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# Remedial Investigation Work Plan

# Ace Suede and Leather
# 808 East 139th Street
# Bronx, New York
# NYSDEC Site No. C203072

## June 2021

| | |
|---|---|
| Prepared for: | Mr. Andrew Bullaro<br>B & B First Holdings LLC<br>334 Faile Street<br>Bronx, NY |

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# REMEDIAL INVESTIGATION WORK PLAN
ACE SUEDE AND LEATHER
808 EAST 139TH STREET
BRONX, NEW YORK
NYSDEC SITE NO: C203072
JUNE 2021

*"I, Mr. Frank Castellano, certify that I am currently a Qualified Environmental Professional (QEP) as defined in 6 NYCRR Part 375 and that this Remedial Investigation Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the Department of Environmental Remediation Technical Guidance for Site Investigation and Remediation (DER-10)."*

Castleton Environmental Geologic Services, DPC.

Frank P. Castellano, P.G. License No.: 000705
Principal

**REMEDIAL INVESTIGATION WORK PLAN**
**ACE SUEDE AND LEATHER**
**808 EAST 139TH STREET**
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## List of Acronyms

- **ASTM** - American Society for Testing and Materials
- **AWQS** - Ambient Waster Quality Standards
- **BCA** – Brownfield Cleanup Agreement
- **BCP –** Brownfield Cleanup Program
- **BGS** – Below Ground Surface
- **CAMP** – Community Air Monitoring Program
- **CVOC** – Chlorinated Volatile Organic Compound
- **DER** - Department of Environmental Remediation
- **DUSR** - Data Usability Summary Report
- **EDD** - Electronic Data Deliverable
- **ELAP** – Environmental Laboratory Accreditation Program
- **EPA** – Environmental Protection Agency
- **ESA** – Environmental Site Assessment
- **GPR** – Ground Penetrating Radar
- **GRO/DRO** - Gasoline Range and Diesel Range Organics
- **HASP** – Health and Safety Plan
- **ID/OD** – Inside Diameter/Outside Diameter
- **IRM** – Interim Remedial Measure
- **MS/MDS** – Matrix Spike/Matrix Duplicate Spike
- **NAPL** – Non-Aqueous Phase Liquid
- **NTC** - Nephelometric Turbidity Unit
- **NYCDOB** - New York City Department of Buildings
- **NYSDEC –** New York State Department of Environmental Conservation
- **NYSDOH** – New York State Department of Health
- **OSHA** - Occupational Safety and Health Administration
- **PCB** - Polychlorinated biphenyls
- **PCE** – Tetrachloroethylene
- **PFAS** - Polyfluoroalkyl Substances
- **PID** – Photoionization Detector
- **PPM/PPB** – Parts per Million/Parts per Billion
- **PVOC** – Petroleum Volatile Organic Compound
- **PVC** - Polyvinyl chloride
- **QAPP** – Quality Assurance Project Plan
- **QA/QC** – Quality Assurance/Quality Control
- **QHHEA** - Qualitative Human Health Exposure Assessment
- **RI** – Remedial Investigation
- **RIR** – Remedial Investigation Report
- **RIWP –** Remedial Investigation Work Plan
- **SCG** - Standards Criteria, and Guidance
- **SCO** – Soil Cleanup Objective
- **SOE** - Support of Excavation
- **SVOC** – Semi-volatile Organic Compound
- **TAL** – Target Analyte List
- **TCE** – Trichloroethene
- **TCL** – Target Compound List
- **USCS** - Unified Soil Classification System
- **UST** – Underground Storage Tank
- **VOC** – Volatile Organic Compound

## 1.0 INTRODUCTION

Castleton Environmental Geologic Services DPC (Castleton), has prepared the following Remedial Investigation Work Plan (RIWP) for the property located 808 East 139th Street in the Port Morris section of the Bronx, New York (the site). The site is listed on the New York State Department of Environmental Conservation's (NYSDEC) Environmental Site Remediation Database as Ace Suede and Leather under site code C203072.

The site location is shown on Figure 1.

The proposed work is being performed on behalf of B&B First Holdings LLC as part of their commitment to investigate and clean up the site under the NYSDEC Brownfield Cleanup Program (BCP). This work is being performed pursuant to the NYSDEC Brownfield Cleanup Agreement (BCA), executed on February 12, 2019 (Index No. C203072-12-18).

This RIWP details the proposed site investigation activities that will be deployed to characterize the nature and extent of site contamination identified in previous investigations, including:

- Performing a geophysical survey in the areas of the building not yet surveyed.
- A vapor investigation consisting of the collection of seven sub-slab vapor, two soil vapor, and nine ambient air samples.
- A subsurface soil investigation including the installation of an estimated ten direct push (Geoprobe®) soil borings and sample collection.
- A groundwater investigation including the installation of an estimated six monitoring well couplets (water table and deep monitoring well pairs) and sampling.

The RIWP is accompanied by a site-specific Health and Safety Plan (HASP) which addresses potential hazards, contaminants of concern on past use, and safety requirements associated with investigation activities in accordance with American Society for Testing and Materials (ASTM) and Occupational Safety and Health Administration (OSHA) guidelines. A Quality Assurance Project Plan (QAPP) has also been prepared and included to provide quality assurance/quality control (QA/QC) procedures to ensure the data derived during the investigation are of sufficient quality for their intended use.

The HASP is included as Appendix A and the QAPP is included as Appendix B.

In addition, a copy of the site Citizen Participation Plan is included in Appendix C.

## 2.0 SITE DESCRIPTION

### 2.1 Site Location and Current Usage

The site is in the Port Morris Section of the Bronx, New York, and is identified as Block 2590 and Lot 36 on the New York City Tax Map. The site measures approximately 0.438-acres in size and is bounded by East 139th Street to the north, a national railway/Amtrak easement to the east, and commercial and industrial properties in the surrounding area to the south and west. The site is currently improved with contiguous single and two-story commercial buildings with no basements which occupy most of the site parcel. The single-story building is occupied by one commercial tenant, Empire Movers, and the two-story building is presently vacant.

A Site Plan is provided as Figure 2.

### 2.2 Description of Surrounding Property

The site and surrounding area are zoned as M3-1, which permits manufacturing. M3 districts are designated for heavy industries that generate noise, traffic, and/or pollutants. The elevated Amtrak/CSX railroad right-of-way is located along the eastern boundary of the site. The surrounding parcels are utilized for a combination of commercial and industrial uses.

### 2.3 Site Geology and Hydrogeology

The near surface geology in the Port Morris portion of the Bronx is like other heavily developed areas found in this area. The site and surrounding area surficial geology is generally considered “urban land” and is characterized by a non-homogenous distribution of soil and fill types. Excavation and backfilling for building foundations, utility conduits, railway systems, and other construction has resulted in a varied subsurface profile. No bedrock outcroppings are present at the site. Based on available information, bedrock is estimated at 20 to 30-feet below ground surface (bgs).

Based upon soil boring data collected during the 2013 Phase II ESA performed by EBC, groundwater at the site was found at depths ranging from 5 to 9 feet bgs. Site geology consisted of poorly sorted sands, gravels, pebbles, and silt. The nearest body of water is the East River, located approximately 1,300-feet to the southeast. Therefore, groundwater flow is estimated to be towards the southeast.

### 2.4 Past Use of the Site

The site was historically operated as a dry-cleaning facility (Lichtenstein General Cleaners Corp.) from the 1940’s through the 1970’s, and as a leather factory (Ace of Suedes Inc.) from the late 1970’s to 2013. According to a 2013 Phase I ESA by Alpha-Hydro Environmental (Alpha), seven Varnolene underground storage tanks (USTs) are present in the south-central portion of the building. It is also likely that PCE was used more recently used as Varnolene and other petroleum distillates were phased out of use as a potential fire hazard. The site has also manifested spent halogenated solvents (F002), chromium (D007), PCE (D039), and trichloroethene (TCE) (D040) under Ace Suede and Leather (EPA I.D. Number: NYD068124585) from 1987 to 2013 as a large quantity generator.

## 3.0 PREVIOUS INVESTIGATIONS

### 3.1 December 2013 Focused Phase II Subsurface Investigation

The impacts to soil and groundwater at the site were identified during the completion of the *Focused Phase II Subsurface Investigation* performed by EBC of Ridge, New York, in December 2013. The Phase II was performed in response to the Alpha Phase I ESA (not provided) that identified the presence of seven Varnolene USTs on historic Sanborn Fire Insurance Maps. Sanborn maps also depicted a gasoline UST located beneath the northeast corner of the building. A geophysical survey performed in advance of the Phase II ESA identified several anomalies indicative of USTs at the site in the areas depicted on the Sanborn maps. Subsurface testing included the characterization of soil and groundwater in the vicinity of the USTs which identified the presence of chlorinated volatile organic compounds (CVOCs), notably tetrachloroethylene (PCE) and trichloroethylene (TCE), and petroleum volatile organic compounds (PVOCs). The reported concentrations in soil and groundwater exceeded the applicable NYSDEC Standards Criteria, and Guidance (SCGs) based on the current and reasonably anticipated use of the site.

In soil, PCE was found at concentrations up to 10,000-mg/Kg, which is above its respective NYSDEC Part 375 Soil Cleanup Objective (SCO) for the Protection of Groundwater of 1.3-mg/Kg and its Industrial Use SCO of 300-mg/Kg. TCE was found at concentrations of up to 570-mg/Kg, which is also above its respective NYSDEC Part 375 SCO for the Protection of Groundwater of 0.47-mg/Kg and Industrial Use SCO of 400-mg/Kg. Subsurface soil samples where CVOCs and PVOCs were identified were collected from within the building at a depth of 6 to 8-feet below ground surface (bgs).

### 3.2 January 2015 Subsurface Investigation Report

A subsurface investigation was conducted by the NYSDEC and performed by EnviroTrac in the areas surrounding the site. The investigation consisted of the collection and laboratory analysis of five soil, five groundwater, and five soil vapor samples. Results of the investigation identified subsurface impacts primarily from petroleum related compounds, and to a lesser extent, chlorinated solvents in the area surrounding the site.

Five soil borings (DEC-01 through DEC-05) were installed in advance of monitoring well (MW-01 through MW-05) installation. One soil sample was retained from each boring location for laboratory analysis for volatile organic compounds (VOCs), semi-VOCs (SVOCs), and polychlorinated biphenyls (PCBs). During drilling activities, elevated photoionization detector (PID) readings and apparent contamination were encountered in two locations, DEC-02 (MW-02) and DEC-03 (MW-03), southeast and south-southeast respectively of the site. Two monitoring wells (EW-1 and EW-2) were located on the northeast side of the site and accessible for sampling. In addition to soil and groundwater, five soil vapor sampling locations (SG-1 through SG-5) were installed approximately five-feet of each soil boring/monitoring well.

Analytical results reported concentrations of VOCs, SVOCs, and PCBs as non-detect or below their respective NYSDEC Part 375 Unrestricted Use SCOs in each of the soil samples analyzed, except for several SVOCs detected in DEC-02 (MW-02). Each of the SVOCs detected were reported below its respective Commercial Use SCO. However, the concentration of benzo(a)anthracene (1,100 ppb), chrysene (1,100 ppb), and naphthalene (23,000 ppb) were each reported above their Part 375 Protection of Groundwater SCOs.

In groundwater, several VOCs and SVOCs were reported above their respective NYSDEC Ambient Water Quality Standard (AWQS) in groundwater side and downgradient to the site.

Analytical results reported several VOCs in both the soil vapor and ambient air samples.

The sample locations and summary results from the EBC and EnviroTrac investigations are shown on Figure 2.

The summary results tables from EBC and Envirotrac are included in Appendix D.

### 3.3 January 2018 Geophysical Survey

In January 2018, Castleton and their subcontractor EnviroProbe Service, Inc. (EnviroProbe), performed a geophysical survey at the site. The objective of the geophysical survey was to identify the presence of buried USTs and/or former UST locations, piping, and buried structures and utilities.

Results of the geophysical survey confirmed the presence and location of the suspected seven Varnolene USTs in the central portion of the site, one reported gasoline UST in the northern portion of the building interior, and one reported fuel oil UST in the sidewalk on the northeast portion of the building. The area of the potential gasoline tank shown in the northeast portion of the building on historic Sanborn Maps was not accessible during the survey.

### 3.4 February 2020 Test Pit Installation

In preparation for the planned Interim Remedial Measure (IRM) to remove the USTs and impacted soil, on February 18 and 19, 2020, Castleton and PAL Environmental Services Corp. (PAL) of Long Island City, New York, mobilized to the site to install test pits in the suspected Varnolene USTs. The effort was performed to determine their status, configuration, and depth of footings and foundation walls for development of Support of Excavation (SOE) to obtain New York City Department of Buildings (NYCDOB) permits.

PAL utilized a pneumatic hammer, mini-excavator, and skid steer to remove concrete and overburden from the suspected tank are in the southern portion of the building. Concrete was segregated and stockpiled in the southeast portion of the room and soil overburden was placed immediately back in the excavation. Real-time air monitoring for VOCs and particulates was performed during intrusive work. A negative pressure, self-contained work enclosure was established by PAL with proper air and emissions controls in place. Continuous real-time air monitoring for VOCs and particulates was performed by Castleton during work activities.

Results of the test pits confirmed the presence of six USTs in the southern portion of the building. The tops of six buried tanks were identified approximately two to three feet below the former concrete slab/pad. The excavated overburden generally consisted of dry, dark grey/dark brown, silty fill material. No elevated PID readings or visual/olfactory evidence of was observed. The concentration of VOCs and particulates monitored outside the work zone did not exceed background concentrations.

Five of the USTs were observed to be configured vertically and one tank was horizontal. Piping was observed to extend beneath the wall footing to the adjacent room to the east. Therefore, at least one buried UST is suspected to exist in this room as well. The width and the depth of the footing/foundation was observed to vary in width and depth along the northern wall of the room containing the USTs.

The test pit area was covered with polyethylene sheeting and secured to the surrounding floor/wall with adhesive spray and ballast by PAL.

Based on the results of the test pits, the building support system was not sufficient to allow for the removal of tanks and impacted soil and would be limited to exposing the tops of the tanks for proper decommissioning. As such, the IRM activities have been deferred until they can be more effectively addressed, following the completion of the remedial investigation.

The results of the 2018 geophysical survey and 2020 test pits are shown on Figure 2.

## 4.0 REMEDIAL INVESTIGATION WORK PLAN

Castleton will perform the following activities to characterize and delineate contamination in vapor, soil, and groundwater at the site. Subsurface soil, and groundwater sampling will be conducted in accordance with NYSDEC Department of Environmental Remediation (DER)-10 Technical Guidance for Site Investigation and Remediation, dated December 2002. *Sampling for 1,4-Dioxane and polyfluoroalkyl substances (PFAS)* Under DECs Part 375 Remedial Programs, dated June 2019, and *Sampling, Analysis, and Assessment of PFAS* Under NYSDECs Part 375 Remedial Programs, dated October 2020.

All sub-slab vapor, soil vapor, and ambient air samples will be collected and analyzed in accordance with the NYSDOH *Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York*, (October 2006), with updates (2015).

Sample locations may be modified during the investigation based on the geophysical survey, field conditions, and vapor, soil, and groundwater sample results with notification to NYSDEC and NYSDOH.

The proposed sampling frequency, analytes, methods, and QA/QC is summarized in Table 1.

Blank sampling logs, monitoring well construction logs, groundwater monitoring logs, etc. are included in the QAPP.

### 4.1 Management of Investigation

The RIWP activities will be performed by several organizations under contract to the volunteer. A description of their roles and relationships is provided below:

- NYSDEC – Lead Regulatory Agency
- NYSDOH – Human Health Exposure regulations
- B&B First Holdings, LLC – NYSDEC BCP Volunteer
- Castleton Environmental Geologic Services, DPC – Qualified Environmental Professional. Castleton will provide overall project management, coordination with the Volunteer, NYSDEC and NYSDOH, and contractors, and provide environmental consulting and oversight during field efforts. Other responsibilities include but are not limited to:
    - Observation and documentation of field effort. Preparation and submission of weekly, monthly, etc. reports to NYSDEC and NYSDOH.
    - Daily scheduling of work activities.
    - Perform air quality monitoring during work activities.
    - Collection of samples.
    - Coordination with the remedial and waste transportation/disposal contractors.
    - Preparation of completion reports.
- Renu Engineering Technologies, P.C. – Engineer of Record. Contracted directly to the volunteer.
    - Prepare work plans, design, and reports that require certification by a NYS licensed PE.
- PAL Environmental Services Corp. (PAL) – Environmental Contractor. Sub-contracted to Castleton.
    - Provide the manpower and machinery necessary to execute the RIWP effort.
    - Obtain necessary permits prior to commencing work.
    - Establish appropriate work/exclusion zones.
    - Provide field supervision, technicians, and equipment operators.
    - Provide transportation and disposal of generated wastes.
- Innovative Recycling Technologies (IRT) – Waste Disposal Contractor. Sub-contracted to PAL.
    - Field inventorying, screening, and segregating of wastes.

  - Field packaging of compatible waste streams.
  - Review of waste characterization data.
  - Determination of appropriate disposal facilities and obtain disposal approvals.
  - Determine appropriate waste haulers/transporters. To be contracted directly to the volunteer.
- York Analytical Laboratories, Inc. – A NYSDOH ELAP certified laboratory that will provide analytical services in support of the project.

### 4.2 Geophysical Survey

Prior to performing ground intrusive activities, geophysical survey shall be performed in the areas necessary to identify below grade obstructions, buried utilities, and clear the proposed subsurface sampling locations. The survey shall consist of the use of several remote sensing techniques including the use of a magnetometer to detect ferrous objects, a ground penetrating radar (GPR) survey to detect changes in soil density, and a utility tracing instrument to trace identified piping and utilities.

In additional to the geophysical survey, public utility mark outs will be completed prior to performing ground intrusive work.

### 4.3 Soil Vapor Intrusion Investigation

A soil vapor investigation will be performed to quantify the presence of VOCs in vapor throughout the site and determine if a vapor intrusion condition exists within the building. To assess the likely worse case conditions, the sampling will be performed during the heating season (approximately November 15 through March 31). Indoor air and co-located sub-slab soil vapor samples collected outside the heating season cannot be used to rule out exposure risk.

The rational for the sub-slab vapor, soil vapor, and ambient air sampling locations is described below:

- Seven sub-slab vapor samples (SSV01 through SSV07) will be collected within the building footprint to assess sub-slab vapor quality.
- Two soil vapor (SV01 and SV02) samples will be collected, one from the outdoor area on the eastern portion of the site and one from inside the building on northern property boundary, immediately adjacent to the sidewalk on East 139th Street to assess soil vapor quality.
- Seven indoor ambient air samples (IA01 through IA08) will be collected concurrently in the locations of the sub-slab and soil vapor samples to assess indoor air quality and potential vapor intrusion conditions.
- One outdoor ambient air sample (OA01) (control) will be collected to assess background air conditions.

A summary of the proposed sample matrices and sample identifications is provided in the table below:

| Vapor Sample Type | Proposed Sample ID | Ambient Air Type | Proposed Sample ID |
|---|---|---|---|
| Sub-Slab Vapor | SSV01 | Indoor Air | IA01 |
| | SSV02 | | IA02 |
| | SSV03 | | IA03 |
| | SSV04 | | IA04 |
| | SSV05 | | IA05 |
| | SSV06 | | IA06 |
| | SSV07 | | IA07 |
| Soil Vapor | SV01 | Outdoor Air | OA01 |
| | SV02 | | |

Notes:
Sub-Slab Vapor = SSV
Soil Vapor = SV
Indoor Air = IA
Outdoor Air = OA

The proposed vapor and ambient air sampling locations are shown on Figure 3.

### *4.3.1 Sub-Slab Vapor Sampling*

The sub-slab vapor samples points (SSV01 through SSV07) will be installed by drilling approximately ½ inch diameter holes through the building slab using a hammer drill or concrete core drill as needed. Sub-slab sampling points will be set no more than two inches below the concrete slab. The soil vapor points will be installed similarly or with a Geoprobe® as needed. The soil vapor point on the eastern exterior of the site (SV01) will be set to approximately two to three feet below the paved surface. The soil vapor point installed adjacent to the sidewalk on East 139th Street (SV02) will be set to approximately two to three feet below sidewalk elevation. Each vapor point will be installed using dedicated ¼ inch OD by 0.125-inch ID Teflon or high-density polyethylene (HDPE) tubing. The annular space will be backfilled with Number 2 filter sand and sealed with bentonite or other another non-VOC containing and non-shrinking product.

A tracer gas (helium) will be used in accordance with NYSDOH protocols to serve as a QA/QC method to verify the integrity of each vapor probe seal.  A portable monitoring device will be used to analyze a sample of air from the sampling point for the tracer prior to sampling. If the tracer sample results show a significant presence of the tracer, the probe seals will be adjusted to prevent infiltration.

One to three volumes of air will be purged prior to sample collection to ensure samples collected are representative. Flow rate of both purging and sampling will not exceed 0.2 L/min.  Sampling will occur for approximately 8-hours. A sample log sheet will be maintained summarizing sample identification, date and time of sample collection, sampling depth, identity of samplers, sampling methods and devices, soil vapor purge volumes, volume of the soil vapor extracted, vacuum of canisters before and after the samples are collected, apparent moisture content of the sampling zone, and chain of custody protocols.

Sub-slab and soil vapor samples will be collected in 6-liter Summa canisters which have been certified clean by the laboratory. The samples will be submitted to a NYSDOH ELAP certified laboratory and tested for the following analytes:

- VOCs via USEPA Method TO-15

### *4.3.2 Indoor and Outdoor Ambient Air Sampling*

Indoor air samples (IA01 through IA07) will be placed approximately three to five feet above the building slab proximate to sub-slab and soil vapor locations. The outdoor air sample will be placed 3 to 5 feet above ground level. Samples will be collected using Summa canisters (batch certified clean by the laboratory) fitted with flow controllers not to exceed 200 ml/min and will run for approximately 8-hours.

Indoor and outdoor ambient air samples will be submitted to a NYSDOH ELAP certified laboratory and tested for the following analytes:

- VOCs by USEPA Method TO-15

## 4.4 Subsurface Soil Investigation

To delineate the horizontal and vertical extent of impact in soil, an estimated ten soil borings (SB01 through SB10) will be installed using direct push technology (Geoprobe®) to the surface of bedrock, estimated at 20-30 feet bgs. Soil boring locations will be determined based on previous investigations, results of the geophysical survey, and field observations. Each soil boring will be logged describing moisture content, color, grain size(s), along with any indications of potential odor and stains.

The proposed soil borings are shown on Figure 4.

### *4.4.1 Subsurface Soil Sampling*

Direct push drilling equipment will be outfitted with a two-inch diameter macro-core sampler using dedicated acetate liners. Boring locations will be pre-cleared by the geophysical survey contractor. Locations may be hand cleared as necessary to avoid buried obstructions or utilities.

Subsurface soil will be collected continuously from grade to the surface of bedrock. The lithology of recovered soil will be logged using the Unified Soil Classification System (USCS) and screened for the presence of VOCs using a PID. Subsurface soil samples shall be consistent with DER-10. If impacted soils are identified, a minimum of four soil samples are recommended, one at the bedrock interface, one immediately above the groundwater interface, one from the most impacted (based on field screening and highest PID readings), and one from the clean interval. If no apparent impacted soils are identified, then a minimum of two samples, one from the interval immediately above the groundwater table interface and one from the deepest/terminal interval of the boring, shall be collected. Groundwater is estimated at five to nine feet bgs.

Additional soil samples may be collected from select boring locations based on field observations. Step out soil borings may be installed based on field observations and/or initial analytical results with communication to NYSDEC and NYSDOH.

Soil samples will be submitted to a NYSDOH ELAP laboratory and tested for the following analytes:

- TCL VOCs via USEPA Method 8260
- TCL SVOCs via USEPA Method 8270
- TCL Pesticides and PCBs by USEPA Methods 8081/8082
- TAL Metals by USEPA Methods 6010/7471
- PFAS by USEPA Method 537m PFAS Analyte List
- 1,4-Dioxane by USEPA Method 8270 SIM

## 4.5 Groundwater Investigation

### *4.5.1 Monitoring Well Installation*

To monitor the degree of impact to groundwater and groundwater flow, a groundwater monitoring network consisting of six monitoring well couplets (MW01 through MW06) will be installed. Each couplet will consist of one well screened at the groundwater table interface and at least one additional deep interval above the surface of bedrock. The final location and screen intervals of the monitoring wells will be based on the results of the vertical profiling. The monitoring wells will be installed using direct push (Geoprobe®) or other drilling technology, as necessary.

Each monitoring well will be constructed using two-inch diameter schedule 40 polyvinyl chloride (PVC) screen (0.010-inch slot) and riser. A #00 sand will be used as a sand filter pack around the screen zones. The filter pack will be sealed using an approximately two-feet thick layer of bentonite clay. The remaining exposed riser will be backfilled using #02 sand to approximately one-foot bgs and completed with flush mounted boxes and covers set in concrete pads. Each monitoring well (excluding bedrock interface wells) will be equipped with a minimum of two-foot PVC well sump.

The proposed monitoring well couplets are shown on Figure 5.

### *4.5.2 Monitoring Well Development*

Following the installation of monitoring wells and prior to sampling, each new monitoring well will be properly developed in accordance with applicable guidance. Each well will be developed by vigorously pumping/surging until the discharge water is relatively sediment free and the groundwater parameters (pH, temperature, and specific conductivity) have stabilized. The intent of the development effort is to remove fine sediment from the annulus surrounding the well screen to improve performance. The turbidity and groundwater parameters of discharge water will be continuously monitored to keep the volume of water discharged to a minimum. A turbidity reading of 50-nephelometric turbidity units (NTUs) and steady state (+/- 10%) groundwater parameters will be used as guidance for discontinuing well development. Groundwater and monitoring wells will be given a minimum of one week to equilibrate prior to the first groundwater sampling event.

