7720DT / Geoprobe**	SAMPLING METHOD **2" Macro-Core**	START-FINISH DATE **4/17/19-4/22/19**
LAND SURFACE ELEVATION **Not Measured**	DEPTH TO WATER **Not Measured**	BACKFILL **Clean cuttings**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0		Brown, fine to medium SAND, some Brick, trace organics (FILL); moist.			Hand cleared to 5 feet bls.
1		Brown, fine to medium SAND, some Brick (FILL); moist.			Collect sample WC-18 (2-9).
					Collect sample for Part 375 full list and emerging contaminants at SB-18 (2-4).
5		BRICK and CONCRETE, some fine to coarse Sand (FILL); dry.			Collect sample for Part 375 full list at SB-18 (4-6).
					Collect sample for Part 375 full list at SB-18 (6-8).
10		BRICK and CONCRETE, some fine to coarse Sand (FILL); moist.			
13		Brown, medium to coarse SAND, some fine to coarse Gravel and Cobble; wet.			
15		Brown, medium to coarse SAND, little fine to coarse Gravel, trace silt; wet.			Collect sample for Part 375 full list at SB-18 (15-17).
20					End of boring at 20 ft bls.

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-19/WC-19	**Not Measured**	**Not Measured**		
PROJECT NO./NAME: **2984.0003Y000 / Sendero Verde - Parcel B**		LOCATION: **75 East 111th Street and 60 East 112th Street New York, New York**		
APPROVED BY: **V. Sabatasso**	LOGGED BY: **A. Paccadolmi**			
DRILLING CONTRACTOR/DRILLER: **AARCO / A. Hutchinson**		GEOGRAPHIC AREA: **Manhattan, Block 1617, Lots 20, 125, and 140**		
DRILL BIT DIAMETER/TYPE: **2-in. / Drive Sampler**	BOREHOLE DIAMETER: **2-inches**	DRILLING EQUIPMENT/METHOD: **7720DT / Geoprobe**	SAMPLING METHOD: **2" Macro-Core**	START-FINISH DATE: **4/18/19-4/22/19**
LAND SURFACE ELEVATION: **Not Measured**	DEPTH TO WATER: **Not Measured**	BACKFILL: **Clean cuttings**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0		Reddish brown, fine to medium SAND, some Brick and Asphalt, trace cobble (FILL); moist.			Hand cleared to 5 feet bls.
2		Brown, fine to medium SAND, some Brick (FILL); moist.			Collect sample WC-19 (2-9).
4		Light brown to brown, fine to medium SAND, some Brick, (FILL); moist.			Collect sample for Part 375 full list and emerging contaminants at SB-19 (2-4).
5		BRICK, some fine to coarse Sand, little Gravel (FILL); dry.			Collect sample for Part 375 full list at SB-19 (4-6). Collect sample for Part 375 full list at SB-19 (6-8).
10		BRICK, some fine to coarse Sand, little Cobble and Gravel (FILL); moist.			
13		Brown, fine to coarse SAND, some Cobble and fine to coarse Gravel; moist.			
14		Brown, fine to coarse SAND, some Cobble and fine to coarse Gravel; wet.			Collect sample for Part 375 full list at SB-19 (15-17).
18		Brown, fine to medium SAND, little Silt; wet.			End of boring at 20 ft bls.
20					

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SOIL BORING LOG

WELL NO. **SB-20/WC-20**	NORTHING **Not Measured**	EASTING **Not Measured**		
PROJECT NO./NAME **2984.0003Y000 / Sendero Verde - Parcel B**		LOCATION **75 East 111th Street and 60 East 112th Street** **New York, New York**		
APPROVED BY **V. Sabatasso**	LOGGED BY **A. Paccadolmi**			
DRILLING CONTRACTOR/DRILLER **AARCO / A. Hutchinson**		GEOGRAPHIC AREA **Manhattan, Block 1617, Lots 20, 125, and 140**		
DRILL BIT DIAMETER/TYPE **2-in. / Drive Sampler**	BOREHOLE DIAMETER **2-inches**	DRILLING EQUIPMENT/METHOD **7720DT / Geoprobe**	SAMPLING METHOD **2" Macro-Core**	START-FINISH DATE **4/17/19-4/22/19**
LAND SURFACE ELEVATION **Not Measured**	DEPTH TO WATER **Not Measured**	BACKFILL **Clean cuttings**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0		Dark brown, fine to medium SAND, little Gravel (FILL); dry.			Hand cleared to 5 feet bls.
2		BRICK and CONCRETE, some fine to medium Sand (FILL); dry.			Collect sample WC-20 (2-9).
					Collect sample for Part 375 full list and emerging contaminants at SB-20 (2-4).
5		BRICK, ASPHALT and WOOD, little fine to medium Sand (FILL); dry.			Collect sample for Part 375 full list at SB-20 (4-6).
					Collect sample for Part 375 full list at SB-20 (6-8).
10		Brown, fine to medium SAND, little Silt; moist.			
12		Brown, fine to medium SAND, little Silt; wet.			
15		Brown, fine to medium SAND, some Silt; wet.			Collect sample for Part 375 full list at SB-20 (15-17).
20					End of boring at 20 ft bls.

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING
SB-21/WC-21	**Not Measured**	**Not Measured**

PROJECT NO./NAME		LOCATION
2984.0003Y000 / Sendero Verde - Parcel B		**75 East 111th Street and 60 East 112th Street**
APPROVED BY: **V. Sabatasso**	LOGGED BY: **A. Paccadolmi**	**New York, New York**

DRILLING CONTRACTOR/DRILLER	GEOGRAPHIC AREA
AARCO / A. Hutchinson	**Manhattan, Block 1617, Lots 20, 125, and 140**

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
2-in. / Drive Sampler	**2-inches**	**7720DT / Geoprobe**	**2" Macro-Core**	**4/17/19-4/19/19**

LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL
Not Measured	**Not Measured**	**Clean cuttings**

Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	Dark brown, fine to medium SAND (FILL); moist.			Hand cleared to 5 feet bls.
	Brown, fine to medium SAND, some Brick and Asphalt (FILL); moist.	G		Collect sample WC-21 (2-9).
				Collect sample for Part 375 full list and emerging contaminants at SB-21 (2-4).
5	Light grey, COBBLE (FILL); dry.			
	Light brown, fine to medium SAND, trace gravel (FILL); moist.			Collect sample for Part 375 full list at SB-21 (4-6).
	Brown, fine to medium SAND, some Cobble, trace gravel (FILL); moist.			Collect sample for Part 375 full list at SB-21 (6-8).
10	Light grey, COBBLE, some Brick and Concrete (FILL); moist.			
	Brown, fine to medium SAND; moist.			
15	Brown, fine to medium SAND; wet.			Collect sample for Part 375 full list at SB-21 (15-17).
	Brown, fine SAND and SILT; wet.			
20				End of boring at 20 ft bls.

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-22/WC-22	**Not Measured**	**Not Measured**		
PROJECT NO./NAME: **2984.0003Y000 / Sendero Verde - Parcel B**		LOCATION: **75 East 111th Street and 60 East 112th Street New York, New York**		
APPROVED BY: **V. Sabatasso**	LOGGED BY: **A. Paccadolmi**			
DRILLING CONTRACTOR/DRILLER: **AARCO / A. Hutchinson**		GEOGRAPHIC AREA: **Manhattan, Block 1617, Lots 20, 125, and 140**		
DRILL BIT DIAMETER/TYPE: **2-in. / Drive Sampler**	BOREHOLE DIAMETER: **2-inches**	DRILLING EQUIPMENT/METHOD: **7720DT / Geoprobe**	SAMPLING METHOD: **2" Macro-Core**	START-FINISH DATE: **4/16/19-4/22/19**
LAND SURFACE ELEVATION: **Not Measured**	DEPTH TO WATER: **Not Measured**	BACKFILL: **Clean cuttings**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0		Brown, fine to medium SAND, some Brick, trace organics (FILL); moist.			Hand cleared to 5 feet bls.
		Brown, fine to medium SAND, some Brick (FILL); moist.			Collect sample WC-18/19/20/21/22 (0-2). Collect sample for Part 375 full list and emerging contaminants at SB-22 (2-4).
5		BRICK, CONCRETE, little fine to medium Sand (FILL); dry.			
		CONCRETE, BRICK, and FABRIC (FILL); dry.			Collect sample for Part 375 full list at SB-22 (4-6).
		Brown, fine to medium SAND, little fine to coarse Gravel, trace silt (FILL); moist.			Collect sample for Part 375 full list at SB-22 (6-8).
10		BRICK, some fine to medium Sand, little Gravel (FILL); moist.			
		Brown, fine to medium SAND, little Silt; wet.			
15					Collect sample for Part 375 full list at SB-22 (15-17).
20					End of boring at 20 ft bls.

G

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SOIL BORING LOG

WELL NO. **SB-23/WC-23**	NORTHING **Not Measured**	EASTING **Not Measured**		
PROJECT NO./NAME **2984.0003Y000 / Sendero Verde - Parcel B**		LOCATION **75 East 111th Street and 60 East 112th Street New York, New York**		
APPROVED BY **V. Sabatasso**	LOGGED BY **A. Paccadolmi**			
DRILLING CONTRACTOR/DRILLER **AARCO / A. Hutchinson**		GEOGRAPHIC AREA **Manhattan, Block 1617, Lots 20, 125, and 140**		
DRILL BIT DIAMETER/TYPE **2-in. / Drive Sampler**	BOREHOLE DIAMETER **2-inches**	DRILLING EQUIPMENT/METHOD **7720DT / Geoprobe**	SAMPLING METHOD **2" Macro-Core**	START-FINISH DATE **4/18/19-4/22/19**
LAND SURFACE ELEVATION **Not Measured**	DEPTH TO WATER **Not Measured**	BACKFILL **Clean cuttings**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0		Brown, fine to medium SAND and BRICK (FILL); dry.			Hand cleared to 5 feet bls.
1					
2					Collect sample WC-23 (2-8).
3			G		
4					Collect sample for Part 375 full list and emerging contaminants at SB-23 (2-4).
5		Brown, fine to medium SAND, some Brick and Concrete (FILL); moist.			
6					Collect sample for Part 375 full list at SB-23 (4-6).
7					
8					Collect sample for Part 375 full list at SB-23 (6-8).
9					End of boring at 10 ft bls.
10					

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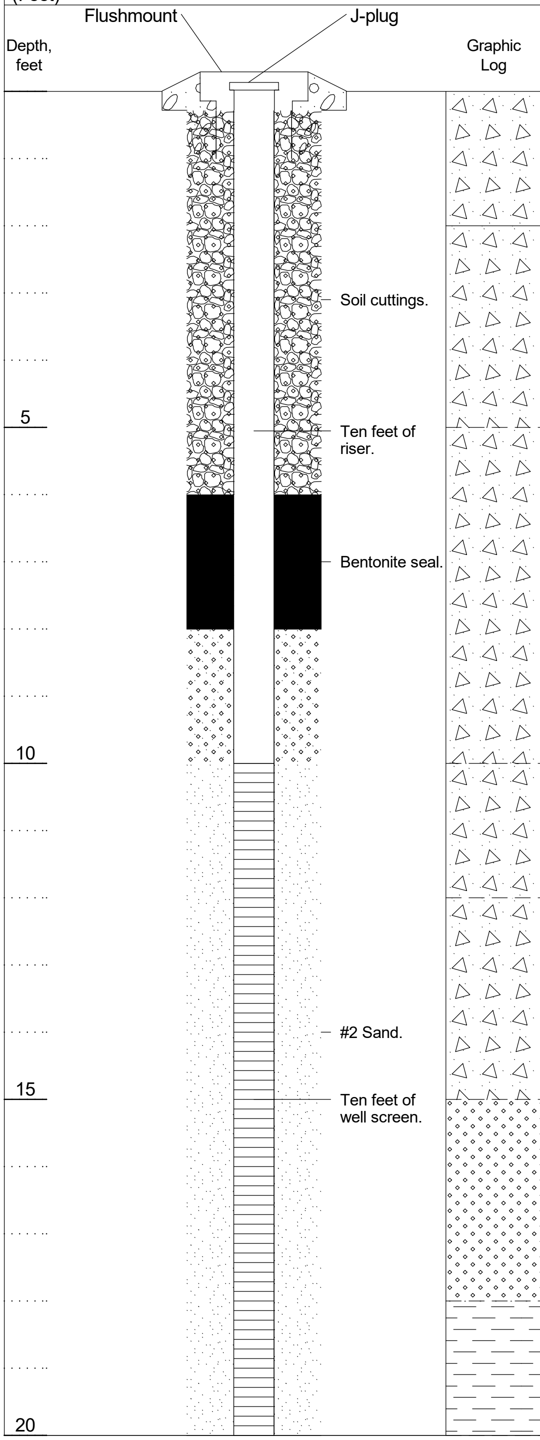
WELL CONSTRUCTION LOG

WELL NO. **SB-24/MW-2/WC-24**	NORTHING **Not Measured**	EASTING **Not Measured**
PROJECT NO./NAME **2984.0003Y000 / Sendero Verde - Parcel B**		LOCATION **75 East 111th Street and 60 East 112th Street** **New York, New York**
APPROVED BY **V. Sabatasso**	LOGGED BY **A. Paccadolmi**	
DRILLING CONTRACTOR/DRILLER **AARCO / A. Hutchinson**		GEOGRAPHIC AREA **Manhattan, Block 1617, Lots 20, 125, and 140**

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
2-in. / Drive Sampler	**2-inches**	**7720DT / Geoprobe**	**2" Macro-Core**	**4/15/19-4/16/19**

CASING MAT./DIA.: **PVC / 2-inch**
SCREEN: TYPE **Slotted** MAT. **PVC** TOTAL LENGTH **10.0**ft DIA. **2-inch** SLOT SIZE **40-Slot**

ELEVATION OF: (Feet)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	GRAVEL PACK SIZES
			/	**#2**



Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
Brown, fine to mediun SAND, some Brick (FILL); moist.			Hand cleared to 5 feet bls.
Brown, fine to medium SAND, some Brick, trace plastic and metal (FILL); moist.			Collect sample WC-24 (2-8). Collect sample for Part 375 full list and emerging contaminants at SB-24 (2-4).
Reddish brown, fine to medium SAND and BRICK (FILL); moist.			Collect sample for Part 375 full list at SB-24 (4-6). Collect sample for Part 375 full list at SB-24 (6-8).
Brown, fine to medium SAND (FILL); moist.			
Brown, fine to medium SAND, fine to medium Cobble, trace brick (FILL); moist.			
Brown, medium to coarse SAND; wet.			
Brown, SILT; wet.			End of boring at 20 ft bls.

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SOIL BORING LOG

WELL NO. **SB-25/WC-25**	NORTHING **Not Measured**	EASTING **Not Measured**		
PROJECT NO./NAME **2984.0003Y000 / Sendero Verde - Parcel B**		LOCATION **75 East 111th Street and 60 East 112th Street New York, New York**		
APPROVED BY **V. Sabatasso**	LOGGED BY **A. Paccadolmi**			
DRILLING CONTRACTOR/DRILLER **AARCO / A. Hutchinson**		GEOGRAPHIC AREA **Manhattan, Block 1617, Lots 20, 125, and 140**		
DRILL BIT DIAMETER/TYPE **2-in. / Drive Sampler**	BOREHOLE DIAMETER **2-inches**	DRILLING EQUIPMENT/METHOD **7720DT / Geoprobe**	SAMPLING METHOD **2" Macro-Core**	START-FINISH DATE **4/18/19-4/23/19**
LAND SURFACE ELEVATION **Not Measured**	DEPTH TO WATER **Not Measured**	BACKFILL **Clean cuttings**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0–1		Brown, fine to medium SAND, some Brick, trace fine gravel (FILL); moist.			Hand cleared to 5 feet bls.
1–3		Reddish brown, fine to medium SAND, some Brick and Asphalt, trace cobble (FILL); moist.		G	Collect sample WC-23/24/25 (0-2). Collect sample WC-25 (2-8).
3–5		Reddish brown, fine to medium SAND, some Brick, trace fine gravel (FILL); moist.			Collect sample for Part 375 full list and emerging contaminants at SB-25 (2-4).
5–10		Brown, fine to medium SAND, BRICK, and CONCRETE (FILL); moist.			Collect sample for Part 375 full list at SB-25 (4-6). Collect sample for Part 375 full list at SB-25 (6-8). End of boring at 10 ft bls.

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-26/WC-26	Not Measured	Not Measured		
PROJECT NO./NAME: 2984.0003Y000 / Sendero Verde - Parcel B		LOCATION: 75 East 111th Street and 60 East 112th Street, New York, New York		
APPROVED BY: V. Sabatasso	LOGGED BY: A. Paccadolmi			
DRILLING CONTRACTOR/DRILLER: AARCO / A. Hutchinson		GEOGRAPHIC AREA: Manhattan, Block 1617, Lots 20, 125, and 140		
DRILL BIT DIAMETER/TYPE: 2-in. / Drive Sampler	BOREHOLE DIAMETER: 2-inches	DRILLING EQUIPMENT/METHOD: 7720DT / Geoprobe	SAMPLING METHOD: 2" Macro-Core	START-FINISH DATE: 4/18/19-4/19/19
LAND SURFACE ELEVATION: Not Measured	DEPTH TO WATER: Not Measured	BACKFILL: Clean cuttings		

Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	Brown, fine to medium SAND, some Organics, trace brick (FILL); moist.			Hand cleared to 5 feet bls.
	Brown, fine to medium SAND, some Brick, trace wood (FILL); moist.			
	Brown, fine to medium SAND, trace brick (FILL); moist.			Collect sample WC-26 (0-6).
5	Brown, fine to medium SAND (FILL); moist.			Collect sample WC-26 (6-17).
	Brown, GRAVEL, BRICK, and ASPHALT (FILL); moist.			
10	Brown, fine to coarse SAND, little Brick and Gravel (FILL); moist.			Collect sample for Part 375 full list and emerging contaminants at SB-26 (11-13). Collect sample for Part 375 full list at SB-26 (13-15).
15	Brown, fine SAND and SILT; moist.			
20				End of boring at 20 ft bls.

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SOIL BORING LOG

WELL NO. **SB-27/WC-27**	NORTHING **Not Measured**	EASTING **Not Measured**		
PROJECT NO./NAME **2984.0003Y000 / Sendero Verde - Parcel B**		LOCATION **75 East 111th Street and 60 East 112th Street New York, New York**		
APPROVED BY **V. Sabatasso**	LOGGED BY **A. Paccadolmi**			
DRILLING CONTRACTOR/DRILLER **AARCO / A. Hutchinson**		GEOGRAPHIC AREA **Manhattan, Block 1617, Lots 20, 125, and 140**		
DRILL BIT DIAMETER/TYPE **2-in. / Drive Sampler**	BOREHOLE DIAMETER **2-inches**	DRILLING EQUIPMENT/METHOD **7720DT / Geoprobe**	SAMPLING METHOD **2" Macro-Core**	START-FINISH DATE **4/18/19-4/19/19**
LAND SURFACE ELEVATION **Not Measured**	DEPTH TO WATER **Not Measured**	BACKFILL **Clean cuttings**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0		Brown, fine to medium SAND, some Brick (FILL); moist.			Hand cleared to 5 feet bls.
				G	Collect sample WC-27 (0-6).
4		Brown, fine to medium SAND, some Brick (FILL); moist.			
5		Brown, medium SAND, some Brick and Concrete (FILL); moist.			Collect sample WC-27 (6-17).
10		Brown, fine to medium SAND, some Brick and Asphalt (FILL); moist.			Collect sample for Part 375 full list and emerging contaminants at SB-27 (11-13).
12		Brown, fine to medium SAND, some Brick and Asphalt (FILL); wet.			
15		Light brown, fine to medium SAND, some Silt; wet.			
20					End of boring at 20 ft bls.

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-28/WC-28	**Not Measured**	**Not Measured**		
PROJECT NO./NAME		LOCATION		
2984.0003Y000 / Sendero Verde - Parcel B		**75 East 111th Street and 60 East 112th Street**		
APPROVED BY	LOGGED BY			
V. Sabatasso	**A. Paccadolmi**	**New York, New York**		
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
AARCO / A. Hutchinson		**Manhattan, Block 1617, Lots 20, 125, and 140**		
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
2-in. / Drive Sampler	**2-inches**	**7720DT / Geoprobe**	**2" Macro-Core**	**4/18/19-4/19/19**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
Not Measured	**Not Measured**	**Clean cuttings**		

Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	Brown, fine to medium SAND, some Brick (FILL); moist.			Hand cleared to 5 feet bls.
2	Reddish brown, fine to medium SAND, some Brick (FILL); moist.	G		Collect sample WC-28 (0-6).
5	GRAVEL, BRICK, and ASPHALT (FILL); dry.			Collect sample WC-28 (6-17).
10	Light brown, fine to medium SAND, some Brick and Asphalt (FILL); moist.			
11	Light brown, fine to medium SAND; moist.			Collect sample for Part 375 full list and emerging contaminants at SB-28 (11-13). Collect sample for Part 375 full list at SB-28 (13-15).
15	Brown, medium to fine SAND, some Silt; moist.			
20				End of boring at 20 ft bls.

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING
SB-29/WC-29	Not Measured	Not Measured

PROJECT NO./NAME: 2984.0003Y000 / Sendero Verde - Parcel B	LOCATION: 75 East 111th Street and 60 East 112th Street, New York, New York
APPROVED BY: V. Sabatasso	LOGGED BY: A. Paccadolmi
DRILLING CONTRACTOR/DRILLER: AARCO / A. Hutchinson	GEOGRAPHIC AREA: Manhattan, Block 1617, Lots 20, 125, and 140

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
2-in. / Drive Sampler	2-inches	7720DT / Geoprobe	2" Macro-Core	4/16/19-4/19/19

LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL
Not Measured	Not Measured	Clean cuttings

Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	Brown, fine to medium SAND and BRICK (FILL); moist.			Hand cleared to 5 feet bls. Collect sample for Part 375 full list and emerging contaminants at SB-29 (0-2). Collect sample WC-29 (0-2). Collect sample WC-29 (2-17).
7.5	Brown, fine to medium SAND, trace gravel (FILL); moist.			
10	Brown, fine to medium SAND (FILL); moist.			Collect sample for Part 375 full list and emerging contaminants at SB-29 (11-13).
12.5	Brown, fine to medium SAND and BRICK (FILL); moist. Brown, fine to medium SAND and BRICK (FILL); wet.			Collect sample for Part 375 full list at SB-29 (13-15).
15	Brown, fine to medium SAND, some Silt; wet.			End of boring at 20 ft bls.

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING
SB-30/WC-30	**Not Measured**	**Not Measured**

PROJECT NO./NAME		LOCATION
2984.0003Y000 / Sendero Verde - Parcel B		**75 East 111th Street and 60 East 112th Street New York, New York**
APPROVED BY: **V. Sabatasso**	LOGGED BY: **A. Paccadolmi**	
DRILLING CONTRACTOR/DRILLER: **AARCO / A. Hutchinson**		GEOGRAPHIC AREA: **Manhattan, Block 1617, Lots 20, 125, and 140**

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
2-in. / Drive Sampler	**2-inches**	**7720DT / Geoprobe**	**2" Macro-Core**	**4/18/19-4/19/19**

LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL
Not Measured	**Not Measured**	**Clean cuttings**

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Brown, fine to medium SAND and BRICK, trace orgnaics (FILL); moist.			Hand cleared to 5 feet bls.
		Brown, fine to medium SAND, some Brick (FILL); moist.			Collect sample WC-30 (0-6).
		Brown, fine to medium SAND, some Cobble and Brick (FILL); moist.			Collect sample for Part 375 full list and emerging contaminants at SB-30 (2-4).
5		Brown, fine to medium SAND, BRICK, and CONCRETE (FILL); moist.			Collect sample for Part 375 full list at SB-30 (4-6).
		Brown, fine to medium SAND, some Brick and Concrete (FILL); moist.			Collect sample for Part 375 full list at SB-30 (6-8).
10		Brown, fine to medium SAND and BRICK (FILL); moist.			Collect sample WC-30 (6-12).
		Brown, medium to coarse SAND, some Cobble; wet.			End of boring at 15 ft bls.
15					

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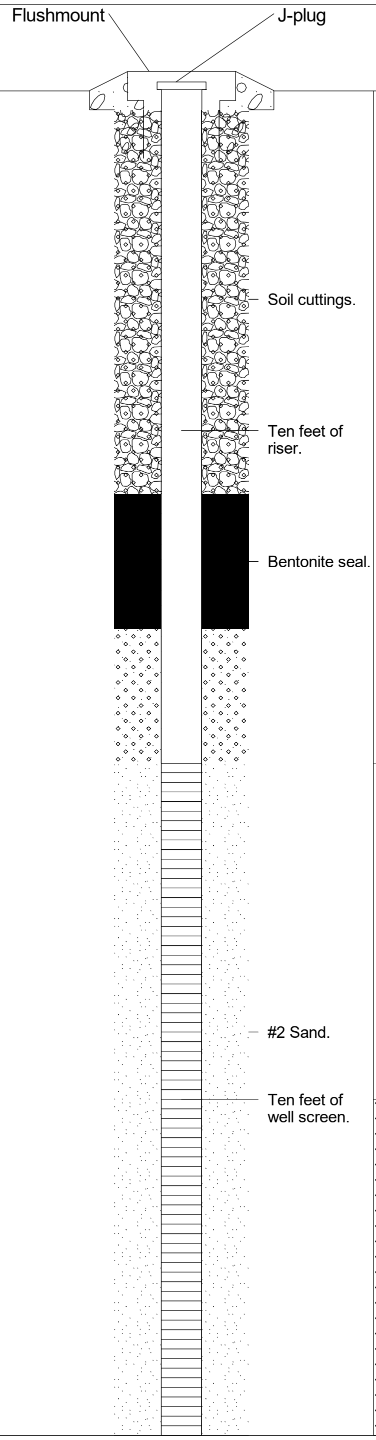
WELL CONSTRUCTION LOG

WELL NO. **SB-31/MW-4/WC-31**	NORTHING **Not Measured**	EASTING **Not Measured**
PROJECT NO./NAME **2984.0003Y000 / Sendero Verde - Parcel B**		LOCATION **75 East 111th Street and 60 East 112th Street New York, New York**
APPROVED BY **V. Sabatasso**	LOGGED BY **A. Paccadolmi**	
DRILLING CONTRACTOR/DRILLER **AARCO / A. Hutchinson**		GEOGRAPHIC AREA **Manhattan, Block 1617, Lots 20, 125, and 140**

DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
2-in. / Drive Sampler	**2-inches**	**7720DT / Geoprobe**	**2" Macro-Core**	**4/15/19-4/16/19**

CASING MAT./DIA.	SCREEN: TYPE	MAT.	TOTAL LENGTH	DIA.	SLOT SIZE
PVC / 2-inch	**Slotted**	**PVC**	**10.0**ft	**2-inch**	**40-Slot**

ELEVATION OF: (Feet)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN	GRAVEL PACK SIZES
			/	**#2**



Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0					Hand cleared to 5 feet bls.
					Collect sample for Part 375 full list and emerging contaminants at SB-31 (0-2).
					Collect sample WC-31 (0-6).
5		Brown, fine to medium SAND, some Brick and Concrete (FILL); moist.			
					Collect sample WC-31 (6-17).
10		Brown to light brown, fine to medium SAND, some Cobble, trace brick (FILL); moist.			
					Collect sample for Part 375 full list and emerging contaminants at SB-31 (11-13).
					Collect sample for Part 375 full list and emerging contaminants at SB-31 (13-15).
15		Brown, fine to medium SAND, some coarse Sand; wet.			
20					End of boring at 20 ft bls.

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SOIL BORING LOG

WELL NO. **SB-32/WC-32**	NORTHING **Not Measured**	EASTING **Not Measured**		
PROJECT NO./NAME **2984.0003Y000 / Sendero Verde - Parcel B**		LOCATION **75 East 111th Street and 60 East 112th Street** **New York, New York**		
APPROVED BY **V. Sabatasso**	LOGGED BY **A. Paccadolmi**			
DRILLING CONTRACTOR/DRILLER **AARCO / A. Hutchinson**		GEOGRAPHIC AREA **Manhattan, Block 1617, Lots 20, 125, and 140**		
DRILL BIT DIAMETER/TYPE **2-in. / Drive Sampler**	BOREHOLE DIAMETER **2-inches**	DRILLING EQUIPMENT/METHOD **7720DT / Geoprobe**	SAMPLING METHOD **2" Macro-Core**	START-FINISH DATE **4/18/19-4/18/19**
LAND SURFACE ELEVATION **Not Measured**	DEPTH TO WATER **Not Measured**	BACKFILL **Clean cuttings**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0–1	FILL	Brown, fine to medium SAND, some Organics (FILL); moist.			Hand cleared to 5 feet bls.
1–4	FILL	Brown, fine to medium SAND, some Brick (FILL); moist.		G	Collect sample for Part 375 full list and emerging contaminants at SB-32 (0-2).
4–5	FILL	Brown, fine to medium SAND, some Cobble, trace brick (FILL); moist.			Collect sample WC-32 (0-6).
5–10	FILL	Brownish red, fine to medium SAND, some Brick and Concrete, trace cobble (FILL); moist.			Collect sample WC-32 (6-14).
10–13	FILL	Brown, fine to medium SAND, some Brick (FILL); moist.			Collect sample for Part 375 full list and emerging contaminants at SB-32 (12-14).
13–15		Brown, medium to coarse SAND, some Cobble; wet.			End of boring at 15 ft bls.

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SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
SB-33/WC-33	**Not Measured**	**Not Measured**		
PROJECT NO./NAME: **2984.0003Y000 / Sendero Verde - Parcel B**		LOCATION: **75 East 111th Street and 60 East 112th Street New York, New York**		
APPROVED BY: **V. Sabatasso**	LOGGED BY: **A. Paccadolmi**			
DRILLING CONTRACTOR/DRILLER: **AARCO / A. Hutchinson**		GEOGRAPHIC AREA: **Manhattan, Block 1617, Lots 20, 125, and 140**		
DRILL BIT DIAMETER/TYPE: **2-in. / Drive Sampler**	BOREHOLE DIAMETER: **2-inches**	DRILLING EQUIPMENT/METHOD: **7720DT / Geoprobe**	SAMPLING METHOD: **2" Macro-Core**	START-FINISH DATE: **4/17/19-4/18/19**
LAND SURFACE ELEVATION: **Not Measured**	DEPTH TO WATER: **Not Measured**	BACKFILL: **Clean cuttings**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0		Brown, fine to medium SAND, some Brick (FILL); moist.			Hand cleared to 5 feet bls.
			G		Collect sample WC-33 (0-6).
5		Brown, fine to medium SAND, some Brick and Concrete (FILL); moist.			Collect sample WC-33 (6-17).
10					Collect sample for Part 375 full list and emerging contaminants at SB-33 (11-13).
		Brown, medium to coarse SAND; wet.			Collect sample for Part 375 full list at SB-33 (13-15).
15		Brown, medium to coarse SAND, some Silt; wet.			Collect sample for Part 375 full list at SB-33 (15-17).
		Brown, SILT; wet.			
20					End of boring at 20 ft bls.

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SOIL BORING LOG

WELL NO. **SB-34/WC-34**	NORTHING **Not Measured**	EASTING **Not Measured**		
PROJECT NO./NAME **2984.0003Y000 / Sendero Verde - Parcel B**		LOCATION **75 East 111th Street and 60 East 112th Street** **New York, New York**		
APPROVED BY **V. Sabatasso**	LOGGED BY **A. Paccadolmi**			
DRILLING CONTRACTOR/DRILLER **AARCO / A. Hutchinson**		GEOGRAPHIC AREA **Manhattan, Block 1617, Lots 20, 125, and 140**		
DRILL BIT DIAMETER/TYPE **2-in. / Drive Sampler**	BOREHOLE DIAMETER **2-inches**	DRILLING EQUIPMENT/METHOD **7720DT / Geoprobe**	SAMPLING METHOD **2" Macro-Core**	START-FINISH DATE **4/17/19-4/18/19**
LAND SURFACE ELEVATION **Not Measured**	DEPTH TO WATER **Not Measured**	BACKFILL **Clean cuttings**		

Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	Brown to dark brown, fine to medium SAND, some Brick (FILL); moist.			Hand cleared to 5 feet bls. Collect sample for Part 375 full list and emerging contaminants at SB-34 (2-4).
	Reddish brown, fine to medium SAND, some Brick and Asphalt (FILL); moist.			Collect sample WC-34 (0-6).
5	Brown, fine to medium SAND, some Brick, Asphalt and Cobble (FILL); moist.			Collect sample for Part 375 full list at SB-34 (4-6).
	Brown to grey, fine to medium SAND, some Asphalt (FILL); moist.			
10	Brown, fine to medium SAND, some Cobble (FILL); moist.			Collect sample WC-34 (6-12).
	Brown, medium to coarse SAND; wet.			
15	Brown, fine to medium SAND, some Silt; wet.			
	Brown, SILT; wet.			
20				End of boring at 20 ft bls.

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SOIL BORING LOG

WELL NO. **SB-35/WC-35**	NORTHING **Not Measured**	EASTING **Not Measured**		
PROJECT NO./NAME **2984.0003Y000 / Sendero Verde - Parcel B**		LOCATION **75 East 111th Street and 60 East 112th Street New York, New York**		
APPROVED BY **V. Sabatasso**	LOGGED BY **A. Paccadolmi**			
DRILLING CONTRACTOR/DRILLER **AARCO / A. Hutchinson**		GEOGRAPHIC AREA **Manhattan, Block 1617, Lots 20, 125, and 140**		
DRILL BIT DIAMETER/TYPE **2-in. / Drive Sampler**	BOREHOLE DIAMETER **2-inches**	DRILLING EQUIPMENT/METHOD **7720DT / Geoprobe**	SAMPLING METHOD **2" Macro-Core**	START-FINISH DATE **4/16/19-4/18/19**
LAND SURFACE ELEVATION **Not Measured**	DEPTH TO WATER **Not Measured**	BACKFILL **Clean cuttings**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0		Brown, fine to medium SAND and BRICK, some Cobble (FILL); moist.			Hand cleared to 5 feet bls.
		Brown, fine to medium SAND, some Brick (FILL); moist.			Collect sample WC-35 (0-6).
					Collect sample for Part 375 full list and emerging contaminants at SB-35 (2-4).
5		Brown, fine to medium SAND, trace brick (FILL);			Collect sample for Part 375 full list at SB-35 (4-6).
		Brown, fine to medium SAND, some Brick (FILL); moist.			Collect sample for Part 375 full list at SB-35 (6-8).
10					Collect sample WC-35 (6-12).
15					
		Brown, SILT, some fine Sand; wet.			
20					End of boring at 20 ft bls.

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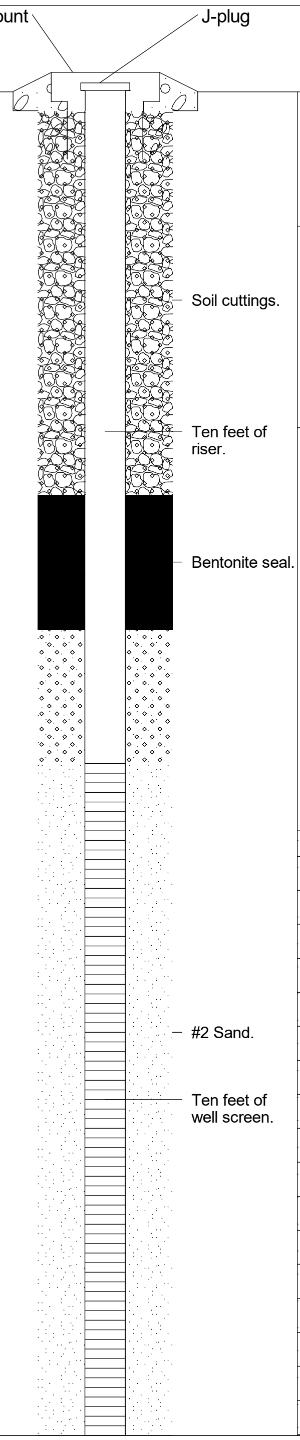
WELL CONSTRUCTION LOG

WELL NO. **SB-36/MW-5/WC-36**	NORTHING **Not Measured**	EASTING **Not Measured**
PROJECT NO./NAME **2984.0003Y000 / Sendero Verde - Parcel B**		LOCATION **75 East 111th Street and 60 East 112th Street New York, New York**
APPROVED BY **V. Sabatasso**	LOGGED BY **A. Paccadolmi**	
DRILLING CONTRACTOR/DRILLER **AARCO / A. Hutchinson**		GEOGRAPHIC AREA **Manhattan, Block 1617, Lots 20, 125, and 140**
DRILL BIT DIAMETER/TYPE **2-in. / Drive Sampler**	BOREHOLE DIAMETER **2-inches**	DRILLING EQUIPMENT/METHOD **7720DT / Geoprobe**; SAMPLING METHOD **2" Macro-Core**; START-FINISH DATE **4/15/19-4/17/19**
CASING MAT./DIA. **PVC / 2-inch**	SCREEN: TYPE **Slotted**	MAT. **PVC**; TOTAL LENGTH **10.0**ft; DIA. **2-inch**; SLOT SIZE **40-Slot**
ELEVATION OF: (Feet) GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN /; GRAVEL PACK SIZES **#2**



Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0		Brown, fine to medium SAND, some Brick (FILL); moist.			Hand cleared to 5 feet bls.
2		Brown, fine to medium SAND, trace brick (FILL); moist.	G		Collect sample WC-36 (0-6).
5		BRICK, ASPHALT, and CONCRETE, some medium to coarse Sand (FILL); moist.			Collect sample WC-36 (6-17).
11		Brown, fine to medium SAND; wet.			Collect sample for Part 375 full list and emerging contaminants at SB-36 (11-13).
20					End of boring at 20 ft bls.

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SOIL BORING LOG

WELL NO. **SB-37/WC-37**	NORTHING **Not Measured**	EASTING **Not Measured**		
PROJECT NO./NAME **2984.0003Y000 / Sendero Verde - Parcel B**		LOCATION **75 East 111th Street and 60 East 112th Street New York, New York**		
APPROVED BY **V. Sabatasso**	LOGGED BY **A. Paccadolmi**			
DRILLING CONTRACTOR/DRILLER **AARCO / A. Hutchinson**		GEOGRAPHIC AREA **Manhattan, Block 1617, Lots 20, 125, and 140**		
DRILL BIT DIAMETER/TYPE **2-in. / Drive Sampler**	BOREHOLE DIAMETER **2-inches**	DRILLING EQUIPMENT/METHOD **7720DT / Geoprobe**	SAMPLING METHOD **2" Macro-Core**	START-FINISH DATE **4/16/19-4/17/19**
LAND SURFACE ELEVATION **Not Measured**	DEPTH TO WATER **Not Measured**	BACKFILL **Clean cuttings**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0		Brown, fine to medium SAND, some Brick and Concrete (FILL); moist.			Hand cleared to 5 feet bls.
				G	Collect sample WC-37 (2-21).
4		Brown, fine to medium SAND, some Brick and Concrete (FILL); moist.			Collect sample for Part 375 full list and emerging contaminants at SB-37 (2-4).
5		Light brown, fine to medium SAND, some Concrete (FILL); moist.			Collect sample for Part 375 full list and emerging contaminants at SB-37 (8-10).
10		Brown, medium to coarse SAND, some Brick and Concrete (FILL); wet.			Collect sample for Part 375 full list and emerging contaminants at SB-37 (10-12).
15		Brown, medium to coarse SAND, some Silt; wet.			
20					End of boring at 20 ft bls.

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SOIL BORING LOG

WELL NO. **SB-38/WC-38**	NORTHING **Not Measured**	EASTING **Not Measured**		
PROJECT NO./NAME **2984.0003Y000 / Sendero Verde - Parcel B**		LOCATION **75 East 111th Street and 60 East 112th Street New York, New York**		
APPROVED BY **V. Sabatasso**	LOGGED BY **A. Paccadolmi**			
DRILLING CONTRACTOR/DRILLER **AARCO / A. Hutchinson**		GEOGRAPHIC AREA **Manhattan, Block 1617, Lots 20, 125, and 140**		
DRILL BIT DIAMETER/TYPE **2-in. / Drive Sampler**	BOREHOLE DIAMETER **2-inches**	DRILLING EQUIPMENT/METHOD **7720DT / Geoprobe**	SAMPLING METHOD **2" Macro-Core**	START-FINISH DATE **4/16/19-4/17/19**
LAND SURFACE ELEVATION **Not Measured**	DEPTH TO WATER **Not Measured**	BACKFILL **Clean cuttings**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		Brown, fine to medium SAND and BRICK, trace organics (FILL); moist.			Hand cleared to 5 feet bls.
		Brown, fine to medium SAND and BRICK (FILL); moist.			Collect sample WC-37/38/39 (0-2). Collect sample for Part 375 full list and emerging contaminants at SB-38 (2-4).
5					
		Brown, medium to coarse SAND, some Brick (FILL); wet.			Collect sample for Part 375 full list and emerging contaminants at SB-38 (8-10).
10		Brown, medium to coarse SAND; wet.			Collect sample for Part 375 full list and emerging contaminants at SB-38 (10-12). Collect sample for Part 375 full list at SB-38 (12-14).
15					Collect sample for Part 375 full list at SB-38 (15-17).
		Brown, medium to coarse SAND, some Silt; wet.			
		Brown, SILT; wet.			
20					End of boring at 20 ft bls.

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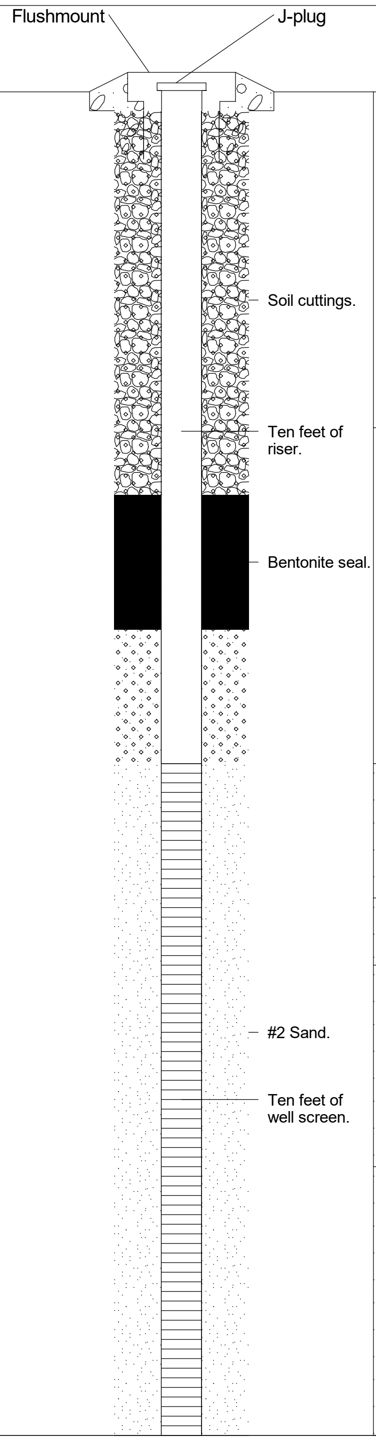
Fax: (631) 232-9898

WELL CONSTRUCTION LOG

WELL NO. **SB-39/MW-3/WC-39**	NORTHING **Not Measured**	EASTING **Not Measured**		
PROJECT NO./NAME **2984.0003Y000 / Sendero Verde - Parcel B**		LOCATION **75 East 111th Street and 60 East 112th Street New York, New York**		
APPROVED BY **V. Sabatasso**	LOGGED BY **A. Paccadolmi**			
DRILLING CONTRACTOR/DRILLER **AARCO / A. Hutchinson**		GEOGRAPHIC AREA **Manhattan, Block 1617, Lots 20, 125, and 140**		
DRILL BIT DIAMETER/TYPE **2-in. / Drive Sampler**	BOREHOLE DIAMETER **2-inches**	DRILLING EQUIPMENT/METHOD **7720DT / Geoprobe**	SAMPLING METHOD **2" Macro-Core**	START-FINISH DATE **4/15/19-4/17/19**
CASING MAT./DIA. **PVC / 2-inch**	SCREEN: TYPE **Slotted** MAT. **PVC**	TOTAL LENGTH **10.0**ft	DIA. **2-inch**	SLOT SIZE **40-Slot**
ELEVATION OF: (Feet)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN **/**	GRAVEL PACK SIZES **#2**



Depth, feet	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0	Brown, fine to medium SAND, some Brick (FILL); moist.			Hand cleared to 5 feet bls. Collect sample WC-39 (2-21). Collect sample for Part 375 full list and emerging contaminants at SB-39 (2-4).
5	BRICK, ASPHALT, and CONCRETE (FILL), some medium to coarse Sand; moist.			Collect sample for Part 375 full list and emerging contaminants at SB-39 (8-10).
10	Brown, medium to coarse SAND; moist.			Collect sample for Part 375 full list and emerging contaminants at SB-39 (10-12).
12	Brown, medium to coarse SAND, some Silt; wet.			
13	Brown, fine to medium SAND; wet.			Collect sample for Part 375 full list at SB-39 (12-14).
16	Brown, fine to medium SAND, some Silt; wet.			Collect sample for Part 375 full list at SB-39 (15-17). End of boring at 20 ft bls.
20				

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SOIL BORING LOG

WELL NO. **SB-40/WC-1**	NORTHING **Not Measured**	EASTING **Not Measured**		
PROJECT NO./NAME **2984.0003Y000 / Sendero Verde - Parcel B**		LOCATION **75 East 111th Street and 60 East 112th Street** **New York, New York**		
APPROVED BY **V. Sabatasso**	LOGGED BY **A. Paccadolmi**			
DRILLING CONTRACTOR/DRILLER **AARCO / A. Hutchinson**		GEOGRAPHIC AREA **Manhattan, Block 1617, Lots 20, 125, and 140**		
DRILL BIT DIAMETER/TYPE **2-in. / Drive Sampler**	BOREHOLE DIAMETER **2-inches**	DRILLING EQUIPMENT/METHOD **7720DT / Geoprobe**	SAMPLING METHOD **2" Macro-Core**	START-FINISH DATE **4/23/19-4/23/19**
LAND SURFACE ELEVATION **Not Measured**	DEPTH TO WATER **Not Measured**	BACKFILL **Clean cuttings**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0		Brown, fine to medium SAND, some Brick, trace organics (FILL); moist.			Hand cleared to 5 feet bls.
1		Brown, fine to medium SAND, some Brick (FILL); moist.			
4					Collect sample WC-1 (0-12).
5					
7		Brown to light grey, fine to medium SAND, trace brick (FILL); moist.			
10		Dark brown, fine to medium SAND, trace brick (FILL); moist.			Collect sample for Part 375 full list and emerging contaminants at SB-40 (11-13).
12		Brown, fine to medium SAND, some fine to coarse Gravel; wet.			Collect sample for Part 375 full list at SB-40 (13-15).
15		Brown, medium to coarse SAND, little fine to coarse Gravel; wet.			Collect sample for Part 375 full list at SB-40 (15-17).
17		Brown, fine SAND, little Silt; wet.			
20					End of boring at 20 ft bls.

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Fax: (631) 232-9898

SOIL BORING LOG

WELL NO. **WC-2**	NORTHING **Not Measured**	EASTING **Not Measured**		
PROJECT NO./NAME **2984.0003Y000 / Sendero Verde - Parcel B**		LOCATION **75 East 111th Street and 60 East 112th Street New York, New York**		
APPROVED BY **V. Sabatasso**	LOGGED BY **A. Paccadolmi**			
DRILLING CONTRACTOR/DRILLER **AARCO / A. Hutchinson**		GEOGRAPHIC AREA **Manhattan, Block 1617, Lots 20, 125, and 140**		
DRILL BIT DIAMETER/TYPE **2-in. / Drive Sampler**	BOREHOLE DIAMETER **2-inches**	DRILLING EQUIPMENT/METHOD **7720DT / Geoprobe**	SAMPLING METHOD **2" Macro-Core**	START-FINISH DATE **4/22/19-4/22/19**
LAND SURFACE ELEVATION **Not Measured**	DEPTH TO WATER **Not Measured**	BACKFILL **Clean cuttings**		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0–5		Brown, fine to medium SAND, some Brick (FILL); moist.			Hand cleared to 5 feet bls. Collect sample WC-2 (0-6).
5–10		Brown, fine to medium SAND, some Brick and Asphalt (FILL); moist.			Collect sample WC-2 (6-12).
10–15		Brown, fine to medium SAND, some Brick and Concrete (FILL); moist.			End of boring at 15 ft bls.

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APPENDIX D

Excavation Work Plan

APPENDIX D – EXCAVATION WORK PLAN (EWP)

D-1 NOTIFICATION

At least 15 days prior to the start of any activity that is anticipated to encounter remaining contamination, the site owner or their representative will notify the NYSDEC. Table 1 includes contact information for the above notification. The information on this table will be updated as necessary to provide accurate contact information. A full listing of site-related contact information is provided in Appendix B.

Table 1: Notifications*

Jane O'Connell, NYSDEC Regional Hazardous Waste Remediation Engineer	Phone: (718) 782-4599 Email: jane.oconnell@dec.ny.gov
Nigel Crawford, NYSDEC Region 2 Project Manager	Phone: (718) 482-7778 Email: nigel.crawford@dec.ny.gov
Kelly Lewandowski, NYSDEC Site Control Section	Phone: (518) 402-9569 Email: kelly.lewandowski@dec.ny.gov
Mark Sergott, NYSDOH Project Manager	Phone: (518) 473-0771 Email: beei@health.ny.gov

* Note: Notifications are subject to change and will be updated as necessary.

This notification will include:

- A detailed description of the work to be performed, including the location and areal extent of excavation, plans/drawings for site re-grading, intrusive elements or utilities to be installed below the soil cover, estimated volumes of contaminated soil to be excavated and any work that may impact an engineering control;
- A summary of environmental conditions anticipated to be encountered in the work areas, including the nature and concentration levels of contaminants of concern, potential presence of grossly contaminated media, and plans for any pre-construction sampling;
- A schedule for the work, detailing the start and completion of all intrusive work;
- A summary of the applicable components of this EWP;
- A statement that the work will be performed in compliance with this EWP and 29 CFR 1910.120;
- A copy of the contractor's health and safety plan (HASP), in electronic format, if it differs from the HASP provided in Appendix E of this SMP;
- Identification of disposal facilities for potential waste streams; and
- Identification of sources of any anticipated backfill, along with all required chemical testing results.

D-2 SOIL SCREENING METHODS

Visual, olfactory and instrument-based (e.g., photoionization detector) soil screening will be performed by a qualified environmental professional during all excavations into known or potentially contaminated material (remaining contamination). Soil screening will be performed when invasive work is done and will include all excavation and invasive work performed during development, such as excavations for foundations and utility work, after issuance of the COC.

Soils will be segregated based on previous environmental data and screening results into material that requires off-site disposal and material that requires testing to determine if the material can be reused on-site as soil beneath a cover or if the material can be used as cover soil. Further discussion of off-site disposal of materials and on-site reuse is provided in Section D-6 and D-7 of this Appendix.

D-3 SOIL STAGING METHODS

Soil stockpiles will be continuously encircled with a berm and/or silt fence. Hay bales will be used as needed near catch basins, surface waters and other discharge points.

Stockpiles will be kept covered at all times with appropriately anchored tarps. Stockpiles will be routinely inspected and damaged tarp covers will be promptly replaced.

Stockpiles will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by the NYSDEC.

Water will be available onsite at suitable supply and pressure for use in dust control.

D-4 MATERIALS EXCAVATION AND LOAD-OUT

A qualified environmental professional or person under their supervision will oversee all invasive work and the excavation and load-out of all excavated material.

The Volunteer and remedial party (if applicable) and its contractors are responsible for safe execution of all invasive and other work performed under this Plan.

The presence of utilities and easements on the site will be investigated by the qualified environmental professional. It will be determined whether a risk or impediment to the planned work under this SMP is posed by utilities or easements on the site.

Loaded vehicles leaving the site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate Federal, State, local, and NYSDOT requirements (and all other applicable transportation requirements).

A truck wash will be operated on-site, as appropriate. The qualified environmental professional or their designated representative will be responsible for ensuring that all outbound trucks will be washed at the truck wash before leaving the site until the activities performed under this section are complete. Truck wash waters will be collected and disposed of off-site in an appropriate manner.

Locations where vehicles enter or exit the site shall be inspected daily for evidence of off-site soil tracking.

The qualified environmental professional or their designated representative will be responsible for ensuring that all egress points for truck and equipment transport from the site are clean of dirt and other materials derived from the site during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to site-derived materials.

D-5 MATERIALS TRANSPORT OFF-SITE

All transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded.

Material transported by trucks exiting the site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

All trucks will be washed prior to leaving the Site.

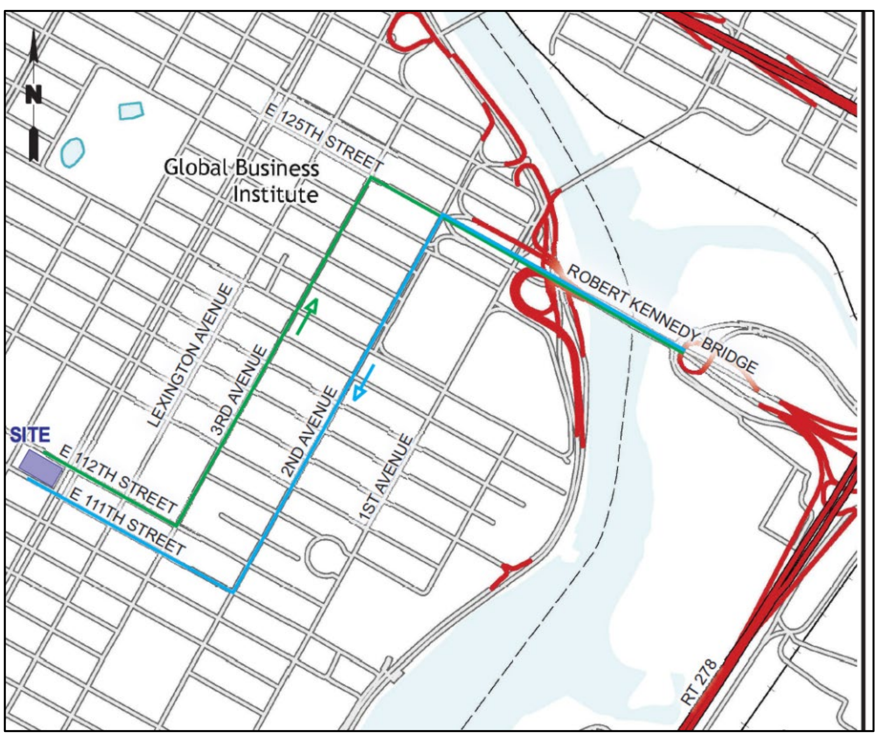
Truck transport routes are as follows:

From Site:

- Head southeast on East 112th Street
- Turn left onto East 125th Street
- Take ramp to Robert F. Kennedy Bridge
- Continue onto Robert F. Kennedy Bridge and exit onto I-278

To Site:

- From I-278 take Robert F. Kennedy Bridge west
- Turn left onto 2nd Avenue
- Turn right onto East 111th Street and proceed to the Site



All trucks loaded with site materials will exit the vicinity of the site using only these approved truck routes. This is the most appropriate route and takes into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting off-site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport.

Trucks will be prohibited from stopping and idling in the neighborhood outside the project site.

Egress points for truck and equipment transport from the site will be kept clean of dirt and other materials during site remediation and development.

Queuing of trucks will be performed on-site in order to minimize off-site disturbance. Off-site queuing will be minimized to the extent practical.

Material transported by trucks exiting the Site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

D-6 MATERIALS DISPOSAL OFF-SITE

All material excavated and removed from the site will be treated as contaminated and regulated material and will be transported and disposed in accordance with all local, State and Federal regulations. If disposal of material from this site is proposed for unregulated off-site disposal (i.e., clean soil removed for development purposes), a formal request with an associated plan will be made to the NYSDEC. Unregulated off-site management of materials from this site will not occur without formal NYSDEC approval.

Off-site disposal locations for excavated soils will be identified in the pre-excavation notification. This will include estimated quantities and a breakdown by class of disposal facility if appropriate, i.e., hazardous waste disposal facility, solid waste landfill, petroleum treatment facility, C&D debris recovery facility, etc. Actual disposal quantities and associated documentation will be reported to the NYSDEC in the Periodic Review Report. This documentation will include: waste profiles, test results, facility acceptance letters, manifests, bills of lading and facility receipts.

Non-hazardous historic fill and contaminated soils taken off-site will be handled consistent with 6NYCRR Parts 360, 361, 362, 363, 364 and 365. Material that does not meet Unrestricted SCOs is prohibited from being taken to a New York State C&D debris recovery facility (6NYCRR Subpart 361-5 registered or permitted facility).

Soils that are contaminated but non-hazardous and are being removed from the Site are considered by the Division of Materials Management (DMM) in NYSDEC to be C&D materials with contamination not typical of virgin soils. These soils may be sent to a permitted Part 360 landfill. They may be sent to a permitted C&D facility without permit modifications only upon prior notification of NYSDEC Region 2 DMM.

D-7 MATERIALS REUSE ON-SITE

Although not planned, on-site soil may be reused for backfill. The qualified environmental professional will ensure that procedures defined for materials reuse in this SMP are followed and that unacceptable material does not remain on-site. Contaminated on-site material, including historic fill and contaminated soil, that is acceptable for reuse on-site will be placed below the demarcation layer or impervious surface, and will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines.

Any demolition material proposed for reuse on-site will be sampled for asbestos and the results will be reported to the NYSDEC for acceptance. Concrete crushing or processing on-site will not be performed without prior NYSDEC approval. Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the site will not be reused on-site.

Sampling and analysis of excavated backfill to qualify for unrestricted or restricted residential uses or onsite/offsite reuse will be performed in accordance with the Field Sampling Plan for the Site (Appendix F in this SMP). Representative sampling will be in accordance with DER-10.

D-8 FLUIDS MANAGEMENT

All liquids to be removed from the site, including but not limited to, excavation dewatering, decontamination waters and groundwater monitoring well purge and development waters, will be handled, transported and disposed in accordance with applicable local, State, and Federal regulations. Dewatering, purge and development fluids will not be recharged back to the land surface or subsurface of the site, and will be managed off-site, unless prior approval is obtained from NYSDEC. Liquids discharged into the New York City sewer system will be addressed through approval by the NYCDEP.

D-9 SITE COVER SYSTEM RESTORATION

After the completion of soil removal and any other invasive activities the cover system will be restored in a manner that complies with the RAWP. The existing Site Cover System is comprised of:

- concrete building foundation in Building B South comprised of 4-inch crushed stone subbase, and 8-inch foundation slab (demarcation layer is the underside of the concrete).
- concrete walkways/ramps/stairways in Building B South comprised of 4-inch crushed stone subbase, demarcation layer (underside of concrete) and 4-inch concrete walkway/ramps/stairways.
- Site Cover System for the support of excavation (SOE) is comprised of clean stone backfill from the terminal excavation depth extending up to one foot above the natural water table, additional clean stone or reused NYSDEC-approved on-Site soils above the water table, RCA subbase, and concrete slab (demarcation layer is the underside of the concrete).

The demarcation layer, consisting of the underside of concrete walkways/ramps/stairways, and/or the underside of the building slab, will be replaced to provide a visual reference to the top of the remaining contamination zone, the zone that requires adherence to special conditions for disturbance of remaining contaminated soils defined in this SMP. If the type of cover system changes from that which exists prior to the excavation (i.e., a soil cover is replaced by asphalt), this will constitute a modification of the cover element of the remedy and the upper surface of the remaining contamination. A figure showing the modified surface will be included in the subsequent Periodic Review Report and in an updated SMP.

D-10 BACKFILL FROM OFF-SITE SOURCES

All materials proposed for import onto the site will be approved by the qualified environmental professional and will be in compliance with provisions in this SMP prior to receipt at the site. A Request to Import/Reuse Fill or Soil form, which can be found at http://www.dec.ny.gov/regulations/67386.html, will be prepared and submitted to the NYSDEC project manager allowing a minimum of 5 business days for review.

Material from industrial sites, spill sites, or other environmental remediation sites or potentially contaminated sites will not be imported to the site. A pre-determined Beneficial Use Determination (BUD) may be applicable for use of recycled concrete aggregate (RCA) with less than 10 percent passing a number 80 sieve sourced from a NYSDEC registered Construction and Demolition Debris processing facility if used as a substitute for conventional aggregate (i.e., drainage layer beneath pavement or slab). A site-specific BUD may be requested under certain circumstances for soil from environmental remediation sites or other sources or RCA used as backfill for excavations.

All imported soils will meet the backfill and cover soil quality standards established in 6NYCRR 375-6.7(d). Based on an evaluation of the land use, protection of groundwater and protection of ecological resources criteria, the resulting soil quality standards are listed in Table 3. Soils that meet 'exempt' fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this site, will not be imported onto the site without prior approval by NYSDEC. Solid waste will not be imported onto the site.

The NYSDEC approved backfill or cover soil quality objectives for the various portions of the site are as follows:

- Track 1 cleanup areas - Unrestricted Use Soil Cleanup Objectives.
- Track 2/4 cleanup areas – lower of the Restricted Residential Soil Cleanup Objectives or the Protection of Groundwater Soil Cleanup Objectives.

Trucks entering the site with imported soils will be securely covered with tight fitting covers. Imported soils will be stockpiled separately from excavated materials and covered to prevent dust releases.

D-11 STORMWATER POLLUTION PREVENTION

Erosion and sediment controls to be installed during future disturbance of residual contamination, if required, will be in conformance with requirements presented in the New York State Guidelines for Urban Erosion and Sediment Control. As required, silt fence, barriers and hay bale checks will be installed and inspected once a week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by the NYSDEC. All necessary repairs shall be made immediately.

Accumulated sediments will be removed as required to keep the barrier and hay bale check functional.

All undercutting or erosion of the silt fence toe anchor shall be repaired immediately with appropriate backfill materials.

Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

Erosion and sediment control measures identified in the SMP shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters.

D-12 EXCAVATION CONTINGENCY PLAN

During the remedial action, a total of seven underground storage tanks were uncovered and properly cleaned and disposed of offsite by a licensed tank contractor and it is unlikely that there are others present due to the extensive work completed onsite.

In the unlikely event that additional underground tanks or other previously unidentified contaminant sources are found during post-remedial subsurface excavations or development related construction, excavation activities will be suspended until sufficient equipment is mobilized to address the condition.

Sampling will be performed on product, sediment and surrounding soils, etc. as necessary to determine the nature of the material and proper disposal method. Chemical analysis will be performed for a full list of analytes (TAL metals; TCL volatiles and semi-volatiles, TCL pesticides and PCBs and Emerging Contaminants), unless the site history and previous sampling results provide a sufficient justification to limit the list of analytes. In this case, a reduced list of analytes will be proposed to the NYSDEC for approval prior to sampling.

Identification of unknown or unexpected contaminated media identified by screening during invasive site work will be promptly communicated by phone to NYSDEC's Project Manager. Reportable quantities of petroleum product will also be reported to the NYSDEC spills hotline. These findings will be also included in the Periodic Review Report.

D-13 COMMUNITY AIR MONITORING PLAN

The CAMP is included within Appendix N of the HASP, which is located in Appendix E of this SMP.

D-14 ODOR CONTROL PLAN

This odor control plan is capable of controlling emissions of nuisance odors off-site and on-site. Specific odor control methods to be used on a routine basis will include limiting open excavation areas and covering excavated soil (i.e., with polyethylene sheeting or covered in roll off containers). If nuisance odors are identified at the site boundary, or if odor complaints are received, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and of any other complaints about the project. Implementation of all odor controls, including the halt of work, is the responsibility of the remedial party's Remediation Engineer, and any measures that are implemented will be discussed in the Periodic Review Report.

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

If nuisance odors develop during intrusive work that cannot be corrected, or where the control of nuisance odors cannot otherwise be achieved due to on-site conditions or close proximity to sensitive receptors, odor control will be achieved by sheltering the excavation and handling areas in a temporary containment structure equipped with appropriate air venting/filtering systems.

D-15 DUST CONTROL PLAN

A dust suppression plan that addresses dust management during invasive on-site work will include, at a minimum, the items listed below:

- Dust suppression will be achieved through the use of a dedicated on-site water truck for road wetting. The truck will be equipped with a water cannon capable of spraying water directly onto off-road areas including excavations and stockpiles.
- Clearing and grubbing of larger sites will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.
- Gravel will be used on roadways to provide a clean and dust-free road surface.
- On-site roads will be limited in total area to minimize the area required for water truck sprinkling.

D-16 OTHER NUISANCES

A plan for rodent control will be developed and utilized by the contractor prior to and during site clearing and site grubbing, and during all remedial work.

A plan will be developed and utilized by the contractor for all remedial work to ensure compliance with NYCDEP noise control ordinances.

APPENDIX E

Health and Safety Plan (Including CAMP)

Site-Specific
Health and Safety Plan

Sendero Verde Redevelopment Project – Parcel B
Tax Block 1617 of Tax Lot 20
New York, New York

August 3, 2020

Prepared for:

SV-B Owners LLC
1865 Palmer Avenue
Larchmont, New York 10538

Prepared by:

Roux Environmental Engineering and Geology, D.P.C.
209 Shafter Street
Islandia, New York 11749

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Appendices

Site-Specific Emergency Information

Emergency Phone Numbers

Most emergency services can be obtained by calling **911**. Where 911 service is not available, use the telephone numbers provided in the below table. The following is a master emergency phone list for use by the project management personnel. A more condensed version of the emergency numbers listed below will be posted throughout project work areas. Emergencies encountered on the Site will be responded to by a combination of off-Site emergency services and Site personnel.

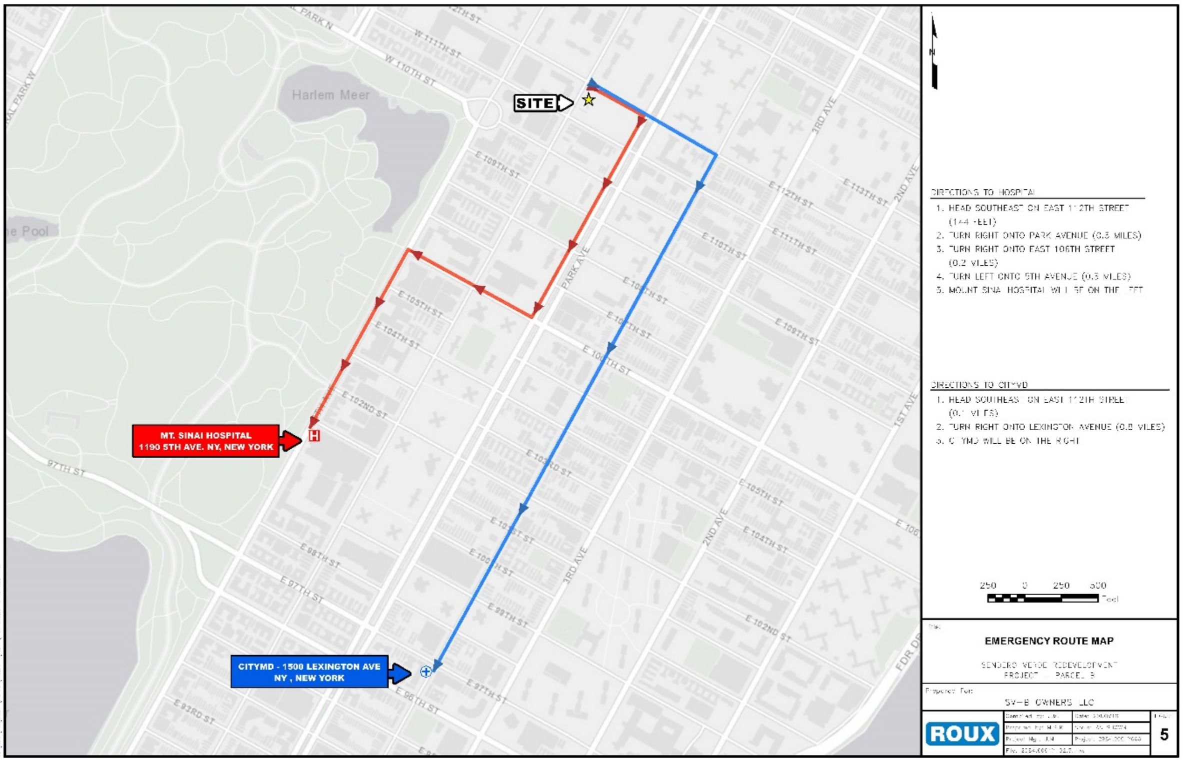
Emergency Contact Information			
Site Personnel			
Title	**Contact**	**Telephone**	
Office Manager	Michael Ritorto	631-630-2370	
Project Principal	Noelle Clarke	631-630-2341	
Project Manager (PM)	Wendy Shen	631-630-2331	
Site Health and Safety Officer (SHSO)	TBD		
Site Supervisor (SS)	TBD		
Office Health and Safety Manager (OHSM)	Kristina DeLuca	631-630-2406	
Corporate Health and Safety Manager (CHSM)	Brian Hobbs	631-630-2419	
Outside Assistance			
Agency	**Contact**	**Telephone**	**Address/Location**
Ambulance/EMS	911	911	N/A
Police	NYPD	212-860-6411	162 East 102nd Street, New York, New York
Fire	FDNY	212-504-4115	1367 5th Avenue, New York, New York

Route to Mount Sinai Hospital, 1190 5th Avenue, New York, NY (Figure 5):

- Head southeast on East 112th Street (144 feet)
- Turn right onto Park Avenue (0.3 miles)
- Turn right onto East 106th Street (0.2 miles)
- Turn left onto 5th Avenue (0.3 miles)
- Mount Sinai Hospital will be on the left

Route to City MD, 1500 Lexington Avenue, New York, NY (Figure 5):

- Head southeast on East 112th Street (0.1 miles)
- Turn right onto Lexington Avenue (0.8 miles)
- City MD will be on the right



SITE
MT. SINAI HOSPITAL
1190 5TH AVE. NY, NEW YORK
CITYMD - 1500 LEXINGTON AVE
NY , NEW YORK
Harlem Meer
PARK AVE
3RD AVE
2ND AVE
1ST AVE
E 106TH ST
E 102ND ST
E 97TH ST
E 96TH ST
DIRECTIONS TO HOSPITAL
1. HEAD SOUTHEAST ON EAST 112TH STREET (144 FEET)
2. TURN RIGHT ONTO PARK AVENUE (0.3 MILES)
3. TURN RIGHT ONTO EAST 106TH STREET (0.2 MILES)
4. TURN LEFT ONTO 5TH AVENUE (0.3 MILES)
5. MOUNT SINAI HOSPITAL WILL BE ON THE LEFT
DIRECTIONS TO CITYMD
1. HEAD SOUTHEAST ON EAST 112TH STREET
2. TURN RIGHT ONTO LEXINGTON AVENUE (0.8 MILES)
3. CITYMD WILL BE ON THE RIGHT
250 0 250 500
Feet
EMERGENCY ROUTE MAP
SENDERO VERDE REDEVELOPMENT PROJECT — PARCEL B
Prepared For:
SV-B OWNERS LLC
ROUX
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1. Introduction

This Site-specific Health and Safety Plan (HASP) has been prepared by Roux Environmental Engineering and Geology, D.P.C. (Roux) for use during excavation activities (e.g., construction/trucking oversight and sampling activities being performed by Roux) as part of the Excavation Work Plan (EWP) included in the Site Management Plan (SMP) at the Sendero Verde Redevelopment Site – Parcel B ("the Site"), located to the west of Park Avenue and to the east of Madison Avenue, between East 111th and East 112th Street (see Figure 1). These activities fall within the scope of operations covered by the Occupational Safety and Health Administration (OSHA) standards promulgated at 29 CFR 1910.120 and 29 CFR 1926.65, both commonly referred to as the Hazardous Waste Operations and Emergency Response (HAZWOPER) Standard. In accordance with the HAZWOPER Standard, this Site-specific HASP was prepared to address the safety and health hazards associated with the excavation activities being performed at the Site by Roux and to provide requirements and procedures for the protection of Roux employees, subcontractor personnel, government oversight personnel, Site personnel, and the general public. It also addresses client- and Site-specific requirements for health and safety.

Implementation of this HASP is the joint responsibilities of the project manager, the Site health and safety officer, and all field staff, with assistance from the project principal and the office health and safety manager. The project manager for this project is Wendy Shen, the Site health and safety officer is to be decided and will be communicated prior to the start of any work.

1.1 Roles and Responsibilities

Overall Roles and Responsibilities (R&Rs) of Roux personnel are provided in Roux's Policies and Procedures Manual. Only those R&Rs specific to HASP requirements are listed below.