### *4.5.3 Well Elevation Survey and Measure Water Levels and Product Thickness*

An elevation survey for each installed monitoring well will be completed to measure and routinely monitor the relative groundwater elevation. The monitoring well elevation will be referenced to an arbitrary vertical datum.

After the relative elevation of monitoring wells is determined, a round of water levels will be measured using an interface probe capable of measuring to the nearest one-hundredth of a foot. If non-aqueous phase liquid (NAPL) is observed, the NAPL thickness will be measured and a NAPL sample will be collected using a dedicated polyethylene bailer. If collected NAPL samples will be submitted to a NYSDOH ELAP certified laboratory and tested for the following analytes:

- Specific Gravity by USEPA Method D1298.
- TCL VOCs by USEPA Method 8260.
- Fingerprint Analysis - Gasoline Range and Diesel Range Organics (GRO/DRO) by USEPA Method 8015.

Given the potential presence of Dense NAPL (DNAPL) in the monitoring wells, special consideration shall be taken, such as (but not limited to) the installation of DNAPL collection systems, sumps, or DNAPL pumps in deep monitoring wells as appropriate.

### *4.5.4 Groundwater Sampling*

An initial round of groundwater sampling will be performed to characterize shallow and deep groundwater quality at the site. One representative groundwater sample will be collected from each well using low-flow sampling techniques. To allow the monitoring wells time to equilibrate, the first groundwater sampling event will take place a minimum of one week after the completion of monitoring well installation and development.

Groundwater samples retained for laboratory analysis shall be placed in laboratory supplied glassware and packed in a cooler on ice for delivery under proper Chain of Custody procedures. Groundwater samples will be submitted to a NYSDOH ELAP laboratory and tested for the following analytes:

- TCL VOCs via USEPA Method 8260
- TCL SVOCs via USEPA Method 8270
- TCL Pesticides PCBs by USEPA Methods 8081/8082
- TAL Metals by USEPA Methods 6010/7471
- PFAS by USEPA Method 537m PFAS Analyte List
- 1,4-Dioxane by USEPA Method 8270 SIM

### 4.6 Investigation Derived Waste

Investigation Derived Waste (IDW) generated during field activities include, but are not limited to the following:

- Purge water
- Poly sheeting
- Spent macrocore acetate liners
- PPE
- Drill cuttings and soil boring spoils

This IDW must be placed in 1A2 open head 55-gallon steel drums pending shipment off site for disposal. Drummed IDW is to be divided into the following categories:

- Drill cuttings and soil boring spoils
- Purge water from monitoring well development/sampling
- Solid waste other than drill cuttings and boring spoils.

Impacted soil or liquid, or other waste derived and removed from the site will be managed as regulated material and will be disposed of in accordance with applicable laws and regulations.

Appropriately licensed haulers will be used for material removed from this Site and will be in full compliance with all applicable local, State and Federal regulations.

Waste characterization will be performed for offsite disposal in a manner required by the receiving facility and in conformance with its applicable permits. Waste characterization sampling and analytical methods, sampling frequency, analytical results, and QA/QC will be reported in the RI Report (RIR). A manifest system for offsite transportation or exported material will be employed and reported in the completion report. Hazardous wastes derived from onsite will be stored, transported, and disposed of in compliance with applicable laws and regulations.

IRT as been subcontracted by the remedial contractor PAL to properly waste profile, handle, transport and dispose of investigation derived waste, as described in Section 4.1.

## 5.0 QUALITY ASSURANCE/QUALITY CONTROL

QA/QC procedures will be used to provide performance information about accuracy, precision, sensitivity, representation, completeness, and comparability associated with the sampling and analysis for this investigation. Field QA/QC procedures will be used (1) to document that samples are representative of actual conditions at the Site and (2) identify possible cross-contamination from field activities or sample transit. Laboratory QA/QC procedures and analyses will be used to demonstrate whether analytical results have been biased either by interfering compounds in the sample matrix, or by laboratory techniques that may have introduced systematic or random errors to the analytical process. At a minimum, QA/QC procedures shall meet ASP-B protocol requirements.

A site-specific QAPP is provided as Appendix B.

### 5.1 QA/QC Samples

To assess the adequacy of the sample collected and decontamination procedures performed in the field, QA/QC samples were collected and analyzed throughout the field sampling program. In general, QA/QC samples shall confirm that the procedures performed in the field are consistent and acceptable. QA/QC samples must include trip blanks, field blanks, blind duplicates, matrix spike (MS), and matrix spike duplicate (MSD). Types and frequencies of field QA/QC samples are provided in the table below:

| **Type** | **Frequency** |
|---|---|
| Trip Blank | One per cooler (when VOCs are collected) |
| Equipment/Field Blank | One per day per matrix sampled |
| Blind Duplicate | One per 20 samples per matrix |
| MS/MSD | One per 20 samples per matrix |

### 5.2 Laboratory QA/QC

An ELAP-certified laboratory will be used for all sample analyses. The laboratory will follow the following QA/QC protocols. All samples will be delivered to the laboratory within 24 hours of sample collection. Samples will be received by laboratory personnel, who will inspect the sample cooler(s) to check the integrity of the custody seals. The cooler(s) will then be opened, the samples unpackaged, and the information on the chain-of-custody form examined. If the shipped samples match those described on the chain-of-custody form, the laboratory sample custodian will sign and date the form on the next “Received” blank and assume responsibility for the samples. If problems are noted with the sample shipment, the laboratory custodian will sign the form and record problems in the “Remarks” box. The custodian will then immediately notify the Project Manager so appropriate follow-up steps can be implemented on a timely basis.

A record of the information detailing the handling of a particular sample through each stage of analysis will be maintained by the laboratory. The record will include:

- Job reference, sample matrix, sample number, and date sampled.
- Date and time received by laboratory, holding conditions, and analytical parameters.
- Extraction date, time, and extractor's initials (if applicable), analysis date, time, and analyst's initials.
- QA batch number, date reviewed, and reviewer's initials.

### 5.3 Data Usability Summary Report (DUSR)

A Data Usability Summary Report (DUSR) will be prepared by a third-party contractor, which will present the results of data validation, including a summary assessment of laboratory data packages, sample preservation and chain of custody procedures, and a summary assessment of precision, accuracy, representativeness, comparability, and completeness for each analytical method.

## 6.0 HEALTH AND SAFETY PLAN

A site-specific HASP has been prepared for the site. The Site Safety Coordinator will be Brian Barth. Investigative work performed under this Work Plan will be in full compliance with applicable health and safety laws and regulations, including Site and OSHA worker safety requirements and HAZWOPER requirements. Confined space entry, if any, will comply with OSHA requirements and industry standards and will address potential risks. The parties performing the investigation work will ensure that performance of work follows the HASP and applicable laws and regulations.

All field personnel involved in investigation activities will participate in training required under 29 CFR 1910.120, including 40-hour hazardous waste operator training and annual 8-hour refresher training. Site Safety Officer will be responsible for maintaining workers training records.

A copy of the site-specific HASP is provided as Appendix A.

## 7.0 COMMUNITY AIR MONITORING PLAN

A Community Air Monitoring Plan (CAMP) is required per DER-10 (Appendix 1A, NYSDOH, Generic CAMP) during all intrusive activities. Real-time continuous air monitoring for VOCs and particulates will be performed during ground intrusive activities. Periodic monitoring for VOCs will be performed during non-intrusive activities such as groundwater sampling from existing monitoring wells.

The monitoring shall be consistent with the NYSDOH *Generic Community Air Monitoring Plan,* dated May 2010 (contained in DER-10). If work is performed within 20 feet of potentially exposed individuals or structures, and for indoor work with co-located residences or facilities, the monitoring shall also be consistent with the *Special Requirements for Work Within 20-feet of Potentially Exposed Individuals or Structures,* dated June 2000.

CAMP data summary tables will be maintained during CAMP activities and provided to the NYSDEC and NYSDOH at a minimum of a weekly basis. The Departments will be notified immediately (within 24 hours) of any CAMP Action Level exceedances and corrective measures taken.

A copy of the CAMP documents is included in Appendix E.

## 8.0 FISH AND WILDLIFE

A Fish and Wildlife Resources Impact Analysis (FWRIA) of existing and future potential environmental impacts to sensitive fish and wildlife receptors, wetlands, groundwater resources, and surface water will be performed upon completion of the RIWP activities and receipt of laboratory analysis.

The FWRIA shall be conducted in accordance with the NYSDEC Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites guidance and DER-10.

The purpose is to characterize the physical and biological characteristics and evaluate the potential impact of site related chemicals of concern to fish and wildlife resources. The results of the FWRIA will be included in the Remedial Investigation Report (RIR) prepared after the completion of RIWP activities.

## 9.0 REPORTING

Following the complete delineation of impact at the site, a RRIR will be prepared to document the results of the remedial investigation (RI). The RIR shall document the results of the RI and make further recommendations as to whether remediation is necessary.

As specified in Appendix 3-B of DER-10, a Qualitative Human Health Exposure Assessment (QHHEA) and Conceptual Site Model will be completed as part of the RIR.
If it is determined that additional delineation is required beyond the anticipated scope of work described, an interim RIR may be prepared to summarize the investigation activities and results and propose further investigation efforts, as necessary.

All data will be submitted electronically to EQuIS, using the standardized electronic data deliverable (EDD) format.

Daily progress reports shall be prepared and submitted to the NYSDEC during site activities. Monthly reports will be submitted to the Department by the 10th of every month.

## 10.0 SCHEDULE

The RIWP activities shall commence upon finalizing the RIWP and completion of the 30-day public comment period. Based on the current timeframe, RIWP activities are anticipated to start by mid-May to June 1, 2021. Estimated project milestones are outlined below:

- June 1, 2021 – Begin RI, mobilize to perform geophysical survey as needed.
- July 1, 2021 – Perform subsurface soil investigation and delineate soil contamination.
- August 1, 2021 – Select monitoring well couplet locations based on results of subsurface soil investigation and install.
- September 1, 2021 – Develop and survey monitoring wells. Begin synoptic groundwater monitoring.
- October 1, 2021 – Delineate groundwater contamination.
- November 15 – Mobilize to perform Soil Vapor Investigation during the heating season (November 15 to March 31).
- December 31, 2021 – Complete vapor, soil, and groundwater sampling for RIWP.
    - Continue groundwater monitoring as required by the NYSDEC.
- January 1, 2022 – Perform data validation and compile investigation results.
- April 1, 2022 – Complete the RIR.

# FIGURES

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# SITE LOCATION

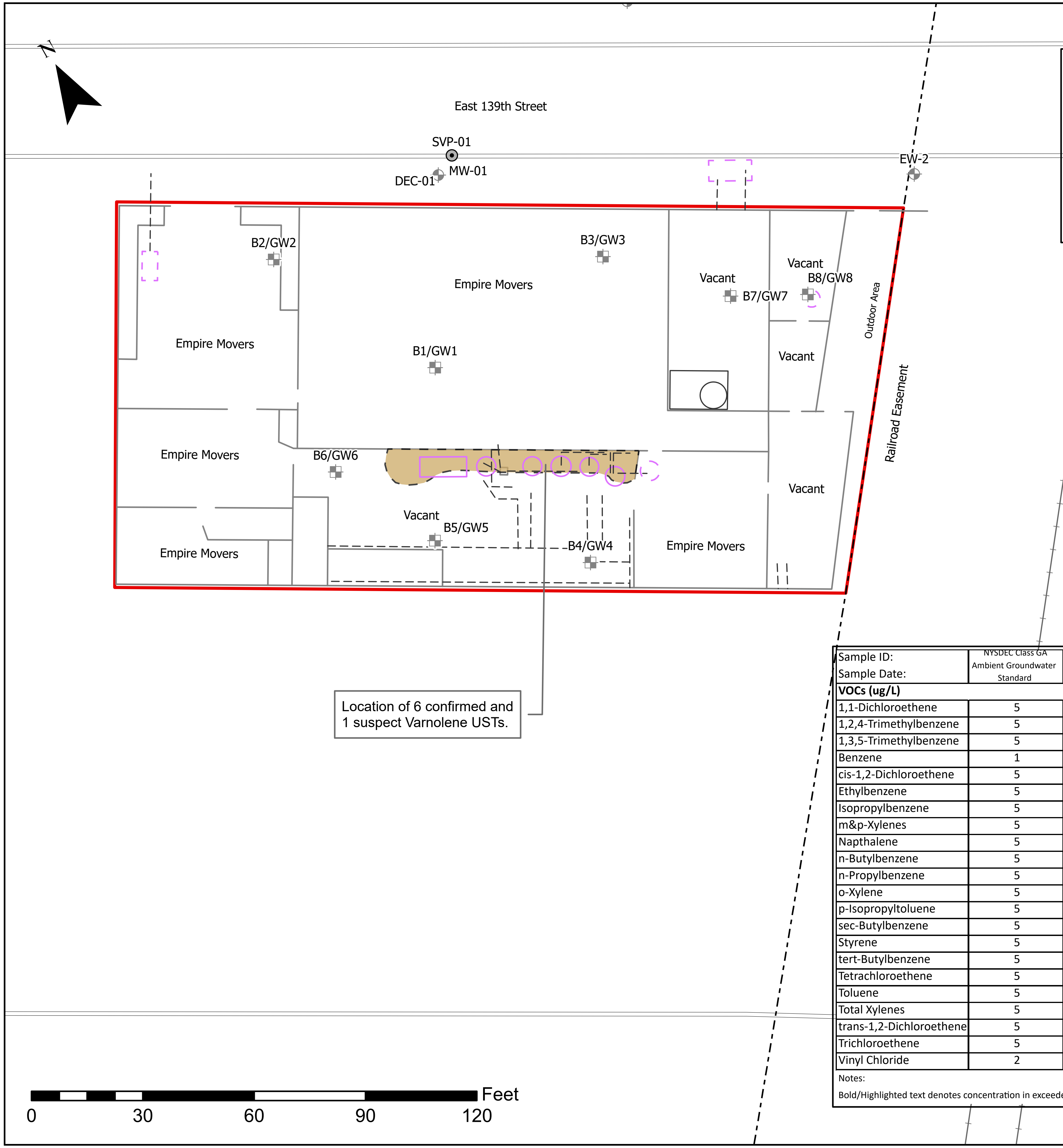
808 East 139th Street
Bronx, New York

Miles
0 ¼ ½ ¾ 1

| | |
|---|---|
| PROJECT: | AJRC1701 |
| DATE: | 7/17/2018 |
| DRAWN BY: | BB |
| APPROVED BY: | FPC |

***FIGURE:***

1



| Sample ID:<br>Sample Date:<br>Depth: | NYSDEC Part 375 IUSCO | NYSDEC Part 375 CUSCO | B1<br>12/10/2013<br>6-8' | B4<br>12/10/2013<br>6-8' | B5<br>12/10/2013<br>6-8' | B6<br>12/10/2013<br>6-8' |
|---|---|---|---|---|---|---|
| **VOCs (mg/Kg)** | | | | | | |
| 1,2,4-Trimethylbenzene | 380 | 190 | 46 | **360** | **260** | **190** |
| Tetrachloroethene | 300 | 150 | **10,000** | ND | ND | ND |
| Trichloroethene | 400 | 200 | **570** | ND | ND | ND |

Notes:

Bold/Highlighted text denotes concentration in exceedece of NYSDEC Part 375 Commercial Use SCO.

IUSCO: Industrial Use SCO - NYSDEC Part 375 Restricted Use - Table 6.8(b)

CUSCO: Commercial Use SCO - NYSDEC Part 375 Restricted Use - Table 6.8(b)

| Sample ID:<br>Sample Date: | NYSDEC Class GA Ambient Groundwater Standard | GW1<br>12/10/2013 | GW2<br>12/10/2013 | GW3<br>12/10/2013 | GW4<br>12/10/2013 | GW5<br>12/10/2013 | GW6<br>12/10/2013 | GW7<br>12/10/2013 | GW8<br>12/10/2013 |
|---|---|---|---|---|---|---|---|---|---|
| **VOCs (ug/L)** | | | | | | | | | |
| 1,1-Dichloroethene | 5 | **170** | ND | ND | ND | ND | ND | ND | ND |
| 1,2,4-Trimethylbenzene | 5 | **230** | **24** | **650** | **3,000** | **1,900** | **1,700** | **15** | ND |
| 1,3,5-Trimethylbenzene | 5 | ND | ND | **130** | **530** | **590** | **530** | **7.1** | ND |
| Benzene | 1 | ND | ND | ND | **16** | **12** | ND | ND | **3.9** |
| cis-1,2-Dichloroethene | 5 | **69,000** | **12** | **140** | **890** | **2,300** | **16,000** | ND | **2.2** |
| Ethylbenzene | 5 | ND | **11** | **89** | **180** | **270** | **100** | ND | ND |
| Isopropylbenzene | 5 | ND | **140** | **180** | **110** | **110** | **90** | **51** | ND |
| m&p-Xylenes | 5 | ND | ND | **59** | **460** | **760** | **340** | ND | ND |
| Napthalene | 5 | ND | **180** | **30** | **210** | **27** | **380** | **11** | ND |
| n-Butylbenzene | 5 | ND | **54** | **250** | **140** | **71** | **100** | **55** | ND |
| n-Propylbenzene | 5 | ND | **270** | **400** | **210** | **190** | **160** | **110** | ND |
| o-Xylene | 5 | ND | ND | **77** | **340** | **370** | **340** | ND | ND |
| p-Isopropyltoluene | 5 | ND | ND | **67** | **120** | **85** | **130** | ND | ND |
| sec-Butylbenzene | 5 | ND | **85** | **240** | **130** | **76** | **100** | ND | **6.5** |
| Styrene | 5 | ND | ND | ND | ND | **12** | ND | ND | ND |
| tert-Butylbenzene | 5 | ND | **17** | **12** | ND | **11** | ND | **12** | ND |
| Tetrachloroethene | 5 | **55,000** | **21** | **1,200** | **26** | **16** | ND | ND | ND |
| Toluene | 5 | ND | ND | **10** | **80** | **68** | **46** | ND | ND |
| Total Xylenes | 5 | ND | ND | **136** | **800** | **1,130** | **680** | ND | ND |
| trans-1,2-Dichloroethene | 5 | **120** | ND | ND | ND | ND | **38** | ND | ND |
| Trichloroethene | 5 | **21,000** | ND | **170** | ND | ND | ND | ND | ND |
| Vinyl Chloride | 2 | **770** | ND | **29** | **32** | **130** | **310** | ND | **45** |

Notes:

Bold/Highlighted text denotes concentration in exceedece of NYSDEC Class GA Ambient Groundwater Standard

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- ⊞ **2013 EBC Phase II Soil and GW Boring**
- ⊕ **2015 Envirotrac Monitoring Well**
- ⊙ **2015 Envirotrac Soil Vapor Point**
- – – **Suspect Piping**
- ⌜⌝ **Suspect UST**
- ▭ **Confirmed UST**
- ▨ **October 2020 IRM Test Pit Extents**
- 🟥 **Subject Site**

Note: The October 2020 test pit effort was performed under the planned IRM.

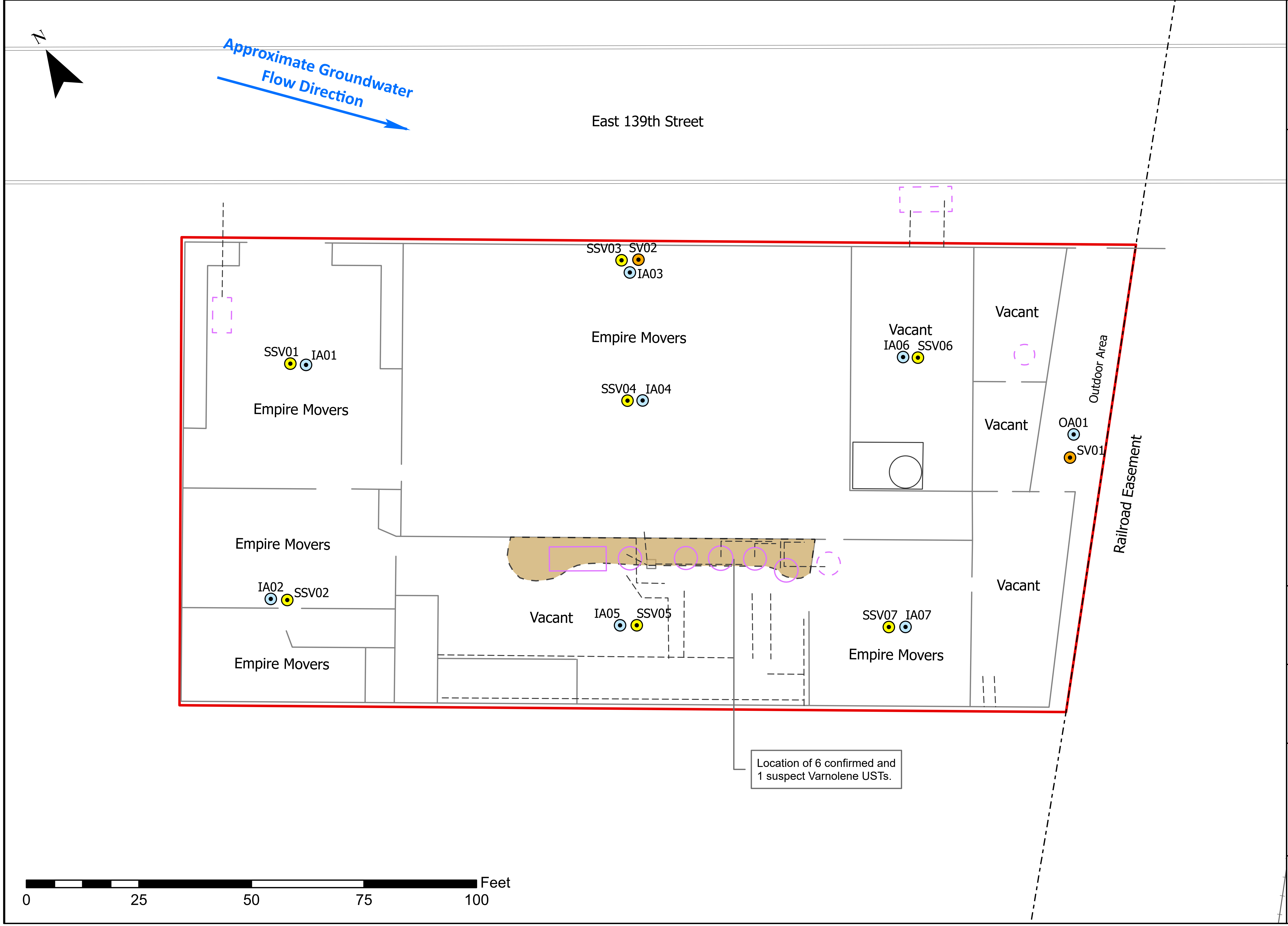
PREPARED FOR:
Mr. Andrew Bullaro
B & B First Holdings LLC
334 Faile Street
Bronx, New York

| | |
|---|---|
| PROJECT: | AJRC1701 |
| DATE: | 5/4/2021 |
| SCALE: | AS SHOWN |
| DRAWN BY: | BB |
| APPROVED BY: | FPC |

# Site Plan And Previous Investigation Results

808 East 139th Street
Bronx, New York

***FIGURE:***
2



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- ● Proposed Sub-Slab Vapor Point
- ● Proposed Soil Vapor Point
- ● Proposed Ambient Air Location
- - - Suspect Piping
- ▭ Suspect UST
- ▭ Confirmed UST
- ▨ October 2020 IRM Test Pit Extents
- ▭ Subject Site

Note: The October 2020 test pit effort was performed under the planned IRM.