Project Manager (PM)
The PM has responsibility and authority to direct all work operations. The PM coordinates safety and health functions with the Site Health and Safety Officer (SHSO), has the authority to oversee and monitor the performance of the SHSO, and bears ultimate responsibility for the proper implementation of this HASP. The specific duties of the PM are:

- preparing and coordinating the Site work plan;
- providing Site supervisor(s) with work assignments and overseeing their performance; Coordinating safety and health efforts with the SSHO;
- ensuring effective emergency response through coordination with the Emergency Response Coordinator (ERC); and
- serving as primary Site liaison with public agencies and officials and Site contractors.

Site Health and Safety Officer (SHSO)
The SHSO has full responsibility and authority to develop and implement this HASP and to verify compliance. The SHSO reports to the Project Manager. The SHSO is on-Site or readily accessible to the Site during all work operations and has the authority to halt Site work if unsafe conditions are detected. The specific responsibilities of the SHSO include:

- managing the safety and health functions on this Site;
- serving as the Site's point of contact for safety and health matters;

- ensuring Site monitoring, worker training, and effective selection and use of PPE;
- assessing Site conditions for unsafe acts and conditions and providing corrective action;
- assisting the preparation and review of this HASP;
- maintaining effective safety and health records as described in this HASP; and
- coordinating with the Site Supervisor(s) and others as necessary for safety and health efforts.

Site Supervisor

The Site Supervisor is responsible for field operations and reports to the Project Manager (PM). The Site Supervisor ensures the implementation of the HASP requirements and procedures in the field. The specific responsibilities of the Site Supervisor include:

- executing the work plan and schedule as detailed by the PM;
- coordination with the SHSO on safety and health; and
- ensuring Site work compliance with the requirements of this HASP.

Site Workers

Site workers are responsible for complying with this HASP, using the proper PPE, reporting unsafe acts and conditions, and following the work and safety and health instructions of the Project Manager (PM), SHSO, and Site Supervisor.

2. Background

The Site consists of a full city block, excluding five parcels. The Site was developed since at least 1896 with several low-rise buildings and the use was mixed residential and commercial. Demolition of the Site buildings began in 1979 and was completed by 1986. The Site is currently fenced and under development to build a multi-story affordable housing complex. Prior to development, the Site contained a baseball field and community gardens surrounding the eastern and southwestern Site perimeter. The Site is zoned for residential use with a commercial overlay. Nearby properties include residential and commercial buildings. The proposed future use of the Site includes residential, commercial and community facility spaces.

There are no known releases of hazardous substances at the Site. As indicated in the Phase I Environmental Site Assessment (ESA), past operators of the Site included tailors and shoe companies, dry cleaners, paints shops, a drug company, printers and furriers. In addition, nearby properties operated as dry cleaners, auto services, dental offices and paint shops.

The following environmental reports were available for review:

- Phase I Environmental Site Assessment (ESA), prepared by Roux, dated March 2018.
- Phase II ESA, prepared by Roux, dated June 2018.
- Amendment to the Phase II ESA, prepared by Roux, dated November 13, 2018.
- Phase I ESA, prepared by Roux, dated May 2019.
- Waste Characterization Report, prepared by Roux, dated May 2019.
- Remedial Investigation Report (RIR)/Remedial Action Work Plan (RAWP), prepared by Roux, dated September 2019.

Based on the 2018 and 2019 Phase I ESAs, prior to Site redevelopment, the site (after the amendment to remove the community gardens) was a relatively flat vacant, unpaved lot surrounded by chain-link fence which was utilized as a baseball field. A portion of the site was identified as a laundry from at least 1911 to 1979 and a portion of the site contained paint stores from at least 1939 to 1968. Numerous residential dwellings existed on-site between 1896 and 1980. Portions of the site operated as a dry cleaner (1968), a printer (1920), a furrier (1920), a pharmacy (1947-1950), and a shoe sale/manufacturer (1920, 1923 and 1934).

Based on the 2018 Roux Phase II ESA, the Site (soil, groundwater, and soil gas) appeared to have been impacted by polycyclic aromatic hydrocarbons (PAHs), metals, and pesticides originating from prior Site operations most likely associated with historic urban fill. As part of the NYSDEC BCP, the Site underwent additional investigations to delineate the nature and extent of contaminants.

<u>Nature and Extent of Contamination Prior to Remediation:</u>

Soil and groundwater samples were analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), metals, polychlorinated biphenyls (PCBs), and pesticides. Groundwater samples were also analyzed for emerging contaminants. Soil vapor samples were analyzed for VOCs. Based upon investigations conducted to date, the primary contaminants of concern are SVOCs and metals.

<u>Soil</u>

Several SVOCs were detected in soil at concentrations exceeding both the unrestricted use soil cleanup objectives (UUSCOs) and the restricted residential soil cleanup objectives (RRSCOs), including:

benzo(a)anthracene at a maximum concentration of 22 parts per million (ppm) as compared to the UUSCO and RRSCO of 1 ppm, benzo(a)pyrene at a maximum concentration of 21 ppm (UUSCO and RRSCO is 1 ppm), benzo(b)fluoranthene at a maximum concentration of 31 ppm (UUSCO and RRSCO is 1 ppm) and chrysene at a maximum concentration of 27 ppm (UUSCO is 1 ppm and RRSCO is 3.9 ppm). Metals including barium, lead and mercury were found in soil exceeding both the UUSCOs and the RRSCO. Barium was found at a maximum concentration of 1,490 ppm (UUSCO is 350 ppm and RRSCO is 400 ppm). Lead was found at a maximum concentration of 3,540 ppm (UUSCO is 63ppm, RRSCO is 400 ppm). Mercury was found at a maximum concentration of 2.36 ppm (UUSCO is 0.18 ppm and RRSCO is 0.81 ppm). No VOCs, PCBs or pesticides were detected at concentrations exceeding the RRSCOs. The data does not indicate any off-site impacts in soil related to this site.

<u>Groundwater</u>

Tetrachloroethene (PCE) was found at a maximum concentration of 9.7 parts per billion (ppb) as compared with the Ambient Water Quality Standards and Guidance Values (AWQSGVs) of 5 ppb. Several SVOCs, including benzo(a)anthracene, benzo(a)pyrene, chrysene and benzo(b)fluoranthene, were also found at concentrations marginally exceeding the AWQSGVs in one well. No PCBs or pesticides were detected at concentrations exceeding the AWQSGVs.

The data does not indicate any off-site impacts in groundwater related to this site.

<u>Soil Vapor</u>

PCE was detected at a maximum concentration of 22.8 micrograms per cubic meter (ug/m3). Several petroleum VOCs were also detected including mixed xylenes at a maximum concentration of 764 ug/m3, and toluene at a maximum concentration of 159 ug/m3. The data does not indicate any off-site impacts in soil vapor related to this site.

The data generated during the RI indicated the following about Site-wide conditions:

- The only VOC detected in soil exceeding NYSDEC UUSCO and PGWSCOs was acetone. In groundwater only Chloroform and Tetrachloroethene were detected at concentrations exceeding the NYSDEC AWQSGVs. Groundwater is not significantly impacted by VOCs and there is no indication that there is a source of groundwater contamination at the Site for VOCs.
- SVOCs, exclusively PAHs, were detected at elevated concentrations above NYSDEC UUSCOs and RRSCOs and PGWSCOs in most shallow soils across the Site as well as detected in groundwater above the AWQSGVs in some samples. It is likely that SVOCs present in the unfiltered groundwater samples were a result of sediment present in the samples and are not representative of dissolved impacts in groundwater. This data indicates that SVOCs in soil are not a significant source of groundwater contamination at the Site.
- Metals were detected in soil at elevated concentrations above NYSDEC SCOs across the Site. Arsenic, barium, cadmium, trivalent chromium, copper, lead, mercury, nickel, silver and zinc were detected at concentrations above NYSDEC UUSCOs. Arsenic, barium, cadmium, lead and mercury were detected at concentrations exceeding NYSDEC RRSCOs. Metals contamination is related to the use of urban fill at the Site. Metals were detected at concentrations above NYSDEC PGWSCOs in soil but were not detected in dissolved groundwater indicating that metals in soil are not a source of groundwater contamination at the Site.
- PCBs were detected in six of the soil sampling locations at concentrations exceeding NYSDEC UUSCOs, but only one sampling location in exceedance of their RRSCOs and they were not detected in groundwater.

- Pesticides and herbicides were detected sporadically throughout Site soils at concentrations exceeding NYSDEC UUSCOs, but only two sampling locations in exceedance of their RRSCOs and they were not detected in groundwater.
- Based on the Site-wide detections, soil vapor at the Site is impacted with VOCs, though at relatively low concentrations not indicative of an on-Site source. Soil vapor at the Site is impacted with petroleum related VOCs and one CVOC (tetrachloroethene), with the highest concentrations of petroleum related VOCs detected in SV-17 (northcentral portion of the Site), and the highest detection of CVOC identified in SV-12. Soil vapor impacts likely originate from off-Site sources as no on-Site source of VOCs was identified in soil.
- According to water-level data collected during this RI, the elevation of the water table surface at the Site ranges from 3.09 ft NAVD 88 at the southeast portion of the Site to 4.26 NAVD 88 in the northcentral portion of the Site. Groundwater depth at the Site varied from 9.15 ft bls to 12.23 ft bls and groundwater flow is generally to the southeast towards the Harlem River.

The remaining contamination after the remedial action was completed is limited to soil in the areas where a Track 1 UUSCOs (Unrestricted Use Soil Cleanup Objectives) were not met (outside the central portion and courtyard portion of Building B North). The western portion of Building B North met Track 2 Restricted Residential SCOs (RRSCOs). The remainder of the Site (Building B South) achieved a Track 4 Restricted Residential Use cleanup through implementation of engineering controls where RRSCOs were exceeded. Based on the endpoint samples collected during the remedial action, the remaining contamination is limited to SVOCs, metals and some PCBs and pesticides. All remaining contamination is located under the building foundation slab and vapor/waterproofing barrier or concrete stairs/walkways. For the areas where a Track 1 UUSCOs and Track 2 RRSCOs were not achieved, long term management of the engineering controls/institutional controls (ECs/ICs) and residual contamination will be performed in accordance with the SMP.

An overall Site Setting and Site Plan are included as Figures 2 and 3.

3. Scope of Work

The scope of work includes the following:

- Construction oversight of excavation activities;
- Trucking oversight for soil disposal and backfill importation;
- Implementation of Community Air Monitoring; and
- Soil sampling as needed.

If there are any changes with the scope a revision of the HASP will be required to address any new hazards.

4. Site Control

This Site control program is designed to reduce the spread of hazardous substances from contaminated areas to clean areas, to identify and isolate contaminated areas of the Site, to facilitate emergency evacuation and medical care, to prevent unauthorized entry to the Site, and to deter vandalism and theft.

4.1 Site Map

A map of this Site, showing Site boundaries, designated work zones, and points of entry and exit is provided in Figure 4.

4.2 Site Access

Access to the Site is restricted to reduce the potential for exposure to its safety and health hazards. During hours of Site operation, Site entry and exit is authorized only at the points identified in Figure 4.

4.3 Buddy System

The buddy system is not applicable.

4.4 Site Communications

The following communication equipment is used to support on-Site communication: cell phones.

4.5 Site Work Zones

This section is not applicable.

5. Job Hazard Evaluation

Roux's work at the Site is expected to entail a variety of physical, chemical, and biological hazards, all of which must be sufficiently managed to allow the work to be performed safely. Some of the hazards are Site-specific, i.e., they are associated with the nature, physical characteristics, and/or routine operation of the Site itself, while others are activity-specific, i.e., they are associated with (or arise from) the particular activity being performed. The various hazards can be grouped into the following categories:

Caught/Crushed – the potential to become caught in, under, between, or by an object or parts of an object, such as equipment with parts that open and close or move up and down ("pinch points") or equipment that rotates, and the accompanying potential to have body parts cut, mangled, or crushed thereby.

Contact – the potential to be struck by or against moving or stationary objects that can cause physical injury, such as heavy machinery, overhead piping, moving vehicles, falling objects, and equipment (including tools and hand-held equipment) or infrastructure with the ability to cut or impale.

Energy Sources – the potential for bodily harm associated with energy sources, most notably electricity, but also including latent energy sources such as compressed air and equipment under tension (which when released could cause injurious contact or a fall).

Ergonomics – the potential for musculoskeletal injury associated with lifting/carrying, pushing/pulling, bending, reaching, and other physical activity attributable to poor body position/mechanics, repetitive motion, and/or vibration.

Exposure – the potential for injury/illness due to physical, chemical, or biological exposures in the work environment, including but not limited to temperature extremes, solar radiation, and noise (physical), chemical splashes and hazardous atmospheres (chemical), and animal/insect bites and poisonous plants (biological).

Falls – the potential to slip or trip and thus fall or drop a load, resulting in bodily injury to oneself or others.

The foregoing is intended to provide Roux employees with a general awareness of the hazards involved with Site work. A more detailed review of the potential hazards associated with each specific activity planned for the Site (or ongoing activity, as the case may be) is provided in the activity-specific Job Safety Analysis (JSA) forms in Appendix A. As can be seen in the JSA forms, the hazards are identified by category per the above, and specific measures designed to mitigate/manage those hazards are also identified. In preparing the JSA forms, all categories of hazards were considered, and all anticipated potential hazards were identified to the extent possible based on the experience of the personnel preparing and reviewing the JSA forms. However, there is always the possibility for an unanticipated hazard to arise, potentially as condition change over the course of the workday. Roux personnel must maintain a continual awareness of potential hazards in the work zone, regardless of whether the hazard is identified in the JSA form. Particular attention should be paid to hazards associated with exposure to hazardous substances (see Table 1 for a listing of the hazardous substances most likely to be encountered in environmental media at the Site) and to Site personnel being located "in the line of fire" with respect to moving equipment, pinch points, and latent energy, e.g., being located or having body parts located within the swing radius of an excavator, between two sections of pipe being connected, below a piece of suspended equipment, or adjacent to a compressed air line.

5.1 Employee Notification of Hazards and Overall Site Information Program

The information in the JSAs and safety data sheets is made available to all employees and subcontractors who could be affected by it prior to the time they begin their work activities. Modifications to JSAs are communicated during routine pre-work briefings.

6. Emergency Response Plan

This emergency response plan details actions to be taken in the event of Site emergencies. The PM and SHSO is responsible for the implementation of emergency response procedures on-Site. The SHSO/PM provides specific direction for emergency action based upon information available regarding the incident and response capabilities and initiates emergency procedures and notification of appropriate authorities. In the event of an emergency, Site personnel are evacuated and do not participate in emergency response activities, response is facilitated through external emergency services.

6.1 Emergency Response

The SHSO, after investigating the incident and relevant information, shall determine the level of response required for containment, rescue and medical care. Limited on-Site emergency response activities could occur therefore the SHSO is responsible for notifying external emergency response agencies. The SHSO provides relevant information to the responding organizations, including but not limited to the hazards associated with the emergency incident, potential containment problems, and missing Site personnel.

6.2 Emergency Alerting and Evacuation

If evacuation notice is given, Site workers leave the worksite, if possible, by way of the nearest exit. Appropriate primary and alternate evacuation routes and assembly areas have been identified and are shown on the Emergency Response Site Map Figure 4. The routes and assembly area will be determined by conditions at the time of the evacuation based on wind direction, the location of the hazard source, and other factors as determined by SHSO/PM.

Personnel exiting the Site gather at a designated assembly point. To determine that everyone has successfully exited the Site, personnel will be accounted for at the assembly Site. If any worker cannot be accounted for, notification is given to so that appropriate action can be initiated. Subcontractors on this Site have coordinated their emergency response plans to ensure that these plans are compatible and potential emergencies are recognized, alarm systems are clearly understood, and evacuation routes are accessible to all personnel relying upon them.

6.3 Emergency Medical Treatment and First Aid

In the event of a work-related injury or illness, employees are required to follow procedures outlined below. All work-place injury and illness situations require Roux's Project and Corporate Management Team to be notified when an injury / illness incident occurs, and communication with the contracted Occupational Health Care Management Provider, AllOne Health, is initiated. The Injury/Illness Notification Flowchart is provided below and within Roux's Incident Investigation and Reporting program included as Appendix D.

If on-Site personnel require any medical treatment, the following steps will be taken:

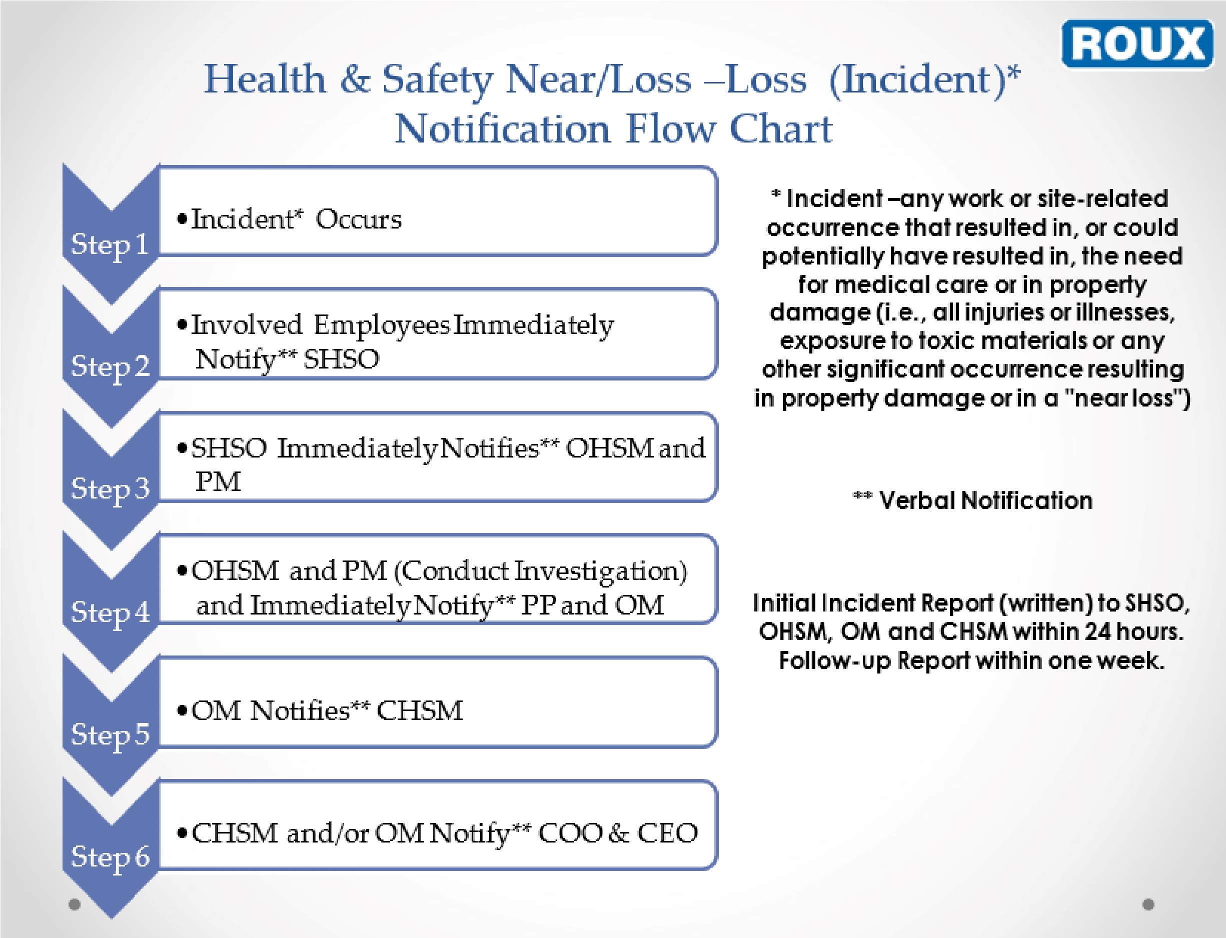
a. If medical emergency requires immediate, professional care, dial 911.
b. Notify Roux's Project and Corporate Management Team for any work-related injury and/or illness occurrence, and communicate with the contracted Occupational Health Care Management Provider, AllOne Health, immediately following the notifications provided above.
c. Based on discussions with the Project Team, Corporate Management and the AOH evaluation, if medical attention beyond on-Site First Aid is warranted, transport the injured / ill person (IP) to the Urgent Care Center, or notify the Fire Department or Ambulance Emergency service and request an

ambulance or transport the victim to the hospital, and continue communications with Corporate Management Team. An Urgent Care/Hospital Route map with location City MD and Mount Sinai Hospital is included as Figure 5.

d. Decontaminate to the extent possible prior to administration of first aid or movement to medical or emergency facilities.

e. First aid medical support will be provided by on-Site personnel trained and certified in First Aid, Cardio Pulmonary Resuscitation (CPR), Automatic External Defibrillation (AED), and Blood-Borne Pathogens (BBP) Awareness, until relieved by emergency medical services (EMS).

f. The SHSO and Project Manager will perform a Loss Investigation (LI) and the Project Team will complete the final Loss Report. If a Roux employee is involved in a vehicular incident, the employee must also complete the Acord Automobile Loss Notice.



6.4 Adverse Weather Conditions

In the event of adverse weather conditions, the SHSO or project principal will determine if work can continue without sacrificing the health and safety of all field workers. Some of the items to be considered prior to determining if work should continue are:

- Potential for heat stress and heat-related injuries.
- Potential for cold stress and cold-related injuries.
- Treacherous weather-related conditions.

- Limited visibility.
- Electrical storm potential.

Site activities will be limited to daylight hours and acceptable weather conditions. Inclement working conditions include heavy rain, fog, high winds, and lightning. Observe daily weather reports and evacuate if necessary in case of inclement weather conditions.

6.5 Electrical Storm Guidelines

In the event that lightning and/or thunder are observed while working on-Site, all on-Site activities shall stop and personnel shall seek proper shelter (e.g., substantial building, enclosed vehicle, etc.). Work shall not resume until the threat of lighting has subsided and no lightning or thunder has been observed for 30 minutes. If the possibility of lightning is forecast for the day, advise the on-Site personnel on the risks and proper procedure at the pre-work safety briefing. Continuously monitor for changing weather conditions and allow enough time to properly stop work if lightning is forecast.

7. Safety Procedures

This section of the HASP presents the specific safety procedures to be implemented during Roux's activities at the Site in order to protect the health and safety of various on-Site personnel. Minimum OSHA-mandated procedures are presented first, followed by client- and Site-specific procedures. Lastly, activity-specific procedures are discussed. These Site- and activity-specific procedures supplement the general safety procedures included in Roux's Corporate Health and Safety Manual, which also must be followed in their entirely.

7.1 Training

At a minimum, Site personnel who will perform work in areas where there exists the potential for toxic exposure will be health and safety-trained prior to performing work on Site per OSHA 29 CFR 1910.120(e) and 29 CFR 1926.65(e). More specifically, all Roux, subcontractor, and other personnel engaged in sampling and remedial activities at the Site and who are exposed or potentially exposed to hazardous substances, health hazards, or safety hazards must have received at a minimum the 40 hour initial HAZWOPER training consistent with the requirements of 29CFR 1910.120(e)(3)(i) training and a minimum of 3 days' actual field experience under the direct supervision of a trained experienced supervisor, plus 8 hours of refresher training on an annual basis. Depending on tasks performed, less training may be permitted. Evidence of such training must be maintained at the Site at all times. Furthermore, all on-Site management and supervisory personnel directly responsible for or who supervise the employees engaged in Site remedial operations, must have received an additional 8 hours of specialized training at the time of job assignment on topics including, but not limited to, the employer's safety and health program and the associated employee training program, personal protective equipment program, spill containment program, and health hazard monitoring procedure and techniques, plus 8 hours of refresher training on an annual basis.

Roux personnel training records are maintained in a corporate database with records available upon request from either the OHSM/SHSO/CHSM or Human Resources Department.

7.2 Site-Specific Safety Briefings for Visitors

A Site-specific briefing is provided to all Site visitors who enter this Site beyond the Site entry point. For visitors, the Site-specific briefing provides information about Site hazards, the Site lay-out including work zones and places of refuge, the emergency alarm system and emergency evacuation procedures, and other pertinent safety and health requirements as appropriate.

7.3 HASP Information and Site-Specific Briefings for Workers

Site personnel review this HASP and are provided a Site-specific tailgate briefing prior to the commencement of work to ensure that employees are familiar with this HASP and the information and requirements it contains as well as relevant JSAs. Additional briefings are provided as necessary to notify employees of any changes to this HASP as a result of information gathered during ongoing Site characterization and analysis. Conditions for which we schedule additional briefings include, but are not limited to: changes in Site conditions, changes in the work schedule/plan, newly discovered hazards, and incidents occurring during Site work.

7.4 Medical Surveillance

The medical surveillance section of the Health and Safety Plan describes how worker health status is monitored at this Site. Medical surveillance is used when there is the potential for worker exposure to hazardous substance at levels above OSHA permissible exposure limits or other published limits. The purpose of a medical surveillance program is to medically monitor worker health to ensure that personnel are not adversely affected by Site hazards. The provisions for medical surveillance at this Site are based on the Site characterization and job hazard analysis found in Section 4 of this HASP and are consistent with OSHA requirements in 29 CFR 1910.120(f).

7.4.1 Site Medical Surveillance Program

Medical surveillance requirements are based on a worker's potential for exposure as determined by the Site characterization and job hazard analysis documented in Section 4 and JSAs within Appendix A of this HASP and in compliance with the requirements of 29 CFR 1910.120(f)(2). Based on Site information and use of direct reading instruments, limited use of respirators (less than 30 days per year), and the absence of an employee-staffed HAZMAT team, a limited medical surveillance program is required and implemented at this Site. The medical surveillance program provides that:

1. Workers assigned to tasks requiring the use of respirators receive medical examinations in accordance with 29 CFR 1910.134(e) to ensure they are physically capable to perform the work and use the equipment, and
2. If a worker is injured, becomes ill, or develops signs or symptoms of possible over-exposure to hazardous substance or health hazards, medical examinations are provided to that worker as soon as possible after the occurrence and as required by the attending physician.
3. These medical examinations and procedures are performed by or under the supervision of a licensed physician and are provided to workers free of cost, without loss of pay, and at a reasonable time and place. In addition, the need to implement a more comprehensive medical surveillance program will be re-evaluated after any apparent over-exposure.

7.4.2 Medical Recordkeeping Procedures

Medical recordkeeping procedures are consistent with the requirements of 29 CFR 1910.1020 and are described in the company's overall safety and health program. A copy of that program is available at our Islandia, New York office.

The following items are maintained in worker medical records:

- Respirator fit test and selection
- Physician's medical opinion of fitness for duty (pre-placement, periodic, termination)
- Physician's medical opinion of fitness for respirator protection (pre-placement, periodic)
- Exposure monitoring results

7.4.3 Program Review

The medical program is reviewed to ensure its effectiveness. The Corporate Health and Safety Manager in coordination with the Human Resources Director is responsible for this review. At minimum, this review consists of:

- Review of accident and injury records and medical records to determine whether the causes of accidents and illness were promptly investigated and whether corrective measures were taken wherever possible,

- Evaluation of the appropriateness of required medical tests based on-Site exposures, and
- Review of emergency treatment procedures and emergency contacts list to ensure they were Site-specific, effective, and current.

7.5 Personnel Protection

Site safety and health hazards are eliminated or reduced to the greatest extent possible through engineering controls and work practices. Where hazards are still present, a combination of engineering controls, work practices and PPE are used to protect employees. Appropriate personal protective equipment (PPE) shall be worn by Site personnel when there is a potential exposure to chemical hazards or physical hazards (e.g., falling objects, flying particles, sharp edges, electricity and noise), as determined by the SHSO. The level of personal protection, type and kind of equipment selected will depend on the hazardous conditions and in some cases cost, availability, compatibility with other equipment, and performance. An accurate assessment of all these factors will be made before work can be safely executed.

Roux maintains a comprehensive written PPE program that addresses proper PPE selection, use, maintenance, storage, fit and inspection. PPE to be used at the Site will meet the appropriate American National Standards Institute (ANSI) standards and the following OSHA (General Industry) standards for minimum PPE requirements.

The minimum level of PPE for entry onto the Site is Level D. The following equipment shall be worn:

- Work uniform (long pants, sleeved shirt)
- Hard hat
- Steel or composite toe work boots
- Safety Glasses (must comply with one of the following ANSI/ISEA Z87.1-2010, ANSI Z87.1-2003, ANSI Z87.1-2003)
- Boot Covers (as needed)
- Hearing Protection (as needed)
- High visibility clothing (shirt/vest)
- Hand Protection (e.g., minimum cut resistance meeting ANSI 105-2000 Level 2)

Note that jewelry shall be removed or appropriately secured to prevent it from becoming caught in rotating equipment or unexpectedly snagged on a fixed object. (e.g., wrist watches bracelets, rings, chains and necklaces, open earrings). Do not wear loose clothing and all shoulder length hair should be tied back.

Site specific PPE ensembles and materials are identified within task specific JSAs located within **Appendix A**, and any upgrades or downgrades of the level of protection (i.e., not specified in the JSA) must be immediately communicated to all Roux personnel and subcontractors as applicable. PPE is used in accordance with manufacturer's recommendations.

7.6 Monitoring

An air monitoring program is important to the safety of on- and off-Site personnel. A preliminary survey, to establish background conditions in the immediate sampling area, may be made prior to the initiation of Site work including, but not limited to, monitoring wind direction and approximate temperature during all invasive

Site activities. This survey will be conducted with the appropriate air monitoring instrument(s) as warranted by the field activity. Once this survey has been complete, any change in the type of PPE will be determined.

Air monitoring may be performed to verify that the proper level of equipment is used and to determine if increased protection or work stoppage is required. The following equipment may be used to monitor conditions:

- Photoionization Detector (PID)

Monitoring equipment will be calibrated in accordance with applicable regulatory requirements and manufacturer specifications. Below are monitoring action levels for Site-specific chemicals of concern. In the event that PID readings above the thresholds identified below are sustained for 5 minutes in the breathing zone, worker protection will require upgrading following notification to the OHSM and applicable parties (e.g., client, board of health, regulators, etc.).

PID Action Levels

Action Levels for Respiratory Protection	
PID Reading in Breathing Zone (ppm)	
<5	No Action
≥5 - <25	Level C
≥25	Cease Field Operations

7.7 Tailgate Safety Meetings

A designated Site worker will provide daily safety briefings (e.g., tailgate meetings) including, but not limited to, the following scenarios:

- When new operations are to be conducted;
- Whenever changes in work practices must be implemented; and
- When new conditions are identified and/or information becomes available.

Daily safety briefings shall be recorded on the Roux Daily Tailgate Health and Safety Meeting Log/Daily Site Safety Checklist, and all completed forms will become a part of the project file.

7.8 Spill Containment

Spill containment equipment and procedures should, at a minimum, meet the requirements of the facility's Spill Prevention, Control and Countermeasure Plan, if applicable. Otherwise, spill containment equipment and procedures must be considered depending on the task including, but no limited to, chemical/product transfer points and handling.

7.8.1 Initial Spill Notification and Response

Any worker who discovers a hazardous substance spill will immediately notify Noelle Clarke, Project Principal. The worker will, to his/her best ability, report the hazardous substance involved, the location of the spill, the estimated quantity of material spilled, the direction/flow of the spill material, related fire/explosion incidents, and any associated injuries without compromising their own safety.

7.8.2 Spill Evaluation and Response

TDB is responsible for evaluating spills and determining the appropriate response. When this evaluation is being made, the spill area will be isolated and demarcated to the extent possible. If necessary to protect nearby community members, notification of the appropriate authorities is made by the PM as appropriate. On-Site response is limited to small spills (e.g., <10 gallons), large spills require external emergency responders who will be contacted by the SHSO.

7.9 Decontamination

The decontamination section of the HASP describes how personnel and equipment are decontaminated when they leave the Exclusion Zone. This section also describes how residual waste from decontamination processes is disposed. The Site decontamination procedures are designed to achieve an orderly, controlled removal or neutralization of contaminants that may accumulate on personnel or equipment. These procedures minimize worker contact with contaminants and protect against the transfer of contaminants to clean areas of the Site and off-Site. They also extend the useful life of PPE by reducing the amount of time that contaminants contact and can permeate PPE surfaces. Decontamination is facilitated within the contamination reduction zone at this Site.

7.9.1 Decontamination Procedures for Personnel and PPE

The following are general decontamination procedures established and implemented at this Site.

1. Decontamination is required for all workers exiting a contaminated area. Personnel may re-enter the Support Zone only after undergoing the decontamination procedures described below in the next section.
2. Protective clothing is decontaminated, cleaned, laundered, maintained and/or replaced as needed to ensure its effectiveness.
3. PPE used at this Site that requires maintenance or parts replacement is decontaminated prior to repairs or
4. PPE used at this Site is decontaminated or prepared for disposal on the premises. Personnel who handle contaminated equipment have been trained in the proper means to do so to avoid hazardous exposure.
5. This Site uses an off-Site laundry for decontamination of PPE. The Site has informed that facility of the hazards associated with contaminated PPE from this Site.
6. The Site requires and trains workers that if their permeable clothing is splashed or becomes wetted with a hazardous substance, they will immediately exit the work zone, perform applicable decontamination procedures, shower, and change into uncontaminated clothing.
7. Procedures for disposal of decontamination waste meet applicable local, State, and Federal regulations.

7.9.2 Decontamination Procedures for Equipment

All tools, equipment, and machinery from the Exclusion Zone or CRZ are decontaminated in the CRZ prior to removal to the Support Zone. Equipment decontamination procedures are designed to minimize the potential for hazardous skin or inhalation exposure and to avoid cross-contamination and chemical incompatibilities.

General Equipment Decontamination Procedures:

1. Decontamination is required for all equipment exiting a contaminated area. Equipment may re-enter the Support Zone only after undergoing the equipment decontamination procedures.
2. Vehicles that travel regularly between the contaminated and clean areas of the Site are carefully decontaminated each time they exit the Exclusion Zone and the effectiveness of that decontamination is monitored to reduce the likelihood that contamination will be spread to other parts of the Site.
3. Particular attention is given to decontaminating tires, scoops, and other parts of heavy equipment that are directly exposed to contaminants and contaminated soil.

The following items may be used to decontaminate equipment:

- Fresh water rinse;
- Non-phosphorus detergent wash;
- Distilled water rinse;
- Acetone rinse;
- Distilled water rinse; and
- A steam cleaner or pressure washer (heavy equipment only)

7.9.3 Monitoring the Effectiveness of Decontamination Procedures

Visual examination and sampling are used to evaluate the effectiveness of decontamination procedures. Visual examination is used to ensure that procedures are implemented as described and that they appear to control the spread of contaminants under changing site conditions. Visual examination is also used to inspect for signs of residual contamination or for contaminant permeation of PPE.

Personnel who work in contaminated areas of the Site, either the Contamination Reduction Zone (CRZ) or the Exclusion Zone, are trained in the principles and practices of decontamination described in this section of the HASP and in related SOPs. If Site procedures are changed as a result of inspection and monitoring, all affected employees are notified of these changes.

7.10 Confined Space Entry

Confined entry will not be performed at the Site. The following is a list of the safety requirements for confined space entry at the Site.

- **ROUX PERSONNEL ARE NOT AUTHORIZED TO ENTER AN OSHA PERMIT REQUIRED CONFINED SPACE**;
- Currently the scope of work **DOES NOT** require personnel to enter permitted confined space for this project; and
- Any changes to the field activities that may necessitate confined space entry will be reported to the Project Principal and OHSM.

Confined space is defined as any space, depression, or enclosure that:

- Has limited opening for entry and egress;
- Is large enough for and employee to enter and perform assigned work; and
- Is not intended for continuous occupancy.

A permit required confined space is one that meets the definition of a confined space and has one or more of the following characteristics:

- May contain or produce life-threatening atmospheres due to oxygen deficiency the presence of toxic, flammable, or corrosive contaminants;
- Contains a material that has the potential for engulfment;
- Has an internal configuration that may cause an entrant to be trapped or asphyxiated by inwardly converging walls or by a floor that slopes downward and tapers to a smaller cross-section; and
- Contains any other serious safety or health hazards.

Although Roux personnel will not perform confined space entry, it is expected that subcontractors performing cleaning and mitigation and/or remedial measures activities may be required to enter structures that are considered to be a permit required confined space. Permitting of the confined space as well as hazard mitigation for entry will be completed by the subcontractor in accordance with 1910.146.

7.11 Client and Site-Specific

In addition to the OSHA-specific procedures discussed above, there may be client and Site-specific safety procedures that must be adhered to during the performance of remedial activities at the Site.

7.12 Unusual or Significant Risks

Field activities that appear to have unusual or significant risks that cannot be adequately managed with existing risk tools such as LPS, HASPs, traffic safety plans, work permits, design and O&M practices, equipment HAZOPS or other safety tools must be referred to the CHSM to help with the assessment and management of the associated potential safety risks. Examples include the use of explosives for demolition, use of firearms to control wildlife, rappelling, demolition over water, etc.

7.13 Activity-Specific

In addition to the general hazards discussed above, there are activity-specific hazards associated with each work activity planned for the Site. An activity-specific JSA has been completed for each of the activities planned for the Site. JSAs are provided in **Appendix A**. In the event that new work activities or tasks are planned, JSAs will be developed and implemented prior to performing the new activities. In the absence of a JSA, the personnel performing work must prepare a field JSA and receive clearance from a designated competent safety official prior to performing any task with significant risk. In emergency situations where time is critical SPSAs will be utilized to identify the task, associated hazards and mitigative actions to take. For lower risk activities (as deemed by the discretion of a Competent Person) where a JSA is determined to not be needed, the individual(s) conducting the activities must perform SPSAs prior to and during the work.

7.14 Community Air Monitoring Plan

A Community Air Monitoring Plan (CAMP) will be implemented during all intrusive activities. Details of the CAMP is provided in Appendix H.

7.15 COVID-19

There is potential for transmission and/or exposure to SARS-CoV-2, the virus that causes COVID-19. Prior to beginning work, on-Site protocols shall be established by the project team, including subcontractors, in accordance with federal, state, county, city, and/or other guidance, as applicable and consistent with **Appendix I**. Government guidance/orders generally consist of implementation of the following protocols/procedures (or some variation thereof):

- Self-monitoring for symptoms;
- Fitness check for work each day;
- Limiting businesses to “essential” operations;
- Social distancing (generally 6 feet);
- Cloth face masks/ coverings;
- Hand washing/ disinfectant use; and
- Care/ awareness of surroundings (public spaces, equipment, hotel rooms, rental cars).

Additional guidance on minimizing potential exposure to SARS-CoV-2, including a JSA, are included in **Appendix I**.

8. Field Team Review

Each person performing work at or visiting this Site shall sign this section after Site-specific training is completed and before being permitted to access the CRZ or Exclusion Zone.

I have read and understand this Site-Specific Health and Safety Plan. I will comply with the provision contained therein.

Site/Project: Sendero Verde Redevelopment Project – Parcel B

Name Printed	Signature	Date

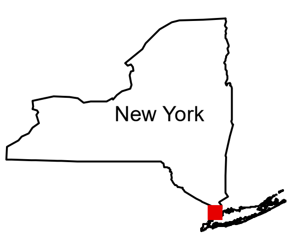
9. Approvals

By their signature, the undersigned certify that this HASP is approved and will be utilized at the Sendero Verde Redevelopment Project – Parcel B Site.

TBD – Site Health and Safety Officer	Date
Kristina DeLuca – Office Health and Safety Manager	Date
Wendy Shen – Project Manager	Date
Noelle Clarke – Project Principal	Date

FIGURES

QUADRANGLE LOCATION



N

1,000 0 1,000'

Title:

SITE LOCATION MAP

SENDERO VERDE REDEVELOPMENT PROJECT - PARCEL B

Prepared for:

SV-B OWNERS LLC

ROUX

Compiled by: W.S.	Date: 07/28/20	FIGURE
Prepared by: M.S.R.	Scale: AS SHOWN	1
Project Mgr: W.S.	Project: 2984.0003Y000	
File: 2984.0003Y138.1.mxd		

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N

LEGEND

SITE BOUNDARY

200 0 200'

Title:

SITE SETTING

SENDERO VERDE REDEVELOPMENT
PROJECT - PARCEL B

Prepared for:

SV-B OWNERS LLC

ROUX	Compiled by: W.S.	Date: 07/28/20	FIGURE
	Prepared by: M.S.R.	Scale: AS SHOWN	
	Project Mgr: W.S.	Project: 2984.0003Y000	2
	File: 2984.0003Y138.2.mxd		

V:\GIS\PROJECTS\2984\0003Y138\2984.0003Y138.2.MXD

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Title:

SITE PLAN

SENDERO VERDE REDEVELOPMENT
PROJECT - PARCEL B

Prepared for:

SV-B OWNERS LLC

ROUX

Compiled by: W.S.	Date: 07/28/20	FIGURE
Prepared by: M.S.R.	Scale: AS SHOWN	3
Project Mgr: W.S.	Project: 2984.0003Y000	
File: 2984.0003Y138.3.mxd		

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LEGEND

SITE BOUNDARY

EMERGENCY MEETING LOCATION

50 0 50'

Title:

EMERGENCY MEETING LOCATION

SENDERO VERDE REDEVELOPMENT
PROJECT - PARCEL B

Prepared for:

SV-B OWNERS LLC

ROUX

Compiled by: W.S.	Date: 07/28/20	FIGURE
Prepared by: M.S.R.	Scale: AS SHOWN	4
Project Mgr: W.S.	Project: 2984.0003Y000	
File: 2984.0003Y138.4.mxd		

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DIRECTIONS TO HOSPITAL

1. HEAD SOUTHEAST ON EAST 112TH STREET
2. TURN RIGHT ONTO PARK AVENUE
3. TURN RIGHT ONTO EAST 106TH STREET
4. TURN LEFT ONTO 5TH AVENUE
5. MOUNT SINAI HOSPITAL WILL BE ON THE LEFT

DIRECTIONS TO URGENT CARE

1. HEAD SOUTHEAST ON EAST 112TH STREET
2. TURN RIGHT ONTO LEXINGTON AVENUE
3. CITYMD WILL BE ON THE RIGHT

500 0 500'

Title:

EMERGENCY ROUTE MAP

SENDERO VERDE REDEVELOPMENT
PROJECT - PARCEL B

Prepared for:

SV-B OWNERS LLC

ROUX

Compiled by: W.S.	Date: 07/28/20	FIGURE
Prepared by: M.S.R.	Scale: AS SHOWN	5
Project Mgr: W.S.	Project: 2984.0003Y000	
File: 2984.0003Y138.5.mxd		

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APPENDICES

A. Job Safety Analysis (JSA) Forms

B. Site-Specific Emergency Response Plan and Routes to Urgent Care and Emergency Medical Facilities

C. SDSs for Chemicals Used

D. Incident Investigation and Reporting Program

E. Heavy Equipment Exclusion Zone Policy

F. Subsurface Utility Clearance Management Program

G. Personal Protective Equipment Management Program

H. Community Air Monitoring Plan

I. COVID-19 Interim Health and Safety Guidance

APPENDIX A

Job Safety Analysis (JSA) Forms

JOB SAFETY ANALYSIS Ctrl. No. GEN-006	DATE 1/4/2018	☐ NEW ☒ REVISED	PAGE 1 of 2

JSA TYPE CATEGORY:	WORK TYPE:	WORK ACTIVITY (Description):	
Generic	**Drilling**	**Direct Push Soil Borings / Well Installation**	
DEVELOPMENT TEAM	**POSITION / TITLE**	**REVIEWED BY:**	**POSITION / TITLE**
Timothy Zei	Project Hydrogeologist	Raymond Olson	Staff Assistant Geologist
		Christine Pietrzyk	Office Health & Safety Manager
		Brian Hobbs	Senior Health & Safety Manager
		Joe Gentile	Corporate Health & Safety Manager

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST ☒ HARD HAT ☐ LIFELINE / BODY HARNESS ☒ SAFETY GLASSES	☐ GOGGLES ☐ FACE SHIELD ☒ HEARING PROTECTION: (as needed) ☒ SAFETY SHOES: Composite-toe or steel toe boots	☐ AIR PURIFYING RESPIRATOR ☐ SUPPLIED RESPIRATOR ☒ PPE CLOTHING: Fluorescent reflective vest or high visibility clothing, Long Sleeve Shirt	☒ GLOVES: Leather, Nitrile and cut resistant ☒ OTHER: Insect Repellant, sunscreen (as needed)

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Geoprobe or Truck-Mounted Direct Push Drill Rig, Hand Tools, Photoionization Detector, Multi-Gas Meter (or equivalent), Macrocore liners, Liner Opening Tool, 20 lb. Type ABC Fire Extinguisher, 42" Cones & Flags, "Work Area" Signs, Water

COMMITMENT TO SAFETY- All personnel onsite will actively participate in hazard recognition and mitigation throughout the day by verbalizing SPSAs

EXCLUSION ZONE (EZ) – All non-essential personnel will maintain a distance of 10 feet from drilling equipment while equipment is moving/engaged

"SHOW ME YOUR HANDS"
Driller and helper should show that hands are clear from controls and moving parts

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Mobilization of drilling rig (ensure the Subsurface Clearance Protocol and Drill Rig Checklist are completed)	**1a. CONTACT:** Equipment/property damage.	1a. The drill rig's tower/derrick will be lowered and secured prior to mobilization. 1a. A spotter should be utilized while moving the drill rig. If personnel move into the path of the drill rig, the drill rig will be stopped until the path is again clear. Use a spotter for all required backing operations. 1a. Set-up the work area and position equipment in a manner that eliminates or reduces the need for backing of support trucks and trailers. 1a. When backing up truck rig with an attached trailer use a second spotter if there is tight clearance simultaneously on multiple sides of the equipment or if turning angles limit driver visibility. 1a. Inspect the driving path for uneven terrain. Level or avoid if needed. 1a. Drill rig should have a minimum **exclusion zone of 10 feet** for non-essential personnel (i.e., driller helper, geologist) when the rig is moving/ in operation.
	1b. FALL: Slip/trip/fall hazards.	1b. Inspect walking path for uneven terrain, weather-related hazards (i.e., ice, puddles, snow, etc.), and obstructions prior to mobilizing equipment. 1b. Do not climb over stored materials/equipment; walk around. Practice good housekeeping. 1b. Use established pathways and walk on stable, secure ground.
	1c. CONTACT: Crushing from roll-over.	1c Geoprobe should cross all hills/obstructions head on with the mast down to reduce risk of roll-over.
2. Raising tower/derrick of drill rig	**2a. CONTACT:** Overhead hazards.	2a. Prior to raising the tower/derrick, the area above the drilling rig will be inspected for wires, tree limbs, piping, or other structures, that could come in contact with the rig's tower and/or drilling rods or tools. 2a. Maintain a safe distance of 10' from overhead structures.
	2b. CONTACT: Pinch Points/Amputation Points when raising the rig and instability of rig	2b. Inspect the equipment prior to use and avoid pinch/amputation points. 2b. Lower outriggers to ensure stability prior to raising rig tower/derrick. 2b. If the rig needs to be mounted, be sure to use three points of contact.
3. Advancement of drilling equipment and well installation	**3a. CONTACT:** Flying debris	3a. Be aware of and avoid potential lines of fire and wear required PPE such as eye, ear, and hand protection.
	3b. EXPOSURE: Noise and dust.	3b. Wet borehole area with sprayer to minimize dust. 3b. Stand upwind and keep body away from rig. 3b. Dust mask should be worn if conditions warrant. 3b. Wear hearing protection when the drill rig is in operation.

[1] Each Job or Operation consists of a set of tasks / steps. Be sure to list all the steps needed to perform job.
[2] A hazard is a potential danger. Break hazards into five types: Contact - victim is struck by or strikes an object; Caught - victim is caught on, caught in or caught between objects; Fall - victim falls to ground or lower level (includes slips and trips); Exertion - excessive strain or stress / ergonomics / lifting techniques; Exposure - inhalation/skin hazards; Energy Source – electricity, pressure, compression/tension.
[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
3. Advancement of drilling equipment and well installation (Continued)	**3a. CONTACT:** Flying debris **3b. EXPOSURE:** Noise and dust. **3c. FALL:** Slip/trip/fall hazards. **3d. CAUGHT:** Limb/extremity pinching; abrasion/crushing. **3e. CONTACT:** Equipment imbalance during advancement of drill equipment. **3f. EXPOSURE:** Inhalation of contamination/vapors. **3g. EXERTION:** Potential for muscle strain/injury while lifting and installing well casings, lifting sand bags, and/or lifting rods.	3c. Contain drill cuttings and drilling water to prevent fall hazards from developing in work area. 3c. See 1b. 3d. Ensure all Emergency Safety Stop buttons function properly. 3d. Always wear leather gloves when making connections and using hand tools; wear cut-resistant (i.e., Kevlar) gloves when handling cutting tools. 3d. Inspect the equipment prior to use for potential pinch/amputation points. Keep hands away from pinch/amputation points and use of tools is preferable compared to fingers and hands. 3d. Inspect drill head for worn surface or missing teeth; replace if damaged or blunt. 3d. Ensure all jewelry is removed, loose clothing is secured, and PPE is secured close to the body. 3d. All non-essential personnel should stay away from the immediate work area; position body out of the line-of-fire of equipment. 3d. Drillers and helpers will understand and use the "Show Me Your Hands" Policy. 3d. Spinning rods/casing have an **exclusion zone of 10 feet** while in operation. 3e. Drillers will advance the borehole with caution to avoid causing the rig to become imbalanced and/or tip. 3e. The blocking and leveling devices used to secure the rig will be inspected by drillers and Roux personnel regularly to see if shifting has occurred. 3e. In addition, personnel and equipment that are non-essential to the advancement of the borehole will be positioned away from the rig at a distance that is at least as far as the boom is high (**minimum exclusion zone of 10 feet**). 3f. Monitor ambient air for dangerous conditions using a calibrated photoionization detector (PID) to periodically monitor the breathing zone of the work area. 3f. If a reading of >5ppm is recorded, the Roux field personnel must temporarily cease work, instruct all Site personnel to step away from the area of elevated readings and inform the Roux PM of the condition. The Roux PM will then recommend additional precautions in accordance with the site specific health and safety plan. 3f. Use a multi-gas meter to monitor ambient air for dangerous conditions (i.e. unsafe levels of carbon monoxide when drilling indoors or the presence of explosive vapors). 3g. Keep back straight and bend at the knees. 3g. Utilize team lifting for objects over 50lbs. 3g. Use mechanical lifting device for odd shaped objects.
4. Remove sample liner.	**4a. EXERTION:** Potential for muscle strain/injury while removing liner from probe rod. **4b. CONTACT:** Pinch points and cuts **4c. EXPOSURE:** Inhalation and/or dermal contact with contaminants.	4a Utilize team lifting for objects over 50lbs. 4a. Use hydraulic liner extruder if available. 4b. Place liner on sturdy surface when opening. 4b. Don cut-resistant gloves and use appropriate liner cutter when opening liners. 4b. Always cut away from the body. 4c. Wear chemical-resistant disposable gloves when handling liners. 4c. See 3e.
5. Decontaminate equipment.	**5a. EXPOSURE/CONTACT**: To contamination (e.g., Separate Phase Hydrocarbons (SPH), contaminated groundwater, vapors). **5b. EXPOSURE:** To chemicals in cleaning solution including ammonia.	5a. Wear chemical-resistant disposable gloves and safety glasses. 5a. Contain decontamination water so that it does not spill. 5a. Use an absorbent pad to clean spills, if necessary. 5a. Spray equipment from side angle, not straight on, to avoid backsplash. 5a. See 3b. 5b. See 4a. Review SDS to ensure appropriate precautions are taken and understood.

[1] Each Job or Operation consists of a set of tasks / steps. Be sure to list all the steps needed to perform job.
[2] A hazard is a potential danger. Break hazards into five types: Contact - victim is struck by or strikes an object; Caught - victim is caught on, caught in or caught between objects; Fall - victim falls to ground or lower level (includes slips and trips); Exertion - excessive strain or stress / ergonomics / lifting techniques; Exposure - inhalation/skin hazards; Energy Source – electricity, pressure, compression/tension.
[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

JOB SAFETY ANALYSIS	Ctrl. No. GEN-009	DATE: 1/4/2018	☐ NEW ☒ REVISED	PAGE 1 of 1

JSA TYPE CATEGORY	WORK TYPE	WORK ACTIVITY (Description)	
Generic	**O&M**	**Movement of 55-Gallon Drums/Drum Handling with Mobile Carrier**	
DEVELOPMENT TEAM	**POSITION / TITLE**	**REVIEWED BY:**	**POSITION / TITLE**
Michael Sarni	Technician	Brian Hobbs	Senior Health & Safety Manager
		Joe Gentile	Corporate Health & Safety Manager

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST ☒ HARD HAT ☐ LIFELINE / BODY HARNESS ☒ SAFETY GLASSES	☐ GOGGLES ☐ FACE SHIELD ☐ HEARING PROTECTION ☒ SAFETY SHOES: Steel or composite toe	☐ AIR PURIFYING RESPIRATOR ☐ SUPPLIED RESPIRATOR ☒ PPE CLOTHING: Fluorescent long sleeve shirt or long sleeve shirt and reflective safety vest.	☒ GLOVES: Cut-resistant gloves ☐ OTHER:

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Mobile Drum Carrier, safety cones, and caution tape

COMMITMENT TO SAFETY- All personnel onsite will actively participate in hazard recognition and mitigation throughout the day by verbalizing SPSAs

EXCLUSION ZONE (EZ): A 10-foot exclusion zone will be maintained around heavy equipment (i.e. forklift).

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Preparing for and Inspection of Drum	**1a. FALL:** Tripping/falling due to uneven surface. Loose debris/garbage in work area.	1a. Clear area of loose garbage and debris. Inspect 55-gal drums for proper condition, labeling, check drum ring and bolts for tightness, inspect mobile drum carrier. 1a. Do a Test Lift to get a general sense of the weight of the drum. 1a. Inspect and use established pathways to avoid uneven terrain, weather-related hazards (i.e., debris, puddles, ice, etc.), and other obstructions. 1a. Secure work area and coordinate and communicate the planned work activities with other personnel working in the area. 1a. Delineate work area with 42" safety cones.
	1b. CONTACT/EXPOSURE: Drums could potentially be damaged or contain hazardous material. Mobile drum carrier could potentially be in poor working condition causing malfunctioning during operation.	1b. Prior to inspecting drums don cut-resistant gloves. If drum is not properly labeled, do not open and cease all drum transport activities. Immediately contact project manager and inform him/her of drum situation. 1b. Do not continue drum transport activities until further actions are determined by the project manager. 1b. If the drum is properly labeled, but leaking, improperly sealed or in poor condition, place drum in an over-pack drum. 1b. Inspect mobile drum carrier to ensure its overall integrity. Look for rust marks or potential weak points where the drum carrier could malfunction. Inspect the wheels to ensure that they easily turn and nothing is impeding their movement.
	1c. EXERTION/CAUGHT: Potential pinching/exertion hazards while securing ring/ tightening bolts	1c. Keep back straight and knees slightly bent while securing drum ring/tightening bolt. Wear cut-resistant gloves.
2. Position drum clamp tightly in between drum ribs, securing drum clamp to drum with chain	**2a. CAUGHT:** Pinching fingers between drum clamp and handle/chain.	2a. Attach drum clamp with chain and tighten until snug. Do not place hands between drum clamp and drum as the chain is tightened; wear cut resistant gloves. Keep face away from drum when handling in case of escaping vapors.

[1] Each Job or Operation consists of a set of tasks / steps. Be sure to list all the steps needed to perform job.
[2] A hazard is a potential danger. Break hazards into six types: Contact - victim is struck by or strikes an object; Caught - victim is caught on, caught in or caught between objects; Fall - victim falls to ground or lower level (includes slips and trips); Exertion - excessive strain or stress / ergonomics / lifting techniques; Exposure - inhalation/skin hazards; Energy source – electricity, pressure, compression/tension.
[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift." Avoid general statements such as, "be careful."

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
3. Disengage safety latches on handle, pull handle down until drum is lifted off ground and safety latches are reengaged; slightly suspending drum off the ground	**3a. EXERTION/ CONTACT:** Potential muscle strain associated with lifting/engaging drum/handle. Drum could shift/slip downward and crush toes. **3b. CAUGHT:** Fingers could be pinched while engaging/disengaging safety latches on handle	3a. Ascertain whether the drum is overweight; if it is, then two people are needed to lower handle while drum is secured with clamp so that safety latches can be engaged. Keep body out of the line of fire of the handle (do not position head above handle) as it is being pushed down. Do not allow feet/toes to be positioned under the drum as it is being lifted; wear steel/composite toe boots. 3b. Wear cut-resistant gloves while disengaging/reengaging safety latches. 3b. Avoid placing hands in pinch points.
4. Transport drums to designated location and disengage drum clamp (repeat Step 3 in reverse order)	**4a. FALL:** Tripping/ falling due to obstructions and uneven terrain. Potential for drum to fall during transport.	4a. Ensure transport path is free of potential obstructions that may cause the drum/carrier to become unstable. Position drum clamp between the ribs on the drum to prevent possible slipping.

[1] Each Job or Operation consists of a set of tasks / steps. Be sure to list all the steps needed to perform job.
[2] A hazard is a potential danger. Break hazards into six types: Contact - victim is struck by or strikes an object; Caught - victim is caught on, caught in or caught between objects; Fall - victim falls to ground or lower level (includes slips and trips); Exertion - excessive strain or stress / ergonomics / lifting techniques; Exposure - inhalation/skin hazards; Energy source – electricity, pressure, compression/tension.
[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift." Avoid general statements such as, "be careful."

JOB SAFETY ANALYSIS Cntrl. No. GEN-009	DATE: 2/11/2015	☐ NEW ☒ REVISED	PAGE 1 of 2
JSA TYPE CATEGORY **GENERIC**	WORK TYPE **Hand Tools**	WORK ACTIVITY (Description) **Pre-Clearing activities, including Air Knifing and Soil Vacuuming**	

DEVELOPMENT TEAM	POSITION / TITLE	REVIEWED BY:	POSITION / TITLE
Alyssa Lau	Staff Engineer	Daniel Abberton	SHSM
		Mike Ritorto	Senior Hydrogeologist
		Laura Jensen	Staff Hydrogeologist

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST ☒ HARD HAT ☐ LIFELINE / BODY HARNESS ☒ SAFETY GLASSES	☐ GOGGLES ☒ FACE SHIELD (while air knifing) ☒ HEARING PROTECTION (as needed) ☒ SAFETY SHOES: Steel or composite toed	☐ AIR PURIFYING RESPIRATOR ☐ SUPPLIED RESPIRATOR ☒ PPE CLOTHING: Fluorescent reflective vest or high visibility clothing	☒ GLOVES: Nitrile and cut resistant ☒ OTHER: Dust mask (as needed)

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Required Equipment: Air Knife, Vactor Truck (Vac Truck), Compressor, Hand Tools, Circular Saw, Dust Mask, Photoionization Detector, Multi-Gas Meter, Traffic Cones, Rigid Barrier, Caution Tape, 20 lb. Fire Extinguisher, "Work Area" and/or "Exclusion Zone" Signs

Commitment to LPS – All personnel onsite will actively participate in SPSA performance by verbalizing SPSAs throughout the day.

EXCLUSION ZONE: A 10 foot exclusion zone will be maintained around air knife and/or soil vacuum operations.

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Verify pre-clearance protocol.	1a. **CONTACT**: Underground utility damage; property damage; personal injury. See Site Walk Inspection JSA for potential hazards.	1a. Confirm that local utility companies were contacted prior to drilling. 1a. Walk the Site to evaluate utility markings and review maps (**See Site Walk Inspection JSA for critical actions**). 1a. Review pre-clearing checklist form and sub-surface clearance form. Pre-clearing protocol indicates that clearance must be conducted to a minimum of 5 vertical feet below ground surface or 8 vertical feet below ground surface in the critical zone using hand tools.
2. Mobilize/demobilize and establish work area.	2a. **See Mobilization / Demobilization JSA for potential hazards.**	2a. **See Mobilization / Demobilization JSA for critical actions.**
3. Pre-clear with air knife, water lance, and soil vacuum, and/or clearance with hand tools	3a. **CONTACT**: Flying debris striking face or body	3a. **Maintain 10 foot exclusion zone.** Only (air knife/vac truck) operator and designated helper shall remain within exclusion zone while air knife/vac truck is active. Use the required PPE, including (at a minimum), cut resistant gloves, safety glasses with side shields, and long sleeved shirt. 3a. Wear a face shield to protect face from flying debris when using air knife. 3a. Aim air knife tip away from self and others, so to avoid line-of-fire hazards. 3a. Use anti-whip devices on compressor hoses.
	3b. **EXPOSURE/ENERGY SOURCE**: Inhalation/exposure to hazardous vapors; inhalation/exposure to dust; electrocution.	3b. Monitor breathing zone with a calibrated PID and multi-gas meter. If vapors sustain levels > 5 ppm, the Roux field personnel must temporarily cease work, instruct all Site personnel to step away from the area of elevated readings and inform the Roux Project Manager of the condition. The Roux Project Manager will then recommend additional precautions. 3b. Wear dust masks as needed 3b. Ensure no open flames/heat sources are present within the work area. 3b. No open flames/heat sources. 3b. Ensure vac truck is properly grounded prior to use. 3b. Do not use metal dig bar; use fiberglass or equivalent.
	3c. **CONTACT:** Damage to unknown/known utility with air knife.	3c. Avoid contacting utilities directly with the high pressure air stream and using the air knife tip as a physical digging tool. 3c. Keep the air knife tip constantly moving to reduce direct pressure on a potential utility. 3c. increase the distance between air knife tip and soil/utility. 3c. Continually remove soil slurry from hole with vacuum, which may have an abrasive effect on utility casings.
	3d. **ERGONOMICS** Poor body positioning when handling equipment and materials.	3d. Use proper body positioning and lifting techniques that minimizes muscle strain; keep back straight, lift with legs, keep load close to body, and never reach with a load.

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[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift." Avoid general statements such as, "be careful."

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
3. Pre-clearing with air knife and soil vacuum, and/or clearance with hand tools (continued)	3d. **ERGONOMICS**: (continued) Poor body positioning when handling equipment and materials.	3d. Ensure that loads are balanced to reduce the potential for muscle strain. 3d. Two people or a mechanical lifting aid are required when lifting objects over 50 lb. or when the shape makes the object difficult to lift.
	3e. **FALL**: Tripping/falling due to uneven terrain, weather conditions, and materials/equipment stored at the Site.	3e. Inspect walking path for uneven terrain, weather-related hazards (e.g., ice, puddles, snow, etc.), and obstructions prior to mobilizing equipment. 3e. Walk around any stored materials/equipment; do not climb over. Practice good housekeeping. 3e. Use established pathways and walk on stable, secure ground. 3e. Equipment and tools will be stored at the lowest point of potential energy and out of the walkway and immediate work area (i.e., tools should not be propped against walls or nearby equipment or vehicles). 3e. Equipment and tools that are not anticipated to be used will be returned to a storage area that is out of the immediate work area. 3e. Ensure power cords/hoses are grouped when used within the work area. Mark out cords/hoses that cross pathways with traffic cones. 3e. Ensure all Site personnel and equipment stay a minimum of 2 feet from an open hole. Mark out open holes with traffic cones/caution tape, etc. 3e. Pre-cleared location will be finished flush to grade as to prevent a slip/trip hazard.
	3f. **CAUGHT**: Pinch points or amputation points associated with the equipment and vacuum hose.	3f. Always wear cut-resistant gloves when making connections and using hand tools. 3f. Inspect the equipment prior to use for potential pinch points. 3f. Test all emergency shutdown devices prior to using equipment. 3f. Ensure all jewelry is removed, loose clothing is secured, and PPE is secured close to the body. 3f. **All non-essential personnel shall maintain a 10 foot exclusion zone**; position body out of the line-of-fire. 3f. **Drillers and helpers will understand and use the "Show Me Your Hands Policy".**
	3g. **EXPOSURE**: Noise from vac truck and/or air compressor.	3g. Wear hearing protection when vac truck and air compressor are in operation. Otherwise, if sound levels exceed 85 dB, don hearing protection.
4. Move drum to staging area using drum cart.	4a. **EXPOSURE/CONTACT**: Contamination (e.g., Separate Phase Hydrocarbons (SPH), contaminated groundwater, soil).	4a. Wear chemically resistant gloves (i.e., Nitrile; worn in addition to cut resistant gloves). 4a. Do not overfill drums. Ensure that the drum lids are attached securely. 4a. Stage all drums in the designated storage area (per Roux Project Manager) and ensure they are labeled.
	4b. **ERGONOMICS**: Muscle strain while maneuvering drums with drum cart/lift gate.	4b. See 3d. Do not overfill drums. Use lift gate on back of truck to load and unload drums or drum cart to transport drums.
	4c. **CAUGHT**: Pinch points or amputation points associated with handling drum lid.	4c. Ensure that fingers are not placed under the lid of the drum. Wear cut-resistant gloves. Use 15/16" ratchet while sealing drum lid.
5. Decontaminate equipment and tools.	5a. **EXPOSURE/CONTACT**: To contamination (e.g., Separate Phase Hydrocarbons (SPH), contaminated groundwater, vapors).	5a. See 4a. 5a. Contain decontamination water (closed lid) so that it does not spill. 5a. Use an absorbent pad to clean spills, if necessary. 5a. Store all impacted materials/PPE in a designated storage container (per Roux Project Manager) and ensure the container is labeled.
	5b. **EXPOSURE**: To chemicals in cleaning solution.	5b. See 4a.

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JOB SAFETY ANALYSIS Ctrl. No. GEN-013	DATE 1/4/2018	☐ NEW ☒ REVISED	PAGE 1 of 2

JSA TYPE CATEGORY **Generic**	WORK TYPE: **Gauging and Sampling**	WORK ACTIVITY (Description): **Gauging and Sampling**	
DEVELOPMENT TEAM	**POSITION / TITLE**	**REVIEWED BY:**	**POSITION / TITLE**
Brandon Tufano	Staff Geologist	Brian Hobbs	Senior Health & Safety Manager
		Joe Gentile	Corporate Health & Safety Manager

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☒ LIFE VEST ☒ HARD HAT ☐ LIFELINE / BODY HARNESS ☒ SAFETY GLASSES	☐ GOGGLES ☐ FACE SHIELD ☐ HEARING PROTECTION ☒ SAFETY SHOES: Composite-toe or steel toe boots	☐ AIR PURIFYING RESPIRATOR ☐ SUPPLIED RESPIRATOR ☒ PPE CLOTHING: Fluorescent reflective vest or high visibility clothing	☒ GLOVES: Leather, Nitrile and cut resistant ☒ OTHER: Knee pads, Insect Repellant, sunscreen (as needed)

REQUIRED AND / OR RECOMMENDED EQUIPMENT

42-inch Safety Cones, Caution Tape, Interface Probe and/or Water Level Meter, 20-lb., Type ABC Fire Extinguisher, Buckets. Tools as needed: Socket Wrench, Screw Driver, Crow Bar, Mallet, and Wire Brush.

COMMITMENT TO SAFETY- All personnel onsite will actively participate in hazard recognition and mitigation throughout the day by verbalizing SPSAs

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Mobilization to monitoring well(s).	**1a. FALL:** Personal injury from slip/trip/fall due to uneven terrain and/or obstructions.	1a. Inspect pathway and plan for most suitable designated pathway prior to mobilization. 1a. Use established pathways, walk and/or drive on stable, secure ground and avoid steep hills or uneven terrain. 1a. If working near open water with an unguarded edge, wear life vest.
	1b. CONTACT: With traffic/third parties.	1b. Identify potential traffic sources and delineate work area with 42-inch traffic safety cones. Position vehicle to protect against oncoming traffic. Use caution tape to provide a more visible delineation of the work area if necessary. 1b. Wear appropriate PPE including high visibility clothing or reflective vest. 1b. Face traffic, maintain eye contact with oncoming vehicles, and establish a safe exit route.
	1c. EXERTION: Muscle strain from lifting equipment	1c. Use proper lifting techniques when handling/moving equipment; bend knees and keep back straight. 4c. Use mechanical assistance or team lifting techniques when equipment is 50 lbs. or heavier. 4c. Make multiple trips to carry equipment.
	1d. EXPOSURE: To biological hazards.	1d. Inspect work area for bees and insects. 1d. Use insect/tick repellent as necessary.
2. Open/close well.	**2a. EXERTION:** Muscle strain.	2a. Use proper lifting techniques; keep back straight, lift with legs and bend knees when reaching to open/close well.
	2b. CAUGHT: Pinch/crush points associated with removing/replacing manholes and working with hand tools.	2b. Wear leather gloves or cut resistant gloves when working with well cover and hand tools. 2b. Use proper tools (ratchet and pry bar for well cover) and inspect before use. 2b. Do not put fingers under well cover.
	2c. CAUGHT: Pinch points associated with placing J-plug back onto PVC pipe.	2c. See 2b. 2c. Keep fingers out of line-of-fire when securing cap.
	2d. EXPOSURE: To potential hazardous vapors.	2d. No open flames/heat sources. 2d. To minimize exposure to vapors, allow well to vent after opening it and before sampling activities begin. 2d. Stand up-wind, if possible, to avoid inhaling vapors.
3. Gauge well.	**3a. CONTACT:** With contamination (e.g. contaminated groundwater).	3a. Wear chemical-resistant disposable gloves (over cut-resistant gloves) and safety glasses when gauging well. 3a. Insert and remove probe slowly to avoid splashing. 3a. Use an absorbent pad to clean probe.
	3b. CONTACT: With traffic.	3b. See 1b.

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Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
4. Purge and sample well	**4a. EXPOSURE/CONTACT:** To contamination (e.g., SPH, contaminated groundwater, vapors) and/or sample preservatives. **4b. CONTACT:** Personal injury from cuts, abrasions, or punctures by glassware or sharp objects. **4c. EXERTION:** Muscle strain while carrying equipment. **4d. CONTACT:** With traffic. **4e. CONTACT:** Pinch points with groundwater pump components (i.e., wheel, line, clamps). **4f. EXERTION:** Muscle strain from repetitive motion of bailing and sampling a well.	4a. Open and fill sample jars slowly to avoid splashing and contact with preservatives. 4a. Wear cut-resistant gloves and chemical-resistant disposable gloves when sampling. 4a. Fill sample containers over purge container to avoid spilling water onto the ground. 4a. Use an absorbent pad to clean spills. 4a. When using a bailer to purge a well, pull the bailer slowly from the well to avoid splash hazards. 4a. When sampling or purging the water using a bailer, pour out water slowly to reduce the potential for splash hazards with groundwater. 4a. When using a tubing valve always remove the valve slowly after sample collection to release any pressure and avoid pressurized splash hazards. 4a. When collecting a groundwater sample always point sampling apparatus (tubing, bailer, etc.) away from face and body. 4b. To avoid spills or breakage, place sample ware on even surface. 4b. Do not over tighten caps on glass sample ware. 4b. Wear chemical-resistant nitrile disposable gloves over cut-resistant (i.e., Kevlar) gloves when sampling and handling glassware (i.e., VOA vials) or when using cutting tools. 4c. Use proper lifting techniques when handling/moving equipment, bend knees and keep back straight. 4c. Use mechanical assistance or team lifting techniques when equipment is 50 lbs. or heavier. 4c. Make multiple trips to carry equipment. 4d. See 1b. 4e. Wear leather gloves when working with groundwater pumps. 4e. Never place hands on or near pinch points such as the wheel, clamps or other moving parts during pump operations. 4e. Use the correct mechanisms, such as a pump reel, to lower pump into well. 4e. Never attempt to manually stop any moving part of equipment including hose reels and/or tubing. 4f. See 4c. 4f. Include a stretch break when repetitive motions are part of the task.
5. Management of purge water.	**5a. EXPOSURE/CONTACT:** To contamination (e.g., SPH, contaminated groundwater, vapors). **5b. EXERTION:** Muscle strain from lifting/carrying and moving containers.	5a. Do not overfill container and pour liquids slowly so that they do not splash. 5a. Properly dispose of used materials/PPE in appropriate container in designated storage area. 5b. Use proper lifting techniques when lifting / carrying or moving container(s) (see 4c.). 5b. Do not overfill container(s).
6. Decontaminate equipment.	**6a. EXPOSURE/CONTACT:** To contamination (e.g., SPH, contaminated groundwater, vapors). **6b. CAUGHT:** Pinch points associated with handling hand tools	6a. Work on the upwind side, where possible, of decon area. 6a. Wear chemical-resistant disposable gloves and safety glasses. 6a. Use an absorbent pad to clean spills. 6b. See 2b. 6b. Inspect hand tools for sharp edges before decontaminating.