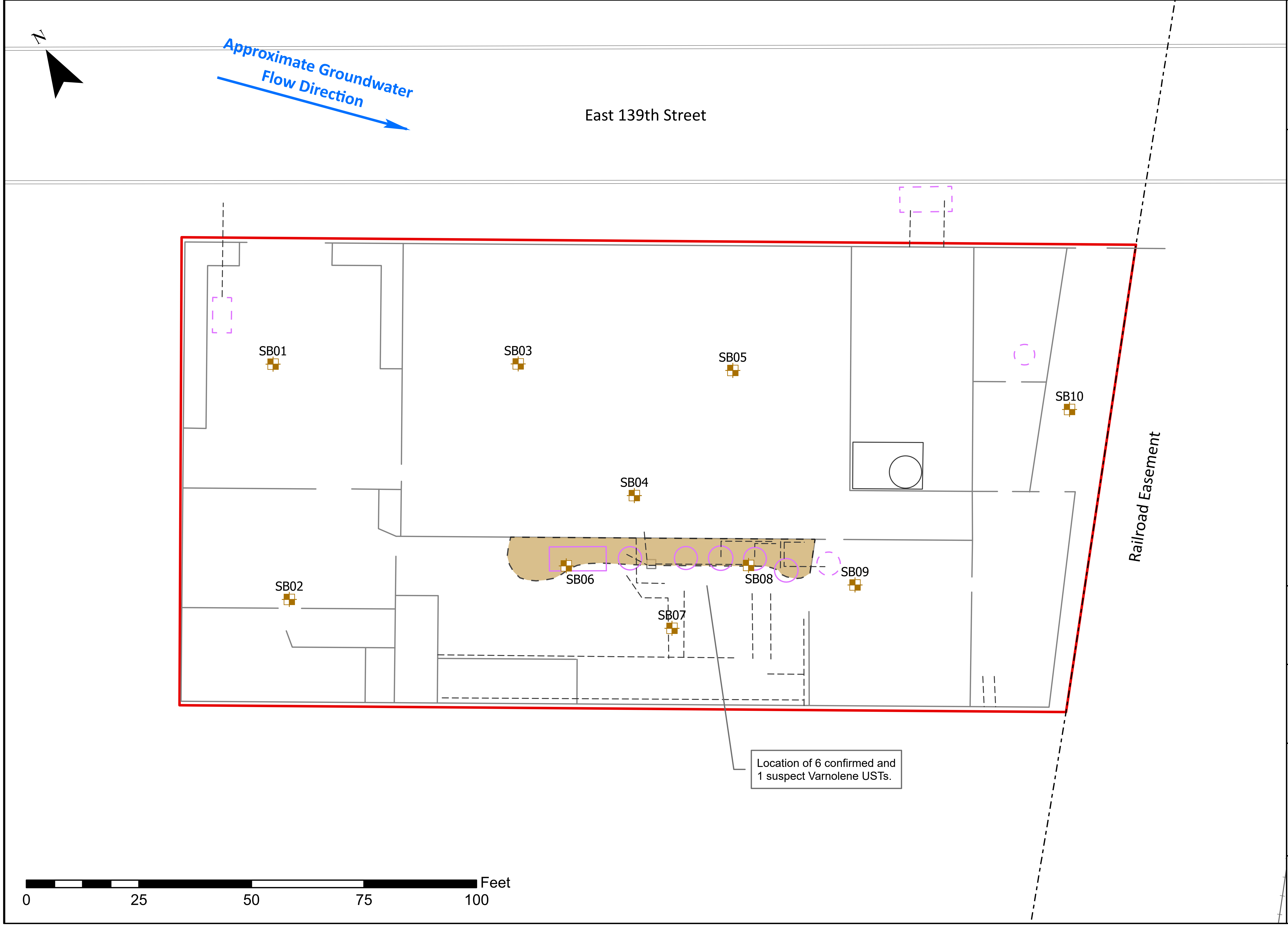
PREPARED FOR:
Mr. Andrew Bullaro
B & B First Holdings LLC
334 Faile Street
Bronx, New York

PROJECT: AJRC1701
DATE: 5/5/2021
SCALE: AS SHOWN
DRAWN BY: BB
APPROVED BY: FPC

## Proposed Vapor Sampling

808 East 139th Street
Bronx, New York

*FIGURE:* 3



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- ▨ Proposed Soil Boring
- - - Suspect Piping
- ⬚ Suspect UST
- ☐ Confirmed UST
- ▨ October 2020 IRM Test Pit Extents
- 🟥 Subject Site

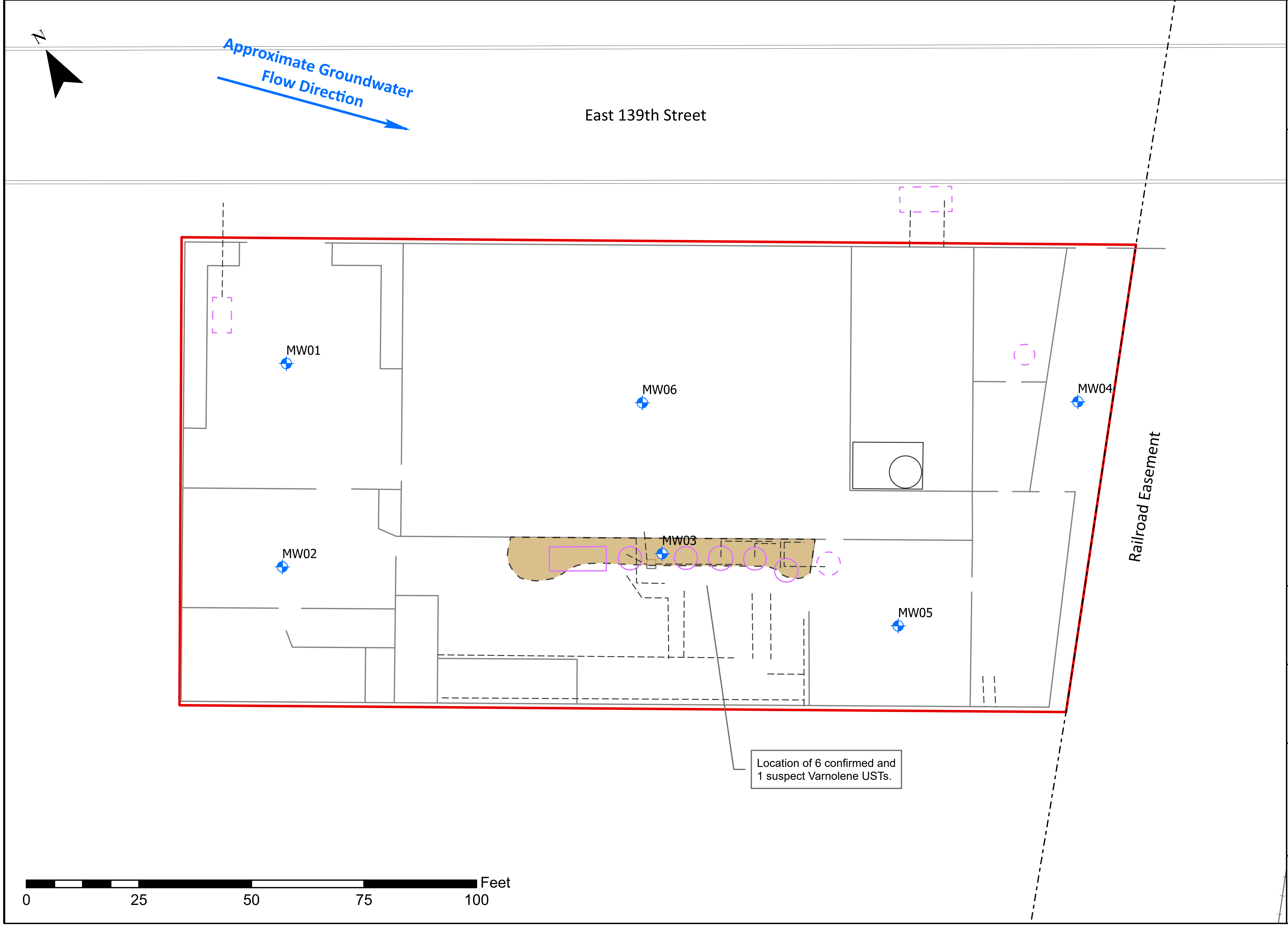
PREPARED FOR:
Mr. Andrew Bullaro
B & B First Holdings LLC
334 Faile Street
Bronx, New York

| | |
|---|---|
| PROJECT: | AJRC1701 |
| DATE: | 5/5/2021 |
| SCALE: | AS SHOWN |
| DRAWN BY: | BB |
| APPROVED BY: | FPC |

# Proposed Soil Borings

808 East 139th Street
Bronx, New York

*FIGURE:*
4



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- **Proposed Monitoring Well Couplet**
- – – **Suspect Piping**
- **Suspect UST**
- **Confirmed UST**
- **October 2020 IRM Test Pit Extents**
- 🟥 **Subject Site**

PREPARED FOR:
Mr. Andrew Bullaro
B & B First Holdings LLC
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Bronx, New York

| | |
|---|---|
| PROJECT: | AJRC1701 |
| DATE: | 5/5/2021 |
| SCALE: | AS SHOWN |
| DRAWN BY: | BB |
| APPROVED BY: | FPC |

## Proposed Monitoring Well Couplets

808 East 139th Street
Bronx, New York

*FIGURE:*
5

# TABLES

## TABLE 1
## 808 E 139th ST, Bronx, NY
## Remedial Investigation Work Plan
## Proposed Sampling Frequency, Matrices, and Analyses

| Matrix | Analyte | USEPA Analytical Method | Sample Frequency | QC Samples | | | | Grand Total |
|---|---|---|---|---|---|---|---|---|
| | | | | Trip Blank | Equipment Blank | Blind Duplicate | MS/MSD | |
| **Soil Vapor Intrusion Investigation** | | | | | | | | |
| Sub-Slab Vapor | TCL VOCs | TO-15 | 7 | NA | 0 | 1 | 0 | |
| Soil Vapor | TCL VOCs | TO-15 | 2 | NA | 0 | 1 | 0 | |
| Ambient Air | TCL VOCs | TO-15 | 9 | NA | 0 | 1 | 0 | |
| *Total Vapor and Air Samples* | | | *18* | NA | 1 | 1 | 1 | **19** |
| **Subsurface Soil Investigation** | | | | | | | | |
| Soil | TCL VOCs | 8260 | 40 | 4 | 4 | 2 | 2 | |
| Soil | TCL SVOCs | 8270 | 40 | 0 | 4 | 2 | 2 | |
| Soil | TCL Pesticides and PCBs | 8080/8082 | 40 | 0 | 4 | 2 | 2 | |
| Soil | TAL Metals | 6010/7471 | 40 | 0 | 4 | 2 | 2 | |
| Soil | PFAS (PFAS Analyte List) | 537m | 40 | 0 | 4 | 2 | 2 | |
| Soil | 1,4-Dioxane | 8270 SIM | 40 | 0 | 4 | 2 | 2 | |
| *Total Subsurface Soil Samples* | | | *40* | 4 | 4 | 2 | 2 | **52** |
| **Initial Round of Monitoring Well Couplet Sampling** | | | | | | | | |
| Groundwater | TCL VOCs | 8260 | 12 | 2 | 2 | 1 | 1 | |
| Groundwater | TCL SVOCs | 8270 | 12 | 0 | 2 | 1 | 1 | |
| Groundwater | TCL Pesticides and PCBs | 8080/8082 | 12 | 0 | 2 | 1 | 1 | |
| Groundwater | TAL Metals | 6010/7471 | 12 | 0 | 2 | 1 | 1 | |
| Groundwater | PFAS (PFAS Analyte List) | 537m | 12 | 0 | 2 | 1 | 1 | |
| Groundwater | 1,4-Dioxane | 8270 SIM | 12 | 0 | 2 | 1 | 1 | |
| *Total Monitoring Well Groundwater Samples* | | | *12* | 2 | 2 | 1 | 1 | **18** |
| **Non-Aqueous Phase Liquids (if necessary)** | | | | | | | | |
| NAPL | Specifc Gravity | D1298 | | | | | | |
| NAPL | TCL VOCs | 8260 | | | | | | |
| NAPL | PCBs | 8082 | | | | | | |
| NAPL | Petroleum Product ID | 8015 | | | | | | |
| NAPL | Viscocity @ 15 Deg C. | D455 | | | | | | |
| NAPL | Interfacial Tension @ 15 Deg C. | D791 | | | | | | |
| **Waste Profile/Disposal Samples (if necessary)** | | | | | | | | |
| Soil | RCRA Characteristics | 1030/9045/SW846 | | | | | | |
| Soil | Full TCLP | 1311/8260/8270/8081/8151/6010/7470 | | | | | | |

Notes:

The total number of samples are estimated and may be changed based upon the screening/sampling results and field observations.

Vapor QA/QC samples (equip. blank, duplicate, and MS/MSD) collected as one QA/QC sample.

# APPENDIX A

CASTLETON
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# Health and Safety Plan

# Ace Suede and Leather
# 808 East 139th Street
# Bronx, New York
# NYSDEC Site No: C203072

## June 2021

Prepared for: B & B First Holdings LLC
334 Faile Street
Bronx, NY

# HEALTH AND SAFETY PLAN
# ACE SUEDE AND LEATHER
# 808 EAST 139TH STREET
# BRONX, NEW YORK
# NYSDEC SITE NO: C203072
# JUNE 2021

## Table of Contents

# HEALTH AND SAFETY PLAN
# ACE SUEDE AND LEATHER
# 808 EAST 139TH STREET
# BRONX, NEW YORK
# NYSDEC SITE NO: C203072
# JUNE 2021

## Tables

## Appendices

## 1.0 STATEMENT OF COMMITMENT

This Health and Safety Plan (HASP) has been prepared to ensure that workers are not exposed to chemical, biological and physical hazards during the planned environmental work to be performed at 808 East 139th Street, Bronx, New York (the site). It is the policy of Castleton Environmental Geologic Services, DPC. (Castleton), to minimize the possibility of work-related exposure through awareness and qualified supervision, health and safety training, medical monitoring, use of appropriate personal protective equipment, and the following activity specific safety protocols contained in this HASP. Castleton has established a guidance program to implement this policy in a manner that protects personnel to the maximum reasonable extent.

This HASP, which applies to persons present at the site actually or potentially exposed to safety or health hazards, describes emergency response procedures for actual and potential physical, biological and chemical hazards. This HASP is also intended to inform and guide personnel entering the work area or exclusion zone. Persons are to acknowledge that they understand the potential hazards and the contents of this Health and Safety policy.

## 2.0 INTRODUCTION

### 2.1 Purpose

This HASP addresses the minimum health and safety practices that will be employed by site workers participating in investigation activities at the project site located at 808 East 139th Street, Bronx, New York.

The HASP considers the specific hazards inherent to the site and presents the minimum requirements which are to be met by Castleton, their subcontractors, and other on-site personnel in order to avoid and, if necessary, protect against health and/or safety hazards. Contractors will have the option of adopting this HASP or developing their own site-specific document. If a subcontractor chooses to prepare their own HASP, it must meet the minimum requirements as detailed in this HASP and must be made available to Castleton.

Activities performed under this HASP will comply with applicable parts of Occupational Safety and Health Administration (OSHA) Regulations, primarily 29 CFR Parts 1910 and 1926 and all other applicable federal, state, and local regulations. Modifications to the HASP may be made with the approval of the Castleton Health and Safety Manager (HSM) and/or Project Manager (PM). A copy of this HASP will be maintained on-site during all work activities.

Refusal to comply with the HASP or violation of any safety procedures by field personnel may result in their immediate removal from the site following consultation with the HSM and the Field Team Leader (FTL).

### 2.2 Scope

This HASP addresses the potential hazards related to the environmental investigation activities. The primary environmental investigation activities include the following:

- Site Mobilization/Demobilization;
- Soil, Groundwater, Soil Vapor, and Ambient Air Sampling, and

- Monitoring Well/Vapor Point Installation

The potential hazards associated with this scope are listed below and are discussed in more detail in this HASP after the project organization and responsibilities section.

- Chemical Hazards
- Biological Hazards
- Physical Hazards

### 2.3 Application

The HASP applies to all personnel involved in the above tasks who wish to gain access to active work areas, including but not limited to:

- Castleton employees and subcontractors;
- Client representatives; and
- Federal, state or local representatives.

## 3.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

This section specifies the project organization and responsibilities.

### 3.1 Project Manager

- Participates in major incident investigations;
- Ensures that the HASP has all the required approvals before site work is conducted; and
- Has the overall project responsibility for project health and safety.

### 3.2 Field Team Leader (FTL) / Site Health and Safety Officer (SHSO)

- Ensures that the HASP is implemented in conjunction with the Health and Safety Manager (HSM);
- Ensures that field work is scheduled with adequate equipment to complete the job safely;
- Enforces site health and safety rules;
- Ensures that proper personal protective equipment is utilized;
- Ensures that the HSM is informed of project changes that require modifications to the HASP;
- Ensures that the procedure modifications are implemented;
- Investigates incidents;
- Conducts the site safety briefing;
- Reports to HSM to provide summaries of field operations and progress; and
- Acts as Emergency Coordinator.

### 3.3 Health and Safety Manager

- Provides for the development of the HASP;
- Serves as the primary contact to review health and safety matters that may arise;
- Approves individuals who are assigned SHSO responsibilities;
- Coordinates revisions of this HASP with field personnel; and
- Assists in the investigation of major accidents.

### 3.4 Site Personnel

- Report any unsafe or potentially hazardous conditions to the FTL/SHSO;
- Maintain knowledge of the information, instructions and emergency response actions contained in this HASP; and
- Comply with rules, regulations and procedures as set forth in this HASP and any revisions.

## 4.0 SITE HISTORY AND PROJECT DESCRIPTION

### 4.1 Project Background

This HASP has been prepared by Castleton in response to the environmental investigation and remediation work for the site.

### 4.2 Site Location and Description

The site is located at 808 East 139th Street, Bronx, New York, and is identified as Block 2590 and Lot 36. The site is comprised of one approximately 19,107-square foot irregularly shaped parcel and is improved with contiguous one and two-story commercial buildings with no basements. The buildings occupy most of the parcel area.

## 5.0 POTENTIAL HAZARDS OF THE SITE

This section presents an assessment of the chemical, biological, and physical hazards that may be encountered during the tasks specified under Section 1.0.

Additional information can be found in Appendix A - Safety Data Sheets or in Appendix B - Activity Hazard Analyses.

### 5.1 Chemical Hazards

Potential on-site chemicals of concern primarily include petroleum and chlorinated VOCs.

The chemicals identified may have an effect on the central nervous system, entering the body through the respiratory system and dermal exposure. Acute exposure symptoms may include skin irritation. Specific information on the chemicals can be found in Table 5-1 below.

*Table 5-1 Chemical Hazards*

| COMPOUND | CAS# | OSHA PEL | ROUTES OF EXPOSURE | SYMPTOMS OF EXPOSURE | TARGET ORGANS |
|---|---|---|---|---|---|
| VOCs (tetrachloroethylene) | 127-18-4 | TWA<br>100 ppm | Inhalation<br>Ingestion<br>Skin/Eye | Irritation eyes, nose, throat; headache, dizziness, central nervous system depression; dermatitis | Eyes, skin, respiratory system, central nervous system |

**Abbreviations:**
C = Ceiling limit, not to be exceeded
CNS = Central Nervous System
PEL = Permissible Exposure Limit

OSHA = Occupational Safety and Health Administration
PPM = Parts per million
TWA = Time-weighted average (8 hours)

## 5.2 Biological Hazards

Work will be performed in a developed urban area of Bronx, New York. During the course of the project, there is potential for workers to come into contact with biological hazards such as animals, insects and plants. The Activity Hazard Analyses found in Appendix B includes specific hazards and control measures for each task, if applicable.

### *5.2.1 Animals*

The Site is located in a predominantly developed area. It is possible that dogs, cats, rats and mice may be present. Workers shall use discretion and avoid all contact with animals.

### *5.2.2 Insects*

Insects, such as mosquitoes, ticks, bees and wasps may be present during certain times of the year. Workers will be encouraged to wear repellents and PPE, if deemed necessary, when working in areas where insects are expected to be present.

During the months of April through October, particular caution must be exercised to minimize exposure to deer ticks and the potential for contracting Lyme disease. Specific precautionary work practices that are recommended include the following:

- Cover your body as much as possible. Wear long pants and long-sleeved shirts. Light color clothing makes spotting ticks easier.
- Try to eliminate possible path by which Deer Ticks may reach unprotected skin. For example, tuck bottoms of pants into socks or boots and sleeves into gloves (duct tape may be utilized to help seal cuffs and ankles). If heavy concentrations of ticks or insects are anticipated or encountered, Tyvek coveralls may be utilized for added protection when the potential for heat stress is not a concern.
- Conduct periodic and frequent (e.g. hourly) surveys of your clothing for the presence of ticks. Remove any tick, save it, and report to the clinic with the tick.
- Use insect/tick repellents that contain the chemical DEET (n,n-diethyltoluamide). Apply repellents in accordance with manufacturers recommendations. These repellents are readily available and include such brands as Deep Woods OFF and Maximum Strength OFF.

### *5.2.3 Plants*

Poison ivy, sumac and oak may be present on site. The FTL/SHSO should identify the susceptible individuals. Worker shall avoid all contact with these plants.

## 5.3 Physical Hazards

Most safety hazards are discussed in the Activity Hazard Analyses (AHA) in Appendix B for the different phases of the project. In addition to the AHAs, general work rules and other safety procedures are described in Section 10 of this HASP.

### 5.3.1 *Temperature Extremes*

Heat Stress

Heat stress is a significant potential hazard, which is greatly exacerbated with the use of PPE in hot environments. The potential hazards of working in hot environments include dehydration, cramps, heat rash, heat exhaustion, and heat stroke.

Cold Stress

At certain times of the year, workers may be exposed to the hazards of working in cold environments. Potential hazards in cold environments include frostbite, trench foot or immersion foot, hypothermia as well as slippery surfaces, brittle equipment, and poor judgment.

Castleton's Heat/Cold Stress Protocols are specified in Appendix C.

### 5.3.2 *Steam, Heat, and Splashing*

Exposure to steam/heat/splashing hazards can occur during steam cleaning activities. Splashing can also occur during well development and sampling activities. Exposure to steam/heat/splashing can result in scalding/burns, eye injury, and puncture wounds.

### 5.3.3 *Noise*

Noise is a potential hazard associated with the operation of heavy equipment, drill rigs, pumps and engines. Workers will wear hearing protection while in the work zone when these types of machinery are operating.

### 5.3.4 *Fire and Explosion*

When conducting excavation or drilling activities, the opportunity of encountering fire and explosion hazards may exist from underground utilities, diesel engine equipment, and other potential ignition sources. During dry periods, there is an increased chance of forest and brush fires starting at the job site. If these conditions occur, no smoking will be permitted at the site and all operations involving potential ignition sources will be monitored continuously (fire watch).

### 5.3.5 *Manual Lifting/Material Handling*

Manual lifting of heavy objects may be required. Failure to follow proper lifting technique can result in back injuries and strains. Back injuries are a serious concern as they are the most common work-place injury, often resulting in lost or restricted work time, and long treatment and recovery periods.

### 5.3.6 *Slips, Trips, and Falls*

Working in and around the site will pose slip, trip and fall hazards due to slippery surfaces that may be oil covered, or from rough terrain, surfaces that are steep inclines, surfaced debris, or surfaces which are wet from rain or ice. Falls may result in twisted ankles, broken bones, head trauma or back injuries.

### *5.3.7 Heavy Equipment Operation*

A Geoprobe/drill rig be used where required. Working with or near heavy equipment poses many potential hazards, including electrocution, fire/explosion, being struck by or against, or pinched/caught/crushed by, and can result in serious physical harm.

### *5.3.8 Electrocution*

Encountering underground utilities may pose electrical hazards to workers. Additionally, overhead electrical lines can be a concern during drilling operations. Potential adverse effects of electrical hazards include burns and electrocution, which could result in death.

## 6.1 ACTIVITY HAZARD ANALYSIS

The Activity Hazard Analysis (AHA) is a systematic way of identifying the potential health and safety hazards associated with major phases of work on the project and the methods to avoid, control, and mitigate those hazards. The AHAs will be used to train work crews in proper safety procedures during phase preparatory meetings.

AHAs have been developed by Castleton for the following phases of work:

1. Site Mobilization/Demobilization;
2. Excavation and Extraction
3. Soil, Groundwater, Soil Vapor, and Ambient Air Sampling, and
4. Monitoring Well/Vapor point installation

Copies of these AHAs are included in Appendix B of this HASP.

## 7.0 PERSONAL PROTECTIVE EQUIPMENT

The personal protective equipment (PPE) specified in Table 7-1 represents the hazard analysis and PPE selection required by 29 CFR 1910.132. Specific information on known potential hazards can be found under Section 4.0 and Appendix B - Activity Hazard Analyses. For the purposes of PPE selection, the HSM and FTL/SHSO are considered competent persons. The signatures on the approval page of the HASP constitute certification of the hazard assessment. For activities not covered by Table 7-1, the FTL/SHSO will conduct the hazard assessment, select the PPE, and document changes in the appropriate field logs. PPE selection will be made in consultation with the HSM.

Modifications for initial PPE selection may also be made by the FTL/SHSO in consultation with the HSM and changes documented accordingly. If major modifications occur, the HSM will notify the PM.

## 7.1 PPE Abbreviations

HEAD PROTECTION
HH = Hard Hat

HEARING PROTECTION
EP = ear plugs EM
= ear muffs

HAND PROTECTION
Cot = cotton
But = Butyl
LWG = Leather Work Gloves
Neo = Neoprene
Nit = Nitrile Sur =
Surgical

EYE/FACE PROTECTION
APR = Full Face Air Purifying
Respirator
MFS = Mesh Face shield PFS
=Plastic Face shield SG =
ANSI approved safety glasses
with side shields

BODY PROTECTION
WC = work clothes
Cot Cov = Cotton Coveralls
Poly = Polyethylene coated
Tyvek® coveralls
Saran = Saranex coated
coveralls
Tyvek® = Uncoated Tyvek®
coveralls

FOOT PROTECTION
Neo = Neoprene OB
= Overboot
Poly = polyethylene coated boot
Rub = rubber slush boots
STB = Leather work boots with steel
toe

RESPIRATORY PROTECTION
APR = Full-face air purifying
respirator with organic vapor
cartridges
ASR = Full face air supplied
respirator with escape bottle SCBA
= Self-contained breathing
apparatus

## 7.2 Hazard Assessment for Selection of Personal Protective Equipment

The initial selectin of personal protective equipment for each task was done by performing a hazard assessment taking into consideration the following:

- Potential chemical and physical hazards present;
- Work operations to be performed;
- Potential routes of exposure;
- Concentrations of contaminants present; and,
- Characteristics, capabilities, and limitations of PPE and any hazards that the PPE presents or magnifies.

A review of the analytical data from previous sampling events indicates that chlorinated VOCs (CVOCs) identified in Table 5-1 are the primary contaminants of concern.

The exposure routes for these chemicals are inhalation, skin absorption, skin/eye contact, and ingestion. Chemical protective gloves will be required for all activities that involve sample handling and the likelihood for skin contact. The proper use of PPE and strict adherence to decontamination and personal hygiene procedures will effectively minimize skin contact and ingestion and potential routes of exposure.

*Table 7-1 Personal Protective Equipment Selection*

| TASK | HEAD | EYE/FACE | FEET | HANDS | BODY | HEARING | RESPIRATOR |
|---|---|---|---|---|---|---|---|
| Mobilization/ Demobilization | HH | SG | STB | WG | WC | None | None |
| Monitoring Well / Vapor Point Installation | HH | SG | STB | WG, Nit & Sur as needed | WC, Tyvek® as needed | None | None initially APR if action levels exceeded |
| Soil, groundwater, vapor and ambient air sampling | HH | SG | STB | WG, Nit & Sur as needed | WC, Tyvek® as needed | None | None initially APR if action levels exceeded |
| Decontamination | HH | SG | STB | Nit + Sur | WC, Tyvek® as needed | None | None initially APR if action levels exceeded |

### 7.3 Respirator Cartridge Change-Out Schedule

A respirator cartridge change-out schedule has been developed in order to comply with 29 CFR. If the use of respirators is necessary, the respirator cartridge change-out schedule for this project will be as follows:

1. Cartridges shall be removed and disposed of at the end of each shift, when cartridges become wet or wearer experiences breakthrough, whichever occurs first; and
2. If the humidity exceeds 85%, then cartridges shall be removed and disposed of after 4 hours of use.

Respirators shall not be stored at the end of the shift with contaminated cartridges left on. Cartridges shall not be worn on the second day, no matter how short of time period they were used the day before.

The schedule was developed based on the following scientific information and assumptions:

- Analytical data that is available regarding site contaminants;
- Using the Rule of Thumb provided by the AIHA;
- All of the chemicals have boiling points greater than 70°C;

- Total airborne concentration of contaminants is anticipated to be less than 200 ppm;
- The humidity is expected to be less than 85%; and
- Desorption of the contaminants (including those with poor warning properties) after partial use of the chemical cartridge can occur after a short period (hours) without use (eg, overnight) and result in a non-use exposure.

The following is a partial list of factors that may affect the usable cartridge service life and/or the degree of respiratory protection attainable under actual workplace conditions. These factors have been considered when developing the cartridge change-out schedule.

Type of contaminant(s);

- Contaminant concentration;
- Relative humidity;
- Breathing rate; temperature; change in contaminant concentration;
- Mixtures of contaminants;
- Accuracy in the determination of the conditions;
- The contaminant concentration in the workplace can vary greatly. Consideration must be given to the quality of the estimate of the workplace concentration;
- Storage conditions between multiple uses of the same respirator cartridges. It is recommended that the chemical cartridges be replaced after each work shift. Contaminants adsorbed on a cartridge can migrate through the carbon bed without airflow;
- Age of the cartridge;
- Condition of the cartridge and respirator;
- Respirator and cartridge selection, respirator fit;
- Respirator assembly, operation, and maintenance;
- User training, experience, and medical fitness;
- Warning properties of the contaminant; and,

The quality of the warning properties should be considered when establishing the chemical cartridge change schedule. Good warning properties may provide a secondary or back-up indication for cartridge change-out.

## 8.0 AIR MONITORING

Air monitoring will be performed for protection for on-site workers and the downwind community (i.e., off-site receptors including residences, businesses, and on-site workers not directly involved in the remedial work) from potential airborne contaminant releases resulting from remedial activities at the site. Air monitoring will be used to help to confirm that the remedial work will not spread contamination off-site through the air. Site monitoring with a photoionization detector (PID) will be performed during any invasive activities.

Real-time monitoring for dust and VOCs will be conducted both within the work area, and along the site perimeter, during intrusive activities such as excavation activities.

## 9.0 ZONES, PROTECTION, AND COMMUNICATION

### 9.1 Site Control

Site zones are intended to control the potential spread of contamination throughout the site and to assure that only authorized individuals are permitted into potentially hazardous areas. A three- zone approach will be utilized. It shall include an Exclusion Zone (EZ), Contamination Reduction Zone (CRZ) and a Support Zone (SZ). Specific zones shall be established on the work site when operations begin.

This project is a hazardous waste remediation project, and any person working in an area where the potential for exposure to site contaminants exists, will only be allowed access after providing the FTL/SHSO with proper training and medical documentation.

The zones are based upon current knowledge of proposed site activities. It is possible that the zone configurations may be altered due to work plan revisions. Should this occur, the work zone will be adjusted accordingly, and documented through use of a field-change request form.

The following shall be used for guidance in revising these preliminary zone designations, if necessary.

Support Zone - The SZ is an uncontaminated area that will be the field support area for most operations. The SZ provides for field team communications and staging for emergency response. Appropriate safety equipment will be located in this zone. Potentially contaminated personnel/materials are not allowed in this zone. The only exception will be appropriately packaged/decontaminated and labeled samples.

Contamination Reduction Zone - The CRZ is established between the EZ and the SZ. The CRZ contains the contamination reduction corridor and provides for an area for decontamination of personnel and portable hand-held equipment, tools and heavy equipment. A personnel decontamination area will be prepared at each exclusion zone. The CRZ will be used for EZ entry and egress in addition to access for heavy equipment and emergency support services.

Exclusion Zone - All activities, which may involve exposure to site contaminants, hazardous materials and/or conditions, should be considered an EZ. The FTL/SHSO may establish more than one EZ where different levels of protection may be employed, or different hazards exist. The size of the EZ shall be determined by the site HSO allowing adequate space for the activity to be completed, field members and emergency equipment.

### 9.2 Contamination Control

Decontamination areas will be established for drilling/sampling activities.

#### *9.2.1 Personnel Decontamination Station*

All personnel and portable equipment used in the EZ shall be subject to a thorough decontamination process, as deemed necessary by the FTL/SHSO. Sampling equipment shall be decontaminated. As necessary, all boots and gloves will be decontaminated using soap and water solution and scrub brushes or simple removal and disposal. All used respiratory protective equipment will be decontaminated daily and sanitized with appropriate sanitizer solution.

All drums generated as a result of sampling and decontamination activities will be marked and stored at a designated area at the site until the materials can be property disposed of off-site.

All non-expendable sampling equipment will be decontaminated. This usually entails the use of Alconox, solvent and distilled/deionized water rinses to eliminate contaminants.

### 9.3 Communication

- Each team member will have a cell phone/radio for communication with the PM, HSO and other team members during field activities.
- Hand Signals - Hand signals shall be used by field teams, along with the buddy system. The entire field team shall know them before operations commence and their use covered during site- specific training. Typical hand signals are the following:

| SIGNAL | MEANING |
|---|---|
| Hand gripping throat | Out of air, can't breathe |
| Grip on a partner's wrist or placement of both hands around a partner's waist. | Leave the area immediately, no debate. |
| Hands on top of head | Need assistance |
| Thumbs up | Okay, I'm all right, I understand. |
| Thumbs down | No, negative. |

## 10.0 MEDICAL SURVEILANCE PROCEDURES

All contractor and subcontractor personnel performing field work where potential exposure to contaminants exists at the site are required to have passed a complete medical surveillance examination in accordance with 29 CFR 1910.120(f).

### 10.1 Medical Surveillance Requirements

A physician's medical release for work will be confirmed by the HSM before an employee can work in the exclusion zone. The examination will be taken annually at a minimum and upon termination of hazardous waste site work if the last examination was not taken within the previous six months.

Additional medical testing may be required by the HSM in consultation with the Corporate Medical Consultant and the FTL/SHSO if an over-exposure or accident occurs, if an employee exhibits symptoms of exposure, or if other site conditions warrant further medical surveillance.

### 10.2 Medical Data Sheet

This medical data sheet is voluntary and should be completed by all on-site personnel and will be maintained at the site. Where possible, this medical data sheet will accompany the personnel needing medical assistance. The medical data sheet will be maintained in a secure location, treated as confidential, and used only on a need- to-know basis.

A medical data sheet is provided in Appendix D.

## 11.0 SAFETY CONSIDERATIONS

### 11.1 General Health and Safety Work Practices

A list of general health and safety work practices is included as an included in Appendix E. The work rules will be posted in a conspicuous location at the site.

### 11.2 The Buddy System

At a minimum, employees shall work in groups of two in such a manner that they can observe each other and maintain line-of-sight for each employee within the work group. The purpose of the buddy system is to provide rapid assistance to employees in the event of an emergency.

### 11.3 Sample Handling

Personnel responsible for the handling of samples should wear the prescribed level of protection. Samples should be identified as to their hazard and packaged as to prevent spillage or breakage. Sample containers shall be decontaminated in the CRZ or EZ before entering a clean Support Zone area. Any unusual sample conditions, odors, or real-time readings should be noted. Laboratory personnel should be advised personnel should be advised of sample hazard level and the potential contaminants present. This can be accomplished by a phone call to the lab coordinator and/or including a written statement with the samples reviewing lab safety procedures in handling, in order to assure that the practices are appropriate for the suspected contaminants in the sample.

### 11.4 Excavation

Excavations will be conducted in accordance with the requirements contained in 29 CFR 1926, Subpart P-Excavations. It provides for the designation of a "Competent Person" and general requirements for safe excavating practices. The program also incorporates company standards for the monitoring of potentially hazardous atmospheres; protection from water hazards; analyzing and maintaining the stability of adjacent structures; daily competent person inspections; soil classification; sloping and benching; protective systems; and training.

The Competent Person will be the FTL or other designee with appropriate training and experience. The Competent Person will be assisted in his/her duties by other technical personnel such as the HSM, geologists, structural engineers and soils engineers.

## 12.0 DISPOSAL PROCEDURES

All discarded materials, waste materials or other objects shall be handled in such a way as to preclude the potential for spreading contamination, creating a sanitary hazard or causing litter to be left on site.

All potentially contaminated materials, e.g., clothing, gloves, etc., will be bagged or drummed as necessary, labeled and segregated for disposal. All non-contaminated materials will be collected and bagged for appropriate disposal as non-hazardous solid waste. Additional waste disposal procedures may be developed as applicable.

## 13.0 EMERGENCY RESPONSE PLAN

This section establishes procedures and provides information for use during a project emergency. Emergencies happen unexpectedly and quickly, and require an immediate response; therefore, contingency planning and advanced training of staff is essential. Specific elements of emergency support procedures which are addressed in the following subsections include communications, local emergency support units, preparation for medical emergencies, first aid for injuries incurred on site, record keeping, and emergency site evacuation procedures.

### 13.1 Responsibilities

#### *13.1.1 Health and Safety Manager (HSM)*

The HSM oversees and approves the Emergency Response/Contingency Plan and performs audits to determine that the plan is in effect and that all pre-emergency requirements are met. The HSM acts as a liaison to applicable regulatory agencies and notifies OSHA of reportable accidents.

#### *13.1.2 Field Team Leader/Site Health and Safety Officer (FOL/HSO)*

The FTL/SHSO is responsible for ensuring that all personnel are evacuated safely and that machinery and processes are shut down or stabilized in the event of a stop work order or evacuation. The FTL/SHSO is required to immediately notify the HSM of any fatalities or catastrophes (three or more workers injured and hospitalized) so that the HSM can ensure that OSHA is notified within the required time frame. The HSM will be notified of all OSHA recordable injuries, fires, spills, releases or equipment damage in excess of $500 within 24 hours.

#### *13.1.3 Emergency Coordinator*

The Emergency Coordinator for the project is the FTL/SHSO.

The Emergency Coordinator shall make contact with Local Emergency Response personnel prior to beginning work on site. In these contacts the emergency coordinator will inform interested parties about the nature and duration of work expected on the site and the type of contaminants and possible health or safety effects of emergencies involving these contaminants. The emergency coordinator will locate emergency phone numbers and identify hospital routes prior to beginning work on site. The emergency coordinator shall make necessary arrangements to be prepared for any emergencies that could occur.

The Emergency Coordinator will implement the Emergency Response/Contingency Plan whenever conditions at the site warrant such action.

### *13.1.4 Site Personnel*

Site personnel are responsible for knowing the Emergency Response/Contingency Plan and the procedures contained herein. Personnel are expected to notify the Emergency Coordinator of situations that could constitute a site emergency.

## 13.2 Communication

A variety of communication systems may be utilized during emergency situations. These are discussed in the following sections.

### *13.2.1 Hand Signals*

Downrange field teams will employ hand signals where necessary for communication during emergency situations. Hand signals are found in Section 8.3.

### *13.2.2 Field Radios and Cell Phones*

Castleton field personnel are provided cellular phones for site communication and emergency use.

## 13.3 Local Emergency Support Units

A route map from the site to the nearest hospital can be found in Appendix F. This map will be placed with the above emergency telephone numbers in all on-site vehicles.

## 13.4 Pre-Emergency Planning

Castleton will communicate directly with administrative personnel from the emergency room at the hospital to determine whether the hospital has the facilities and personnel needed to treat cases of trauma resulting from exposure to any of the contaminants expected to be found on the site.

Instructions for finding the hospital will be posted conspicuously in the site office and in each site vehicle.

Before the field activities begin, the local emergency response personnel will be notified of the schedule for field activities and about the materials that are thought to exist on the site so that they will be able to respond quickly and effectively in the event of a fire, explosion, or other emergency. Before fieldwork on the site commences, each person who will be working there or observing the operations will complete a medical data sheet (Appendix D). These data sheets will be filled out during site-specific training and will be kept on the site.

In the event of an incident where a team member becomes exposed or suffers from an acute symptom of exposure to site materials and has to be taken to a hospital, a copy of his/her medical data sheet will be presented to the attending physician.

**Table 13-1**
**Emergency Telephone Numbers**

| Contact | Firm or Agency | Telephone Number |
|---|---|---|
| Police | | 911 |
| Fire | | 911 |
| Hospital | Bronx Lebanon Hospital Center | (718) 860-6169 |
| Ambulance | | 911 |
| Project Manager/Health and Safety Manager | Brian Barth<br>Castleton | (631) 482-1818 |
| Health & Safety Officer | Brian Barth<br>Castleton | (631) 482-1818 |
| Poison Control Center | | (800) 962-1253 |
| Chemtrec | | (800) 424-9300 |

### 13.5 Emergency Medical Treatment

The procedures and rules in this HASP are designed to prevent employee injury. However, should an injury occur, no matter how slight, it will be reported to the FTL/SHSO immediately. First aid equipment will be available on site at the following locations:

- First Aid Kit: Support Zone (or designated by FTL/SHSO upon arrival)
- Emergency Eye Wash: Support Zone (or designated by FTL/SHSO upon arrival)

During site-specific training, project personnel will be informed of the location of the first aid station(s) that has been set up. Unless they are in immediate danger, severely injured persons will not be moved until paramedics can attend to them. Some injuries, such as severe cuts and lacerations or burns, may require immediate treatment. Any first aid instructions that can be obtained from doctors or paramedics, before an emergency-response squad arrives at the site or before the injured person can be transported to the hospital, will be followed closely.

There will be at least two people with current First Aid and CPR certification on each active work shift. When personnel are transported to the hospital, the FTL/SHSO will provide a copy of the Medical Data Sheet to the paramedics and treating physician.
Only in non-emergency situations will an injured person be transported to the hospital by means other than an ambulance.

A map and directions to the hospital can be found in Appendix F.

### 13.6 Emergency Site Evacuation Routes and Procedures

In order to mobilize the manpower resources and equipment necessary to cope with a fire or other emergency, a clear chain of authority will be established. The EC will take charge of all emergency response activities and dictate the procedures that will be followed for the duration of the emergency. The EC will report immediately to the scene of the emergency, assess the seriousness of the situation, and direct whatever efforts are necessary

until the emergency response units arrive. At his/her discretion, the EC also may order the closure of the site for an indefinite period.

All project personnel will be instructed on proper emergency response procedures and locations of emergency telephone numbers during the initial site safety meeting. If an emergency occurs, including but not limited to fire, explosion or significant release of toxic gas into the atmosphere, an air horn will be sounded on the site. The horn will sound continuously for one blast, signaling that immediate evacuation of all personnel is necessary due to an immediate or impending danger. All heavy equipment will be shut down and all personnel will evacuate the work areas and assemble at the evacuation meeting point, which will be determined upon arrival at the site by the FTL/SHSO, prior to work beginning. This will then be conveyed to all crew members during the site-specific briefing.

The EC will give directions for implementing whatever actions are necessary. Any project team member may be assigned to be in charge of emergency communications during an emergency.

He/she will attend the site telephone specified by the EC from the time the alarm sounds until the emergency has ended.

After sounding the alarm and initiating emergency response procedures, the EC will check and verify that access roads are not obstructed. If traffic control is necessary, as in the event of a fire or explosion, a project team member, who has been trained in these procedures and designated at the site safety meeting, will take over these duties until local police and fire fighters arrive.

The EC will remain at the site to provide any assistance requested by emergency-response squads as they arrive to deal with the situation. A map showing evacuation routes, meeting places and the location of emergency equipment will be posted in all trailers and used during site-specific training.

## 13.7 Fire Prevention and Protection

In the event of a fire or explosion, procedures will include immediately evacuating the site (air horn will sound for a single continuous blast), and notification of local fire and police departments. No personnel will fight a fire beyond the stage where it can be put out with a portable extinguisher (incipient stage).

### *13.7.1 Fire Prevention*

Adhering to the following precautions will prevent fires:

- Good housekeeping and storage of materials;
- Storage of flammable liquids and gases away from oxidizers;
- No smoking in the exclusion zone or any work area;
- No hot work without a properly executed hot work permit;
- Shutting off engines to refuel;
- Grounding and bonding metal containers during transfer of flammable liquids;

- Use of UL approved flammable storage cans;
- Fire extinguishers rated at least 10 pounds ABC located on all heavy equipment, in all trailers and near all hot work activities; and
- Monthly inspections of all fire extinguishers.

### 13.8 Overt Chemical Exposure

The following are standard procedures to treat chemical exposures. Other, specific procedures detailed on the Safety Data Sheet or recommended by the Corporate Medical Consultant will be followed, when necessary.

SKIN AND EYE CONTACT: Use copious amounts of soap and water. Wash/rinse affected areas thoroughly, and then provide appropriate medical attention. Eyes should be rinsed for 15 minutes upon chemical contamination. Skin should also be rinsed for 15 minutes if contact with caustics, acids or hydrogen peroxide occurs.

INHALATION: Move to fresh air. Decontaminate and transport to hospital or local medical provider.

INGESTION: Decontaminate and transport to emergency medical facility.

PUNCTURE WOUND OR LACERATION: Decontaminate and transport to emergency medical facility.

### 13.9 Decontamination during Medical Emergencies

If emergency life-saving first aid and/or medical treatment is required, normal decontamination procedures may need to be abbreviated or postponed. The FTL/SHSO or designee will accompany contaminated victims to the medical facility to advise on matters involving decontamination, when necessary. The outer garments can be removed if they do not cause delays, interfere with treatment or aggravate the problem. Respiratory equipment must always be removed. Protective clothing can be cut away. If the outer contaminated garments cannot be safely removed on-site, a plastic barrier placed between the injured individual and clean surfaces should be used to help prevent contamination of the inside of ambulances and/or medical personnel. Outer garments may then be removed at the medical facility. No attempt will be made to wash or rinse the victim if his/her injuries are life threatening, unless it is known that the individual has been contaminated with an extremely toxic or corrosive material which could also cause severe injury or loss of life to emergency response personnel. For minor medical problems or injuries, the normal decontamination procedures will be followed.

### 13.10 Accident/Incident Reporting

As soon as first aid and/or emergency response needs have been met, the following parties are to be contacted by telephone:

- Health and Safety Manager;
- Project Manager; and
- The employer of any injured worker who is not a Castleton employee

Written confirmation of verbal reports are to be completed by the FTL/SHSO using the Incident Report Form and submitted within 24 hours. If the employee involved is not a Castleton employee, his employer will receive a copy of the report.

The incident report and investigation form is found in Appendix G.

### 13.11 Adverse Weather Conditions

In the event of adverse weather conditions, the FTL/SHSO will determine if work can continue without potentially risking the 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 working conditions (hail, rain, snow, ice, high winds);

- Limited visibility (fog);
- Potential for electrical storms;
- Earthquakes; and
- Other major incidents.

Site activities will be limited to daylight hours, or when suitable artificial light is provided, and acceptable weather conditions prevail. The FTL/SHSO will determine the need to cease field operations or observe daily weather reports and evacuate, if necessary, in case of severe inclement weather conditions.

### 13.12 Spill Control and Response

All small hazardous spills/environmental releases shall be contained as close to the source as possible. Whenever possible, the MSDS will be consulted to assist in determining the best means of containment and cleanup. For small spills, sorbent materials such as sand, sawdust or commercial sorbents should be placed directly on the substance to contain the spill and aid recovery. Any acid spills should be diluted or neutralized carefully prior to attempting recovery. Berms of earthen or sorbent materials can be used to contain the leading edge of the spills. Drains or drainage areas should be blocked. All spill containment materials will be properly disposed. An exclusion zone of 50 to 100 feet around the spill area should be established depending on the size of the spill. The following seven steps should be taken by the Emergency Coordinator:

- Determine the nature, identity and amounts of major spill components;
- Make sure all unnecessary persons are removed from the spill area;
- Notify appropriate response teams and authorities;
- Use proper PPE in consultation with the FTL/SHSO;
- If a flammable liquid, gas or vapor is involved, remove all ignition sources and use non-sparking and/or explosive proof equipment to contain or clean up the spill (diesel only vehicles, air operated pumps, etc.);
- If possible, try to stop the leak with appropriate material; and,
- Remove all surrounding materials that can react or compound with the spill.

### 13.13 Emergency Equipment

The following minimum emergency equipment shall be kept and maintained on-site:

- Industrial first aid kit;
- Burn kit and portable eye washes (one per field team);
- Fire extinguishers (one per work area); and

- Absorbent material /spill kit.

## 14.0 TRAINING

### 14.1 General Health and Safety Training

In accordance with Castleton corporate policy, and pursuant to 29 CFR 1910.120, hazardous waste site workers shall, at the time of job assignment, have received a minimum of 40 hours of initial health and safety training for hazardous waste site operations unless otherwise noted in the above reference. At a minimum, the training shall have consisted of instruction in the topics outlined in the standard.

Personnel who have not met the requirements for initial training shall not be allowed to work in any site activities in which they may be exposed to hazards (chemical or physical).

#### *14.1.1 Three Day Supervised On the Job Training*

In addition to the required initial hazardous waste operations training, each employee shall have received three days of directly supervised on-the-job training. This training will address the duties the employees are expected to perform.

### 14.2 Annual Eight-Hour Refresher Training

Annual eight-hour refresher training will be required of all hazardous waste site field personnel in order to maintain their qualifications for fieldwork. The training will cover a review of 1910.120 requirements and related company programs and procedures.

### 14.3 Site-Specific Training

Prior to commencement of field activities, all field personnel assigned to the project will have completed training that will specifically address the activities, procedures, monitoring, and equipment used in the site operations. It will include site and facility layout, hazards and emergency services at the site, and will highlight all provisions contained within this HASP. This training will also allow field workers to clarify anything they do not understand and to reinforce their responsibilities regarding safety and operations for their particular activity.

### 14.4 On-Site Safety Briefings

Project personnel and visitors will be given on-site health and safety briefings daily by the FTL/SHSO to assist site personnel in safely conducting their work activities. A copy of the Daily Briefing Sign-In Sheet is contained in Appendix H. The briefings will include information on new operations to be conducted, changes in work practices or changes in the site's environmental conditions, as well as periodic reinforcement of previously discussed topics. The briefings will also provide a forum to facilitate conformance with safety requirements and to identify performance deficiencies related to safety during daily activities or as a result of safety inspections. The meetings will also be an opportunity to periodically update the crews on monitoring results. Prior to starting any new activity, a training session using the Activity Hazard Analysis will be held for crew members involved in the activity.

### 14.5 First Aid and CPR

The HSM will identify those individuals requiring first aid and CPR training to ensure that emergency medical treatment is available during field activities. It is anticipated that a minimum of one field person on-site at any one time will have first aid and CPR training. The training will be consistent with the requirements of the American Red Cross Association or American Heart Association. If none are available on-site, then the HSM shall be notified.

## 15.0 LOGS, REPORTS, AND RECORDKEEPING

### 15.1 Medical and Training Records

Copies or verification of training (40-hour, 8-hour, supervisor, site-specific training and documentation of three-day OJT) and medical clearance for hazardous waste site work and respirator use will be maintained on-site. Records for all subcontractor employees will also be kept on-site.

### 15.2 Incident Report and Investigation Form

The incident report and investigation form is to be completed for all accidents and incidents, including near misses. The form can be found in Appendix G.

### 15.3 Health and Safety Logbooks

The FTL/SHSO will maintain a logbook during site work. The daily site conditions, personnel, monitoring results and significant events will be recorded. The original logbooks will become part of the exposure records file.

## 16.0 FIELD PERSONNEL REVIEW

This form serves as documentation that field personnel have read, or have been informed of, and understand the provisions of the HASP. It is maintained on site by the FTL/SHSO as a project record. Each field team member shall sign this section after site-specific training is completed and before being permitted to work on site.