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JOB SAFETY ANALYSIS	Ctrl. No. GEN-014	DATE: 1/4/2018	☐ NEW ☒ REVISED	PAGE 1 of 2

JSA TYPE CATEGORY:	WORK TYPE:	WORK ACTIVITY (Description):
Generic	**Drilling**	**Hollow Stem Auger Soil Borings / Well Installation**

DEVELOPMENT TEAM	POSITION / TITLE	REVIEWED BY:	POSITION / TITLE
Douglas Ferraiolo	Staff Geologist	Brian Hobbs	Senior Health & Safety Manager
		Joe Gentile	Corporate Health & Safety Manager

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST ☒ HARD HAT ☐ LIFELINE / BODY HARNESS ☒ SAFETY GLASSES	☒ GOGGLES: Spoggles required if winds exceed 15 mph. ☐ FACE SHIELD ☒ HEARING PROTECTION: (as needed). ☒ SAFETY SHOES: Steel or Composite Toe.	☐ AIR PURIFYING RESPIRATOR ☐ SUPPLIED RESPIRATOR ☒ PPE CLOTHING: Fluorescent long-sleeve shirt or long-sleeve shirt and reflective safety vest.	☒ GLOVES: Leather, Cut-Resistant, and Nitrile. ☒ OTHER: Insect Repellant, Sunscreen (as needed).

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Truck-Mounted Drilling Rig or Track Rig, Saw, Hand Tools, Photoionization Detector, Multi-Gas Meter (or equivalent), Interface Probe, 20 lb. Type ABC Fire Extinguisher, 42" Cones & Flags, "Work Area" Signs.

COMMITMENT TO SAFETY- All personnel onsite will actively participate in hazard recognition and mitigation throughout the day by verbalizing SPSAs

EXCLUSION ZONE (EZ) – All non-essential personnel shall maintain a **10 foot** exclusion zone while drill rig is engaged.

"SHOW ME YOUR HANDS"
Driller and helper should show that hands are clear from controls and moving parts

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Mobilization / demobilization and establish a work area.	**1a. See Mobilization/ Demobilization JSA GEN-015.**	1a. See Mobilization / Demobilization JSA GEN-015.
2. Raising tower / derrick of drilling rig.	**2a. CONTACT:** Overhead hazards. **2b. CONTACT:** Amputation / crush points when raising the rig and instability of rig.	2a. Prior to raising the tower / derrick, the area above the drilling rig will be inspected for overhead hazards (wires, tree limbs, piping or other structures) that may be contacted by the rig's tower or drilling rods. 2a. The tower / derrick must not be raised beneath overhead power lines unless approved by the Roux PM. 2a. Maintain a minimum of 10' from all overhead structures. 2a. Do not move the rig while the tower / derrick is raised. 2b. Inspect the equipment prior to use and avoid any potential amputation points. 2b. Lower outriggers to ensure stability prior to raising rig tower derrick. Keep feet and body out of the line of fire when lowering out-riggers. 2b. Inspect the set-up location for uneven terrain. Level or avoid area if needed. 2b. If the rig needs to be mounted, be sure to use three points of contact.
3. Advancement of augers for soil boring installation.	**3a. CONTACT:** Equipment imbalance during advancement of drill equipment. **3b. CONTACT:** Flying / spraying debris. **3c. CAUGHT:** Limb/extremity amputation, abrasion, and crushing.	3a. Drillers will advance the borehole with caution to avoid causing the rig to become imbalanced and / or tip. 3a. The blocking and leveling devices used to secure the rig will be inspected by drillers and Roux personnel regularly to see if shifting has occurred. 3a. Drillers will maintain the "Purple Zone" policy surrounding augers to ensure no personnel come into contact with augers while in use. Workers will spray paint a 3' semi-circle surrounding the augers to visually show that no personnel should enter the "Purple Zone" while drilling activities are being conducted. 3a. In addition, personnel and equipment that are non-essential to the advancement of the borehole will be positioned away from the rig at a distance that is at least as far as the boom is high (minimum exclusion zone of 20 feet). 3b. Wear all required PPE (especially hand, eye, and ear protection). 3b. Maintain minimum 20' EZ distance when rig is in operation to avoid potential line of fire hazards from flying materials or debris. 3c. Inspect the equipment prior to use for potential pinch points. 3c. Test all emergency shutdown devices prior to drilling. 3c. Inspect drill head for worn surface or missing teeth; replace if damaged or blunt. 3c. Inspect augers, do not use if auger flight is damaged or bent.
Assess	Analyze	Act

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[1]JOB STEPS	[2]POTENTIAL HAZARDS	[3]CRITICAL ACTIONS
3. Advancement of augers for soil boring installation (Continued).		3c. Ensure all jewelry is removed, loose clothing is secured, and PPE is secured close to the body. 3c. All non-essential personnel should stay away from the immediate work area; position body out of the line-of-fire of equipment particularly when installing auger flights and steel override casings. 3c. Drillers and helpers will understand and use the "Show Me Your Hands" Policy. 3c. Spinning augers should have an exclusion zone of 20 feet when in operation.
	3d. FALL: Slip/trip/fall hazards.	3d. Inspect walking path for uneven terrain, weather-related hazards (i.e., ice, puddles, snow, etc.), and obstructions prior to mobilizing equipment. 3d. Do not climb over stored materials/equipment; walk around. Practice good housekeeping. 3d. Use established pathways and walk on stable, secure ground. 3d. Use three points of contact when mounting or dismounting the rig. 3d. Remove soil cuttings to avoid a tripping hazard from developing near augers.
	3e. EXPOSURE: Inhalation of contamination / vapors.	3e. Air monitoring using a calibrated photoionization detector (PID) to periodically monitor the breathing zone of the work area. 3e. The Action Level for breathing zone air is five parts per million (sustained) as detected by the PID. 3e. If a reading of >5ppm is recorded, the Roux field personnel must temporarily cease work, instruct all Site personnel to step away from the area of elevated readings and inform the Roux PM of the condition. The Roux PM will then recommend additional appropriate precautions in accordance with the site specific health and safety plan.
	3f. EXPOSURE: Noise and dust.	3f. Wet borehole area with sprayer to minimize dust. Stand upwind and keep body positioned away from rig. 3f. Wear hearing protection while drill rig is operating and / or the noise levels exceed 85 dBA.
	3g. EXERTION: Installing well casings and lifting augers.	3g. Keep back straight and bend at the knees. 3g. Utilize team lifting for objects over 50lbs. 3g. Use mechanical lifting device for odd shaped objects.
4. Installation of well materials.	**4a. CONTACT:** Installing well materials while also pulling up augers.	4a. Potential contact with augers during installation of well materials. 4a. Keep distance from augers and do not place any materials while augers are in motion.
	4b. CAUGHT: Possible pinch or crush hazard assembling PVC and sending down the borehole.	4b. Keep all body parts out of potential pinch points while placing PVC together and sending down borehole.
	4c. FALL: Slip/trip/fall hazards with hand tools and materials.	4c. See 3d.
	4d. EXPOSURE: Potential contamination, harmful vapors, dust, and / or noise.	4d. See 3e and 3f. 4d. Stand upwind to avoid exposure to dust generated from packing materials.
	4e. EXERTION: Lifting heavy bags of materials to backfill borehole.	4e. Ergonomic hazard lifting bags of sand and bentonite while packing the well.
5. Cleaning the auger flights	**5a. CONTACT:** Cuts/scrapes or puncture wound from contacting auger.	5a. Follow "Show Me Your Hands" Procedure and make sure auger is out of gear before contacting auger with tool or hand. 5a. Pull cleaning tool across your body with handle away from body; do not push toward the auger. 5a. Do not clean more than ¾ turn around the auger at a time. 5a. Wear cut resistant and leather gloves. 5a. Always use two hands to operate cleaning tool. 5a. Inspect tool before use and remove from service if handle or metal are cracked/fatigued. 5a. Stand out of the line of fire.
6. Decontaminate equipment.	**6a. EXPOSURE / CONTACT:** To contamination (e.g., contaminated groundwater, vapors).	6a. Wear chemical-resistant disposable gloves and safety glasses. 6a. Contain decontamination water so that it does not spill. 6a. Use an absorbent pad to clean spills, if necessary.
	6b. EXPOSURE: To chemicals in cleaning solution (including ammonia).	6b. See 3e. Wear all appropriate PPE and stand upwind of any exposed cleaning solutions.

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JOB SAFETY ANALYSIS	Ctrl. No. GEN-015	DATE: 1/4/2018	☐NEW ☒REVISED	

JSA TYPE CATEGORY	WORK TYPE	WORK ACTIVITY (Description)	
GENERIC	**Site Recon**	**Mobilization/Demobilization**	
DEVELOPMENT TEAM	**POSITION / TITLE**	**REVIEWED BY:**	**POSITION / TITLE**
Rebecca Lowy	Staff Assistant Geologist	Brian Hobbs	Senior Health & Safety Manager
Tally Sodre	OHSM	Joe Gentile	Corporate Health & Safety Manager

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST ☒ HARD HAT ☐ LIFELINE / BODY HARNESS ☒ SAFETY GLASSES	☐ GOGGLES ☐ FACE SHIELD ☒ HEARING PROTECTION (as needed) ☒ SAFETY SHOES: Steel Toe or composite toe	☐ AIR PURIFYING RESPIRATOR ☐ SUPPLIED RESPIRATOR ☒ PPE CLOTHING: Fluorescent reflective vest of high-visibility clothing; long sleeve shirt; long pants	☒ GLOVES: Leather, nitrile, and cut resistant (as needed) ☐ OTHER

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Required Equipment: None

COMMITMENT TO SAFETY- All personnel onsite will actively participate in hazard recognition and mitigation throughout the day by verbalizing SPSAs

EXCLUSION ZONE (EZ): A 10-foot exclusion zone will be maintained around equipment in use..

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Mobilize/demobilize and establish work area	**1a. FALL:** Slip/trips/falls from obstructions, uneven terrain, weather conditions, heavy loads, and/or poor housekeeping.	1a. Use 3 points-of-contact/ensure secure footing when entering and exiting vehicle. 1a. Inspect walking path for uneven terrain, steep hills, obstructions, and/or weather-related hazards (i.e., ice, snow, and puddles) prior to mobilizing equipment. Use established pathways. Walk on stable/secure ground. 1a. Do not climb over stored materials/equipment; walk around. Practice good housekeeping; organize and store equipment neatly in one area at its lowest potential energy. 1a. Wear boots with adequate treads. 1a. Delineate unsafe areas with 42" cones, caution tape and/or flagging.
	1b. CONTACT: Personal injury and/or property damage caused by being struck by Site traffic or equipment used in Site activities.	1b. Observe and maintain the posted speed limits. 1b. When first arriving onsite, park vehicles in designated parking space and/or out of the way locations. Use parking brake on all vehicles and tire chocks on work trucks and trailers. 1b. Check in with Site Manager/Supervisor to ensure coordination with other Site activities and to discuss any special hazards. Ensure that short-service employees (SSE) are identified. 1b. Identify potential traffic sources. 1b. Wear PPE including high visibility clothing or reflective vest. 1b. Use a spotter while moving work vehicles; plan ahead to avoid backing whenever possible. 1b. Maintain a minimum 10' exclusion zone when vehicles are in motion. When backing up truck rig with an attached trailer use a second spotter if there is tight clearance simultaneously on multiple sides of the equipment or if turning angles limit driver-to-spotter visibility. 1b. Delineate work area with 42" cones, flags, caution tape, and/or other barriers. 1b. Position "Work Area" signs at Site entrances, if possible, or at either side of work area.

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[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift." Avoid general statements such as, "be careful."

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
		1b. Position largest vehicle to protect against oncoming traffic. 1b. Face traffic, maintain eye contact with oncoming vehicles, use a spotter, and establish a safe exit route. 1b. Observe potential overhead and ground surface features that may interfere with moving equipment. Clear the path of physical hazards prior to initiating mobilization.
	1c. CAUGHT: Personal injury from pinch points and being in line-of-fire of vehicle and/or equipment.	1c. Make sure driver has engaged parking brake and placed wheel chocks in a position to prevent movement. Be sure that vehicle is parked in front/down gradient (positioned to best block oncoming traffic) of work area. 1c. Wear leather gloves when handling any tools or equipment. Wear cut-resistant gloves (Kevlar or similar) when handling sharp objects/cutting tools/glass. 1c. Keep body parts away from line-of-fire of equipment. 1c. Always carry tools by the handles and/or designated carrier. Ensure sharp-edged tools are sheathed/secure. 1c. Remove any loose jewelry. Avoid wearing loose clothing and/or ensure loose clothing is secure. 1c. Secure all items on the equipment, tighten up any items or features that have potential to shift or break during mobilization.
	1d. OVEREXERTION: Muscle strains while lifting/carrying equipment.	1d. Use body positioning and lifting techniques that avoid muscle strain; keep back straight, lift with legs, turn with whole body, keep load close to body, and never reach with a load. 1d. Ensure that loads are balanced. Use assistance (mechanical or additional person) to carry equipment that is either unwieldy or over 50 lbs.
	1e. EXPOSURE: Personal injury from exposure to biological and environmental hazards.	1e. Inspect area to avoid contact with biological hazards (i.e. poisonous plants, stinging insects, ticks, etc.). 1e. Wear long sleeved clothes treated with Permethrin, apply insect repellant containing DEET to exposed skin, and inspect clothes and skin for ticks during and after work. 1e. Apply sunscreen (SPF 15+) if exposure to sun for 30 minutes or more is expected.
	1f. EXPOSURE: Weather related injuries.	1f. Watch for heat stress symptoms (muscle cramping, exhaustion, dizziness, nausea, rapid and shallow breathing). Take breaks in cool places and hydrate as needed. 1f. Watch for cold stress symptoms (severe shivering, slowing of body movement, weakness, stumbling or inability to walk, collapse). Take breaks in warm areas as needed. 1f. Wear clothing appropriate for weather and temperature conditions (e.g., rain jackets, snow pants, multiple layers). 1f. If lightning is observed, wait 30 minutes in a sheltered location (car is acceptable) before resuming work.
	1g. EXPOSURE: Personal injury from noise hazards.	1g. Wear hearing protection if sound levels exceed 85 dBA (if you must raise your voice for normal conversation).

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JOB SAFETY ANALYSIS	Ctrl. No. GEN-017	DATE 1/4/2018	☐NEW ☒REVISED	

JSA TYPE CATEGORY:	WORK TYPE:	WORK ACTIVITY (Description):
GENERIC	**Drilling**	**Monitoring and Recovery Well Development**

DEVELOPMENT TEAM	POSITION / TITLE	REVIEWED BY:	POSITION / TITLE
Amy Hoffman	Staff Geologist	Brian Hobbs	Senior Health & Safety Manager
Ron Lombino	Staff Geologist	Joe Gentile	Corporate Health & Safety Manager
Courtney Lind	Staff Engineer		

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST ☒ HARD HAT ☐ LIFELINE / BODY HARNESS ☒ SAFETY GLASSES	☐ GOGGLES ☐ FACE SHIELD ☒ HEARING PROTECTION (as needed) ☒ SAFETY SHOES: Composite-toe or steel toe boots	☐ AIR PURIFYING RESPIRATOR ☐ SUPPLIED RESPIRATOR ☒ PPE CLOTHING: Fluorescent reflective vest or high visibility clothing	☒ GLOVES: Leather or cut-resistant and Nitrile ☒ OTHER: Insect repellant, sunscreen (as needed)

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Required Equipment as needed: Truck Rig or support truck, Trailer, 42-inch Safety cones and flags, Caution Tape, Interface Probe, Power Source, Submersible Pump, Surge Block/Plunger, 20 lb. Type ABC Fire Extinguisher, Holding Tanks and/or Buckets, Absorbent Pads, 5-gas meter, Tools as needed: Socket and Pipe Wrench, Screw Driver, Pry Bar, Ratchet, Vault Key.

COMMITMENT TO SAFETY- All personnel onsite will actively participate in hazard recognition and mitigation throughout the day by verbalizing SPSAs

EXCLUSION ZONE (EZ): Maintain a 20 Foot EZ During Development Activities

"SHOW ME YOUR HANDS"
Driller and helper should show that hands are clear from controls and moving parts

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Mobilization / Demobilization (**Review Mobilization and Demobilization JSA**)	**1a. CONTACT:** Equipment/property damage. **1b. FALL:** Slip/trip/fall hazards.	1a. The truck rig's tower/derrick will be lowered and secured prior to mobilization. 1a. Set-up the work area / position equipment in a manner that eliminates or reduces the need for backing of trucks and trailers. 1a. All non-essential personnel should **maintain an exclusion zone of 20 feet**. 1a. Beep horn twice before backing up. 1a. When backing up with an attached trailer use a spotter Level or avoid if needed. 1b Inspect walking path for uneven terrain, weather-related hazards (i.e., ice, puddles, snow, etc.), and obstructions prior to mobilizing equipment. 1b. Do not climb over stored materials/equipment; walk around. Store equipment at lowest potential energy.
2. Open/close well.	**2a. EXERTION:** Muscle strain (some wells have large vault covers). **2b. CAUGHT:** Pinch points associated with removing/replacing manholes and working with hand tools. **2c. EXPOSURE:** Potentially hazardous vapors. **2d. CONTACT:** Traffic.	2a. Keep back straight, lift with legs, keep load close to body, and never reach with a load. Ensure that loads are balanced to reduce the potential for muscle strain. Two people are required when lifting objects over 50 lbs or when the shape makes the object difficult to lift. 2b. Wear cut-resistant/leather gloves when working with well vault/cover and hand tools. Do not put fingers under well vault/cover. 2b. Use ratchet and pry bar for well cover and inspect before use. 2c. No open flames/heat sources. 2c. Allow well to vent after opening it and before starting development activities to minimize exposure to vapors. Air monitoring must be performed prior to set up and during the well development activities. Work on upwind side of well. 2d. Wear required PPE including high visibility clothing or reflective vest. 2d. Delineate work area with 42" safety cones and/or other barriers. Position vehicle to protect against oncoming traffic. 2d. Face traffic, maintain eye contact with oncoming vehicles, and establish a safe exit route.

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Assess ¹JOB STEPS	Analyze ²POTENTIAL HAZARDS	Act ³CRITICAL ACTIONS
3. Develop well (mechanical surging).	**3a. CAUGHT:** Cut hazards and finger pinch points.	3a See 2b. 3a. Use required PPE including leather/cut-resistant gloves when handling development equipment. Identify finger/hand pinch points. Keep hands away from active surge equipment. 3a. All non-essential personnel should **maintain an exclusion zone of 20 feet**.
	3b. CONTACT/EXPOSURE: Contamination (e.g., SPH, contaminated groundwater, vapors).	3b. See 2c. 3b. Wear Nitrile gloves and safety glasses. Insert and remove surge block/plunger and line/cable slowly to avoid splashing at the surface. 3b. Use an absorbent pad to clean any spills.
	3c. EXERTION: Muscle strain from lifting equipment.	3c. See 2a. 3c. Use mechanical device to insert and remove surge block/plunger if greater than 50lb.
	3d. CONTACT: Injury while handling wench line/cable, or with active surging equipment.	3d. If using a drill rig, inspect all wench lines/cables for any kinks or if frayed prior to use. Replace any damaged lines/cables. Review **Drill Rig checklist prior to development activities**. 3d. See 3a.
4. Purging well (pumping water to holding tanks/drums/buckets).	**4a. CAUGHT:** Pinch points associated with connecting hose to tank. Pinch points associated with handling pump and hoses.	4a. See 3a. 4a. Ensure that fingers are not placed near coupling when attaching and securing hose(s). Do not place fingers under pump/hoses. Wear leather or cut-resistant gloves when handling pump/hose(s). 4a. Keep hands clear from any line of fire.
	4b. FALL: Using side mounted ladder when attaching hose to tank. Slip, trip, fall from lines/hoses	4b. Inspect ladder steps to make sure steps are not bent/damaged and free of debris/fluid. 4b. Use three points of contact always when using ladder. 4b. Use hoist or other mechanical means to secure and move hose. 4b. Utilize anti-whip cords on all compressed hoses. Keep hoses and lines coiled and organized out of designated walking paths around the work zone.
	4c. CONTACT: Contamination (e.g., SPH, contaminated groundwater).	4c. Secure water hose. 4c. Do not overfill tanks, and purge/transfer liquids in such a manner that they do not splash. (See 3b). 4c. Dispose of used materials/PPE in the designated impacted PPE container.
	4d. EXERTION: Muscle strain from lifting/carrying equipment.	4d. See 2a.
	4e. FALL: Spilled purge water.	4e. Clean up any spills using absorbent pads or spill kits.
5. Decontaminate equipment	**5a. CONTACT/EXPOSURE:** Contamination (e.g., SPH, contaminated groundwater, vapors).	5a. See 3b.
	5b. EXPOSURE/CONTACT: Chemicals in cleaning solution	5b. Decontaminate equipment in well-ventilated area. Wear nitrile gloves to avoid skin contact with cleaning solutions.

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JOB SAFETYANALYSIS Ctrl. No. GEN-020	DATE: 1/4/2018	☐NEW ☒REVISED	PAGE 1 of 2
JSA TYPE CATEGORY: **GENERIC**	WORK TYPE: **Gauging & Sampling**	WORK ACTIVITY (Description): **Soil Sampling**	

DEVELOPMENT TEAM	POSITION / TITLE	REVIEWED BY:	POSITION / TITLE
MaryBeth Lyons	Project Scientist	Brian Hobbs	Senior Health & Safety Manager
		Joe Gentile	Corporate Health and Safety Manager

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST ☒ HARD HAT ☐ LIFELINE / BODY HARNESS ☒ SAFETY GLASSES ☒ FLAME RESISTANT CLOTHING (as needed)	☐ GOGGLES ☐ FACE SHIELD: ☒ HEARING PROTECTION: (as needed) ☒ SAFETY SHOES: Composite-toe or steel toe boots	☐ AIR PURIFYING RESPIRATOR ☐ SUPPLIED RESPIRATOR ☒ PPE CLOTHING: Fluorescent reflective vest or high visibility clothing	☒ GLOVES: Leather, Nitrile and cut resistant ☒ OTHER: Insect repellant, sunscreen (as needed)

REQUIRED AND / OR RECOMMENDED EQUIPMENT

Recommended Equipment: 42" traffic cones, caution tape, trowel

COMMITMENT TO SAFETY- All personnel onsite will actively participate in hazard recognition and mitigation throughout the day by verbalizing SPSAs.

EXCLUSION ZONE (EZ): A 10-foot exclusion zone will be maintained around moving equipment, if present.

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Secure location	**1a. CONTACT:** Personnel and vehicular traffic may enter the work area.	1a. If in an area with foot or vehicle traffic, delineate the work area with 42" traffic cones and/or caution tape to prevent exposure to traffic and inform others of work activity. 1a. Wear reflective vest and/or high visibility clothing. 1a. Face the direction of any vehicular traffic. Position vehicle to protect worker from traffic. 1a. Communicate work activity with adjacent work areas.
	1b. FALL: Tripping/falling due to uneven terrain or entry/exit from excavations.	1b. Inspect pathways and work area for uneven terrain, weather-related hazards (i.e., ice, puddles, snow, etc.), and obstructions. 1b. Use established pathways and walk on stable, secure ground. 1b. Stage equipment and tools in a convenient, stable, and orderly manner. Store equipment at lowest potential energy. 1b. Roux employees should stay 5 feet from in-progress excavations and trenches. Should entry to an excavation be required (when stabilization is complete), ladders must be employed for steep embankments, excavations, pits, and trenches.
	1c. EXPOSURE: Exposure to sun and excessive heat, possibly causing sunburn, heat exhaustion or heat stroke. Exposure to cold temperatures possibly causing cold stress. Skin burn as a result of fire, if applicable. Exposure to explosive vapors due to tank farm operations. Exposure to airborne dust due to high wind speeds. Biological hazards - ticks, bees/wasps, poison ivy, thorns, insects, etc.	1c. Wear sunscreen with an SPF 15 or greater whenever 30 minutes or more of exposure is expected. 1c. Use a tent to shade the work area from direct sunlight particularly when warm temperatures are expected. 1c. Be aware of the location of all Site personnel. 1c. Watch for heat stress symptoms (muscle cramping, exhaustion, dizziness, rapid and shallow breathing). 1c. Watch for cold stress symptoms (severe shivering, slowing of body movement, weakness, stumbling or inability to walk, collapse). 1c. Take breaks for rest and water as necessary. Move to an area that is well shaded or a climate controlled area (i.e., car, site trailer, etc.). 1c. No open flames/heat sources. 1c. Flame retardant clothing must be worn when specified by Site policy. 1c. Cell phones should be disabled when specified by Site policy. 1c. Pre-treat field clothing with Permethrin prior to site visit to kill ticks and insects. 1c. Wear long sleeved shirts and tuck in (or tape) pant legs into socks or boots to prevent ticks from reaching skin. 1c. Spray insect repellant containing DEET on exposed skin when working in overgrown areas of the Site. 1c. Inspect area to avoid contact with biological hazards. 1c. Wear cut-resistant gloves when handling branches, shrubs, etc. that may lie within the walking path. 1c. Wear spoggles if the average wind speeds are above 15 mph. 1c. Personnel shall examine themselves and co-worker's outer clothing for ticks periodically when onsite. 1c. If skin comes in contact with poison ivy, wash skin thoroughly with soap and water. If rash persists after washing, immediately notify your supervisor, the OM and OHSM for possible consultation with a physician at an approved Occupational Health Clinic.

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Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
2. Collect Soil Sample	**2a. CONTACT:** Personal injury from pinch points, cuts, and abrasions from sampling equipment tools, and material within soil sample. Personal injury from contact with moving equipment while sampling. Personal injury from contact with glass sample jars.	2a. Wear cut-resistant (i.e., Kevlar) gloves under chemical-resistant (nitrile) disposable gloves when handling soil samples and sampling jars. 2a. Where possible, use trowel or equivalent tool to avoid contact with soil. 2a. If sampling from bucket of heavy equipment, ensure all equipment is off and operator utilizes the “show me your hands” policy. 2a. See 1a.
	2b. EXPOSURE: Exposure to contamination (impacted soil) and/or lab preservatives.	2b. Wear chemical-resistant (nitrile) disposable gloves over cut resistant gloves to protect hands when handling samples; use containment material or plastic sheeting to protect surrounding areas. 2b. Wear safety glasses to protect eyes from dust or air-borne contaminants that may results from disturbing the soil. 2b. Where possible, remain upgradient from sample location if collecting soil sample from stockpile, drill rig, etc. to avoid breathing contaminant vapors, if they are present. 2b. When collecting soil sample from hand auger, put large zip lock bag over entire auger to prevent spillage of soil on to the ground. 2b. Open sample jars slowly and fill carefully to avoid contact with preservatives.
	2c. EXERTION: Exertion due to repetitive motion and ergonomics.	2c. Utilize a table or raised surface for soil sampling if multiple soil samples are going to be taken to minimize repetitive bending motion.
3. Decontaminate equipment	**3a. EXPOSURE/CONTACT:** Contamination (e.g., Separate Phase Hydrocarbons (SPH), contaminated vapors and/or soil). **3b. EXPOSURE:** Chemicals in cleaning solution including ammonia.	3a. Wear chemical-resistant (nitrile) disposable gloves and safety glasses. 3a. Use an absorbent pad to clean spills. 3a. Properly dispose of used materials/PPE in provided drums in designated drum storage area. 3a. Remain upwind of sample and avoid breathing contaminant vapors, if they are present. 3b. Wear chemical-resistant (nitrile) disposable gloves and safety glasses. 3b. Work on the upwind side of decontamination area. 3b. Use an absorbent pad to clean spills. 3b. Properly dispose of used materials/PPE in provided drums in designated drum storage area. Ensure that all drums are properly labeled and secured.

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JOB SAFETY ANALYSIS Ctrl. No. GEN-021	DATE: 1/4/2018	☐ NEW ☒ REVISED	PAGE 1 of 2
JSA TYPE CATEGORY: **GENERIC**	WORK TYPE **Gauging and Sampling**	WORK ACTIVITY (Description) **Soil Vapor Sampling (Permanent Monitoring Points)**	

DEVELOPMENT TEAM	POSITION / TITLE	REVIEWED BY:	POSITION / TITLE
Jeff Wills	Project Hydrogeologist	Brian Hobbs	Senior Health & Safety Manager
Julie Moriarity	Project Scientist	Joe Gentile	Corporate Health and Safety Manager

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST ☒ HARD HAT ☐ LIFELINE / BODY HARNESS ☒ SAFETY GLASSES	☐ GOGGLES ☐ FACE SHIELD ☐ HEARING PROTECTION ☒ SAFETY SHOES: Steel-toe boots	☐ AIR PURIFYING RESPIRATOR ☐ SUPPLIED RESPIRATOR ☒ PPE CLOTHING: Fluorescent reflective vest or high visibility clothing	☒ GLOVES: Cut-resistant & Nitriles ☒ OTHER: Bug Spray, Sun Screen, Knee Pads or kneeling pad

REQUIRED AND / OR RECOMMENDED EQUIPMENT

9/16” Socket and Wrench, Non-Toxic Clay, Teflon-Lined Tubing, Masterflex Tubing, Air Pump with Low Flow, Dry Cal, Enclosure (Bucket with 2 holes), Helium Gas Canister, Summa Canisters and Flow Controllers, MultiRae Photo Ionization Detector (PID), Helium Detector, Tubing Cutter, 42-inch Safety Cones, Caution Tape or Retractable Cone Bars

COMMITMENT TO SAFETY- All personnel onsite will actively participate in hazard recognition and mitigation throughout the day by verbalizing SPSAs.

EXCLUSION ZONE (EZ): A 5-foot exclusion zone will be maintained for non-essential personnel.

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
1. Define and secure work area.	**1a. FALL:** Potential tripping hazards. **1b. CONTACT:** Potential contact with moving vehicles or pedestrians. **1c. EXERTION:** Muscle strain while lifting and carrying equipment.	1a. Ensure work area is secure and inform others (third party) of work activity. 1a. Remove tripping hazards and inspect walking path for uneven terrain, weather-related hazards (i.e., ice, puddles, snow, etc.), and obstructions prior to mobilizing equipment. 1b. If working alongside roads, look both ways before entering roadways, face traffic, and utilize work vehicle to protect employees. 1b. Delineate work area (including vehicles) with traffic safety cones and caution tape or retractable cone bars. 1b. Maintain a 5-foot exclusion zone. 1b. Wear high visibility clothing or reflective safety vest. 1c. When carrying equipment to/from work area, keep back straight, lift with legs, keep load close to body, never reach with a load. Ensure that loads are balanced. Use mechanical assistance/make multiple trips to carry equipment.
2. Remove well cover / close well cover.	**2a. CONTACT/CAUGHT:** Pinch points and scrapes associated with hand tools and well covers. **2b. FALL:** Potential tripping hazards associated with installing bolts. **2c. EXERTION:** Physical exertion to remove bolts that were over torqued or stripped.	2a. Keep hands away from pinch points. 2a. Use hand tools with extensions to remove and replace well covers. 2a. Wear cut-resistant gloves. 2a. Use knee pads or kneeling pad when repetitive kneeling on rough ground is anticipated. 2b. Place security bolts in secure location so not to create tripping hazards. Replace security bolts so that they fit flush with monitoring well covers. 2c. Replace any security bolts that show signs of stripping. Do not over tighten. 2c. Use body positioning and bending techniques that minimize muscle strain; keep back straight, bend at the knees. 2c. See 2a.

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Assess ¹JOB STEPS	Analyze ²POTENTIAL HAZARDS	Act ³CRITICAL ACTIONS
3. Screen vapor point with PID.	**3a. FALL:** Potential tripping hazards associated with equipment. **3b. EXPOSURE:** Inhalation of soil vapor	3a. Place equipment in one area close to the sampling location. 3b. Identify area where equipment is to be stored within the work area (away from main walking path). 3a. Don't leave equipment on the ground. Return equipment to storage area between uses. 3b. Replace brass caps immediately upon completion to avoid soil vapors migrating to the surface through sample tubing. 3b. Stand upwind of sample point during screening activities.
4. Remove / replace brass caps at the end of the sam`ple tubing.	**4a. CONTACT:** Pinch points associated with hand tools and brass caps. **4b. EXPOSURE:** Potential pathway for vapors to migrate to land surface.	4a. Use wrench to remove and replace brass caps. 4a. Wear cut-resistant gloves to protect against pinch points and scrapes. 4b. See 3b. 4b. Stand up wind of sample point location.
5. Set up soil vapor sampling equipment and calibration of meters.	**5a. FALL:** Potential tripping hazards associated with equipment and tubing.5b. **5b. CONTACT:** Pinch points associated with handling equipment. **5c. EXPOSURE:** Inhalation of calibration gas and helium.	5a. See 3a. 5a. Keep tubing slack to a minimum and locate the summa canister as close to the sampling location as possible. 5a. Avoid stepping over equipment and tubing. 5b. Do not place fingers/hands under sampling equipment. 5b. Make multiple trips when unloading equipment in work area. 5b. Wear cut-resistant gloves to protect against pinch points while handling sampling equipment. 5c. Review SDS for each type of calibration gas used before calibrating. 5c. Calibrate meters in a well-ventilated area and keep air flow regulator away from face. 5c. Close valve on canisters after use to avoid inhalation of excess helium or calibration gas. 5c. Stand up wind of bucket during helium tracer gas test.
6. Cleaning Work Area.	**6a. FALL:** Potential tripping hazards associated with equipment and tubing. **6b. CONTACT:** Storing and transport of equipment in car.	6a. See 3a. 6a. See 3b. 6b. Ensure that equipment is placed securely in the vehicle. Do not stack equipment on top of each other. Secure equipment so that it will not slide while being transported. 6b. Wear cut-resistant gloves while handling/loading equipment.

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APPENDIX B

Site-Specific Emergency Response Plan and
Routes to Urgent Care and Emergency Medical Facilities

DIRECTIONS TO HOSPITAL

1. HEAD SOUTHEAST ON EAST 112TH STREET (144 FEET)
2. TURN RIGHT ONTO PARK AVENUE (0.3 MILES)
3. TURN RIGHT ONTO EAST 106TH STREET (0.2 MILES)
4. TURN LEFT ONTO 5TH AVENUE (0.3 MILES)
5. MOUNT SINAI HOSPITAL WILL BE ON THE LEFT

DIRECTIONS TO CITYMD

1. HEAD SOUTHEAST ON EAST 112TH STREET (0.1 MILES)
2. TURN RIGHT ONTO LEXINGTON AVENUE (0.8 MILES)
3. CITYMD WILL BE ON THE RIGHT

250 0 250 500
Feet

Title:

EMERGENCY ROUTE MAP

SENDERO VERDE REDEVELOPMENT PROJECT – PARCEL B

Prepared For:

SV–B OWNERS LLC

ROUX

Compiled by: J.M.	Date: 20NOV18	FIGURE
Prepared by: M.S.R.	Scale: AS SHOWN	5
Project Mgr: J.M.	Project: 2984.0001Y000	
File: 2984.0001Y102.5.mxd		

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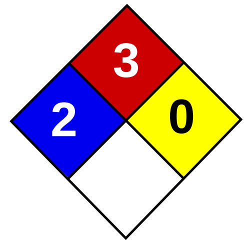
APPENDIX C

SDSs for Chemicals Used



Health	2
Fire	3
Reactivity	0
Personal Protection	H

Material Safety Data Sheet
Benzene MSDS

Section 1: Chemical Product and Company Identification

Product Name: Benzene

Catalog Codes: SLB1564, SLB3055, SLB2881

CAS#: 71-43-2

RTECS: CY1400000

TSCA: TSCA 8(b) inventory: Benzene

CI#: Not available.

Synonym: Benzol; Benzine

Chemical Name: Benzene

Chemical Formula: C6-H6

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Benzene	71-43-2	100

Toxicological Data on Ingredients: Benzene: ORAL (LD50): Acute: 930 mg/kg [Rat]. 4700 mg/kg [Mouse]. DERMAL (LD50): Acute: >9400 mg/kg [Rabbit]. VAPOR (LC50): Acute: 10000 ppm 7 hours [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of eye contact (irritant), of inhalation. Hazardous in case of skin contact (irritant, permeator), of ingestion. Inflammation of the eye is characterized by redness, watering, and itching.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Classified A1 (Confirmed for human.) by ACGIH, 1 (Proven for human.) by IARC. MUTAGENIC EFFECTS: Classified POSSIBLE for human. Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Classified Reproductive system/toxin/female [POSSIBLE]. The substance is toxic to blood, bone marrow, central nervous system (CNS). The substance may be toxic to liver, Urinary System. Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. WARM water MUST be used. Get medical attention immediately.

Skin Contact:
In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if symptoms appear.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 497.78°C (928°F)

Flash Points: CLOSED CUP: -11.1°C (12°F). (Setaflash)

Flammable Limits: LOWER: 1.2% UPPER: 7.8%

Products of Combustion: These products are carbon oxides (CO, CO2).

Fire Hazards in Presence of Various Substances:
Highly flammable in presence of open flames and sparks, of heat. Slightly flammable to flammable in presence of oxidizing materials. Non-flammable in presence of shocks.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. Explosive in presence of oxidizing materials, of acids.

Fire Fighting Media and Instructions:
Flammable liquid, soluble or dispersed in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog.

Special Remarks on Fire Hazards:
Extremely flammable liquid and vapor. Vapor may cause flash fire. Reacts on contact with iodine heptafluoride gas. Dioxygenyl tetrafluoroborate is as very powferful oxidant. The addition of a small particle to small samples of benzene, at ambient temperature, causes ignition. Contact with sodium peroxide with benzene causes ignition. Benzene ignites in contact with powdered chromic anhydride. Virgorous or incandescent reaction with hydrogen + Raney nickel (above 210 C) and bromine trifluoride.

Special Remarks on Explosion Hazards:
Benzene vapors + chlorine and light causes explosion. Reacts explosively with bromine pentafluoride, chlorine, chlorine trifluoride, diborane, nitric acid, nitryl perchlorate, liquid oxygen, ozone, silver perchlorate. Benzene + pentafluoride and methoxide (from arsenic pentafluoride and potassium methoxide) in trichlorotrifluoroethane causes explosion. Interaction

of nitryl perchlorate with benzene gave a slight explosion and flash. The solution of permanganic acid (or its explosive anhydride, dimaganese heptoxide) produced by interaction of permanganates and sulfuric acid will explode on contact with benzene. Peroxodisulfuric acid is a very powferful oxidant. Uncontrolled contact with benzene may cause explosion. Mixtures of peroxomonsulfuric acid with benzene explodes.

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:
Flammable liquid. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up.. Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, acids.

Storage:
Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 0.5 STEL: 2.5 (ppm) from ACGIH (TLV) [United States] TWA: 1.6 STEL: 8 (mg/m3) from ACGIH (TLV) [United States] TWA: 0.1 STEL: 1 from NIOSH TWA: 1 STEL: 5 (ppm) from OSHA (PEL) [United States] TWA: 10 (ppm) from OSHA (PEL) [United States] TWA: 3 (ppm) [United Kingdom (UK)] TWA: 1.6 (mg/m3) [United Kingdom (UK)] TWA: 1 (ppm) [Canada] TWA: 3.2 (mg/m3) [Canada] TWA: 0.5 (ppm) [Canada]Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor:
Aromatic. Gasoline-like, rather pleasant. (Strong.)

Taste: Not available.

Molecular Weight: 78.11 g/mole

Color: Clear Colorless. Colorless to light yellow.

pH (1% soln/water): Not available.

Boiling Point: 80.1 (176.2°F)

Melting Point: 5.5°C (41.9°F)

Critical Temperature: 288.9°C (552°F)

Specific Gravity: 0.8787 @ 15 C (Water = 1)

Vapor Pressure: 10 kPa (@ 20°C)

Vapor Density: 2.8 (Air = 1)

Volatility: Not available.

Odor Threshold: 4.68 ppm

Water/Oil Dist. Coeff.: The product is more soluble in oil; log(oil/water) = 2.1

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, diethyl ether, acetone.

Solubility:
Miscible in alcohol, chloroform, carbon disulfide oils, carbon tetrachloride, glacial acetic acid, diethyl ether, acetone. Very slightly soluble in cold water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Heat, ignition sources, incompatibles.

Incompatibility with various substances: Highly reactive with oxidizing agents, acids.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Benzene vapors + chlorine and light causes explosion. Reacts explosively with bromine pentafluoride, chlorine, chlorine trifluoride, diborane, nitric acid, nitryl perchlorate, liquid oxygen, ozone, silver perchlorate. Benzene + pentafluoride and methoxide (from arsenic pentafluoride and potassium methoxide) in trichlorotrifluoroethane causes explosion. Interaction of nitryl perchlorate with benzene gave a slight explosion and flash. The solution of permanganic acid (or its explosive anhydride, dimaganese heptoxide) produced by interaction of permanganates and sulfuric acid will explode on contact with benzene. Peroxodisulfuric acid is a very powfferful oxidant. Uncontrolled contact with benzene may cause explosion. Mixtures of peroxomonsulfuric acid with benzene explodes.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 930 mg/kg [Rat]. Acute dermal toxicity (LD50): >9400 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 10000 7 hours [Rat].

Chronic Effects on Humans:

CARCINOGENIC EFFECTS: Classified A1 (Confirmed for human.) by ACGIH, 1 (Proven for human.) by IARC. MUTAGENIC EFFECTS: Classified POSSIBLE for human. Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. DEVELOPMENTAL TOXICITY: Classified Reproductive system/toxin/female [POSSIBLE]. Causes damage to the following organs: blood, bone marrow, central nervous system (CNS). May cause damage to the following organs: liver, Urinary System.

Other Toxic Effects on Humans:
Very hazardous in case of inhalation. Hazardous in case of skin contact (irritant, permeator), of ingestion.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans:
May cause adverse reproductive effects (female fertility, Embryotoxic and/or foetotoxic in animal) and birth defects. May affect genetic material (mutagenic). May cause cancer (tumorigenic, leukemia)) Human: passes the placental barrier, detected in maternal milk.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: Causes skin irritation. It can be absorbed through intact skin and affect the liver, blood, metabolism,and urinary system. Eyes: Causes eye irritation. Inhalation: Causes respiratory tract and mucous membrane irritation. Can be absorbed through the lungs. May affect behavior/Central and Peripheral nervous systems (somnolence, muscle weakness, general anesthetic, and other symptoms similar to ingestion), gastrointestinal tract (nausea), blood metabolism, urinary system. Ingestion: May be harmful if swallowed. May cause gastrointestinal tract irritation including vomiting. May affect behavior/Central and Peripheral nervous systems (convulsions, seizures, tremor, irritability, initial CNS stimulation followed by depression, loss of coordination, dizziness, headache, weakness, pallor, flushing), respiration (breathlessness and chest constriction), cardiovascular system, (shallow/rapid pulse), and blood.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: CLASS 3: Flammable liquid.

Identification: : Benzene UNNA: 1114 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Benzene California prop. 65 (no significant risk level): Benzene: 0.007 mg/day (value) California prop. 65: This product contains the following ingredients

for which the State of California has found to cause cancer which would require a warning under the statute: Benzene Connecticut carcinogen reporting list.: Benzene Connecticut hazardous material survey.: Benzene Illinois toxic substances disclosure to employee act: Benzene Illinois chemical safety act: Benzene New York release reporting list: Benzene Rhode Island RTK hazardous substances: Benzene Pennsylvania RTK: Benzene Minnesota: Benzene Michigan critical material: Benzene Massachusetts RTK: Benzene Massachusetts spill list: Benzene New Jersey: Benzene New Jersey spill list: Benzene Louisiana spill reporting: Benzene California Director's list of Hazardous Substances: Benzene TSCA 8(b) inventory: Benzene SARA 313 toxic chemical notification and release reporting: Benzene CERCLA: Hazardous substances.: Benzene: 10 lbs. (4.536 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
R11- Highly flammable. R22- Harmful if swallowed. R38- Irritating to skin. R41- Risk of serious damage to eyes. R45- May cause cancer. R62- Possible risk of impaired fertility. S2- Keep out of the reach of children. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S39- Wear eye/face protection. S46- If swallowed, seek medical advice immediately and show this container or label. S53- Avoid exposure - obtain special instructions before use.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 3

Reactivity: 0

Personal Protection: h

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 3

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/10/2005 08:35 PM

Last Updated: 11/06/2008 12:00 PM

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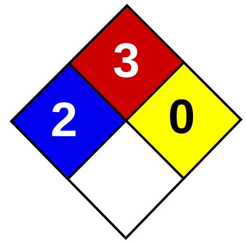

Health	2
Fire	3
Reactivity	0
Personal Protection	H

Material Safety Data Sheet
Toluene MSDS

Section 1: Chemical Product and Company Identification

Product Name: Toluene

Catalog Codes: SLT2857, SLT3277

CAS#: 108-88-3

RTECS: XS5250000

TSCA: TSCA 8(b) inventory: Toluene

CI#: Not available.

Synonym: Toluol, Tolu-Sol; Methylbenzene; Methacide; Phenylmethane; Methylbenzol

Chemical Name: Toluene

Chemical Formula: C6-H5-CH3 or C7-H8

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Toluene	108-88-3	100

Toxicological Data on Ingredients: Toluene: ORAL (LD50): Acute: 636 mg/kg [Rat]. DERMAL (LD50): Acute: 14100 mg/kg [Rabbit]. VAPOR (LC50): Acute: 49000 mg/m 4 hours [Rat]. 440 ppm 24 hours [Mouse].

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator).

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to blood, kidneys, the nervous system, liver, brain, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.

Skin Contact:
In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 480°C (896°F)

Flash Points: CLOSED CUP: 4.4444°C (40°F). (Setaflash) OPEN CUP: 16°C (60.8°F).

Flammable Limits: LOWER: 1.1% UPPER: 7.1%

Products of Combustion: These products are carbon oxides (CO, CO2).

Fire Hazards in Presence of Various Substances:
Flammable in presence of open flames and sparks, of heat. Non-flammable in presence of shocks.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
Flammable liquid, insoluble in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray or fog.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards:
Toluene forms explosive reaction with 1,3-dichloro-5,5-dimethyl-2,4-imidazolididione; dinitrogen tetraoxide; concentrated nitric acid, sulfuric acid + nitric acid; N2O4; AgClO4; BrF3; Uranium hexafluoride; sulfur dichloride. Also forms an explosive mixture with tetranitromethane.

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:
Toxic flammable liquid, insoluble or very slightly soluble in water. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents.

Storage:
Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 200 STEL: 500 CEIL: 300 (ppm) from OSHA (PEL) [United States] TWA: 50 (ppm) from ACGIH (TLV) [United States] SKIN TWA: 100 STEL: 150 from NIOSH [United States] TWA: 375 STEL: 560 (mg/m3) from NIOSH [United States] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Sweet, pungent, Benzene-like.

Taste: Not available.

Molecular Weight: 92.14 g/mole

Color: Colorless.

pH (1% soln/water): Not applicable.

Boiling Point: 110.6°C (231.1°F)

Melting Point: -95°C (-139°F)

Critical Temperature: 318.6°C (605.5°F)

Specific Gravity: 0.8636 (Water = 1)

Vapor Pressure: 3.8 kPa (@ 25°C)

Vapor Density: 3.1 (Air = 1)

Volatility: Not available.

Odor Threshold: 1.6 ppm

Water/Oil Dist. Coeff.: The product is more soluble in oil; log(oil/water) = 2.7

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, diethyl ether, acetone.

Solubility:
Soluble in diethyl ether, acetone. Practically insoluble in cold water. Soluble in ethanol, benzene, chloroform, glacial acetic acid, carbon disulfide. Solubility in water: 0.561 g/l @ 25 deg. C.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Heat, ignition sources (flames, sparks, static), incompatible materials

Incompatibility with various substances: Reactive with oxidizing agents.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Incompatible with strong oxidizers, silver perchlorate, sodium difluoride, Tetranitromethane, Uranium Hexafluoride. Frozen Bromine Trifluoride reacts violently with Toluene at -80 deg. C. Reacts chemically with nitrogen oxides, or halogens to form nitrotoluene, nitrobenzene, and nitrophenol and halogenated products, respectively.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 636 mg/kg [Rat]. Acute dermal toxicity (LD50): 14100 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 440 24 hours [Mouse].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC. May cause damage to the following organs: blood, kidneys, the nervous system, liver, brain, central nervous system (CNS).

Other Toxic Effects on Humans:
Hazardous in case of skin contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator).

Special Remarks on Toxicity to Animals:
Lowest Published Lethal Dose: LDL [Human] - Route: Oral; Dose: 50 mg/kg LCL [Rabbit] - Route: Inhalation; Dose: 55000 ppm/40min

Special Remarks on Chronic Effects on Humans:
Detected in maternal milk in human. Passes through the placental barrier in human. Embryotoxic and/or foetotoxic in animal. May cause adverse reproductive effects and birth defects (teratogenic). May affect genetic material (mutagenic)

Special Remarks on other Toxic Effects on Humans:

Acute Potential Health Effects: Skin: Causes mild to moderate skin irritation. It can be absorbed to some extent through the skin. Eyes: Cauess mild to moderate eye irritation with a burning sensation. Splash contact with eyes also causes conjunctivitis, blepharospasm, corneal edema, corneal abraisons. This usually resolves in 2 days. Inhalation: Inhalation of vapor may cause respiratory tract irritation causing coughing and wheezing, and nasal discharge. Inhalation of high concentrations may affect behavior and cause central nervous system effects characterized by nausea, headache, dizziness, tremors, restlessness, lightheadedness, exhilaration, memory loss, insomnia, impaired reaction time, drowsiness, ataxia, hallucinations, somnolence, muscle contraction or spasticity, unconsciousness and coma. Inhalation of high concentration of vapor may also affect the cardiovascular system (rapid heart beat, heart palpitations, increased or decreased blood pressure, dysrhythmia,), respiration (acute pulmonary edema, respiratory depression, apnea, asphyxia), cause vision disturbances and dilated pupils, and cause loss of appetite. Ingestion: Aspiration hazard. Aspiration of Toluene into the lungs may cause chemical pneumonitis. May cause irritation of the digestive tract with nausea, vomiting, pain. May have effects similar to that of acute inhalation. Chronic Potential Health Effects: Inhalation and Ingestion: Prolonged or repeated exposure via inhalation may cause central nervous system and cardiovascular symptoms similar to that of acute inhalation and ingestion as well liver damage/failure, kidney damage/failure (with hematuria, proteinuria, oliguria, renal tubular acidosis), brain damage, weight loss, blood (pigmented or nucleated red blood cells, changes in white blood cell count), bone marrow changes, electrolyte imbalances (Hypokalemia, Hypophostatemia), severe, muscle weakness and Rhabdomyolysis. Skin: Repeated or prolonged skin contact may cause defatting dermatitis.

Section 12: Ecological Information

Ecotoxicity:
Ecotoxicity in water (LC50): 313 mg/l 48 hours [Daphnia (daphnia)]. 17 mg/l 24 hours [Fish (Blue Gill)]. 13 mg/l 96 hours [Fish (Blue Gill)]. 56 mg/l 24 hours [Fish (Fathead minnow)]. 34 mg/l 96 hours [Fish (Fathead minnow)]. 56.8 ppm any hours [Fish (Goldfish)].

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: CLASS 3: Flammable liquid.

Identification: : Toluene UNNA: 1294 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Toluene California prop. 65 (no significant risk level): Toluene: 7 mg/day (value) California prop. 65 (acceptable daily intake level): Toluene: 7 mg/day (value) California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: Toluene Connecticut hazardous material survey.: Toluene Illinois

toxic substances disclosure to employee act: Toluene Illinois chemical safety act: Toluene New York release reporting list: Toluene Rhode Island RTK hazardous substances: Toluene Pennsylvania RTK: Toluene Florida: Toluene Minnesota: Toluene Michigan critical material: Toluene Massachusetts RTK: Toluene Massachusetts spill list: Toluene New Jersey: Toluene New Jersey spill list: Toluene Louisiana spill reporting: Toluene California Director's List of Hazardous Substances.: Toluene TSCA 8(b) inventory: Toluene TSCA 8(d) H and S data reporting: Toluene: Effective date: 10/04/82; Sunset Date: 10/0/92 SARA 313 toxic chemical notification and release reporting: Toluene CERCLA: Hazardous substances.: Toluene: 1000 lbs. (453.6 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
R11- Highly flammable. R20- Harmful by inhalation. S16- Keep away from sources of ignition - No smoking. S25- Avoid contact with eyes. S29- Do not empty into drains. S33- Take precautionary measures against static discharges.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 3

Reactivity: 0

Personal Protection: h

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 3

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/10/2005 08:30 PM

Last Updated: 11/06/2008 12:00 PM

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Chemicals & Laboratory Equipment

Health	2
Fire	3
Reactivity	0
Personal Protection	H

Material Safety Data Sheet
Ethylbenzene MSDS

Section 1: Chemical Product and Company Identification

Product Name: Ethylbenzene

Catalog Codes: SLE2044

CAS#: 100-41-4

RTECS: DA0700000

TSCA: TSCA 8(b) inventory: Ethylbenzene

CI#: Not available.

Synonym: Ethyl Benzene; Ethylbenzol; Phenylethane

Chemical Name: Ethylbenzene

Chemical Formula: C8H10

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Ethylbenzene	100-41-4	100

Toxicological Data on Ingredients: Ethylbenzene: ORAL (LD50): Acute: 3500 mg/kg [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of eye contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant, permeator).

Potential Chronic Health Effects:
Slightly hazardous in case of skin contact (irritant, sensitizer). CARCINOGENIC EFFECTS: Classified 2B (Possible for human.) by IARC. MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. WARM water MUST be used. Get medical attention.

Skin Contact: Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

Serious Skin Contact: Not available.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 432°C (809.6°F)

Flash Points:
CLOSED CUP: 15°C (59°F). (Tagliabue.) OPEN CUP: 26.667°C (80°F) (Cleveland) (CHRIS, 2001) CLOSED CUP: 12.8 C (55 F) (Bingham et al, 2001; NIOSH, 2001) CLOSED CUP: 21 C (70 F) (NFPA)

Flammable Limits: LOWER: 0.8% - 1.6%UPPER: 6.7% - 7%

Products of Combustion: These products are carbon oxides (CO, CO_2).

Fire Hazards in Presence of Various Substances: Highly flammable in presence of open flames and sparks, of heat.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. Slightly explosive in presence of heat.

Fire Fighting Media and Instructions:
Flammable liquid, soluble or dispersed in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog.

Special Remarks on Fire Hazards:
Vapor may travel considerable distance to source of ignition and flash back. Vapors may form explosive mixtures with air. When heated to decomposition it emits acrid smoke and irritating fumes.

Special Remarks on Explosion Hazards: Vapors may form explosive mixtures in air.

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:
Flammable liquid. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Avoid contact with eyes. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents.

Storage:
Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame). Sensitive to light. Store in light-resistant containers.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 100 STEL: 125 (ppm) from OSHA (PEL) [United States] TWA: 435 STEL: 545 from OSHA (PEL) [United States] TWA: 435 STEL: 545 (mg/m3) from NIOSH [United States] TWA: 100 STEL: 125 (ppm) from NIOSH [United States] TWA: 100 STEL: 125 (ppm) from ACGIH (TLV) [United States] TWA: 100 STEL: 125 (ppm) [United Kingdom (UK)] TWA: 100 STEL: 125 (ppm) [Belgium] TWA: 100 STEL: 125 (ppm) [Finland] TWA: 50 (ppm) [Norway] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Sweetish. Gasoline-like. Aromatic.

Taste: Not available.

Molecular Weight: 106.16 g/mole

Color: Colorless.

pH (1% soln/water): Not available.

Boiling Point: 136°C (276.8°F)

Melting Point: -94.9 (-138.8°F)

Critical Temperature: 617.15°C (1142.9°F)

Specific Gravity: 0.867 (Water = 1)

Vapor Pressure: 0.9 kPa (@ 20°C)

Vapor Density: 3.66 (Air = 1)

Volatility: 100% (v/v).

Odor Threshold: 140 ppm

Water/Oil Dist. Coeff.: The product is more soluble in oil; log(oil/water) = 3.1

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, diethyl ether.

Solubility:
Easily soluble in diethyl ether. Very slightly soluble in cold water or practically insoluble in water. Soluble in all proportions in Ethyl alcohol. Soluble in Carbon tetrachloride, Benzene. Insoluble in Ammonia. Slightly soluble in Chloroform. Solubility in Water: 169 mg/l @ 25 deg. C.; 0.014 g/100 ml @ 15 deg. C.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Heat, ingnition sources (flames, sparks, static), incompatible materials, light

Incompatibility with various substances: Reactive with oxidizing agents.

Corrosivity: Not considered to be corrosive for metals and glass.

Special Remarks on Reactivity:
Can react vigorously with oxidizing materials. Sensitive to light.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Inhalation.

Toxicity to Animals: Acute oral toxicity (LD50): 3500 mg/kg [Rat].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified 2B (Possible for human.) by IARC. MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. May cause damage to the following organs: central nervous system (CNS).

Other Toxic Effects on Humans:
Hazardous in case of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant, permeator).

Special Remarks on Toxicity to Animals:
Lethal Dose/Conc 50% Kill: LD50 [Rabbit] - Route: Skin; Dose: 17800 ul/kg Lowest Published Lethal Dose/Conc: LDL[Rat] - Route: Inhalation (vapor); Dose: 4000 ppm/4 H

Special Remarks on Chronic Effects on Humans:
May cause adverse reproductive effects and birth defects (teratogenic) based on animal test data. May cause cancer based on animals data. IARC evidence for carcinogenicity in animals is sufficient. IARC evidence of carcinogenicity in humans inadequate. May affect genetic material (mutagenic).

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: Can cause mild skin irritation. It can be absorbed through intact skin. Eyes: Contact with vapor or liquid can cause severe eye irritation depending on concentration. It may also cause conjunctivitis. At a vapor exposure level of 85 - 200 ppm , it is mildly and transiently irritating to the eyes; 1000 ppm causes further irritation and tearing; 2000 ppm results in immediate and severe irritation and tearing; 5,000 ppm is intolerable (ACGIH, 1991; Clayton and Clayton, 1994). Standard draize test for eye irritation using 500 mg resulted in severe irritation (RTECS) Inhalation: Exposure to high concentrations can cause nasal, mucous membrane and respiratory tract irritation and can also result in chest constriction and, trouble breathing, respiratory failure, and even death. It can also affect behavior/Central Nervous System. The effective dose for CNS depression in experimental animals was 10,000 ppm (ACGIH, 1991). Symptoms of CNS depression include

headache, nausea, weakness, dizziness, vertigo, irritability, fatigue, lightheadedness, sleepiness, tremor, loss of coordination, judgement and conciousness, coma, and death. It can also cause pulmonary edema. Inhalation of 85 ppm can produce fatigue, insomnia, headache, and mild irritation of the respiratory tract (Haley & Berndt, 1987). Ingestion: Do not drink, pipet or siphon by mouth. May cause gastroinestinal/digestive tract irritation with Abdominal pain, nausea, vomiting. Ethylbenzene is a pulmonary aspiration hazard. Pulmonary aspiration of even small amounts of the liquid may cause fatal pneumonitis. It may also affect behavior/central nervous system with

Section 12: Ecological Information

Ecotoxicity:
Ecotoxicity in water (LC50): 14 mg/l 96 hours [Fish (Trout)] (static). 12.1 mg/l 96 hours [Fish (Fathead Minnow)] (flow-through)]. 150 mg/l 96 hours [Fish (Blue Gill/Sunfish)] (static). 275 mg/l 96 hours [Fish (Sheepshead Minnow)]. 42.3 mg/l 96 hours [Fish (Fathead Minnow)](soft water). 87.6mg/l 96 hours [Shrimp].

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: CLASS 3: Flammable liquid.

Identification: : Ethylbenzene UNNA: 1175 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
Connecticut hazardous material survey.: Ethylbenzene Illinois toxic substances disclosure to employee act: Ethylbenzene Illinois chemical safety act: Ethylbenzene New York release reporting list: Ethylbenzene Rhode Island RTK hazardous substances: Ethylbenzene Pennsylvania RTK: Ethylbenzene Minnesota: Ethylbenzene Massachusetts RTK: Ethylbenzene Massachusetts spill list: Ethylbenzene New Jersey: Ethylbenzene New Jersey spill list: Ethylbenzene Louisiana spill reporting: Ethylbenzene California Director's List of Hazardous Substances: Ethylbenzene TSCA 8(b) inventory: Ethylbenzene TSCA 4(a) proposed test rules: Ethylbenzene TSCA 8(d) H and S data reporting: Ethylbenzene: Effective Date: 6/19/87; Sunset Date: 6/19/97 SARA 313 toxic chemical notification and release reporting: Ethylbenzene

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-2A: Material causing other toxic effects (VERY TOXIC). CLASSE D-2B: Material causing other toxic effects (TOXIC).

DSCL (EEC):
R11- Highly flammable. R20- Harmful by inhalation. S16- Keep away from sources of ignition - No smoking. S24/25- Avoid contact with skin and eyes. S29- Do not empty into drains.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 3

Reactivity: 0

Personal Protection: h

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 3

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

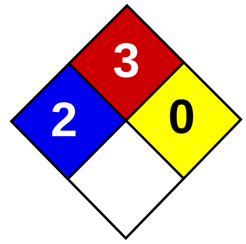
Section 16: Other Information

References:
-Manufacturer's Material Safety Data Sheet. -Fire Protection Guide to Hazardous Materials, 13th ed., Nationial Fire Protection Association (NFPA) -Registry of Toxic Effects of Chemical Substances (RTECS) -Chemical Hazard Response Information System (CHRIS) -Hazardous Substance Data Bank (HSDB) -New Jersey Hazardous Substance Fact Sheet -Ariel Global View -Reprotext System

Other Special Considerations: Not available.

Created: 10/09/2005 05:28 PM

Last Updated: 11/06/2008 12:00 PM



Health	2
Fire	3
Reactivity	0
Personal Protection	H

Material Safety Data Sheet
Xylenes MSDS

Section 1: Chemical Product and Company Identification

Product Name: Xylenes

Catalog Codes: SLX1075, SLX1129, SLX1042, SLX1096

CAS#: 1330-20-7

RTECS: ZE2100000

TSCA: TSCA 8(b) inventory: Xylenes

CI#: Not available.

Synonym: Xylenes; Dimethylbenzene; xylol; methyltoluene

Chemical Name: Xylenes (o-, m-, p- isomers)

Chemical Formula: C6H4(CH3)2

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Xylenes	1330-20-7	100

Toxicological Data on Ingredients: Xylenes: ORAL (LD50): Acute: 4300 mg/kg [Rat]. 2119 mg/kg [Mouse]. DERMAL (LD50): Acute: >1700 mg/kg [Rabbit].

Section 3: Hazards Identification

Potential Acute Health Effects: Hazardous in case of skin contact (irritant, permeator), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: 3 (Not classifiable for human.) by IARC. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to blood, kidneys, liver, mucous membranes, bone marrow, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.

Skin Contact:
In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if symptoms appear.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 464°C (867.2°F)

Flash Points: CLOSED CUP: 24°C (75.2°F). (Tagliabue.) OPEN CUP: 37.8°C (100°F).

Flammable Limits: LOWER: 1% UPPER: 7%

Products of Combustion: These products are carbon oxides (CO, CO2).

Fire Hazards in Presence of Various Substances:
Highly flammable in presence of open flames and sparks, of heat. Non-flammable in presence of shocks.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Slightly explosive in presence of open flames and sparks, of heat.

Fire Fighting Media and Instructions:
Flammable liquid, soluble or dispersed in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

Special Remarks on Fire Hazards: Vapors may travel to source of ignition and flash back.

Special Remarks on Explosion Hazards:
Vapors may form explosive mixtures with air. Containers may explode when heated. May polymerize explosively when heated. An attempt to chlorinate xylene with 1,3-Dichloro-5,5-dimethyl-2,4-imidazolidindione (dichlorohydrantoin) caused a violent explosion

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:
Flammable liquid. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not touch spilled material. Prevent entry into sewers, basements or confined

areas; dike if needed. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, acids.

Storage:
Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 100 (ppm) [Canada] TWA: 435 (mg/m3) [Canada] TWA: 434 STEL: 651 (mg/m3) from ACGIH (TLV) [United States] TWA: 100 STEL: 150 (ppm) from ACGIH (TLV) [United States] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Sweetish.

Taste: Not available.

Molecular Weight: 106.17 g/mole

Color: Colorless. Clear

pH (1% soln/water): Not available.

Boiling Point: 138.5°C (281.3°F)

Melting Point: -47.4°C (-53.3°F)

Critical Temperature: Not available.

Specific Gravity: 0.864 (Water = 1)

Vapor Pressure: 0.9 kPa (@ 20°C)

Vapor Density: 3.7 (Air = 1)

Volatility: Not available.

Odor Threshold: 1 ppm

Water/Oil Dist. Coeff.: The product is more soluble in oil; log(oil/water) = 3.1

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility:
Insoluble in cold water, hot water. Miscible with absolute alcohol, ether, and many other organic liquids.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Heat, ignition sources, incompatibles

Incompatibility with various substances: Reactive with oxidizing agents, acids.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Store away from acetic acid, nitric acid, chlorine, bromine, and fluorine.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 2119 mg/kg [Mouse]. Acute dermal toxicity (LD50): >1700 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 5000 4 hours [Rat].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: 3 (Not classifiable for human.) by IARC. May cause damage to the following organs: blood, kidneys, liver, mucous membranes, bone marrow, central nervous system (CNS).

Other Toxic Effects on Humans: Hazardous in case of skin contact (irritant, permeator), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals:
Lowest Lethal Dose: LDL [Human] - Route: Oral; Dose: 50 mg/kg LCL [Man] - Route: Oral; Dose: 10000 ppm/6H

Special Remarks on Chronic Effects on Humans:
Detected in maternal milk in human. Passes through the placental barrier in animal. Embryotoxic and/or foetotoxic in animal. May cause adverse reproductive effects (male and femael fertility (spontaneous abortion and fetotoxicity)) and birth defects based animal data.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: Causes skin irritation. Can be absorbed through skin. Eyes: Causes eye irritation. Inhalation: Vapor causes respiratory tract and mucous membrane irritation. May affect central nervous system and behavior (General anesthetic/CNS depressant with effects including headache, weakness, memory loss, irritability, dizziness, giddiness, loss of coordination and judgement, respiratory depression/arrest or difficulty breathing, loss of appetite, nausea, vomiting, shivering, and possible coma and death). May also affects blood, sense organs, liver, and peripheral nerves. Ingestion: May cause gastrointestinal irritation including abdominal pain, vomiting, and nausea. May also affect liver and urinary system/ kidneys. May cause effects similar to those of acute inhalation. Chronic Potential Health Effects: Chronic inhalation may affect the urinary system (kidneys) blood (anemia), bone marrow (hyperplasia of bone marrow) brain/behavior/Central Nervous system. Chronic inhalation may alsocause mucosal bleeding. Chronic ingestion may affect the liver and metabolism (loss of appetite) and may affect urinary system (kidney damage)

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: CLASS 3: Flammable liquid.

Identification: : Xylenes UNNA: 1307 PG: III

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
Connecticut hazardous material survey.: Xylenes Illinois chemical safety act: Xylenes New York acutely hazardous substances: Xylenes Rhode Island RTK hazardous substances: Xylenes Pennsylvania RTK: Xylenes Minnesota: Xylenes Michigan critical material: Xylenes Massachusetts RTK: Xylenes Massachusetts spill list: Xylenes New Jersey: Xylenes New Jersey spill list: Xylenes Louisiana spill reporting: Xylenes California Director's List of Hazardous Substances: Xylenes TSCA 8(b) inventory: Xylenes SARA 302/304/311/312 hazardous chemicals: Xylenes SARA 313 toxic chemical notification and release reporting: Xylenes CERCLA: Hazardous substances.: Xylenes: 100 lbs. (45.36 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
R10- Flammable. R21- Harmful in contact with skin. R36/38- Irritating to eyes and skin. S2- Keep out of the reach of children. S36/37- Wear suitable protective clothing and gloves. S46- If swallowed, seek medical advice immediately and show this container or label.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 3

Reactivity: 0

Personal Protection: h

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 3

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

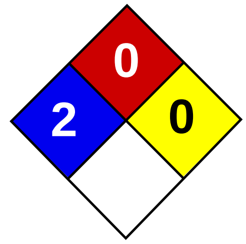
Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/11/2005 12:54 PM

Last Updated: 11/06/2008 12:00 PM



Health	2
Fire	0
Reactivity	0
Personal Protection	G

Material Safety Data Sheet
Tetrachloroethylene MSDS

Section 1: Chemical Product and Company Identification

Product Name: Tetrachloroethylene

Catalog Codes: SLT3220

CAS#: 127-18-4

RTECS: KX3850000

TSCA: TSCA 8(b) inventory: Tetrachloroethylene

CI#: Not available.

Synonym: Perchloroethylene; 1,1,2,2-Tetrachloroethylene; Carbon bichloride; Carbon dichloride; Ankilostin; Didakene; Dilatin PT; Ethene, tetrachloro-; Ethylene tetrachloride; Perawin; Perchlor; Perclene; Perclene D; Percosolvel; Tetrachloroethene; Tetraleno; Tetralex; Tetravec; Tetroguer; Tetropil

Chemical Name: Ethylene, tetrachloro-

Chemical Formula: C2-Cl4

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Tetrachloroethylene	127-18-4	100

Toxicological Data on Ingredients: Tetrachloroethylene: ORAL (LD50): Acute: 2629 mg/kg [Rat]. DERMAL (LD): Acute: >3228 mg/kg [Rabbit]. MIST(LC50): Acute: 34200 mg/m 8 hours [Rat]. VAPOR (LC50): Acute: 5200 ppm 4 hours [Mouse].

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of skin contact (irritant), of inhalation. Slightly hazardous in case of skin contact (permeator), of eye contact (irritant), of ingestion.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH. Classified 2A (Probable for human.) by IARC, 2 (anticipated carcinogen) by NTP. MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to kidneys, liver, peripheral nervous system, respiratory tract, skin, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.

Skin Contact:
In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if symptoms appear.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: Not applicable.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:
Absorb with an inert material and put the spilled material in an appropriate waste disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Do not ingest. Do not breathe gas/fumes/ vapor/spray. Avoid contact with skin. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents, metals, acids, alkalis.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value.

Personal Protection:
Safety glasses. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 25 (ppm) from OSHA (PEL) [United States] TWA: 25 STEL: 100 (ppm) from ACGIH (TLV) [United States] TWA: 170 (mg/m3) from OSHA (PEL) [United States] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Ethereal.

Taste: Not available.

Molecular Weight: 165.83 g/mole

Color: Clear Colorless.

pH (1% soln/water): Not available.

Boiling Point: 121.3°C (250.3°F)

Melting Point: -22.3°C (-8.1°F)

Critical Temperature: 347.1°C (656.8°F)

Specific Gravity: 1.6227 (Water = 1)

Vapor Pressure: 1.7 kPa (@ 20°C)

Vapor Density: 5.7 (Air = 1)

Volatility: Not available.

Odor Threshold: 5 - 50 ppm

Water/Oil Dist. Coeff.: The product is more soluble in oil; log(oil/water) = 3.4

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility:
Miscible with alcohol, ether, chloroform, benzene, hexane. It dissolves in most of the fixed and volatile oils. Solubility in water: 0.015 g/100 ml @ 25 deg. C It slowly decomposes in water to yield Trichloroacetic and Hydrochloric acids.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials

Incompatibility with various substances: Reactive with oxidizing agents, metals, acids, alkalis.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Oxidized by strong oxidizing agents. Incompatible with sodium hydroxide, finely divided or powdered metals such as zinc, aluminum, magnesium, potassium, chemically active metals such as lithium, beryllium , barium. Protect from light.

Special Remarks on Corrosivity: Slowly corrodes aluminum, iron, and zinc.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 2629 mg/kg [Rat]. Acute dermal toxicity (LD50): >3228 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 5200 4 hours [Mouse].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH. Classified 2A (Probable for human.) by IARC, 2 (Some evidence.) by NTP. MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast. May cause damage to the following organs: kidneys, liver, peripheral nervous system, upper respiratory tract, skin, central nervous system (CNS).

Other Toxic Effects on Humans:
Hazardous in case of skin contact (irritant), of inhalation. Slightly hazardous in case of skin contact (permeator), of ingestion.