I have read, or have been informed of, the Health and Safety Plan and understand the information presented. I will comply with the provisions contained therein.

| ***Name (Print and Sign)*** | ***Date*** |
|---|---|
| | |
| | |
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# APPENDIX A
# SAFETY DATA SHEETS

# SAFETY DATA SHEET

**Creation Date** 10-Dec-2009 **Revision Date** 23-Jan-2018 **Revision Number** 5

## 1. Identification

| | |
|---|---|
| **Product Name** | **Tetrachloroethylene** |
| **Cat No. :** | **AC445690000; ACR445690010; AC445690025; AC445691000** |
| **CAS-No** | 127-18-4 |
| **Synonyms** | Perchloroethylene |
| **Recommended Use** | Laboratory chemicals. |
| **Uses advised against** | Not for food, drug, pesticide or biocidal product use |

**Details of the supplier of the safety data sheet**

**Company**
Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Acros Organics
One Reagent Lane
Fair Lawn, NJ 07410

**Emergency Telephone Number**
For information **US** call: 001-800-ACROS-01 / **Europe** call: +32 14 57 52 11
Emergency Number **US:**001-201-796-7100 / **Europe:** +32 14 57 52 99
**CHEMTREC** Tel. No.**US:**001-800-424-9300 / **Europe:**001-703-527-3887

## 2. Hazard(s) identification

**Classification**
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

| | |
|---|---|
| Skin Corrosion/irritation | Category 2 |
| Serious Eye Damage/Eye Irritation | Category 2 |
| Skin Sensitization | Category 1 |
| Carcinogenicity | Category 1B |
| Specific target organ toxicity (single exposure) | Category 3 |
| Target Organs - Central nervous system (CNS). | |
| Specific target organ toxicity - (repeated exposure) | Category 2 |
| Target Organs - Kidney, Liver, Blood. | |

**Label Elements**

**Signal Word**
Danger

**Hazard Statements**
Causes skin irritation
Causes serious eye irritation
May cause an allergic skin reaction
May cause drowsiness or dizziness
May cause cancer
May cause damage to organs through prolonged or repeated exposure

**Precautionary Statements**
**Prevention**
Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Use personal protective equipment as required
Wash face, hands and any exposed skin thoroughly after handling
Contaminated work clothing should not be allowed out of the workplace
Do not breathe dust/fume/gas/mist/vapors/spray
Use only outdoors or in a well-ventilated area
Wear protective gloves/protective clothing/eye protection/face protection
**Response**
IF exposed or concerned: Get medical attention/advice
**Inhalation**
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
**Skin**
IF ON SKIN: Wash with plenty of soap and water
Take off contaminated clothing and wash before reuse
If skin irritation or rash occurs: Get medical advice/attention
**Eyes**
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
If eye irritation persists: Get medical advice/attention
**Storage**
Store locked up
Store in a well-ventilated place. Keep container tightly closed
**Disposal**
Dispose of contents/container to an approved waste disposal plant
**Hazards not otherwise classified (HNOC)**
Toxic to aquatic life with long lasting effects
**WARNING.** Cancer - https://www.p65warnings.ca.gov/.

## 3. Composition/Information on Ingredients

| Component | CAS-No | Weight % |
|---|---|---|
| Tetrachloroethylene | 127-18-4 | >95 |

## 4. First-aid measures

| | |
|---|---|
| **General Advice** | If symptoms persist, call a physician. |
| **Eye Contact** | Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention. |
| **Skin Contact** | Wash off immediately with plenty of water for at least 15 minutes. If skin irritation persists, call a physician. |
| **Inhalation** | Move to fresh air. If not breathing, give artificial respiration. Get medical attention if symptoms occur. |
| **Ingestion** | Clean mouth with water and drink afterwards plenty of water. |

| | |
|---|---|
| **Most important symptoms and effects** | None reasonably foreseeable. May cause allergic skin reaction. Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting: Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain or flushing |
| **Notes to Physician** | Treat symptomatically |

## 5. Fire-fighting measures

| | |
|---|---|
| **Suitable Extinguishing Media** | Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. |
| **Unsuitable Extinguishing Media** | No information available |
| **Flash Point** | No information available |
| **Method -** | No information available |
| **Autoignition Temperature** | No information available |
| **Explosion Limits** | |
| **Upper** | No data available |
| **Lower** | No data available |
| **Sensitivity to Mechanical Impact** | No information available |
| **Sensitivity to Static Discharge** | No information available |

**Specific Hazards Arising from the Chemical**

Thermal decomposition can lead to release of irritating gases and vapors. Containers may explode when heated.

**Hazardous Combustion Products**

Chlorine Hydrogen chloride gas Phosgene

**Protective Equipment and Precautions for Firefighters**

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

**NFPA**

| Health | Flammability | Instability | Physical hazards |
|---|---|---|---|
| 2 | 0 | 0 | N/A |

## 6. Accidental release measures

| | |
|---|---|
| **Personal Precautions** | Use personal protective equipment. Ensure adequate ventilation. |
| **Environmental Precautions** | Do not flush into surface water or sanitary sewer system. |
| **Methods for Containment and Clean Up** | Soak up with inert absorbent material. Keep in suitable, closed containers for disposal. |

## 7. Handling and storage

| | |
|---|---|
| **Handling** | Wear personal protective equipment. Do not get in eyes, on skin, or on clothing. Ensure adequate ventilation. Avoid ingestion and inhalation. |
| **Storage** | Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from sunlight. |

## 8. Exposure controls / personal protection

**Exposure Guidelines**

| Component | ACGIH TLV | OSHA PEL | NIOSH IDLH | Mexico OEL (TWA) |
|---|---|---|---|---|
| Tetrachloroethylene | TWA: 25 ppm<br>STEL: 100 ppm | (Vacated) TWA: 25 ppm<br>(Vacated) TWA: 170 mg/m$^3$<br>Ceiling: 200 ppm<br>TWA: 100 ppm | IDLH: 150 ppm | TWA: 100 ppm<br>TWA: 670 mg/m$^3$<br>TWA: 200 ppm<br>TWA: 1250 mg/m$^3$<br>STEL: 200 ppm<br>STEL: 1340 mg/m$^3$ |

*Legend*

*ACGIH - American Conference of Governmental Industrial Hygienists*
*OSHA - Occupational Safety and Health Administration*
*NIOSH IDLH: The National Institute for Occupational Safety and Health Immediately Dangerous to Life or Health*

**Engineering Measures** Use only under a chemical fume hood. Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are close to the workstation location.

**Personal Protective Equipment**

**Eye/face Protection** Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

**Skin and body protection** Long sleeved clothing.

**Respiratory Protection** Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

**Hygiene Measures** Handle in accordance with good industrial hygiene and safety practice.

## 9. Physical and chemical properties

| | |
|---|---|
| **Physical State** | Liquid |
| **Appearance** | Colorless |
| **Odor** | Characteristic, sweet |
| **Odor Threshold** | No information available |
| **pH** | No information available |
| **Melting Point/Range** | -22 °C / -7.6 °F |
| **Boiling Point/Range** | 120 - 122 °C / 248 - 251.6 °F @ 760 mmHg |
| **Flash Point** | No information available |
| **Evaporation Rate** | 6.0 (Ether = 1.0) |
| **Flammability (solid,gas)** | Not applicable |
| **Flammability or explosive limits** | |
| **Upper** | No data available |
| **Lower** | No data available |
| **Vapor Pressure** | 18 mbar @ 20 °C |
| **Vapor Density** | No information available |
| **Density** | 1.619 |
| **Specific Gravity** | 1.625 |
| **Solubility** | 0.15 g/L water (20°C) |
| **Partition coefficient; n-octanol/water** | No data available |
| **Autoignition Temperature** | No information available |
| **Decomposition Temperature** | > 150°C |
| **Viscosity** | 0.89 mPa s at 20 °C |
| **Molecular Formula** | $C_2Cl_4$ |
| **Molecular Weight** | 165.83 |

## 10. Stability and reactivity

| | |
|---|---|
| **Reactive Hazard** | None known, based on information available |
| **Stability** | Stable under normal conditions. |
| **Conditions to Avoid** | Incompatible products. Excess heat. Exposure to moist air or water. |
| **Incompatible Materials** | Strong acids, Strong oxidizing agents, Strong bases, Metals, Zinc, Amines, Aluminium |
| **Hazardous Decomposition Products** | Chlorine, Hydrogen chloride gas, Phosgene |
| **Hazardous Polymerization** | Hazardous polymerization does not occur. |
| **Hazardous Reactions** | None under normal processing. |

## 11. Toxicological information

**Acute Toxicity**

**Product Information**

**Component Information**

| Component | LD50 Oral | LD50 Dermal | LC50 Inhalation |
|---|---|---|---|
| Tetrachloroethylene | LD50 = 2629 mg/kg ( Rat ) | LD50 > 10000 mg/kg (Rat) | LC50 = 27.8 mg/L ( Rat ) 4 h |

**Toxicologically Synergistic Products** No information available

**Delayed and immediate effects as well as chronic effects from short and long-term exposure**

| | |
|---|---|
| **Irritation** | Irritating to eyes and skin |
| **Sensitization** | No information available |
| **Carcinogenicity** | The table below indicates whether each agency has listed any ingredient as a carcinogen. |

| Component | CAS-No | IARC | NTP | ACGIH | OSHA | Mexico |
|---|---|---|---|---|---|---|
| Tetrachloroethylene | 127-18-4 | Group 2A | Reasonably Anticipated | A3 | X | A3 |

| | |
|---|---|
| *IARC: (International Agency for Research on Cancer)* | *IARC: (International Agency for Research on Cancer)*<br>*Group 1 - Carcinogenic to Humans*<br>*Group 2A - Probably Carcinogenic to Humans*<br>*Group 2B - Possibly Carcinogenic to Humans* |
| *NTP: (National Toxicity Program)* | *NTP: (National Toxicity Program)*<br>*Known - Known Carcinogen*<br>*Reasonably Anticipated - Reasonably Anticipated to be a Human Carcinogen* |
| *ACGIH: (American Conference of Governmental Industrial Hygienists)* | *A1 - Known Human Carcinogen*<br>*A2 - Suspected Human Carcinogen*<br>*A3 - Animal Carcinogen*<br>*ACGIH: (American Conference of Governmental Industrial Hygienists)* |
| *Mexico - Occupational Exposure Limits - Carcinogens* | *Mexico - Occupational Exposure Limits - Carcinogens*<br>*A1 - Confirmed Human Carcinogen*<br>*A2 - Suspected Human Carcinogen*<br>*A3 - Confirmed Animal Carcinogen*<br>*A4 - Not Classifiable as a Human Carcinogen*<br>*A5 - Not Suspected as a Human Carcinogen* |

| | |
|---|---|
| **Mutagenic Effects** | No information available |
| **Reproductive Effects** | No information available. |
| **Developmental Effects** | No information available. |
| **Teratogenicity** | No information available. |
| **STOT - single exposure** | Central nervous system (CNS) |

| | |
|---|---|
| **STOT - repeated exposure** | Kidney Liver Blood |
| **Aspiration hazard** | No information available |
| **Symptoms / effects,both acute and delayed** | Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting: Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain or flushing |

**Endocrine Disruptor Information**

| Component | EU - Endocrine Disrupters Candidate List | EU - Endocrine Disruptors - Evaluated Substances | Japan - Endocrine Disruptor Information |
|---|---|---|---|
| Tetrachloroethylene | Group II Chemical | Not applicable | Not applicable |

**Other Adverse Effects** Tumorigenic effects have been reported in experimental animals.

## 12. Ecological information

**Ecotoxicity**

Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. The product contains following substances which are hazardous for the environment.

| Component | Freshwater Algae | Freshwater Fish | Microtox | Water Flea |
|---|---|---|---|---|
| Tetrachloroethylene | EC50: > 500 mg/L, 96h (Pseudokirchneriella subcapitata) | LC50: 4.73 - 5.27 mg/L, 96h flow-through (Oncorhynchus mykiss)<br>LC50: 11.0 - 15.0 mg/L, 96h static (Lepomis macrochirus)<br>LC50: 8.6 - 13.5 mg/L, 96h static (Pimephales promelas)<br>LC50: 12.4 - 14.4 mg/L, 96h flow-through (Pimephales promelas) | EC50 = 100 mg/L 24 h<br>EC50 = 112 mg/L 24 h<br>EC50 = 120.0 mg/L 30 min | EC50: 6.1 - 9.0 mg/L, 48h Static (Daphnia magna) |

| | |
|---|---|
| **Persistence and Degradability** | Insoluble in water Persistence is unlikely based on information available. |
| **Bioaccumulation/ Accumulation** | No information available. |
| **Mobility** | . Is not likely mobile in the environment due its low water solubility. Will likely be mobile in the environment due to its volatility. |

| Component | log Pow |
|---|---|
| Tetrachloroethylene | 2.53 - 2.88 |

## 13. Disposal considerations

**Waste Disposal Methods** Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

| Component | RCRA - U Series Wastes | RCRA - P Series Wastes |
|---|---|---|
| Tetrachloroethylene - 127-18-4 | U210 | - |

## 14. Transport information

**DOT**

| | |
|---|---|
| **UN-No** | UN1897 |
| **Proper Shipping Name** | TETRACHLOROETHYLENE |
| **Hazard Class** | 6.1 |
| **Packing Group** | III |

**TDG**

| | |
|---|---|
| **UN-No** | UN1897 |

| | |
|---|---|
| **Proper Shipping Name** | TETRACHLOROETHYLENE |
| **Hazard Class** | 6.1 |
| **Packing Group** | III |

**IATA**

| | |
|---|---|
| **UN-No** | UN1897 |
| **Proper Shipping Name** | TETRACHLOROETHYLENE |
| **Hazard Class** | 6.1 |
| **Packing Group** | III |

**IMDG/IMO**

| | |
|---|---|
| **UN-No** | UN1897 |
| **Proper Shipping Name** | TETRACHLOROETHYLENE |
| **Hazard Class** | 6.1 |
| **Subsidiary Hazard Class** | P |
| **Packing Group** | III |

## 15. Regulatory information

**All of the components in the product are on the following Inventory lists:** X = listed

**International Inventories**

| Component | TSCA | DSL | NDSL | EINECS | ELINCS | NLP | PICCS | ENCS | AICS | IECSC | KECL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Tetrachloroethylene | X | X | - | 204-825-9 | - | | X | X | X | X | X |

**Legend:**
**X - Listed**
**E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.**
**F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.**
**N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.**
**P - Indicates a commenced PMN substance**
**R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.**
**S - Indicates a substance that is identified in a proposed or final Significant New Use Rule**
**T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.**
**XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B).**
**Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.**
**Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.**

### U.S. Federal Regulations

**TSCA 12(b)** Not applicable

**SARA 313**

| Component | CAS-No | Weight % | SARA 313 - Threshold Values % |
|---|---|---|---|
| Tetrachloroethylene | 127-18-4 | >95 | 0.1 |

**SARA 311/312 Hazard Categories** See section 2 for more information

**CWA (Clean Water Act)**

| Component | CWA - Hazardous Substances | CWA - Reportable Quantities | CWA - Toxic Pollutants | CWA - Priority Pollutants |
|---|---|---|---|---|
| Tetrachloroethylene | - | - | X | X |

**Clean Air Act**

| Component | HAPS Data | Class 1 Ozone Depletors | Class 2 Ozone Depletors |
|---|---|---|---|
| Tetrachloroethylene | X | | - |

**OSHA** Occupational Safety and Health Administration
Not applicable

**CERCLA** This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

| Component | Hazardous Substances RQs | CERCLA EHS RQs |
|---|---|---|
| Tetrachloroethylene | 100 lb 1 lb | - |

**California Proposition 65** This product contains the following proposition 65 chemicals

| Component | CAS-No | California Prop. 65 | Prop 65 NSRL | Category |
|---|---|---|---|---|
| Tetrachloroethylene | 127-18-4 | Carcinogen | 14 µg/day | Carcinogen |

**U.S. State Right-to-Know Regulations**

| Component | Massachusetts | New Jersey | Pennsylvania | Illinois | Rhode Island |
|---|---|---|---|---|---|
| Tetrachloroethylene | X | X | X | X | X |

**U.S. Department of Transportation**

| | |
|---|---|
| Reportable Quantity (RQ): | Y |
| DOT Marine Pollutant | Y |
| DOT Severe Marine Pollutant | N |

**U.S. Department of Homeland Security**
This product does not contain any DHS chemicals.

**Other International Regulations**

**Mexico - Grade** No information available

## 16. Other information

**Prepared By**
Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

| | |
|---|---|
| **Creation Date** | 10-Dec-2009 |
| **Revision Date** | 23-Jan-2018 |
| **Print Date** | 23-Jan-2018 |
| **Revision Summary** | This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS). |

**Disclaimer**
**The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text**

**End of SDS**

# SAFETY DATA SHEET

**Creation Date** 03-Feb-2010 **Revision Date** 14-Jul-2016 **Revision Number** 2

## 1. Identification

| | |
|---|---|
| **Product Name** | **Trichloroethylene** |
| **Cat No. :** | **T340-4; T341-4; T341-20; T341-500; T403-4** |
| **Synonyms** | Trichloroethene (Stabilized/Technical/Electronic/Certified ACS) |
| **Recommended Use** | Laboratory chemicals. |
| **Uses advised against** | |

**Details of the supplier of the safety data sheet**

**Company**
Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

**Emergency Telephone Number**
CHEMTREC®, Inside the USA: 800-424-9300
CHEMTREC®, Outside the USA: 001-703-527-3887

## 2. Hazard(s) identification

**Classification**

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

| | |
|---|---|
| Skin Corrosion/irritation | Category 2 |
| Serious Eye Damage/Eye Irritation | Category 2 |
| Skin Sensitization | Category 1 |
| Germ Cell Mutagenicity | Category 2 |
| Carcinogenicity | Category 1A |
| Specific target organ toxicity (single exposure) | Category 3 |
| Target Organs - Central nervous system (CNS). | |
| Specific target organ toxicity - (repeated exposure) | Category 2 |
| Target Organs - Kidney, Liver, Heart, spleen, Blood. | |

**Label Elements**

**Signal Word**
Danger

**Hazard Statements**
Causes skin irritation
Causes serious eye irritation
May cause an allergic skin reaction
May cause drowsiness or dizziness
Suspected of causing genetic defects
May cause cancer
May cause damage to organs through prolonged or repeated exposure

**Precautionary Statements**
**Prevention**
Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Use personal protective equipment as required
Wash face, hands and any exposed skin thoroughly after handling
Contaminated work clothing should not be allowed out of the workplace
Do not breathe dust/fume/gas/mist/vapors/spray
Use only outdoors or in a well-ventilated area
Wear protective gloves/protective clothing/eye protection/face protection
**Response**
IF exposed or concerned: Get medical attention/advice
**Inhalation**
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
**Skin**
IF ON SKIN: Wash with plenty of soap and water
Take off contaminated clothing and wash before reuse
If skin irritation or rash occurs: Get medical advice/attention
**Eyes**
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
If eye irritation persists: Get medical advice/attention
**Storage**
Store locked up
Store in a well-ventilated place. Keep container tightly closed
**Disposal**
Dispose of contents/container to an approved waste disposal plant
**Hazards not otherwise classified (HNOC)**
Harmful to aquatic life with long lasting effects
WARNING! This product contains a chemical known in the State of California to cause cancer, birth defects or other reproductive harm.

## 3. Composition / information on ingredients

| Component | CAS-No | Weight % |
|---|---|---|
| Trichloroethylene | 79-01-6 | 100 |

## 4. First-aid measures

| | |
|---|---|
| **General Advice** | Show this safety data sheet to the doctor in attendance. Immediate medical attention is required. |
| **Eye Contact** | Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice. |
| **Skin Contact** | Wash off immediately with plenty of water for at least 15 minutes. Immediate medical attention is required. |
| **Inhalation** | Move to fresh air. If not breathing, give artificial respiration. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a |

| | |
|---|---|
| | pocket mask equipped with a one-way valve or other proper respiratory medical device. Immediate medical attention is required. |
| **Ingestion** | Do not induce vomiting. Call a physician or Poison Control Center immediately. |
| **Most important symptoms/effects** | None reasonably foreseeable. May cause allergic skin reaction. Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting: Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain or flushing |
| **Notes to Physician** | Treat symptomatically |

## 5. Fire-fighting measures

| | |
|---|---|
| **Suitable Extinguishing Media** | Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. |
| **Unsuitable Extinguishing Media** | No information available |
| **Flash Point** | No information available |
| **Method -** | No information available |
| **Autoignition Temperature** | 410 °C / 770 °F |
| **Explosion Limits** | |
| **Upper** | 10.5 vol % |
| **Lower** | 8 vol % |
| **Oxidizing Properties** | Not oxidising |
| **Sensitivity to Mechanical Impact** | No information available |
| **Sensitivity to Static Discharge** | No information available |

**Specific Hazards Arising from the Chemical**

Thermal decomposition can lead to release of irritating gases and vapors. Containers may explode when heated. Keep product and empty container away from heat and sources of ignition.

**Hazardous Combustion Products**

Hydrogen chloride gas Chlorine Phosgene Carbon monoxide (CO) Carbon dioxide ($CO_2$)

**Protective Equipment and Precautions for Firefighters**

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapors.

**NFPA**

| Health | Flammability | Instability | Physical hazards |
|---|---|---|---|
| 2 | 1 | 0 | N/A |

## 6. Accidental release measures

| | |
|---|---|
| **Personal Precautions** | Ensure adequate ventilation. Use personal protective equipment. Keep people away from and upwind of spill/leak. Evacuate personnel to safe areas. |
| **Environmental Precautions** | Should not be released into the environment. Do not flush into surface water or sanitary sewer system. |
| **Methods for Containment and Clean Up** | Soak up with inert absorbent material. Keep in suitable, closed containers for disposal. |

## 7. Handling and storage

| | |
|---|---|
| **Handling** | Wear personal protective equipment. Do not get in eyes, on skin, or on clothing. Use only under a chemical fume hood. Do not breathe vapors or spray mist. Do not ingest. |
| **Storage** | Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from light. Do not store in aluminum containers. |

## 8. Exposure controls / personal protection

**Exposure Guidelines**

| Component | ACGIH TLV | OSHA PEL | NIOSH IDLH | Mexico OEL (TWA) |
|---|---|---|---|---|
| Trichloroethylene | TWA: 10 ppm<br>STEL: 25 ppm | (Vacated) TWA: 50 ppm<br>(Vacated) TWA: 270 mg/m³<br>Ceiling: 200 ppm<br>(Vacated) STEL: 200 ppm<br>(Vacated) STEL: 1080 mg/m³<br>TWA: 100 ppm | IDLH: 1000 ppm | TWA: 100 ppm<br>TWA: 535 mg/m³<br>STEL: 200 ppm<br>STEL: 1080 mg/m³ |

*Legend*

*ACGIH - American Conference of Governmental Industrial Hygienists*
*OSHA - Occupational Safety and Health Administration*
*NIOSH IDLH: The National Institute for Occupational Safety and Health Immediately Dangerous to Life or Health*

| | |
|---|---|
| **Engineering Measures** | Use only under a chemical fume hood. Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are close to the workstation location. |

**Personal Protective Equipment**

| | |
|---|---|
| **Eye/face Protection** | Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. |
| **Skin and body protection** | Long sleeved clothing. |
| **Respiratory Protection** | Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced. |
| **Hygiene Measures** | Handle in accordance with good industrial hygiene and safety practice. |

## 9. Physical and chemical properties

| | |
|---|---|
| **Physical State** | Liquid |
| **Appearance** | Colorless |
| **Odor** | Characteristic |
| **Odor Threshold** | No information available |
| **pH** | No information available |
| **Melting Point/Range** | -85 °C / -121 °F |
| **Boiling Point/Range** | 87 °C / 188.6 °F |
| **Flash Point** | No information available |
| **Evaporation Rate** | 0.69 (Carbon Tetrachloride = 1.0) |
| **Flammability (solid,gas)** | Not applicable |
| **Flammability or explosive limits** | |
| **Upper** | 10.5 vol % |
| **Lower** | 8 vol % |
| **Vapor Pressure** | 77.3 mbar @ 20 °C |
| **Vapor Density** | 4.5 (Air = 1.0) |
| **Specific Gravity** | 1.460 |
| **Solubility** | Slightly soluble in water |
| **Partition coefficient; n-octanol/water** | No data available |
| **Autoignition Temperature** | 410 °C / 770 °F |
| **Decomposition Temperature** | > 120°C |
| **Viscosity** | 0.55 mPa.s (25°C) |

**Molecular Formula** C2 H Cl3
**Molecular Weight** 131.39

## 10. Stability and reactivity

**Reactive Hazard** None known, based on information available

**Stability** Light sensitive.

**Conditions to Avoid** Incompatible products. Excess heat. Exposure to light. Exposure to moist air or water.

**Incompatible Materials** Strong oxidizing agents, Strong bases, Amines, Alkali metals, Metals,

**Hazardous Decomposition Products** Hydrogen chloride gas, Chlorine, Phosgene, Carbon monoxide (CO), Carbon dioxide ($CO_2$)

**Hazardous Polymerization** Hazardous polymerization does not occur.

**Hazardous Reactions** None under normal processing.

## 11. Toxicological information

**Acute Toxicity**

**Product Information**
**Component Information**

| Component | LD50 Oral | LD50 Dermal | LC50 Inhalation |
|---|---|---|---|
| Trichloroethylene | LD50 = 4290 mg/kg ( Rat )<br>LD50 = 4920 mg/kg ( Rat ) | LD50 > 20 g/kg ( Rabbit )<br>LD50 = 29000 mg/kg ( Rabbit ) | LC50 = 26 mg/L ( Rat ) 4 h |

**Toxicologically Synergistic Products** No information available

**Delayed and immediate effects as well as chronic effects from short and long-term exposure**

**Irritation** Irritating to eyes and skin

**Sensitization** No information available

**Carcinogenicity** The table below indicates whether each agency has listed any ingredient as a carcinogen.

| Component | CAS-No | IARC | NTP | ACGIH | OSHA | Mexico |
|---|---|---|---|---|---|---|
| Trichloroethylene | 79-01-6 | Group 1 | Reasonably Anticipated | A2 | X | Not listed |

| | |
|---|---|
| *IARC: (International Agency for Research on Cancer)* | *IARC: (International Agency for Research on Cancer)*<br>*Group 1 - Carcinogenic to Humans*<br>*Group 2A - Probably Carcinogenic to Humans*<br>*Group 2B - Possibly Carcinogenic to Humans* |
| *NTP: (National Toxicity Program)* | *NTP: (National Toxicity Program)*<br>*Known - Known Carcinogen*<br>*Reasonably Anticipated - Reasonably Anticipated to be a Human Carcinogen* |
| *ACGIH: (American Conference of Governmental Industrial Hygienists)* | *A1 - Known Human Carcinogen*<br>*A2 - Suspected Human Carcinogen*<br>*A3 - Animal Carcinogen*<br>*ACGIH: (American Conference of Governmental Industrial Hygienists)* |