Special Remarks on Toxicity to Animals:
Lowest Publishe Lethal Dose/Conc: LDL [Rabbit] - Route: Oral; Dose: 5000 mg/kg LDL [Dog] - Route: Oral; Dose: 4000 mg/kg LDL [Cat] - Route: Oral; Dose: 4000 mg/kg

Special Remarks on Chronic Effects on Humans:
May cause adverse reproductive effects and birth defects(teratogenic). May affect genetic material (mutagenic). May cause cancer.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: Causes skin irritation with possible dermal blistering or burns. Symtoms may include redness, itching, pain, and possible dermal blistering or burns. It may be absorbed through the skin with possible systemic effects. A single prolonged skin exposure is not likely to result in the material being absorbed in harmful amounts. Eyes: Contact causes transient eye irritation, lacrimation. Vapors cause eye/conjunctival irritation. Symptoms may include redness and pain. Inhalation: The main route to occupational exposure is by inhalation since it is readily absorbed through the lungs. It causes respiratory tract irritation, . It can affect behavior/central nervous system (CNS depressant and anesthesia ranging from slight inebriation to death, vertigo, somnolence, anxiety, headache, excitement, hallucinations, muscle incoordination, dizziness, lightheadness, disorentiation, seizures, enotional instability, stupor, coma). It may cause pulmonary edema Ingestion: It can cause nausea, vomiting, anorexia, diarrhea, bloody stool. It may affect the liver, urinary system (proteinuria, hematuria, renal failure, renal tubular disorder), heart (arrhythmias). It may affect behavior/central nervous system with symptoms similar to that of inhalation. Chronic Potential Health Effects: Skin: Prolonged or repeated skin contact may result in excessive drying of the skin, and irritation. Ingestion/Inhalation: Chronic exposure can affect the liver(hepatitis,fatty liver degeneration), kidneys, spleen, and heart (irregular heartbeat/arrhythmias, cardiomyopathy, abnormal EEG), brain, behavior/ central nervous system/peripheral nervous system (impaired memory, numbness of extremeties, peripheral neuropathy and other

Section 12: Ecological Information

Ecotoxicity:
Ecotoxicity in water (LC50): 18.4 mg/l 96 hours [Fish (Fatthead Minnow)]. 18 mg/l 48 hours [Daphnia (daphnia)]. 5 mg/l 96 hours [Fish (Rainbow Trout)]. 13 mg/l 96 hours [Fish (Bluegill sunfish)].

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The product itself and its products of degradation are not toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: CLASS 6.1: Poisonous material.

Identification: : Tetrachloroethylene UNNA: 1897 PG: III

Special Provisions for Transport: Marine Pollutant

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Tetrachloroethylene California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Tetrachloroethylene Connecticut hazardous material survey.: Tetrachloroethylene Illinois toxic substances disclosure to employee act: Tetrachloroethylene Illinois chemical safety act: Tetrachloroethylene New York release reporting list: Tetrachloroethylene Rhode Island RTK hazardous substances: Tetrachloroethylene Pennsylvania RTK: Tetrachloroethylene Minnesota: Tetrachloroethylene Michigan critical material: Tetrachloroethylene Massachusetts RTK: Tetrachloroethylene Massachusetts spill list: Tetrachloroethylene New Jersey: Tetrachloroethylene New Jersey spill list: Tetrachloroethylene Louisiana spill reporting: Tetrachloroethylene California Director's List of Hazardous Substances: Tetrachloroethylene TSCA 8(b) inventory: Tetrachloroethylene TSCA 8(d) H and S data reporting: Tetrachloroethylene: Effective date: 6/1/87; Sunset date: 6/1/97 SARA 313 toxic chemical notification and release reporting: Tetrachloroethylene CERCLA: Hazardous substances.: Tetrachloroethylene: 100 lbs. (45.36 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC). CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
R40- Possible risks of irreversible effects. R51/53- Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. S23- Do not breathe gas/fumes/vapour/spray S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S37- Wear suitable gloves. S61- Avoid release to the environment. Refer to special instructions/Safety data sheets.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 0

Reactivity: 0

Personal Protection: g

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Safety glasses.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/10/2005 08:29 PM

Last Updated: 05/21/2013 12:00 PM

APPENDIX D

Incident Investigation and Reporting Program

INCIDENT INVESTIGATION AND REPORTING MANAGEMENT PROGRAM

CORPORATE HEALTH AND SAFETY MANAGER	**:**	**Brian Hobbs, CIH, CSP**
EFFECTIVE DATE	**:**	**01/19**
REVISION NUMBER	**:**	**4**

TABLE OF CONTENTS

APPENDICES

1. PURPOSE

Roux Associates, Inc. and its affiliated companies, Roux Environmental Engineering and Geology, D.P.C, and Remedial Engineering (collectively, “Roux”) has instituted the following management program for reporting Environmental Health and Safety (EHS) incidents and near losses, investigation and correcting the causes of incidents, tracking incidents and corrective actions taken, and sharing the cause and corrective actions with Roux personnel. These practices and procedures establish a method to track progress and improvements to the company EHS performance.

2. SCOPE AND APPLICABILITY

These procedures apply to all Roux employees. Employees are required to follow these procedures for all incidents involving Roux personnel, or other personnel (e.g., subcontractors) working for Roux, regardless of the specific work activity or work location.

This program is intended, in part, to fulfill the Occupational Safety and Health Administration (OSHA) occupational injury and illness reporting and recording requirements cited in the Code of Federal Regulations (CFR) at 29 CFR 1904.

3. RESPONSIBILITIES

It shall be the responsibility of all Roux employees to report all incidents as soon as possible to the PM (or Administrative Manager for office-related incidents), SHSO, OHSM and OM, regardless of severity. Additionally, the following positions have specific responsibilities for implementing this specific SOP.

3.1 Corporate Health and Safety Manager (CHSM)

- The CHSM has the responsibility of ensuring that a system is in place for reporting, investigation, correction, and communicating of EHS incidents and near losses.
- The CHSM has the overall responsibility of implementing and communicating the contents of this program to Office Health and Safety Managers (OHSMs).
- The CHSM will review all incidents and corrective actions taken. The CHSM will provide a summary of serious incidents to the Board of Directors.
- The CHSM will communicate learnings from incidents and corrective actions taken to all personnel, through quarterly communications.
- The CHSM will periodically review and evaluate the effectiveness of this procedure.

3.2 Office Manager (OM)

- The OM will designate the individual to serve as the OHSM responsibility for ensuring that requirements in this procedure are met.
- The OM will ensure that sufficient resources are allocated to fulfill the requirements of this procedure.
- The OM will conduct final review of all incident reports prepared under this procedure.

3.3 Office Health and Safety Manager (OHSM)

- It is the responsibility of the OHSM to review draft incident reports and assist the OM in finalizing reports of all accidents, illnesses and incidents related to work activity, and to assist the SHSO when necessary.

- The OHSM may not approve a site-specific HASP unless the HASP includes incident reporting procedures and forms.
- The OHSM will suggest and implement corrective actions to prevent the same type of incident from re-occurring.
- The OHSM will keep all incident reports, corrective action taken, and follow-up forms on file. The OHSM will provide copies of all final reports and forms to the CHSM within one week of the incident. If a serious incident occurs, the CHSM will be notified as soon as possible.
- The occurrence of a serious incident will trigger an EHS audit by the OHSM.

3.4 Project Manager (PM)

- It shall be the PM's responsibility to promptly correct any deficiencies that were determined to cause or contribute to the incident investigated.
- If a site-specific HASP is not utilized, the PM must ensure that field personnel have copies of the Roux Accident Reporting and Investigation Forms.
- The PM has the responsibility of ensuring that the SHSO and other field personnel understand the need for timely incident reporting.
- In the event of an incident, the PM will determine the root cause of the incident with the assistance of the SHSO and/or OHSM. The PM should provide input as to corrective preventative measures.

3.5 Site Health and Safety Officer (SHSO)

- The SHSO shall provide the details of the incident to the OHSM, PM and OM. The OM or his delegate will provide additional notifications, such as, in the event of a work-related motor vehicle accident, to include Roux Legal.
- It is the SHSO's responsibility to immediately notify the OHSM and the PM when any incident occurs. Such notification should take place immediately following the completion of any emergency actions required by the HASP.
- The SHSO should provide input as to corrective preventative measures.
- The SHSO must ensure that corrective actions proposed by the OHSM or OM are carried out.

3.6 All Personnel

- All personnel are responsible for reporting and describing the details of any incident in which they are involved to the SHSO and PM. Such notification should take place immediately following the completion of any emergency actions required by the HASP and after the loss and before the scene is disturbed or vehicles moved.

4. PROCEDURE

4.1 Incident Investigation

On receiving a report of incident or near loss occurrence from a Roux employee, the SHSO or OHSM shall immediately investigate the circumstances and shall make appropriate recommendations to prevent recurrence. The Incident Report form can be found in **Appendix A**, and Near Loss form can be found in **Appendix B**. The OHSM may participate in the investigation of more serious accidents and incidents that occur on-site. The Corporate Health and Safety Manager (CHSM) shall also be immediately notified by telephone on occurrence of a serious accident or incident. At the CHSM's discretion, he may also participate in the investigation.

4.2 Incident Report

Details of the incident shall be documented using the Accident Report and Investigation Forms (Appendix A) within twenty-four (24) hours of the incident and shall be distributed to the SHSO, the OHSM, PM, OM and the CHSM. The CHSM will update OSHA Forms 301 and the 300 log when necessary.

Appendix A – Accident Report and Investigation Form

☐ **Roux Environmental Engineering and Geology, D.P.C.**
☐ **Roux Associates, Inc.** ☐ **Remedial Engineering, P.C.**

ACCIDENT REPORT

Brian Hobbs, Corporate Health and Safety Manager
Cell: (631) 807-0193; Office: (631) 630-2416

PART 1: ADMINISTRATIVE INFORMATION

Project #: ____________________
Project Name: ____________________
Project Location (street address/city/state): ____________________

Client Corporate Name / Contact / Address / Phone #: ____________________

Immediate Verbal Notifications Given To:

Corporate Health & Safety	☐Yes	☐No
Office Health & Safety	☐Yes	☐No
Office Manager	☐Yes	☐No
Project Principal	☐Yes	☐No
Project Manager	☐Yes	☐No
Client Contact	☐Yes	☐No

REPORT STATUS (time due):

☐ Initial (24 hr) ☐ Final (5-10 days)
Date: __________ Date: __________

Accident Report Delivered To:

Corporate Health & Safety	☐Yes	☐No
Office Health & Safety	☐Yes	☐No
Office Manager	☐Yes	☐No
Project Principal	☐Yes	☐No
Project Manager	☐Yes	☐No

REPORT TYPE: ☐ Loss ☐ Near Loss Estimated Costs: $ _____

OSHA CASE # Assigned by Corporate Health & Safety if Applicable:

Corporate Health & Safety Confirmed Final Accident Report ☐Yes ☐No

DATE OF INCIDENT: ______________

TIME INCIDENT OCCURRED: __________ ☐AM ☐PM

INCIDENT LOCATION – City, State, and Country (If outside U.S.A.) ____________________

INCIDENT TYPES: (Select most appropriate if Loss occurred.)
From lists below, please select the option that best categories the incident. When selecting an injury or illness, also indicate the severity level.

☐**INJURY** ☐**ILLNESS**

------------------------**Severity Level**---------------------------

☐Fatality ☐First Aid ☐Medical Treatment
☐Restricted Work ☐Lost Time

OTHER INCIDENT TYPES

☐Spill / Release
Material involved: ______________
Quantity (U.S. Gallons): ______________

☐Misdirected Waste ☐Consent Order ☐NOV
☐Property Damage ☐Exceedance
☐Motor Vehicle ☐Fine / Penalty

ACTIVITY TYPE (Check most appropriate one.)

☐CAMP ☐Gauging ☐Subsurface Clearance
☐Construction ☐O&M ☐Trucking
☐Drilling ☐Other Soil Work (e.g. Compaction) ☐Waste Mgmt.
☐Driving ☐Sampling ☐Work Area Prep.
☐Excavation / Trenching ☐Site Walk/Inspection ☐Other

INJURY TYPE (Check all applicable.)

☐Abrasion ☐Occupational Illness
☐Amputation ☐Puncture
☐Burn ☐Rash
☐Cold/Heat Stress ☐Repetitive Motion
☐Inflammation ☐Sprain/Strain
☐Laceration ☐Other________

BODY PART AFFECTED (Check all applicable.)

☐Respiratory ☐Shoulder ☐Face
☐Neck ☐Arm ☐Leg
☐Chest ☐Wrist ☐Knee
☐Abdomen ☐Hand/Fingers ☐Ankle
☐Groin ☐Eye ☐Foot/Toes
☐Back ☐Head ☐Other______

I. PERSON(S) DIRECTLY / INDIRECTLY INVOLVED IN INCIDENT (Attach additional information as necessary/applicable.)

Name/Phone # of Each Person Directly/Indirectly Involved in Incident:	Designate: Roux/Remedial Employee; Roux/Remedial Subcontractor; Client Employee; Client Contractor; Third Party	As applicable, Current Occupation; Yrs in Current Occupation; Current Position; and Yrs in Current Position:	As applicable, Employer Name; Address; and Phone #:	As applicable, Supervisor Name; and Phone #:
1)				
2)				

II. PERSONS INJURED IN INCIDENT (Attach additional information as necessary/applicable.)					
Name/Phone # of Each Person Injured in Incident:	Designate: Roux/Remedial Employee Roux/Remedial Subcontractor Client Employee Client Contractor Third Party	As applicable, Current Occupation; Yrs in Current Occupation; Current Position; and Yrs in Current Position:	As applicable, Employer Name; Address; and Phone #:	As applicable, Supervisor Name; and Phone #:	Description of Injury:
1)					
2)					

III. PROPERTY DAMAGED IN INCIDENT (Attach additional information as necessary/applicable.)				
Property Damaged:	Property Location:	Owner Name, Address & Phone #:	Description of Damage:	Estimated Cost:
1)				
2)				$

IV. WITNESSES TO INCIDENT (Attach additional information as necessary/applicable.)		
Witness Name:	Address:	Phone #:
1)		
2)		

PART 2: WHAT HAPPENED AND INCIDENT DETAILS

PROVIDE FACTUAL DESCRIPTION OF INCIDENT (e.g., describe loss/near loss, injury, response / treatment).

I. AUTHORITIES/GOVERNMENTAL AGENCIES NOTIFIED (Attach additional information as necessary/applicable.)				
Authority/Agency Notified:	Name/Phone #/Fax # of Person Notified:	Address of Person Notified:	Date & Time of Notification:	Exact Information Reported/Provided:

II. PUBLIC RESPONSES TO INCIDENT (if applicable)				
Response/Inquiry By: (check one)	Entity Name:	Name/Phone # of Respondent/ Inquirer:	Address of Entity/Person:	Date & Time of Response/Inquiry:
☐Newspaper ☐Television ☐Community Group ☐Neighbors ☐Other ________________				
Describe Response/Inquiry:				
Roux/Remedial Response:				

(Check all that apply.) (Attach photos, drawings, etc. to help illustrate the incident.)
ATTACHED INFORMATION: ☐Photo ☐Sketches ☐Vehicle Acord Form ☐Police Report ☐Other

Name(s) of person(s) who prepared Initial and Final Report:	**Title(s):**	**Phone number(s):**

PART 3: INVESTIGATION TEAM ANALYSIS

Date Investigation Started (MM/DD/YYYY):

Factors, Root Causes, and Solution (FRCS): Complete FRCS form and answer all 7 factor questions. If answering NO to Factors 1 – 4 identify root cause(s) and explain why QIs) occurred. If answering YES to Factors 5 – 7 circle the root cause(s). Transfer the solutions guidance that addresses each root cause from the FRCS form to this form. Attach your completed FRCS Worksheet. If Factors 1-7 do not apply to the incident, write “External Cause” in the Factor column below and leave the remaining fields blank.

DESCRIPTION OF UNDESIRABLE BEHAVIOR/CONDITION

1.
2.

FACTOR(S) AND SOLUTION(S): HOW TO REDUCE POSSIBILITY OF INCIDENT RECURRING

Selection of factors and solutions reflects the analysis of investigation team and is not meant to be a legally binding conclusion as to the Root Cause and/or solution.

CAUSAL FACTOR/ BEHAVIOR/ CONDITION	ROOT CAUSE	SOLUTION(S) [Must Match Root Cause(s)]	PERSON RESPONSIBLE	AGREED DUE DATE	ACTUAL COMPLETION DATE

INVESTIGATION TEAM:

PRINT NAME	JOB POSITION	DATE	SIGNATURE

QUALITY REVIEW Correct root cause(s) identified? Do root cause(s) and solution(s) match? Are solution(s) feasible / maintainable?

Name: **Job Title:**

PART 4: Date Solutions were Implemented & Validated (Were Solutions Effective?)

Date	Solution	Verifier / Validator Name and Job Title	**Details** (of I & V performed)

Appendix B – Near Loss Form

HEALTH & SAFETY NEAR LOSS
ROUX REPORT FORM

☐ **Roux Environmental Engineering and Geology, D.P.C.**
☐ **Roux Associates, Inc.** ☐ **Remedial Engineering, P.C.**

(Check applicable company name)

<table>
<tr><td colspan="4">PART 1: ADMINISTRATIVE INFORMATION</td></tr>
<tr><td colspan="4">Office: ☐ New York ☐ Massachusetts ☐ New Jersey ☐ Illinois ☐ CA - Los Angeles ☐ CA - Oakland</td></tr>
<tr><td colspan="2">Project Manager:</td><td colspan="2">Project Principal:</td></tr>
<tr><td colspan="2">Project Name:</td><td colspan="2">Project Location:</td></tr>
<tr><td colspan="4">PART 2: NEAR LOSS INCIDENT DETAILS</td></tr>
<tr><td colspan="2">Date\Time Occurred (MM/DD/YYYY HH:MM):</td><td colspan="2">Date\Time Submitted (MM/DD/YYYY HH:MM):</td></tr>
<tr><td colspan="4">NEAR LOSS INCIDENT TYPE - What could have happened? - Select all that apply (1-7)</td></tr>
<tr><td colspan="4">1. ☐ Fire / Explosion
2. ☐ Injury / Illness
3. ☐ Security (e.g., theft, trespassing, vandalism)
4. ☐ Environmental (Spill, permit exceedance, etc.)
5. ☐ Transportation of personnel (vehicle accident)
6. ☐ Property/Equipment Damage
7. ☐ Business Interruption</td></tr>
<tr><td colspan="4">Event Leading to Potential Injury/Illness:</td></tr>
<tr><td colspan="2">Job Task*:</td><td colspan="2">Equipment Involved*:</td></tr>
<tr><td colspan="4">WHAT HAPPENED? Do not include individuals' names. Ensure photos, sketches, etc. are not personally identifiable unless written consent has been obtained.</td></tr>
<tr><td colspan="4">Summary (1-2 sentences. Provide brief description of the incident. Provide facts only, no speculation or opinion):

Incident Details (Brief factual details of what, where, when; include photos, sketches, etc. as attachments):

Immediate Corrective Actions Taken:</td></tr>
<tr><td colspan="4">SERIOUS INJURY OR FATALITY (SIF): IF AN ACTUAL SIF, USE EXISTING ROUX ACCIDENT REPORTING FORM</td></tr>
<tr><td colspan="4">Could this have resulted in a SIF? ☐ Yes ☐No</td></tr>
<tr><td colspan="4">A potential SIF is defined as likely to have caused an injury resulting in significant physical body damage with probable long term and/or life altering complications.</td></tr>
<tr><td colspan="4">INCIDENT INVOLVED:</td></tr>
<tr><td colspan="4">Roux Employee: ☐ Yes ☐ No Subcontractor Company Name:</td></tr>
<tr><td colspan="4">INVESTIGATION TEAM</td></tr>
<tr><td>NAME</td><td>JOB TITLE</td><td>NAME</td><td>JOB TITLE</td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
</table>

PART 3: INCIDENT INVESTIGATION FINDINGS AND REPORT QUALITY REVIEW

Date Investigation Started (mm/dd/yyyy):

Factors, Root Causes, and Solution (FRCS): Complete FRCS form and answer all 7 factor questions. If answering NO to Factors 1 – 4 identify root cause(s) and explain why QIs) occurred. If answering YES to Factors 5 – 7 circle the root cause(s). Transfer the solutions guidance that addresses each root cause from the FRCS form to this form. Attach your completed FRCS Worksheet. If Factors 1-7 do not apply to the incident, write "External Cause" in the Factor column below and leave the remaining fields blank. Do not include individuals' names.

DESCRIPTION OF UNDESIRABLE BEHAVIOR/CONDITION

1.

2.

FACTOR(S) AND SOLUTION(S): HOW TO REDUCE POSSIBILITY OF INCIDENT RECURRING
Selection of factors and solutions reflects the analysis of investigation team and is not meant to be a legally binding conclusion as to the Root Cause and/or solution.

Behavior / Condition	Root Cause	Solution(s) (Must Match Root Cause)	Person Responsible for Completion	Completion Target Date	Completion Actual Date

QUALITY REVIEW Correct root cause(s) identified? Do root cause(s) and solution(s) match? Are solution(s) feasible / maintainable?

Name: **Job Title:**

PART 4: Date Solutions were Implemented & Validated (Were Solutions Effective?)

Date	Solution	Verifier / Validator Name and Job Title	**Details** (of I & V performed)

***JOB TASK - Select the most appropriate one** (primary job associated with incident-related work activity, avoid "Other" if possible)

1. CAMP
2. Construction
3. Drilling
4. Driving
5. Excavation/Trenching
6. Gauging
7. O&M
8. Other Soil Work (e.g. Compaction)
9. Sampling
10. Site Walk/ Inspection
11. Subsurface Clearance
12. Trucking
13. Waste Management
14. Work Area Preparation
15. Other

***EQUIPMENT INVOLVED THAT CONTRIBUTED TO H&S NEAR LOSS - Select all that apply**

1. Air Stripper
2. API Separator
3. Automobile
4. Boom Material
5. Bulldozer
6. Cable
7. Carbon Drum / Vessel
8. Chain Block
9. Compressor, Air
10. Control Panel (local)
11. Crane (mobile)
12. Drill Rig
13. Drilling Equipment, Vacuum
14. Drum, Vertical
15. Dump Truck
16. Electric Heater
17. Electrical Power Supply
18. Engine, Combustion
19. Equipment Safety Grounding
20. Excavator / Power Shovel
21. Exclusion Zone Equipment
22 Fan / Blower
23 Fencing
24 Filter
25. Fire Extinguisher
26. Forklift
27. Front End Loader
28. Grader
29. Hammer
30. Knife
31. Non-Powered Equipment
32. Powered Equipment
33. Drill
34. Grinder
35. Hydraulic Torque Wrench
36. Powered Saw
37. Impact Wrench
38. Saw
39. Screwdriver
40. Shears
41. Shovel
42. Snip
43. Wrench
44. Hoist
45, Hook/Clamp/Buckle, etc.
46. Jack
47. Ladder, Extension
48. Ladder, Platform
49. Ladder, Step
50. Lock Out / Tag Out
51. Maintenance Tool, General
52. Manifold
53, Manlift/Basket/Cherry Picker
54. Motor, Electric
55. Oxidizer
56. Pallet
57. Piping
58. Piping, Hose
59. Piping, Injection/Mixing Point
60. Hydrojet
61. Centrifugal Pump
62. Diaphragm Pump
63. Reciprocating Pump
64. Regenerative Pump
65. Rotary Pump
66. Transfer Pump
67. Submersible Pump
68. Face Shield
69. Fall Protection
70. Gloves
71. Hard Hat / Helmet
72. Hearing Protection
73. Respiratory PPE (Chemical)
74. Respiratory PPE (Particulate)
75. Safety Glasses
76. Safety Goggles
77. Safety Shoes / Boots
78. Safety Vest / Clothing
79. Rope
80. Bailer
81. Geoprobe
82. Hand Auger
83. PID
84. Multi-Gas Meter
85. Sample Container
86. Split-Spoon Sampler
87. Sling
88. Snow Blower
89. Snow Plow
90. Space Heater
91. Air Sparging System
92. Carbon Treatment Sy
93. Chemical Oxidation S
94. Dual Phase Product Recovery System
95. Groundwater Pump and Treat System
96. POET System
97. Shed or Trailer
98. Vapor Extraction System
99. Vapor-Phase Treatment System
100. Other System, Type:____
101. Surge Tank
102. Underground Tank
103. Telemetry System
104. Testing Devices
105. Tractor Trailer
106. Truck, Flatbed
107. Truck, Pickup
108. Truck, Tank Truck
109. Truck, Vacuum
110. Safety Valve
111. Block Valve
112. Extraction Well
113. Monitoring Well
114. Recovery Well
115. Winch
116. Wire Rope
117. No Equipment Involved
118. MPT – Traffic Control Devices
118. Not in List (describe):____

Appendix C – Injury Illness Reporting Flow Chart

Health & Safety Near/Loss – Loss (Incident)*
Notification Flow Chart

Incident*
Occurs

↓

Involved Employees
Immediately Notify**
SHSO

↓

SHSO Immediately Notifies**
OHSM and/PM

↓

OHSM and PM (Conduct Invest.)
Immediately Notify** PP and OM

↓

OM Notifies**
CHSM

↓

CHSM and/or OM Notify**
COO & CEO

* Incident – any work or site-related occurrence that resulted in, or could potentially have resulted in, the need for medical care or in property damage (i.e., all injuries or illnesses, exposure to toxic materials or any other significant occurrence resulting in property damage or in a "near loss")

** Verbal Notification

Initial Incident Report (written) to SHSO, OHSM, OM and CHSM within 24 hours
Follow-up Report within one week.

APPENDIX E

Heavy Equipment Exclusion Zone Policy

HEAVY EQUIPMENT EXCLUSION ZONE MANAGEMENT PROGRAM

CORPORATE HEALTH AND SAFETY MANAGER	:	**Brian Hobbs, CIH, CSP**
EFFECTIVE DATE	:	**07/18**
REVISION NUMBER	:	**1**

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1. PURPOSE

The purpose of the Exclusion Zone Management Program is to establish the minimum clearance distance that must be maintained between workers and heavy equipment while equipment is in operation (i.e., engaged or moving). The intent is to have no personnel or equipment entering the Exclusion Zone while the equipment is in operation or moving to ensure that Roux and Subcontractor employees are not unnecessarily exposed to the hazards of the equipment.

2. SCOPE AND APPLICABILITY

This Management Program applies to all Roux Associates, Inc. and its affiliated companies, Roux Environmental Engineering and Geology, D.P.C, and Remedial Engineering (collectively, "Roux") employees and their subcontractors who are performing field work and are potentially exposed to heavy equipment. For the purpose of this program, heavy equipment includes, but is not necessarily limited to: excavation equipment, drill rigs, vacuum trucks, forklifts, lull telehandlers, man lifts, bobcats, delivery trucks, etc.

3. PROCEDURES

As specified in the following sections of this Program, an Exclusion Zones must be established and maintained during activities involving the movement/operation of heavy equipment. The Exclusion Zone requirements apply to all personnel on the site but are primarily focused on those personnel who are required to be working in the vicinity of the equipment. The exclusion zone is in effect when heavy equipment is moving or engaged (ex. movement of an arm or bucket of an excavator, rotation of an auger, lifting of a load with a forklift, raising/lowering of a man lift, etc.).

1. The Exclusion Zone must meet the following minimum requirements:
   - A minimum distance of 10 feet from all heavy equipment and loads being moved by the equipment;
   - Greater than the swing/reach radius of any moving part on the heavy equipment (i.e., for large equipment this may mean an exclusion zone distance larger than 20 feet);
   - Greater than the tip-over distance of the heavy equipment; and
   - Greater than the radius of blind spots.

The size of the Exclusion Zone will need to be determined on a task-specific basis considering the size of the heavy equipment in use and the task being performed. Prior to all heavy equipment operations, the Exclusion Zone(s) distance must be specifically identified in the Job Safety Analysis (JSA).

2. The spotter (or another individual) should be assigned responsibility for enforcing the Exclusion Zone. The spotter should be positioned immediately outside of the Exclusion Zone within a clear line of sight of the equipment operator. The spotter must signal the operator to stop work if anyone or anything has the potential to enter or compromise the Exclusion Zone. The operator should stop work if the spotter is not within his/her line of sight. If multiple pieces of equipment are being used, each piece of equipment must have its own Exclusion Zone and spotter. For large excavation and demolition projects the spotter should be in constant radio contact (not cell phone) with the machine driver.
3. If an individual must enter the Exclusion Zone, the designated Spotter must signal the Equipment Operator to stop the equipment. Once the equipment is no longer moving (ex. movement of an arm of an excavator is STOPPED, lifting of a load with a forklift STOPPED, raising/lowering of a man lift is

STOPPED, etc.), the operator must DISENGAGE THE CONTROLS and STOP and SIGNAL BY "SHOWING HIS HANDS". This signal will indicate that it is safe for the personnel to enter the limits of the Exclusion Zone to perform the required activity. The equipment must remain completely stopped/disengaged until all personnel have exited the limits of the Exclusion Zone and the designated Spotter has signaled by "SHOWING HIS HANDS" to the Equipment Operator that it is safe to resume operations.

4. When entering the limits of the Exclusion Zone, personnel must at a minimum:
   - Establish eye contact with the operator and approach the heavy equipment in a manner that is in direct line of sight to the Equipment Operator;
   - Never walk under any suspended loads or raised booms/arms of the heavy equipment; and
   - Identify a travel path that is free of Slip/Trip/Fall hazards.
5. The Exclusion Zone should be delineated using cones with orange snow fence or solid poles between the cones, barrels, tape or other measures. For work in rights-of-way rigid barriers, such as Jersey barriers or temporary chain link fence should be used. For certain types of wide-spread or moving/mobile equipment operations, such delineation may not be practicable around pieces of equipment or individual work areas. In such instances, it is expected that the entire operation will be within a larger secure work area or that additional means will be utilized to ensure security of the work zone.

> All subcontractors who provide heavy equipment operations to field projects must implement a program that meets or exceeds the expectations described above as well as any additional requirements that may be required on a client or site-specific basis.

3.1 Exceptions

It is recognized that certain heavy equipment activities may require personnel to work within the limits of the Exclusion Zone as specified in this program. Such activities may include certain excavation clearance tasks, drill crew activities or construction tasks. However, any such activity must be pre-planned with emphasis on limiting the amount and potential exposure of any activity required within the zone. The critical safety steps to mitigate the hazards associated with working within the Exclusion Zone must be defined in the JSA and potentially other project-specific plans (i.e., critical lift plans, etc.), and approved by the Roux Project Principal and client representative, if required, prior to implementation.

4. TRAINING

Many Roux projects have different requirements that are client-specific or site-specific in nature. It is the responsibility of the Project Principal (or Project Manager if delegated this responsibility by the Project Principal) to ensure that the workers assigned to his/her projects are provided orientation and training with respect to these client and/or site-specific requirements.

APPENDIX F

Subsurface Utility Clearance Management Program

SUBSURFACE UTILITY CLEARANCE MANAGEMENT PROGRAM

CORPORATE HEALTH AND SAFETY MANAGER	**:**	**Brian Hobbs, CIH, CSP**
EFFECTIVE DATE	**:**	**07/18**
REVISION NUMBER	**:**	**1**

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APPENDICES

1. PURPOSE

Roux Associates, Inc. and its affiliated companies, Roux Environmental Engineering and Geology, D.P.C, and Remedial Engineering (collectively, "Roux") has instituted the following program for completing proper utility mark-outs and for conducting subsurface clearance activities. This establishes a method to ensure, to the greatest extent possible, that utilities have been identified and contact and/or damage to underground utilities and other subsurface structures will be avoided.

2. SCOPE AND APPLICABILITY

The Subsurface Utility Clearance Management Program applies to all Roux employees, its contractors and subcontractors. Employees are expected to follow this program for all intrusive work involving Roux or other personnel (e.g., contractors/subcontractors) working for Roux unless the client's requirements are more stringent. Deviation from the program regardless of the specific work activity or work location must be pre-approved based on client's site knowledge, site experience and client's willingness for the use of this program. Any and all exceptions shall be documented and pre-approved by the Project Principal and the Office Manager.

3. PROCEDURES

3.1 Before Intrusive Activities

During the project kick-off meeting for intrusive activities the PM will review the Roux Subsurface Utility Clearance Checklist and Utility Verification (Appendix C) / Site Walkthrough Record (Appendix D) and the below bullet points with the project field team:

(Please note that these are intended as general reminders only and should not be solely relied upon.)

- Ensure the Mark-out / Stake-out Request Information Sheet (or one-call report) is complete and accurate for the site including address and cross streets and review for missing utilities. (Note: utility mark-out organizations do not have contracts with all utilities and it is often necessary to contact certain utilities separately such as the local water and sewer authorities).
- Have written confirmation prior to mobilizing to the site that the firm or Roux personnel performing the intrusive activity has correctly completed the mark-out notification process including requesting mark-outs, waiting for mark-outs to be applied to ground surfaces at the site, and receiving written confirmation of findings (via fax or email) from utility operators for all known or suspected utilities in the proposed area of intrusive activity, and provided utility owner written confirmation to Roux personnel for review and project files documentation.
- Do not begin any intrusive activity until all utilities mark-out has been completed (i.e., did all utilities mark-out the site?) and any unresolved mark-out issues are finalized. Perform a site walk to review the existing utilities and determine if said utilities have been located by the utility locators.

  (Note: The Tolerance Zone is defined as two feet plus half of the diameter or half of the greatest dimension (for elliptical sewers, duct banks and other non-cylindrical utilities) of a utility and two feet from the outside edge of any subsurface structure.)
- Install Pre-Clearance exploratory test holes (e.g., hand-dug test holes or other soft digging techniques) for the first 5-ft below land surface (BLS) at each location prior to conducting mechanized intrusive activities. The size of the pre-clearance exploratory test hole should be at a minimum twice the diameter of any downhole tool or boring device. (Note: Pre-Clearance exploratory test holes should be defined in the SOW/proposal provided to the client to prevent project delays and to allow adequate time for PM and PP to evaluate alternative approaches for the project. Alternative approaches will need to be pre-approved by the OM.

- For excavations, all utilities need to be marked and then exposed by hand following the protocols in this program. Pre-clearing for excavations may be performed by the "moat" technique (i.e., soft digging around the perimeter). In these cases, dig in small lifts (<12" for first 5 feet) using a dedicated spotter.) For Tolerance Zone work, unless otherwise agreed upon with the Utility Operator, work within the tolerance zone requires verification by means of hand-dug test holes performed to expose the utility. Once structures have been verified a minimum clearance of two feet must be maintained between the utility and any powered equipment.
- In addition, the following activities should be conducted:
  - Review the work scope to be performed with the site owner/tenant to determine if it may impact any utilities;
  - Attempt to procure any utility maps or historic drawings of subsurface conditions of the site;
  - **Determine the need for utility owner companies to be contacted or to have their representatives on site**;
  - Where mark-outs terminate at the property boundary, consider the use of private utility locating / GPR / geophysical-type services which may be helpful in locating utilities. Use of private utility locating firms, however, does not eliminate the legal requirement for the Excavator firm to submit a request for Public Utility Mark-outs. Also, the information provided by the service may be inaccurate and unable to locate subsurface utilities and structures in urban areas, landfills, urban fill areas and below reinforced slabs, etc. They should not be relied upon as the only means of performing utility clearance;
  - Documented description of the dig site which is included in the projects Health and Safety Plan (HASP) and one call report will be maintained in the field and distributed amongst Roux personnel its contractors and subcontractors; and
  - Documentation of the actual placement of mark outs in the field shall be collected using dated pictures, videos and/or sketches with distance from markings to fixed objects. All documentation shall be maintained within the project file.

3.2 During Intrusive Activities

The PM, field team lead or personnel performing oversight is to:

- Ensure the mark-out remains valid. (In certain states there are limits regarding the duration of time after the mark-out was applied to the ground surface work can be started or interrupted.) Additionally, the mark-outs must be maintained, documented, and in many cases refreshed periodically to be considered valid, this will be accomplished through calls to the one call center.
- Ensure intrusive activities are only performed within the safe boundaries of the mark-out as detailed in the One-Call Report.
- Halt all work if intrusive activities have resulted in discovery of an unmarked utility. Roux personnel shall notify the facility owner/operator and the one call center. All incidents such as this will be reported as per Roux Incident Investigation and Reporting Management Program.
- Halt all work if intrusive activities must take place outside of the safe boundaries of a mark-out and only proceed after new mark-outs are performed.
- Halt the intrusive activities and immediately consult with the PP if an unmarked utility is encountered.
- Completing any subsurface utility clearance incident reports that are necessary.

- If a utility cannot be found as marked Roux personnel shall notify the facility owner/operator directly or through the one call center. Following notification, the excavation may continue, unless otherwise specified in state law.
- Contractors/subcontractors must contact the one-call center to refresh the ticket when the excavation continues past the life of the ticket. Ticket life shall be dictated by state law however at a maximum ticket life shall not exceed 20 working days.

3.3 Stop Work Authority

Each Roux employee has Stop Work Authority which he or she will execute upon determination of any imminent safety hazard, emergency situation, or other potentially dangerous situation, such as hazardous weather conditions. This Stop Work Authority includes subsurface clearance issues such as the adequacy of a mark-out or identification during intrusive operations of an unexpected underground utility. Authorization to proceed with work will be issued by the PM/PP after such action is reviewed and resolved. The PM will initiate and execute all management notifications and contact with emergency facilities and personnel when this action is appropriate.

Appendix A - Definitions

Intrusive Work Activities	All activities such as digging or scraping the surface, including but not limited to, excavation, test pitting or trenching, soil vapor sampling or the installation of soil borings, soil vapor monitoring points and wells, or monitoring wells, and drilling within the basement slab of a recently demolished building.
Mark-out / Stake Out	The process of contracting with a competent and qualified company to confirm the presence or absence of underground utilities and structures. This process will clearly mark-out and delineate utilities that are identified so that intrusive work activities can be performed without causing disturbance or damage to the subsurface utilities and structures. After utility mark-outs are completed the soft digging will be completed prior to intrusive work.
Tolerance Zone	Defined as two feet on either side of the designated centerline of an identified utility, plus half of the diameter or half of the greatest dimension (for elliptical sewers, duct backs and other non-cylindrical utilities) of that utility and two feet from the outside edge of any subsurface structure.
Structure	For the purpose of this program a structure is defined as any underground feature that may a present potential source(s) of energy such as, but not limited to, utility vaults, bunkers, piping, electrical boxes, wires, conduits, culverts, utility lines, underground tanks and ducts.
Soft Digging	The safest way to remove material from unknown obstructions or services is by using tools such as a vactor or air knife, non-mechanical tools, or hand tools. The methods are clean and non-evasive and used for uncovering and exposing buried services, excavating and for providing a quick method of soil removal from sensitive areas.
Verification	Exploratory test-hole dug with hand tools within the Tolerance Zone to expose and verify the location, type, size, direction-of-run and depth of a utility or subsurface structure. Vacuum excavation (soft dig) methods can further facilitate exposure of a subsurface utility and accurately provide its location and identification prior to intrusive work approaching the Tolerance Zone.

Appendix B - Example of Completed One Call Report

Example Completed One-Call Report

New York 811

Send To: C_EMAIL Seq No: 744

Ticket No: 133451007 ROUTINE

Start Date: 12/16/13 Time: 7:00 AM Lead Time: 20

State: NY County: QUEENS Place: QUEENS
Dig Street: 46TH AVE Address:
Nearest Intersecting Street: VERNON BLVD
Second Intersecting Street: 11TH ST

Type of Work: SOIL BORINGS
Type of Equipment: GEOPROBE
Work Being Done For: ROUX

In Street: X On Sidewalk: X Private Property: Other:
On Property Location if Private: Front: Rear: Side:

Location of Work: MARK THE ENTIRE NORTH SIDE OF THE STREET AND SIDEWALK OF:
46TH AVE BETWEEN VERNON BLVD AND 11TH STREET

Remarks:

Nad: Lat: Lon: Zone:
ExCoord NW Lat: 40.7475399 Lon: -73.9534811 SE Lat: 40.7457406 Lon: -73.9493680

Company : ZEBRA ENVIROMENTAL Best Time: 6AM-5PM
Contact Name: DAVID VINES Phone: (516)596-6300
Field Contact: DAVID VINES Phone: (516)596-6300
Caller Address: 30 N PROSPECT AVE Fax Phone: (516)596-4422
LYNBROOK, NY 11563
Email Address: david@zebraenv.com

Additional Operators Notified:

ATTNY01	AT&T CORPORATION	(903)753-3145
CEQ	CONSOLIDATED EDISON CO. OF N.Y	(800)778-9140
MCINY01	MCI	(800)289-3427
PANYNJ01	PORT AUTHORITY OF NY & NJ	(201)595-4841
VZQ	VERIZON COMMUNICATIONS	(516)297-1602

Link to Map for C_EMAIL: http://ny.itic.occinc.com/XGMZ-DF2-L23-YAY

Original Call Date: 12/11/13 Time: 1:15 PM Op: webusr
IMPORTANT NOTE: YOU MUST CONTACT ANY OTHER UTILITIES DIRECTLY

Appendix C - Roux Subsurface Utility Clearance Checklist

Roux Subsurface Utility Clearance Checklist ***Date of Revision – 12/3/14***

Work site set-up and work execution

ACTIVITY	Yes	No	N/A	COMMENTS INCLUDING JUSTIFICATION IF RESPONSE IS NO OR NOT APPLICABLE
Daily site safety meeting conducted, SPSAs performed, JSAs reviewed, appropriate work permits obtained.				
HASP is available and reviewed by site workers / visitors.				
Subsurface Utility Clearance Procedure has been reviewed with all site workers.				
Work area secured; traffic control established as needed. Emergency shut-off switch located. Fire extinguishers / other safety equipment available as needed.				
Utility mark-outs (public / private) clear and visible. Provide Excavator's Stake-Out Reference Number / Request Date / Time.				
Tolerance zone work identified.				
Work execution plan reviewed and adhered to (ground disturbance methods, clearance depths, any special utility protection requirements, or any other execution requirements; especially for Tolerance Zone work).				
Verbal endorsement received from Roux PM for any required field deviations to work execution plan.				

<u>Key reminders for execution</u>:

The Subsurface Utility Clearance Protocol should be referenced to determine all requirements while executing subsurface work. The bullet points below are intended as general reminders only and should not be solely relied upon.

- Tolerance zone is defined as two feet plus half of the diameter or half of the greatest dimension (for elliptical sewers, duct banks and other non-cylindrical utilities) of a utility and two feet from the outside of any subsurface structure.
- Install Pre-Clearance exploratory test holes (e.g., hand-dug test holes or vacuum excavation) must be performed for the first five feet below land surface (BLS) at each location prior to conducting mechanized intrusive activities. The size of the pre-clearance exploratory test hole should be at a minimum twice the diameter of any downhole tool or boring device. (Note: Pre-clearance exploratory test holes should be defined in the SOW/proposal provided to the client to prevent project delays and to allow adequate time for PM and PP to evaluate alternative approaches for the project. Alternate approaches will need to be pre-approved by the OM.
- For excavations, all utilities need to be marked and then exposed by hand following the protocols in this program. Pre-clearing for excavations may be performed by the "moat" technique (i.e., soft

digging around the perimeter). In these cases, dig in small lifts (<12" for first five feet) using a dedicated spotter.) For Tolerance Zone work, unless otherwise agreed upon with the Utility Operator, work within the tolerance zone requires verification by means of hand-dug test holes to expose the utility. Once structures have been verified a minimum clearance of two feet must be maintained between the utility and any powered equipment.

Appendix D - Utility Verification/Site Walkthrough Record

Employee Name:____

Date: ____

Instructions: For each utility suspected at the job site, indicate location on the job site, approximate burial depth, and means of detecting the utility. Leave blank if that utility is not believed to be present.

Utility	Description of Utility Location Identified Onsite	Approx. Depth (bls)	Method / Instrumentation used to determine Utility Location	Utility Owner Response (Date/Time)	Mark Out Indicates (Clear / Conflict)
Electrical Lines					
Gas Lines					
Pipelines					
Steam Lines					
Water Lines					
Sanitary and Stormwater Sewer lines					
Pressured Air-Lines					
Tank Vent Lines					
Fiber Optic Lines					
Underground Storage Tanks					
Phone Lines/ Other					

* bls - below land surface

Site Sketch Showing Utilities:

Color Code

- ELECTRIC
- Gas-oil Steam
- Communications CATV
- WATER
- Reclaimed Water
- SEWER
- Temp. Survey Markings
- Proposed Excavation

Other Comments / Findings:

Completed by: ______________________________

Signature: ______________________________ Date: ____________

APPENDIX G

Personal Protective Equipment Management Program

PERSONAL PROTECTIVE EQUIPMENT MANAGEMENT PROGRAM

CORPORATE HEALTH AND SAFETY MANAGER	:	**Brian Hobbs, CIH, CSP**
EFFECTIVE DATE	:	**01/19**
REVISION NUMBER	:	**4**

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1. PURPOSE

Roux Associates, Inc. and its affiliated companies, Roux Environmental Engineering and Geology, D.P.C, and Remedial Engineering (collectively, “Roux”) has instituted the following program to establish guidelines for the selection of personal protective equipment (PPE) for use by Roux personnel performing field activities in hazardous environments. PPE is not meant to be a substitute for engineering, work practice, and/or administrative controls, but PPE should be used in conjunction with these controls to protect the employees in the work place. Clothing, body coverings, and other accessories designed to prevent worker exposure to workplace hazards are all types of PPE. To ensure adequate PPE employee-owned PPE is evaluated on a case-by-case basis to insure its adequacy, maintenance and sanitation.

2. SCOPE AND APPLICABILITY

These guidelines apply to all PPE selection decisions to be made in implementing the Roux program. The foundations for this program are the numerous Occupational Health and Safety Administration (OSHA) standards related to PPE cited in 29 CFR 1910 Subpart I, 29 CFR 1926 Subpart E, and the hazardous environment work employee protection requirements under the OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) standard at 29 CFR 1910.120 and 1926.65. To ensure hazard assessments are documented the levels of protection, types of protection and tasks requiring protection are covered in site-specific Health and Safety Plans (HASPs) and Job Safety Analyses (JSAs).

3. PROCEDURES

Due to the varied nature of site activities and the different potential hazards associated with different sites, several aspects must be considered when selecting PPE. The following text describes PPE selection logic and provides guidelines and requirements for the appropriate selection and use of PPE.

3.1 Introduction

To harm the body, chemicals must first gain entrance. The intact skin and the respiratory tract are usually the first body tissues attacked by chemical contaminants. These tissues provide barriers to some chemicals but in many cases, are damaged themselves or are highly permeable by certain chemical compounds. Personal protective equipment therefore is used to minimize or eliminate chemical compounds coming into contact with these first barrier tissues.

The proper selection of equipment is important in preventing exposures. The PM making the selection will have to take several factors into consideration. The level of protection, type and kind of equipment selected depends on the hazardous conditions and in some cases cost, availability, compatibility with other equipment, and performance. An accurate assessment of all these factors must be made before work can be safely carried out.

3.2 Types of PPE

The type and selection of PPE must meet certain general criteria and requirements as required under OSHA 29 CFR 1910.132 and 1926.95. In addition to these general requirements, specific requirements and specifications exist for some types of PPE that form the basis of the protective clothing scheme. Following is a list of the common types of specific PPE and the specific requirements for the PPE type, where applicable:

1. Hard Hats - Regulated by 29 CFR 1910.135 and 1926.100; and, specified in ANSI Z89.1.

2. Face Shields and Safety Glasses - Regulated by 29 CFR 1910.133 and 1926.102; and, specified in ANSI Z87.1.
3. Respiratory Protection - Regulated by 29 CFR 1910.134 and 1926.103.
4. Hand Protection - Not specifically regulated.
5. Foot Protection - Regulated by 29 CFR 1910.136 and 1926.96; and, specified in ANSI Z41.1.
6. Protective Clothing (e.g., fully encapsulated suits, aprons) - Not specifically regulated.

3.3 Protective Clothing Selection Criteria

3.3.1 Chemicals Present

The most important factor in selecting PPE is the determination of what chemicals the employee may be exposed to. On field investigations, the number of chemicals may range from a few to several hundred. The exact chemicals or group of chemicals present at the site (certain groups tend to require similar protection) can be determined by collecting and analyzing samples of the air, soil, water, or other site media. When data are lacking, research into the materials used or stored at the site can be used to infer chemicals possibly on the site.

Once the known or suspected chemicals have been identified, and taking into consideration the type of work to be performed, the most appropriate clothing shall be selected.

Protective garments are made of several different substances for protection against specific chemicals. There is no universal protective material. All will decompose, be permeated by, or otherwise fail to protect under given circumstances. Fortunately, most manufacturers make guides to the use of their products (i.e., Dupont's Tyvek™ Permeation Guide). These guides are usually for gloves and coveralls and typically provide information regarding chemical degradation rates (failure of the material to maintain structural integrity when in contact with the chemical), and may provide information on the permeation rate (whether or not the material allows the chemical to pass through). When permeation tables are available, they shall be used in conjunction with degradation tables to determine the most appropriate protective material.

During most site work, chemicals are usually in mixed combinations and the protective materials are not in continuous contact with pure chemicals for long periods of time; therefore, the selected material may be adequate for the particular chemical and type of work being performed, yet not the "best" protecting material for all site chemicals and activities. Selection shall depend upon the most hazardous chemicals based on their hazards and concentrations. Sometimes layering, using several different layers of protective materials, affords the best protection.

3.3.2 Concentration of the Chemical(s)

One of the major criteria for selecting protective material is the concentration of the chemical(s) in air, liquid, and/or solid state. Airborne and liquid chemical concentrations should be compared to the OSHA standards and/or American Conference of Governmental Industrial Hygienists (ACGIH) and National Institute for Occupational Safety and Health (NIOSH) guidelines to determine the level of skin or other absorptive surface (e.g., eyes) protection needed. While these standards are not designed specifically for skin exposed directly to the liquid, they may provide skin designations indicative of chemicals known to have significant skin or dermal absorption effects. For example, airborne levels of PCB on-site may be low because it is not very volatile, so the inhalation hazard may be minimal; however, PCB-containing liquid coming in direct contact with the skin may cause overexposure. Thus, PCB has been assigned a skin designation in both the OSHA and ACGIH exposure limit tables.

3.3.3 Physical State

The characteristics of a chemical may range from nontoxic to extremely toxic depending on its physical state. Inorganic lead in soil would not be considered toxic to site personnel, unless it became airborne, since it is generally not absorbed through the intact skin. Organic lead in a liquid could be readily absorbed. Soil is frequently contaminated with hazardous materials. Concentrations will vary from a few parts per million to nearly one hundred percent. The degree of hazard is dependent on the type of soil and concentration of the chemical. Generally speaking, "dry" soils do not cause a hazard to site personnel if they take minimal precautions such as wearing some type of lightweight gloves.

3.3.4 Length of Exposure

The length of time a material is exposed to a chemical increases the probability of breakthrough. Determinations of actual breakthrough times for short-term exposures indicate that several different materials can be used which would be considered inadequate under long-term exposures. It should be kept in mind that during testing, a pure (100% composition) liquid is usually placed in direct contact with the material producing a worst-case situation.

3.3.5 Abrasion

When selecting protective clothing, the job the employee is engaged in must be taken into consideration. Persons moving drums or performing other manual tasks may require added protection for their hands, lower chest and thighs. The use of leather gloves and a heavy apron over the other normal protective clothing will help prevent damage to the normal PPE and thus reduce worker exposures.

3.3.6 Dexterity

Although protection from skin and inhalation hazards is the primary concern when selecting PPE, the ability to perform the assigned task must be maintained. For example, personnel cannot be expected to perform work that requires fine dexterity if they must wear a thick glove. Therefore, the PPE selection process must consider the task being performed and provide PPE alternatives or techniques that allow dexterity to be maintained while still protecting the worker (e.g., wearing tight latex gloves over more bulky hand protection to increase dexterity).

3.3.7 Ability to Decontaminate

If disposable clothing cannot be used, the ability to decontaminate the materials selected must be taken into consideration. Once a chemical contacts the material, it must be cleaned before it can be reused. If the chemical has completely permeated the material, it is unlikely that the clothing can be adequately decontaminated and the material should be discarded.

3.3.8 Climactic Conditions

The human body works best with few restraints from clothing. Protective clothing adds a burden by adding weight and restricting movement as well as preventing the natural cooling process. In severe situations, a modified work program must be used.

Some materials act differently when they are very hot and very cold. For example, PVC becomes almost brittle in very cold temperatures. If there are any questions about the stability of the protective materials under different conditions, the manufacturer should be contacted.

3.3.9 Work Load

Like climactic conditions, the type of work activity may affect work duration and the ability or personnel to perform certain tasks. Similarly, the amount of protective materials a person wears will affect their ability to perform certain tasks. For example, a person in a total encapsulating suit, even at 72 ^{o}F, cannot work for more than a short period of time without requiring a break.

The work schedule should be adjusted to maintain the health of the employees. Special consideration should be given to the selection of clothing that both protects and adds the least burden when personnel are required to perform strenuous tasks. Excessive bodily stress frequently represents the most significant hazard encountered during field work.

3.4 Types of Protective Materials

1. Cellulose or Paper
2. Natural and Synthetic Fibers
   a. Tyvek™
   b. Nomex™
3. Elastomers
   a. Polyethylene
   b. Saran
   c. Polyvinyl Chloride (PVC)
   d. Neoprene
   e. Butyl Rubber
   f. Viton

3.5 Protection Levels

3.5.1 Level A Protection

Level A protection (a fully encapsulated suit) is used when skin hazards exist or when there is no known data that positively rule out skin and other absorption hazards. Since Level A protection is extremely physiologically and psychologically stressful, the decision to use this protection must be carefully considered. At no time will Level A work be performed without the consent of the OM. The following conditions suggest a need for Level A protection:

- confined facilities where probability of skin contact is high;
- sites containing known skin hazards;
- sites with no established history to rule out skin and other absorption hazards;
- atmosphere immediately dangerous to life and health (IDLH) through the skin absorption route;
- site exhibiting signs of acute mammalian toxicity (e.g., dead animals, illnesses associated with past entry into site by humans);

- sites at which sealed drums of unknown materials must be opened;
- total atmospheric readings on the Photoionization Detector (PID), Flame Ionization Detector (FID), and similar instruments indicate 500 to 1,000 ppm of unidentified substances; and
- extremely hazardous substances (e.g., cyanide compounds, concentrated pesticides, Department of Transportation Poison "A" materials, suspected carcinogens and infectious substances) are known or suspected to be present and skin contact is possible.

The following items constitute Level A protection:

- open circuit, pressure-demand self-contained breathing apparatus (SCBA);
- totally encapsulated suit;
- gloves, inner (surgical type);
- gloves, outer;
- chemical protective;
- boots, chemical protective, steel toe and shank;
- radiation detector (if applicable); and
- communications.

3.5.2 Level B Protection

Level B protection is utilized when the highest level of respiratory protection is needed but hazardous material exposure to the few unprotected areas of the body is unlikely.

The following conditions suggest a need for Level B protection:

- the type and atmospheric concentration of toxic substances have been identified and they require the highest level of respiratory protection;
- IDLH atmospheres where the substance or concentration in the air does not present a severe skin hazard;
- the type and concentrations of toxic substances do not meet the selection criteria permitting the use of air purifying respirators; and
- it is highly unlikely that the work being done will generate high concentrations of vapors, gases or particulates, or splashes of materials that will affect the skin of personnel.

Personal protective equipment for Level B includes:

- open circuit, pressure-demand SCBA;
- chemical protective clothing:
- overalls and long-sleeve jacket; or
- coveralls;
- gloves, inner (surgical type); gloves, outer, chemical protective;
- boots, chemical protective, steel toe and shank; and
- communications optional.

3.5.3 Level C Protection

Level C protection is utilized when both skin and respiratory hazards are well defined and the criteria for the use of negative pressure respirators have been fulfilled (i.e., known contaminants and contaminant concentrations, acceptable oxygen levels, approved filter/cartridge available, known cartridge service life, etc.). Level C protection may require carrying an emergency escape respirator during certain initial entry and site reconnaissance situations, or when applicable thereafter.

Personal protective equipment for Level C typically includes:

- full facepiece air-purifying respirator;
- emergency escape respirator (optional);
- chemical protective clothing:
    - overalls and long-sleeved jacket; or
    - coveralls;
- gloves, inner (surgical type);
- gloves, outer, chemical protective; and
- boots, chemical protective, steel toe and shank.

3.5.4 Level D Protection

Level D is the basic work uniform. Personal protective equipment for Level D includes:

- coveralls;
- safety boots/shoes;
- eye protection;
- hand protection;
- reflective traffic safety vest (mandatory for traffic areas or railyard);
- hard hat (with face shield is optional); and
- emergency escape respirator is optional.

3.5.5 Level E Protection

Level E protection is used when radioactivity above 10 mr/hr is detected at the site. Personal protective equipment for Level E includes:

- coveralls;
- air purifying respirator;
- time limits on exposure;
- appropriate dermal protection for the type of radiation present; and
- radiation dosage monitoring.

3.5.6 Additional Considerations

Field work will contain a variety of situations due to chemicals in various concentrations and combinations. These situations may be partially ameliorated by following the work practices listed below:

1. Some sort of foot protection is needed on a site. If the ground to be worked on is contaminated with liquid and it is necessary to walk in the chemicals, some sort of protective "booties" can be worn over the boots. This cuts down on decontamination requirements. They are designed with soles to help prevent them from slipping around. If non-liquids are to be encountered, a Tyvek™ bootie could be used. If the ground contains any sharp objects, the advantage of booties is questionable. Boots should be worn with either cotton or wool socks to help absorb the perspiration.
2. If the site situation requires the use of hard hats, chin straps should be used if a person will be stooping over where his/her hat may fall off. Respirator straps should not be placed over the hard hats. This will affect the fit of the respirator.

   Some types of protective materials conduct heat and cold readily. In cold conditions, natural material clothing should be worn under the protective clothing. Protective clothing should be removed prior to allowing a person "to get warm". Applying heat, such as a space heater, to the outside of the protective clothing may drive the contaminants through. In hot weather, under clothing will absorb sweat. It is recommended that workers use all cotton undergarments.
3. Body protection should be worn and taped to prevent anything from running into the top of the boot. Gloves should be worn and taped to prevent substances from entering the top of the glove. Duct tape is preferred, but masking tape can be used. When aprons are used, they should be taped across the back for added protection. However, this should be done in such a way that the person has mobility.
4. Atmospheric conditions such as precipitation, temperature, wind direction, wind velocity, and pressure determine the behavior of contaminants in air or the potential for volatile material getting into the air. These parameters should be considered in determining the need for and the level of protection.
5. A program must be established for periodic monitoring of the air during site operations. Without an air monitoring program, any changes would go undetected and might jeopardize response personnel. Monitoring can be done with various types of air pumps and filtering devices followed by analysis of the filtration media; personnel dosimeters; and periodic walk-throughs by personnel carrying real-time survey instruments.
6. For operations in the exclusion zone, different levels of protection may be selected, and various types of chemical-resistant clothing may be worn. This selection should be based on the job function, reason for being in the area, and the potential for skin contact with, or inhalation of, the chemicals present.
7. Escape masks must be readily available when levels of respiratory protection do not include a SCBA and the possibility of an IDLH atmosphere exists. Their use can be made on a case-by-case basis. Escape masks could be strategically located at the site in areas that have higher possibilities of vapors, gases or particulates.

APPENDIX H

Community Air Monitoring Plan

ROUX

Community Air Monitoring Plan

Sendero Verde Redevelopment Project – Parcel B
Tax Block 1617 of Tax Lot 20
New York, New York

August 3, 2020

Prepared for:

SV-B Owners LLC
1865 Palmer Avenue
Larchmont, New York 10538

Prepared by:

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209 Shafter Street
Islandia, New York 11749

2984.0003Y.140/CV

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Appendix

1. Introduction

Roux Environmental Engineering and Geology, D.P.C. (Roux) on behalf of Sendero Verde Redevelopment Project – Parcel B, (the "Volunteer"), have developed a project specific Community Air Monitoring Plan (CAMP) to implement real time monitoring at the Site, which occupies Tax Lot 20 of Tax Block 1617, during the activities associated with the Excavation Work Plan (EWP) as part of the Site Management Plan (SMP).

The monitoring program will be implemented at all times during which earth disturbance activities are occurring. The CAMP is designed to provide a measure of protection for the downwind community and onsite workers not directly involved with the subject work activities from potential airborne contaminant releases as a direct result of remedial and construction activities. This plan is consistent with the New York State Department of Health's (NYSDOH) Generic Community Air Monitoring Plan guidance document.

The specifics of the CAMP are presented in the following four (4) sections:

- 1.1 VOC Monitoring Approach
- 1.2 Particulate Monitoring Approach
- 1.3 Meteorological Monitoring Approach
- 1.4 Available Suppression Techniques

1.1 VOC Monitoring Approach

Total VOC concentrations in air will be monitored continuously at a location downwind of the excavation activities during all ground intrusive activities. An upwind monitoring station will be set up adjacent to where the excavation is occurring. The VOC monitoring equipment will be located at temporary monitoring stations that will be established daily based on Site logistics and weather conditions. The monitoring work will be conducted using MiniRAE 3000 (or equivalent) portable VOC monitors, or similar type monitors, for all VOC monitoring. The equipment will be calibrated at least once daily using isobutylene as the calibration gas. One (1) upwind and one (1) downwind monitor will be deployed each day. Each monitoring unit is equipped with an audible alarm to indicate exceedance of the action levels (as defined below and summarized in Table 1).

The equipment is capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- If the ambient air concentration of total VOCs at the downwind perimeter of the Site exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.
- If the ambient air concentration of total VOCs at the downwind perimeter of the Site persists at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of VOCs identified, suppression techniques employed to abate emissions, and monitoring continued. After these steps, work activities can resume if the total organic vapor level at the Site perimeter is below 5 ppm over the background concentration for the 15-minute average. If levels are in excess of 25 ppm above background, identified contributing ground-intrusive activities will be halted and vapor suppression techniques will be evaluated and modified until monitoring indicates VOC levels at the Site perimeter are below 5 ppm over background. Once VOC levels are below 5 ppm at the Site perimeter, work will resume with continued monitoring.

- All 15-minute readings will be recorded and be available for State Regulator (NYSDEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes will be recorded. If an exceedance of the action level occurs, an Action Limit Report (ALR) will be completed, identifying the monitoring device location, the measured VOC level, the activity causing the exceedance, meteorological conditions, and the corrective actions taken, as provided in Appendix A. Additionally, the NYSDEC and NYSDOH will be notified within 24 hours of the VOC ALR generation. Daily monitoring equipment locations and meteorological conditions will also be documented on the daily CAMP Monitoring Location Plan. All documentation will be kept on file at the Site.

1.2 Particulate Monitoring, Response Levels and Actions

Particulate concentrations will be monitored continuously at temporary particulate monitoring stations set up at the sidewalk at upwind and downwind locations. The particulate monitoring will be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action levels (as defined below and summarized in Table 1). Monitoring equipment will be MIE Data Ram monitors or equivalent. A minimum of one (1) upwind and one (1) downwind monitor will be deployed each day, equipped with an omni-directional sampling inlet and a PM-10 sample head. The data logging averaging period will be set to 15-minutes with time and date stamp recording. Alarm averaging will be set at 90 micrograms per cubic meter (µg/m^3) per 15-minute period. This setting will allow proactive evaluation of Site conditions prior to reaching Action Levels of 100 µg/m^3 above background. The equipment will be outfitted with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration will be visually assessed during all work activities. The monitoring will be used to compare values to the following:

- If the downwind PM-10 particulate level is 100 µg/m^3 greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the Site, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 µg/m^3 above the upwind level and provided that no visible dust is migrating from the Site.
- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 µg/m^3 above the upwind level, work must be stopped, a re-evaluation of activities initiated, and dust suppression techniques modified. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 µg/m^3 of the upwind level and in preventing visible dust migration.

All 15-minute readings will be recorded and be available for State Regulator (NYSDEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes will be recorded. If an exceedance of the action level occurs, an ALR will be completed, identifying the monitoring device location, the measured particulate concentration, the activity causing the exceedance, meteorological conditions, and the corrective actions taken, as provided in Appendix A. Daily monitoring equipment locations will also be documented on the daily CAMP Monitoring Location Plan. All documentation will be kept on file at the Site.

1.3 Meteorological Monitoring

Wind speed (estimated) and wind direction, will be approximated based on field observations of onsite personnel. Meteorological data consisting of temperature, barometric pressure, and relative humidity will be recorded in the field book based upon publically available information from local weather stations.

1.4 Available Suppression Techniques

Odor Control

Due to the nature of the project, with excavation occurring, the potential for generation of nuisance odors and the need for odor control may be necessary. If nuisance odors are identified, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and of all other complaints about the project.

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

Dust Control

Due to the nature of the project, the potential for generation of nuisance dust and the need for dust control may be necessary. Dust suppression will be achieved through the use of water for wetting excavation areas, if required. Water will be available on-site at suitable supply and pressure for use in dust control.

1.5 Reporting

All recorded monitoring data will be downloaded, and field logged periodically, including action limit reports (if any) and daily CAMP monitoring location plans. All records will be maintained on-Site and available for NYSDEC/NYSDOH review. A summary of CAMP findings, including excursions, will be provided in the Daily Reports. All CAMP monitoring records will be included in the Periodic Review Report that will be submitted to the NYSDEC and NYSDOH and will include all of the CAMP data collected, daily monitoring station location maps, and copies of the ALRs (if any). If an ALR is generated due to VOC exceedances, the NYSDEC and NYSDOH will be notified within 24 hours of the exceedance.

TABLE

Action Limit Summary for VOCs and Particulates

Table 1. Action Limit Summary for VOCs and Particulates, Sendero Verde Redevelopment Project - Parcel B, New York, NY

Contaminant	Downwind Action Levels*	Action/Response
Volatile Organic Compounds (VOCs) (Monitoring Via Photoionization Detector and Odor Observation)	< 5 ppm	1. Resume work with continuing monitoring.
	5 ppm < level < 25 ppm	1. Work activities must be temporarily halted, source vapors must be identified, suppression techniques employed to abate emissions and monitoring continued. 2. After these steps, if VOC levels (200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or structure, whichever is less) is below 5 ppm over background, resume work.
	> 25 ppm	1. Identified contributing ground intrusive activities must be halted and vapor suppression techniques must be evaluated and modified until monitoring indicates VOC levels below the action level. 2. After these steps, if VOC levels (half the distance to the nearest potential receptor or structure) are below 5 ppm over background, resume work.
Particulates (Monitoring Via Particulate Meter and Observation)	< 100 ug/m^3	1. If dust is observed leaving the work area, then dust control techniques must be implemented or additional controls used.
	100 ug/m3 < level < 150 ug/m^3	1. Employ dust suppression techniques. 2. Work may continue with dust suppression techniques provided that downwind PM-10 particulate concentration do not exceed 150 ug/m^3 above the upwind level and provided that no visible dust is migrating from the work area.
	> 150 ug/m^3	1. STOP work 2. Re-evaluate activities, modify dust suppression techniques. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 ug/m^3 of the upwind level and in preventing visible dust migration.

* Instantaneous readings above background. Particulate readings are based on the respirable (PM-10) fraction. Background readings are taken at upwind locations relative to Work Areas or Exclusion Zones.

APPENDIX A

Action Limit Report

ACTION LIMIT REPORT

Sendero Verde Redevelopment Project - Parcel B

Project Location:

Date: ______________________ Time: ______________________

Name: ____

Contaminant: PM-10: ______________ VOC: ______________________

Wind Speed: ______________ Wind Direction: ______________________

Temperature: ______________ Barometric Pressure: ______________________

DOWNWIND DATA

Monitor ID #: ______________ Location: ______________ Level Reported: __________

Monitor ID#: ______________ Location: ______________ Level Reported: __________

UPWIND DATA

Monitor ID #: ______________ Location: ______________ Level Reported: __________

Monitor ID#: ______________ Location: ______________ Level Reported: __________

BACKGROUND CORRECTED LEVELS

Monitor ID #: ______________ Location: ______________ Level Reported: __________

Monitor ID#: ______________ Location: ______________ Level Reported: __________

ACTIVITY DESCRIPTION

CORRECTIVE ACTION TAKEN

APPENDIX I

COVID-19 Interim Health and Safety Guidance

COVID-19 INTERIM HEALTH AND SAFETY GUIDANCE

CORPORATE HEALTH AND SAFETY MANAGER	:	**Brian Hobbs, CIH, CSP**
EFFECTIVE DATE	:	**03/2020**
REVISION DATE	:	**05/04/2020**
REVISION NUMBER	:	**3**

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APPENDICES

1. PURPOSE

This guidance has been implemented to establish work practices, administrative procedures, and engineering controls to minimize potential exposure to SARS-CoV-2, the virus that causes COVID-19. The following guidance has been developed based on local, state and federal recommendations/requirements regarding COVID-19. The purpose of this document is to supplement existing site-specific Health and Safety Plans (HASPs) and provide interim health and safety guidance to minimize potential exposure to SARS-CoV-2. Should additional scientific information or regulatory information change, this document shall be updated accordingly.

2. SCOPE AND APPLICABILITY

This guidance covers all Roux employees and the subcontractors that Roux oversees. Site specific HASPs shall be developed to incorporate elements of mitigative measures against COVID-19 exposure. If work cannot be carried out in compliance with this guidance, the project shall be further evaluated by the Project Principal (PP), Office Manager (OM), and Corporate Health and Safety Manager (CHSM) prior to work authorization.

3. BACKGROUND

What is COVID-19?

COVID-19 is a respiratory illness that can spread from person to person. The virus that causes COVID-19 is a novel coronavirus that was first identified during an investigation into an outbreak in Wuhan, China. This virus continues to spread internationally and within the United States. There is currently no vaccine to prevent COVID-19.

What are the symptoms of COVID-19?

Reported illnesses have ranged from mild symptoms to severe illness and death for confirmed COVID-19 cases. Symptoms may appear 2 to14 days following exposure to the virus. People with these symptoms or combinations of symptoms may have COVID-19:

- Cough
- Shortness of breath or difficulty breathing

Or at least two of these symptoms:

- Fever
- Chills
- Repeated shaking with chills
- Muscle pain
- Headache
- Sore throat
- New loss of taste or smell

If someone develops emergency warning signs for COVID-19, they should be instructed to get medical attention immediately. Emergency warning signs can include those listed below; however, this list is not all inclusive. Please consult your medical provider for any other symptoms that are severe or concerning.

- Trouble breathing
- Persistent pain or pressure in the chest
- New confusion or inability to arouse
- Bluish lips or face

How does COVID-19 spread?

Person-to-person spread

The virus is thought to spread mainly from person-to-person contact.

- Between people who are in close contact with one another (within about 6 feet).
- Through respiratory droplets produced when an infected person coughs, sneezes or talks.
  - These droplets can land in the mouths or noses of people who are nearby or possibly be inhaled into the lungs.
- Some recent studies suggested that COVID-19 may be spread by people who are not showing symptoms.

Spread from contact with contaminated surfaces or objects

It also may be possible that a person can get COVID-19 by touching a contaminated surface or object and then touching their mouth, nose, or possibly their eyes. Based on current data, this is not thought to be the main way the virus spreads.

According to the Centers for Disease Control and Prevention (CDC), people are thought to be most contagious when they are most symptomatic; however, there is a possibility for the virus to spread before an individual shows symptoms (asymptomatic).

How easily the virus spreads

How easily a virus spreads from person-to-person can vary. Several viruses, such as measles, are highly contagious while others do not spread as easily. Based on current data, COVID-19 spreads very easily and sustainably between people and suggests the virus is spreading more efficiently compared to influenza, but not as efficiently as measles.

4. TRAINING REQUIREMENTS

All employees with potential exposure to COVID-19 shall be provided training that incorporates COVID-19 exposure mitigation strategies, such as implementation of proper social distancing, personal hygiene (e.g., handwashing), as well as disinfection procedures, as outlined by CDC guidelines.

5. EXPOSURE RISK POTENTIAL

Worker risk of occupational exposure to COVID-19 can vary from very high, high, medium, or lower (caution) risk. This level of exposure is dependent on several factors, which can include industry type; need for contact within 6 feet of people known to be or suspected of being infected with COVID-19; density of work environment; and industrial setting (i.e., healthcare building, occupied interior work area, minimal ventilation).

Provided below is background risk level information taken from the U.S. Department of Labor Occupational Safety and Health Administration Guidance on preparing workplaces for COVID-19. Risk evaluations for each project shall be conducted by the PP and OM in consultation with the CHSM to ensure Roux employees and subcontractors remain within the lower exposure (caution) category. If it is identified there is a medium exposure risk or higher, further evaluation and mitigative measures shall be evaluated to reduce overall exposure risk prior to work authorization.

Very High Exposure Risk (Activities not conducted by Roux)

Very high exposure risk includes occupations/work activities with high potential for exposure to known or suspected sources of COVID-19 during specific medical, postmortem, or laboratory procedures. This can include but is not limited to:

- Healthcare workers (e.g., doctors, nurses, dentists, paramedics, emergency medical technicians) performing aerosol-generating procedures (e.g., intubation, cough induction procedures, bronchoscopies, some dental procedures and exams, or invasive specimen collection) on known or suspected COVID-19 patients.
- Healthcare or laboratory personnel collecting or handling specimens from known or suspected COVID-19 patients (e.g., manipulating cultures from known or suspected COVID-19 patients).
- Morgue workers performing autopsies, which generally involve aerosol-generating procedures on the bodies of people who are known to have, or suspected of having, COVID-19 at the time of their death.