**Mutagenic Effects** Mutagenic effects have occurred in humans.

**Reproductive Effects** No information available.

**Developmental Effects** No information available.

**Teratogenicity** No information available.

| | |
|---|---|
| **STOT - single exposure** | Central nervous system (CNS) |
| **STOT - repeated exposure** | Kidney Liver Heart spleen Blood |
| **Aspiration hazard** | No information available |
| **Symptoms / effects,both acute and delayed** | Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting: Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain or flushing |
| **Endocrine Disruptor Information** | No information available |
| **Other Adverse Effects** | The toxicological properties have not been fully investigated. |

## 12. Ecological information

**Ecotoxicity**

Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Do not empty into drains. The product contains following substances which are hazardous for the environment. Contains a substance which is:. Harmful to aquatic organisms. Toxic to aquatic organisms.

| Component | Freshwater Algae | Freshwater Fish | Microtox | Water Flea |
|---|---|---|---|---|
| Trichloroethylene | EC50: = 175 mg/L, 96h (Pseudokirchneriella subcapitata)<br>EC50: = 450 mg/L, 96h (Desmodesmus subspicatus) | LC50: 39 - 54 mg/L, 96h static (Lepomis macrochirus)<br>LC50: 31.4 - 71.8 mg/L, 96h flow-through (Pimephales promelas) | EC50 = 0.81 mg/L 24 h<br>EC50 = 115 mg/L 10 min<br>EC50 = 190 mg/L 15 min<br>EC50 = 235 mg/L 24 h<br>EC50 = 410 mg/L 24 h<br>EC50 = 975 mg/L 5 min | EC50: = 2.2 mg/L, 48h (Daphnia magna) |

| | |
|---|---|
| **Persistence and Degradability** | Persistence is unlikely based on information available. |
| **Bioaccumulation/ Accumulation** | No information available. |
| **Mobility** | Will likely be mobile in the environment due to its volatility. |

| Component | log Pow |
|---|---|
| Trichloroethylene | 2.4 |

## 13. Disposal considerations

| | |
|---|---|
| **Waste Disposal Methods** | Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification. |

| Component | RCRA - U Series Wastes | RCRA - P Series Wastes |
|---|---|---|
| Trichloroethylene - 79-01-6 | U228 | - |

## 14. Transport information

**DOT**

| | |
|---|---|
| **UN-No** | UN1710 |
| **Proper Shipping Name** | TRICHLOROETHYLENE |
| **Hazard Class** | 6.1 |
| **Packing Group** | III |

**TDG**

| | |
|---|---|
| **UN-No** | UN1710 |
| **Proper Shipping Name** | TRICHLOROETHYLENE |
| **Hazard Class** | 6.1 |
| **Packing Group** | III |

**IATA**

| | |
|---|---|
| **UN-No** | UN1710 |
| **Proper Shipping Name** | TRICHLOROETHYLENE |

| | |
|---|---|
| **Hazard Class** | 6.1 |
| **Packing Group** | III |

**IMDG/IMO**

| | |
|---|---|
| **UN-No** | UN1710 |
| **Proper Shipping Name** | TRICHLOROETHYLENE |
| **Hazard Class** | 6.1 |
| **Packing Group** | III |

## 15. Regulatory information

**All of the components in the product are on the following Inventory lists:** X = listed

**International Inventories**

| Component | TSCA | DSL | NDSL | EINECS | ELINCS | NLP | PICCS | ENCS | AICS | IECSC | KECL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Trichloroethylene | X | X | - | 201-167-4 | - | | X | X | X | X | X |

**Legend:**
**X - Listed**
**E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.**
**F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.**
**N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.**
**P - Indicates a commenced PMN substance**
**R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.**
**S - Indicates a substance that is identified in a proposed or final Significant New Use Rule**
**T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.**
**XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B).**
**Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.**
**Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.**

**U.S. Federal Regulations**

**TSCA 12(b)** Not applicable

| Component | TSCA 12(b) |
|---|---|
| Trichloroethylene | Section 5 |

**SARA 313**

| Component | CAS-No | Weight % | SARA 313 - Threshold Values % |
|---|---|---|---|
| Trichloroethylene | 79-01-6 | 100 | 0.1 |

**SARA 311/312 Hazard Categories**

| | |
|---|---|
| **Acute Health Hazard** | Yes |
| **Chronic Health Hazard** | Yes |
| **Fire Hazard** | No |
| **Sudden Release of Pressure Hazard** | No |
| **Reactive Hazard** | No |

**CWA (Clean Water Act)**

| Component | CWA - Hazardous Substances | CWA - Reportable Quantities | CWA - Toxic Pollutants | CWA - Priority Pollutants |
|---|---|---|---|---|
| Trichloroethylene | X | 100 lb | X | X |

**Clean Air Act**

| Component | HAPS Data | Class 1 Ozone Depletors | Class 2 Ozone Depletors |
|---|---|---|---|
| Trichloroethylene | X | | - |

**OSHA** Occupational Safety and Health Administration
Not applicable

**CERCLA**
This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

| Component | Hazardous Substances RQs | CERCLA EHS RQs |
|---|---|---|
| Trichloroethylene | 100 lb 1 lb | - |

**California Proposition 65** This product contains the following proposition 65 chemicals

| Component | CAS-No | California Prop. 65 | Prop 65 NSRL | Category |
|---|---|---|---|---|
| Trichloroethylene | 79-01-6 | Carcinogen<br>Developmental<br>Male Reproductive | 14 µg/day<br>50 µg/day | Developmental<br>Carcinogen |

**U.S. State Right-to-Know Regulations**

| Component | Massachusetts | New Jersey | Pennsylvania | Illinois | Rhode Island |
|---|---|---|---|---|---|
| Trichloroethylene | X | X | X | X | X |

**U.S. Department of Transportation**

| | |
|---|---|
| Reportable Quantity (RQ): | Y |
| DOT Marine Pollutant | N |
| DOT Severe Marine Pollutant | N |

**U.S. Department of Homeland Security**
This product does not contain any DHS chemicals.

**Other International Regulations**

**Mexico - Grade** No information available

## 16. Other information

**Prepared By**
Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

**Creation Date** 03-Feb-2010
**Revision Date** 14-Jul-2016
**Print Date** 14-Jul-2016
**Revision Summary** This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

**Disclaimer**
**The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text**

**End of SDS**

CASTLETON
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# APPENDIX B
# ACTIVITY HAZARD ANALYSES

| **Project Identification** | **Location**<br>808 E 139th St, Bronx, NY | **Estimated Dates**<br>TBD |
|---|---|---|
| **Phase of Work**<br>Drilling/Excavation | **Page 1 of 1** | **Analysis Approved by**<br>Brian Barth,<br>PM/HSM |
| **TASKS** | **HAZARDS** | **CONTROL MEASURES** |
|  | Noise | • Hearing protection mandatory at or above 85dBA.<br>• Instruct personnel how to properly wear heating protective devices.<br>•Disposable ear plugs or other hearing protection required when working near noisy equipment. |
|  | Steam/Heat/Splashing | • Use face shield and safety glasses or goggles;<br>• Stay out of the splash/steam radius;<br>• Do not direct steam at anyone;<br>• Do not hold objects with your foot and steam area near it;<br>• Direct spray to minimize spread of constituents of concern;and<br>• Use shielding as necessary. |
|  | Excavation hazards | • Follow 29 CFR 1926 Subpart P. |
|  | Overhead hazards | • Personnel will be required to wear hard hats that meet ANSI Standard Z89.1;<br>• Ground personnel will stay clear of suspended loads;<br>• Equipment will be provided with guards, canopies or grills to protect the operator from falling or flying objects; and<br>• Overhead hazards will be identified prior to commencing work operations. |
|  | Electrocution | • Equipment will be equipped with GFCI;<br>• A licensed electrician will conduct electricalwork;<br>• Equipment will stay a minimum of 15 feet from overhead-energized electrical lines (up to 50 kV). This distance will increase 0.4 inches for each 1 kV above 50kV. |

# APPENDIX C
# HEAT/COLD STRESS PROTOCOLS

# HEAT STRESS

## Heat Stress (Hyperthermia)

Heat stress is the body's inability to regulate the core temperature. A worker's susceptibility to heat stress can vary according to his/her physical fitness, degree of acclimation to heat, humidity, age and diet.

1. Prior to site activity, the field team leader may make arrangements for heat stress monitoring (i.e., monitoring heart rate, body temperature, and body water loss) during actual site work if conditions warrant. In addition, the FTL is to ensure that each team member has been acclimatized to the prevailing environmental conditions, that personnel are aware of the signs and symptoms of heat sickness, that they have been adequately trained in first aid procedures, and that there are enough personnel on-site to rotate work assignments and schedule work during hours of reduced temperatures. Personnel should not consume alcoholic or caffeinated beverages but rather drink moderate levels of an electrolyte solution and eat well prior to commencing site work.

2. Although there is no specific test given during a baseline physical that would identify a person's intolerance to heat, some indicators are tobacco or medication use, dietary habits, body weight, and chronic conditions such as high blood pressure or diabetes.

3. *Heat cramps*, caused by profuse perspiration with inadequate fluid intake and salt replacement, most often afflict people in good physical condition who work in high temperature and humidity. Heat cramps usually come on suddenly during vigorous activity. Untreated, heat cramps may progress rapidly to heat exhaustion or heat stroke. First aid treatment: remove victim to a cool place and replace lost fluids with water.

4. Thirst is not an adequate indicator of heat exposure. Drinking fluid by itself does not indicate sufficient water replacement during heat exposure. A general rule, the amount of water administered should replace the amount of water lost, and it should be administered at regular intervals throughout the day. For every half pound of water lost, 8 ounces of water should be ingested. Water should be replaced by drinking 2 – 4 ounce servings during every rest period. A recommended alternative to water is an electrolyte drink split 50/50 with water.

5. *Heat exhaustion* results from salt and water loss along with peripheral pooling of blood. Like heat cramps, heat exhaustion tends to occur in persons in good physical health who are working in high temperatures and humidity. Heat exhaustion may come on suddenly as dizziness and collapse. Untreated, heat exhaustion may progress to heat stroke.

6. *Treatment for heat exhaustion*: Move the victim to a cool environment (e.g. air-conditioned room/car), lay victim down and fan him/her. If the air-conditioning is not available, remove the victim to a shaded area, remove shirt, and fan. If symptoms do not subside within an hour, notify 911 to transport to hospital.

7. *Heat stroke* results from the body's inability to dissipate excess heat. A true medical emergency that requires immediate care, it usually occurs when one ignores the signs of heat exhaustion and continues strenuous activities. Working when the relative humidity exceeds 60% is a particular problem. Workers in the early phase of heat stress may not be coherent of they will be confused, delirious or comatose. Changes in behavior, irritability and combativeness are useful early signs of heat stroke.

8. *Treatment of heat stroke*: Move the victim to a cool, air-conditioned environment. Place victim in a semi-reclined position with head elevated and strip to underclothing. Cool victim as rapidly as possible, applying ice packs to the arms and legs and massaging the neck and torso. Spray victim with tepid water and constantly fan to promote evaporation. Notify 911 to transport to hospital as soon as possible.

# TABLE 1

## SYMPTOMS OF HEAT STRESS

*Heat cramps* are caused by heavy sweating with inadequate fluid intake. Symptoms include;

- Muscle cramps
- Cramps in the hands, legs, feet and abdomen

*Heat exhaustion* occurs when body organs attempt to keep the body cool. Symptoms include;

- Pale, cool moist skin
- Core temperature elevated 1-2°
- Thirst
- Anxiety
- Rapid heart rate
- Heavy sweating
- Dizziness
- Nausea

*Heat stroke* is the most serious form of heat stress. Immediate action must be taken to cool the body before serious injury and death occur. Symptoms are;

- Red, hot, dry skin
- Lack of perspiration
- Seizures
- Dizziness and confusion
- Strong, rapid pulse
- Core temperature of 104° or above
- Coma

# TABLE 2

## HEAT STRESS INDICATORS

| Heat stress indicator | When to measure | If Exceeds… | Action |
|---|---|---|---|
| Heart rate (pulse) | Beginning of rest period | 110 beats per minute | Shorten next work period by 33% |
| Oral temperature | Beginning of rest period | 99°F (after thermometer is under tongue for 3 minutes)<br>100.6°F | Shorten next work period by 33%<br>Prohibit work in impermeable clothing |
| Body weight | 1. Before workday begins (a.m.)<br>2. After workday ends (p.m.) |  | Increase fluid intake |

# COLD STRESS

## Cold stress (Hypothermia)

In hypothermia the core body temperature drops below 95°F. Hypothermia can be attributed to a decrease in heat production, increased heat loss or both.

## Prevention

Institute the following steps to prevent overexposure of workers to cold:

1. Maintain body core temperature at 98.6°F or above by encouraging workers to drink warm liquids during breaks (preferably not coffee) and wear several layers of clothing that can keep the body warm even when the clothing is wet.
2. Avoid frostbite by adequately covering hands, feet and other extremities. Clothing such as insulated gloves or mittens, earmuffs and hat liners should be worn. To prevent contact frostbite (from touching metal and cold surfaces below 20°F), workers should wear gloves. Tool handles should be covered with insulating material.
3. Adjust work schedules to provide adequate rest periods. When feasible, rotate personnel and perform work during the warmer hours of the day.
4. Provide heated shelter. Workers should remove their outer layer(s) of clothing while in the shelter to allow sweat to evaporate.
5. In the event that wind barriers are constructed around an intrusive operation (such as drilling), the enclosure must be properly vented to prevent the buildup of toxic or explosive gases or vapors. Care must be taken to keep a heat source away from flammable substances.

Using a wind chill chart such as the one in Table 3, obtain the equivalent chill temperature (ECT) based on actual wind speed and temperature. Refer to the ECT when setting up work warm-up schedules, planning appropriate clothing, etc. Workers should use warming shelters at regular intervals at or below an ECT of 20°F. For exposed skin, continuous exposure should not be permitted at or below an ECT of -25°F.

## Frostbite

Personnel should be aware of symptoms of frostbite/hypothermia. If the following symptoms are noticed in any worker, he/she should immediately go to a warm shelter.

1. *Frostnip* is the incipient stage of frostbite, brought about by direct contact with a cold object or exposure of a body part to cool/cold air. Wind chill or cold water also can be major factors. This condition is not serious. Tissue damage is minor and the response to care is good. The tip of the nose, tips of ears, upper cheeks and fingers (all areas generally exposed) are most susceptible to frostnip.

| Condition | Skin Surface | Tissue Under Skin | Skin Color |
|---|---|---|---|
| Frostnip | Soft | Soft | Initially red, then white |
| Frostbite | Hard | Soft | White and waxy |
| Freezing | Hard | Hard | Blotchy, white to yellow-gray to gray |

2. *Treatment of frostnip*: Care for frostnip by warming affected areas. Usually the worker can apply warmth from his/her bare hands, blow warm air on the site, or, if the fingers are involved, hold them in the armpits. During recovery, the worker may complain of tingling or burning sensation, which is normal. If the condition does not respond to this simple care, begin treatment for frostbite.

3. *Frostbite*: The skin and subcutaneous layers become involved. If frostnip goes untreated, it becomes superficial frostbite. This condition is serious. Tissue damage may be serious. The worker must be transported to a medical facility for evaluation. The tip of the nose, tips of ears, upper cheeks and fingers (all areas generally exposed) are most susceptible to frostbite. The affected area will feel frozen, but only on the surface. The tissue below the surface must still be soft and have normal response to touch. *DO NOT* squeeze or poke the tissue. The condition of the deeper tissues can be determined by gently palpating the affected area. The skin will turn mottled or blotchy. It may also be white and then turn grayish-yellow.

4. *Treatment of frostbite*: When practical, transport victim as soon as possible. Get the worker inside and keep him/her warm. Do not allow any smoking or alcohol consumption. Thaw frozen parts by immersion, re-warming in a 100°F to 106°F water bath. Water temperature will drop rapidly, requiring additional warm water throughout the process. Cover the

thawed part with a dry sterile dressing. Do not puncture or drain any blisters.

**NOTE**: Never listen to myths and folk tales about the care of frostbite. *Never* rub a frostbitten or frozen area. *Never* rub snow on a frostbitten or frozen area. Rubbing the area may cause serious damage to already injured tissues. Do not attempt to thaw a frozen area if there is any chance it will be re-frozen.

5. *General cooling/Hypothermia*: General cooling of the body is known as systemic hypothermia. This condition is not a common problem unless workers are exposed to cold for prolonged periods of time without any shelter.

| Body Temperature | °C | Symptoms |
|---|---|---|
| 99-96 | 37-35.5 | Intense, uncontrollable shivering |
| 95-91 | 35.5-32.7 | Violent shivering persists. If victim is conscious, he has difficulty speaking. |
| 90-86 | 32-30 | Shivering decreases and is replaced by strong muscular rigidity. Muscle coordination is affected. Erratic or jerkey movements are produced. Thinking is less clear. General comprehension is dulled. There may be total amnesia. The worker is generally still able to maintain the appearance of psychological contact with his surroundings. |
| 85-81 | 29.4-27.2 | Victim becomes irrational, loses contact with his environment, and drifts into a stuporous state. Muscular rigidity continues. Pulse and respirations are slow and the worker may develop cardiac arrhythmias. |
| 80-78 | 26.6-18.5 | Victim becomes unconscious. He does not respond to the spoken word. Most reflexes cease to function. Heartbeat becomes erratic |
| Below 78 | 25.5 | Cardiac and respiratory centers of the brain fail. Ventricular fibrillation occurs; probably edema and hemorrhage in the lungs; death. |

6. *Treatment of hypothermia*: Keep worker dry. Remove any wet clothing and replace with dry clothes or wrap person in dry blankets. Keep person at rest. Do not allow him/her to move around. Transport the victim to a medical facility as soon as possible.

## TABLE 3(1)

## COOLING POWER OF WIND ON EXPOSED FLESH EXPRESSED AS AN EQUIVALENT TEMPERATURE (UNDER CALMCONDITIONS)

| Estimated wind Speed (in mph) | Actual Temperature Reading (°F)P | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 50 | 40 | 30 | 20 | 10 | 0 | 10 | 20 | 30 | 40 | 50 | 60 |
| | Equivalent Chill Temperature(°F) | | | | | | | | | | | |
| Calm | 50 | 40 | 30 | 20 | 10 | 0 | -10 | -20 | -30 | -40 | -50 | -60 |
| 5 | 48 | 37 | 27 | 16 | 6 | -5 | -15 | -26 | -36 | -47 | -57 | -68 |
| 10 | 40 | 28 | 15 | 4 | -9 | -24 | -33 | -46 | -58 | -70 | -83 | -95 |
| 15 | 36 | 22 | 9 | -5 | -18 | -32 | -45 | -58 | -72 | -85 | -99 | -112 |
| 20 | 32 | 18 | 4 | -10 | -25 | -39 | -53 | -67 | -82 | -96 | -110 | -121 |
| 25 | 30 | 16 | 0 | -15 | -29 | -44 | -59 | -74 | -88 | -104 | -118 | -133 |
| 30 | 28 | 13 | -2 | -18 | -33 | -48 | -63 | -79 | -94 | -109 | -125 | -140 |
| 35 | 27 | 11 | -4 | -20 | -35 | -51 | -67 | -82 | -98 | -113 | -129 | -145 |
| 40 | 26 | 10 | -6 | -21 | -37 | -53 | -69 | -85 | -100 | -116 | -132 | -146 |
| (Wind speeds greater than 40 mph have little additional effect.) | LITTLE DANGER<br>in < hr with dry skin. Maximum danger of false sense of security. | | | | INCREASING DANGER<br>Danger from freezing of exposed flesh within one minute | | | GREAT DANGER<br>Flesh may freeze within 30 seconds. | | | | |
| | Trench foot and imersion foot mayoccur | | | | at any point on thischart | | | | | | | |

Developed by U.S. Army Research Institute of Environmental Medicine, Natick, MA.

(1) Reproduced from American Conference of Governmental Industrial Hygienists, Threshold Limit Values and Biological Exposure Indices for 1985-1986, p.01.

# APPENDIX D

# MEDICAL DATA SHEET

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| **Medical Data Sheet** |
|---|
| Name: |
| Date: |
| Phone: |
| Emergency contact: |
| Medical Conditions: |
| Allergies: |
| Current Medications: |

# APPENDIX E

# GENERAL HEALTH AND SAFETY WORK PRACTICES

GENERAL HEALTH AND SAFETY WORK PRACTICES

1. Site personnel must attend each day's Daily Briefing and sign the attendance sheet.

2. Any individual taking prescribed drugs shall inform the FTL/HSO of the type of medication. The FTL/HSO will review the matter with the HSM and the Corporate Medical Consultant (CMC), who will decide if the employee can safely work on-site while taking the medication.

3. The personal protective equipment specified by the FTL/HSO and/or associated procedures shall be worn by site personnel. This includes hard hats and safety glasses which must be worn in active work areas.

4. Facial hair (beards, long sideburns or mustaches) which may interfere with a satisfactory fit of a respirator mask is not allowed on any person who may be required to wear a respirator.

5. Personnel must follow proper decontamination procedures and shower as soon as possible upon completion of work shift.

6. Eating, drinking, chewing tobacco or gum, smoking and any other practice that may increase the possibility of hand-to-mouth contact is prohibited in the exclusion zone or the contamination reduction zone. (Exceptions may be permitted by the HSM to allow fluid intake during heat stress conditions).

7. Lighters, matches, cigarettes and other forms of tobacco are prohibited in the Exclusion Zone.

8. Signs and demarcations shall be followed. Such signs and demarcation shall not be removed, except as authorized by the FTL/HSO.

9. No one shall enter a permit-required confined space without a permit and appropriate training. Confined space entry permits shall be implemented as issued.

10. Personnel must follow Hot Work Permits as issued.

11. Personnel must use the Buddy System in the Exclusion Zone.

12. Personnel must follow the work-rest regimens and other practices required by the heat stress program.

13. Personnel must follow lockout/tagout procedures when working on equipment involving moving parts or hazardous energy sources.

14. No person shall operate equipment unless trained and authorized.

15. No one may enter an excavation greater than four feet deep unless authorized by the Competent Person. Excavations must be sloped or shored properly. Safe means of access and egress from excavations must be maintained.

16. Ladders and scaffolds shall be solidly constructed, in good working condition, and inspected prior to use. No one may use defective ladders or scaffolds.

17. Fall protection or fall arrest systems must be in place when working at elevations greater than six feet for temporary working surfaces and four feet for fixed platforms.

18. Safety belts, harnesses and lanyards must be selected by the Supervisor. The user must inspect the equipment prior to use. No defective personal fall protection equipment shall be used. Personal fall protection that has been shock loaded must be discarded.

19. Hand and portable power tools must be inspected prior to use. Defective tools and equipment shall not be used.

20. Ground fault interrupters shall be used for cord and plug equipment used outdoors or in damp locations. Electrical cords shall be kept out walkways and puddles unless protected and rated for the service.

21. Improper use, mishandling, or tampering with health and safety equipment and samples is prohibited.

22. Horseplay of any kind is prohibited.

23. Possession or use of alcoholic beverages, controlled substances, or firearms on any site is forbidden.

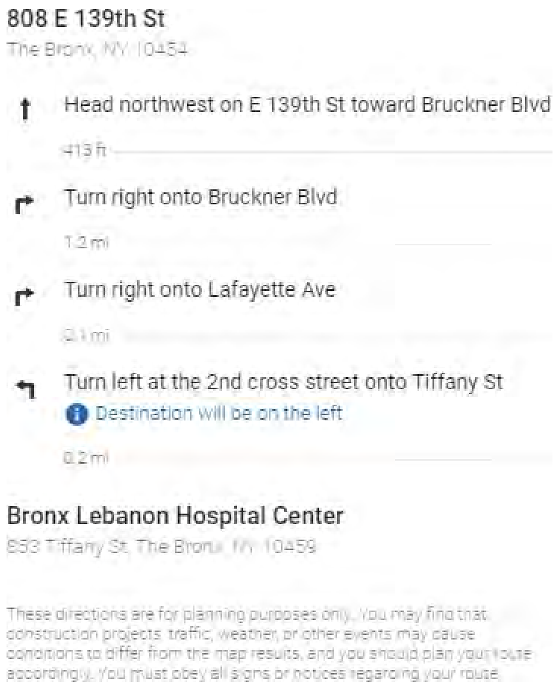
24. Incidents, no matter how minor, must be reported immediately to the Supervisor.

25. Personnel shall be familiar with the Site Emergency Action Plan, which is contained in Section 12 of the HASP/EAP.

The above Health and Safety Rules are not all inclusive and it is your responsibility to comply with regulations set forth by OSHA, the client, Castleton Supervisors, and the FTL/HSO.