High Exposure Risk (Activities not conducted by Roux)

High exposure risk occupations/work activities include exposure to known or suspected COVID-19 positive individuals. This can include but not limited to:

- Healthcare delivery and support staff (e.g., doctors, nurses, and other hospital staff who must enter patients' rooms) exposed to known or suspected COVID-19 patients. (Note: when such workers perform aerosol-generating procedures, their exposure risk level becomes very high.)
- Medical transport workers (e.g., ambulance vehicle operators) moving known or suspected COVID-19 patients in enclosed vehicles.
- Mortuary workers involved in preparing (e.g., for burial or cremation) the bodies of people who are known to have, or suspected of having, COVID-19 at the time of their death.

Medium Exposure Risk

Medium exposure risk occupations/work activities include those that require frequent and/or close contact with (i.e., within 6 feet of) people who may be infected with COVID-19, but who are not known or suspected to be COVID-19 positive. For most of our worksites, it is assumed there is on-going community transmission for COVID-19. Therefore, workers who work at sites and may have contact with the general public, other contractors, high-population-density work environments (i.e., greater than 10 people) fall within medium exposure risk group category. This can include, but is not limited to, sampling events that require two or more workers to collect and log samples in close contact or work occurring in an interior space with limited ventilation and several workers present.

Lower Exposure Risk (Caution)

Lower exposure risk (caution) occupations/work activities are those that do not require contact with people known to be or suspected of being COVID-19 positive. During these activities, there is limited contact (i.e., within 6 feet of) the general public or other workers. Workers in this category have minimal occupational contact with the public and other coworkers. This can include construction oversight that does not require close contact as well as sampling or gauging events performed by one worker.

6. EXPOSURE/SUSPECTED EXPOSURE

What do I do if I am sick or come into close contact with someone who is sick (e.g. living with/caring for)?

If you or others you are living with/caring for experience any of the following symptoms, such as acute respiratory illness (i.e., cough, shortness of breath or difficulty breathing), chills, repeated shaking with chills, muscle pain, headache, sore throat, new loss of taste or smell or fever (100.4 °F [37.8 °C]), we ask you not report to your office/field site and stay home. Employees shall notify the OM immediately so proper notifications can be made.

Additionally, if you have come into close contact (i.e., within about 6 feet for at least 15 minutes) with someone who is experiencing COVID-19-like symptoms, please notify the OM immediately. Information provided shall be used to determine appropriate internal response in consultation with the CHSM and Human Resources Director (HRD).

What if I am asked to self-isolate at home and when can I return from home isolation?

Depending on the situation, if you are COVID-19 positive or suspected to have COVID-19, employees may be required to self-isolate in their homes as per CDC or local health department guidance. As per CDC guidance, return from isolation has been broken out into two categories. The first includes confirmed or suspected COVID-19 individuals exhibiting symptoms and the second includes those who have not had COVID-19 symptoms (i.e., asymptomatic) but tested positive and are under self-isolation. Both categories, along with strategies to return from home isolation, are outlined below.

People with COVID-19 under isolation[1]:
Options include a symptom-based (i.e., time-since-illness-onset and time-since-recovery strategy) or a test-based strategy.

1) Symptom-based strategy

If you have not had a test to determine if you are still contagious, you can leave home after these three things have happened:

- At least 3 days (72 hours) have passed since recovery defined as resolution of fever without the use of fever-reducing medications; and
- improvement in respiratory symptoms (e.g., when your cough or shortness of breath have improved); and
- at least 10 days have passed since symptoms first appeared.

2) Test-based strategy

If you will be tested to determine if you are still potentially contagious, you can leave home after these three things have happened:

- Resolution of fever without the use of fever-reducing medications; and
- improvement in respiratory symptoms (e.g., when your cough or shortness of breath have improved); and
- you received two negative tests in a row, at least 24 hours apart. Your doctor shall follow CDC guidance.

People who have not had COVID-19 symptoms but tested positive and are under isolation[1]:
Options include both a time-based or test-based strategy.

1) Time-based strategy

If you have not had a test to determine if you are still contagious, you can leave home after these two things have happened:

- At least 10 days have passed since the date of their first positive COVID-19 diagnostic test; and
- you continue to have no symptoms (no cough or shortness of breath, etc.) since the positive COVID-19 diagnostic test.

2) Test-based strategy

If you have had a test to determine if you are still contagious, you can leave home after:

- You received two negative tests in a row, at least 24 hours apart. Your doctor shall follow CDC guidance.

Test-based strategies

Previous recommendations for a test-based strategy remain applicable; however, a test-based strategy is contingent on the availability of ample testing supplies and laboratory capacity as well as convenient access to testing.

[1] In all cases, follow the guidance of your healthcare provider and local health department. The decision to stop home isolation should be made in consultation with your healthcare provider and state and local health departments. Local decisions depend on local circumstances.

7. WORKPLACE CONTROLS

During the project planning phase, worksite evaluations shall be carried out by the PP and OM in consultation with the CHSM to determine risk exposure levels for work activities. If it is determined there is a medium exposure risk level or higher, additional workplace controls shall be evaluated and implemented as required in addition to the basic infection prevention measures outlined below in Section 8. Additional workplace controls can include engineering controls (i.e., ventilation, physical barriers), administrative controls (i.e., minimizing contact between workers, rotating shifts, site specific training), and additional personal protective equipment (i.e., respiratory protection). If exposure risk cannot be mitigated, potential project postponement may be necessary at the discretion of the OM in consultation with the CHSM.

A Job Safety Analysis (JSA) has been developed and is provided in Appendix B which summarizes and applies concepts within this guidance including the infection prevention measures listed below. This JSA shall be required for all field work in areas where there is community-based transmission of COVID-19.

8. INFECTION PREVENTION MEASURES

The following is basic infection prevention and personal hygiene practices which shall be implemented for all Roux field activities as well as in the office setting.

- ***Personal Hygiene***
  - Wash your hands often with soap and water for at least 20 seconds.
    - If soap and water are not available, use an alcohol-based sanitizer that contains at least 60% ethanol or 70% isopropanol.
    - Key times to wash your hands include after blowing your nose, coughing or sneezing, after using the restroom, and before eating or preparing food.
  - Do not touch your eyes, face, nose and mouth with unwashed hands.
  - Cover your mouth and nose with a tissue when you cough or sneeze or use the inside of your elbow.
  - Throw potentially contaminated items (e.g., used tissues) in the trash.
- ***Avoid Close Contact/Secondary Contact with People and Potentially Contaminated Surfaces***
  - Apply appropriate social distance (6+ feet).
  - Stop handshaking—use and utilize other noncontact methods for greeting.
  - Do not work in areas with limited ventilation with other Site workers (e.g., small work trailer which lacks HVAC system). If working in a trailer, the following conditions must be met: limited to 4 workers, large enough to have the ability to apply social distance, and has open windows and/or operational HVAC to ensure proper ventilation of the workspace.
  - Morning tailgate/safety meetings shall occur outside and not within work trailers.
    - Do not require employees or subcontractors to sign in using the same tailgate form. The Site Supervisor/SHSO should record names of those in attendance on the form.
    - If the Site has more than 10 workers, separate tailgate meetings should be performed in smaller groups.
  - Do not share equipment or other items with co-workers and subcontractors unless wearing appropriate PPE (e.g. nitrile gloves). Assume equipment and other surfaces are potentially contaminated and remove gloves aseptically.
  - If receiving labware or other equipment disinfect to the extent feasible. If there are concerns for contaminating labware please wear appropriate PPE (e.g. gloves) to minimize contact.
  - Contact your lab/equipment vendor to confirm equipment is properly disinfected prior to being shipped.
  - Do not carpool with others (e.g. clients, coworkers).

  - For company owned vehicles limit sharing of vehicles with coworkers. If unable to limit sharing of company owned vehicles, properly disinfect vehicle before driving with a focus on commonly touched surfaces (e.g. steering wheels, shifters, buttons, etc.).
  - Use caution when using public restrooms, portable toilets. Use paper towel as a barrier when touching door handles and faucets.
- ***Cleaning and Disinfecting***
  - Clean and disinfect frequently touched surfaces daily. Commonly touched items can include but are not limited to tables, doorknobs, light switches, countertops, handles, desks, phones, keyboards, toilets, faucets, sinks, and field equipment (i.e., photo-ionization detector, field equipment).
  - **Hard (Non-porous) Surfaces**
    - If surfaces are dirty, they should be cleaned with a detergent/soap and water prior to disinfection.
    - Refer to the manufacturer's instructions to ensure safe and effective use of the product and wear appropriate personal protective equipment (e.g., gloves, safety glasses, face shield).
    - Many products require:
      - Keeping surface wet for a period of time (i.e. contact time)
        - Refer to manufacturer's instructions outlining adequate contact time.
      - Precautions such as wearing gloves and making sure you have good ventilation during use of the product.
    - Disposable gloves should be removed aseptically and discarded after cleaning. Wash hands immediately following removal of gloves. Refer to Appendix A for how to remove gloves aseptically.
    - For disinfection, diluted household bleach solutions, alcohol solutions with at least 70% alcohol, and most common EPA-registered household disinfectants should be effective.
      - Diluted household bleach solutions can be used if appropriate for the surface. Follow manufacturer's instructions for application and proper ventilation. Check to ensure the product is not past its expiration date. Never mix household bleach with ammonia or any other cleanser. Unexpired household bleach will be effective against coronaviruses when properly diluted. Leave the solution on the surface for at least 1 minute.
        - Prepare a bleach solution by mixing:
          - 5 tablespoons (1/3 cup) bleach per gallon of water or
          - 4 teaspoons bleach per quart of water
    - Products with EPA-approved emerging viral pathogen claims are expected to be effective against COVID-19. Follow the manufacturer's instructions for all cleaning and disinfecting products (e.g., concentration, application method and contact time, etc.).
  - **Soft (Porous) Surfaces**
    - For soft (porous) surfaces, remove visible contamination if present and clean with appropriate cleaners indicated for use on the surfaces. After cleaning:
      - Launder items as appropriate in accordance with the manufacturer's instructions. If possible, launder using the warmest appropriate water setting for the item and dry items completely; or
      - Use products with the EPA-approved emerging viral pathogens that claim they are suitable for porous surfaces.
  - **Electronics**
    - For electronics such as tablets, touch screens, keyboards, remote controls, etc. remove visible contamination if present.
      - Follow the manufacturer's instructions for all cleaning and disinfection products.
      - Consider use of wipeable covers for electronics.

- If no manufacturer guidance is available, consider the use of alcohol-based wipes or sprays containing at least 70% alcohol to disinfect touch screens. Dry surfaces thoroughly to avoid pooling of liquids.

- ***Linens, Clothing, and Other Items that Go in the Laundry***
  - Although it is unlikely field clothing would become potentially contaminated with COVID-19, it is recommended that field staff regularly launder field clothing following any field event upon returning home.
  - In order to minimize the possibility of dispersing the virus from potentially contaminated clothing, do not shake dirty laundry.
  - Wash items as appropriate in accordance with the manufacturer's instructions. If possible, launder items using the warmest appropriate water setting for the items and dry items completely.
  - Clean and disinfect hampers or other containers used for transporting laundry according to guidance listed above.

9. CLOTH FACE COVERINGS

The CDC recommends the use of cloth face coverings in public settings where other social distancing measures are difficult to maintain, such as grocery stores and pharmacies, and especially in areas of significant community-based transmission. This recommendation is based on recent studies and an understanding that a significant portion of asymptomatic, as well as pre-symptomatic, individuals can shed the virus to others before showing symptoms. Studies indicate that COVID-19 can spread among people interacting in close proximity through speaking, coughing, or sneezing. The purpose of the cloth covering is NOT to provide protection to the wearer, but to protect the wearer from unknowingly infecting others if they are asymptomatic/pre-symptomatic. The use of cloth face coverings is to supplement and NOT replace the existing practices outlined above.

Based on existing studies and on-going recommendations and/or requirements from federal, state, and local entities, Roux is recommending the use of cloth face coverings, when appropriate. Appropriate use is defined when local authorities or clients require the use of cloth face coverings in conjunction with established social distancing, or if an employee elects to use a cloth covering on their own accord. Roux will provide cloth face coverings that shall meet the basic requirements outlined by the CDC guidance provided in Appendix C: CDC Use of Cloth Face Coverings to Help Slow the Spread of COVID-19.

Cloth Face Coverings should:

- Fit snugly but comfortably against the side of the face;
- Be secured with ties or ear loops, when possible;
- May include multiple layers of fabric;
- Allow for breathing without restriction; and
- Be able to be laundered and machine dried with no damage or change to shape.

When donning and doffing the cloth face covering, individuals should avoid touching their eyes, nose, and mouth. Following removal of the cloth face covering, employees should wash their hands immediately using the guidelines described in Section 8 above. Cloth face coverings should be routinely washed depending on the frequency of use.

The use of existing cloth covering products/materials, such as a scarf, neck gaiter, or bandana, is deemed acceptable by the CDC. Note, the cloth face coverings recommended are not surgical masks or N-95 respirators. Those are critical supplies that must continue to be reserved for healthcare workers and other medical first responders, as recommended by current CDC guidance. Should there be a requirement for workers to be in respiratory protection (e.g. full-face respirator w/cartridges, P100, N95 respirators), it shall be addressed during the project pre-planning phase, which includes discussions with the PP and OM in consultation with CHSM.

10. HOTEL SELECTION PROCESS AND OVERNIGHT/REMOTE WORK

Hotel Selection

Due to the current COVID-19 situation, Roux is recommending overnight travel be limited to the extent possible. If there is a project requiring the overnight stay at a hotel, accommodations shall be made only after the hotel and hotel's location have been vetted in accordance with Roux's established guidance as defined below. The Project Team, which includes the Project Manager (PM) and PP along with the OM, in consultation with the CHSM, shall verify the hotel has appropriate protocols in place to limit the potential exposure and spread of COVID- 19 through proper cleaning and disinfection practices. Discussions with the hotel shall include, but are not limited to, measures taken to keep guests safe during their stay, guest room sanitization schedule, training of staff regarding disinfecting protocols using EPA-approved disinfectants, hotel staff fitness for duty requirements, etc. Following the initial hotel assessment by the Project Team, the OM and the CHSM shall review the hotel assessment findings prior to the CHSM's authorization that the hotel may be used by any Roux employees.

Employees staying overnight should abide by the following guidance:

- Ensure you properly disinfect your room upon arrival. This should include a wipe down of all commonly touched surfaces with an approved disinfectant. Use appropriate PPE (e.g. nitrile gloves) when disinfecting surfaces.
- Place the "Do Not Disturb" placard on the room while away and consider limiting hotel housekeeping service to the extent feasible (e.g., not having the room cleaned each day) to minimize potential secondary contact with others.
- Do not spend any more time in hotel common areas (i.e., lobby, hallways, etc.) than is necessary.
- Follow proper Infection Prevention Measures found within Section 8 above.
- Have meals in your hotel room after disinfecting outer package surfaces, as outlined in Section 8 above. Do not eat in public spaces or restaurants.
- If the hotel has a restaurant or café, do not have your meal in a common area; instead order food to be picked up or delivered to your room. If delivered, opt for contactless delivery (left outside the door, delivery person knocks and leaves). Always use your own pen if you need to sign something.
- Employees may also pick up food from takeout locations, order groceries or food for delivery to the hotel. Call local restaurants to order food for delivery (call the hotel lobby for recommendations) or use food ordering apps. Some apps have options for contactless delivery.

11. TRANSPORTATION-RENTAL CARS AND ROUX-OWNED VEHICLES

Rental Cars

Due to the current COVID-19 situation, Roux recommends rental car usage be limited to the extent possible. If there is a project requiring the use of a rental car (e.g. truck/van), accommodations shall be made only after the rental car company and their store's location have been vetted in accordance with Roux's established guidance, as defined below. The Project Team (PM and PP) and OM in consultation with the CHSM shall verify the rental company where you are picking up your vehicle has appropriate protocols in place to limit the potential exposure and spread of COVID- 19 through proper cleaning and disinfection practices. Discussions with the rental car company shall include, but are not limited to, measures to be taken to keep customers safe during pickup/drop-off, rental car disinfection protocols, training of staff regarding disinfecting protocols using EPA-approved disinfectants, rental car company staff fitness for duty requirements, etc. Following the initial rental car company store assessment by the Project Team, the OM and the CHSM shall review the rental car company assessment findings prior to the CHSM's authorization that the rental car company store may be used by any Roux employees.

Upon vehicle pickup, employees shall don nitrile gloves and safety glasses and clean/disinfect all high-touch surfaces (steering wheel, knobs, door handles, turn signals, radio, etc.) by wiping thoroughly with approved disinfectants (following manufacturer's instructions). Aseptically remove gloves and dispose of them along with rags/wipes, appropriately. Wash hands or use hand sanitizer immediately after each episode of cleaning. Due to social distancing requirements, personnel shall not carpool to destinations.

Roux-Owned Vehicles

Due to the current COVID-19 situation, Roux-owned vehicles should be dedicated to individual employees to the extent feasible, and if authorized by the OM. In the case this cannot be accommodated, employees shall don nitrile gloves and safety glasses and clean/disinfect all high-touch surfaces (steering wheel, knobs, door handles, turn signals, radio, etc.) by wiping thoroughly with approved disinfectants (following manufacturer's instructions). This cleaning and disinfection shall occur before and after each use of the vehicle. Aseptically remove gloves and dispose of them along with rags/wipes, appropriately. Wash hands or use hand sanitizer immediately after each episode of cleaning. Due to social distancing requirements, personnel shall not carpool to destinations.

APPENDIX A

How to Remove Gloves

How to Remove Gloves

To protect yourself, use the following steps to take off gloves

Grasp the outside of one glove at the wrist.
Do not touch your bare skin.

Peel the glove away from your body,
pulling it inside out.

Hold the glove you just removed in
your gloved hand.

Peel off the second glove by putting your fingers
inside the glove at the top of your wrist.

Turn the second glove inside out while pulling
it away from your body, leaving the first glove
inside the second.

Dispose of the gloves safely. Do not reuse the gloves.

Clean your hands immediately after removing gloves.

APPENDIX B

Job Safety Analysis-Working in Areas Affected by COVID-19

JOB SAFETY ANALYSIS	Ctrl. No. CVD-19	DATE: 04/16/2020	☒ NEW ☐ REVISED	PAGE 1 of 2

JSA TYPE CATEGORY	WORK TYPE	WORK ACTIVITY (Description)	
Generic	**Fieldwork**	**Working in Areas Affected by Coronavirus**	
DEVELOPMENT TEAM	**POSITION / TITLE**	**REVIEWED BY:**	**POSITION / TITLE**
Kristina DeLuca	Health and Safety Specialist	Brian Hobbs	CHSM
REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT			
☐ LIFE VEST ☒ HARD HAT – In field ☐ LIFELINE / BODY HARNESS ☒ SAFETY GLASSES – In field	☐ GOGGLES ☐ FACE SHIELD ☐ HEARING PROTECTION ☒ SAFETY SHOES – Steel/composite toe in fie	☐ AIR PURIFYING RESPIRATOR ☐ SUPPLIED RESPIRATOR ☒ PPE CLOTHING – High visibility vest in field	☒ GLOVES – Leather/cut-resistant in field and nitrile as needed ☐ OTHER
REQUIRED AND / OR RECOMMENDED EQUIPMENT			
Cloth face covering, nitrile gloves, hand soap, water source, hand sanitizer, disinfectant spray and disinfectant wipes.			
Commitment to Safety – All personnel onsite will actively participate in SPSA performance by verbalizing SPSAs throughout the day.			
SOCIAL DISTANCING: Maintain 6' of distance between yourself and all other people at all times. If you do not believe the scope of work can be conducted while maintaining this distance, contact your Project Manager immediately.			

Assess **[1]JOB STEPS**	**Analyze** **[2]POTENTIAL HAZARDS**	**Act** **[3]CRITICAL ACTIONS**
1. Project Preplanning	N/A	• Review and follow COVID-19 CDC, Roux, Client and local orders/protocols. • Ensure all workers are fit for duty - anyone feeling sick should remain at home even if symptoms do not align with COVID-19. If a worker has been in contact with someone potentially positive or positive for COVID-19, contact your Office Manager. • Determine PPE needs and ensure adequate supply of disinfectant wipes/spray, soap and water or hand sanitizer at Site. Due to high demands and limited supply, plan ahead. • Use the minimum number of employees necessary to safely complete the work.
2. Mobilization	**Exposure:** Becoming infected or infecting co-workers	**Personal/Rental/Roux Owned Vehicle** • Do not carpool. • Use the same vehicle every day and do not share with co-workers. • Verify workers/other people are not approaching vehicle prior to exiting the vehicle. Maintain 6' of distance from others. • DO not valet your car or allow others to use your car. If necessary, don nitrile gloves and safety glasses and clean/disinfect all high touch surfaces (steering wheel, knobs, door handles, turn signals, radio, etc.) by wiping thoroughly with approved disinfectants (follow manufacturer's instructions). This cleaning and disinfection shall occur before and after each use of the vehicle. Aseptically remove gloves and dispose of them along with rags/wipes, appropriately. Wash hands or use hand sanitizer immediately after each episode of cleaning. **Public Transportation** • Public transit should not be used unless absolutely necessary. Consider renting a car rather than taking public transit. If public transit is required, wear appropriate PPE and apply social distancing (6 ft). Use proper donning and doffing procedures for nitrile gloves. Wash hands or use hand sanitizer immediately after. **Hotel Stay (Refer to COVID-19 H&S Guidance for more info)** • If a hotel stay is deemed necessary for the given field work, ensure that you disinfect your room upon initial arrival and returning each day. Disinfect all surfaces of your room with an appropriate disinfectant using nitrile gloves. Use proper donning and doffing procedures for nitrile gloves. • Place the "Do Not Disturb" placard on the room while away and limit housekeeping services to the extent feasible during your stay to minimize the reintroduction and spread of the virus from others. Minimize, or avoid entirely, time spent in hotel common areas (i.e., the lobby, dining areas, gyms, etc.). Wash hands or use hand sanitizer often.

[1] Each Job or Operation consists of a set of tasks / steps. Be sure to list all the steps needed to perform job.
[2] A hazard is a potential danger. Break hazards into six types: Contact - victim is struck by or strikes an object;
Caught - victim is caught on, caught in or caught between objects; Fall - victim falls to ground or lower level (includes slips and trips); Exertion - excessive strain or stress / ergonomics / lifting techniques; Exposure - inhalation/skin hazards, energy source; Energy Source – electricity, pressure, compression/tension.
[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

3. Tailgate Meeting	**Exposure:** Becoming infected or infecting co-workers	• Must occur outside or remotely (i.e. video or conference call). • Maintain at least a 6+ ft distance between you and others. • Discuss primary infection prevention measures listed below. • Do not require employees or subcontractors to sign in, the Site Supervisor shall record names on the attendance form. • If the Site has more than 10 workers, separate tailgate meetings should be performed. • Discuss COVID-19 symptoms with coworkers and subcontractors to ensure fitness for duty. Anyone exhibiting signs or symptoms should be instructed to leave the Site, contact your Project Manager.
4. Site Activities	**Exposure:** Becoming infected or infecting co-workers	• Coordinate field activities at the beginning of the day (i.e. Tailgate meeting) to minimize time spent in crowded spaces or overlap while completing job tasks. • Don cloth face coverings as appropriate. • Apply social distancing (6+ ft) when interacting with others. If anyone comes within 6 ft of you while conducting work and your work prevents you from moving away, politely ask them to move back. If others are unable to move from your space, stop work and leave area. • Do not shake hands or touch others. • Do not share equipment or other items with co-workers and subcontractors unless wearing appropriate PPE (e.g. nitrile gloves). Assume equipment and other surfaces are potentially contaminated and remove gloves aseptically (See Appendix A of Roux Interim H&S Guidance for proper glove removal). • If anyone is coughing or sneezing in your vicinity, stop work and leave the area. • Do not work in areas with limited ventilation with others. • Cover your mouth and nose with tissue or paper towel or with your elbow when coughing or sneezing and wash hands or use hand sanitizer immediately after. If sick contact SHSO/PM and leave Site immediately. • Disinfect work surfaces/areas with approved disinfectant you're responsible for (ex: desk, office doorknob, computer, etc.) at least once at the beginning of your shift and at least once at the end of your shift with either sanitizing wipes or disinfectant spray. • Phones should be operated hands free to extent feasible. Sanitize your phone on a regular basis. Disinfection should also take place whenever suspected contaminated material comes in contact with any work surfaces/areas. Wash hands or use hand sanitizer immediately after. • Avoid public spaces and going out to eat by bringing your own lunch to the Site. If performing work in high density urban areas, it is recommended all food must be consumed at or in your vehicle. Wash hands or use hand sanitizer before eating and immediately after.

Primary Infection Prevention Measures

- Wash your hands often with soap and water for at least 20 seconds.
    - If soap and water are not available, use an alcohol-based sanitizer that contains at least 60% ethanol or 70% isopropanol. Key times to wash hands include after blowing your nose, coughing or sneezing, after using the restroom, and before eating or preparing food.
- Do not touch your eyes, face, nose and mouth with unwashed hands.
- Cover your mouth and nose with a tissue when you cough or sneeze or use the inside of your elbow. Throw potentially contaminated items (e.g. used tissues) in the trash.
- Avoid close contact/secondary contact with people and potentially contaminated surfaces.
    - Apply appropriate social distance (6+ feet).
    - Stop handshaking/touching others and use caution when accessing public spaces.
- Clean and disinfect frequently touched surfaces daily. Commonly touched items can include but are not limited to tables, doorknobs, light switches, countertops, handles, desks, phones, keyboard, toilets, sinks and field equipment. If surfaces are dirty, they should be cleaned with soap and water prior to disinfection. If surface cannot be cleaned/disinfected, then wash hands or use sanitizer as soon as possible.

[1] Each Job or Operation consists of a set of tasks / steps. Be sure to list all the steps needed to perform job.
[2] A hazard is a potential danger. Break hazards into six types: Contact - victim is struck by or strikes an object; Caught - victim is caught on, caught in or caught between objects; Fall - victim falls to ground or lower level (includes slips and trips); Exertion - excessive strain or stress / ergonomics / lifting techniques; Exposure - inhalation/skin hazards; Energy source – electricity, pressure, compression/tension.
[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

APPENDIX C

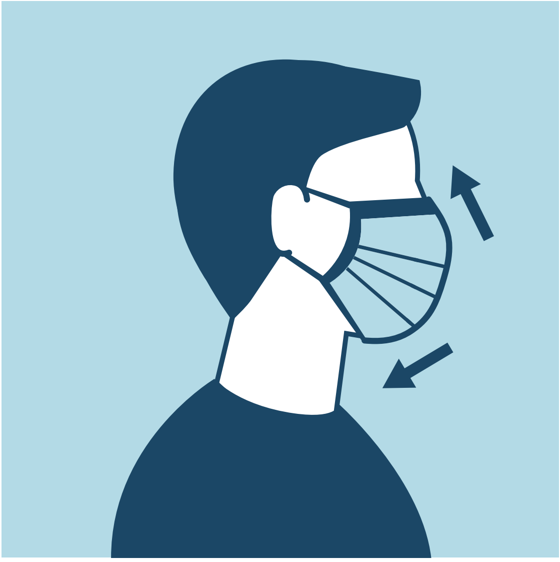
Centers for Disease Control (CDC)
Use of Cloth Face Coverings to Help Slow the Spread of COVID-19

Use of Cloth Face Coverings to Help Slow the Spread of COVID-19

How to Wear Cloth Face Coverings

Cloth face coverings should—

- fit snugly but comfortably against the side of the face
- be secured with ties or ear loops
- include multiple layers of fabric
- allow for breathing without restriction
- be able to be laundered and machine dried without damage or change to shape



CDC on Homemade Cloth Face Coverings

CDC recommends wearing cloth face coverings in public settings where other social distancing measures are difficult to maintain (e.g., grocery stores and pharmacies), **especially** in areas of significant community-based transmission.

CDC also advises the use of simple cloth face coverings to slow the spread of the virus and help people who may have the virus and do not know it from transmitting it to others. Cloth face coverings fashioned from household items or made at home from common materials at low cost can be used as an additional, voluntary public health measure.

Cloth face coverings should not be placed on young children under age 2, anyone who has trouble breathing, or is unconscious, incapacitated or otherwise unable to remove the cloth face covering without assistance.

The cloth face coverings recommended are not surgical masks or N-95 respirators. Those are critical supplies that must continue to be reserved for healthcare workers and other medical first responders, as recommended by current CDC guidance.

Should cloth face coverings be washed or otherwise cleaned regularly? How regularly?

Yes. They should be routinely washed depending on the frequency of use.

How does one safely sterilize/clean a cloth face covering?

A washing machine should suffice in properly washing a cloth face covering.

How does one safely remove a used cloth face covering?

Individuals should be careful not to touch their eyes, nose, and mouth when removing their cloth face covering and wash hands immediately after removing.

DEPARTMENT OF HEALTH & HUMAN SERVICES·USA
CDC

cdc.gov/coronavirus

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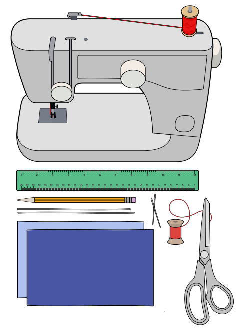
Sewn Cloth Face Covering

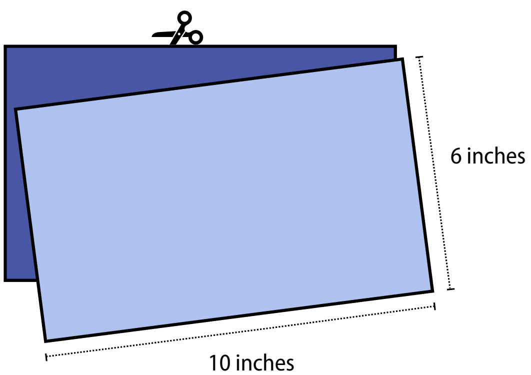
Materials

- Two 10”x6” rectangles of cotton fabric
- Two 6” pieces of elastic (or rubber bands, string, cloth strips, or hair ties)
- Needle and thread (or bobby pin)
- Scissors
- Sewing machine

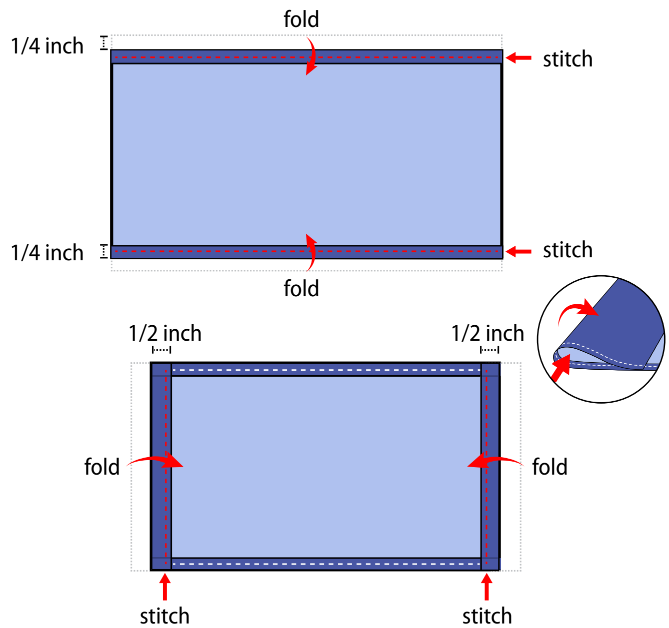


Tutorial

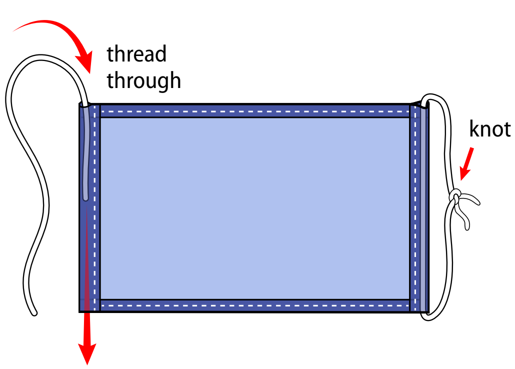
1. Cut out two 10-by-6-inch rectangles of cotton fabric. Use tightly woven cotton, such as quilting fabric or cotton sheets. T-shirt fabric will work in a pinch. Stack the two rectangles; you will sew the cloth face covering as if it was a single piece of fabric.



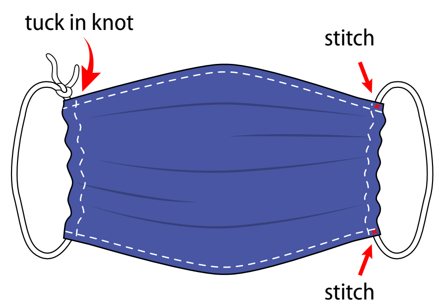
2. Fold over the long sides ¼ inch and hem. Then fold the double layer of fabric over ½ inch along the short sides and stitch down.



3. Run a 6-inch length of 1/8-inch wide elastic through the wider hem on each side of the cloth face covering. These will be the ear loops. Use a large needle or a bobby pin to thread it through. Tie the ends tight.
   Don’t have elastic? Use hair ties or elastic head bands. If you only have string, you can make the ties longer and tie the cloth face covering behind your head.



4. Gently pull on the elastic so that the knots are tucked inside the hem.
   Gather the sides of the cloth face covering on the elastic and adjust so the mask fits your face. Then securely stitch the elastic in place to keep it from slipping.



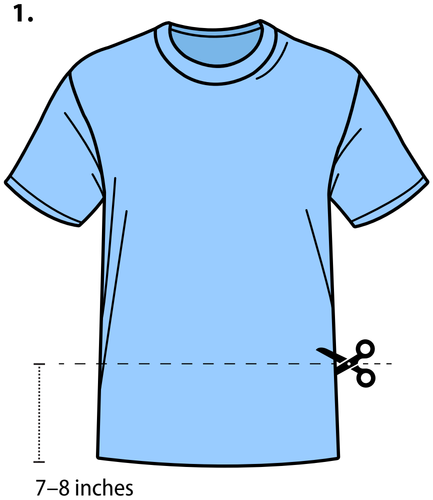
Quick Cut T-shirt Cloth Face Covering (no sew method)

Materials

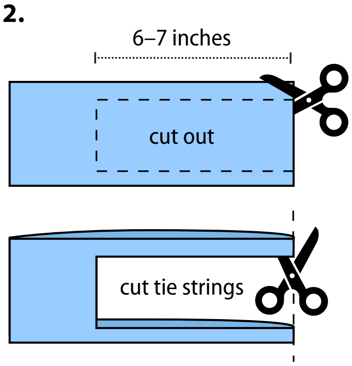
- T-shirt
- Scissors

Tutorial

1.



2.



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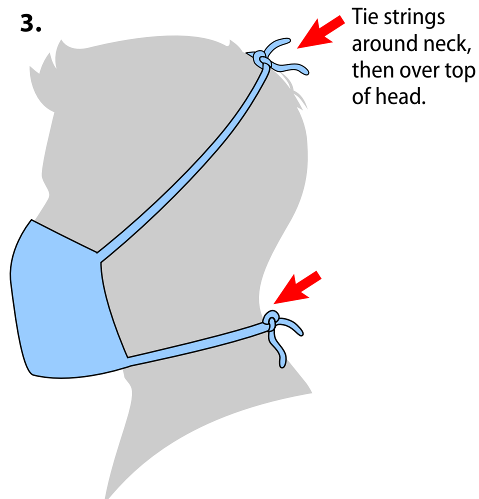


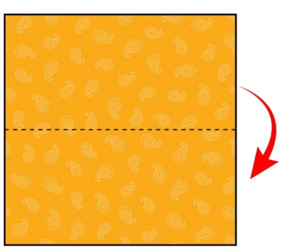
Bandana Cloth Face Covering (no sew method)

Materials

- Bandana (or square cotton cloth approximately 20”x20”)
- Rubber bands (or hair ties)
- Scissors (if you are cutting your own cloth)

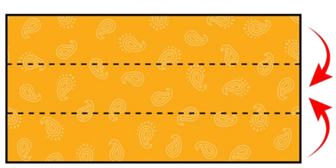
Tutorial

1.



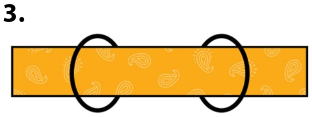
Fold bandana in half.

2.



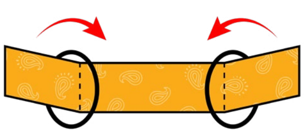
Fold top down. Fold bottom up.

3.



Place rubber bands or hair ties about 6 inches apart.

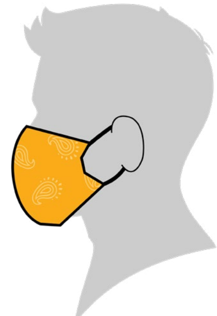
4.



Fold side to the middle and tuck.

5.

6.



APPENDIX F

Quality Assurance Project Plan/Field Sampling Plan

ROUX

Quality Assurance Project Plan/ Field Sampling Plan

Sendero Verde Redevelopment Project – Parcel B
Block 1617, Lot 20
New York, New York

December 3, 2020

Prepared for:

SV-B Owners LLC
1865 Palmer Avenue
Larchmont, New York 10538

Prepared by:

Roux Environmental Engineering and Geology, D.P.C.
209 Shafter Street
Islandia, New York 11749

2984.0003y139/cv

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Tables

Attachments

1. Introduction

Roux Environmental Engineering and Geology, D.P.C. (Roux), on behalf of SV-B Owners LLC (referred to herein as the Applicant), has prepared this Quality Assurance Project Plan/Field Sampling Plan (QAPP/FSP) to describe the measures that will be taken to ensure the data generated during performance of the Excavation Work Plan (EWP) as part of the Site Management Plan (SMP) for the Sendero Verde Redevelopment Project – Parcel B Site occupying Tax Block 1617, Lot 20, New York, New York (Site) are of quality sufficient to meet project-specific data quality objectives (DQOs). This QAPP/FSP also includes field sampling procedures.

The Applicant was accepted into the Brownfield Cleanup Program (BCP) as a Volunteer. A Brownfield Cleanup Agreement (BCA) was executed on February 27, 2019 and BCP Site number C231128 has been assigned to the Site as a Volunteer. Remedial action activities were conducted under the New York State Department of Environmental Conservation (NYSDEC) BCP. This QAPP/FSP was prepared in accordance with the guidance provided in NYSDEC Technical Guidance DER-10 Technical Guidance for Site Investigation and Remediation (DER-10), the NYSDEC BCP Guide, and the United States Environmental Protection Agency's (USEPA's) Guidance for the Data Quality Objectives Process (EPA QA/G 4).

1.1 Purpose

The QAPP/FSP describes in detail the field sampling and quality assurance/quality control (QA/QC) methods to be used during soil sampling tasks performed during the EWP.

This QAPP/FSP was prepared in accordance with the NYSDEC's DER-10 and provides guidelines and procedures to be followed by field personnel during performance of sampling during the EWP. Information contained in this QAPP/FSP relates to:

- Sampling objectives (Section 2);
- Project organization (Section 3);
- Sample media, sampling locations, analytical suites, sampling frequencies, and laboratory analysis (Section 4);
- Field sampling procedures (Section 5);
- Sample handling, sample analysis, and quality assurance/quality control (Section 6); and
- Site control procedures and decontamination (Section 7).

2. Sampling Objectives

The objective of the proposed sampling is to obtain a current representation of the environmental conditions at the Site during the EWP.

Sampling procedures are discussed in Section 5 of this QAPP/FSP. A discussion of the DQOs and quality assurance/quality control is provided in Section 6.

3. Project Organization

A general and generic summary of the overall management structure and responsibilities of project team members are presented below. Professional profiles for the team are provided in Attachment 1.

Project Principal

Mr. Joseph Duminuco, P.G. of Roux will serve as Project Principal. The Project Principal is responsible for defining project objectives and bears ultimate responsibility for the successful completion of the EWP.

Remedial Engineer

The Remedial Engineer for this project will be Ms. Noelle Clarke, P.E. The Remedial Engineer is a registered professional engineer licensed by the State of New York. The Remedial Engineer will have primary direct responsibility for implementation of the EWP. The Remedial Engineer will certify in the Periodic Review Report (PRR) that the excavation activities were observed by qualified environmental professionals under supervision as well as any other relevant provisions of ECL 27-1419 have been achieved in full conformance with the EWP.

Project Manager

Wendy Shen of Roux will serve as Project Manager. The Project Manager is responsible for defining project objectives and bears ultimate responsibility for the successful completion of the work. This individual will provide overall management for the implementation of the scope of work and will coordinate all field activities. The Project Manager is also responsible for data review/interpretation and report preparation.

Field Team Leader

The Field Team Leader will be determined at a later date. The Field Team Leader bears the responsibility for the successful execution of the field program. The Field Team Leader will direct the activities of the technical staff in the field, as well as all subcontractors. The Field Team Leader will also assist in the interpretation of data and in report preparation. The Field Team Leader reports to the Project Manager.

Laboratory Project Manager

Laboratory analysis will be completed by Alpha Analytical Laboratories of Westborough, MA and Mansfield, MA, NYSDOH Environmental Laboratory Accreditation Program (ELAP)-certified laboratories (11148 and 11627, respectively). The Laboratory Project Manager is Karyn Raymond. The Laboratory Project Manager will be determined prior to the start of the Work. The Laboratory Project Manager is responsible for sample container preparation, sample custody in the laboratory, and completion of the required analysis through oversight of the laboratory staff. The Laboratory Project Manager will ensure that quality assurance procedures are followed, and an acceptable laboratory report is prepared and submitted. The Laboratory Project Manager reports to the Field Team Leader.

Quality Assurance Officer

David Kaiser, P.E. of Roux will serve as the Quality Assurance Officer (QAO) for this project. The QAO is responsible for conducting reviews, inspections, and audits to ensure the data collection is conducted in accordance with the QAPP/FSP. The QAO's responsibilities range from ensuring effective field equipment decontamination procedures and proper sample collection to the review of all laboratory analytical data for completeness and usefulness. The QAO reports to the Project Manager and makes independent recommendations to the Field Team Leader.

4. Sample Media, Locations, Analytical Suites, and Frequency

The media to be sampled during the EWP include soil and fill materials. Sampling locations will be determined prior to the excavation activities. Analytical suites, and frequency is provided below and shown in Tables 1 and 2. Specifics regarding the collection of samples at each location and for each task are provided in Section 5 of this QAPP/FSP.

4.1 Offsite Backfill/On-Site Reuse Soil Sampling

For offsite fill/on-Site reuse soil materials requiring chemical testing, the following samples shall be collected:

- One sample for pre-qualification chemical testing at the source location, including the following:
    1. Chemical testing shall be performed at a minimum for the parameters listed in Table 375-6.8(b) of the latest revision of Part 375. Samples will be analyzed by the following analytical methods: Herbicides by USEPA method SW-846 8151A; Pesticides and PCBs by USEPA methods SW-846 8081A/8082; VOCs by USEPA method SW-846 8260; SVOCs by USEPA method SW-846 8270; Arsenic, barium, beryllium, cadmium, copper, cyanide, lead, manganese, nickel, selenium, silver, and zinc by USEPA method SW-846 6010B; Total mercury by USEPA method SW-846 7471; Total chromium, hexavalent chromium, and trivalent chromium by USEPA method SW-846 7196A; 1,4-Dioxane by USEPA method 8270 SIM; and Per- and Polyfluoroalkyl Substances (PFAS) by Modified EPA Method 537.
    2. Backfill/on-Site reuse soil materials excluding those materials that do not require sampling as described below, shall meet criteria presented in Section 2.0.
    3. Backfill/on-Site reuse soil materials that exceed the criteria presented in Section 2.0 shall not be imported to the Site without prior approval of the NYSDEC.
    4. The backfill/on-Site reuse soil material will be free of extraneous debris or solid waste.
    5. If the NYSDEC agrees that the material originated from a virgin source, then a minimum of one sample (i.e., the pre-qualification sample) will be collected and analyzed per source.
- If the source is not virgin, the sampling frequency will comply with DER-10 Table 5.4(e)10 shown below:

Table 5.4(e)10
Recommended Number of Soil Samples for Soil Imported To or Exported From a Site

Contaminant	VOCs	SVOCs, Inorganics & PCBs/Pesticides	
Soil Quantity (cubic yards)	Discrete Samples	Composite	Discrete Samples/Composite
0-50	1	1	3-5 discrete samples from different locations in the fill being provided will comprise a composite sample for analysis
50-100	2	1	
100-200	3	1	
200-300	4	1	
300-400	4	2	
400-500	5	2	
500-800	6	2	
800-1000	7	2	
➢ 1000	Add an additional 2 VOC and 1 composite for each additional 1000 Cubic yards or consult with DER		

The source of the offsite fill/on-Site reuse soil must be documented by the supplier, including the location where the fill/on-Site reuse soil was obtained and a brief history of the site that is the source of the fill.

Samples of offsite backfill/on-Site reuse soil will be analyzed for the following parameters:

- Herbicides by USEPA method SW-846 8151A.
- Pesticides and PCBs by USEPA methods SW-846 8081A/8082.
- VOCs by USEPA method SW-846 8260.
- SVOCs by USEPA method SW-846 8270.
- Arsenic, barium, beryllium, cadmium, copper, cyanide, lead, manganese, nickel, selenium, silver, and zinc by USEPA method SW-846 6010B.
- Total mercury by USEPA method SW-846 7471.
- Total chromium, hexavalent chromium, and trivalent chromium by USEPA method SW-846 7196A.
- 1,4-Dioxane by USEPA method 8270 SIM.
- Per- and Polyfluoroalkyl Substances (PFAS) by Modified EPA Method 537.

The 21 PFAS are:

- Perfluorobutanesulfonic acid
- Perfluorohexanesulfonic acid
- Perfluoroheptanesulfonic acid
- Perfluorooctancessulfonic acid
- Perfluorodecanesulfonic acid
- Perfluorobutanoics acid
- Perfluoropentanoic acid
- Perfluorohexanoic acid
- Perfluoroheptanoic acid
- Perfluorooctanoic acid
- Perfluorononanoic acid
- Perfluorodecanoic acid
- Perfluoroundecanoic acid
- Perfluorododecanoic acid
- Perfluorotridecanoic acid
- Perfluorotetradecanoic acid
- 6:2 Fluorotelomer sulfonate
- 8:2 Fluorotelomer sulfonate
- Perfluroroctanesulfonamide
- N-methyl perfluorooctanesulfonamidoacetic acid

- N-ethyl perfluorooctanesulfonamidoacetic acid

The parameters to be sampled are listed on Table 375-6.8(b) of the latest revision of Part 375. QA/QC samples are not required for backfill/on-Site reuse soil samples. All PFAS compounds, listed above, will be analyzed and reported to 0.5 microgram per kilogram (ug/kg). 1,4-Dioxane will be analyzed and reported to 0.1 milligram per kilogram (mg/kg).

The following materials may be imported, without chemical testing, to be used as backfill beneath pavement, buildings or as part of the site cover, provided that it contains less than 10 percent by weight material that would pass through a size 80 sieve and consists of:

- gravel, rock or stone, consisting of virgin material from a permitted mine or quarry; or
- recycled concrete or brick from a NYSDEC registered construction and demolition debris processing facility if the material conforms to the requirements of Section 304 of the 2002 New York State Department of Transportation Standard Construction and Materials Volume 1.

5. Field Sampling Procedures

This section provides a detailed discussion of the field procedures to be used during sampling of the various media being evaluated as part of the EWP (i.e. soil and fill materials). Additional details regarding sampling procedures and protocols are described in Roux's relevant Standard Operating Procedures (SOPs), which are provided in Attachment 2.

5.1 Offsite Backfill/On-Site Reuse Soil Sampling

All imported fill/on-Site reuse soil material samples will be collected using pre-cleaned stainless steel sampling tools (i.e., trowels, spatulas, etc.) or new Ziploc bags. As noted above, waste characterization samples will be collected as required by the selected disposal facility. In general, where composite samples are required for waste characterization or offsite fill/on-Site reuse soil material samples, composite samples will be collected from a minimum of three locations across the stockpiled materials. The exception is for VOC samples, which will be collected as grab samples.

Additional necessary precautions will be taken when sampling for ECs in the field, incuding but not limited to:

- Using the proper field clothing or personal protective equipment (i.e. no materials will contain Gore-Tex or Tyvek);
- Avoid using sampling equipment components/containers making contact with aluminum foil, low density polyethylene (LDPE), glass, or polytetrafluoroethylene materials;
- Following PFAS field sampling guidelines (i.e. using sampling materials made from high density polyethylene [HDPE], silicon, or stainless steel and avoid using equipment containing Teflon and using sharpies, permanent markers, adhesives, and waterproof/plastic clipboards and notebooks); and
- Utilizing regular ice cubes for sample presevation and only Alconox for decontamination.

6. Sample Handling and Analysis

To ensure quality data acquisition and collection of representative samples, there are selective procedures to minimize sample degradation or contamination. These include procedures for preservation of the samples, as well as sample packaging, shipping procedures, and QA/QC.

6.1 Field Sample Handling

A discussion of the proposed number and types of samples to be collected during each task, as well as the analyses to be performed, can be found in Section 4.0 of this QAPP/FSP. The types of containers, volumes, and preservation techniques for the aforementioned testing parameters are presented in Table 3.

6.2 Sample Custody Documentation

The purpose of documenting sample custody is to ensure the integrity and handling of the samples is not subject to question. Sample custody will be maintained from the point of sampling through the analysis (and return of unused sample portions, if applicable).

Each individual collecting samples is personally responsible for the care and custody of the samples. All sample labels should be pre-printed or filled out using waterproof ink. The technical staff will review all field activities with the Field Team Leader to determine whether proper custody procedures were followed during the fieldwork and to decide if additional samples are required.

All samples being shipped offsite for analysis must be accompanied by a properly completed chain of custody form. The sample numbers will be listed on the chain of custody form. When transferring the possession of samples, individuals relinquishing and receiving will sign, date, and note the time on the record. This record documents transfer of custody of samples from the sampler to another person, to/from a secure storage area, and to the laboratory.

Samples will be packaged for shipment and dispatched to the appropriate laboratory for analysis with a separate signed custody record enclosed in each sample box or cooler. Shipping containers will be locked and/or secured with strapping tape in at least two locations for shipment to the laboratory.

6.3 Sample Shipment

Laboratory analysis will be completed by Alpha Analytical Laboratories of Westborough, MA and Mansfield, MA, NYSDOH Environmental Laboratory Accreditation Program (ELAP)-certified laboratories (11148, and 11627, respectively). Sample packaging and shipping procedures are based upon USEPA specifications, as well as DOT regulations. The procedures vary according to potential sample analytes, concentration, and matrix and are designed to provide optimum protection for the samples and the public. Sample packaging and shipment must be performed using the general outline described below.

All samples will be shipped within 24 hours of collection and will be preserved appropriately from the time of sample collection. A description of the sample packing and shipping procedures is presented below:

1. Prepare cooler(s) for shipment:
   - tape drain(s) of cooler shut;
   - affix "This Side Up" arrow labels and "Fragile" labels on each cooler; and

- place mailing label with laboratory address on top of cooler(s).

2. Arrange sample containers in groups by sample number.
3. Ensure all bottle labels are completed correctly. Place clear tape over bottle labels to prevent moisture accumulation from causing the label to peel off.
4. Arrange containers in front of assigned coolers.
5. Place packaging material appropriately at the bottom of the cooler to act as a cushion for the sample containers.
6. Arrange containers in the cooler so they are not in contact with the cooler or other samples.
7. Fill remaining spaces with packaging material.
8. Ensure all containers are firmly packed in packaging material.
9. If ice is required to preserve the samples, ice cubes should be repackaged in Ziploc™ bags and placed on top of the packaging material.
10. Sign chain of custody form (or obtain signature) and indicate the time and date it was relinquished to courier as appropriate.
11. Separate chain of custody forms. Seal proper copies within a large Ziploc™ bag and tape to inside cover of cooler. Retain copies of all forms.
12. Close lid and latch.
13. Secure each cooler using custody seals.
14. Tape cooler shut on both ends.
15. Relinquish to overnight delivery service as appropriate. Retain air bill receipt for project records. (Note: All samples will be shipped for "NEXT A.M." delivery).

6.4 Quality Assurance/Quality Control

Joshua Cope of Roux will review the analytical data for quality assurance and quality control in accordance with NYSDEC standards. Joshua Cope has no involvement in project related operations of the Sendero Verde Redevelopment Project Parcel B and his role is limited to data validation. The professional profile for Joshua Cope is provided in Attachment 1. A laboratory SOP for analysis of PFAS is included in Attachment 2.

The primary DQO of the soil program is that data be accurate and precise, thus, representative of the actual Site conditions. Accuracy refers to the ability of the laboratory to obtain a true value (i.e., compared to a standard) and is assessed through the use of laboratory quality control (QC) samples, including laboratory control samples and matrix spike samples, as well as through the use of surrogates, which are compounds not typically found in the environment that are injected into the samples prior to analysis. Precision refers to the ability to replicate a value and is assessed through both field and laboratory duplicate samples.

Sensitivity is also a critical issue in generating representative data. Laboratory equipment must be of sufficient sensitivity to detect target compounds and analytes at levels below NYSDEC standards and guidelines whenever possible. Equipment sensitivity can be decreased by field or laboratory contamination of samples, and by sample matrix effects. Assessment of instrument sensitivity is performed through the analysis of reagent blanks, near-detection-limit standards, and response factors. Potential field and/or laboratory contamination is assessed through use of trip blanks, method blanks, and equipment rinse blanks (also called "field blanks"). Field blanks for PFAS will be collected at a minimum frequency of one per day.

Table 1 lists the requirements for field and laboratory QC samples that will be analyzed to assess data accuracy and precision, as well as to determine if equipment sensitivity has been compromised. Table 2 lists the number/type of field and QA/QC samples that will be collected during the EWP. Table 3 lists the preservation, holding times and sample container information.

All EWP analyses will be performed in accordance with the NYSDEC Analytical Services Protocol (ASP), using USEPA SW 846 methods.

All laboratory data are to be reported in NYSDEC ASP Category B deliverables and will be delivered to NYSDEC in electronic data deliverable (EDD) format as described on NYSDEC's website (http://www.dec.ny.gov/chemical/62440.html). A Data Usability Report will be prepared meeting the requirements in Section 2.2(a)1.ii and Appendix 2B of DER-10 for all data packages generated for the RAWP implementation. The DUSR will be prepared by Joshua Cope, a project-independent Roux data validator. Validator resume is included in Attachment 1.

7. Site Control Procedures

Site control procedures, including decontamination and waste handling and disposal, are discussed below. Site control procedures have been developed to minimize both the risk of exposure to contamination and the spread of contamination during field activities at the Site. All personnel who come into designated work areas, including contractors and observers, will be required to adhere strictly to the conditions imposed herein and to the provisions of a Site-Specific Health and Safety Plan (HASP). The HASP is included as Appendix E to the SMP.

7.1 Decontamination

In an attempt to avoid the spread of contamination, all drilling and sampling equipment must be decontaminated at a reasonable frequency in a properly designed and located decontamination area. Detailed procedures for the decontamination of field and sampling equipment are included in Roux's SOPs for the Decontamination of Field Equipment located in Attachment 2. The location of the decontamination area will be determined prior to the start of field operations. The decontamination area will be constructed to ensure that all wash water generated during decontamination can be collected and containerized for proper disposal.

Only "PFAS-free" water will be used for decontamination of sample equipment onsite. Only Alconox will be used as decontamination detergent (Liquinox shall not be used).

7.2 Waste Handling and Disposal

All waste materials (decontamination water, etc.) generated during the EWP will be consolidated, and stored in appropriate labeled bulk containers (drums, etc.), and temporarily staged at an investigation derived waste storage area on-site. Roux will then coordinate waste characterization and disposal by appropriate means.

Respectfully submitted,

ROUX ENVIRONMENTAL ENGINEERING AND GEOLOGY, D.P.C.

Wendy Shen
Senior Engineer

Noelle Clarke, P.E.
Principal Engineer

TABLES

Table 1. Field and Laboratory QC Summary

QC Check Type	Minimum Frequency	Use
Field QC		
Duplicate	1 per matrix per 20 samples or SI	Precision
Trip Blank	1 per VOC cooler	Sensitivity
Field Blank (non-PFAS)	1 per matrix per 20 samples	Sensitivity
Field Blank (PFAS)	1 per matrix per 20 samples	Sensitivity
Laboratory QC		
Laboratory Control Sample	1 per matrix per SDG	Accuracy
Matrix Spike/Matrix Spike Duplicate/Matrix Duplica	1 per matrix per SDG	Accuracy/Precision
Surrogate Spike	All organics samples	Accuracy
Laboratory Duplicate	1 per matrix per SDG	Precision
Method Blank	1 per matrix per SDG	Sensitivity

Notes:
* SDG - Sample Delivery Group - Assumes a single extraction or preparation
** Provided to lab by field sampling personnel
PFAS - Per- and Polyfluoroalkyl Substances

Table 2. Excavation Work Plan Sampling Summary

Sample Medium	Target Analytes	Field Samples	Replicates[1]	Trip Blanks[2]	Field Blanks[1]	Matrix Spikes[1]	Spike Duplicates[1]	Total No. of Samples
Soil (Import for Backfill/On-Site Reuse)	TCL/Part 375 VOCs	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	TCL/Part 375 SVOCs	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	TAL/Part 375 Metals	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	TAL/Part 375 Pesticides	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	TCL/Part 375 Herbicides	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	Total Cyanide	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	TCL PCBs	TBD	TBD	TBD	TBD	TBD	TBD	TBD
	PFAS, 1,4 dioxane	TBD	TBD	TBD	TBD	TBD	TBD	TBD

TBD - To Be Determined
Totals are estimated based on scope of work as written, actual sample quantities may vary based on field conditions. QA/QC sample quantities will be adjusted accordingly.
[1] Based on 1 per day for PFAS or 1 per 20 samples or 1 per Sample Delivery Group (3 days max) for all other parameters.
[2] Based on 1 cooler per day
TAL - USEPA Contract Laboratory Program Target Analyte List
TCL - USEPA Contract Laboratory Program Target Compound List
USEPA - United States Environmental Protection Agency
VOCs - Volatile Organic Compounds
SVOCs - Semivolatile Organic Compounds
PCBs - Polychlorinated Biphenyls
PFAS - Per- and Polyfluoroalkyl Substances

Table 3. Preservation, Holding Times and Sample Containers

Analysis	Matrix	Bottle Type	Preservation(a)	Holding Time(b)
TAL/Part 375 Metals (total)	Soil	8 oz wide mouth glass, teflon lined cap	Cool to 4°C	180 days, Hg 28 days
SW-846 6010/7471	Water	250 mL plastic, teflon lined cap	Nitric acid	
Hexavalent Chromium	Soil	2 oz wide mouth glass, teflon lined cap	None	30 days from sample collection to extraction; 7 days following extraction
SW-846 7196A	Water	500 mL plastic bottle		24 hours from sample collection
Total Cyanide	Soil	4 oz wide mouth glass, teflon lined cap	Cool to 4°C	14 days from sample collection
SW-846 9012B	Water	250 mL plastic bottle	NaOH	14 days from sample collection
PFAS vis EPA 537(M)-Isotope Dilution	Soil	Three 250 mL HDPE bottles	None	14 days to extract, 40 days to analysis
PFAS vis EPA 537(M)-Isotope Dilution	Water	Three 250 mL HDPE bottles	Trizma	14 days to extract, 28 days following extraction
1,4-Dioxane via 8270SIM	Soil	8 oz wide mouth glass, teflon lined cap	Cool to 4°C	14 days to extract, 40 days to analysis
1,4-Dioxane via 8270SIM	Water	500 mL amber glass	Cool to 4°C	7 days to extract, 28 days following extraction
TO-15	Air	2.7 liter Summa Canister	None	14 days from sample collection
<u>**Target Compound List (TCL)/Part 375**</u>				
TCL/Part 375 Volatile Organic Compounds (VOCs)	Soil	Encore	Cool to 4°C	48 hours to extrude into methanol/DI vials, 14 days to analysis
	Soil	Terracore	Cool to 4°C	48 hours to freeze DI vials, 14 days to analysis
SW-846 8260B	Water	40mL voa vial, teflon lined cap	Hydrochloric Acid	14 days from sample collection
TCL/Part 375 Semivolatile Organic Compounds (SVOCs)	Soil	8 oz wide mouth glass, teflon lined cap	Cool to 4°C	14 days to extract, 40 days to analysis
SW-846 8270C	Water	1 liter amber glass, teflon lined cap		7 days to extract, 40 days to analysis
TCL/Part 375 Pesticides	Soil	8 oz wide mouth glass, teflon lined cap	Cool to 4°C	14 days to extract, 40 days to analysis
SW-846 8081A	Water	1 liter amber glass, teflon lined cap		7 days to extract, 40 days to analysis
TCL/Part 375 Herbicides	Soil	8 oz wide mouth glass, teflon lined cap	Cool to 4°C	14 days to extract, 40 days to analysis
SW-846 8051A	Water	1 liter amber glass, teflon lined cap		7 days to extract, 40 days to analysis
TCL/Part 375 Polychlorinated biphenyls (PCBs)	Soil	8 oz wide mouth glass, teflon lined cap	Cool to 4°C	14 days to extract, 40 days to analysis
SW-846 8082/TCLP	Water	1 liter amber glass, teflon lined cap		7 days to extract, 40 days to analysis

(a) All soil and groundwater samples to be preserved in ice during collection and transport
(b) Days from date of sample collection.
TAL - Target Analyte List
PFAS - Per- and Polyfluoroalkyl Substances
TCL - USEPA Contract Laboratory Program Target Compound List
USEPA - United States Environmental Protection Agency

ATTACHMENTS

1. Professional Profiles
2. Standard Operating Procedures, Laboratory Detection Limits for Emerging Contaminants and NYSDEC Guidance for Sampling Emerging Contaminants

ATTACHMENT 1

Professional Profiles

Noelle M. Clarke, P.E.
Principal Engineer

TECHNICAL SPECIALTIES
Phase I/Phase II Environmental Site Assessments (ESA), remedial investigations, feasibility studies, pilot testing, remedial design, implementation, construction management, and startup evaluations for remediation of soil, groundwater, and sediment. Extensive experience at brownfields redevelopment sites, former industrial facilities, and public works facilities. Evaluation and design of storm water drainage systems. Evaluation, design, and construction management for new and existing wastewater treatment processes.

EXPERIENCE SUMMARY
Twenty-seven years' experience: Principal Engineer/Senior Engineer at Roux/Remedial Engineering, P.C; Project Engineer at Camp Dresser & McKee

CREDENTIALS
B.S. - Civil Engineering, Manhattan College, 1991

M.E. - Environmental Engineering, Manhattan College, 1994

Professional Engineer, New York, 1995

KEY PROJECTS
- Principal Engineer for a Brownfield redevelopment of a property adjacent to a dry-cleaning solvent distribution facility in Brooklyn, New York under the NYSDEC BCP. The site was previously a warehouse built on a former freight railyard that serviced the dry-cleaning solvent facility. Offloading spillage on site and migration from the offsite facility resulted in significant soil, groundwater, and vapor contamination with chlorinated VOCs. The site was developed into multifamily housing with first floor retail use. Pre-remediation and posts-remediation Phase I ESAs were prepared by Roux. The remedy, as summarized in the Remedial Action Work Plan, consisted of soil hot spot removal to 35 feet below grade, a physical barrier to limit on site migration, a permeable reactive wall to mitigate offsite contaminant migration, and a sub slab depressurization system. In order to reach the target excavation depths of 35 feet, maintain stability of the adjacent aging building, limit VOC emissions and avoid significant dewatering, soil was removed from the hot spots by excavating trenches, which were simultaneously backfilled with a cement /bentonite slurry mix. Roux conducted continuous monitoring of VOCs and dust at the site perimeter and of all personnel working in the excavation exclusion zone. Vapor suppressant foam was used to control VOC emissions and water was used to control dust during excavation and loading of trucks. Implementation of a perimeter community air monitoring plan assured that the public was not exposed to contaminants during the remediation process. Roux, under the direction of Ms. Clarke provided full time oversight of the remediation and prepared the Final Engineering Report and Site Management Plan. The Certificate of Completion for the Site was obtained in October 2015 and Roux is currently providing post-remediation monitoring services.
- Principal Engineer for the alternatives evaluation, remedy selection, regulatory negotiation, preparation of design documents (drawings, specifications and permit applications), permitting, bidding, contractor selection, construction management and regulatory reporting for all remedial components in support of redevelopment at a former metals manufacturing site in Staten Island, New York under the New York State Department of Environmental Conservation Voluntary Cleanup Program. The remedy included dredging, ex *situ* stabilization and onsite disposal of stream sediments; consolidation and capping of fill material across the site; in-place abandonment of the Site's former sewer system; installation of drainage swales for storm water management; and wetland bank stabilization and mitigation/restoration. As part of the remedy selection process, a bench scale testing program for several stabilization reagents was developed and implemented. Roux was responsible for specification, sourcing and testing of multiple types certified clean backfill and capping materials. The work included permitting of remedial activities with multiple federal, state and local agencies. Required permits and regulatory approvals for the project included a Joint Permit from the USACE and NYSDEC for dredging of Mill Creek, bank stabilization and construction activities in the wetlands; a NYSDEC SPDES equivalency permit for discharge of treated water to the Arthur Kill, a New York State Department of State Coastal Management Program Federal Consistency Assessment; a New York City Waterfront Revitalization Program Consistency Assessment, a modification of topography authorization from New York City Department of City Planning; and a New York City Department of Environmental Protection permit for temporary discharge to a combined sewer. Also required by the USACE and National Marine Fisheries, was preparation of an Essential Fish Habitat Study, in support of the Joint Permit application. Permitting activities included preparation of the various permit applications, forms and supporting documentation, as well as follow up meetings and correspondence to finalize the authorizations. Roux was heavily involved in coordinating with the client, regulators and contractor for mobilization to the site in late 2006. During the construction Ms. Clarke provided support to the onsite construction manager regarding field changes, design revisions to account for unexpected conditions and contractor questions. The Final Engineering Report summarizing the construction activities was accepted by NYSDEC.

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- Principal-in-Charge of an extensive investigation and remediation project at a former petroleum refinery and current distribution facility located in Buffalo, New York. The site entered the NYSDEC BCP in 2006. Multiple Alternatives Analysis Reports (to document analysis of engineering options and remedy recommendation), Remedial Action Work Plans and remedial design documents have been prepared to address the environmental impacts associated with the five Operable Units (OU) on the Site. Remedial construction for OU-1 was completed in 2007 and included excavation and disposal of impacted soil. The Final Construction Certification Report for OU-1 was accepted by the NYSDEC. The Alternatives Analysis Report and Remedial Design for OU-4 were submitted and approved by NYSDEC. The remedy for OU-4 included stabilization of 1,400 linear feet of river embankment using tiered slopes, rip rap, and reinforced bioengineering, slurry wall groundwater containment, low permeability capping over eight acres, a stormwater collection system and constructed wetland treatment for stormwater. Various vegetative measures were incorporated into the design to promote vegetative growth and enhance wildlife habitats. The Alternatives Analysis Reports for OU-2 and OU-3 were submitted to NYSDEC. For OU-2, bench scale studies of in situ stabilization/solidification reagents were completed and evaluated for treatment of lead and petroleum impacted soil. In addition, field pilot studies of multiple in situ stabilization reagents were completed and evaluated. Design of a stormwater collection system for portions of OU-2 and OU-3 was completed in 2010 and construction was completed in 2014 under the direction of Ms. Clarke. For all projects, Roux was responsible for specification, sourcing and testing of multiple types certified clean backfill and capping materials.

- For the same petroleum terminal in Buffalo, New York, the work also includes performing activities related to the operation of the remediation systems at the Site. These activities have included preparing a feasibility study work plan for improving water management systems at the site; preparing a work plan, directing the field work and preparing an evaluation summary report for startup and testing of a portion of the groundwater extraction system at the Site; and assisting in preparation of plans to upgrade the existing treatment facilities at the Site.

- For the same petroleum terminal in Buffalo, New York, the work also included preparation of design documents and a completion report for in-place closure of the site's former in-ground oil water separator. In addition, a vapor enhanced extraction pilot study work plan was prepared and implemented at the site for recovery of separate-phase product in one portion of the site located adjacent to the Buffalo River. The results of the VER pilot testing, along with the results of chemical oxidation pilot testing conducted at the site, have been summarized in a Remedial Action Selection report, which recommended implementation of chemical oxidation in this portion of the site. A conceptual plan for implementation of chemical oxidation was submitted with the selection document. The work also included maintaining contact with regulatory agencies regarding the status of activities at the Terminal; preparing compliance monitoring reports for submittal to the regulatory agencies; overall project coordination; and budget management and tracking.

- Principal Engineer for a complex dredging project on the Allegheny River in New York to remove petroleum impacted sediments. Included the Site Investigation, Remedial Investigation, Alternative Feasibility Study and regulatory permitting with multiple federal, state and local agencies and for upcoming dredge of 1,000 tons of sediment.

- Principal Engineer providing due diligence support for real estate transactions on multiple projects in the New York metropolitan area. Projects have included multi-family housing (both affordable and market rate), retail/commercial, community services and industrial properties. Services have included Phase I and Phase II ESAs.

- Principal Engineer for a Brownfield redevelopment in Brooklyn, New York at a mixed use multifamily housing/neighborhood retail complex with a former onsite dry cleaner under the NYSDEC BCP. There is soil, groundwater, and vapor contamination from chlorinated VOCs from the former onsite dry cleaner, as well as groundwater contamination from offsite dry cleaners. The remedy, described in the Remedial Action Work Plan prepared by Roux, consisted of hot spot soil removal within the basement of the building, *in situ* groundwater treatment and a sub slab depressurization system for vapor mitigation in the existing buildings. Roux was responsible for specification, sourcing and testing of certified clean backfill material. Remedial construction was completed under the oversight of Roux, including continuous monitoring of VOCs for all personnel working in the basement excavation area. A combination of ventilation, work sequencing and vapor suppressant foam was used to control VOC emissions and allow the work to be completed successfully in this challenging setting. The Final Engineering Report and Site Management Plan were prepared by Roux and the Certificate of Completion for the Site was obtained in 2016. Roux is currently providing post-remediation monitoring services.

- Principal Engineer for the investigation, remedial design, construction oversight and operation and maintenance of a bioventing and soil vapor extraction system at the Site of a diesel UST failure in Brooklyn. A free product recovery system was also designed, installed, and operated by Roux. Investigation activities included the use of the sonic drilling technique to advance twelve wells to 85 feet below grade through cobbles and boulders for delineation of separate phase product, soil and groundwater impacts. Eight wells were converted to combination biovent/SVE wells. Design included specification of SVE and biovent blowers, piping, valves, and an automatic control system. Product only pumps were also designed and installed in three wells. Approximately 2,000 gallons of product were recovered to by the two systems and the spill was closed by NYSDEC in 2011.

- Principal Engineer for the investigation, design, and implementation of a soil remediation project at a portion of a former oil terminal in Sag Harbor, New York. The remedy completed included excavation and offsite disposal of approximately 2,000 tons of petroleum contaminated soil from beneath an active public roadway under the NYSDEC spills program. The remedy included extensive traffic control and coordination with Village of Sag Harbor officials, dewatering, water treatment, temporary water discharge of treated water to Sag Harbor and restoration of the public roadway in accordance with the Village of Sag Harbor Department of Public Works requirements. VOC emissions were controlled during the excavation and loading of trucks using vapor suppressant foam. Dust was controlled using water. Implementation of a perimeter community air monitoring plan assured that the public was not exposed to contaminants during the remediation process. Roux prepared a Final Engineering Report, which was accepted by NYSDEC and resulted in the closure of the spill number for the Site.

- Principal engineer for a NYSDEC BCP redevelopment in Staten Island, New York of a former retail service station site. There is soil, groundwater, and vapor contamination from petroleum-related constituents near the former gasoline piping and pump island (the petroleum source area), as well as historic fill across the entire site. An interim remedial measure consisting of removal of four underground gasoline storage tanks, pump island, associated piping and petroleum impacted soil was completed in 2015. VOC emissions were controlled during the excavation and loading of trucks using vapor suppressant foam. Dust was controlled using water. Implementation of a perimeter community air monitoring plan assured that the public was not exposed to contaminants during the work. The Site-wide remedy, described in the Remedial Action Work Plan prepared by Roux, will consist of a sheet pile containment wall around the petroleum source area, a Site Cover System across the entire site (comprised of concrete building slab/walkways, asphalt parking areas and limited landscaped areas) and a sub-slab depressurization system to prevent vapor intrusion into the proposed retail building and offsite migration of impacted soil vapor.