# APPENDIX F

# HOSPITAL ROUTE MAP AND DIRECTIONS



**808 E 139th St**
The Bronx, NY 10454

↑ Head northwest on E 139th St toward Bruckner Blvd

413 ft

↱ Turn right onto Bruckner Blvd

1.2 mi

↱ Turn right onto Lafayette Ave

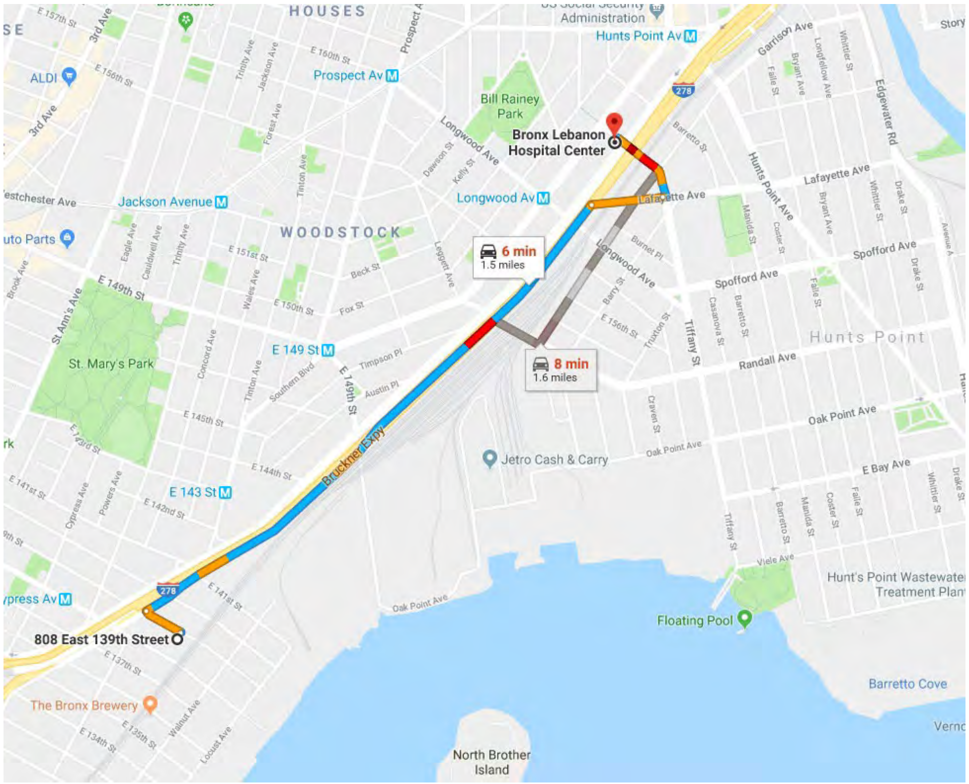
0.1 mi

↰ Turn left at the 2nd cross street onto Tiffany St
ⓘ Destination will be on the left

0.2 mi

**Bronx Lebanon Hospital Center**
853 Tiffany St, The Bronx, NY 10459

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.



# APPENDIX G

# INCIDENT REPORT FORM/INVESTIGATION FORM

## INCIDENT / NEAR MISS REPORT AND INVESTIGATION - PAGE 1 OF 2

### TYPE OF INCIDENT - CHECK ALL THAT APPLY

☐ INJURY/ILLNESS ☐ VEHICLE DAMAGE ☐ PROPERTY DAMAGE ☐ FIRE

☐ SPILL/RELEASE ☐ PERMIT EXCEEDENCE ☐ NEAR MISS ☐ OTHER

### GENERAL INFORMATION

PROJECT NAME: DATE OF REPORT: REPORT NO.:

DATE OF INCIDENT: TIME: DAY OF WEEK:

LOCATION OF INCIDENT:

WEATHER CONDITIONS: ADEQUATE LIGHTING AT SCENE? ☐ YES ☐ NO ☐N/A

### DESCRIBE WHAT HAPPENED (STEP BY STEP - USE ADDITIONAL PAGES IFNECESSARY)

### AFFECTED EMPLOYEE INFORMATION

NAME: EMPLOYEE: ☐YES ☐NO

HOME ADDRESS:

SOCIAL SECURITY NO.: HOME PHONE NO.:

JOB CLASSIFICATION: YEARS IN JOB CLASSIFICATION:

HOURS WORKED ON SHIFT PRIOR TO INCIDENT: AGE:

DID INCIDENT RELATE TO ROUTINE TASK FOR JOB CLASSIFICATION? ☐YES ☐ NO

### INJURY/ILLNESS INFORMATION

NATURE OF INJURY OR ILLNESS:

OBJECT/EQUIPMENT/SUBSTANCE CAUSING HARM:

FIRST AID PROVIDED? ☐YES ☐ NO

IF YES, WHERE WAS IT GIVEN: ☐ ON-SITE ☐ OFF-SITE

IF YES, WHO PROVIDED FIRST AID:

WILL THE INJURY/ILLNESS RESULT IN: ☐ RESTRICTED DUTY ☐ LOST TIME ☐ UNKNOWN

| | |
|---|---|
| INCIDENT / NEAR MISS REPORT AND INVESTIGATION - PAGE 2 OF 2 | REPORT NO. |
| | |
| MEDICAL TREATMENT INFORMATION | |
| WAS MEDICAL TREATMENT PROVIDED? ☐YES ☐NO | |
| IF YES, WAS MEDICAL TREATMENT PROVIDED: ☐ON-SITE ☐DR.’S OFFICE ☐HOSPITAL | |
| NAME OF PERSON(S) PROVIDING TREATMENT: | |
| ADDRESS WHERE TREATMENT WAS PROVIDED: | |
| TYPE OF TREATMENT: | |
| VEHICLE AND PROPERTY DAMAGE INFORMATION | |
| VEHICLE/PROPERTY DAMAGED: | |
| DESCRIPTION OF DAMAGE: | |
| SPILL AND AIR EMISSIONS INFORMATION: | |
| SUBSTANCE SPILLED OR RELEASED: | FROM WHERE: TO WHERE: |
| ESTIMATED QUANTITY/DURATION: | |
| CERCLA HAZARDOUS SUBSTANCE? ☐YES ☐NO | |
| REPORTABLE TO AGENCY? ☐YES ☐NO SPECIFY: | |
| WRITTEN REPORT: ☐YES ☐NO TIME FRAME: | |
| RESPONSE ACTION TAKEN: | |
| PERMIT EXCEEDENCE | |
| TYPE OF PERMIT: | PERMIT #: |
| DATE OF EXCEEDENCE: | DATE FIRST KNOWLEDGE OF EXCEEDENCE: |
| PERMITTED LEVEL OR CRITERIA: | |
| EXCEEDENCE LEVEL OR CRITERIA: | |
| REPORTABLE TO AGENCY? ☐YES ☐NO SPECIFY: | |
| WRITTEN REPORT: ☐YES ☐NO TIME FRAME: | |
| RESPONSE ACTION TAKEN: | |
| NOTIFICATIONS | |
| NAMES OF PERSONNEL NOTIFIED: | DATE/TIME: |
| CLIENT NOTIFIED: | DATE/TIME: |
| AGENCY NOTIFIED: | DATE/TIME: |
| CONTACT NAME: | |
| PERSONS PREPARING REPORT | |
| EMPLOYEE’S NAME:(PRINT) | SIGN: |

SUPERVISOR'S NAME:(PRINT) SIGN:

INVESTIGATIVE REPORT

DATE OF INCIDENT: DATE OF REPORT: REPORT NUMBER:

INCIDENT COST: ESTIMATED: $ ACTUAL: $

OSHA RECORDABLE(S): ☐YES ☐NO # RESTRICTED DAYS # DAYS AWAY FROM WORK

CAUSE ANALYSIS

IMMEDIATE CAUSES - WHAT ACTIONS AND CONDITIONS CONTRIBUTED TO THIS EVENT?

BASIC CAUSES - WHAT SPECIFIC PERSONAL OR JOB FACTORS CONTRIBUTED TO THIS EVENT?

ACTION PLAN

REMEDIAL ACTIONS - WHAT HAS AND OR SHOULD BE DONE TO CONTROL EACH OF THE CAUSES

| ACTION | PERSON RESPONSIBLE | TARGET DATE | COMPLETION DATE |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |

**PERSONS PERFORMING INVESTIGATION**

INVESTIGATOR'S NAME: (PRINT) SIGN: DATE:

INVESTIGATOR'S NAME: (PRINT) SIGN: DATE:

INVESTIGATOR'S NAME: (PRINT) SIGN: DATE:

**MANAGEMENT REVIEW**

PROJECT MANAGER: (PRINT) SIGN: DATE:

COMMENTS:

H&S MANAGER: (PRINT) SIGN: DATE:

COMMENTS:

## EXAMPLES OF IMMEDIATE CAUSES

### Substandard Actions

1. Operating equipment without authority
2. Failure to warn
3. Failure to secure
4. Operating at improper speed
5. Making safety devices inoperable
6. Removing safety devices
7. Using defective equipment
8. Failure to use PPE properly
9. Improper loading
10. Improper placement
11. Improper lifting
12. Improper position for task
13. Servicing equipment in operation
14. Under influence of alcohol/drugs
15. Horseplay

### Substandard Conditions

1. Guards or barriers
2. Protective equipment
3. Tools, equipment, or materials
4. Congestion
5. Warning system
6. Fire and explosion hazards
7. Poor housekeeping
8. Noise exposure
9. Exposure to hazardous materials
10. Extreme temperature exposure
11. Illumination
12. Ventilation
13. Visibility

## EXAMPLES OF BASIC CAUSES

### Personal Factors

1. Capability
2. Knowledge
3. Skill
4. Stress
5. Motivation
6. Work Standards
7. Wear and tear
8. Abuse or misuse

### Job Factors

1. Supervision
2. Engineering
3. Purchasing
4. Maintenance
5. Tools/equipment

## MANAGEMENT PROGRAMS FOR CONTROL OF INCIDENTS

1. Leadership and administration
2. Management training
3. Planned inspections
4. Task analysis and procedures
5. Task observation
6. Emergency preparedness
7. Organizational rules
8. Accident/incident analysis
9. Personal protective equipment
10. Health control
11. Program audits
12. Engineering controls
13. Personal communications
14. Group meetings
15. General promotion
16. Hiring and placement
17. Purchasing controls

# APPENDIX H

# DAILY BRIEFING SIGN-IN SHEET

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# DAILY BRIEFING SIGN-IN SHEET

Date:__________________________________
Project Name/Location: ___________________________________________
Person Conducting Briefing:_________________________________________

1. AWARENESS (topics discussed, special safety concerns, recent incidents, etc.)

_______________________________________________________________________________________

_______________________________________________________________________________________

_______________________________________________________________________________________

2. OTHER ISSUES (HASP/EAP changes, attendee comments, etc.)

_______________________________________________________________________________________

_______________________________________________________________________________________

_______________________________________________________________________________________

3. ATTENDEES (Print Name):

| | |
|---|---|
| 1. | 21. |
| 2. | 22. |
| 3. | 23. |
| 4. | 24. |
| 5. | 25. |
| 6. | 26. |
| 7. | 27. |
| 8. | 28. |
| 9. | 29. |
| 10. | 30. |
| 11. | 31. |
| 12. | 32. |
| 13. | 33. |
| 14. | 34. |
| 15. | 35. |
| 16. | 36. |
| 17. | 37. |
| 18. | 38. |
| 19. | 39. |
| 20. | 40. |

CASTLETON
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# APPENDIX B

CASTLETON
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# Quality Assurance Project Plan

## Ace Suede and Leather
## 808 East 139th Street
## Bronx, New York
## NYSDEC Site No: C203072

## June 2021

Prepared for: B & B First Holdings LLC
334 Faile Street
Bronx, NY

CASTLETON
ENVIRONMENTAL

# QUALITY ASSURANCE PROJECT PLAN
# ACE SUEDE AND LEATHER
# 808 EAST 139TH STREET
# BRONX, NY
# NYSDEC SITE NO: C203072
# JUNE 2021

## Table of Contents

**Figures**

**Tables**

**Appendices**

## 1.0 INTRODUCTION

Castleton Environmental Geologic Services DPC (Castleton, has prepared this Quality Assurance Project Plan (QAPP) for the property located 808 East 139th Street in the Port Morris section of the Bronx, New York (the site). The site is listed on the New York State Department of Environmental Conservation's (NYSDEC) Environmental Site Remediation Database as Ace Suede and Leather under site code C203072.

The proposed work is being performed on behalf of B&B First Holdings, LLC. (B&B), as part of their commitment to investigate and clean up the site under the NYSDEC Brownfield Cleanup Program (BCP). This work is being performed pursuant to the NYSDEC Brownfield Cleanup Agreement (BCA), executed on February 12, 2019 (Index No. C203072-12-18).

This QAPP provides a general overview of the measure to be employed during the field investigation and remedial activities at the site. Specific procedures for the various tasks to be performed are included in the Field Activities Plan.

The Field Activities Plan is included in Appendix A. The site location is shown on Figure 1.

## 2.0 PROJECT SCOPE

The scope of this QAPP is to provide Quality Assurance/Quality Control (QA/QC) procedures during the proposed Remedial Investigation (RI). The intent of the RIWP effort is to delineate contamination to soil and groundwater at the site identified during the December 2013 Phase II Environmental Site Assessment (ESA) by Environmental Business Consultants (EBC). The anticipated RIWP scope of work includes performing a soil vapor intrusion (SVI) investigation, installation of soil boring and collecting subsurface soil samples, installation of a monitoring well network and collection of groundwater samples, and laboratory analysis. The purpose and scope of this QAPP is to provide guidance and procedures intended to ensure data derived during the RIWP activities are of sufficient quality to be relied upon for its intended use. The goals of this QAPP include ensuring QA/QC measures are met and include:

- Accuracy
- Precision
- Sensitivity
- Representation
- Completeness
- Comparability (Where applicable during the IRM)

A site plan is provided as Figure 2.

## 3.0 PROJECT TEAM

The QAPP shall be implemented by several organizations and personnel under contract to B&B as listed below:

- Project Manager – Castleton – Brian Barth
- Quality Assurance Officer (QAO) – Castleton – Frank Castellano (Principal)
- Field Staff – Castleton – Sarah Heyne (Staff Scientists)
- Data Validator – Laboratory Data Consultants, Inc. (LDC) of Carlsbad, California.

Personnel and Data Validator resumes are included as Appendix B.

### 3.1 Environmental Laboratory Accreditation Program

An ELAP-certified laboratory will be used for all sample analyses. The laboratory will follow the following QA/QC protocols. All samples will be delivered to the laboratory within 24 hours of sample collection. Samples will be received by laboratory personnel, who will inspect the sample cooler(s) to check the integrity of the custody seals. The cooler(s) will then be opened, the samples unpackaged, and the information on the chain-of-custody form examined. If the shipped samples match those described on the chain-of-custody form, the laboratory sample custodian will sign and date the form on the next “Received” blank and assume responsibility for the samples. If problems are noted with the sample shipment, the laboratory custodian will sign the form and record problems in the “Remarks” box. The custodian will then immediately notify the Project Manager so appropriate follow-up steps can be implemented on a timely basis.

A record of the information detailing the handling of a particular sample through each stage of analysis will be maintained by the laboratory. The record will include:

- Job reference, sample matrix, sample number, and date sampled;
- Date and time received by laboratory, holding conditions, and analytical parameters;
- Extraction date, time and extractor’s initials (if applicable), analysis date, time, and analyst’s initials; and
- QA batch number, date reviewed, and reviewer’s initials.

The selected ELAP approved for this project: York Analytical Laboratories, Inc. (York) of Stratford, Connecticut.

The York Analytical New York State Department of Health (NYSDOH) ELAP Certification is included as Appendix C.

## 4.0 DATA QUALITY USABILITY OBJECTIVES

The overall data quality objectives of this QAPP is to collect and derive data that is of reliable and documented quality for its intended purpose. Specific to the proposed RIWP, the specific objectives include collected representative sub-slab vapor, soil vapor, ambient air, subsurface soil, and groundwater samples of sufficient frequency and distribution to delineate the extent of contamination at the site. By implementing appropriate QA/QC procedures for the endpoint sample collection, laboratory analysis, and validation will help ensure the analytical results are accurate and of documented quality which can be relied upon for decision making for future investigation and remediation activities.

## 5.0 SAMPLING AND DECONTAMINATION PROCEDURES

Field QA/QC will include the following procedures:

- Calibration of field equipment, including PID, daily;
- Use of dedicated and/or disposable field sampling equipment;
- Proper decontamination when non-disposable field equipment is utilized;
- Proper sample handling and preservation;
- Proper sample chain of custody documentation; and
- Completion of report logs.

The above procedures will be executed as follows:

- Disposable sampling equipment, including acetate sleeves, latex gloves, and disposable bailers (or sample tubing), will be used to minimize cross-contamination between samples;
- For each of the parameters analyzed, a sufficient sample volume will be collected to adhere to the specific analytical protocol, and provide sufficient sample for reanalysis if necessary;

Samples will be analyzed prior to the expiration of the respective holding time for each analytical parameter to ensure the integrity of the analytical results.

QA/QC procedures will be used to provide performance information regarding field procedures to:

- document that samples are representative of actual conditions at the site and
- identify possible cross-contamination from field activities or sample transit.

Specific laboratory QA/QC procedures and analyses will be used to:

- demonstrate whether analytical results have been biased either by interfering compounds in the sample matrix, or
- by laboratory techniques that may have introduced systematic or random errors to the analytical process.

Sample handling in the field will conform to appropriate sample custody procedures. Field custody procedures include proper sample identification, chain-of-custody forms, and packaging and shipping procedures. Sample labels will be attached to all sampling canisters before field activities begin to ensure proper sample identification. Each label will identify the site and sample location.

A summary of the field and laboratory QA/QC procedures is provided below.

### 5.1 Soil Sampling Procedures

For the purpose of this QAPP, the sampling matrix considered during RIWP activities includes subsurface soil samples from soil borings, groundwater samples from permanent monitoring well couplets, sub-slab and soil vapor samples, and ambient air samples. Standard methods of sampling for each matrix is provided in the Field Activities Plan.

The Field Activities Plan included as Appendix A.

### 5.2 Decontamination Procedures

To ensure that cross-contamination or outside contamination is not introduced to samples and/or data, the following cleaning procedure will apply for non-dedicated sampling equipment prior to and between sample collection locations.

- Thoroughly clean equipment using a laboratory-grade (Liquinox) solution and scrubbing to remove visual contamination (Liquinox will not be used for the decontamination of 1,4-dioxane sample equipment);
- Rinse with water until soap is removed;
- Allow to dry before next use;
- If equipment is not to be used immediately, wrap in aluminum foil.

### 5.3 Chain of Custody Procedures

After each sample is collected and appropriately identified, the following information will be recorded on the chain-of-custody form:

- sample identification;
- date and time of sample collection;
- sampling depth;
- identity of samplers;
- sampling methods and devices;
- soil vapor purge volumes;
- volume of soil vapor extracted;
- if canisters used, vacuum of canisters before and after samples collected,
- apparent moisture content (dry, moist, saturated, etc.) of the sampling zone; and
- chain of custody protocols and records used to track samples from sampling point to analysis.

The sampler will sign and date the “Relinquished” blank space prior to removing one copy of the custody form and sealing the remaining copies of the form in a Ziploc plastic bag. The canisters will be picked up by a laboratory representative from the Site or hand delivered to the laboratory.

### 5.4 Field Logs and Reports

Field logs and borings logs will be completed throughout the course of this investigation. A field log will be completed daily which will describe all field activities including:

- Project number, name, manager, and address;
- The date and time;
- The weather conditions;
- On-site personnel and associated affiliations;
- Description of field activities; and
- Pertinent sample collection information including sample identification numbers, description of samples, location of sampling points, number of samples taken, method of sample collection and any factors that may affect its quality, time of sample collection, name of collector, and field screening results.

## 6.0 SAMPLING FOR EMERGING CONTAMINANTS UNDER NYSDEC PART 375

As part of the NYSDECs requirement, sampling of the emerging contaminants including 1,4-Dioxane and per and poly-fluoroalkyl substances (PFAS) will be performed during the RIWP activities.

### 6.1 Specific Guidelines for PFAS

Samples collected will be analyzed by LC-MC/MS for PFAS using methodologies based on EPA method 537.1 and include the 21 PFAS compounds listed below:

| Group | Chemical Name | Abbreviation |
|---|---|---|
| Perfluoroalkyl sulfonates | Perfluorobutanesulfonic acid | PFBS |
| | Perfluorohexanesulfonic acid | PFHxS |
| | Perfluoroheptanesulfonic acid | PFHpS |
| | Perfluorooctanesulfonic acid | PFOS |
| | Perfluorodecanesulfonic acid | PFDS |
| Perfluoroalkyl carboxylates | Perfluorobutanoic acid | PFBA |
| | Perfluoropentanoic acid | PFPeA |
| | Perfluorohexanoic acid | PFHxA |
| | Perfluoroheptanoic acid | PFHpA |
| | Perfluorooctanoic acid | PFOA |
| | Perfluorononanoic acid | PFNA |
| | Perfluorodecanoic acid | PFDA |
| | Perfluoroundecanoic acid | PFUA/PFUdA |
| | Perfluorododecanoic acid | PFDoA |
| | Perfluorotridecanoic acid | PFTriA/PFTrDA |
| | Perfluorotetradecanoic acid | PFTA/PFTeDA |
| Fluorinated Telomer Sulfonates | 6:2 Fluorotelomer sulfonate | 6:2 FTS |
| | 8:2 Fluorotelomer sulfonate | 8:2 FTS |
| Perfluorooctanesulfonamides | Perfluroroctanesulfonamide | FOSA |
| Perfluorooctanesulfonamidoacetic acids | N-methyl perfluorooctanesulfonamidoacetic acid | N-MeFOSAA |
| | N-ethyl perfluorooctanesulfonamidoacetic acid | N-EtFOSAA |

### 6.2 PFAS Reporting Limits

Reporting limits for PFAS groundwater are to be 0.35 ug/L (ppb) and 0.5 ug/kg (ppb) in soil. If contract labs or work plans submitted by responsible parties indicate that they are not able to achieve these reporting limits for the entire list of 21 PFAS, site-specific decisions will need to be made by the DEC project manager in consultation with the DEC remedial program chemist.

The laboratory SOP for PFAS is included as Appendix D.

The method detection limits (MDLs) for the 21 PFAS compounds are included in Appendix E.

### 6.3 PFAS Specific Sampling Procedures

Sampling for PFAS via EPA Method 537 can be challenging due to the prevalence of these compounds in many consumer and sampling specific products. The following sampling procedures and guidelines are necessary to ensure the usability of PFAS analytical results:

- Clothing or boots should not contain Gore-Tex (wet weather gear made of polyurethane and PVC only);
- All safety boots should be made from polyurethane and PVC;
- No materials containing Tyvek;
- Do not use fabric softener on field clothing;
- Do not use cosmetics, moisturizers, hand cream, or other related products the morning of the sampling event;
- Do not use unauthorized sunscreen or insect repellant;
- All sample containers made of HDPE or polypropylene;
- Caps are unlined and made of HDPE or polypropylene (no Teflon lined caps);
- Equipment decontamination must utilize PFAS-free water onsite for sample equipment;
- Only Alconox and/or Liquinox can be used as decontamination materials;
- Food or drinks must be left in the staging areas;
- Sample for PFAS first, other containers/methods may have PFAS present on containers/equipment;
- Field equipment must not contain Teflon;
- Sampling materials must be made from stainless-steel, HDPE, acetate, silicon, or polypropylene;
- No waterproof field books;
- No plastic clipboards, binders, or spiral notebooks;
- No adhesives
- No sharpies/permanent markers. Must use regular ball point pens;
- No use of aluminum foil;
- Keep PFAS samples in a separate cooler filled with regular ice only (do not use chemical ice packs).
- Sampler must wash hands before wearing nitrile gloves to limit contamination during sampling.

### 6.4 Specific Guidelines for 1,4-Dioxane

Soil and groundwater samples collected will be analyzed for 1,4-Dioxane using EPA Method 8270 SIM to achieve the minimum method reporting limit of 0.35 ug/L in groundwater and 0.5 ug/Kg in soils. Liquinox will not be used for decontamination during sampling for 1,4-dioxane.

## 7.0 ANALYTICAL METHODS/QUALITY ASSURANCE

To assess the adequacy of the soil endpoint samples collected and decontamination procedures performed in the field, QA/QC samples shall be collected and analyzed throughout the field sampling program. In general, QA/QC samples shall confirm that the procedures performed in the field are consistent and acceptable. QA/QC samples must include trip blanks, field blanks, blind duplicates, matrix spike (MS), and matrix spike duplicate (MSD).

The anticipated sample matrices collected for the purpose of this IRM and QAPP include soil endpoint samples. The types and frequencies of endpoint samples, field QA/QC samples are provided in the table below:

| QA/QC Samples | Frequency |
|---|---|
| Field/Equipment Blanks | 1 per day / matrix |
| Trip Blanks | 1 per cooler |
| Analytical Parameters | In accordance with 6 NYCRR Part 375. |
| Minimum reporting Limits | In accordance with 6 NYCRR Part 375 |
| MS/MSD Samples to be Collected | 1 each per 20 samples/matrix |
| Duplicate and Blind Duplicate Samples | 1 each per 20 samples/matrix |

Notes:

*Number of soil endpoint samples based on maximum extent of excavation anticipated. Actual number of soil endpoint samples shall be determined based on actual extents of excavation and DER-10.