- Principal-in-charge of the hot spot soil removal and final soil capping of a former 7.5-acre petroleum terminal in Hastings on Hudson New York. Roux oversaw the field work which included sourcing and sampling of over 22,000 cubic yards of soil and topsoil that was transported to the Site via barge and truck to backfill the hot spot excavation and implement a two-foot soil cap across the Site. Oversight activities included ensuring compliance with the contract documents, daily oversight and health and safety for subcontractors on land and on barge, implementation of site specific storm water pollution prevention plan and community air monitoring at the Site perimeter to ensure that VOC and dust emissions during construction did not impact the surrounding community.

- Principal Engineer for the investigation, design, and implementation of a soil remediation project at a 4-acre former oil terminal in Cold Spring Harbor, New York under the NYSDEC spills program. The remedy completed included excavation and offsite disposal of approximately 20,000 tons of petroleum contaminated and/or hazardous lead contaminated soil in accordance with the future use of the site under an Environmental Easement. Additional activities completed by Roux at the site included asbestos remediation followed by building demolition, UST removal, and cesspool remediation. Roux was responsible for specification, sourcing and testing of certified clean backfill material. VOC emissions were controlled during the excavation and loading of trucks using vapor suppressant foam. Dust was controlled using water. Implementation of a perimeter community air monitoring plan assured that the public was not exposed to contaminants during the remediation process. Roux prepared a Final Engineering Report, which was accepted by NYSDEC and resulted in the closure of the spill number for the Site.

- Principal Engineer for the design and specification of a large-scale (750 scfm) soil vapor extraction (SVE) pilot system with thermal oxidation off-gas treatment for a client in Brazil. Responsibilities included equipment

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sizing and specification, selection of materials of construction, SVE well and equipment layout, description of general startup procedures and preparation of a pilot test work plan. The pilot test work plan included a description of the pilot test operating procedures to be followed, operating parameters to be monitored and data to be collected and analyzed. The work also included conducting the pilot test activities and generating a report that included plans for expanding the SVE system across the Site. The work currently also included technical support for evaluating and optimizing system performance.

- Project Manager for a storm sewer study at the former metals manufacturing facility in Staten Island, New York as part of the Voluntary Cleanup Program for the Site to identify contaminated infiltration sources, provide an accurate site drainage map, and verify contributing areas to each outfall. The investigation included field inspections, surveying, dye testing, and sampling during varying tidal conditions. The storm sewer map prepared was used for future sewer closure and site redevelopment planning.
- Project Manager for preparation of a work plan, direction the field activities and preparation of a summary report for investigation of the storm-water collection system at a petroleum terminal in Buffalo, New York. The objectives of the storm sewer investigation were to: prepare a detailed map of the Site's sewer system; re-establish connections that may have become blocked by debris; investigate the structural integrity of the storm sewers; locate areas of groundwater infiltration and assess infiltration rate and quality; assess wet and dry-weather flow and quality; and identify areas contributing surface water to the collection system, including hydrologic modeling using TR-55. Based on the results of the investigation, several improvements to the sewer system were recommended, including eliminating inlets to the system in areas of the site where no active operations currently take place and rehabilitation and/or installation of new sewers to restore flow by gravity to the treatment system.
- Principal engineer for the design of a new storm water collection system for a metals manufacturing site in Staten Island, New York under the NYSDEC VCP. The design included evaluation and hydrologic modeling of the system using the U.S. Soil Conservation Service TR-55 hydrologic analysis model, inlet structure and pipe sizing and layout, outfall design and specification of materials and methods of construction for all system components.
- Principal-in-Charge of the operation, maintenance, monitoring and reporting activities at multiple active and former petroleum storage and distribution terminals located in New York for a large petroleum company. The work includes operation, maintenance, and performance/compliance monitoring services at the sites that currently have active remediation system installed and monitoring, sampling, and reporting services at sites without systems. The remediation systems include groundwater extraction and treatment, free product recovery, bio-sparging, and soil vapor extraction/air sparging. At these sites, Roux Associates is responsible for: maintaining and troubleshooting the various system components to reduce downtime to the extent possible; repairing and/or replacing equipment as needed; coordinating the upgrading of the electrical systems, as needed, to meet current building code requirements; expanding systems to meet regulatory requirements, as needed; optimizing system performance; collecting performance monitoring samples and data to track the efficiency of the treatment systems; and collecting compliance monitoring data.
- Principal Engineer for at multiple petroleum terminals in New York State for groundwater quality and surface water quality sampling and monitoring well gauging as required by the New York State Department of Environmental Conservation, as well as quarterly reporting for all sites. The work has also included collection of soil quality data at several sites and performance of an electromagnetic survey to support the divestiture and redevelopment of one of these sites. Based on these results, soil removal activities were performed at one of the former terminals in order to obtain regulatory closure of the site. Roux Associates successfully completed the remedial activities to the satisfaction of the regulator and received closure for the client of the open spill number. Regulatory closure of another of these former terminals was obtained based upon the results of ongoing groundwater monitoring and reporting.
- Project Engineer for design of a 2.6-mgd groundwater treatment system at the Fireman's Training Center for Nassau County Department of Public Works on Long Island. The work included design of air strippers, exhaust stacks, liquid-phase GAC treatment units, and all chemical feed and storage facilities, including unit sizing, selection of materials of construction, equipment layout, and coordination with other disciplines. The work also included development of the "mass balance" for the facility.
- Task leader in charge of overseeing a bioventing pilot study conducted by a subconsultant, to treat contaminated vadose zone soils at the Fireman's Training Center site in Nassau County, New York. The work included development of a preliminary design

report for the full-scale implementation of bioventing at the site based upon the results of the pilot study.

- Project Engineer for the design, specification, construction and operation of an air sparging and soil vapor extraction pilot at the Long Island terminal of a large petrochemical distributor. The pilot was designed to treat contaminated ground water and vadose zone soils resulting from a one-million-gallon gasoline spill at the site. The work included development of the field sampling program and sampling and evaluation of various parameters to determine the pilot's radius of influence and effectiveness. The work also included performing data analysis and preparation of the pilot study report, which recommended full scale implementation of air sparging at the site. The site-wide implementation of air sparging and expansion of the site's existing vapor extraction system at the same Long Island petrochemical terminal was also part of the work. Responsibilities included design, specification, and layout of all mechanical equipment, vapor extraction, and air sparging wells and new vapor extraction/air sparging piping.
- Task leader responsible for investigating alternatives for the treatment of gasoline contaminated off-gas from air stripping operations a Long Island petrochemical terminal. Based on this evaluation, biofiltration was selected for piloting. Responsibilities included design of a pilot unit; development of sampling and data collection procedures; construction oversight and "troubleshooting" for the unit; coordination of data collection activities; and compilation and analysis of the pilot data.
- Project Engineer for the design of a 0.50-mgd groundwater treatment facility a Long Island petrochemical terminal. Responsibilities included the design, specification, and layout of mechanical equipment, including the air stripping tower, vapor phase granular activated carbon off-gas treatment, centrifugal blowers, ductwork, influent pump, and concrete wet well. Responsible for shop drawing review during the construction phase.
- Project Manager for an investigation at a gasoline service station with soil and groundwater contamination. Responsible for reviewing and evaluating the work of another consultant that performed the soil and groundwater sampling and conducted remedial activities at the site including: investigation summary reports; remedial designs; remediation progress reports; correspondence with regulators; and plans for future work at the Site. The work also included mapping the groundwater flow patterns in the area of the service station and mapping the areal and vertical extent of the groundwater contamination. Responsible for project coordination and budget management and tracking.
- Project Manager for the remedial design at a Superfund Site in Nanuet, New York for the New York State Department of Environmental Conservation. The work included preparation of a preliminary design report, which evaluated two alternatives for handling hazardous soils and sediments at the site contaminated with volatile organic compounds. Each alternative was evaluated on the basis of technical feasibility, cost and schedule for implementation. Based upon this evaluation, off-site disposal was recommended over on-site treatment. The report presented a site-wide conceptual plan for remediation, including: soil/sediment excavation, staging and sampling; stream diversion; excavation dewatering; temporary on-site groundwater treatment; and long term monitoring. Duties also included managing and tracking all project budgets and serving as the main client contact.
- Project Manager for the field investigation, feasibility evaluation, and remedial design at Superfund Site in Spring Valley, New York for the New York State Department of Environmental Conservation. The work included development of a work plan and site operations plan. The field investigations included Geoprobe soil borings; groundwater monitoring well installation; groundwater sampling; aquifer pump testing; and vapor extraction pilot testing. Work also included conducting the field operations for the vapor extraction pilot and producing a summary report of the field investigation results. The report presented an evaluation of the cost and feasibility of several alternatives for remediation of the site. It recommended reducing the level of effort of the remediation presented in the Record of Decision, based on lower levels of contamination encountered during the investigation. Duties also included project coordination; budget management and tracking; and development of subcontract agreements.
- Project Engineer for upgrades to the Spring Creek Auxiliary Water Pollution Control Plant for the City of New York. The work included the evaluation, design and specification of a two-stage odor control system, chemical storage and feed facilities and new effluent disinfection system.
- Project Engineer responsible for preparation of design documents for the replacement of the sodium hypochlorite pumps and piping at the Mamaroneck Wastewater Treatment Plant for Westchester County Department of Environmental Facilities in New York.
- Project Engineer for design of upgrades to the New Rochelle Wastewater Treatment Facility for Westchester County Department of Environmental Facilities in New York. Designed upgrades to the main

influent pump station, including rehabilitation of the existing influent pumps and replacement of the magnetic drives with new variable frequency drives. Responsibilities also included design of a submersible automatic duplex sump pump system, new primary sludge pumps and piping and new primary and secondary settling tank equipment. The work also included assisting the County during the bidding and contractor selection phase and preparing addenda to the contract documents.

- Project Manager for the construction of upgrades to the New Rochelle Wastewater Treatment Facility. Responsibilities included overseeing the shop drawing logging and distribution process; reviewing mechanical equipment shop drawings; addressing contractor questions regarding the contract documents; and coordinating with the resident engineer in the field and the electrical and general contractors.
- Project Engineer for the performance evaluation of the Harriman Wastewater Treatment Plant for the Orange County Department of Environmental Facilities and Services. Responsibilities included documentation of the existing conditions at the plant and evaluation of the historical and current performance of the plant with respect to its potential for expansion. A summary report was prepared, which included evaluations of the existing plant processes with respect to standard design criteria, typical design practices and receiving water considerations. This summary report served as the basis for the facilities plan prepared as the next phase of the project.
- Project Engineer for the facilities plan for the upgrade of the Harriman Wastewater Treatment Plant. Responsibilities included evaluation of alternatives for expanding the plant's treatment capacity. A report was prepared, which recommended the conversion of the existing oxidation ditches to sequencing batch reactors in order to increase the plant's treatment capacity to 6.0 mgd within the limited space available on the site.
- Project Engineer for the Gates-Chili-Ogden Pump Station and Force main design for Monroe County, New York. The design consisted of a new 36 mgd wet pit/dry pit pump station, influent sewer and force main. Responsibilities included evaluating influent pumping conditions, and design of the influent sewer, manual influent bar racks and a duplex automatic submersible sump pump system for the station.
- Project Engineer for the design of a submersible pump station to handle sewage flow from a proposed dog pound for the City of Waterbury in Connecticut. The design included a concrete manhole pump station with two 100 gpm submersible grinder pumps, a separate valve vault, and a 4-inch force main. The station was designed to operate automatically based upon wet well levels and included monitoring and transmitting of alarm conditions via a telephone interconnection.
- Project Manager for the annual emissions testing of the landfill gas thermal oxidizer at the Oyster Bay Solid Waste Disposal Complex on Long Island. Responsibilities included scheduling the field testing; coordinating with the testing subcontractor, the Town's laboratory, and the site project manager; overseeing the field testing; compiling and analyzing the test data; and preparing a draft and final test report.
- Project Manager for the Flow Augmentation Needs Study (FANS) for Suffolk County Department of Public Works, New York. Responsibilities included coordinating and implementing the annual wetland monitoring effort for collection of data to characterize the vegetation communities and surface water and groundwater conditions at four freshwater wetland sites in Suffolk County. Duties also included maintaining a database of all vegetation data collected; developing and refining equations to characterize the groundwater table and wetlands vegetation in all monitoring areas; evaluating potential impacts of sewering on sensitive wetlands; and evaluating the need for any mitigation of these sites as triggered by vegetation changes correlated to groundwater drawdown. Responsibilities also included coordinating the production of a draft and final annual monitoring report summarizing the findings the program.
- Task leader for two project tasks for the Nassau County Water Management Plan for Nassau County Department of Public Works. The first task included researching, compiling data and describing the County's approximately 50 public water supply systems and mapping their different methods of treatment, storage and pumping. The second task included summarizing all Federal, State and local laws, regulations and programs that relate to the protection of the County's groundwater resources.

Wendy Shen
Senior Engineer

TECHNICAL SPECIALTIES
Management of construction and remediation projects, including Brownfield redevelopment, building construction, excavation and disposal of impacted soil, engineering services for the investigation, design, construction, and operation and maintenance of remedial systems for the treatment of contaminated soil and groundwater.

EXPERIENCE SUMMARY
Seventeen years of experience: Senior Engineer, Project Engineer, Staff Engineer, and Staff Assistant Engineer with Roux.

CREDENTIALS
M.S. in Environmental Engineering, Polytechnic University, Brooklyn, New York, 2001

B.S. in Chemical Engineering, Universidade Federal do Rio Grande do Sul, Brazil, 1997

OSHA 40 Hour Health and Safety Course, 2000

OSHA 8 Hour Refresher Courses

KEY PROJECTS
- Senior Engineer responsible for the management of investigation and remediation various Brownfields redevelopment sites containing hazardous and nonhazardous soils in New York City and surrounding. These projects included the implementation of in situ waste characterization sampling program and a Remedial Action Work Plan, which included excavation of soils below grade and management of soils including transportation and disposal and coordination with various disposal facilities. Most of these sites were accepted into the New York City Office of Environmental Remediation (NYC OER) Brownfield Cleanup Program (BCP) or the New York State BCP.
- Senior Engineer responsible for scheduling at a large petroleum remediation project in Brooklyn, New York. Responsibilities included management of all present and future tasks to be completed including operations and maintenance, remedial investigation, design and construction, facility upgrades, special operations, permitting and compliance tracking, health and safety, audits/assessments, sampling and regulatory reporting.
- Project Engineer for the remediation of soil and groundwater at 100+ facilities owned and/or operated by various city agencies in New York City. Activities included preparation of administrative/contractual requirements, work plans, and monitoring reports, cost estimates, proposals, engineering support, and construction oversight.
- Project Engineer for the design of an air sparge and soil vapor extraction system in Andover, Massachusetts.
- Project Engineer for the remediation of soil and groundwater at a former chemical manufacturing company in Rensselaer, New York. Activities included construction oversight, preparation of reports including Feasibility Study, Interim Remedial Measures, Community Air Monitoring Plans, Sampling Plans, Bid Review, Invoice Review, and various field investigations.
- Project Engineer for an investigation and remediation at a former petroleum refinery in Buffalo, New York. Responsible for assisting in the preparation of multiple work plans and reports of results for field investigations including soil borings and sampling, well installation, and groundwater sampling. Also responsible for reviewing and assisting in the preparation of activities related to the operation of the remediation systems at the Site, including maps, evaluation summaries, plans and compliance monitoring reports.
- Project Engineer for the closure of an underground storage tank (UST) at a shipping facility in Queens, New York. Activities included preparation of cost estimate, work plans, and field management.
- Project and Resident Engineer for the soil remediation of the Captain's Cove Condominiums Site, a federal NPL site, located in Glen Cove, New York. Activities include: supervision of Contractor's activities, regulatory interaction, compile daily field reports, manage laboratory database for excavated and reclaimed soil, shop drawing review, change order preparation, and Health and Safety compliance. Site remediation was completed in September 2001 to accommodate site redevelopment as a commercial waterfront and operating seaport area. Currently managing OM&M groundwater monitoring program at the Site.
- Staff Engineer for a 450-gpm, dual-phase, product recovery system in Greenpoint, Brooklyn, New York. Tasks include: operation and maintenance of groundwater recovery and treatment system and free product recovery system. Also assisted in reviewing drawings and specs related to installation of aboveground storage tanks.
- Staff Engineer for the remediation of soil and groundwater at a former chemical company facility in Brooklyn, New York using a Soil Vapor Extraction and Air Sparging System. Tasks include: review of performance data for air sparge system, operation and maintenance for the SVE/AS System, progress report preparation, and monthly groundwater sampling.
- Staff Engineer for a divestment assessment at a service station in Stratford, Connecticut. Tasks include: oversight, soil sampling, FOIA investigation, coordination with subcontractor and

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regulatory agencies, and preparation of letters and reports.

- Resident Engineer for the soil remediation at a former chemical company facility in Dayton, New Jersey. Activities include: construction oversight, Health and Safety compliance, field sampling, and completion report preparation.
- Responsible for assisting in preparing cost estimates, proposals, feasibility studies, interim remedial measures, remedial action plans, health and safety plans, and technical specifications for a variety of soil and groundwater remedial objectives.
- Student/Research Assistant at Laboratory of Polymers, Universidade Federal do Rio Grande do Sul, POA, Brazil. Performed experiments on the metalization of plastics using polyaniline.
- Intern/Researcher at Laboratory of Research and Development at a petrochemical company, Ipiranga Petroquimica, Brazil. Conducted laboratory tests involving additives used in polymers and responsible for quality control/assurance of products.

ROUX

PROFESSIONAL PROFILE

Joseph Duminuco, P.G.

Executive Vice President/Principal Hydrogeologist

TECHNICAL SPECIALTIES

Providing environmental consulting services and strategic planning to the real estate industry focused on Brownfield Redevelopment projects. Investigation and remediation of soil, groundwater, and soil vapor at commercial and industrial sites, focusing on the use of innovative solutions.

EXPERIENCE SUMMARY

Thirty-two years of experience: Executive Vice President, Vice President, Practice Area Leader, Office Manager, Principal, Senior, and Project Hydrogeologist at Roux; Staff Hydrogeologist at Geraghty & Miller; and Geologist at Mueser Rutledge Consulting Engineers.

CREDENTIALS

M.S. in Geology, Wright State University, 1990

B.S. in Geology, Hofstra University, 1983

Licensed Professional Geologist, NY (License No. 000119)

EXPERIENCE OVERVIEW

- Principal-in-Charge of multiple dry cleaner remediation project takeovers:
  - Brooklyn, New York – NYSDEC BCP
  - Long Island, New York – NYSDEC BCP
  - Long Island, New York – NYSDEC Inactive Hazardous Waste Site
  - Bernardsville, New Jersey – LSRP Program
  - Enfield, Connecticut – LEP Program

  Sites included a mixed use multifamily affordable housing neighborhood retail complex, a healthcare facility, and retail shopping centers. Impacts included soil, groundwater, vapor, indoor air, and building material contamination from chlorinated VOCs from the former dry cleaner operations. Activities included historical research, re-delineation of contaminant source areas, negotiations with regulatory agencies and remediation including hot spot soil removal, SVE, in situ groundwater treatment, and negative pressure approaches (SSDS) for vapor mitigation in the existing buildings.

- Principal in Charge of multiple NYSDEC BCP/VCP Site Redevelopments:
  - Brooklyn – Former railroad freight yard and dry cleaner solvent distribution plant into mixed use multifamily housing and retail.
  - Brooklyn – Former manufactured gas plant into big box retail.
  - Brooklyn – Mixed use multifamily affordable housing with neighborhood retail complex.
  - Long Island – Former NYSDEC Inactive Hazardous Waste Site into mixed use multifamily housing, retail, hotel, office and community space.
  - Long Island – Former defense contractor manufacturing facility into multifamily waterfront housing.
  - Long Island – Former dry cleaner and auto repair into a healthcare facility.
  - Staten Island – Former gas station into a fast food restaurant.
  - Queens – Former paint and varnish factory into waterfront mixed use multifamily housing, retail and community space.
  - Westchester – Multi-block former auto sales and service, dry cleaner and gas station into mixed use multifamily housing and retail.

  Activities included Pre-Application scoping meetings, agency negotiations, Phase I ESAs, investigation, remedial design and oversight, in-situ waste characterization, CAMP and preparation of: BCP Application; CPP; RIWP; RIR; RAWP; SMP; and FER.

- Principal in Charge of multiple NYCOER/NYCDEP/HPD Site Redevelopments:
  - Bronx – Expansion and renovation of retail center built on former illegal landfill.
  - Bronx – Multi-block redevelopment of former industrial/manufacturing area into mixed use multifamily affordable housing, retail, and community services.
  - Bronx – Redevelopment of an abandoned recreational property into supportive housing.
  - Bronx – Redevelopment of residential and commercial parcels into supportive housing.
  - Brooklyn – Redevelopment of a vacant residential and wooded lot into supportive housing.
  - Manhattan – A full city block redevelopment of former commercial and tenement housing into a mixed use multifamily affordable housing, retail and community services.
  - Manhattan – Expansion and renovation of former auto sales and service center into high-end US auto dealer flagship facility.
  - Manhattan – Former parking lot into mixed use NYC Public School and multifamily luxury tower.
  - Manhattan – The redevelopment of a former garage and auto repair operation and a manufacturing facility on two adjacent lots into a multi-story single-family residence.
  - Queens – Redevelopment of former industrial use parcels on land previously underwater into multifamily affordable housing.

  Activities included Pre-Application scoping meetings, agency negotiations, Phase I ESAs, investigation, remedial design and oversight, in situ waste characterization, CAMP and preparation of: VCP Application; RIWP; RIR; RAP; CHASP: SMP; and Completion Reports.

KEY PROJECTS

- Principal-in-Charge of the 45-acre development of a state of the art sports arena and commercial/retail complex at

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an existing sports venue on Long Island, NY. Responsibilities include: Phase I and Phase II ESAs, EIS support, and Waste Characterization sampling design and implementation.

- Principal-in-Charge of the redevelopment of an entire city block into a mix of public and private open space with community gardens, 655 mixed-income residential units, and community services containing three multi-use buildings in Harlem, NY. The buildings will be certified to Passive House standards. Responsibilities include: Phase I and II ESAs, Remedial Action Plans, waste characterization sampling design, and implementation and reporting to the NYCDEP.
- Principal-in-Charge of the redevelopment of a waterfront Site that will include two high-rise affordable residential towers in Queens, NY. Additionally, the development includes public spaces, including two piers extending into the East River. The Site is being entered into the NYSDEC BCP and is immediately adjacent to the Newtown Creek Federal Superfund Site.
- Principal-in-Charge of the redevelopment of a former garage and auto repair operation and a manufacturing facility on two adjacent lots into a multi-story single-family residence in lower Manhattan, NY. The Site contains an E-Designation and as such is going through the NYCOER VCP. Roux completed a Phase I ESA, an RI, a RAWP, a waste characterization plan, and is providing oversight of waste management, UST removals, and CAMP.
- Principal-in-Charge of a NYSDEC BCP redevelopment of a property adjacent to a dry-cleaning solvent distribution facility in Brooklyn, New York. The Site was a former freight railyard, and offloading spillage on-site and migration from the off-site solvent facility resulted in significant soil, groundwater, and vapor contamination with chlorinated VOCs. The Site was developed into multifamily units with first floor retail use and the remedy consisted of soil hot spot removal, a physical barrier to limit on-site migration, a permeable reactive wall to eliminate off-site migration, hot-spot in situ injections, and a sub-slab depressurization system. The Site contained an E-Designation which was satisfied through the NYCOER simultaneously with the BCP process. Roux was awarded the Big Apple Brownfield Award for Innovation based on our successful cleanup approach.
- Principal-in-Charge of a NYSDEC BCP redevelopment project that also required a RCRA-compliant facility closure. The Site is a former paint factory located in Queens, NY. Historical site operations adversely impacted the subsurface including a LNAPL plume, in addition to petroleum hydrocarbon impacts to the soil and groundwater. Roux completed a RI at the Site which characterized the nature and extent of the impacts. The remedial action included a large excavation that required SOE and was completed under a tent due to odor concerns, multiple ISCO injections, UST removal/abandonment, installation of a LNAPL recovery system, and installation of an SSDS. Additionally, Roux provided oversight of RCRA closure activities at the Site, which included emptying, cleaning, and scrapping 65 ASTs/vessels; decontaminating the ceilings, walls, and floors of the Paint Factory Building; and collection of compliance samples.
- Principal-in-Charge of a NYSDEC VCP redevelopment of a former MGP site into a Big Box retail site in Brooklyn, NY. The project consisted of negotiations with the NYSDEC and Roux limited remediation to former gasholders filled with coal tar, soil hot spots with mobile coal tar, and perimeter containment of coal tar. All the remaining soil at the Site was impacted with MGP waste and most of the Site was underlain by liquid coal tar. Roux negotiated use of institutional/engineering controls to allow significant contamination to remain in place. A sub-slab depressurization system and vapor barrier was installed to address the mobile coal tar left below the retail building.
- Principal-in-Charge for a NYSDEC BCP redevelopment project at a site in White Plains, NY, which consists of 16 separate parcels spanning 4.5 acres and had a variety of former uses including automotive service/repair and multiple dry cleaners. The Site has both chlorinated and petroleum hydrocarbon impacts to the soil and groundwater. The remedy will consist of a site cover system, soil hot spot removals, in situ chemical oxidation for groundwater contamination, and installation of a sub-slab depressurization system.
- Principal-in-Charge for ongoing large and complex mixed use redevelopment of a 92-acre site located in Long Island, NY. The Site was accepted into the NYSDEC BCP. The Site has an extensive environmental history, including former use as a wire and conduit manufacturer (former NYS Inactive Hazardous Waste Site), former landfill (currently a Federal Superfund Site), and town DPW facility. Activities completed included compiling, reviewing, extracting, and summarizing numerous historical environmental reports prepared for the Site; interacting with the NYSDEC, USEPA, and NCDOH; completing a supplemental soil investigation (including extensive use of XRF Technology as metals are the compound of concern); and a groundwater investigation (water is over 100 feet deep). The remedy will likely consist of hot spot removals, a site cover system and a sub-slab depressurization system.
- Principal-in-Charge for a NYSDEC BCP redevelopment in Staten Island, NY of a former retail service station site. There is soil, groundwater, and vapor contamination from petroleum-related constituents in the vicinity of the former gasoline piping and pump island (the petroleum source area), as well as historic fill across the entire Site. The remedy, described in the Remedial Action Work Plan prepared by Roux, will consist of a sheet pile containment wall around the petroleum source area, a Site Cover System across the entire Site comprised of

concrete building slab/walkways, asphalt parking areas and limited landscaped areas, and site-wide a sub-slab depressurization system to prevent vapor intrusion into the proposed retail building and off-site migration of impacted soil vapor.

- Principal-in-Charge of a mixed-use (public school and residential) Brownfield redevelopment in lower Manhattan, NY. Project consisted of a Phase I and a Phase II ESA to satisfy NYCDEP requirements. Due to the presence of contaminated historic fill, Roux performed in situ waste characterization to assist in the development of NYCDEP-required plans. In addition, Roux provided oversight of the waste removal, completion of waste manifests, and full-time CAMP during all soil moving activities. Roux provided support to the excavation contractor when two previously unknown USTs were discovered during excavation activities.
- Principal-in-Charge of a multi-phased NYSDEC VCP redevelopment of a former Defense Site to water front, upscale housing in Long Island, NY. This investigation included determining the nature and extent of chlorinated VOCs in soil, groundwater, and vapor- phase contamination on-site and off-site. Utilized a risk assessment to argue the level of residual contamination allowed to remain on-site with an intended residential future use. Remedial alternatives were selected in accordance with future development plans and institutional/engineering controls were proposed to limit cleanup costs. Successfully argued the technical impracticability of remediation of the heavily contaminated deeper aquifer beneath the site and off-site.
- Principal-in-Charge of a retail/commercial redevelopment in the Bronx, NY. The Site contained a NYCDEP E-Designation due to a previous on-site service station UST release. In addition, a previous Phase I and Phase II ESA identified a former dry cleaner with a chlorinated VOC release. Roux performed a focused Phase II ESA at the dry cleaner and determined the chlorinated solvent release was not a hazard. Roux obtained closure under the NYSDEC Spills group and the Site was redeveloped with a restaurant, a pharmacy, and reuse of a former supermarket.
- Principal-in-Charge of the redevelopment and expansion of an automobile dealer/service center in New York, NY into the US Flagship dealer for a major European luxury car manufacturer. Supported the client and legal team during lease negotiations. Worked closely with the NYCOER to address NYCDEP "E" designation. Coordination with the NYCOER to implement remedial investigation and develop a Site Materials Management Plan as part of the expansion. Also, worked closely with the NYSDEC to address an on-site spill, as well as coordinate efforts to evaluate whether a 19,000-gallon dielectric fluid release by others impacted the Site.
- Principal-in-Charge for the completion of Phase I and Phase II Environmental Site Assessment activities associated with a proposed mixed use redevelopment located in Westchester, NY waterfront. Work included management of subsurface investigation activities to characterize soil conditions, and working closely with the client's architects and construction contractors to integrate the proposed site remediation into the project development plan (including evaluating multiple potential disposal scenarios). Site contaminants included hydrocarbons (including free-product plume from former USTs) and historic fill constituents.
- Principal-in-Charge of an 80-acre redevelopment in Yonkers, NY. Work included Phase I and Phase II investigations, asbestos surveys and abatement support, and response to a free product impact form an adjacent landowner. Coordinated with the NYSDEC and responsible party to address contamination issue and not impact the client's construction schedule.
- Principal-in-Charge for the redevelopment of a property in Brooklyn, NY into supportive housing. Worked closely with the NYCOER to address the NYCDEP "E" designation. Coordination with the NYCOER to implement remedial investigation and develop RAP/CHASP as part of the NYC VCP.
- Principal-in-Charge for the redevelopment of a property in the Bronx, New York into supportive housing. Worked closely with NYCDEP to address "E" designation. Coordination with NYCDEP to implement remedial investigation and develop RAP/CHASP as part of the redevelopment. Also performed an ASTM VEC to address vapor concerns.
- Principal-in-Charge of a Brownfield Redevelopment for a large vacant parcel (460 acres) on Long Island, NY. The project involved an extensive investigation, UST, and PCB remediation; removal and proper disposal of numerous tanks, drums, abandoned vehicles and transformers; and participation in contentious public meetings. The Site was redeveloped into a golf course and a senior care facility.
- Principal-in-Charge for a property transfer support project at a heavily contaminated (chlorinated volatile organic compounds from an adjacent dry cleaner and on-site MGP waste) distribution facility in the Bronx, NY. The Site was a former MGP being handled under the VCP, in addition to an open petroleum spill under the regional spills group. Roux performed a Phase I for the buyer, a Phase II and remedial cost estimate for the owner, and negotiated with the buyer's consultant and the NYSDEC to limit the scope of the investigation and cleanup.
- Principal-in-Charge of investigation and remediation of a catastrophic heating oil release for a commercial office building in Brooklyn, NY. All work was performed under the oversight of the NYSDEC Spills Group and

time was of the essence for the initial response as the heating season was fast approaching. Roux performed free product delineation and remediation and indoor air monitoring at adjacent buildings. Site closure was obtained from the NYSDEC.

- Principal-in-Charge of a mixed use (residential, retail, commercial) Brownfield redevelopment in the Bronx, NY. Project consisted of a Phase I and Phase II ESA to satisfy NYCDEP requirements. The media investigated included soil, groundwater, soil vapor, and building materials. During the Phase II ESA, Roux performed preliminary in situ waste characterization.
- Principal-in-Charge of an interior Brownfield Redevelopment of a PCB, metals, and hydrocarbon-contaminated wire manufacturing facility in Westchester County, NY into use as a movie studio. Activities included delineation and characterization of building surfaces, design of a remediation program, and interim cleanups to allow studio use as the project progressed.
- Principal-in-Charge of multiple phases of Brownfield project for construction of a cogeneration facility in Brooklyn, NY. The project consisted of construction oversight; environmental compliance monitoring; asbestos and lead paint abatement oversight; data evaluation and report preparation; soil, offshore sediment, and sewer effluent sampling; PCB-contaminated material remediation; preparation of a waste handling and disposal plan; and permitting.
- Principal-in-Charge of multiple retail developments in Harlem, NY. Work included Phase I and Phase II investigations to satisfy the NYCDEP and lender requirements. Lead-based paint and asbestos surveys were performed as part of due diligence. Extensive asbestos issues were identified in building materials and soil backfill. Worked with asbestos contractors to determine best abatement approaches for the redevelopments.
- Principal-in-Charge of a fast-paced property transfer environmental assessment at an electronics manufacturing facility contaminated with metals and solvents in Bridgeport, CT. The project consisted of the development and implementation of a detailed field sampling plan within a one-week time frame, including indoor and outdoor soil sampling and monitoring well installation; groundwater and sewer effluent sampling; asbestos survey and asbestos sampling; and a tidal influence assessment. Data was evaluated and a summary report was prepared within one week and a remedial alternatives evaluation and cost estimate was prepared in less than one week.
- Principal-in-Charge of a multi-phase RI/FS at a PCB and diesel fuel-contaminated railroad yard in New York City. The Site is on the State Superfund list because PCBs were detected in soil, groundwater, hydrocarbon plume, sewer water, and sewer sediment. Responsibilities included preparation of work plans; delineation of PCB hot spots with immunoassays; sewer investigation including pumpouts, monitoring, flow measurements, and video surveys prior to abandonment; investigation and remediation of numerous USTs including gasoline, solvents, and fuel oils; support of construction activities; report preparation; negotiations with the NYSDEC/NYSDOH; participation in public meetings; and implementation of interim remedial measures to mitigate the PCB-contaminated hydrocarbon plume; interim remedial measures to mitigate PCB, PAH, and lead-contaminated soil hot spots; and agency acceptance of alternate cleanup levels for site soils that resulted in savings of over $80 million.
- Project Coordinator of multi-year environmental consulting contracts with Amtrak and New Jersey Transit. Responsibilities include contract negotiations, workload/resource distribution, compliance with contract requirements including utilization of M/WBE contractors, client-staff liaison, adherence to budgets and schedules, and overall quality assurance.
- Principal-in-Charge of a project to support the construction of a high-speed rail program. Performed Phase I and II Environmental Site Assessments as part of due diligence at three major railyards. Prepared reports and presentations regarding environmental conditions to regulatory agencies and the design-build consortium. Performed pre-construction sampling and hot spot remediation programs. Also, prepared environmental contingency plans for construction contractors to follow.
- Principal-in-Charge of an investigation at a PCB and solvent-contaminated transformer manufacturing/repair facility in North Carolina. Responsibilities included preparation of a work plan and oversight of the project which consists of soil borings and sampling, immunoassay testing, monitoring well installation, groundwater sampling, report preparation, and remedial alternatives evaluation.
- Principal-in-Charge of an NPL Superfund Site in Delaware. Responsibilities include ongoing performance monitoring of a groundwater extraction system. The remedial system was installed to capture a chlorinated solvent plume emanating from a former PVC manufacturing facility. In addition, prepared and implemented an RI work plan for a USEPA-required off-site investigation of adjacent chemical manufacturing facilities and a large petroleum refinery. Also included DNAPL investigation and deep aquifer study.
- Principal-in-Charge of a NJDEP-ECRA/ISRA investigation and cleanup involving groundwater and soil contamination at a pesticide formulation and distribution facility in New Jersey. Responsibilities include delineating the nature and extent of the off-site contaminant plume; determining groundwater flow patterns in a two-aquifer system; using a three-dimensional computer model to

determine proper location for extraction and injection wells; and preparing work plans and summary reports for NJDEP-required additional delineation of the nature and extent of on-site soil contamination.

- Project Director of all UST investigative and remedial work performed at service station sites in New England for a major oil company. Responsibilities included preparation and negotiation of work orders; coordination of monitoring and sampling; communication with client, regulator, and site owner contacts; management of technical aspects of all projects; strategy evaluation with client; administration of all contracts; and operation and maintenance of remediation systems to mitigate UST releases which included groundwater pump and treat, product recovery, and soil venting systems.

- Project Manager of an RI/FS at a former electronics manufacturing facility in an industrial area of Long Island, NY. Metals and solvents (plating wastes) were detected in on-site leach pools and in soil and groundwater. Responsibilities included reviewing and revising the work plan and providing technical oversight of the project, including Geoprobe® drilling, soil sampling, soil-gas surveys, leach pool sediment sampling, monitoring well installation, groundwater sampling, geophysical mapping, report preparation, and negotiations with the NYSDEC. Convinced the NYSDEC that groundwater remediation was inappropriate in an industrialized area. Focused remediation to a few soil hot spots only.

- Principal-in-Charge of a multi-year quarterly monitoring and reporting program at a municipal landfill complex on Long Island, NY. The complex consists of multiple landfills, leachate containment systems, and leachate holding tanks. The project involves the collection of water level and water quality data from dozens of monitoring wells, sampling of leachate containment systems, coordination with contract laboratory, data validation, data evaluation, and report preparation.

- Provided litigation support for an industrial property owner where a tenant's manufacturing operations had resulted in contamination of the building in addition to soil and groundwater. Without prior notification or consent from the owner, the tenant had conducted a Phase II investigation and remediation activities to address metals and VOCs. Reviewed technical reports and prepared a work plan to address areas for further investigation and perform confirmatory sampling in support of the owner of the property. Provided deposition testimony in connection with the case.

PRESENTATIONS

- Incentives: Programs and Lessons. 2018 Environmental Law Forum – New Jersey State Bar Association; Cape May, NJ; June 2018.

- Environmental Law in Real Estate Transactions – Working with Technical Professionals. Hofstra University Law School; January 13, 2013.

- Duminuco J., Coyle F., Property Redevelopment and Brownfield Sites. Proceedings of the 11th Annual Environmental Law Conference; ISBA Conference; May 2012.

- Duminuco J., Transactions and the Environment: Contaminated Property Issues in Real Estate and Corporate Matters. New York State Bar Association; Tarrytown, NY; June 2006.

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David E. Kaiser, P.E.
Senior Engineer

TECHNICAL SPECIALTIES

Engineering services including development and review of design drawings, implementation of design, development of technical specifications, review of construction submittals, development of SWPPPs, field management and site safety of various heavy construction projects, and civil/remediation engineering construction management. Designs have included stormwater drainage systems, NYCDEP sewer system, NYCDOB/DOT sidewalk project, and remedial system design. Additional services including budget management, permitting, project coordination, project scheduling, development of bid packages and cost estimating.

Field management and construction oversight of heavy equipment construction including sewer construction, drainage construction, crane lift activities and remedial construction activities. Environmental site assessments focusing on soil, soil vapor, groundwater and excavation dewatering investigations.

EXPERIENCE SUMMARY

Twelve years of experience: Project Engineer with Roux Environmental Engineering & Geology, D.P.C.; Design Engineer with Bohler Engineering.

CREDENTIALS

B.E. Civil Engineering, Hofstra University, 2006
Fundamentals of Engineering E.I.T. Certification, 2006
Professional Engineer (NY), 2017
OSHA 40-Hour HAZWOPER Training, 2008
OSHA 30-Hour Construction Safety Training, 2011
OSHA 10-Hour Construction Safety Training, 2018
OSHA 8-Hour Hazardous Waste Refresher Training, 2017
LPS 8-Hour Training Certification, 2008
First Aid and CPR Certified, 2016
DOT Hazardous Materials Awareness Training, 2017
NYSDEC Erosion and Sediment Control Training, 2016
Transportation Worker Identification Credential (TWIC)

KEY PROJECTS

- Land Development Site Plan Preparation – Design Engineer for the design and development of residential, commercial and industrial site plan packages for Suffolk County, Nassau County and New York City Boroughs. Site plan packages for the various municipalities within Suffolk County, Nassau County and New York City included components such as: zoning analysis, site removals plan, site design and construction documents, water and sewer system design (detention and retention systems), site grading and drainage plans, and lighting analysis and design.
- Suffolk County Drywell Closure – Senior Engineer for the planning and coordination of closing existing drywell structures serving as sanitary and industrial retention basins for an industrial facility. The project consisted of developing a sampling plan for the site, coordinating sampling and inspection of existing sanitary and industrial drywells in accordance with Suffolk County Department of Health Services Article 12, SOP No. 9-95 Pumpout and Soil Cleanup Criteria. Following the sampling event, a summary of results was prepared and sent to the SCDHS for review. Due to exceedances that were present within the septic tanks, a remedial action work plan was developed to identify the required steps for successful closure which included coordinating the SCDHS field inspection, extraction of contaminated liquids and solids, and proper disposal of the waste.
- Property Drainage System Design and Construction – Project Engineer for the design and development of a new on-site stormwater treatment system located at a former petroleum terminal in Brooklyn, NY. Design included drainage improvements and modifications for the former petroleum terminal to support ongoing remediation activities that were being conducted to facilitate the future closure of an existing in-ground oil/water separator and removal of associated piping, and to support the anticipated long-term remedy for, and potential future redevelopment of, the subject property. The proposed drainage modifications included the installation of new drainage structures, Contech treatment structures and conveyance piping to collect and treat stormwater runoff within the property, and bypass the existing in-ground oil/water separator, prior to discharging the stormwater via an existing SPDES outfall.
- Oil/Water Separator Closure – Project Engineer for engineering support and review for the closure of an existing in-ground oil/water separator at a former petroleum terminal in Brooklyn, NY. The closure and abandonment of the oil/water separator was deemed the long-term remedy as approved by the NYSDEC. The oil/water separator was originally constructed in the early 1900s and has served the property by providing stormwater runoff treatment. The closure project includes the following tasks: dewatering and treatment of separator water; excavation of existing sludge in separator; dewatering and drying/stabilization of the sludge removed; power washing of interior; backfill and compaction of clean fill inside separator; removal of all existing above grade structures including catwalks, guardrails and piping; proper shipping and disposal of sludge contents; installation of a final cover system consisting of a geosynthetic clay liner (GCL) and filter fabric barrier; and final site grading.
- Utility Tunnel Extension – Project Engineer for construction management of a utility tunnel extension and modification project. The project consisted of installation of a precast concrete stairway access to an existing utility tunnel, installation of a structural slab to span the tunnel extension, installation of a new base slab, installation of cast-in-place concrete walls and top slab, installation of sidewalks and relocation of all existing system piping and conduits. The work was performed in accordance with the requirements of the New York City Department of Buildings (NYCDOB) and the New York City Department of Transportation (NYCDOT).

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- Treatment System Building Upgrades – Project Engineer for the review and implementation of engineering drawings for a metals removal system upgrade to an existing 450-gpm groundwater treatment system. The upgrades consisted of: relocating and reinstalling the existing oil/water separator tank on a steel spacer via crane; lifting and installing the existing 10,000 gallon equalization tank to be repurposed as a filter backwash solids removal tank; lifting and installing prefabricated concrete pads with a subbase of Geogrid BX1200 and 6" of aggregate size number 57 (as per NYCDDC Highway Specifications and ASTM C33) compacted to 95% Standard Proctor, under proposed tank locations; locating a new 20,000 gallon equalization/aeration tank on the new pad; installing of new blower motor and enclosure; and installing of new piping and appurtenances.
- Recovery Well Construction – Staff Engineer for the construction of aspects of a dual-phase free-phase petroleum product (free-product) and groundwater recovery well at a former petroleum terminal in Brooklyn, NY. Groundwater extracted from the recovery well would be conveyed through 4-inch diameter high density polyethylene standard dimension ratio 11 (HDPE SDR 11) piping and connected to an existing 6-inch HPDE SDR 11 force main piping network that transports the groundwater to an existing on-site groundwater treatment system. Any free-product recovered would be sent to an existing 2,000 gallon above ground storage tank (AST) via 1-inch double wall product piping. Electrical and signal conduits were routed to an existing well house where the system control components were housed.
- Treatment System Building Roof Rehabilitation and Platform Installation – Project/Staff Engineer for providing engineering design, review and construction management of the rehabilitation of a roof and installation of an internal platform in an existing remediation groundwater treatment system building located at a former petroleum terminal in Brooklyn, NY. The roof rehabilitation project included the replacement of approximately 1,200 square feet of stainless steel decking, insulation and waterproofing. The project also included the construction of three new skylights and access ladders. The platform installation project included the installation of new steel members and fiberglass reinforced polymer (FRP) molded grating within the existing remediation groundwater treatment to provide a working platform for on-site technicians. The new steel members were bolted to existing infrastructure to limit on-site welding and the platform was installed with tubular steel handrails. Responsibilities included: ensuring that the development of the plans and technical specifications were in accordance with the New York City Construction Codes, New York State Building Standards and Codes, various ASTM standards, American Institute of Steel Construction (AISC) "Code of Standard Practice for Steel Buildings and Bridges", and Steel Structures Painting Council (SSPC) Publications.
- NYCDEP Private Storm and Sanitary Sewer System – Project/Staff Engineer for the design and development of a New York City Department of Environmental Protection (NYCDEP) Private Storm and Sanitary Sewer System located at a former petroleum terminal in Brooklyn, NY. The sewer system comprised of over 2,600 LF of sewer in Greenpoint Brooklyn over two phases of construction. During the duration of this project responsibilities included: develop/revise NYCDEP sewer design plans and construction notes, address NYCDEP comments and markups, develop Bill of Materials, develop cost estimates, develop technical specifications, develop bid package, ensure compliance with NYCDEP and NYCDOT specifications and requirements, develop/revise NYCDOT Builder's Pavement Plan (BPP), develop NYCDOT Maintenance and Protection of Traffic plans, conduct/participate in design construction meetings, review subcontractor submittals and cut sheets, address NYCDEP punch list items, management/oversight/coordination of subcontractor construction activities.
- NYCDOB/NYCDOT Sidewalk Installation – Project/Staff Engineer for the design, development, and installation of over 4,000 linear feet of new sidewalks over various phases located at a former petroleum terminal in Brooklyn, NY. The design, development, and installation of these sidewalks were in accordance with the New York City Department of Buildings and New York City Department of Transportation specifications and details of construction. During the duration of these projects my major responsibilities included: develop/revise NYCDOT Builder's Pavement Plans, develop cost estimates, develop technical specifications, develop bid package, ensure compliance with NYCDOB and NYCDOT specifications and requirements, develop NYCDOT Maintenance and Protection of Traffic plans, conduct/participate in design construction meetings, ensure proper installation and testing of sidewalks in accordance with NYCDOB and NYCDOT, management/oversight/coordination of subcontractor construction activities.
- Sub Slab Depressurization System – Staff Engineer for the design and construction of two sub slab depressurization systems (SSDS) located within the footprint of a petroleum remediation site where a new building was proposed to be built. These projects were part of an Interim Remedial Measure (IRM) Action Plan as approved by the NYSDEC to provide a preventative proactive measure to address potential soil vapor issues. The SSDSs were designed to operate passively; however, header piping was installed to allow for the installation of the necessary equipment if an active system was required. The SSDSs consisted of ¾-inch gravel with 4-inch diameter polyvinyl chloride (PVC) schedule 40 well screen used as soil gas collection piping and 6-inch diameter solid PVC used as the header piping. A vapor barrier/waterproofing membrane and nonwoven geotextile fabric were installed between the venting layer and the floor slab.

All penetrations through the floor slab were sealed using a silicone based waterproof sealant. The scope of work included, excavation and trench work for the SSDS; placement of pipe bedding; jointing and installation of the pipe fittings, valves and appurtenances; installation of pipe sleeves and mechanical seals; and installation of nonwoven geotextile fabric and silicone based waterproof sealant.

- Remediation System Signal Network Utility Expansion Oversight and Management – Staff Engineer and Field Manager for the completion of a signal communication network expansion as part of a petroleum remediation system. My responsibilities included oversight of a subcontractor while installing level sensors within the product pull boxes to improve the safety of the system operations by continuously monitoring the underground product piping network for potential leaks, and programming, testing and verification of operation of sensors. The scope of work also included the installation of signal and control wiring from recovery well houses to subsurface vaults through existing conduit located beneath New York City streets located in Greenpoint Brooklyn. The signal expansion was part of an effort to integrate the sensor/components within the vaults with the existing remediation system's programmable logic controllers (PLCs). The scope of work also included: development of programming to integrate input infrastructure to existing PLCs, development of human machine interface (HMI) screens to allow for remote viewing at the system control buildings, and installation of power supplies and other apparatuses as required for the operation of the new infrastructure. My responsibilities for this work included: subcontractor management, submittal and cut sheet review, scheduling management, 3rd party coordination, and construction meetings.
- New York City Transit Plan Submission – Staff Engineer for researching, preparing and submitting New York City Transit (NYCT) Plans for various sites to seek approval for drilling and other subsurface activities in proximity to NYC Subways. The scope of work included visiting the Microfilm Room at the NYCT Office to obtain copies of the as-built plans, roof plans, profiles, sections, and alignments adjacent to the properties that our clients were proposing to perform subsurface work. Using these plans, develop proposed boring location plans and cross section plans, overlaying the NYCT plans to determine the proposed distance to adjacent NYCT structures. Ensured that these plans had the most up to date NYCT construction notes since these drawing became part of the projects' contract drawings. Submitted the plans and fees to the NYCT and coordinated with the NYCT inspectors assigned to each project ensuring that all requirements and questions were satisfied. Procured the associated NYCT approvals and distributed to the client so that they may proceed.
- Stormwater Pollution Prevention Plan (SWPPP) Reports – Staff Engineer for preparing and submitting Stormwater Pollution Prevention Plans (SWPPP) for various residential and commercial development sites in New York City and Long Island. The scope of work included preparation of SWPPP Reports in accordance with the most current New York State Department of Environmental Conservation (NYSDEC) regulations at the time including the 'General Permit for Stormwater Discharges from Construction Activity' and the 'New York State Stormwater Management Design Manual'. Preparation of the SWPPP Reports included: summarizing the site history and project description, soil geology, potential pollutants, erosion and sediment control practices, inspection and maintenance procedures, water quantity and water quality control plans, construction sequence scheduling, and the Notice of Intent (NOI) for each project as required by the NYSDEC.
- Former Petroleum Storage Wetland and Canal Remediation Site – Staff Engineer for daily construction oversight of subcontractors as a field manager and implementation of the site-specific health and safety plan as a Community Air Monitoring Program manager. The scope of work included conducting an on-site Community Air Monitoring Program monitoring for airborne dust and VOCs that were potentially generated by remedial and construction work activities. Stopping work and implementing best engineering/control practices if action levels were exceeded. Recording and providing QA/QC analysis of on-site weather and air monitoring data, as well as ensuring the proper operation of all instruments/monitors on a daily basis. Inspections were conducted of three on-site aboveground API concrete oil/water separators. Stormwater Pollution Prevention Plan (SWPPP) inspections were performed, ensuring compliance with NYSDEC State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity and daily reports were generated which would comprehensively document daily work activities and CAMP data and exceedances.

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Josh Cope
Senior Scientist

TECHNICAL SPECIALTIES
Fuel oil forensics and age dating, USEPA Superfund, OPA, and NJDEP environmental regulations, Site Assessment and Contractor Oversight, GC/MS Operator, Data Validation, Technical Report preparation and review, Field Chemistry: field screening, HAZCATTING, groundwater and soil sampling, Hazardous Waste Transportation and Disposal

EXPERIENCE SUMMARY
25 years experience; Senior Scientist with Roux Associates, Inc.; Senior Chemist, Project Manager with Tetra Tech, Inc.; Owner of Geodyne Engineering Consultants, Inc.; Quality Assurance Officer, GC/MS Operator, Twenty First Century Environmental, Inc.; Project Manager, Field Technician, Resource Applications, Inc.

CREDENTIALS
B.A., 1991, Chemistry, Haverford College
OSHA 40-Hour Health and Safety Training
Level A Personal Protective Equipment Training
DOT and IATA Hazardous Material Shipping Training
New Jersey Transit (NJT) – Roadway Worker / On Track Protection

FEDERAL PROGRAMS – CLIENT: USEPA
KEY PROJECTS
- Provide technical and project management support to USEPA Removal and Remedial Branches in Regions 2, 3, 4 on Superfund and OPA projects.
- Manage and perform phase I and II site assessments, remedial investigations, removal action oversight, prepare health and safety plans, monitor site health and safety, support USEPA enforcement actions, implementation of Facility Response Plan (FRP) program, emergency response, biowatch exercises, criminal investigation support, contractor oversight, cost tracking, documentation, daily reporting, prepare after action reports, data validation, waste management, and attend public meetings
- Sites include: UST, AST, and pipeline leaks, lead smelter sites, wood treatment facilities, coal to gas plants, dry cleaners, junk yards, federal facilities, unpermitted landfills, drum burial, flood and hurricane clean up, oil refinery inspections, farmland, and historic industrial sites.
- Contaminants include: TCE, PCE, MTBE, BTEX, oil, gasoline, PCP, PAHs, mercury, lead, arsenic, ammonia, acids, bases, pesticides, PCBs, asbestos, and unknowns.
- Participated in the largest USEPA sponsored interagency response emergency response exercise, Liberty Radex, in Philadelphia. Acted as planner prior to the exercise and master controller during the exercise.
- Interface with state and local regulators on sites in Pennsylvania, Delaware, New Jersey, Maryland, Virginia, West Virginia, and Mississippi.

STATE PROGRAMS – CLIENTS: BUSINESSES AND INDIVIDUALS IN NEW JERSEY
- Provide a wide array of environmental services to homeowners, land developers, insurance companies, gas stations, and small industrial companies in New Jersey.
- Manage and/or perform ISRA reporting, phase I and II site assessments, third party investigations, subsurface evaluation, UST removal, air emissions permitting preparation, soil, groundwater, and vapor intrusion investigations, NPDES compliance.
- Manage remedial investigation, design, and execution for LUSTs, and farmland development.
- Manage reporting, deed restriction preparation, CEAs, remedial action permits, and response action outcome preparation (RAO).
- Evaluate environmental costs for insurance claims and litigation cases.
- Prepare and present justification for fine reduction to state regulators for private client.
- Meet with clients, prepare proposals, and negotiate contracts.

DATA VALIDATION/LABORATORY EXPERIENCE
- Perform level 3 and 4 data validation of analytical data packages in accordance with USEPA National Functional Guidelines.
- Quality assurance officer and GC/MS operator for New Jersey certified laboratory.
- Performed analysis of volatile and semi-volatile organics.
- Preformed maintenance and repair of analytical instruments.
- Performed method development and trouble shooting of analytical issues.
- Set up and operated mobile laboratory for organic and inorganic analyses on Superfund site assessments.
- Performed field screening of contaminants using test kits, XRF, radiation meters, and various types of air monitoring equipment.

WASTE MANAGEMENT
- Waste Management Specialist for oil pipeline client in Michigan for largest inland oil spill in United States during August 2010 through October 2011.
- Responsible for compliance, cost tracking, cost estimation, waste tracking and reporting, oil recovery calculation and reporting, contractor oversight.
- Prepared Waste Transportation and Disposal Plans and responses to regulator comments.

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- Prepared waste profiles, negotiated waste removal protocols with USEPA and MDEQ to streamline process of waste handling to realize savings through greater efficiency and lowering sampling requirements.
- Located disposal facilities, negotiated disposal rates.
- Performed cost benefit analysis of various soil dewatering agents and procedures and proposed methods and protocols to client, USEPA, and MDEQ.
- Performed some oversight of removal actions along river.
- Supported submerged oil assessment of river.

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ATTACHMENT 2

Standard Operating Procedures, Laboratory Detection Limits for Emerging Contaminants and NYSDEC Guidance for Sampling Emerging Contaminants

NEW YORK STATE OF OPPORTUNITY. | Department of Environmental Conservation

SAMPLING, ANALYSIS, AND ASSESSMENT OF PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS)

Under NYSDEC's Part 375 Remedial Programs

October 2020

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October 2020

ERRATA SHEET for

SAMPLING, ANALYSIS, AND ASSESSMENT OF PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) Under NYSDEC's Part 375 Remedial Programs Issued January 17, 2020

Citation and Page Number	Current Text	Corrected Text	Date
Title of Appendix I, page 32	Appendix H	Appendix I	2/25/2020
Document Cover, page 1	Guidelines for Sampling and Analysis of PFAS	Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (PFAS) Under NYSDEC's Part 375 Remedial Programs	9/15/2020
Routine Analysis, page 9	"However, laboratories analyzing environmental samples…PFOA and PFOS in drinking water by EPA Method 537, 537.1 or ISO 25101."	"However, laboratories analyzing environmental samples…PFOA and PFOS in drinking water by EPA Method 537, 537.1, ISO 25101, or Method 533."	9/15/2020
Additional Analysis, page 9, new paragraph regarding soil parameters	None	"In cases where site-specific cleanup objectives for PFOA and PFOS are to be assessed, soil parameters, such as Total Organic Carbon (EPA Method 9060), soil pH (EPA Method 9045), clay content (percent), and cation exchange capacity (EPA Method 9081), should be included in the analysis to help evaluate factors affecting the leachability of PFAS in site soils."	9/15/2020
Data Assessment and Application to Site Cleanup Page 10	Until such time as Ambient Water Quality Standards (AWQS) and Soil Cleanup Objectives (SCOs) for PFAS are published, the extent of contaminated media potentially subject to remediation should be determined on a case-by-case basis using the procedures discussed below and the criteria in DER-10. Target levels for cleanup of PFAS in other media, including biota and sediment, have not yet been established by the DEC.	Until such time as Ambient Water Quality Standards (AWQS) and Soil Cleanup Objectives (SCOs) for PFOA and PFOS are published, the extent of contaminated media potentially subject to remediation should be determined on a case-by-case basis using the procedures discussed below and the criteria in DER-10. Preliminary target levels for cleanup of PFOA and PFOS in other media, including biota and sediment, have not yet been established by the DEC.	9/15/2020
Water Sample Results Page 10	PFAS should be further assessed and considered as a potential contaminant of concern in groundwater or surface water (…) If PFAS are identified as a contaminant of concern for a site, they should be assessed as	PFOA and PFOS should be further assessed and considered as potential contaminants of concern in groundwater or surface water (…) If PFOA and/or PFOS are identified as contaminants of concern for a site, they should be assessed as part of the remedy selection process in accordance with Part 375 and DER-10.	9/15/2020

Citation and Page Number	Current Text	Corrected Text	Date
	part of the remedy selection process in accordance with Part 375 and DER-10.		
Soil Sample Results, page 10	"The extent of soil contamination for purposes of delineation and remedy selection should be determined by having certain soil samples tested by Synthetic Precipitation Leaching Procedure (SPLP) and the leachate analyzed for PFAS. Soil exhibiting SPLP results above 70 ppt for either PFOA or PFOS (individually or combined) are to be evaluated during the cleanup phase."	"Soil cleanup objectives for PFOA and PFOS will be proposed in an upcoming revision to 6 NYCRR Part 375-6. Until SCOs are in effect, the following are to be used as guidance values. " [Guidance Value Table] "PFOA and PFOS results for soil are to be compared against the guidance values listed above. These guidance values are to be used in determining whether PFOA and PFOS are contaminants of concern for the site and for determining remedial action objectives and cleanup requirements. Site-specific remedial objectives for protection of groundwater can also be presented for evaluation by DEC. Development of site-specific remedial objectives for protection of groundwater will require analysis of additional soil parameters relating to leachability. These additional analyses can include any or all the parameters listed above (soil pH, cation exchange capacity, etc.) and/or use of SPLP. As the understanding of PFAS transport improves, DEC welcomes proposals for site-specific remedial objectives for protection of groundwater. DEC will expect that those may be dependent on additional factors including soil pH, aqueous pH, % organic carbon, % Sand/Silt/Clay, soil cations: K, Ca, Mg, Na, Fe, Al, cation exchange capacity, and anion exchange capacity. Site-specific remedial objectives should also consider the dilution attenuation factor (DAF). The NJDEP publication on DAF can be used as a reference: https://www.nj.gov/dep/srp/guidance/rs/daf.pdf. "	9/15/2020
Testing for Imported Soil Page 11	Soil imported to a site for use in a soil cap, soil cover, or as backfill is to be tested for PFAS in general conformance with DER-10, Section 5.4(e) for the PFAS Analyte List (Appendix F) using the analytical procedures discussed below and the criteria in DER-10 associated with SVOCs.	Testing for PFAS should be included any time a full TAL/TCL analyte list is required. Results for PFOA and PFOS should be compared to the applicable guidance values. If PFOA or PFOS is detected in any sample at or above the guidance values then the source of backfill should be rejected, unless a site-specific exemption is provided by DER based on SPLP testing, for example. If the concentrations of PFOA and PFOS in leachate are at or above 10 ppt (the Maximum Contaminant Levels established for drinking water by the New York State Department of Health), then the soil is not acceptable.	9/15/2020

Citation and Page Number	Current Text	Corrected Text	Date
	If PFOA or PFOS is detected in any sample at or above 1 µg/kg, then soil should be tested by SPLP and the leachate analyzed for PFAS. If the SPLP results exceed 10 ppt for either PFOA or PFOS (individually) then the source of backfill should be rejected, unless a site-specific exemption is provided by DER. SPLP leachate criteria is based on the Maximum Contaminant Levels proposed for drinking water by New York State's Department of Health, this value may be updated based on future Federal or State promulgated regulatory standards. Remedial parties have the option of analyzing samples concurrently for both PFAS in soil and in the SPLP leachate to minimize project delays. Category B deliverables should be submitted for backfill samples, though a DUSR is not required.	PFOA, PFOS and 1,4-dioxane are all considered semi-volatile compounds, so composite samples are appropriate for these compounds when sampling in accordance with DER-10, Table 5.4(e)10. Category B deliverables should be submitted for backfill samples, though a DUSR is not required.	
Footnotes	None	[1] TOP Assay analysis of highly contaminated samples, such as those from an AFFF (aqueous film-forming foam) site, can result in incomplete oxidation of the samples and an underestimation of the total perfluoroalkyl substances. [2] The movement of PFAS in the environment is being aggressively researched at this time; that research will eventually result in more accurate models for the behaviors of these chemicals. In the meantime, DEC has calculated the soil cleanup objective for the protection of groundwater using the same procedure used for all other chemicals, as described in Section 7.7 of the Technical Support Document (http://www.dec.ny.gov/docs/remediation_hudson_pdf/techsuppdoc.pdf).	9/15/2020

Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (PFAS) Under NYSDEC's Part 375 Remedial Programs

Objective

New York State Department of Environmental Conservation's Division of Environmental Remediation (DER) performs or oversees sampling of environmental media and subsequent analysis of PFAS as part of remedial programs implemented under 6 NYCRR Part 375. To ensure consistency in sampling, analysis, reporting, and assessment of PFAS, DER has developed this document which summarizes currently accepted procedures and updates previous DER technical guidance pertaining to PFAS.

Applicability

All work plans submitted to DEC pursuant to one of the remedial programs under Part 375 shall include PFAS sampling and analysis procedures that conform to the guidelines provided herein.

As part of a site investigation or remedial action compliance program, whenever samples of potentially affected media are collected and analyzed for the standard Target Analyte List/Target Compound List (TAL/TCL), PFAS analysis should also be performed. Potentially affected media can include soil, groundwater, surface water, and sediment. Based upon the potential for biota to be affected, biota sampling and analysis for PFAS may also be warranted as determined pursuant to a Fish and Wildlife Impact Analysis. Soil vapor sampling for PFAS is not required.

Field Sampling Procedures

DER-10 specifies technical guidance applicable to DER's remedial programs. Given the prevalence and use of PFAS, DER has developed "best management practices" specific to sampling for PFAS. As specified in DER-10 Chapter 2, quality assurance procedures are to be submitted with investigation work plans. Typically, these procedures are incorporated into a work plan, or submitted as a stand-alone document (e.g., a Quality Assurance Project Plan). Quality assurance guidelines for PFAS are listed in Appendix A - Quality Assurance Project Plan (QAPP) Guidelines for PFAS.

Field sampling for PFAS performed under DER remedial programs should follow the appropriate procedures outlined for soils, sediments or other solids (Appendix B), non-potable groundwater (Appendix C), surface water (Appendix D), public or private water supply wells (Appendix E), and fish tissue (Appendix F).

QA/QC samples (e.g. duplicates, MS/MSD) should be collected as specified in DER-10, Section 2.3(c). For sampling equipment coming in contact with aqueous samples only, rinsate or equipment blanks should be collected.

Equipment blanks should be collected at a minimum frequency of one per day per site or one per twenty samples, whichever is more frequent.

Analysis and Reporting

As of October 2020, the United States Environmental Protection Agency (EPA) does not have a validated method for analysis of PFAS for media commonly analyzed under DER remedial programs (non-potable waters, solids). DER has developed the following guidelines to ensure consistency in analysis and reporting of PFAS.

The investigation work plan should describe analysis and reporting procedures, including laboratory analytical procedures for the methods discussed below. As specified in DER-10 Section 2.2, laboratories should provide a full Category B deliverable. In addition, a Data Usability Summary Report (DUSR) should be prepared by an independent, third party data validator. Electronic data submissions should meet the requirements provided at: https://www.dec.ny.gov/chemical/62440.html.

DER has developed a *PFAS Analyte List* (Appendix F) for remedial programs to understand the nature of contamination at sites. It is expected that reported results for PFAS will include, at a minimum, all the compounds listed. If lab and/or matrix specific issues are encountered for any analytes, the DER project manager, in consultation with the DER chemist, will make case-by-case decisions as to whether certain analytes may be temporarily or permanently discontinued from analysis at each site. As with other contaminants that are analyzed for at a site, the *PFAS Analyte List* may be refined for future sampling events based on investigative findings.

Routine Analysis

Currently, New York State Department of Health's Environmental Laboratory Approval Program (ELAP) does not offer certification for PFAS in matrices other than finished drinking water. However, laboratories analyzing environmental samples for PFAS (e.g., soil, sediments, and groundwater) under DER's Part 375 remedial programs need to hold ELAP certification for PFOA and PFOS in drinking water by EPA Method 537, 537.1, ISO 25101, or Method 533. Laboratories should adhere to the guidelines and criteria set forth in the DER's laboratory guidelines for PFAS in non-potable water and solids (Appendix H - Laboratory Guidelines for Analysis of PFAS in Non-Potable Water and Solids). Data review guidelines were developed by DER to ensure data comparability and usability (Appendix H - Data Review Guidelines for Analysis of PFAS in Non-Potable Water and Solids).

LC-MS/MS analysis for PFAS using methodologies based on EPA Method 537.1 is the procedure to use for environmental samples. Isotope dilution techniques should be utilized for the analysis of PFAS in all media. Reporting limits for PFOA and PFOS in aqueous samples should not exceed 2 ng/L. Reporting limits for PFOA and PFOS in solid samples should not exceed 0.5 µg/kg. Reporting limits for all other PFAS in aqueous and solid media should be as close to these limits as possible. If laboratories indicate that they are not able to achieve these reporting limits for the entire *PFAS Analyte List*, site-specific decisions regarding acceptance of elevated reporting limits for specific PFAS can be made by the DER project manager in consultation with the DER chemist.

Additional Analysis

Additional laboratory methods for analysis of PFAS may be warranted at a site, such as the Synthetic Precipitation Leaching Procedure (SPLP) and Total Oxidizable Precursor Assay (TOP Assay).

In cases where site-specific cleanup objectives for PFOA and PFOS are to be assessed, soil parameters, such as Total Organic Carbon (EPA Method 9060), soil pH (EPA Method 9045), clay content (percent), and cation exchange capacity (EPA Method 9081), should be included in the analysis to help evaluate factors affecting the leachability of PFAS in site soils.

SPLP is a technique used to determine the mobility of chemicals in liquids, soils and wastes, and may be useful in determining the need for addressing PFAS-containing material as part of the remedy. SPLP by EPA Method 1312 should be used unless otherwise specified by the DER project manager in consultation with the DER chemist.

Impacted materials can be made up of PFAS that are not analyzable by routine analytical methodology. A TOP Assay can be utilized to conceptualize the amount and type of oxidizable PFAS which could be liberated in the environment, which approximates the maximum concentration of perfluoroalkyl substances that could be generated if all polyfluoroalkyl substances were oxidized. For example, some polyfluoroalkyl substances may degrade or transform to form perfluoroalkyl substances (such as PFOA or PFOS), resulting in an increase in perfluoroalkyl substance concentrations as contaminated groundwater moves away from a source. The TOP Assay converts, through oxidation, polyfluoroalkyl substances (precursors) into perfluoroalkyl substances that can be detected by routine analytical methodology.[1]

Commercial laboratories have adopted methods which allow for the quantification of targeted PFAS in air and biota. The EPA's Office of Research and Development (ORD) is currently developing methods which allow for air emissions characterization of PFAS, including both targeted and non-targeted analysis of PFAS. Consult with the DER project manager and the DER chemist for assistance on analyzing biota/tissue and air samples.

Data Assessment and Application to Site Cleanup

Until such time as Ambient Water Quality Standards (AWQS) and Soil Cleanup Objectives (SCOs) for PFOA and PFOS are published, the extent of contaminated media potentially subject to remediation should be determined on a case-by-case basis using the procedures discussed below and the criteria in DER-10. Preliminary target levels for cleanup of PFOA and PFOS in other media, including biota and sediment, have not yet been established by the DEC.

Water Sample Results

PFOA and PFOS should be further assessed and considered as potential contaminants of concern in groundwater or surface water if PFOA or PFOS is detected in any water sample at or above 10 ng/L (ppt) and is determined to be attributable to the site, either by a comparison of upgradient and downgradient levels, or the presence of soil source areas, as defined below. In addition, further assessment of water may be warranted if either of the following screening levels are met:

a. any other individual PFAS (not PFOA or PFOS) is detected in water at or above 100 ng/L; or
b. total concentration of PFAS (including PFOA and PFOS) is detected in water at or above 500 ng/L

If PFOA and/or PFOS are identified as contaminants of concern for a site, they should be assessed as part of the remedy selection process in accordance with Part 375 and DER-10.

Soil Sample Results

Soil cleanup objectives for PFOA and PFOS will be proposed in an upcoming revision to 6 NYCRR Part 375-6. Until SCOs are in effect, the following are to be used as guidance values.

[1] TOP Assay analysis of highly contaminated samples, such as those from an AFFF (aqueous film-forming foam) site, can result in incomplete oxidation of the samples and an underestimation of the total perfluoroalkyl substances.

Guidance Values for Anticipated Site Use	PFOA (ppb)	PFOS (ppb)
Unrestricted	0.66	0.88
Residential	6.6	8.8
Restricted Residential	33	44
Commercial	500	440
Industrial	600	440
Protection of Groundwater[2]	1.1	3.7

PFOA and PFOS results for soil are to be compared against the guidance values listed above. These guidance values are to be used in determining whether PFOA and PFOS are contaminants of concern for the site and for determining remedial action objectives and cleanup requirements. Site-specific remedial objectives for protection of groundwater can also be presented for evaluation by DEC. Development of site-specific remedial objectives for protection of groundwater will require analysis of additional soil parameters relating to leachability. These additional analyses can include any or all the parameters listed above (soil pH, cation exchange capacity, etc.) and/or use of SPLP.

As the understanding of PFAS transport improves, DEC welcomes proposals for site-specific remedial objectives for protection of groundwater. DEC will expect that those may be dependent on additional factors including soil pH, aqueous pH, % organic carbon, % Sand/Silt/Clay, soil cations: K, Ca, Mg, Na, Fe, Al, cation exchange capacity, and anion exchange capacity. Site-specific remedial objectives should also consider the dilution attenuation factor (DAF). The NJDEP publication on DAF can be used as a reference: https://www.nj.gov/dep/srp/guidance/rs/daf.pdf.

Testing for Imported Soil

Testing for PFAS should be included any time a full TAL/TCL analyte list is required. Results for PFOA and PFOS should be compared to the applicable guidance values. If PFOA or PFOS is detected in any sample at or above the guidance values then the source of backfill should be rejected, unless a site-specific exemption is provided by DER based on SPLP testing, for example. If the concentrations of PFOA and PFOS in leachate are at or above 10 ppt (the Maximum Contaminant Levels established for drinking water by the New York State Department of Health), then the soil is not acceptable.

PFOA, PFOS and 1,4-dioxane are all considered semi-volatile compounds, so composite samples are appropriate for these compounds when sampling in accordance with DER-10, Table 5.4(e)10. Category B deliverables should be submitted for backfill samples, though a DUSR is not required.

[2] The movement of PFAS in the environment is being aggressively researched at this time; that research will eventually result in more accurate models for the behaviors of these chemicals. In the meantime, DEC has calculated the guidance value for the protection of groundwater using the same procedure used for all other chemicals, as described in Section 7.7 of the Technical Support Document (http://www.dec.ny.gov/docs/remediation_hudson_pdf/techsuppdoc.pdf).

Appendix A - Quality Assurance Project Plan (QAPP) Guidelines for PFAS

The following guidelines (general and PFAS-specific) can be used to assist with the development of a QAPP for projects within DER involving sampling and analysis of PFAS.

General Guidelines in Accordance with DER-10

- Document/work plan section title – Quality Assurance Project Plan
- Summarize project scope, goals, and objectives
- Provide project organization including names and resumes of the project manager, Quality Assurance Officer (QAO), field staff, and Data Validator
    - The QAO should not have another position on the project, such as project or task manager, that involves project productivity or profitability as a job performance criterion
- List the ELAP-approved lab(s) to be used for analysis of samples
- Include a site map showing sample locations
- Provide detailed sampling procedures for each matrix
- Include Data Quality Usability Objectives
- List equipment decontamination procedures
- Include an "Analytical Methods/Quality Assurance Summary Table" specifying:
    - Matrix type
    - Number or frequency of samples to be collected per matrix
    - Number of field and trip blanks per matrix
    - Analytical parameters to be measured per matrix
    - Analytical methods to be used per matrix with minimum reporting limits
    - Number and type of matrix spike and matrix spike duplicate samples to be collected
    - Number and type of duplicate samples to be collected
    - Sample preservation to be used per analytical method and sample matrix
    - Sample container volume and type to be used per analytical method and sample matrix
    - Sample holding time to be used per analytical method and sample matrix
- Specify Category B laboratory data deliverables and preparation of a DUSR

Specific Guidelines for PFAS

- Include in the text that sampling for PFAS will take place
- Include in the text that PFAS will be analyzed by LC-MS/MS for PFAS using methodologies based on EPA Method 537.1
- Include the list of PFAS compounds to be analyzed (*PFAS Analyte List*)
- Include the laboratory SOP for PFAS analysis
- List the minimum method-achievable Reporting Limits for PFAS
    - Reporting Limits should be less than or equal to:
        - Aqueous – 2 ng/L (ppt)
        - Solids – 0.5 µg/kg (ppb)
- Include the laboratory Method Detection Limits for the PFAS compounds to be analyzed
- Laboratory should have ELAP certification for PFOA and PFOS in drinking water by EPA Method 537, 537.1, EPA Method 533, or ISO 25101
- Include detailed sampling procedures
    - Precautions to be taken
    - Pump and equipment types
    - Decontamination procedures
    - Approved materials only to be used
- Specify that regular ice only will be used for sample shipment

- Specify that equipment blanks should be collected at a minimum frequency of 1 per day per site for each matrix

Appendix B - Sampling Protocols for PFAS in Soils, Sediments and Solids

General

The objective of this protocol is to give general guidelines for the collection of soil, sediment and other solid samples for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Containers

Samples collected using this protocol are intended to be analyzed for PFAS using methodologies based on EPA Method 537.1.

The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation’s Division of Environmental Remediation.

No sampling equipment components or sample containers should come in to contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials including sample bottle cap liners with a PTFE layer.

A list of acceptable equipment is provided below, but other equipment may be considered appropriate based on sampling conditions.

- stainless steel spoon
- stainless steel bowl
- steel hand auger or shovel without any coatings

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Sampling is often conducted in areas where a vegetative turf has been established. In these cases, a pre-cleaned trowel or shovel should be used to carefully remove the turf so that it may be replaced at the conclusion of sampling. Surface soil samples (e.g. 0 to 6 inches below surface) should then be collected using a pre-cleaned, stainless steel spoon. Shallow subsurface soil samples (e.g. 6 to ~36 inches below surface) may be collected by digging a hole using a pre-cleaned hand auger or shovel. When the desired subsurface depth is reached, a pre-cleaned hand auger or spoon shall be used to obtain the sample.

When the sample is obtained, it should be deposited into a stainless steel bowl for mixing prior to filling the sample containers. The soil should be placed directly into the bowl and mixed thoroughly by rolling the material into the middle until the material is homogenized. At this point the material within the bowl can be placed into the laboratory provided container.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at 4 ± 2º Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- Request appropriate data deliverable (Category B) and an electronic data deliverable

Documentation

A soil log or sample log shall document the location of the sample/borehole, depth of the sample, sampling equipment, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate. Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appropriate rain gear (PVC, polyurethane, or rubber rain gear are acceptable), bug spray, and sunscreen should be used that does not contain PFAS. Well washed cotton coveralls may be used as an alternative to bug spray and/or sunscreen.

PPE that contains PFAS is acceptable when site conditions warrant additional protection for the samplers and no other materials can be used to be protective. Documentation of such use should be provided in the field notes.

Appendix C - Sampling Protocols for PFAS in Monitoring Wells

General

The objective of this protocol is to give general guidelines for the collection of groundwater samples for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Container

Samples collected using this protocol are intended to be analyzed for PFAS using methodologies based on EPA Method 537.1.

The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include: stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials including plumbers tape and sample bottle cap liners with a PTFE layer.

A list of acceptable equipment is provided below, but other equipment may be considered appropriate based on sampling conditions.

- stainless steel inertia pump with HDPE tubing
- peristaltic pump equipped with HDPE tubing and silicone tubing
- stainless steel bailer with stainless steel ball
- bladder pump (identified as PFAS-free) with HDPE tubing

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Monitoring wells should be purged in accordance with the sampling procedure (standard/volume purge or low flow purge) identified in the site work plan, which will determine the appropriate time to collect the sample. If sampling using standard purge techniques, additional purging may be needed to reduce turbidity levels, so samples contain a limited amount of sediment within the sample containers. Sample containers that contain sediment may cause issues at the laboratory, which may result in elevated reporting limits and other issues during the sample preparation that can compromise data usability. Sampling personnel should don new nitrile gloves prior to sample collection due to the potential to contact PFAS containing items (not related to the sampling equipment) during the purging activities.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at 4 ± 2º Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- Collect one equipment blank per day per site and minimum 1 equipment blank per 20 samples. The equipment blank shall test the new and decontaminated sampling equipment utilized to obtain a sample for residual PFAS contamination. This sample is obtained by using laboratory provided PFAS-free water and passing the water over or through the sampling device and into laboratory provided sample containers
- Additional equipment blank samples may be collected to assess other equipment that is utilized at the monitoring well
- Request appropriate data deliverable (Category B) and an electronic data deliverable

Documentation

A purge log shall document the location of the sample, sampling equipment, groundwater parameters, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate. Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appropriate rain gear (PVC, polyurethane, or rubber rain gear are acceptable), bug spray, and sunscreen should be used that does not contain PFAS. Well washed cotton coveralls may be used as an alternative to bug spray and/or sunscreen.

PPE that contains PFAS is acceptable when site conditions warrant additional protection for the samplers and no other materials can be used to be protective. Documentation of such use should be provided in the field notes.

Appendix D - Sampling Protocols for PFAS in Surface Water

General

The objective of this protocol is to give general guidelines for the collection of surface water samples for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Container

Samples collected using this protocol are intended to be analyzed for PFAS using methodologies based on EPA Method 537.1.

The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include: stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials including sample bottle cap liners with a PTFE layer.

A list of acceptable equipment is provided below, but other equipment may be considered appropriate based on sampling conditions.

- stainless steel cup

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Where conditions permit, (e.g. creek or pond) sampling devices (e.g. stainless steel cup) should be rinsed with site medium to be sampled prior to collection of the sample. At this point the sample can be collected and poured into the sample container.

If site conditions permit, samples can be collected directly into the laboratory container.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at 4 ± 2º Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- Collect one equipment blank per day per site and minimum 1 equipment blank per 20 samples. The equipment blank shall test the new and decontaminated sampling equipment utilized to obtain a sample for residual PFAS contamination. This sample is obtained by using laboratory provided PFAS-free water and passing the water over or through the sampling device and into laboratory provided sample containers
- Request appropriate data deliverable (Category B) and an electronic data deliverable

Documentation

A sample log shall document the location of the sample, sampling equipment, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate. Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appropriate rain gear (PVC, polyurethane, or rubber rain gear are acceptable), bug spray, and sunscreen should be used that does not contain PFAS. Well washed cotton coveralls may be used as an alternative to bug spray and/or sunscreen.

PPE that contains PFAS is acceptable when site conditions warrant additional protection for the samplers and no other materials can be used to be protective. Documentation of such use should be provided in the field notes.

Appendix E - Sampling Protocols for PFAS in Private Water Supply Wells

General

The objective of this protocol is to give general guidelines for the collection of water samples from private water supply wells (with a functioning pump) for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Container

Drinking water samples collected using this protocol are intended to be analyzed for PFAS by ISO Method 25101. The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include: stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials (e.g. plumbers tape), including sample bottle cap liners with a PTFE layer.

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Locate and assess the pressure tank and determine if any filter units are present within the building. Establish the sample location as close to the well pump as possible, which is typically the spigot at the pressure tank. Ensure sampling equipment is kept clean during sampling as access to the pressure tank spigot, which is likely located close to the ground, may be obstructed and may hinder sample collection.

Prior to sampling, a faucet downstream of the pressure tank (e.g., washroom sink) should be run until the well pump comes on and a decrease in water temperature is noted which indicates that the water is coming from the well. If the homeowner is amenable, staff should run the water longer to purge the well (15+ minutes) to provide a sample representative of the water in the formation rather than standing water in the well and piping system including the pressure tank. At this point a new pair of nitrile gloves should be donned and the sample can be collected from the sample point at the pressure tank.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at 4 ± 2º Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- If equipment was used, collect one equipment blank per day per site and a minimum 1 equipment blank per 20 samples. The equipment blank shall test the new and decontaminated sampling equipment utilized to obtain a sample for residual PFAS contamination. This sample is obtained by using laboratory provided PFAS-free water and passing the water over or through the sampling device and into laboratory provided sample containers.
- A field reagent blank (FRB) should be collected at a rate of one per 20 samples. The lab will provide a FRB bottle containing PFAS free water and one empty FRB bottle. In the field, pour the water from the one bottle into the empty FRB bottle and label appropriately.
- Request appropriate data deliverable (Category B) and an electronic data deliverable
- For sampling events where multiple private wells (homes or sites) are to be sampled per day, it is acceptable to collect QC samples at a rate of one per 20 across multiple sites or days.

Documentation

A sample log shall document the location of the private well, sample point location, owner contact information, sampling equipment, purge duration, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate and available (e.g. well construction, pump type and location, yield, installation date). Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appendix F - Sampling Protocols for PFAS in Fish

This appendix contains a copy of the latest guidelines developed by the Division of Fish and Wildlife (DFW) entitled "General Fish Handling Procedures for Contaminant Analysis" (Ver. 8).

Procedure Name: General Fish Handling Procedures for Contaminant Analysis

Number: FW-005

Purpose: This procedure describes data collection, fish processing and delivery of fish collected for contaminant monitoring. It contains the chain of custody and collection record forms that should be used for the collections.

Organization: Environmental Monitoring Section
Bureau of Ecosystem Health
Division of Fish and Wildlife (DFW)
New York State Department of Environmental Conservation (NYSDEC)
625 Broadway
Albany, New York 12233-4756

Version: 8

Previous Version Date: 21 March 2018

Summary of Changes to this Version: Updated bureau name to Bureau of Ecosystem Health. Added direction to list the names of all field crew on the collection record. Minor formatting changes on chain of custody and collection records.

Originator or Revised by: Wayne Richter, Jesse Becker

Date: 26 April 2019

Quality Assurance Officer and Approval Date: Jesse Becker, 26 April 2019

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

GENERAL FISH HANDLING PROCEDURES FOR CONTAMINANT ANALYSES

A. Original copies of all continuity of evidence (i.e., Chain of Custody) and collection record forms must accompany delivery of fish to the lab. A copy shall be directed to the Project Leader or as appropriate, Wayne Richter. All necessary forms will be supplied by the Bureau of Ecosystem Health. Because some samples may be used in legal cases, it is critical that each section is filled out completely. Each Chain of Custody form has three main sections:

   1. The top box is to be filled out **and signed** by the person responsible for the fish collection (e.g., crew leader, field biologist, researcher). This person is responsible for delivery of the samples to DEC facilities or personnel (e.g., regional office or biologist).

   2. The second section is to be filled out **and signed** by the person responsible for the collections while being stored at DEC, before delivery to the analytical lab. This may be the same person as in (1), but it is still required that they complete the section. Also important is the **range of identification numbers** (i.e., tag numbers) included in the sample batch.

   3. Finally, the bottom box is to record any transfers between DEC personnel and facilities. Each subsequent transfer should be **identified, signed, and dated**, until laboratory personnel take possession of the fish.

B. The following data are required on each **Fish Collection Record** form:

   1. Project and Site Name.

   2. DEC Region.

   3. All personnel (and affiliation) involved in the collection.

   4. Method of collection (gill net, hook and line, etc.)

   5. Preservation Method.

C. The following data are to be taken on each fish collected and recorded on the **Fish Collection Record** form:

   1. Tag number - Each specimen is to be individually jaw tagged at time of collection with a unique number. Make sure the tag is turned out so that the number can be read without opening the bag. Use tags in sequential order. For small fish or composite samples place the tag inside the bag with the samples. The Bureau of Ecosystem Health can supply the tags.

   2. Species identification (please be explicit enough to enable assigning genus and species). Group fish by species when processing.

   3. Date collected.

   4. Sample location (waterway and nearest prominent identifiable landmark).

   5. Total length (nearest mm or smallest sub-unit on measuring instrument) and weight (nearest g or

smallest sub-unit of weight on weighing instrument). Take all measures as soon as possible with calibrated, protected instruments (e.g. from wind and upsets) and prior to freezing.

6. Sex - fish may be cut enough to allow sexing or other internal investigation, but do not eviscerate. Make any incision on the right side of the belly flap or exactly down the midline so that a left-side fillet can be removed.

D. General data collection recommendations:

1. It is helpful to use an ID or tag number that will be unique. It is best to use metal striped bass or other uniquely numbered metal tags. If uniquely numbered tags are unavailable, values based on the region, water body and year are likely to be unique: for example, R7CAY11001 for Region 7, Cayuga Lake, 2011, fish 1. If the fish are just numbered 1 through 20, we have to give them new numbers for our database, making it more difficult to trace your fish to their analytical results and creating an additional possibility for errors.

2. Process and record fish of the same species sequentially. Recording mistakes are less likely when all fish from a species are processed together. Starting with the bigger fish species helps avoid missing an individual.

3. If using Bureau of Ecosystem Health supplied tags or other numbered tags, use tags in sequence so that fish are recorded with sequential Tag Numbers. This makes data entry and login at the lab and use of the data in the future easier and reduces keypunch errors.

4. Record length and weight as soon as possible after collection and before freezing. Other data are recorded in the field upon collection. An age determination of each fish is optional, but if done, it is recorded in the appropriate "Age" column.

5. For composite samples of small fish, record the number of fish in the composite in the Remarks column. Record the length and weight of each individual in a composite. All fish in a composite sample should be of the same species and members of a composite should be visually matched for size.

6. Please submit photocopies of topographic maps or good quality navigation charts indicating sampling locations. GPS coordinates can be entered in the Location column of the collection record form in addition to or instead for providing a map. These records are of immense help to us (and hopefully you) in providing documented location records which are not dependent on memory and/or the same collection crew. In addition, they may be helpful for contaminant source trackdown and remediation/control efforts of the Department.

7. When recording data on fish measurements, it will help to ensure correct data recording for the data recorder to call back the numbers to the person making the measurements.

E. Each fish is to be placed in its own individual plastic bag. For small fish to be analyzed as a composite, put all of the fish for one composite in the same bag but use a separate bag for each composite. It is important to individually bag the fish to avoid difficulties or cross contamination when processing the fish for chemical analysis. Be sure to include the fish's tag number inside the bag, preferably attached to the fish with the tag number turned out so it can be read. Tie or otherwise secure the bag closed. **<u>The Bureau of Ecosystem Health will supply the bags.</u>** If necessary, food grade bags may be procured from a suitable vendor (e.g., grocery store). It is preferable to redundantly label each bag with a manila tag tied between the knot and the body of the bag. This tag should be labeled with the project name, collection location, tag number, collection date, and fish species. If scales are collected, the scale envelope should be labeled with the same information.

F. Groups of fish, by species, are to be placed in one large plastic bag per sampling location. **The Bureau of Ecosystem Health will supply the larger bags.** Tie or otherwise secure the bag closed. Label the site bag with a manila tag tied between the knot and the body of the bag. The tag should contain: project, collection location, collection date, species and **tag number ranges**. Having this information on the manila tag enables lab staff to know what is in the bag without opening it.

G. Do not eviscerate, fillet or otherwise dissect the fish unless specifically asked to. If evisceration or dissection is specified, the fish must be cut along the exact midline or on the right side so that the left side fillet can be removed intact at the laboratory. If filleting is specified, the procedure for taking a standard fillet (SOP PREPLAB 4) must be followed, including removing scales.

H. Special procedures for PFAS: Unlike legacy contaminants such as PCBs, which are rarely found in day to day life, PFAS are widely used and frequently encountered. Practices that avoid sample contamination are therefore necessary. While no standard practices have been established for fish, procedures for water quality sampling can provide guidance. The following practices should be used for collections when fish are to be analyzed for PFAS:

    No materials containing Teflon.
    No Post-it notes.
    No ice packs; only water ice or dry ice.
    Any gloves worn must be powder free nitrile.
    No Gore-Tex or similar materials (Gore-Tex is a PFC with PFOA used in its manufacture).
    No stain repellent or waterproof treated clothing; these are likely to contain PFCs.
    Avoid plastic materials, other than HDPE, including clipboards and waterproof notebooks.
    Wash hands after handling any food containers or packages as these may contain PFCs. Keep pre-wrapped food containers and wrappers isolated from fish handling.
    Wear clothing washed at least six times since purchase.
    Wear clothing washed without fabric softener.
    Staff should avoid cosmetics, moisturizers, hand creams and similar products on the day of sampling as many of these products contain PFCs (Fujii et al. 2013). Sunscreen or insect repellent should not contain ingredients with “fluor” in their name. Apply any sunscreen or insect repellent well downwind from all materials. Hands must be washed after touching any of these products.

I. All fish must be kept at a temperature <45° F (<8° C) immediately following data processing. As soon as possible, freeze at -20° C ± 5° C. Due to occasional freezer failures, daily freezer temperature logs are required. The freezer should be locked or otherwise secured to maintain chain of custody.

J. In most cases, samples should be delivered to the Analytical Services Unit at the Hale Creek field station. Coordinate delivery with field station staff and send copies of the collection records, continuity of evidence forms and freezer temperature logs to the field station. For samples to be analyzed elsewhere, non-routine collections or other questions, contact Wayne Richter, Bureau of Ecosystem Health, NYSDEC, 625 Broadway, Albany, New York 12233-4756, 518-402-8974, or the project leader about sample transfer. Samples will then be directed to the analytical facility and personnel noted on specific project descriptions.

K. A recommended equipment list is at the end of this document.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF FISH AND WILDLIFE
FISH COLLECTION RECORD

Project and Site Name ____ DEC Region ____________

Collections made by (include all crew) ____

Sampling Method: ☐Electrofishing ☐Gill netting ☐Trap netting ☐Trawling ☐Seining ☐Angling ☐Other ______________________

Preservation Method: ☐Freezing ☐Other ________________ Notes (SWFDB survey number): ______________________

FOR LAB USE ONLY- LAB ENTRY NO.	COLLECTION OR TAG NO.	SPECIES	DATE TAKEN	LOCATION	AGE	SEX &/OR REPROD. CONDIT	LENGTH ( )	WEIGHT ( )	REMARKS

richter: revised 2011, 5/7/15, 10/4/16, 3/20/17; becker: 3/23/17, 4/26/19

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
CHAIN OF CUSTODY

I, ______________________________, of ____ collected the
(Print Name) (Print Business Address)

following on ____________________, 20____ from ____
(Date) (Water Body)

in the vicinity of ____
(Landmark, Village, Road, etc.)

Town of ____, in _________________________________ County.

Item(s) ____

____

Said sample(s) were in my possession and handled according to standard procedures provided to me prior to collection. The sample(s) were placed in the custody of a representative of the New York State Department of Environmental Conservation on ____________________________________, 20______.

____ ___________________________
Signature Date

I, __________________________________, received the above mentioned sample(s) on the date specified and assigned identification number(s) ____ to the sample(s). I have recorded pertinent data for the sample(s) on the attached collection records. The sample(s) remained in my custody until subsequently transferred, prepared or shipped at times and on dates as attested to below.

______________________________________ ___________________
Signature Date

SECOND RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	UNIT	
THIRD RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	UNIT	
FOURTH RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	UNIT	
RECEIVED IN LABORATORY BY (Print Name)	TIME & DATE	REMARKS
SIGNATURE	UNIT	
LOGGED IN BY (Print Name)	TIME & DATE	ACCESSION NUMBERS
SIGNATURE	UNIT	

richter: revised 21 April 2014; becker: 23 March 2017, 26 April, 2019

NOTICE OF WARRANTY

By signature to the chain of custody (reverse), the signatory warrants that the information provided is truthful and accurate to the best of his/her ability. The signatory affirms that he/she is willing to testify to those facts provided and the circumstances surrounding the same. Nothing in this warranty or chain of custody negates responsibility nor liability of the signatories for the truthfulness and accuracy of the statements provided.

HANDLING INSTRUCTIONS

On day of collection, collector(s) name(s), address(es), date, geographic location of capture (attach a copy of topographic map or navigation chart), species, number kept of each species, and description of capture vicinity (proper noun, if possible) along with name of Town and County must be indicated on reverse.

Retain organisms in manila tagged plastic bags to avoid mixing capture locations. Note appropriate information on each bag tag.

Keep samples as cool as possible. Put on ice if fish cannot be frozen within 12 hours. If fish are held more than 24 hours without freezing, they will not be retained or analyzed.

Initial recipient (either DEC or designated agent) of samples from collector(s) is responsible for obtaining and recording information on the collection record forms which will accompany the chain of custody. This person will seal the container using packing tape and writing his signature, the time and the date across the tape onto the container with indelible marker. Any time a seal is broken, for whatever purpose, the incident must be recorded on the Chain of Custody (reason, time, and date) in the purpose of transfer block. Container then is resealed using new tape and rewriting signature, with time and date.

EQUIPMENT LIST

Scale or balance of appropriate capacity for the fish to be collected.

Fish measuring board.

Plastic bags of an appropriate size for the fish to be collected and for site bags.

Individually numbered metal tags for fish.

Manila tags to label bags.

Small envelops, approximately 2” x 3.5”, if fish scales are to be collected.

Knife for removing scales.

Chain of custody and fish collection forms.

Clipboard.

Pens or markers.

Paper towels.

Dish soap and brush.

Bucket.

Cooler.

Ice.

Duct tape.

Appendix G – PFAS Analyte List

Group	Chemical Name	Abbreviation	CAS Number
Perfluoroalkyl sulfonates	Perfluorobutanesulfonic acid	PFBS	375-73-5
	Perfluorohexanesulfonic acid	PFHxS	355-46-4
	Perfluoroheptanesulfonic acid	PFHpS	375-92-8
	Perfluorooctanesulfonic acid	PFOS	1763-23-1
	Perfluorodecanesulfonic acid	PFDS	335-77-3
Perfluoroalkyl carboxylates	Perfluorobutanoic acid	PFBA	375-22-4
	Perfluoropentanoic acid	PFPeA	2706-90-3
	Perfluorohexanoic acid	PFHxA	307-24-4
	Perfluoroheptanoic acid	PFHpA	375-85-9
	Perfluorooctanoic acid	PFOA	335-67-1
	Perfluorononanoic acid	PFNA	375-95-1
	Perfluorodecanoic acid	PFDA	335-76-2
	Perfluoroundecanoic acid	PFUA/PFUdA	2058-94-8
	Perfluorododecanoic acid	PFDoA	307-55-1
	Perfluorotridecanoic acid	PFTriA/PFTrDA	72629-94-8
	Perfluorotetradecanoic acid	PFTA/PFTeDA	376-06-7
Fluorinated Telomer Sulfonates	6:2 Fluorotelomer sulfonate	6:2 FTS	27619-97-2
	8:2 Fluorotelomer sulfonate	8:2 FTS	39108-34-4
Perfluorooctane-sulfonamides	Perfluroroctanesulfonamide	FOSA	754-91-6
Perfluorooctane-sulfonamidoacetic acids	N-methyl perfluorooctanesulfonamidoacetic acid	N-MeFOSAA	2355-31-9
	N-ethyl perfluorooctanesulfonamidoacetic acid	N-EtFOSAA	2991-50-6

Appendix H - Laboratory Guidelines for Analysis of PFAS in Non-Potable Water and Solids

General

New York State Department of Environmental Conservation's Division of Environmental Remediation (DER) developed the following guidelines for laboratories analyzing environmental samples for PFAS under DER programs. If laboratories cannot adhere to the following guidelines, they should contact DER's Quality Assurance Officer, Dana Barbarossa, at dana.barbarossa@dec.ny.gov prior to analysis of samples.

Isotope Dilution

Isotope dilution techniques should be utilized for the analysis of PFAS in all media.

Extraction

For water samples, the entire sample bottle should be extracted, and the sample bottle rinsed with appropriate solvent to remove any residual PFAS.

For samples with high particulates, the samples should be handled in one of the following ways:

1. Spike the entire sample bottle with isotope dilution analytes (IDAs) prior to any sample manipulation. The sample can be passed through the SPE and if it clogs, record the volume that passed through.
2. If the sample contains too much sediment to attempt passing it through the SPE cartridge, the sample should be spiked with isotope dilution analytes, centrifuged and decanted.
3. If higher reporting limits are acceptable for the project, the sample can be diluted by taking a representative aliquot of the sample. If isotope dilution analytes will be diluted out of the sample, they can be added after the dilution. The sample should be homogenized prior to taking an aliquot.

If alternate sample extraction procedures are used, please contact the DER remedial program chemist prior to employing. Any deviations in sample preparation procedures should be clearly noted in the case narrative.

Signal to Noise Ratio

For all target analyte ions used for quantification, signal to noise ratio should be 3:1 or greater.

Blanks

There should be no detections in the method blanks above the reporting limits.

Ion Transitions

The ion transitions listed below should be used for the following PFAS:

PFOA	413 > 369
PFOS	499 > 80
PFHxS	399 > 80
PFBS	299 > 80
6:2 FTS	427 > 407
8:2 FTS	527 > 507
N-EtFOSAA	584 > 419
N-MeFOSAA	570 > 419

Branched and Linear Isomers

Standards containing both branched and linear isomers should be used when standards are commercially available. Currently, quantitative standards are available for PFHxS, PFOS, NMeFOSAA, and NEtFOSAA. As more standards become available, they should be incorporated in to the method. All isomer peaks present in the standard should be integrated and the areas summed. Samples should be integrated in the same manner as the standards.

Since a quantitative standard does not exist for branched isomers of PFOA, the instrument should be calibrated using just the linear isomer and a technical (qualitative) PFOA standard should be used to identify the retention time of the branched PFOA isomers in the sample. The total response of PFOA branched and linear isomers should be integrated in the samples and quantitated using the calibration curve of the linear standard.

Secondary Ion Transition Monitoring

Quantifier and qualifier ions should be monitored for all target analytes (PFBA and PFPeA are exceptions). The ratio of quantifier ion response to qualifier ion response should be calculated for each target analyte and the ratio compared to standards. Lab derived criteria should be used to determine if the ratios are acceptable.

Reporting

Detections below the reporting limit should be reported and qualified with a J qualifier.

The acid form of PFAS analytes should be reported. If the salt form of the PFAS was used as a stock standard, the measured mass should be corrected to report the acid form of the analyte.

Appendix I - Data Review Guidelines for Analysis of PFAS in Non-Potable Water and Solids

General

These guidelines are intended to be used for the validation of PFAS analytical results for projects within the Division of Environmental Remediation (DER) as well as aid in the preparation of a data usability summary report. Data reviewers should understand the methodology and techniques utilized in the analysis. Consultation with the end user of the data may be necessary to assist in determining data usability based on the data quality objectives in the Quality Assurance Project Plan. A familiarity with the laboratory's Standard Operating Procedure may also be needed to fully evaluate the data. If you have any questions, please contact DER's Quality Assurance Officer, Dana Barbarossa, at dana.barbarossa@dec.ny.gov.

Preservation and Holding Time

Samples should be preserved with ice to a temperature of less than 6°C upon arrival at the lab. The holding time is 14 days to extraction for aqueous and solid samples. The time from extraction to analysis for aqueous samples is 28 days and 40 days for solids.

Temperature greatly exceeds 6ºC upon arrival at the lab*	Use professional judgement to qualify detects and non-detects as estimated or rejected
Holding time exceeding 28 days to extraction	Use professional judgement to qualify detects and non-detects as estimated or rejected if holding time is grossly exceeded

*Samples that are delivered to the lab immediately after sampling may not meet the thermal preservation guidelines. Samples are considered acceptable if they arrive on ice or an attempt to chill the samples is observed.

Initial Calibration

The initial calibration should contain a minimum of five standards for linear fit and six standards for a quadratic fit. The relative standard deviation (RSD) for a quadratic fit calibration should be less than 20%. Linear fit calibration curves should have an R^2 value greater than 0.990.

The low-level calibration standard should be within 50% - 150% of the true value, and the mid-level calibration standard within 70% - 130% of the true value.

%RSD >20%	J flag detects and UJ non detects
R^2 >0.990	J flag detects and UJ non detects
Low-level calibration check <50% or >150%	J flag detects and UJ non detects
Mid-level calibration check <70% or >130%	J flag detects and UJ non detects

Initial Calibration Verification

An initial calibration verification (ICV) standard should be from a second source (if available). The ICV should be at the same concentration as the mid-level standard of the calibration curve.

ICV recovery <70% or >130%	J flag detects and non-detects

Continuing Calibration Verification

Continuing calibration verification (CCV) checks should be analyzed at a frequency of one per ten field samples. If CCV recovery is very low, where detection of the analyte could be in question, ensure a low level CCV was analyzed and use to determine data quality.

CCV recovery <70 or >130%	J flag results

Blanks

There should be no detections in the method blanks above the reporting limits. Equipment blanks, field blanks, rinse blanks etc. should be evaluated in the same manner as method blanks. Use the most contaminated blank to evaluate the sample results.

Blank Result	Sample Result	Qualification
Any detection	<Reporting limit	Qualify as ND at reporting limit
Any detection	>Reporting Limit and >10x the blank result	No qualification
>Reporting limit	>Reporting limit and <10x blank result	J+ biased high

Field Duplicates

A blind field duplicate should be collected at rate of one per twenty samples. The relative percent difference (RPD) should be less than 30% for analyte concentrations greater than two times the reporting limit. Use the higher result for final reporting.

RPD >30%	Apply J qualifier to parent sample

Lab Control Spike

Lab control spikes should be analyzed with each extraction batch or one for every twenty samples. In the absence of lab derived criteria, use 70% - 130% recovery criteria to evaluate the data.

Recovery <70% or >130% (lab derived criteria can also be used)	Apply J qualifier to detects and UJ qualifier to non detects

Matrix Spike/Matrix Spike Duplicate

One matrix spike and matrix spike duplicate should be collected at a rate of one per twenty samples. Use professional judgement to reject results based on out of control MS/MSD recoveries.

Recovery <70% or >130% (lab derived criteria can also be used)	Apply J qualifier to detects and UJ qualifier to non detects of parent sample only
RPD >30%	Apply J qualifier to detects and UJ qualifier to non detects of parent sample only

Extracted Internal Standards (Isotope Dilution Analytes)

Problematic analytes (e.g. PFBA, PFPeA, fluorotelomer sulfonates) can have wider recoveries without qualification. Qualify corresponding native compounds with a J flag if outside of the range.

Recovery <50% or >150%	Apply J qualifier
Recovery <25% or >150% for poor responding analytes	Apply J qualifier
Isotope Dilution Analyte (IDA) Recovery <10%	Reject results

Secondary Ion Transition Monitoring

Quantifier and qualifier ions should be monitored for all target analytes (PFBA and PFPeA are exceptions). The ratio of quantifier ion response to qualifier ion response should be calculated from the standards for each target analyte. Lab derived criteria should be used to determine if the ratios are acceptable. If the ratios fall outside of the laboratory criteria, qualify results as an estimated maximum concentration.

Signal to Noise Ratio

The signal to noise ratio for the quantifier ion should be at least 3:1. If the ratio is less than 3:1, the peak is discernable from the baseline noise and symmetrical, the result can be reported. If the peak appears to be baseline noise and/or the shape is irregular, qualify the result as tentatively identified.

Branched and Linear Isomers

Observed branched isomers in the sample that do not have a qualitative or quantitative standard should be noted and the analyte should be qualified as biased low in the final data review summary report. Note: The branched isomer peak should also be present in the secondary ion transition.

Reporting Limits

If project-specific reporting limits were not met, please indicate that in the report along with the reason (e.g. over dilution, dilution for non-target analytes, high sediment in aqueous samples).

Peak Integrations

Target analyte peaks should be integrated properly and consistently when compared to standards. Ensure branched isomer peaks are included for PFAS where standards are available. Inconsistencies should be brought to the attention of the laboratory or identified in the data review summary report.

EPA 537 (PFAS) Field Sampling Guidelines

PLEASE READ INSTRUCTIONS ENTIRELY PRIOR TO SAMPLING EVENT

Sampling for PFAS via EPA 537 can be challenging due to the prevalence of these compounds in consumer products. The following guidelines are strongly recommended when conducting sampling.

Reference-NHDES https://www.des.nh.gov/organization/divisions/waste/hwrb/documents/pfc-stakeholder-notification-20161122.pdf

FIELD CLOTHING and PPE

- No clothing or boots containing Gore-Tex®
- All safety boots made from polyurethane and PVC
- No materials containing Tyvek®
- Do not use fabric softener on clothing to be worn in field
- Do not used cosmetics, moisturizers, hand cream, or other related products the morning of sampling
- Do not use unauthorized sunscreen or insect repellant (see reference above for acceptable products)

FOOD CONSIDERATIONS

No food or drink on-site with exception of bottled water and/or hydration drinks (i.e., Gatorade and Powerade) that is available for consumption only in the staging area

OTHER RECOMMENDATIONS

Sample for PFAS first! Other containers for other methods may have PFAS present on their sampling containers

SAMPLE CONTAINERS

- All sample containers made of HDPE or polypropylene
- Caps are unlined and made of HDPE or polypropylene (no Teflon® -lined caps)

WET WEATHER (AS APPLICABLE)

Wet weather gear made of polyurethane and PVC only

EQUIPMENT DECONTAMINATION

- "PFAS-free" water on-site for decontamination of sample equipment. No other water sources to be used
- Only Alconox and Liquinox can be used as decontamination materials

FIELD EQUIPMENT

- Must not contain Teflon® (aka PTFE) or LDPE materials
- All sampling materials must be made from stainless steel, HDPE, acetate, silicon, or polypropylene
- No waterproof field books can be used
- No plastic clipboards, binders, or spiral hard cover notebooks can be used
- No adhesives (i.e. Post-It® Notes) can be used
- Sharpies and permanent markers not allowed; regular ball point pens are acceptable
- Aluminum foil must not be used
- Keep PFC samples in separate cooler, away from sampling containers that may contain PFAS
- Coolers filled with regular ice only - Do not use chemical (blue) ice packs

EPA 537 (PFAS) Field Sampling Guidelines

PLEASE READ INSTRUCTIONS ENTIRELY PRIOR TO SAMPLING EVENT

Sampler must wash hands before wearing nitrile gloves in order to limit contamination during sampling. Each sample set requires a set of containers to comply with the method as indicated below. **Sample set is composed of samples collected from the same sample site and at the same time.*

Container Count	Container Type	Preservative
3 Sampling Containers - Empty	250 mL container	Pre preserved with 1.25 g Trizma
1 Reagent Water for Field Blank use	250 mL container	Pre preserved with 1.25 g Trizma
P1 Field Blank (FRB) - Empty	250 mL container	Unpreserved

Sampling container must be filled to the neck. For instructional purposes a black line has been drawn to illustrate the required fill level for each of the 3 Sample containers

Field blanks are recommended and the containers have been provided, please follow the instructions below.

Field Blank Instructions:

1. Locate the Reagent Water container from the bottle order. The Reagent Water container will be pre-filled with PFAS-free water and is preserved with Trizma.
2. Locate the empty container labeled "Field Blank".
3. Open both containers and proceed to transfer contents of the "Reagent Water" container into the "Field Blank" container.
4. If field blanks are to be analyzed, they need to be noted on COC, and will be billed accordingly as a sample.

Both the empty Reagent Water container and the filled Field Blank container must be returned to the lab along with the samples taken.

Sampling Instructions:

1. Each sampling event requires 3 containers to be filled to the neck of the provided containers for each sampling location.
2. Before sampling, remove faucet aerator, run water for 5 min, slow water to flow of pencil to avoid splashing and fill sample containers to neck of container (as previously illustrated) and invert 5 times.
3. Do not overfill or rinse the container.
4. Close containers securely. Place containers in sealed ZipLoc® bags, and in a separate cooler (no other container types).
5. Ensure Chain-of-Custody and all labels on containers contain required information. Place sample, Field Blank and empty Reagent Blank containers in ice filled cooler (do not use blue ice) and return to the laboratory. Samples should be kept at 4°C ±2. Samples must not exceed 10°C during first 48 hours after collection. Hold time is 14 days.

Please contact your Alpha Analytical project manager with additional questions or concerns.

Determination of Selected Perfluorinated Alkyl Substances by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry Isotope Dilution (LC/MS/MS)

References: EPA Method 537.1, Version 2, March 2020, EPA Document #: EPA/600/R-20/006

Department of Defense, Quality Systems Manual for Environmental Laboratories, Version 5.3, 2019

1. Scope and Application

Matrices: Drinking water, Non-potable Water, , Tissues, Biosolids and Soil Matrices (Drinking water is applicable for specific state regulatory requirements for this method)

Definitions: Refer to Alpha Analytical Quality Manual.

1.1 This is a liquid chromatography/tandem mass spectrometry (LC/MS/MS) method for the determination of selected perfluorinated alkyl substances (PFAS) in Non-Drinking Water and soil Matrices. Accuracy and precision data have been generated in reagent water, and finished ground and surface waters and soils for the compounds listed in Table 1.

1.2 The data report packages present the documentation of any method modification related to the samples tested. Depending upon the nature of the modification and the extent of intended use, the laboratory may be required to demonstrate that the modifications will produce equivalent results for the matrix. Approval of all method modifications is by one or more of the following laboratory personnel before performing the modification: Area Supervisor, Department Supervisor, Laboratory Director, or Quality Assurance Officer.

1.3 This method is restricted to use by or under the supervision of analysts experienced in the operation of the LC/MS/MS and in the interpretation of LC/MS/MS data. Each analyst must demonstrate the ability to generate acceptable results with this method by performing an initial demonstration of capability.

2. Summary of Method

2.1 A 250-mL water sample is fortified with extracted internal standards (EIS) and passed through a solid phase extraction (WAX) cartridge containing a mixed mode, Weak Anion Exchange, reversed phase, water-wettable polymer to extract the method analytes and isotopically-labeled compounds. The compounds are eluted from the solid phase in two fractions with methanol followed by a small amount of 2% ammonium hydroxide in methanol solution. The extract is concentrated with nitrogen in a heated water bath, and then adjusted to a 1-mL volume with 80:20% (vol/vol) methanol:water.

A 2-4 gram soil, solid, tissue or biosolid sample is is fortified with extracted internal standards (EIS), diluted in methanol and agitated rigorously. An aliquot of the methanol is passed across an SPE based clean-up cartridge and the eluate collected. The extract is concentrated with nitrogen in a heated water bath, and then adjusted to a 1-mL volume with 80:20% (vol/vol) methanol:water.

2.2 A 3 µl injection is made into an LC equipped with a C18 column that is interfaced to an MS/MS. The analytes are separated and identified by comparing the acquired mass spectra and retention times to reference spectra and retention times for calibration standards acquired under identical LC/MS/MS conditions. The concentration of each analyte is determined by using the isotope dilution technique. Extracted Internal Standards (EIS) analytes are used to monitor the extraction efficiency of the method analytes.

2.3 Method Modifications from Reference

None.

Table 1

Parameter	Acronym	CAS
PERFLUOROALKYL ETHER CARBOXYLIC ACIDS (PFECAs)		
Tetrafluoro-2-(heptafluoropropoxy)propanoic acid	HFPO-DA	13252-13-6
4,8-dioxa-3H-perfluorononanoic acid	ADONA	919005-14-4
PERFLUOROALKYLCARBOXILIC ACIDS (PFCAs)		
Perfluorobutanoic acid	PFBA	375-22-4
Perfluoropentanoic acid	PFPeA	2706-90-3
Perfluorohexanoic acid	PFHxA *	307-24-4
Perfluoroheptanoic acid	PFHpA *	375-85-9
Perfluorooctanoic acid	PFOA *	335-67-1
Perfluorononanoic acid	PFNA *	375-95-1
Perfluorodecanoic acid	PFDA *	335-76-2
Perfluoroundecanoic acid	PFUnA *	2058-94-8
Perfluorododecanoic acid	PFDoA *	307-55-1
Perfluorotridecanoic acid	PFTrDA *	72629-94-8
Perfluorotetradecanoic acid	PFTA *	376-06-7
Perfluorohexadecanoic acid	PFHxDA	67905-19-5
Perfluorooctadecanoic acid	PFODA	16517-11-6
PERFLUOROALKYLSULFONATES (PFASs)		
Perfluorobutanesulfonic acid	PFBS *	375-73-5
Perfluoropentanesulfonic acid	PFPeS	2706-91-4
Perfluorohexanesulfonic acid	PFHxS *	355-46-4
Perfluoroheptanesulfonic acid	PFHpS	375-92-8
Perfluorooctanesulfonic acid	PFOS *	1763-23-1
Perfluorononanesulfonic acid	PFNS	68259-12-1
Perfluorodecanesulfonic acid	PFDS	335-77-3
Perfluorododecanesulfonic acid	PFDoS	79780-39-5

*** also reportable via the standard 537 method**

Table 1 Cont.

Parameter	Acronym	CAS
CHLORO-PERFLUOROALKYLSULFONATE		
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	11Cl-PF3OUdS	763051-92-9
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	9Cl-PF3ONS	756426-58-1
PERFLUOROOCTANESULFONAMIDES (FOSAs)		
Perfluorooctanesulfonamide	PFOSA	754-91-6
N-methylperfluoro-1-octanesulfonamide	NMeFOSA	31506-32-8
N-ethylperfluoro-1-octanesulfonamide	NEtFOSA	4151-50-2
TELOMER SULFONATES		
1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	4:2FTS	27619-93-8
1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	6:2FTS	27619-97-2
1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	8:2FTS	39108-34-4
1H,1H,2H,2H-perfluorododecane sulfonate (10:2)	10:2FTS	120226-60-0
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS		
N-methyl perfluorooctanesulfonamidoacetic acid	NMeFOSAA *	2355-31-9
N-ethyl perfluorooctanesulfonamidoacetic acid	NEtFOSAA *	2991-50-6
NATIVE PERFLUOROOCTANESULFONAMIDOETHANOLS (FOSEs)		
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	NMeFOSE	24448-09-7
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	NEtFOSE	1691-99-2

*** also reportable via the standard 537 method**

3. Reporting Limits

The reporting limit for PFAS's is 2 ng/L for aqueous samples (20 ng/L for HFPO-DA) and 1 ng/g (10 ng/g for HFPO-DA) for soil samples.

4. Interferences

4.1 PFAS standards, extracts and samples should not come in contact with any glass containers or pipettes as these analytes can potentially adsorb to glass surfaces. PFAS analyte and EIS standards commercially purchased in glass ampoules are acceptable; however, all subsequent transfers or dilutions performed by the analyst must be prepared and stored in polypropylene containers.

4.2 Method interferences may be caused by contaminants in solvents, reagents (including reagent water), sample bottles and caps, and other sample processing hardware that lead to discrete artifacts and/or elevated baselines in the chromatograms. The method analytes in this method can also be found in many common laboratory supplies and equipment, such as PTFE (polytetrafluoroethylene) products, LC solvent lines, methanol, aluminum foil, SPE sample transfer lines, etc. All items such as these must be routinely demonstrated to be free from interferences (less than 1/3 the RL for each method analyte) under the conditions of the analysis by analyzing laboratory reagent blanks as described in Section 9.2. **Subtracting blank values from sample results is not permitted.**

4.3 Matrix interferences may be caused by contaminants that are co-extracted from the sample. The extent of matrix interferences will vary considerably from source to source, depending upon the nature of the water. Humic and/or fulvic material can be co-extracted during SPE and high levels can cause enhancement and/or suppression in the electrospray ionization source or low recoveries on the SPE sorbent. Total organic carbon (TOC) is a good indicator of humic content of the sample.

4.4 SPE cartridges can be a source of interferences. The analysis of field and laboratory reagent blanks can provide important information regarding the presence or absence of such interferences. Brands and lots of SPE devices should be tested to ensure that contamination does not preclude analyte identification and quantitation.

5. Health and Safety

5.1 The toxicity or carcinogenicity of each reagent and standard used in this method is not fully established; however, each chemical compound should be treated as a potential health hazard. From this viewpoint, exposure to these chemicals must be reduced to the lowest possible level by whatever means available. A reference file of material safety data sheets is available to all personnel involved in the chemical analysis. Additional references to laboratory safety are available in the Chemical Hygiene Plan.

5.2 All personnel handling environmental samples known to contain or to have been in contact with municipal waste must follow safety practices for handling known disease causative agents.

5.3 PFOA has been described as “likely to be carcinogenic to humans.” Pure standard materials and stock standard solutions of these method analytes should be handled with suitable protection to skin and eyes, and care should be taken not to breathe the vapors or ingest the materials.

6. Sample Collection, Preservation, Shipping and Handling

6.1 Sample Collection for Aqueous Samples

6.1.1 Samples must be collected in two (2) 250-mL high density polyethylene (HDPE) container with an unlined plastic screw cap.

6.1.2 The sample handler must wash their hands before sampling and wear nitrile gloves while filling and sealing the sample bottles. PFAS contamination during sampling can occur from a number of common sources, such as food packaging and certain foods and beverages. Proper hand washing and wearing nitrile gloves will aid in minimizing this type of accidental contamination of the samples.

6.1.3 Open the tap and allow the system to flush until the water temperature has stabilized (approximately 3 to 5 min). Collect samples from the flowing system.

6.1.4 Fill sample bottles. Samples do not need to be collected headspace free.

6.1.5 After collecting the sample and cap the bottle. Keep the sample sealed from time of collection until extraction.

6.1.6 Field Reagent Blank (FRB)

6.1.6.1 A FRB must be handled along with each sample set. The sample set is composed of samples collected from the same sample site and at the same time. At the laboratory, fill the field blank sample bottle with reagent water and preservatives, seal, and ship to the sampling site along with the sample bottles. For each FRB shipped, an empty sample bottle (no preservatives) must also be shipped. At the sampling site, the sampler must open the shipped FRB and pour the reagent water into the empty shipped sample bottle, seal and label this bottle as the FRB. The FRB is shipped back to the laboratory along with the samples and analyzed to ensure that PFAS's were not introduced into the sample during sample collection/handling.

The reagent water used for the FRBs must be initially analyzed for method analytes as a MB and must meet the MB criteria in Section 9.2.1 prior to use. This requirement will ensure samples are not being discarded due to contaminated reagent water rather than contamination during sampling.

6.2 Sample Collection for Soil and Sediment samples.

Grab samples are collected in polypropylene containers. Sample containers and contact surfaces containing PTFE shall be avoided.

6.3 Sample Preservation

Not applicable.

6.4 Sample Shipping

Samples must be chilled during shipment and must not exceed 10 °C during the first 48 hours after collection. Sample temperature must be confirmed to be at or below 10 °C when the samples are received at the laboratory. Samples stored in the lab must be held at or below 6 °C until extraction, but should not be frozen.

NOTE: Samples that are significantly above 10° C, at the time of collection, may need to be iced or refrigerated for a period of time, in order to chill them prior to shipping. This will allow them to be shipped with sufficient ice to meet the above requirements.

6.5 Sample Handling

6.5.1 Holding Times

6.5.1.1 Water samples should be extracted as soon as possible but must be extracted within 14 days. Soil samples should be extracted within 14 days. Extracts are stored at < 10 ° C and analyzed within 28 days after extraction.

7. Equipment and Supplies

7.1 SAMPLE CONTAINERS – 250-mL high density polyethylene (HDPE) bottles fitted with unlined screw caps. Sample bottles must be discarded after use.

7.2 SAMPLE JARS – 8 ounce wide mouth high density polyethylene (HDPE) bottles fitted with unlined screw caps. Sample bottles must be discarded after use.

7.3 POLYPROPYLENE BOTTLES – 4-mL narrow-mouth polypropylene bottles.

7.4 CENTRIFUGE TUBES – 50-mL conical polypropylene tubes with polypropylene screw caps for storing standard solutions and for collection of the extracts.

7.5 AUTOSAMPLER VIALS – Polypropylene 0.7-mL autosampler vials with polypropylene caps.

7.5.1 NOTE: Polypropylene vials and caps are necessary to prevent contamination of the sample from PTFE coated septa. However, polypropylene caps do not reseal, so evaporation occurs after injection. Thus, multiple injections from the same vial are not possible.

7.6 POLYPROPYLENE GRADUATED CYLINDERS – Suggested sizes include 25, 50, 100 and 1000-mL cylinders.

7.7 Auto Pipets – Suggested sizes include 5, 10, 25, 50, 100, 250, 500, 1000, 5000 and 10,000-µls.

7.8 PLASTIC PIPETS – Polypropylene or polyethylene disposable pipets.

7.9 ANALYTICAL BALANCE – Capable of weighing to the nearest 0.0001 g.

7.10 ANALYTICAL BALANCE – Capable of weighing to the nearest 0.1 g.

7.11 SOLID PHASE EXTRACTION (SPE) APPARATUS FOR USING CARTRIDGES

7.11.1 SPE CARTRIDGES – 0.5 g SPE cartridges containing a reverse phase copolymer characterized by a weak anion exchanger (WAX) sorbent phase.

7.11.2 VACUUM EXTRACTION MANIFOLD – A manual vacuum manifold with large volume sampler for cartridge extractions, or an automatic/robotic sample preparation system designed for use with SPE cartridges, may be used if all QC requirements discussed in Section 9 are met. Extraction and/or elution steps may not be changed or omitted to accommodate the use of an automated system. Care must be taken with automated SPE systems to ensure the PTFE commonly used in these systems does not contribute to unacceptable analyte concentrations in the MB (Sect. 9.2.1).

7.11.3 SAMPLE DELIVERY SYSTEM – Use of a polypropylene transfer tube system, which transfers the sample directly from the sample container to the SPE cartridge, is recommended, but not mandatory. Standard extraction manifolds come equipped with PTFE transfer tube systems. These can be replaced with 1/8” O.D. x 1/16” I.D. polypropylene or polyethylene tubing cut to an appropriate length to ensure no sample contamination from the sample transfer lines. Other types of non-PTFE tubing may be used provided it meets the MB (Sect. 9.2.1) and LCS (Sect. 9.3) QC requirements. The PTFE transfer tubes may be used, but an MB must be run on each PFTE transfer tube and the QC requirements in Section 13.2.2 must be met. In the case of automated SPE, the removal of PTFE lines may not be feasible; therefore, MBs will need to be rotated among the ports and must meet the QC requirements of Sections 13.2.2 and 9.2.1.

7.12 Extract Clean-up Cartridge – 250 mg 6ml SPE Cartridge containing graphitized polymer carbon

7.13 EXTRACT CONCENTRATION SYSTEM – Extracts are concentrated by evaporation with nitrogen using a water bath set no higher than 65 °C.

7.14 LABORATORY OR ASPIRATOR VACUUM SYSTEM – Sufficient capacity to maintain a vacuum of approximately 10 to 15 inches of mercury for extraction cartridges.

7.15 LIQUID CHROMATOGRAPHY (LC)/TANDEM MASS SPECTROMETER (MS/MS) WITH DATA SYSTEM

7.15.1 LC SYSTEM – Instrument capable of reproducibly injecting up to 10-µL aliquots, and performing binary linear gradients at a constant flow rate near the flow rate used for development of this method (0.4 mL/min). The LC must be capable of pumping the water/methanol mobile phase without the use of a degasser which pulls vacuum on the mobile phase bottle (other types of degassers are acceptable). Degassers which pull vacuum on the mobile phase bottle will volatilize the ammonium acetate mobile phase causing the analyte peaks to shift to earlier retention times over the course of the analysis batch. The usage of a column heater is optional.

7.15.2 LC/TANDEM MASS SPECTROMETER – The LC/MS/MS must be capable of negative ion electrospray ionization (ESI) near the suggested LC flow rate of 0.4 mL/min. The system must be capable of performing MS/MS to produce unique product ions for the method analytes within specified retention time segments. A minimum of 10 scans across the chromatographic peak is required to ensure adequate precision.

7.15.3 DATA SYSTEM – An interfaced data system is required to acquire, store, reduce, and output mass spectral data. The computer software should have the capability of processing stored LC/MS/MS data by recognizing an LC peak within any given retention time window. The software must allow integration of the ion abundance of any specific ion within specified time or scan number limits. The software must be able to calculate relative response factors, construct linear regressions or quadratic calibration curves, and calculate analyte concentrations.

7.15.4 ANALYTICAL COLUMN – An LC BEH C_{18} column (2.1 x 50 mm) packed with 1.7 µm d_p C_{18} solid phase particles was used. Any column that provides adequate resolution, peak shape, capacity, accuracy, and precision (Sect. 9) may be used.

8. Reagents and Standards

8.1 GASES, REAGENTS, AND SOLVENTS – Reagent grade or better chemicals must be used.

8.1.1 REAGENT WATER – Purified water which does not contain any measurable quantities of any method analytes or interfering compounds greater than 1/3 the RL for each method analyte of interest. Prior to daily use, at least 3 L of reagent water should be flushed from the purification system to rinse out any build-up of analytes in the system's tubing.

8.1.2 METHANOL (CH_3OH, CAS#: 67-56-1) – High purity, demonstrated to be free of analytes and interferences.

8.1.3 AMMONIUM ACETATE ($NH_4C_2H_3O_2$, CAS#: 631-61-8) – High purity, demonstrated to be free of analytes and interferences.

8.1.4 ACETIC ACID (H_3CCOOH, CAS#: 64-19-7) - High purity, demonstrated to be free of analytes and interferences.

8.1.5 1M AMMONIUM ACETATE/REAGENT WATER – High purity, demonstrated to be free of analytes and interferences.

8.1.6 2mM AMMONIUM ACETATE/METHANOL:WATER (5:95) – To prepare, mix 2 ml of 1M AMMONIUM ACETATE,1 ml ACETIC ACID and 50 ml METHANOL into I Liter of REAGENT WATER.

8.1.7 Methanol/Water (80:20) – To prepare a 1 Liter bottle, mix 200 ml of REAGENT WATER with 800 ml of METHANOL.

8.1.8 AMMONIUM HYDROXIDE (NH_3, CAS#: 1336-21-6) – High purity, demonstrated to be free of analytes and interferences.

8.1.9 Sodium Acetate ($NaOOCCH_3$, CAS#: 127-09-3) – High purity, demonstrated to be free of analytes and interferences.

8.1.10 25 mM Sodium Acetate Buffer – To prepare 250mls, dissolve .625 grams of sodium acetate into 100 mls of reagent water. Add 4 mls Acetic Acid and adjust the final volume to 250 mls with reagent water.

8.1.11 NITROGEN – Used for the following purposes: Nitrogen aids in aerosol generation of the ESI liquid spray and is used as collision gas in some MS/MS instruments. The nitrogen used should meet or exceed instrument manufacturer's specifications. In addition, Nitrogen is used to concentrate sample extracts (Ultra High Purity or equivalent).

8.1.12 ARGON – Used as collision gas in MS/MS instruments. Argon should meet or exceed instrument manufacturer's specifications. Nitrogen gas may be used as the collision gas provided sufficient sensitivity (product ion formation) is achieved.

8.2 STANDARD SOLUTIONS – When a compound purity is assayed to be 96% or greater, the weight can be used without correction to calculate the concentration of the stock standard. PFAS analyte and IS standards commercially purchased in glass ampoules are acceptable; however, all subsequent transfers or dilutions performed by the analyst must be prepared and stored in polypropylene containers. Standards for sample fortification generally should be prepared in the smallest volume that can be accurately measured to minimize the addition of excess organic solvent to aqueous samples.

NOTE: Stock standards and diluted stock standards are stored at ≤4 °C.

8.2.1 ISOTOPE DILUTION Extracted Internal Standard (ID EIS) STOCK SOLUTIONS - ID EIS stock standard solutions are stable for at least 6 months when stored at 4 °C. The stock solution is purchased at a concentration of 1000 ng/mL.

8.2.2 ISOTOPE DILUTION Extracted Internal Standard PRIMARY DILUTION STANDARD (ID EIS PDS) – Prepare the ID EIS PDS at a concentration of 500 ng/mL. The ID PDS is prepared in 80:20% (vol/vol) methanol:water. The ID PDS is stable for 6 months when stored at ≤4 °C.

Table 2

Isotope Labeled Standard	Conc. of EIS Stock (ng/mL)	Vol. of EIS Stock (mL)	Final Vol. of EIS PDS (mL)	Final Conc. of EIS PDS (ng/mL)
M4PFBA	1000	1.0	2.0	500
M5PFPeA	1000	1.0	2.0	500
M5PFHxA	1000	1.0	2.0	500
M4PFHpA	1000	1.0	2.0	500
M8PFOA	1000	1.0	2.0	500
M9PFNA	1000	1.0	2.0	500
M6PFDA	1000	1.0	2.0	500
M7PFUdA	1000	1.0	2.0	500
MPFDoA	1000	1.0	2.0	500
M2PFTeDA	1000	1.0	2.0	500
M2PFHxDA	50,000	.02	2.0	500
d3-N-MeFOSA	50,000	.02	2.0	500
d5-N-EtFOSA	50,000	.02	2.0	500
d7-N-MeFOSE	50,000	.02	2.0	500
d9-N-EtFOSE	50,000	.02	2.0	500
M8FOSA	1000	1.0	2.0	500
d3-N-MeFOSAA	1000	1.0	2.0	500
d5-N-EtFOSAA	1000	1.0	2.0	500
M3PFBS	929	1.0	2.0	464.5
M3PFHxS	946	1.0	2.0	473
M8PFOS	957	1.0	2.0	478.5
M2-4:2FTS	935	1.0	2.0	467.5
M2-6:2FTS	949	1.0	2.0	474.5
M2-8:2FTS	958	1.0	2.0	479
M3HFPO-DA	50,000	.4	2.0	10,000

8.2.3 ANALYTE STOCK STANDARD SOLUTION – Analyte stock standards are stable for at least 6 months when stored at 4 °C. When using these stock standards to prepare a PDS, care must be taken to ensure that these standards are at room temperature and adequately vortexed.

8.2.4 Analyte Secondary Spiking Standard Prepare the spiking solution of additional add on components for project specific requirements only. ANALYTE PRIMARY SPIKING STANDARD – Prepare the spiking standard at a concentration of 500 ng/mL in methanol. The spiking standard is stable for at least two months when stored in polypropylene centrifuge tubes at room temperature.

Table 3

Analyte	**Conc. of Stock (ng/mL)**	**Vol. of Stock (mL)**	**Final Vol. of PDS (mL)**	**Final Conc. of PDS (ng/mL)**
PFBA	2000	1	4	500
PFPeA	2000	1	4	500
PFHxA	2000	1	4	500
PFHpA	2000	1	4	500
PFOA	2000	1	4	500
PFNA	2000	1	4	500
PFDA	2000	1	4	500
PFUdA	2000	1	4	500
PFDoA	2000	1	4	500
PFTrDA	2000	1	4	500
PFTeDA	2000	1	4	500
FOSA	2000	1	4	500
N-MeFOSAA	2000	1	4	500
N-EtFOSAA	2000	1	4	500
L-PFBS	1770	1	4	442.5
L-PFPeS	1880	1	4	470
L-PFHxSK	1480	1	4	370
Br-PFHxSK	344	1	4	86
L-PFHpS	1900	1	4	475
L-PFOSK	1460	1	4	365
Br-PFOSK	391	1	4	97.75
L-PFNS	1920	1	4	480
L-PFDS	1930	1	4	482.5
4:2FTS	1870	1	4	467.5
6:2FTS	1900	1	4	475
8:2FTS	1920	1	4	480

8.2.5 Analyte Secondary Spiking Standard Prepare the spiking solution of additional add on components for project specific requirements only.

Table 4

Analyte	Conc. of IS Stock (ng/mL)	Vol. of IS Stock (mL)	Final Vol. of IS PDS (mL)	Final Conc. of IS PDS (ng/mL)
ADONA	2000	1	4	500
PFHxDA	2000	1	4	500
PFODA	2000	1	4	500
HFPO-DA	100,000	.4	4	10,000
9ClPF3ONS	50,000	0.04	4	500
11ClPF3OUdS	50,000	0.04	4	500

8.2.6 LOW, MEDIUM AND HIGH LEVEL LCS – The LCS's will be prepared at the following concentrations and rotated per batch; 2 ng/L, 40 ng/L, 500 ng/l for drinking waters. The analyte PDS contains all the method analytes of interest at various concentrations in methanol. The analyte PDS has been shown to be stable for six months when stored at ≤4 °C.

8.2.7 Isotope Dilution Labeled Recovery Stock Solutions (ID REC) – ID REC Stock solutions are stable for at least 6 months when stored at 4 °C. The stock solution is purchased at a concentration of 1000 ng/mL.

8.2.8 Isotope Dilution Labeled Recovery Primary Dilution Standard (ID REC PDS) - Prepare the ID REC PDS at a concentration of 500 ng/mL. The ID REC PDS is prepared in 80:20% (vol/vol) methanol:water. The ID REC PDS is stable for at least six months when stored in polypropylene centrifuge tubes at ≤4 °C.

Table 5

Analyte	Conc. of REC Stock (ng/mL)	Vol. of REC Stock (mL)	Final Vol. of REC PDS (mL)	Final Conc. of REC PDS (ng/mL)
M2PFOA	2000	1	4	500
M2PFDA	2000	1	4	500
M3PFBA	2000	1	4	500
M4PFOS	2000	1	4	500

8.2.9 CALIBRATION STANDARDS (CAL) –

Current Concentrations (ng/mL): 0.5, 1.0, 5.0, 10.0, 50.0, 125, 150, 250, 500

Prepare the CAL standards over the concentration range of interest from dilutions of the analyte PDS in methanol containing 20% reagent water. 20 µl of the EIS PDS and REC PDS are added to the CAL standards to give a constant concentration of 10 ng/ml. The lowest concentration CAL standard must be at or below the RL (2 ng/L), which may depend on system sensitivity. The CAL standards may also be used as CCVs (Sect. 9.8). To make calibration stock standards:

Table 6

Calibration Standard Concentration	Final Aqueous Cal STD Level Concentration	Final Soil Cal STD Level Concentration	24 compound stock added (ul)	PFHxDA Stock added (ul)	500 ng/ml PFHxDA dilution added (ul)	PFODA Stock added (ul)	500 ng/ml PFODA dilution added (ul)	ADONA, HFPO-DA, 11Cl-PF3OUdS, 9Cl-PF3ONS Stock added (ul)	500 ng/ml ADONA dilution added (ul)	Final Volume in MeOH/H_2O (82:20)
.5 ng/ml	2 ng/L	.25 ng/g	6.25		25		25		25	25 mls
1 ng/ml	4 ng/L	.5 ng/g	5		20		20		20	10 mls
5 ng/ml	20 ng/L	1 ng/g	25		100		100		100	10 mls
10 ng/ml	40 ng/L	5 ng/g	125	5		5		5		25 mls
50 ng/ml	200 ng/L	25 ng/g	250	10		10		10		10 mls
125 ng/ml	500 ng/L	62.5 ng/g	625	25		25		25		10 mls
150 ng/ml	600 ng/L	75 ng/g	750	30		30		30		10 mls
250 ng/ml	1000 ng/L	125 ng/g	625							5 mls
500 ng/ml	2000 ng/L	250 ng/g	1250							5 mls

9. Quality Control

The laboratory must maintain records to document the quality of data that is generated. Ongoing data quality checks are compared with established performance criteria to determine if the results of analyses meet the performance characteristics of the method.

9.1 MINIMUM REPORTING LIMIT (MRL) CONFIRMATION

9.1.1 Fortify, extract, and analyze seven replicate LCSs at 2 ng/l. Calculate the mean measured concentration (*Mean*) and standard deviation for these replicates. Determine the Half Range for the prediction interval of results (HR_{PIR}) using the equation below

$$HR_{PIR} = 3.963s$$

Where:

s = the standard deviation
3.963 = a constant value for seven replicates.

9.1.2 Confirm that the upper and lower limits for the Prediction Interval of Result ($PIR = Mean \pm HR_{PIR}$) meet the upper and lower recovery limits as shown below

The Upper PIR Limit must be ≤150% recovery.

$$\frac{Mean + HR_{PIR}}{Fortified\ Concentration} \times 100\% \leq 150\%$$

The Lower PIR Limit must be ≥ 50% recovery.

$$\frac{Mean - HR_{PIR}}{Fortified\ Concentration} \times 100\% \geq 50\%$$

9.1.3 The RL is validated if both the Upper and Lower PIR Limits meet the criteria described above. If these criteria are not met, the RL has been set too low and must be determined again at a higher concentration.

9.2 Blank(s)

9.2.1 **METHOD BLANK (MB) -** A Method Blank (MB) is required with each extraction batch to confirm that potential background contaminants are not interfering with the identification or quantitation of method analytes. Prep and analyze a MB for every 20 samples. If the MB produces a peak within the retention time window of any analyte that would prevent the determination of that analyte, determine the source of contamination and eliminate the interference before processing samples. Background contamination must be reduced to an acceptable level before proceeding. Background from method analytes or other contaminants that interfere with the measurement of method analytes must be below the RL. If the method analytes are detected in the MB at concentrations equal to or greater than this level, then all data for the problem analyte(s) must be considered invalid for all samples in the extraction batch. Because background contamination is a significant problem for several method analytes, it is highly recommended that the analyst maintain a historical record of MB data.

9.2.2 **FIELD REAGENT BLANK (FRB)** - The purpose of the FRB is to ensure that PFAS's measured in the Field Samples were not inadvertently introduced into the sample during sample collection/handling. Analysis of the FRB is required only if a Field Sample contains a method analyte or analytes at or above the RL. The FRB is processed, extracted and analyzed in exactly the same manner as a Field Sample.

9.3 Laboratory Control Sample (LCS) and Laboratory Control Sample Duplicates (LCSD)

9.3.1 An LCS is required with each extraction batch. The fortified concentration of the LCS may be rotated between low, medium, and high concentrations from batch to batch. Default limits of 50-150% of the true value may be used for analytes until sufficient replicates have been analyzed to generate proper control limits. Calculate the percent recovery (%*R*) for each analyte using the equation

$$\%R = \frac{A \times 100}{B}$$

Where:

A = measured concentration in the fortified sample
B =fortification concentration.

9.3.2 Where applicable, LCSD's are to be extracted and analyzed. The concentration and analyte recovery criteria for the LCSD must be the same as the batch LCS The RSD's must fall within ≤30% of the true value for medium and high level replicates, and ≤50% for low level replicates. Calculate the relative percent difference (RPD) for duplicate MSs (MS and MSD) using the equation

$$RPD = \frac{|LCS - LCSD|}{(LCS + LCSD) / 2} \times 100$$

9.3.3 If the LCS and or LCSD results do not meet these criteria for method analytes, then all data for the problem analyte(s) must be considered invalid for all samples in the extraction batch.

9.4 Labeled Recovery Standards (REC)

The analyst must monitor the peak areas of the REC(s) in all injections during each analysis day.

9.5 Extracted Internal Standards (EIS)

9.5.1 The EIS standard is fortified into all samples, CCVs, MBs, LCSs, MSs, MSDs, FD, and FRB prior to extraction. It is also added to the CAL standards. The EIS is a means of assessing method performance from extraction to final chromatographic measurement. Calculate the recovery (%R) for the EIS using the following equation:

$$\%R = (A / B) \times 100$$

Where:

A = calculated EIS concentration for the QC or Field Sample
B = fortified concentration of the EIS.

9.5.2 Default limits of 50-150% may be used for analytes until sufficient replicates have been analyzed to generate proper control limits. A low or high percent recovery for a sample, blank, or CCV does not require discarding the analytical data but it may indicate a potential problem with future analytical data. When EIS recovery from a sample, blank, or CCV are outside control limits, check 1) calculations to locate possible errors, 2) standard solutions for degradation, 3) contamination, and 4) instrument performance. For CCVs and QC elements spiked with all target analytes, if the recovery of the corresponding target analytes meet the acceptance criteria for the EIS in question, the data can be used but all potential biases in the recovery of the EIS must be documented in the sample report. If the associated target analytes do not meet the acceptance criteria,the data must be reanalyzed.

9.6 Matrix Spike (MS)

9.6.1 Analysis of an MS is required in each extraction batch and is used to determine that the sample matrix does not adversely affect method accuracy. Assessment of method precision is accomplished by analysis of a Field Duplicate (FD) (Sect. 9.6); however, infrequent occurrence of method analytes would hinder this assessment. If the occurrence of method analytes in the samples is infrequent, or if historical trends are unavailable, a second MS, or MSD, must be prepared, extracted, and analyzed from a duplicate of the Field Sample. Extraction batches that contain MSDs will not require the extraction of a field sample duplicate. If a variety of different sample matrices are analyzed regularly, for example, drinking water from groundwater and surface water sources, method performance should be established for each. Over time, MS data should be documented by the laboratory for all routine sample sources.

9.6.2 Within each extraction batch, a minimum of one Field Sample is fortified as an MS for every 20 Field Samples analyzed. The MS is prepared by spiking a sample with an appropriate amount of the Analyte Stock Standard (Sect. 8.2.3). Use historical data and rotate through the low, mid and high concentrations when selecting a fortifying concentration. Calculate the percent recovery (%*R*) for each analyte using the equation

$$\%R = \frac{(A - B)}{C} \times 100$$

Where:

A = measured concentration in the fortified sample
B = measured concentration in the unfortified sample
C = fortification concentration.

9.6.3 Analyte recoveries may exhibit matrix bias. For samples fortified at or above their native concentration, recoveries should range between 50-150%. If the accuracy of any analyte falls outside the designated range, and the laboratory performance for that analyte is shown to be in control in the LCS, the recovery is judged to be matrix biased. The result for that analyte in the unfortified sample is labeled suspect/matrix to inform the data user that the results are suspect due to matrix effects.

9.7 Laboratory Duplicate

9.7.1 FIELD DUPLICATE OR LABORATORY FORTIFIED SAMPLE MATRIX DUPLICATE (FD or MSD) – Within each extraction batch (not to exceed 20 Field Samples), a minimum of one FD or MSD must be analyzed. Duplicates check the precision associated with sample collection, preservation, storage, and laboratory procedures. If method analytes are not routinely observed in Field Samples, an MSD should be analyzed rather than an FD.

9.7.2 Calculate the relative percent difference (*RPD*) for duplicate measurements (*FD1* and *FD2*) using the equation

$$RPD = \frac{|FD1 - FD2|}{(FD1 + FD2) / 2} \times 100$$

9.7.3 RPDs for FDs should be ≤30%. Greater variability may be observed when FDs have analyte concentrations that are within a factor of 2 of the RL. At these concentrations, FDs should have RPDs that are ≤50%. If the RPD of any analyte falls outside the designated range, and the laboratory performance for that analyte is shown to be in control in the CCV, the recovery is judged to be matrix biased. The result for that analyte in the unfortified sample is labeled suspect/matrix to inform the data user that the results are suspect due to matrix effects.

9.7.4 If an MSD is analyzed instead of a FD, calculate the relative percent difference (RPD) for duplicate MSs (MS and MSD) using the equation

$$RPD = \frac{|MS - MSD|}{(MS + MSD) / 2} \times 100$$

9.7.5 RPDs for duplicate MSs should be ≤30% for samples fortified at or above their native concentration. Greater variability may be observed when MSs are fortified at analyte concentrations that are within a factor of 2 of the RL. MSs fortified at these concentrations should have RPDs that are ≤50% for samples fortified at or above their native concentration. If the RPD of any analyte falls outside the designated range, and the laboratory performance for that analyte is shown to be in control in the LCSD where applicable, the result is judged to be matrix biased. If no LCSD is present, the associated MS and MSD are to be re-analyzed to determine if any analytical has occurred. If the resulting RPDs are still outside control limits, the result for that analyte in the unfortified sample is labeled suspect/matrix to inform the data user that the results are suspect due to matrix effects.

9.8 Initial Calibration Verification (ICV)

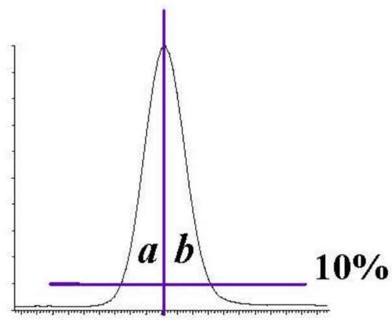
9.8.1 As part of the IDC (Sect. 13.2), and after each ICAL, analyze a QCS sample from a source different from the source of the CAL standards. If a second vendor is not available, then a different lot of the standard should be used. The QCS should be prepared and analyzed just like a CCV. Acceptance criteria for the QCS are identical to the CCVs; the calculated amount for each analyte must be ± 30% of the expected value. If measured analyte concentrations are not of acceptable accuracy, check the entire analytical procedure to locate and correct the problem.

9.9 Continuing Calibration Verification (CCV)

9.9.1 CCV Standards are analyzed at the beginning of each analysis batch, after every 10 Field Samples, and at the end of the analysis batch. See Section 10.7 for concentration requirements and acceptance criteria.

9.10 Method-specific Quality Control Samples

9.10.1 PEAK ASYMMETRY FACTOR – A peak asymmetry factor must be calculated using the equation below during the IDL and every time a calibration curve is generated. The peak asymmetry factor for the first two eluting peaks in a midlevel CAL standard (if only two analytes are being analyzed, both must be evaluated) must fall in the range of 0.8 to 1.5. Modifying the standard or extract composition to more aqueous content to prevent poor shape is not permitted. See guidance in Section 10.6.4.1 if the calculated peak asymmetry factors do not meet the criteria.



$$A_s = b / a$$

Where:

A_s = peak asymmetry factor

b = width of the back half of the peak measured (at 10% peak height) from the trailing edge of the peak to a line dropped perpendicularly from the peak apex

a = the width of the front half of the peak measured (at 10% peak height) from the leading edge of the peak to a line dropped perpendicularly from the apex.

9.11 Method Sequence

- CCV-LOW
- MB
- LCS
- LCSD
- MS
- Duplicate or MSD
- Field Samples (1-10)
- CCV-MID
- Field Samples (11-20)
- CCV-LOW

10. Procedure

10.1 Equipment Set-up

10.1.1 This procedure may be performed manually or in an automated mode using a robotic or automatic sample preparation device. If an automated system is used to prepare samples, follow the manufacturer's operating instructions, but all extraction and elution steps must be the same as in the manual procedure. Extraction and/or elution steps may not be changed or omitted to accommodate the use of an automated system. If an automated system is used, the MBs should be rotated among the ports to ensure that all the valves and tubing meet the MB requirements (Sect. 9.2).

10.1.2 Some of the PFAS's adsorb to surfaces, including polypropylene. Therefore, the aqueous sample bottles must be rinsed with the elution solvent (Sect 10.3.4) whether extractions are performed manually or by automation. The bottle rinse is passed through the cartridge to elute the method analytes and is then collected (Sect. 10.3.4).

10.1.3 **NOTE:** The SPE cartridges and sample bottles described in this section are designed as single use items and should be discarded after use. They may not be refurbished for reuse in subsequent analyses.

10.2 Sample Preparation and Extraction of Aqueous Samples

10.2.1 Samples are preserved, collected and stored as presented in Section 6.

The entire sample that is received must be sent through the SPE cartridge. In addition, the bottle must be solvent rinsed and this rinse must be sent through the SPE cartridge as well. The method blank (MB) and laboratory control sample (LCS) must be extracted in exactly the same manner (i.e., must include the bottle solvent rinse). It should be noted that a water rinse alone is not sufficient. This does not apply to samples with high concentrations of PFAS that are prepared using serial dilution and not SPE.

10.2.2 Determine sample volume. Weigh all samples to the nearest 1g. If visible sediment is present, centrifuge and decant into a new 250mL HDPE bottle and record the weight of the new container.

NOTE: Some of the PFAS's adsorb to surfaces, thus the sample volume may **NOT** be transferred to a graduated cylinder for volume measurement.

10.2.3 The MB, LCS and FRB may be prepared by measuring 250 mL of reagent water with a polypropylene graduated cylinder or filling a 250-mL sample bottle to near the top.

10.2.4 Adjust the QC and sample pH to 3 by adding acetic acid in water dropwise

10.2.5 Add 20 µL of the EIS PDS (Sect. 8.2.2) to each sample and QC, cap and invert to mix.

10.2.6 If the sample is an LCS, LCSD, MS, or MSD, add the necessary amount of analyte PDS (Sect. 8.2.3). Cap and invert each sample to mix.

10.3 Cartridge SPE Procedure

10.3.1 CARTRIDGE CLEAN-UP AND CONDITIONING – DO NOT allow cartridge packing material to go dry during any of the conditioning steps. Rinse each cartridge with 3 X 5 mL of 2% ammonium hydroxide in methanol, followed by 5mls of methanol. Next, rinse each cartridge with 5 mls of the 25 mM acetate buffer, followed by 15 mL of reagent water, without allowing the water to drop below the top edge of the packing. If the cartridge goes dry during the conditioning phase, the conditioning must be started over. Add 4-5 mL of reagent water to each cartridge, attach the sample transfer tubes (Sect. 7.9.3), turn on the vacuum, and begin adding sample to the cartridge.

10.3.2 SAMPLE EXTRACTON – Adjust the vacuum so that the approximate flow rate is approximately 4 mL/min. Do not allow the cartridge to go dry before all the sample has passed through.

10.3.3 SAMPLE BOTTLE AND CARTRIDGE RINSE – After the entire sample has passed through the cartridge, rinse the sample bottles with 4 ml reagent water followed by 4 ml 25 mM acetate buffer at pH 4 and draw the aliquot through the sample transfer tubes and the cartridges. Draw air or nitrogen through the cartridge for 5-10 min at high vacuum (10-15 in. Hg). NOTE: If empty plastic reservoirs are used in place of the sample transfer tubes to pass the samples through the cartridges, these reservoirs must be treated like the transfer tubes. After the entire sample has passed through the cartridge, the reservoirs must be rinsed to waste with reagent water.

10.3.4 SAMPLE BOTTLE AND CARTRIDGE ELUTION, Fraction 1 – Turn off and release the vacuum. Lift the extraction manifold top and insert a rack with collection tubes into the extraction tank to collect the extracts as they are eluted from the cartridges. Rinse the sample bottles with 12 mls of methanol and draw the aliquot through the sample transfer tubes and cartridges. Use a low vacuum such that the solvent exits the cartridge in a dropwise fashion.

SAMPLE BOTTLE AND CARTRIDGE ELUTION, Fraction 2 In a separate collection vial, rinse the sample bottles with 12 mL of 2% ammonium hydroxide in methanol and elute the analytes from the cartridges by pulling the 4 mL of methanol through the sample transfer tubes and the cartridges. Use a low vacuum such that the solvent exits the cartridge in a dropwise fashion.

NOTE: If empty plastic reservoirs are used in place of the sample transfer tubes to pass the samples through the cartridges, these reservoirs must be treated like the transfer tubes. After the reservoirs have been rinsed in Section 10.3.3, the elution solvent used to rinse the sample bottles must be swirled down the sides of the reservoirs while eluting the cartridge to ensure that any method analytes on the surface of the reservoirs are transferred to the extract.

CLEAN-UP CARTRIDGE ELUTION, Elute the clean-up cartridge with 8 additional mls of methanol and draw the aliquot through the cartridge. Use a low vacuum such that the solvent exits the cartridge in a dropwise fashion.

10.3.5 Fractions 1 and 2 are to be combined during the concentration stage (section10.6).

10.4 Sample Prep and Extraction Protocol for Soils, Solids and Sediments.

10.4.1 Homogenize and weigh 4 grams of sample (measured to the nearest hundredth of a gram) into a 50 ml polypropylene centrifuge tube. For laboratory control blanks and spikes, 4 grams of clean sand is used.

10.4.2 Add 40 µL of the EIS PDS (Sect. 8.2.2) to each sample and QC.

10.4.3 If the sample is an LCS, LCSD, MS, or MSD, add the necessary amount of analyte PDS (Sect. 8.2.3). Cap and invert each sample to mix.

10.4.4 To all samples, add 10 mls of methanol, cap, vortex for 25 seconds at 2500 RPM.

10.4.5 Following mixing, sonicate each sample for 30 minutes and let samples sit overnight (at least 2 hours is required for RUSH samples).

10.4.6 Centrifuge each sample at 3500RPM for 10 minutes.

10.4.7 Remove 5ml of supernatant, and reserve for clean-up.

10.5 Sample Prep and Extraction Protocol for Tissues, Oils and Biosolids.

10.5.1 Homogenize and weigh 2-8 grams of sample (measured to the nearest hundredth of a gram) into a 50 ml polypropylene centrifuge tube. For laboratory control blanks and spikes, 4 grams of clean sand is used.

10.5.2 Add 40 µL of the EIS PDS (Sect. 8.2.2) to each sample and QC.

10.5.3 If the sample is an LCS, LCSD, MS, or MSD, add the necessary amount of analyte PDS (Sect. 8.2.3). Cap and invert each sample to mix.

10.5.4 Add 100 ul of Ammonium Hydroxide.

10.5.5 To all samples, add 10 mls of methanol, cap, vortex for 25-30 seconds at 2500 RPM.

10.5.6 Following mixing, sonicate each sample for 30 minutes and let samples sit for 2 hours.

10.5.7 Centrifuge each sample at 3500RPM for 10 minutes.

10.5.8 Remove 5 mls of the supernatant, and reserve for clean-up.

10.6 Extract Clean-up: Soils, Solids and Aqueous Matrices

10.6.1 CARTRIDGE CLEAN-UP AND CONDITIONING –. Rinse each cartridge with 15 mL of methanol and discard. If the cartridge goes dry during the conditioning phase, the conditioning must be started over. Attach the sample transfer tubes (Sect. 7.9.3), turn on the vacuum, and begin adding sample to the cartridge. For Soils extracts, transfer 5 mls of the MeOH eluate to the cartridge. Samples should be allowed to pass through the cartridge by gravity feed at a dropwise rate to ensure adequate contact time with the cartridge sorbent. Vacuum is only to applied if the flow of solvent through the cartridge stops.

10.6.2 Adjust the vacuum so that the approximate flow rate is 1-2 mL/min. Do not allow the cartridge to go dry before all the sample has passed through.

10.6.3 SAMPLE BOTTLE AND CARTRIDGE RINSE – After the entire sample has passed through the cartridge, rinse the sample collection vial with two 4-mL aliquots of methanol and draw each aliquot through the cartridges. Draw air or nitrogen through the cartridge for 5 min at high vacuum (10-15 in. Hg).

10.6.4 If extracts are not to be immediately evaporated, cover collection tubes and store at ambient temperature till concentration.

10.7 Extract Clean-up: Tissues, Oils and Biosolids

10.7.1 CARTRIDGE CLEAN-UP AND CONDITIONING –. Stack a 500 mg WAX cartridge onto a 250 mg GCB cartridge. Rinse each cartridge set with 10 mL of 2% NH_4OH and discard. Immediately rinse each cartridge stack with 15 mls MeOH and discard, If the cartridge goes dry during the conditioning phase, the conditioning must be started over. Attach the sample transfer tubes (Sect. 7.9.3), turn on the vacuum.

10.7.2 Adjust the vacuum so that the approximate flow rate is 1-2 mL/min. Do not allow the cartridge to go dry before all the sample has passed through.

10.7.3 SAMPLE elution AND CARTRIDGE RINSE – Load 5 mls of the MeOH sample extract to the cartridge. After the entire sample has passed through the cartridge, rinse the cartridges with 5-mLs of methanol and draw through the cartridges. Immediately add and elute 2 5ml aliquots of 2% NH_4OH to the cartridges, collecting the eluate with the MeOH eluate.

If extracts are not to be immediately evaporated, cover collection tubes and store at ambient temperature till concentration.

10.8 Extract Concentration

10.8.1 Concentrate the extract to dryness under a gentle stream of nitrogen in a heated water bath (60-65 °C) to remove all the water/methanol mix. Add the appropriate amount of 80:20% (vol/vol) methanol:water solution and 20 µl of the ID REC PDS (Sect. 8.2.7) to the collection vial to bring the volume to 1 mL and vortex. Transfer two aliquots with a plastic pipet (Sect. 7.6) into 2 polypropylene autosampler vials.

NOTE: It is recommended that the entire 1-mL aliquot not be transferred to the autosampler vial because the polypropylene autosampler caps do not reseal after injection. Therefore, do not store the extracts in the autosampler vials as evaporation losses can occur occasionally in these autosampler vials. Extracts can be split between 2 X 700 µl vials (Sect. 7.4).

10.9 Sample Volume Determination

10.9.1 If the level of the sample was marked on the sample bottle, use a graduated cylinder to measure the volume of water required to fill the original sample bottle to the mark made prior to extraction. Determine to the nearest 10 mL.

10.9.2 If using weight to determine volume, weigh the empty bottle to the nearest 10 g and determine the sample weight by subtraction of the empty bottle weight from the original sample weight (Sect. 10.2.2). Assume a sample density of 1.0 g/mL. In either case, the sample volume will be used in the final calculations of the analyte concentration (Sect. 11.2).

10.10 Initial Calibration - Demonstration and documentation of acceptable initial calibration is required before any samples are analyzed. After the initial calibration is successful, a CCV is required at the beginning and end of each period in which analyses are performed, and after every tenth Field Sample.

10.10.1 ESI-MS/MS TUNE

10.10.1.1 Calibrate the mass scale of the MS with the calibration compounds and procedures prescribed by the manufacturer.

10.10.1.2 Optimize the [M-H]- for each method analyte by infusing approximately 0.5-1.0 µg/mL of each analyte (prepared in the initial mobile phase conditions) directly into the MS at the chosen LC mobile phase flow rate (approximately 0.4 mL/min). This tune can be done on a mix of the method analytes. The MS parameters (voltages, temperatures, gas flows, etc.) are varied until optimal analyte responses are determined. The method analytes may have different optima requiring some compromise between the optima.

10.10.1.3 Optimize the product ion for each analyte by infusing approximately 0.5-1.0 µg/mL of each analyte (prepared in the initial mobile phase conditions) directly into the MS at the chosen LC mobile phase flow rate (approximately 0.4 mL/min). This tune can be done on a mix of the method analytes. The MS/MS parameters (collision gas pressure, collision energy, etc.) are varied until optimal analyte responses are determined. Typically, the carboxylic acids have very similar MS/MS conditions and the sulfonic acids have similar MS/MS conditions.

10.10.2 Establish LC operating parameters that optimize resolution and peak shape. Modifying the standard or extract composition to more aqueous content to prevent poor shape is not permitted.

Cautions: LC system components, as well as the mobile phase constituents, contain many of the method analytes in this method. Thus, these PFAS's will build up on the head of the LC column during mobile phase equilibration. To minimize the background PFAS peaks and to keep background levels constant, the time the LC column sits at initial conditions must be kept constant and as short as possible (while ensuring reproducible retention times). In addition, prior to daily use, flush the column with 100% methanol for at least 20 min before initiating a sequence. It may be necessary on some systems to flush other LC components such as wash syringes, sample needles or any other system components before daily use.

10.10.3 Inject a mid-level CAL standard under LC/MS conditions to obtain the retention times of each method analyte. If analyzing for PFTA, ensure that the LC conditions are adequate to prevent co-elution of PFTA and the mobile phase interferants. These interferants have the same precursor and products ions as PFTA, and under faster LC conditions may co-elute with PFTA. Divide the chromatogram into retention time windows each of which contains one or more chromatographic peaks. During MS/MS analysis, fragment a small number of selected precursor ions ([M-H]-) for the analytes in each window and choose the most abundant product ion. For maximum sensitivity, small mass windows of ±0.5 daltons around the product ion mass were used for quantitation.

10.10.4 Inject a mid-level CAL standard under optimized LC/MS/MS conditions to ensure that each method analyte is observed in its MS/MS window and that there are at least 10 scans across the peak for optimum precision.

10.10.4.1 If broad, split or fronting peaks are observed for the first two eluting chromatographic peaks (if only two analytes are being analyzed, both must be evaluated), change the initial mobile phase conditions to higher aqueous content until the peak asymmetry ratio for each peak is 0.8 – 1.5. The peak asymmetry factor is calculated as described in Section 9.9.1 on a mid-level CAL standard. The peak asymmetry factor must meet the above criteria for the first two eluting peaks during the IDL and every time a new calibration curve is generated. Modifying the standard or extract composition to more aqueous content to prevent poor shape is not permitted.

NOTE: PFHxS, PFOS, NMeFOSAA, and NEtFOSAA have multiple chromatographic peaks using the LC conditions in Table 5 due to chromatographic resolution of the linear and branched isomers of these compounds. Most PFAS's are produced by two different processes. One process gives rise to linear PFAS's only while the other process produces both linear and branched isomers. Thus, both branched and linear PFAS's can potentially be found in the environment. For the aforementioned compounds that give rise to more than one peak, all the chromatographic peaks observed in the standard must be integrated and the areas totaled. Chromatographic peaks in a sample must be integrated in the same way as the CAL standard.

10.10.5 Prepare a set of CAL standards as described in Section 8.2.5. The lowest concentration CAL standard must be at or below the RL (2 ng/L), which may depend on system sensitivity.

10.10.6 The LC/MS/MS system is calibrated using the isotope dilution technique. Target analytes are quantitated against their isotopically labeled analog (Extracted Internal Standard) where commercially available. If a labeled analog is not commercially available, the extracted internal standard with the closest retention time and /or closest chemical similarity is to be used. Use the LC/MS/MS data system software to generate a linear regression or quadratic calibration curve for each of the analytes. This curve must always be forced through zero and may be concentration weighted, if necessary. Forcing zero allows for a better estimate of the background levels of method analytes. A minimum of 5 levels are required for a linear calibration model and a minimum of 6 levels are required for a quadratic calibration model.

10.10.7 CALIBRATION ACCEPTANCE CRITERIA – A linear fit is acceptable if the coefficient of determination (r^2) is greater than 0.99. When quantitated using the initial calibration curve, each calibration point, except the lowest point, for each analyte must calculate to be within 70-130% of its true value. The lowest CAL point must calculate to be within 50-150% of its true value. If these criteria cannot be met, the analyst will have difficulty meeting ongoing QC criteria. It is recommended that corrective action is taken to reanalyze the CAL standards, restrict the range of calibration, or select an alternate method of calibration (forcing the curve through zero is still required).

10.10.7.1 CAUTION: When acquiring MS/MS data, LC operating conditions must be carefully reproduced for each analysis to provide reproducible retention times. If this is not done, the correct ions will not be monitored at the appropriate times. As a precautionary measure, the chromatographic peaks in each window must not elute too close to the edge of the segment time window.

10.11 CONTINUING CALIBRATION CHECK (CCV) – Minimum daily calibration verification is as follows. Verify the initial calibration at the beginning and end of each group of analyses, and after every tenth sample during analyses. In this context, a "sample" is considered to be a Field Sample. MBs, CCVs, LCSs, MSs, FDs FRBs and MSDs are not counted as samples. The beginning CCV of each analysis batch must be at or below the RL in order to verify instrument sensitivity prior to any analyses. If standards have been prepared such that all low CAL points are not in the same CAL solution, it may be necessary to analyze two CAL standards to meet this requirement. Alternatively, the analyte concentrations in the analyte PDS may be customized to meet these criteria. Subsequent CCVs should alternate between a medium and Low concentration CAL standard.

10.11.1 Inject an aliquot of the appropriate concentration CAL standard and analyze with the same conditions used during the initial calibration.

10.11.2 Calculate the concentration of each analyte and EIS in the CCV. The calculated amount for each analyte for medium level CCVs must be within ± 30% of the true value with an allowance of 10% of the reported analytes to be greater than 30%. The calculated amount for each EIS must be within ± 50% of the true value. The calculated amount for the lowest calibration point for each analyte must be within ± 50%. If these conditions do not exist, then all data for the problem analyte must be considered invalid, and remedial action should be taken (Sect. 10.7.4) which may require recalibration. Any Field or QC Samples that have been analyzed since the last acceptable calibration verification should be reanalyzed after adequate calibration has been restored, with the following exception. If the CCV fails because the calculated concentration is greater than 130% (150% for the low-level CCV) for a particular method analyte, and Field Sample extracts show no detection for that method analyte, non-detects may be reported without re-analysis.

10.11.3 REMEDIAL ACTION – Failure to meet CCV QC performance criteria may require remedial action. Major maintenance, such as cleaning the electrospray probe, atmospheric pressure ionization source, cleaning the mass analyzer, replacing the LC column, etc., requires recalibration (Sect 10.6) and verification of sensitivity by analyzing a CCV at or below the RL (Sect 10.7).

10.12 EXTRACT ANALYSIS

10.12.1 Establish operating conditions equivalent to those summarized in Tables 6-8 of Section 16. Instrument conditions and columns should be optimized prior to the initiation of the IDC.

10.12.2 Establish an appropriate retention time window for each analyte. This should be based on measurements of actual retention time variation for each method analyte in CAL standard solutions analyzed on the LC over the course of time. A value of plus or minus three times the standard deviation of the retention time obtained for each method analyte while establishing the initial calibration and completing the IDC can be used to calculate a suggested window size. However, the experience of the analyst should weigh heavily on the determination of the appropriate retention window size.

10.12.3 Calibrate the system by either the analysis of a calibration curve (Sect. 10.6) or by confirming the initial calibration is still valid by analyzing a CCV as described in Section 10.7. If establishing an initial calibration, complete the IDC as described in Section 13.2.

10.12.4 Begin analyzing Field Samples, including QC samples, at their appropriate frequency by injecting the same size aliquots under the same conditions used to analyze the CAL standards.

10.12.5 At the conclusion of data acquisition, use the same software that was used in the calibration procedure to identify peaks of interest in predetermined retention time windows. Use the data system software to examine the ion abundances of the peaks in the chromatogram. Identify an analyte by comparison of its retention time with that of the corresponding method analyte peak in a reference standard.

10.12.6 The analyst must not extrapolate beyond the established calibration range. If an analyte peak area exceeds the range of the initial calibration curve, the sample should be re-extracted with a reduced sample volume in order to bring the out of range target analytes into the calibration range. If a smaller sample size would not be representative of the entire sample, the following options are recommended. Re-extract an additional aliquot of sufficient size to insure that it is representative of the entire sample. Spike it with a higher concentration of internal standard. Prior to LC/MS analysis, dilute the sample so that it has a concentration of internal standard equivalent to that present in the calibration standard. Then, analyze the diluted extract.

11. Data Evaluation, Calculations and Reporting

11.1 Complete chromatographic resolution is not necessary for accurate and precise measurements of analyte concentrations using MS/MS. In validating this method, concentrations were calculated by measuring the product ions listed in Table 7.

11.2 Calculate analyte concentrations using the multipoint calibration established in Section 10.6. Do not use daily calibration verification data to quantitate analytes in samples. Adjust final analyte concentrations to reflect the actual sample volume determined in Section 10.6 where:

C_{ex} = (Area of target analyte * Concentration of Labeled analog) / (area of labeled analog * CF)

C_s = (C_{ex} / sample volume in ml) * 1000

C_{ex} = The concentration of the analyte in the extract
CF = calibration factor from calibration.

11.3 Prior to reporting the data, the chromatogram should be reviewed for any incorrect peak identification or poor integration.

11.4 PFHxS, PFOS, PFOA, NMeFOSAA, and NEtFOSAA have multiple chromatographic peaks using the LC conditions in Table 5 due to the linear and branch isomers of these compounds (Sect. 10.6.4.1). The areas of all the linear and branched isomer peaks observed in the CAL standards for each of these analytes must be summed and the concentrations reported as a total for each of these analytes.

11.5 Calculations must utilize all available digits of precision, but final reported concentrations should be rounded to an appropriate number of significant figures (one digit of uncertainty), typically two, and not more than three significant figures.

12. Contingencies for Handling Out-of-Control Data or Unacceptable Data

12.1 Section 9.0 outlines sample batch QC acceptance criteria. If non-compliant organic compound results are to be reported, the Organic Section Head and/or the Laboratory Director, and the Operations Manager must approve the reporting of these results. The laboratory Project Manager shall be notified, and may choose to relay the non-compliance to the client, for approval, or other corrective action, such as re-sampling and re-analysis. The analyst, Data Reviewer, or Department Supervisor performing the secondary review initiates the project narrative, and the narrative must clearly document the non-compliance and provide a reason for acceptance of these results.

12.2 All results for the organic compounds of interest are reportable without qualification if extraction and analytical holding times are met, preservation requirements (including cooler temperatures) are met, all QC criteria are met, and matrix interference is not suspected during extraction or analysis of the samples. If any of the below QC parameters are not met, all associated samples must be evaluated for re-extraction and/or re-analysis.

13. Method Performance

13.1 Detection Limit Study (DL) / Limit of Detection Study (LOD) / Limit of Quantitation (LOQ)

13.1.1 The laboratory follows the procedure to determine the DL, LOD, and/or LOQ as outlined in Alpha SOP ID 1732. These studies performed by the laboratory are maintained on file for review.

13.2 Demonstration of Capability Studies

13.2.1 The IDC must be successfully performed prior to analyzing any Field Samples. Prior to conducting the IDC, the analyst must first generate an acceptable Initial Calibration following the procedure outlined in Section 10.6.

13.2.2 INITIAL DEMONSTRATION OF LOW SYSTEM BACKGROUND – Any time a new lot of SPE cartridges, solvents, centrifuge tubes, disposable pipets, and autosampler vials are used, it must be demonstrated that an MB is reasonably free of contamination and that the criteria in Section 9.2.1 are met. If an automated extraction system is used, an MB should be extracted on each port to ensure that all the valves and tubing are free from potential PFAS contamination.

13.2.3 INITIAL DEMONSTRATION OF PRECISION (IDP) – Prepare, extract, and analyze four to seven replicate LCSs fortified near the midrange of the initial calibration curve according to the procedure described in Section 10. Sample preservatives as described in Section 6.2.1 must be added to these samples. The relative standard deviation (RSD) of the results of the replicate analyses must be less than 20%.

13.2.4 INITIAL DEMONSTRATION OF ACCURACY (IDA) – Using the same set of replicate data generated for Section 13.2.3, calculate average recovery. The average recovery of the replicate values must be within ± 30% of the true value.

13.2.5 INITIAL DEMONSTRATION OF PEAK ASYMMETRY FACTOR – Peak asymmetry factors must be calculated using the equation in Section 9.10.1 for the first two eluting peaks (if only two analytes are being analyzed, both must be evaluated) in a mid-level CAL standard. The peak asymmetry factors must fall in the range of 0.8 to 1.5. See guidance in Section 10.6.4.1 if the calculated peak asymmetry factors do not meet the criteria.

13.2.6 Refer to Alpha SOP ID 1739 for further information regarding IDC/DOC Generation.

13.2.7 The analyst must make a continuing, annual, demonstration of the ability to generate acceptable accuracy and precision with this method.

14. Pollution Prevention and Waste Management

14.1 Refer to Alpha's Chemical Hygiene Plan and Hazardous Waste Management and Disposal SOP for further pollution prevention and waste management information.

14.2 This method utilizes SPE to extract analytes from water. It requires the use of very small volumes of organic solvent and very small quantities of pure analytes, thereby minimizing the potential hazards to both the analyst and the environment as compared to the use of large volumes of organic solvents in conventional liquid-liquid extractions.

14.3 The analytical procedures described in this method generate relatively small amounts of waste since only small amounts of reagents and solvents are used. The matrices of concern are finished drinking water or source water. However, laboratory waste management practices must be conducted consistent with all applicable rules and regulations, and that laboratories protect the air, water, and land by minimizing and controlling all releases from fume hoods and bench operations. Also, compliance is required with any sewage discharge permits and regulations, particularly the hazardous waste identification rules and land disposal restrictions.

15. Referenced Documents

Chemical Hygiene Plan – ID 2124

SOP ID 1732 Detection Limit (DL), Limit of Detection (LOD) & Limit of Quantitation (LOQ) SOP

SOP ID 1739 Demonstration of Capability (DOC) Generation SOP

SOP ID 1728 Hazardous Waste Management and Disposal SOP

16. Attachments

Table 7: LC Method Conditions

Time (min)	2 mM Ammonium Acetate (5:95 MeOH/H_2O)	100% Methanol
Initial	100.0	0.0
1.0	100.0	0.0
2.2	85.0	15.0
11	20.0	80.0
11.4	0.0	100.0
12.4	100.0	00.0
15.5	100.0	0.0
Waters Aquity UPLC ® BEHC_{18} 2.1 x 50 mm packed with 1.7 µm BEH C_{18} stationary phase Flow rate of 0.4 mL/min 3 µL injection		

Table 8: ESI-MS Method Conditions

ESI Conditions	
Polarity	Negative ion
Capillary needle voltage	.5 kV
Cone Gas Flow	25 L/hr
Nitrogen desolvation gas	1000 L/hr
Desolvation gas temp.	500 ºC

Table 9: Method Analyte Source, Retention Times (RTs), and EIS References

#	Analyte	Transition	RT	IS	Type
1	M3PBA	216>171	2.65		REC
2	PFBA	213 > 169	2.65	2: M4PFBA	
3	M4PFBA	217 > 172	2.65	1: M3PBA	EIS
4	PFPeA	263 > 219	5.67	4: M5PFPEA	
5	M5PFPEA	268 > 223	5.66	1: M3PBA	EIS
6	PFBS	299 > 80	6.35	6: M3PFBS	
7	M3PFBS	302 > 80	6.35	29:M4PFOS	EIS
8	FtS 4:2	327 > 307	7.47	9: M2-4:2FTS	
9	M2-4:2FTS	329 > 81	7.47	29:M4PFOS	EIS
10	PFHxA	303 > 269	7.57	10: M5PFHxA	
11	M5PFHxA	318 > 273	7.57	19:M2PFOA	EIS
12	PFPeS	349 > 80	7.88	18: M3PFHxS	
13	PFHpA	363 > 319	8.80	14: M4PFHpA	
14	M4PFHpA	367 > 322	8.80	19:M2PFOA	EIS

#	Analyte	Transition	RT	IS	Type
15	L-PFHxS	399 > 80	8.94	18: M3PFHxS	
16	br-PFHxS	399 > 80	8.72	18: M3PFHxS	
17	PFHxS Total	399 > 80	8.94	18: M3PFHxS	
18	M3PFHxS	402 > 80	8.94	29:M4PFOS	EIS
19	MPFOA	415 > 370	9.7		REC
20	PFOA	413 > 369	9.7	23: M8PFOA	
21	br-PFOA	413 > 369	9.48	23: M8PFOA	
22	PFOA Total	413 > 369	9.7	23: M8PFOA	
23	M8PFOA	421 > 376	9.7	19: M2PFOA	EIS
24	FtS 6:2	427 > 407	9.66	25: M2-6:2FTS	
25	M2-6:2FTS	429 > 409	9.66	29:M4PFOS	EIS
26	PFHpS	449 > 80	9.78	33: M8PFOS	
27	PFNA	463 > 419	10.41	33: M8PFOS	
28	M9PFNA	472 > 427	10.41	19: M2PFOA	EIS
29	M4PFOS	501 > 80	10.45		REC
30	PFOS	499 > 80	10.45	33: M8PFOS	
31	br-PFOS	499 > 80	10.27	33: M8PFOS	
32	PFOS Total	499 > 80	10.45	33: M8PFOS	
33	M8PFOS	507 > 80	10.45	29: M4PFOS	EIS
34	FtS 8:2	527 > 507	10.99	38: M2-8:2FTS	
35	M2-8:2FTS	529 > 509	10.99	29:M4PFOS	EIS
36	M2PFDA	515 > 470	11.00		REC
37	PFDA	513 > 469	11.00	38: M6PFDA	
38	M6PFDA	519 > 474	11.00	36: M2PFDA	EIS
39	PFNS	549 > 80	11.02	33:M8PFOS	
40	NMeFOSAA	570 > 419	11.41	41: D3-NMeFOSAA	
41	d3-NMeFOSAA	573 > 419	11.41	36: M2PFDA	EIS
42	PFOSA	498 > 78	11.48	29: M8FOSA	
43	M8FOSA	506 > 78	11.48	19: M2PFOA	EIS
44	PFUnDA	563 > 519	11.51	41: M7-PFUDA	
45	M7-PFUDA	570 > 525	11.51	36: M2PFDA	EIS
46	PFDS	599 > 80	11.51	33:M8PFOS	
47	NEtFOSAA	584 > 419	11.68	48: d5-NEtFOSAA	
48	d5-NEtFOSAA	589 > 419	11.68	36: M2PFDA	EIS
49	PFDoA	613 > 569	11.96	50: MPFDOA	
50	MPFDOA	615 > 570	11.96	36: M2PFDA	EIS
51	PFTriA	663 > 619	12.34	50: MPFDOA	
52	PFTeA	713 > 669	12.6	53: M2PFTEDA	
53	M2PFTEDA	715 > 670	12.6	36: M2PFDA	EIS

#	Analyte	Transition	RT	IS	Type
54	M3HFPO-DA	329>285	7.97	19: M2PFOA	EIS
55	HFPO-DA	332>287	7.97	54: M3HFPO-DA	
56	ADONA	377>251	8.00	23: M8PFOA	
57	PFHxDA	813>769	13.20	59: M2PFHxDA	
58	PFODA	913>869	13.50	59: M2PFHxDA	
59	M2PFHxDA	815>770	13.20	36:M2PFDA	EIS
60	NEtFOSA	526>169	11.00	61: NMeFOSA	
61	NMeFOSA	512>169	10.50	63: d3-NMeFOSA	
62	d3-NMeFOSA	515>169	10.50	36: M2PFDA	EIS
63	d5-NEtFOSA	531>169	11.00	36: M2PFDA	EIS
64	NMeFOSE	556>122	11.25	66: d7-NMeFOSE	
65	NEtFOSE	570>136	10.75	67: d9-NEtFOSE	
66	d7-NMeFOSE	563>126	11.25	36: M2PFDA	EIS
67	d9-NEtFOSE	579>142	10.75	36: M2PFDA	EIS
68	FtS 10:2	627>607	11.50	25: M2-6:2FTS	
69	PFDoS	699>99	12.50	33: M8PFOS	
70	9ClPF3ONS	531>351	10.23	33: M8PFOS	
10	11ClPF3OUdS	631>451	11.27	33: M8PFOS	

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NY PFAAs via LCMSMS-Isotope Dilution (SOIL)

Holding Time: 14 days
Container/Sample Preservation: 1 - Plastic 8oz unpreserved

Analyte	CAS #	RL	MDL	Units	LCS Criteria	LCS RPD	MS Criteria	MS RPD	Duplicate RPD	Surrogate Criteria		
Perfluorobutanoic Acid (PFBA)	375-22-4	0.5	0.0227	ug/kg	71-135	30	71-135	30	30			
Perfluoropentanoic Acid (PFPeA)	2706-90-3	0.5	0.046	ug/kg	69-132	30	69-132	30	30			
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	0.5	0.039	ug/kg	72-128	30	72-128	30	30			
Perfluorohexanoic Acid (PFHxA)	307-24-4	0.5	0.0525	ug/kg	70-132	30	70-132	30	30			
Perfluoroheptanoic Acid (PFHpA)	375-85-9	0.5	0.0451	ug/kg	71-131	30	71-131	30	30			
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	0.5	0.0605	ug/kg	67-130	30	67-130	30	30			
Perfluorooctanoic Acid (PFOA)	335-67-1	0.5	0.0419	ug/kg	69-133	30	69-133	30	30			
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	27619-97-2	0.5	0.1795	ug/kg	64-140	30	64-140	30	30			
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	0.5	0.1365	ug/kg	70-132	30	70-132	30	30			
Perfluorononanoic Acid (PFNA)	375-95-1	0.5	0.075	ug/kg	72-129	30	72-129	30	30			
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	0.5	0.13	ug/kg	68-136	30	68-136	30	30			
Perfluorodecanoic Acid (PFDA)	335-76-2	0.5	0.067	ug/kg	69-133	30	69-133	30	30			
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	39108-34-4	0.5	0.287	ug/kg	65-137	30	65-137	30	30			
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSA/	2355-31-9	0.5	0.2015	ug/kg	63-144	30	63-144	30	30			
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	0.5	0.0468	ug/kg	64-136	30	64-136	30	30			
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	0.5	0.153	ug/kg	59-134	30	59-134	30	30			
Perfluorooctanesulfonamide (FOSA)	754-91-6	0.5	0.098	ug/kg	67-137	30	67-137	30	30			
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	0.5	0.0845	ug/kg	61-139	30	61-139	30	30			
Perfluorododecanoic Acid (PFDoA)	307-55-1	0.5	0.07	ug/kg	69-135	30	69-135	30	30			
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	0.5	0.2045	ug/kg	66-139	30	66-139	30	30			
Perfluorotetradecanoic Acid (PFTA)	376-06-7	0.5	0.054	ug/kg	69-133	30	69-133	30	30			
PFOA/PFOS, Total		0.5	0.0419	ug/kg				30	30			
Perfluoro[13C4]Butanoic Acid (MPFBA)	*NONE*									*60-153*		
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	*NONE*									*65-182*		
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	*NONE*									*70-151*		
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	*NONE*									*61-147*		
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	*NONE*									*62-149*		
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	*NONE*									*63-166*		
Perfluoro[13C8]Octanoic Acid (M8PFOA)	*NONE*									*62-152*		
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6	*NONE*									*32-182*		
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	*NONE*									*61-154*		
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	*NONE*									*65-151*		
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	*NONE*									*65-150*		
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8	*NONE*									*25-186*		
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid	*NONE*									*45-137*		
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	*NONE*									*64-158*		
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	*NONE*									*1-125*		
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d	*NONE*									*42-136*		
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	*NONE*									*56-148*		
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	*NONE*									*26-160*		

Please Note that the RL information provided in this table is calculated using a 100% Solids factor. (Soil/Solids only)
Please Note that the information provided in this table is subject to change at anytime at the discretion of Alpha Analytical, Inc.

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Roux Env. Eng. & Geology, DPC

NY PFAAs via LCMSMS-Isotope Dilution (WATER)

Holding Time: 14 days
Container/Sample Preservation: 1 - 2 Plastic/1 Plastic/1 H20 Plastic

Analyte	CAS #	RL	MDL	Units	LCS Criteria	LCS RPD	MS Criteria	MS RPD	Duplicate RPD	Surrogate Criteria		
Perfluorobutanoic Acid (PFBA)	375-22-4	2	0.408	ng/l	67-148	30	67-148	30	30			
Perfluoropentanoic Acid (PFPeA)	2706-90-3	2	0.396	ng/l	63-161	30	63-161	30	30			
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	2	0.238	ng/l	65-157	30	65-157	30	30			
Perfluorohexanoic Acid (PFHxA)	307-24-4	2	0.328	ng/l	69-168	30	69-168	30	30			
Perfluoroheptanoic Acid (PFHpA)	375-85-9	2	0.2252	ng/l	58-159	30	58-159	30	30			
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	2	0.376	ng/l	69-177	30	69-177	30	30			
Perfluorooctanoic Acid (PFOA)	335-67-1	2	0.236	ng/l	63-159	30	63-159	30	30			
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	27619-97-2	2	1.332	ng/l	49-187	30	49-187	30	30			
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	2	0.688	ng/l	61-179	30	61-179	30	30			
Perfluorononanoic Acid (PFNA)	375-95-1	2	0.312	ng/l	68-171	30	68-171	30	30			
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	2	0.504	ng/l	52-151	30	52-151	30	30			
Perfluorodecanoic Acid (PFDA)	335-76-2	2	0.304	ng/l	63-171	30	63-171	30	30			
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	39108-34-4	2	1.212	ng/l	56-173	30	56-173	30	30			
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSA/	2355-31-9	2	0.648	ng/l	60-166	30	60-166	30	30			
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	2	0.26	ng/l	60-153	30	60-153	30	30			
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	2	0.98	ng/l	38-156	30	38-156	30	30			
Perfluorooctanesulfonamide (FOSA)	754-91-6	2	0.58	ng/l	46-170	30	46-170	30	30			
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	2	0.804	ng/l	45-170	30	45-170	30	30			
Perfluorododecanoic Acid (PFDoA)	307-55-1	2	0.372	ng/l	67-153	30	67-153	30	30			
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	2	0.3272	ng/l	48-158	30	48-158	30	30			
Perfluorotetradecanoic Acid (PFTA)	376-06-7	2	0.248	ng/l	59-182	30	59-182	30	30			
Perfluoro[13C4]Butanoic Acid (MPFBA)	*NONE*									*2-156*		
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	*NONE*									*16-173*		
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	*NONE*									*31-159*		
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4	*NONE*									*1-313*		
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	*NONE*									*21-145*		
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	*NONE*									*30-139*		
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	*NONE*									*47-153*		
Perfluoro[13C8]Octanoic Acid (M8PFOA)	*NONE*									*36-149*		
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6	*NONE*									*1-244*		
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	*NONE*									*34-146*		
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	*NONE*									*42-146*		
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	*NONE*									*38-144*		
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8	*NONE*									*7-170*		
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid	*NONE*									*1-181*		
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	*NONE*									*40-144*		
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	*NONE*									*1-87*		
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d	*NONE*									*23-146*		
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	*NONE*									*24-161*		
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	*NONE*									*33-143*		
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13	*NONE*									*50-150*		
Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)	*NONE*									*50-150*		

Please Note that the RL information provided in this table is calculated using a 100% Solids factor. (Soil/Solids only)

Please Note that the information provided in this table is subject to change at anytime at the discretion of Alpha Analytical, Inc.

APPENDIX G

Site Management Forms

ROUX ENVIRONMENTAL ENGINEERING AND GEOLOGY D.P.C.

SITE-WIDE MONITORING, INSPECTION, AND MAINTENANCE FORM

Client: **Sendero Verde Redevelopment Project - Parcel B**

Location: **75 East 111th Street and 60 East 112th Street, New York, New York**

BCP Site # **C231128**

Inspector: ____________________

Date: ____________________

____

Site Observations:

Yes	**No**	
[ ]	[ ]	Have any site improvements been made since the last inspection?
[ ]	[ ]	Has there been any maintenance activity impacting the institutional and/or engineering controls?
		-Include sketches or photos of observations

Inspection of Building Covers and Asphalt/Concrete Caps:

Yes	**No**	
[ ]	[ ]	Were all buildings inspected?
[ ]	[ ]	Were significant cracks observed?
[ ]	[ ]	Was any other damage observed? If yes, refer to Page 3 for additional clarification.
[ ]	[ ]	Were any new slab penetrations observed? If yes, include description on Page 3.
		-Include sketches or photos of observations

Inspection of Groundwater Usage:

Yes	**No**	
[ ]	[ ]	Is groundwater underlying the property being used for any purposes including, but not limited to, drinking water or industrial purposes?

Include additional information and details on Page 3 of this inspection form if the response to any of the above questions warrants additional explanation.

ROUX ENVIRONMENTAL ENGINEERING AND GEOLOGY D.P.C.

SITE-WIDE MONITORING, INSPECTION, AND MAINTENANCE FORM

Client: **Sendero Verde Redevelopment Project - Parcel B**

Location: **75 East 111th Street and 60 East 112th Street, New York, New York**

BCP Site # **C231128**

Inspector: ____________________

Date: ____________________

Inspection of Remaining Contaminated Material:

Yes	No	
[ ]	[ ]	Have there been any activities that caused a disturbance of remaining contaminated material since the last inspection?
[ ]	[ ]	If yes, were the activities conducted in accordance with the Site Management Plan (SMP)?
		-Include sketches or photos of observations

Inspection of Gardens and Farming:

Yes	No	
[ ]	[ ]	Is there any evidence of vegetable gardens and/or farming at the property (aside from raised planters)?
		-Include sketched or photos of observations.

Site Records:

Yes	No	
[ ]	[ ]	Are site records up to date (e.g., Site Inspection Checklists)?

Inspection of Property Usage:

Yes	No	
[ ]	[ ]	Is the property being used for any purposed other than restricted residential, commercial, and/or industrial use?

Include additional information and details on Page 3 of this inspection form if the response to any of the above questions warrants additional explanation.

ROUX ENVIRONMENTAL ENGINEERING AND GEOLOGY, D.P.C.

SITE-WIDE MONITORING, INSPECTION, AND MAINTENANCE FORM

Client: **Sendero Verde Redevelopment Project - Parcel B**

Location: **75 East 111th Street and 60 East 112th Street, New York, New York**

BCP Site # **C231128**

Inspector: ______________________

Date: ______________________

Site Observations

____

Additional Comments or Clarification Where Corrective Actions May Be Required:

____

Summary of Green Remediation Metrics for Site Management

Site Name: Sendero Verde Redevelopment Project- Parcel B ______Site Code: C231128
Address: 75 East 111th Street and 60 East 112th Street______City: New York____________
State: ________NY____ Zip Code: 10029_____County: Manhattan________________

Initial Report Period (Start Date of period covered by the Initial Report submittal)
Start Date: ______________________

Current Reporting Period
Reporting Period From: ________________________To: ____________________________

Contact Information
Preparer's Name: _____________________________ Phone No.: _____________________
Preparer's Affiliation: ______________________________________

I. Energy Usage: Quantify the amount of energy used directly on-site and the portion of that derived from renewable energy sources.

	Current Reporting Period	**Total to Date**
Fuel Type 1 (e.g. natural gas (cf))		
Fuel Type 2 (e.g. fuel oil, propane (gals))		
Electricity (kWh)		
Of that Electric usage, provide quantity:		
Derived from renewable sources (e.g. solar, wind)		
Other energy sources (e.g. geothermal, solar thermal (Btu))		

Provide a description of all energy usage reduction programs for the site in the space provided on Page 3.

II. Solid Waste Generation: Quantify the management of solid waste generated on-site.

	Current Reporting Period (tons)	**Total to Date (tons)**
Total waste generated on-site		
OM&M generated waste		
Of that total amount, provide quantity:		
Transported off-site to landfills		
Transported off-site to other disposal facilities		
Transported off-site for recycling/reuse		
Reused on-site		

Provide a description of any implemented waste reduction programs for the site in the space provided on Page 3.

III. Transportation/Shipping: Quantify the distances travelled for delivery of supplies, shipping of laboratory samples, and the removal of waste.

	Current Reporting Period (miles)	**Total to Date (miles)**
Standby Engineer/Contractor		
Laboratory Courier/Delivery Service		
Waste Removal/Hauling		

Provide a description of all mileage reduction programs for the site in the space provided on Page 3. Include specifically any local vendor/services utilized that are within 50 miles of the site.

IV. Water Usage: Quantify the volume of water used on-site from various sources.

	Current Reporting Period (gallons)	**Total to Date (gallons)**
Total quantity of water used on-site		
Of that total amount, provide quantity:		
Public potable water supply usage		
Surface water usage		
On-site groundwater usage		
Collected or diverted storm water usage		

Provide a description of any implemented water consumption reduction programs for the site in the space provided on Page 3.

V. Land Use and Ecosystems: Quantify the amount of land and/or ecosystems disturbed and the area of land and/or ecosystems restored to a pre-development condition (i.e. Green Infrastructure).

	Current Reporting Period (acres)	**Total to Date (acres)**
Land disturbed		
Land restored		

Provide a description of any implemented land restoration/green infrastructure programs for the site in the space provided on Page 3.

Description of green remediation programs reported above (Attach additional sheets if needed)
Energy Usage:
Waste Generation:
Transportation/Shipping:
Water usage:
Land Use and Ecosystems:
Other:

CERTIFICATION BY CONTRACTOR
I, ___________________________ (**Name**) do hereby certify that I am ______________________ (**Title**) of the Company/Corporation herein referenced and contractor for the work described in the foregoing application for payment. According to my knowledge and belief, all items and amounts shown on the face of this application for payment are correct, all work has been performed and/or materials supplied, the foregoing is a true and correct statement of the contract account up to and including that last day of the period covered by this application. ____ **Date** **Contractor**

APPENDIX H

Responsibilities of Owner and Remedial Party

APPENDIX H- RESPONSIBILITIES of OWNER and REMEDIAL PARTY RESPONSIBILITIES

The responsibilities for implementing the Site Management Plan ("SMP") for the Sendero Verde Redevelopment Project- Parcel B site (the "site"), number C231128, are divided between the site owner(s) and a Remedial Party, as defined below. The owner(s) is/are currently listed as:

- Legal Owner - Acacia Sendero Verde II Housing Development Fund Company, Inc.
- Beneficial Owner - SV-B Owners LLC, 1865 Palmer Avenue, Larchmont, NY, att. Ms. Jessica Yoon (the "owner")

Solely for the purposes of this document and based upon the facts related to a particular site and the remedial program being carried out, the term Remedial Party ("RP") refers to any of the following: certificate of completion holder, volunteer, applicant, responsible party, and, in the event the New York State Department of Environmental Conservation ("NYSDEC") is carrying out remediation or site management, the NYSDEC and/or an agent acting on its behalf. The RP is:

SV-B Owners LLC, 1865 Palmer Avenue, Larchmont, NY, att. Ms. Jessica Yoon

Nothing on this page shall supersede the provisions of an Environmental Easement, Consent Order, Consent Decree, agreement, or other legally binding document that affects rights and obligations relating to the site.

<u>Site Owner's Responsibilities:</u>

1) The owner shall follow the provisions of the SMP as they relate to future construction and excavation at the site.
2) In accordance with a periodic time frame determined by the NYSDEC, the owner shall periodically certify, in writing, that all Institutional Controls set forth in a(n) Environmental Easement remain in place and continue to be complied with. The owner shall provide a written certification to the RP, upon the RP's request, in order to allow the RP to include the certification in the site's Periodic Review Report (PRR) certification to the NYSDEC.
3) In the event the site is delisted, the owner remains bound by the Environmental Easement and shall submit, upon request by the NYSDEC, a written certification that the Environmental Easement is still in place and has been complied with.
4) The owner shall grant access to the site to the RP and the NYSDEC and its agents for the purposes of performing activities required under the SMP and assuring compliance with the SMP.
5) The owner is responsible for assuring the security of the remedial components located on its property to the best of its ability. In the event that damage to the remedial components or vandalism is evident, the owner shall notify the site's RP and the NYSDEC in accordance with the timeframes indicated in Section D-1: Notifications.
6) In the event some action or inaction by the owner adversely impacts the site, the owner must notify the site's RP and the NYSDEC in accordance with the time frame indicated in Section D-1: Notifications and (ii) coordinate the performance of necessary corrective actions with the RP.
7) The owner must notify the RP and the NYSDEC of any change in ownership of the site property (identifying the tax map numbers in any correspondence) and provide contact

information for the new owner of the site property. 6 NYCRR Part contains notification requirements applicable to any construction or activity changes and changes in ownership. Among the notification requirements is the following: Sixty days prior written notification must be made to the NYSDEC. Notification is to be submitted to the NYSDEC Division of Environmental Remediation's Site Control Section. Notification requirements for a change in use are detailed in Section 2.4 of the SMP. A 60-Day Advance Notification Form and Instructions are found at http://www.dec.ny.gov/chemical/76250.html.

8) The owner will maintain fences, conduct mowing, etc. on behalf of the RP. The RP remains ultimately responsible for maintaining the engineering controls.

Remedial Party Responsibilities

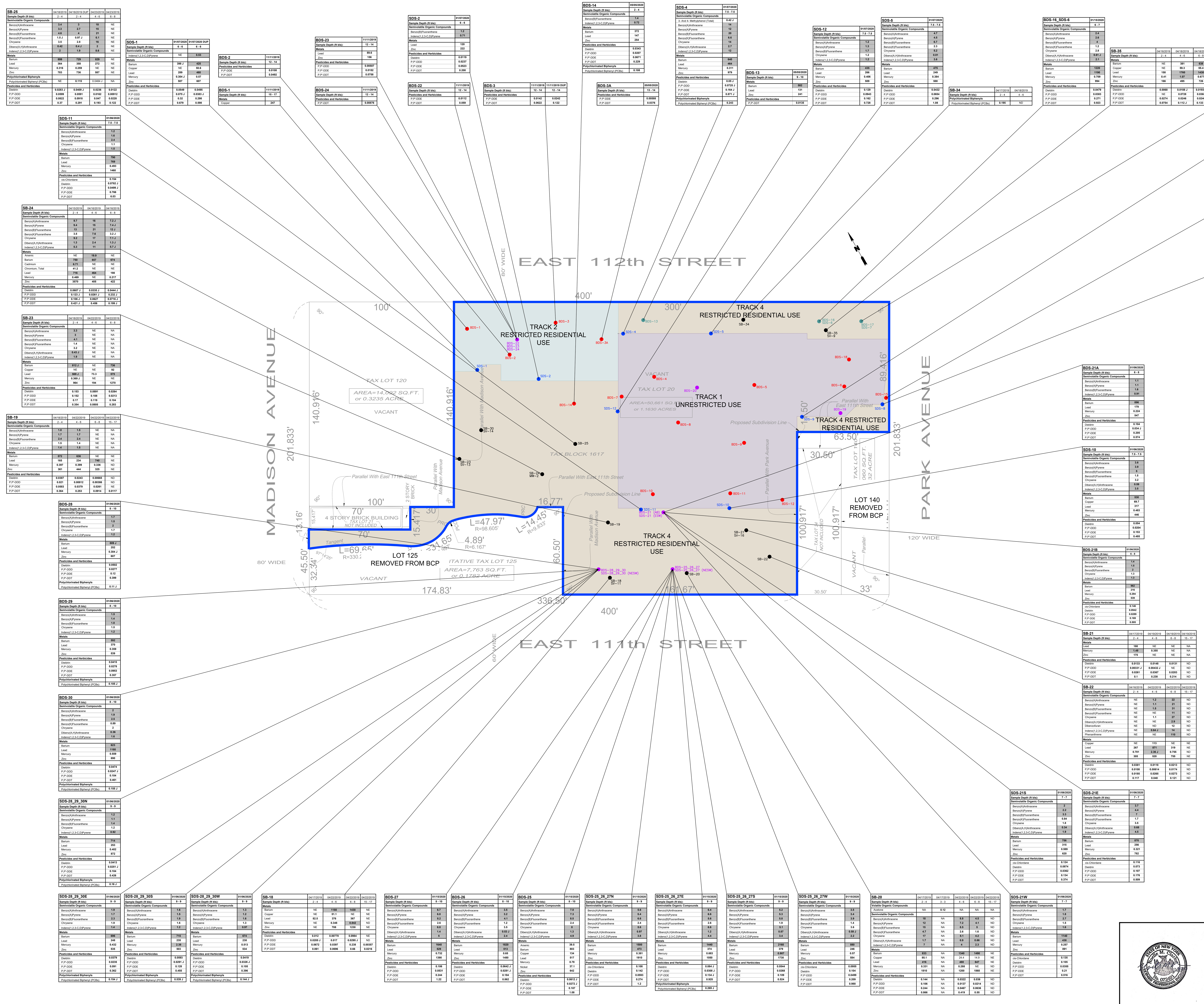
1) The RP must follow the SMP provisions regarding any construction and/or excavation it undertakes at the site.
2) The RP shall report to the NYSDEC all activities required for remediation, operation, maintenance, monitoring, and reporting. Such reporting includes, but is not limited to, periodic review reports and certifications, electronic data deliverables, corrective action work plans and reports, and updated SMPs.
3) Before accessing the site property to undertake a specific activity, the RP shall provide the owner advance notification that shall include an explanation of the work expected to be completed. The RP shall provide to (i) the owner, upon the owner's request, (ii) the NYSDEC, and (iii) other entities, if required by the SMP, a copy of any data generated during the site visit and/or any final report produced.
4) If the NYSDEC determines that an update of the SMP is necessary, the RP shall update the SMP and obtain final approval from the NYSDEC. Within 5 business days after NYSDEC approval, the RP shall submit a copy of the approved SMP to the owner(s).
5) The RP shall notify the NYSDEC and the owner of any changes in RP ownership and/or control and of any changes in the party/entity responsible for the maintenance and reporting with respect to any Engineering Control. The RP shall provide contact information for the new party/entity. Such activity constitutes a Change of Use pursuant to 375-1.11(d) and requires 60-days prior notice to the NYSDEC. A 60-Day Advance Notification Form and Instructions are found at http://www.dec.ny.gov/chemical/76250.html .
6) The RP shall notify the NYSDEC of any damage to or modification of the Engineering Control as required under Section D-1: Notifications of the SMP.
7) Prior to a change in use that impacts the Engineering Control or requirements and/or responsibilities for implementing the SMP, the RP shall submit to the NYSDEC for approval an amended SMP.
8) Any change in use, change in ownership, change in site classification (*e.g.*, delisting), reduction or expansion of remediation, and other significant changes related to the site may result in a change in responsibilities and, therefore, necessitate an update to the SMP and/or updated legal documents. The RP shall contact the Department to discuss the need to update such documents.

Change in RP ownership and/or control and/or site ownership does not affect the RP's obligations with respect to the site unless a legally binding document executed by the NYSDEC releases the RP of its obligations.

Future site owners and RPs and their successors and assigns are required to carry out the activities set forth above.

PLATES

1. Remaining Soil Sample Exceedances
2. Site Cover System



LEGEND

- BCP SITE BOUNDARY
- BDS–1 BOTTOM ENDPOINT SAMPLE LOCATION
- SDS–1 SIDEWALL ENDPOINT SAMPLE LOCATION
- BDS–13 HYBRID BOTTOM/SIDEWALL ENDPOINT SAMPLE LOCATION
- BDS–20 UST ENDPOINT SAMPLE LOCATION
- SB–25 APRIL 2019 RI ENDPOINT SAMPLE LOCATION
- TRACK 1 UNRESTRICTED CLEANUP
- TRACK 2 RESTRICTED RESIDENTIAL CLEANUP
- TRACK 4 RESTRICTED RESIDENTIAL CLEANUP

Parameter	NYSDEC Part 375 Unrestricted Use SCO	NYSDEC Part 375 Restricted Residential SCO
SVOCs		
3- And 4- Methylphenol (Total)	0.33	100
Benzo(A)Anthracene	1	1
Benzo(A)Pyrene	1	1
Benzo(B)Fluoranthene	1	1
Benzo(K)Fluoranthene	1	3.9
Chrysene	1	3.9
Dibenz(A,H)Anthracene	0.33	0.33
Indeno(1,2,3-C,D)Pyrene	1	0.5
Metals		
Arsenic	13	16
Barium	350	400
Chromium, Hexavalent	1	110
Copper	50	270
Lead	63	400
Manganese	1600	2000
Mercury	0	0.81
Nickel	30	310
Zinc	109	10000
PCBs		
Polychlorinated Biphenyl (PCBs)	0.1	1
Peticides and Herbicides		
cis-Chlordane	0.094	4.2
Dieldrin	0.005	0.2
P,P'-DDD	0.0033	13
P,P'-DDE	0.0033	8.9
P,P'-DDT	0.0033	7.9

CONCENTRATIONS IN mg/kg

mg/kg – MILLIGRAMS PER KILOGRAM
NYSDEC – NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
SCO – SOIL CLEANUP OBJECTIVE
J – ESTIMATED VALUE
DUP – DUPLICATE SAMPLE
ND – NO DETECTION
NA – NOT ANALYZED
NE – NO EXCEEDANCE
FT BLS – FEET BELOW LAND SURFACE
BDS – BOTTOM DOCUMENTATION SAMPLE
SDS – SIDEWALL DOCUMENTATION SAMPLE
UST – UNDERGROUND STORAGE TAMK

THE FOLLOWING ENDPOINT DOCUMENTATION SAMPLES WERE RELATED TO THE PREVIOUSLY UNKNOWN USTS FOUND AND REMOVED DURING CONSTRUCTION. WHERE NO SIDEWALL DOCUMENTATION SAMPLES WERE COLLECTED, ALL SOIL SURROUNDING THE TANKS WAS REMOVED. THE SAMPLE DEPTH IS IN PARENTHESES AFTER THE IDENTIFICATION.

- BDS–19 (13–15) IS ASSOCIATED WITH USTS UNREG–1 AND UNREG–2 DISCOVERED ON 09/09/2019
- BDS–20 (15–17) IS ASSOCIATED WITH UST UNREG–3 DISCOVERED ON 09/27/2019Đ
- BDS–21A (6–8), BDS–21B (6–8), SDS–21E (7), SDS–21S (7) AND SDS–21W (7) ARE ASSOCIATED WITH UST UNREG–4 DISCOVERED ON 10/01/2019
- BDS–22 (12–14), BDS–23 (12–14) AND BDS–24 (12–14) ARE ASSOCIATED WITH UST UNREG–5 DISCOVERED ON 10/11/2019
- BDS–25 (8–10), BDS–26 (8–10), BDS–27 (8–10), SDS–25_26_27E (9), SDS–25_26_27N (9), SDS–25_26_27S (9) AND SDS–25_26_27W (9) ARE ASSOCIATED WITH UST UNREG–6 DISCOVERED ON 12/03/2019
- BDS–28 (8–10), BDS–29 (8–10), BDS–30 (8–10), SDS–28_29_30E (9), SDS–28_29_30N (9), SDS–28_29_30S (9), AND SDS–28_29_30W (9) ARE ASSOCIATED WITH UST UNREG–7 DISCOVERED ON 12/05/2019

20' 0 20'

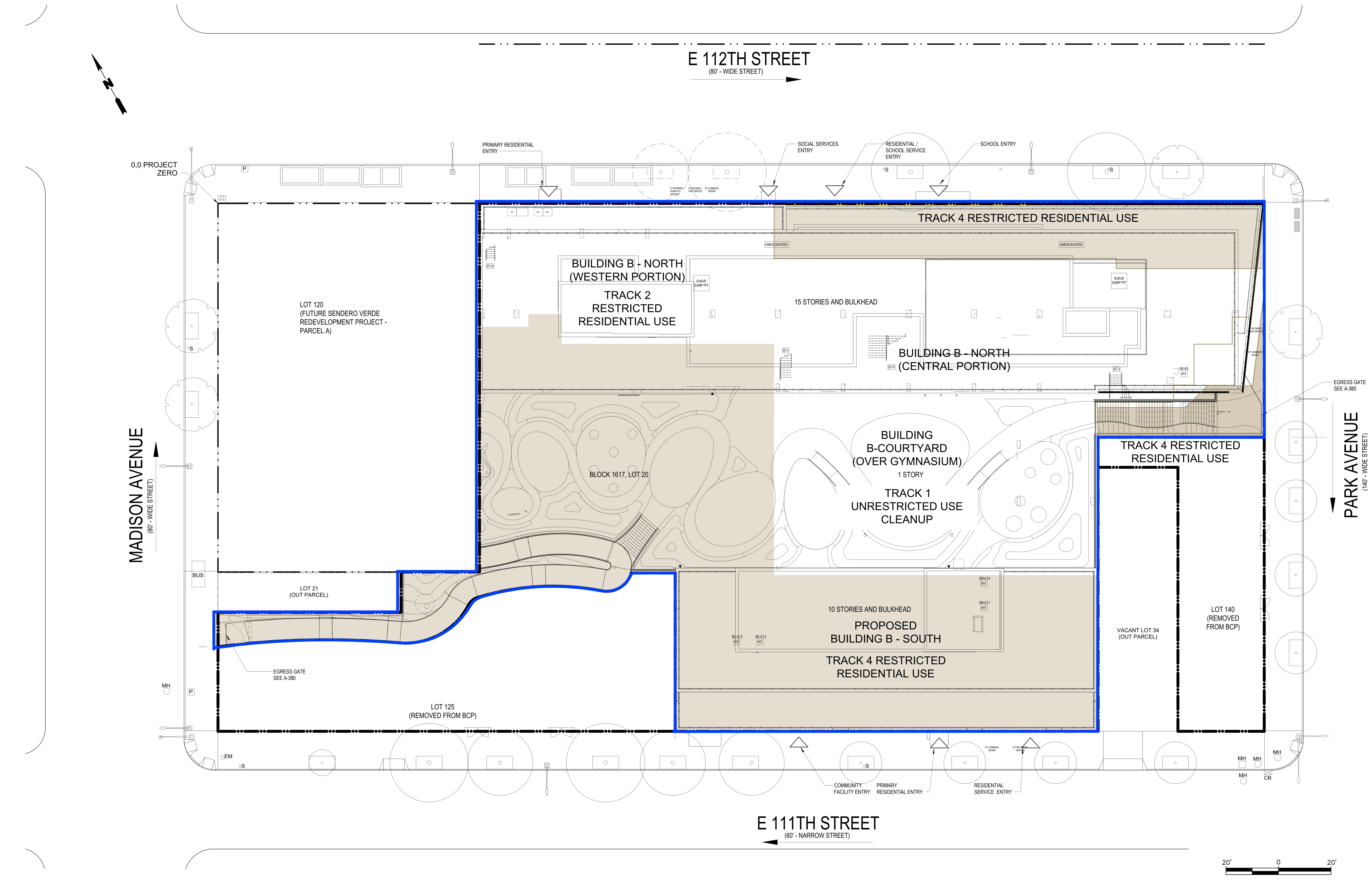
Title: **REMAINING SOIL SAMPLE EXCEEDANCES**

SENDERO VERDE
REDEVELOPMENT PROJECT - PARCEL B

Prepared for:
SV-B OWNERS LLC

ROUX

Compiled by: W.S.	Date: 20JUL20	PLATE
Prepared by: G.M.	Scale: AS SHOWN	1
Project Mgr: W.S.	Project: 2984.0003Y000	
File: 2984.0003Y137.05.DWG		

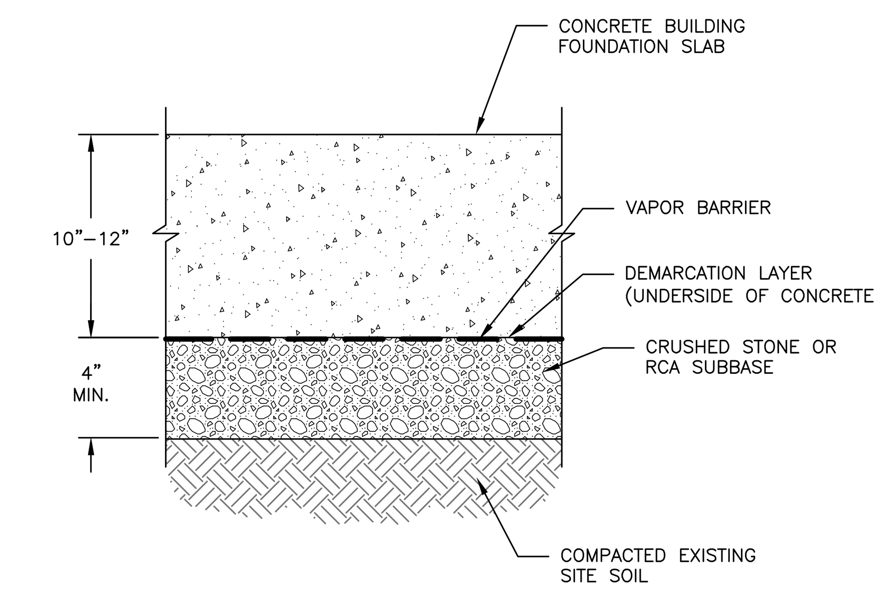


LEGEND

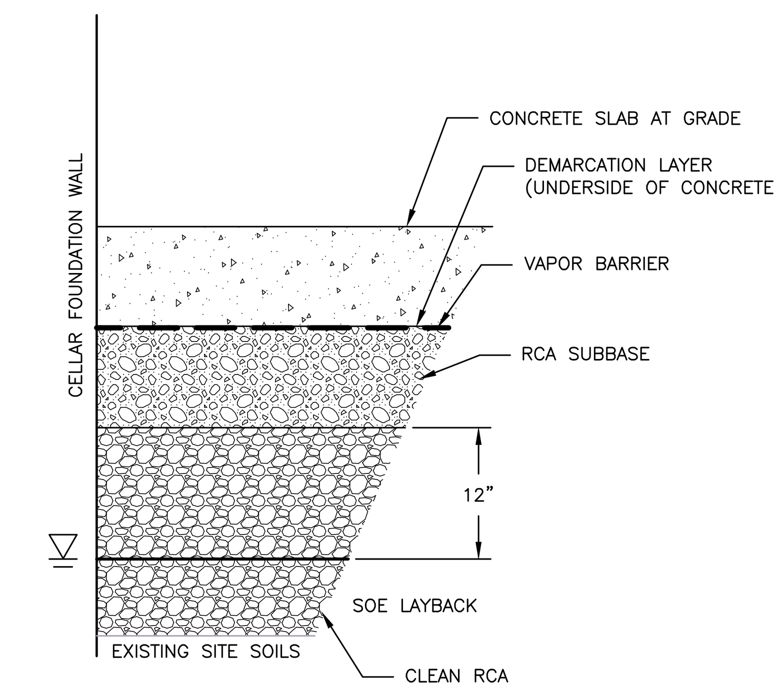
- BCP SITE BOUNDARY
- NYSDEC – NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
- RRSCOs – PART 375 RESTRICTED RESIDENTIAL SOIL CLEANUP OBJECTIVES
- UUSCOs – PART 375 UNRESTRICTED SOIL CLEANUP OBJECTIVES
- RCA – RECYCLED CONCRETE AGGREGATE
- FT BLS – FEET BELOW LAND SURFACE

KEY

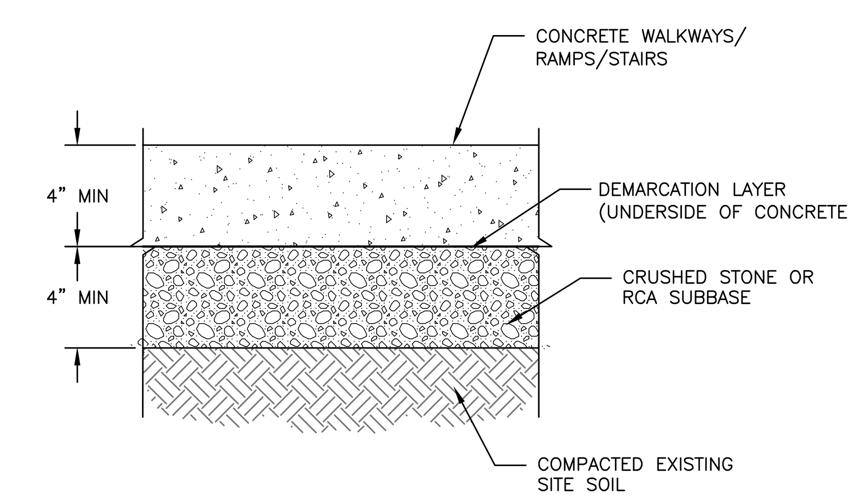
- TRACK 4 (RESTRICTED RESIDENTIAL USE) AREAS: SITE COVER SYSTEM COMPRISED OF CONCRETE BUILDING FOUNDATIONS OR CONCRETE WALKWAYS/STAIRS/RAMPS WITH A DEMARCATION LAYER (UNDERSIDE OF THE CONCRETE) AND SUB-BASE AGGREGATE (STONE OR RCA) BACKFILL. SEE DETAILS 1, 2 AND 3.
- TRACK 1 (UNRESTRICTED USE) AND TRACK 2 (RESTRICTED RESIDENTIAL USE) AREAS: NO SITE COVER SYSTEM REQUIRED



1 SITE COVER SYSTEM: CONCRETE BUILDING FOUNDATION
SCALE: NOT TO SCALE



2 SITE COVER SYSTEM: SUPPORT OF EXCAVATION
SCALE: NOT TO SCALE



3 SITE COVER SYSTEM: CONCRETE WALKWAYS/RAMPS/STAIRS
SCALE: NOT TO SCALE

NO.	DATE	REVISION DESCRIPTION	INT.

STATE OF NEW YORK · Noelle M. Clarke · LICENSED PROFESSIONAL ENGINEER · No. 072491

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DESIGNED BY: N.C.	CHECKED BY:
DRAWING SCALE: AS SHOWN	PLOT SCALE: 1:1
DRAWING DATE: 12SEP19	PRINT TYPE: CLR
OFFICE: NY	PAPER SIZE: ARCH D
PROJECT NO.: 2984.0003Y000	
DRAWING FILE: 2984.0003Y137.04.DWG	

ROUX
Roux Environmental Engineering and Geology, D.P.C.
209 SHAFTER STREET ISLANDIA NEW YORK 11749
(631) 232-2600

PROJECT NAME:
SENDERO VERDE REDEVELOPMENT PROJECT - PARCEL B

PROJECT FOR:
SV-B OWNERS LLC

TITLE:
AS-BUILT SITE COVER SYSTEM

PLATE
2
DRAWING 2 OF 2

V:\CAD\PROJECTS\2984Y\0003Y\137\2984.0003Y137.04.DWG