**Aqueous samples not anticipated as part of this IRM effort.

A summary of the proposed sampling frequency is provided in Table 1.
The following table summarizes the sample preservation methods, analytical methods, container volumes and types, and sample holding times per matrix:

| **Analyte Group (Vapor/Air Matrix)** | **EPA Method(s)** | **Holding Time** | **Preservatives** | **Volume** |
|---|---|---|---|---|
| Volatile Organics | TO-15 | 30 days | None | 6L SUMMA |

| Analyte Group (Soil Matrix) | EPA Method(s) | Holding Time | Preservatives | Volume |
|---|---|---|---|---|
| Volatile Organics | 8260 | 48 hours to freeze.<br>14 days to analysis | Terracore:<br>MeOH<br>DI Water<br>Unpreserved. | (1) 45ml VOA<br>(2) 45ml VOA<br>(1) 45ml VOA |
| Semi Volatile Organics | 8270 | 14 days | Ice | 4oz jar |
| Pesticides | 8081 | 14 days | Ice | 4oz jar |
| PCBs | 8082 | 14 days | Ice | 4oz jar |
| Herbicides | 8151 | 14 days | Ice | 4oz jar |
| PFAS | 537.1 | 14 days | Ice | (1) 250ml HDPE |
| 1,4-Dioxane | 8270 SIM | 14 Days | Ice | 4oz jar |
| Metals | 6010/6020 | 6 months (total)<br>28 days (Hg) | Ice | 2oz jar |

| Analyte Group (Water Matrix) | EPA Method(s) | Holding Time | Preservatives | Volume |
|---|---|---|---|---|
| Volatile Organics | 8260 | 14 days | HCL. | (3) 45ml VOA |
| Semi Volatile Organics | 8270 | 7 days | Ice | (2) 1 Liter Amber |
| Pesticides | 8081 | 7 days | Ice | (2) 1 Liter Amber |
| PCBs | 8082 | 7 days | Ice | (2) 1 Liter Amber |
| Herbicides | 8151 | 7 days | Ice | (1) 1 Liter Amber |
| PFAS | 537m | 14 days to extraction and 28 days to analysis | Ice | (2) 250ml HDPE |
| 1,4-Dioxane | 8270 SIM | 7 days | Ice | (1) 1 Liter Amber |
| Metals | 6010/6020 | 6 months | HN03 | (1) 250ml Plastic |

## 8.0 DATA USABILITY SUMMARY REPORT

A Category B Data Usability Summary Report (DUSR) will be prepared by a third-party contractor. This will present the results of data validation, including a summary assessment of laboratory data packages, sample preservation and chain of custody procedures, and a summary assessment of precision, accuracy, representativeness, comparability, and completeness for each analytical method.

# Figures

CASTLETON ENVIRONMENTAL

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*www.castletonenv.com*

# SITE LOCATION

808 East 139th Street
Bronx, New York

| | |
|---|---|
| PROJECT: | AJRC1701 |
| DATE: | 4/12/2019 |
| DRAWN BY: | BB |
| APPROVED BY: | FPC |

***FIGURE:***

**1**

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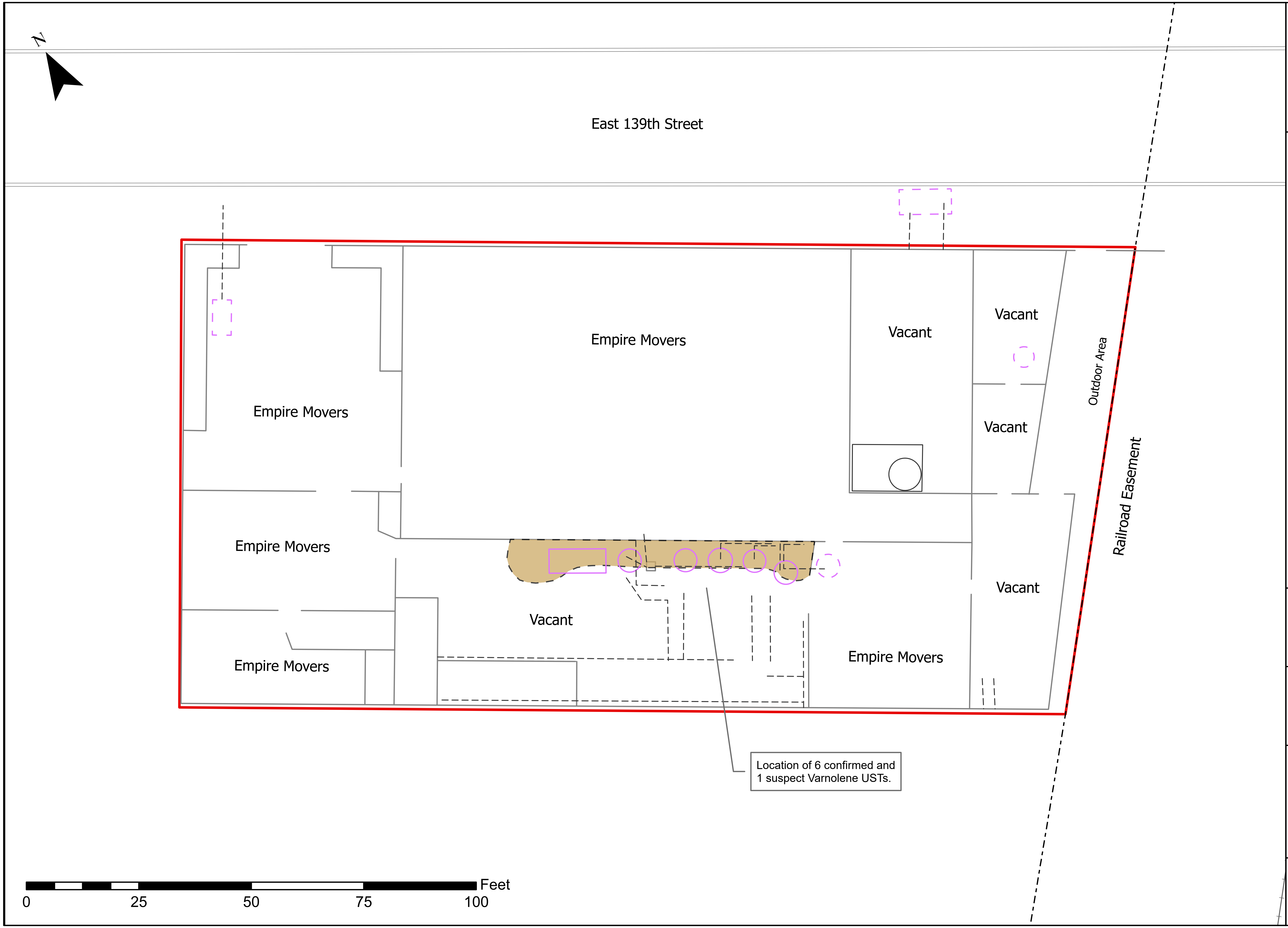

PREPARED FOR:
Mr. Andrew Bullaro
B & B First Holdings LLC
334 Faile Street
Bronx, New York

| | |
|---|---|
| PROJECT: | AJRC1701 |
| DATE: | 5/5/2021 |
| SCALE: | AS SHOWN |
| DRAWN BY: | BB |
| APPROVED BY: | FPC |

## Site Plan

808 East 139th Street
Bronx, New York

***FIGURE:***
**2**

# TABLES

# TABLE 1
## 808 E 139th ST, Bronx, NY
## Remedial Investigation Work Plan
## Proposed Sampling Frequency, Matrices, and Analyses

| **Matrix** | **Analyte** | **USEPA Analytical Method** | **Sample Frequency** | **QC Samples** | | | | **Grand Total** |
|---|---|---|---|---|---|---|---|---|
| | | | | **Trip Blank** | **Equipment Blank** | **Blind Duplicate** | **MS/MSD** | |
| **Soil Vapor Intrusion Investigation** | | | | | | | | |
| Sub-Slab Vapor | TCL VOCs | TO-15 | 7 | NA | 0 | 1 | 0 | |
| Soil Vapor | TCL VOCs | TO-15 | 2 | NA | 0 | 1 | 0 | |
| Ambient Air | TCL VOCs | TO-15 | 9 | NA | 0 | 1 | 0 | |
| *Total Vapor and Air Samples* | | | *18* | NA | 1 | 1 | 1 | **19** |
| **Subsurface Soil Investigation** | | | | | | | | |
| Soil | TCL VOCs | 8260 | 40 | 4 | 4 | 2 | 2 | |
| Soil | TCL SVOCs | 8270 | 40 | 0 | 4 | 2 | 2 | |
| Soil | TCL Pesticides and PCBs | 8080/8082 | 40 | 0 | 4 | 2 | 2 | |
| Soil | TAL Metals | 6010/7471 | 40 | 0 | 4 | 2 | 2 | |
| Soil | PFAS (PFAS Analyte List) | 537m | 40 | 0 | 4 | 2 | 2 | |
| Soil | 1,4-Dioxane | 8270 SIM | 40 | 0 | 4 | 2 | 2 | |
| *Total Subsurface Soil Samples* | | | *40* | 4 | 4 | 2 | 2 | **52** |
| **Initial Round of Monitoring Well Couplet Sampling** | | | | | | | | |
| Groundwater | TCL VOCs | 8260 | 12 | 2 | 2 | 1 | 1 | |
| Groundwater | TCL SVOCs | 8270 | 12 | 0 | 2 | 1 | 1 | |
| Groundwater | TCL Pesticides and PCBs | 8080/8082 | 12 | 0 | 2 | 1 | 1 | |
| Groundwater | TAL Metals | 6010/7471 | 12 | 0 | 2 | 1 | 1 | |
| Groundwater | PFAS (PFAS Analyte List) | 537m | 12 | 0 | 2 | 1 | 1 | |
| Groundwater | 1,4-Dioxane | 8270 SIM | 12 | 0 | 2 | 1 | 1 | |
| *Total Monitoring Well Groundwater Samples* | | | *12* | 2 | 2 | 1 | 1 | **18** |
| **Non-Aqueous Phase Liquids (if necessary)** | | | | | | | | |
| NAPL | Specifc Gravity | D1298 | | | | | | |
| NAPL | TCL VOCs | 8260 | | | | | | |
| NAPL | PCBs | 8082 | | | | | | |
| NAPL | Petroleum Product ID | 8015 | | | | | | |
| NAPL | Viscocity @ 15 Deg C. | D455 | | | | | | |
| NAPL | Interfacial Tension @ 15 Deg C. | D791 | | | | | | |
| **Waste Profile/Disposal Samples (if necessary)** | | | | | | | | |
| Soil | RCRA Characteristics | 1030/9045/SW846 | | | | | | |
| Soil | Full TCLP | 1311/8260/8270/8081/8151/6010/7470 | | | | | | |

Notes:

The total number of samples are estimated and may be changed based upon the screening/sampling results and field observations.

Vapor QA/QC samples (equip. blank, duplicate, and MS/MSD) collected as one QA/QC sample.

# Appendix A

CASTLETON
ENVIRONMENTAL

# Field Activities Plan

## Ace Suede and Leather
## 808 East 139th Street
## Bronx, NY
## NYSDEC Site No. C203072

## June 2021

Prepared for:

Mr. Andrew Bullaro
B&B First Holdings LLC.
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# FIELD ACTIVITIES PLAN
# FOR
# REMEDIAL INVESTIGATIONS
# JUNE 2021

## Table of Contents

**Appendices**

Appendix A – Field Forms and Logs
Appendix B – Laboratory SOP for PFAS/1,4-Dioxane and Analytical Method Information

## 1.0 INTRODUCTION

RENU Engineering Technologies, PC (RENU), has prepared this Field Activity Plan (FAP) which is designed to provide detailed step-by-step procedures for the field activities associated with work activities for Remedial Investigations. It will serve as the field procedures manual to be strictly followed by all RENU personnel. Adherence to these procedures will ensure the quality and defensibility of the field data collected. In addition to the field procedures outlined in this document, all personnel performing field activities must do so in compliance with: (1) the Quality Assurance/Quality Control measures outlined in the existing Quality Assurance Project Plan; (QAPP); (2) the appropriate Health and Safety guidelines found in the existing Health and Safety Plan (HASP); and (3) the scope of work outlined in the Project Work Plan.

## 2.0 MOBILIZATION

A mobile decontamination trough or temporary decontamination pad will be available at the site to decontaminate equipment used for the subsurface investigations. The decontamination pad will be of sufficient size to allow equipment and materials to be cleaned as needed for the various tasks.

Prior to each field phase, proposed sampling locations will be staked, labeled, and flagged prior to sampling. Utilities in areas designated for intrusive activities will be cleared through Dig Safely New York, at http://www.digsafelynewyork.com. Vehicle access routes to drilling and boring locations shall be determined and cleared prior to field activities.

If overhead electric is nearby, field staff will coordinate with Consolidated Edison Company of New York, Inc. to arrange rubber bumper protection on the overhead wires. The contact for Con Edison is (347) 672-3236; CustC2@coned.com

## 3.0 SUBSURFACE INVESTIGATION

### 3.1 General Program

The subsurface investigation programs under the various Project Work Plans will provide information that will assist in geologic, geotechnical, hydrogeological, and chemical site interpretation. Proposed investigation locations are described in the Project Work Plans. Typical field procedures for the various activities are described below.

### 3.2 Surface Soil Sampling

Summary: If areas of exposed surface soil are present, representative soil samples will be collected for chemical analysis of the target compounds.

Procedure:

1. Remove any vegetation and the upper two inches of soil.
2. Using a disposable or decontaminated trowel, excavate soils down to a maximum depth of six inches and place the soil in a decontaminated steel bowl. Collect a sufficient quantity of soil as needed for the intended chemical analyses.
3. Place the desired quantity of soil for the volatile organic compound (VOC) analysis directly into the appropriate laboratory-supplied container.
4. Homogenize the remaining soil and place in the appropriate laboratory-supplied containers.
5. All sample bottles will be labeled in the field using a waterproof permanent marker.
6. Surface soil samples will be placed on ice and shipped overnight to the laboratory under chain of custody (COC) control.

### 3.3 Test Pit Excavation

Summary: Test pits allow for visual inspection and sample collection directly from the subsurface.

Procedure:

1. Decontaminate backhoe bucket prior to excavation.
2. Maneuver backhoe into position.
3. Remove subsurface materials in 1-foot lifts. Conduct continuous air monitoring with appropriate air monitoring equipment as indicated in the HASP. Screen soil with photoionization detector (PID) and place excavated soil on plastic sheeting adjacent to test pit.
4. Upon completion of test pit, visually inspect the soil horizons for discoloration, perched water zones or staining and photo document the test pit.
5. Record the following information in the fieldbook for each test pit:
    - The total length and width of the excavation
    - The depth and thickness of distinct soil or lithologic units
    - A lithologic description of each unit
    - A description of any man-made materials or apparent impacted soil encountered
    - A Test Pit Log sheet will be completed for each test pit (Appendix A).
6. Collect necessary soil samples. The excavator will collect a sample from a specific horizon and bring the sample to the ground surface. No personnel will enter the excavation to collect samples. The sampler will remove approximately 2 inches of soil from the outside of the soil sample prior to collecting the sample to prevent cross contamination of the sample.
7. Soil samples will be placed on ice and shipped overnight to the laboratory under COC control.
8. The test pit will be backfilled with excavated material immediately after the required information has been recorded and the samples collected. The first soils out should be

the last soils in when filling the test pit. Soils will be compacted in 1-foot lifts using the excavator bucket. No test pits will be left open overnight.

9. Decontaminate sampling equipment and excavator bucket.

### 3.4 Vac-Tron® Utility Clearance

Summary: Excavation with a Vac-Tron® unit allows for excavation near subsurface utilities with reduced chance of impacting the utilities.

Procedure:

1. Excavate a two-foot square by approximately five-foot deep area manually using post-hole diggers, pry bars, soil knifes, and/or hand digging, along with the Vac-Tron® unit.
2. After the location is cleared for drilling, the hole will be backfilled flush with the sidewalk using the excavated spoils (small rocks and debris removed) and if necessary, temporarily patched with blacktop patch or concrete.
3. Excavated material not returned to the hole will be drummed along with the monitoring well boring spoils for proper disposal.

### 3.5 Hollow-Stem Auger Drilling Procedures

Summary: A standard method of subsurface drilling which enables the recovery of representative subsurface samples for identification and laboratory testing.

Procedure:

1. Hollow stem augers (HSAs), drill rods, and the drill rig will be thoroughly decontaminated prior to initial borehole installation and between each borehole at the centralized decontamination area. All decontamination liquids will be collected and placed in DOTapproved 55-gallon drums.
2. The drill rig will be inspected for oil leaks and any leaks reported prior to starting drilling operations.
3. Advance the boring by rotating and advancing the HSAs to the desired depth. The borings will be advanced incrementally to permit continuous or intermittent subsurface soil sampling, as required.
4. Remove center plug from the HSAs and collect a split spoon sample per the method stipulated by the project geologist or hydrogeologist.

References: *American Society for Testing and Materials (ASTM) Standard Practice for Soil Exploration and Sampling by Auger Borings D1452/D1452M-16, and Standard Test Method for Standard Penetration Test (SPT) and Split Barrel Sampling of Soils D1586-11*.

### 3.6 Rotosonic Drilling Procedures

Summary: Rotosonic Drilling (aka. Sonic Drilling, Rotosonic, Rotary Sonic, Sonicore or Resonant Sonic Drilling) is a subsurface drilling method that employs the use of high frequency mechanical vibrations to take continuous core samples of overburden and most bedrock formations using a dual cased drill string. Rotosonic drilling is also used to advance casing in the ground for the installation of monitoring wells and other purposes.

Procedure:

1. Core barrel and outer casing will be decontaminated prior to advancing boreholes.
2. The core barrel (core barrels are typically 5, 10 or 20 feet in length) is attached to the drill head. The boring is advanced by rotating the core barrel incrementally to the desired depth. The borings will be advanced incrementally to permit continuous subsurface soil sampling.
3. Once the core barrel is driven to its incremental depth (i.e., 5, 10 or 20 feet), the drill head is disconnected from the core barrel and connected to the outer casing. The outer casing is then driven down over the core barrel. Note: A small amount of water may be used during the driving of the outer casing to flush materials from the annular space between the core barrel and the outer casing.
4. The drill head is disconnected from the outer casing and reattached to the core barrel. The core barrel is brought to the surface and a clear polyethylene tube is attached to the end of the core barrel. The drive head is vibrated which extrudes the soil sample into the polyethylene tube.
5. The core barrel is reinserted into the outer casing and the boring is advanced to the desired depth by repeating Steps 2 through 4.
6. Split the sample lengthwise and screen the soil with a PID for volatile organic vapors
7. Document all properties and sample locations in the field notebook, and later on the Boring Log form (Appendix A).

Reference: *ASTM Standard Practice for Sonic Drilling for Site Characterization and the Installation of Subsurface Monitoring Devices D6914/D6914M-16*.

### 3.7 NX-Rock Coring Procedures

Summary: NX-Coring is a standard method of subsurface drilling which enables the recovery of bedrock cores for identification.

Procedure:

1. Advance the boring into the bedrock by core drilling using an NX-size, double-tube, swiveltype core barrel. Continue drilling until core blockage occRENU or until the net length of the core barrel has been drilled.
2. Remove the core barrel from the hole and disassemble it as necessary to remove the core. Reassemble the core barrel and return it to the hole. Resume coring.
3. Place recovered core in the core box with the upper (surface) end of the core at the upper-left corner of the core box. Fit fractured, bedded, or jointed pieces of core together as they naturally occurred.
4. Label core box with borehole ID, date, time, and depth interval of core.
5. The following observations will be recorded from the rock core:

- Core recovery percent
- Color
- Rock classification
- Rock hardness
- Rock fractures, including descriptions of natural breaks
- Rock Quality Designation (RQD)

RQD = Sum of core lengths > 4”   X 100%        Total length of core run

Reference: *ASTM Standard Practice for Rock Core Drilling and Sampling of Rock for Site Exploration D2113-14*.

### 3.8 Wash/Mud Rotary Drilling Procedures

Summary: Wash/mud rotary drilling is a method of subsurface drilling wherein a drilling fluid (water or drill mud) is circulated through the drill string and drill bit, and up through HSAs or casing, if present, to flush cuttings out of the borehole and lubricate drilling tools.

Procedure:

1. Connect drilling water supply pump to drill string.
2. Advance the boring by spinning the drill bit the desired distance into the subsurface.
3. Use a recirculating system to collect and separate cuttings rising out of the borehole.
4. Note rate of drilling and volume of water/mud lost down the borehole.

Reference: *ASTM Standard Guide for Use of Direct Rotary Drilling with Water-Based Drilling Fluid for Geoenvironmental Exploration and the Installation of Subsurface WaterQuality Monitoring Devices1 D5783-95*.

### 3.9 Air Rotary Drilling Procedures

Summary: Air rotary drilling is a method of subsurface drilling wherein compressed air is circulated through the drill string and drill bit, and up through HSAs or casing, if present, to flush cuttings out of the borehole and lubricate drilling tools.

Procedure:

1. Connect air compressor discharge hose to drill string.
2. Advance the boring by spinning the drill bit the desired distance into the subsurface.
3. Use a cyclone system to collect and containerize cuttings rising out of the borehole.
4. Note rate of drilling down the borehole.

Reference: *ASTM Standard Guide for Use of Direct Air Rotary Drilling for Geoenvironmental Exploration and the Installation of Subsurface Water-Quality Monitoring Devices1 D5782-95*.

### 3.10 Split-Spoon Sampling Procedures

Summary: Split-spoon sampling is a standard method of soil sampling to obtain representative samples for identification and laboratory testing as well as to serve as a measure of resistance of soil to sampler penetration. Split-spoon samples will be collected during boring advancement at continuous 2 foot intervals.

Procedure:

1. Measure the sampling equipment lengths to ensure that they conform to specifications. Confirm the weight of the hammer (140 pounds.).
2. Clean out the HSAs to the bottom depth prior to sampling. Select additional components as required (i.e., leaf spring core retainer for clays or a sand trap for non-cohesive sands).
3. Lower the decontaminated 2-inch outside diameter (O.D.) split-spoon to the bottom of the HSAs and check the depth against length of the rods and the split-spoon.
4. Attach the drive head and hammer to the drill rods without the weight of the hammer resting on the rods.
5. Lower the weight and allow the split-spoon to settle up to 6 inches below the bottom of the HSAs. If it settles more, consider use of another type of sampler.
6. Mark four 6-inch intervals on the drill rods relative to a drive reference point on the rig. With the split-spoon resting on the bottom of the hole, drive the split-spoon with the 140-pound hammer falling freely over its 30-inch fall until 24 inches have been penetrated or 50 blows have applied in any 6-inch interval.
7. Record the number of blows required to drive the split-spoon 6 inches into the overburden. Determine the "N" value by adding the blows for the 6-to 12-inch and 12-to 18-inch interval of each sample attempt.
8. After penetration is complete, remove the split-spoon sampler.
9. Open the split-spoon to determine the percent recovery and describe the soil.
10. Split the sample lengthwise and screen the soil with a PID for volatile organic vapors.
11. Document all properties and sample locations in the field notebook, and later on the Boring Log form (Appendix A).

Reference: *ASTM Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils D1586-11*.

#### 3.10.1 Unified Soil Classification System

Soils are classified for engineering purposes according to the Unified Soil Classification System (USCS) adopted by the U.S. Army Corps of Engineers and U.S. Department of the Interior Bureau of Reclamation. Soil properties that form the basis for the USCS are:

- Percentage of gravel, sand, and fines;
- Shape of the grain-size distribution curve; and
- Plasticity and compressibility characteristics.

According to this system, all soils are divided into three major groups: coarse-grained, fine-grained, and highly-organic (peaty). The boundary between coarse-grained and fine-grained soils is taken to be the 200-mesh sieve (0.074 mm). In the field the distinction is based on whether the individual particles can be seen with the unaided eye. If more than 50% of the soil by weight is judged to consist of grains that can be distinguished separately, the soil is considered to be coarse-grained.

The coarse-grained soils are divided into gravelly (G) or sandy (S) soils, depending on whether more or less than 50% of the visible grains are larger than the No. 4 sieve (3/16 inch).
They are each divided further into four groups:

W: Well graded; fairly clean (<5% finer than 0.074 mm)
P: Poorly graded (gap-graded); fairly clean (<5% finer than 0.074mm)
C: Clayey (>12% finer than 0.074mm); plastic (clayey) fines. Fine fraction above the A- line with plasticity index above 7.
M: Silty (>12% finer than 0.074 mm); non-plastic or silty fines. Fine fraction below the A- line and plasticity index below 4.

The soils are represented by symbols such as GW or SP. Borderline materials are represented by a double symbol, as GW-GC.

The fine-grained soils are divided into three groups: inorganic silts (M), inorganic clays (C), and organic silts and clays (O). The soils are further divided into those having liquid limits lower than 50% (L), or higher than 50% (H).

The distinction between the inorganic clays (C), the inorganic silts (M), and organic soils (O) is made on the basis of a modified plasticity chart. Soils CH and CL are represented by points above the A-line, whereas soils OH, OL, and MH correspond to positions below the Aline. Soils ML, except for a few clayey fine sands, are also represented by points below the Aline. The organic soils O are distinguished from the inorganic soils M and C by their characteristic odor and dark color.

Reference: *ASTM Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System) D2487-17*.

### 3.10.2 Visual Identification

Soil samples collected during boring advancement will be visually identified. Soil properties required to define the USCS classification of a soil and other observed characteristics normally identified in describing a soil are defined below:

- Color

- Moisture conditions
- Grain size
    - Estimated maximum grain size
    - Estimated percent by weight of fines (material passing No. 200 sieve)

- Gradation

- Grain shape

- Plasticity

- Predominant soil type

- Secondary components of soil

- Classification symbol

- Other features such as:
    - organic, chemical, or metallic content;
    - compactness;
    - consistency;
    - cohesiveness near plastic limit;
    - dry strength; and
    - source - residual, or transported (aeolian, water borne, glacial deposit, etc.)

Reference: *ASTM Standard Practice for Description and Identification of Soils (Visual-Manual Procedure) D2488-17*.

### 3.11 Shelby Tube Sampling Procedures

Summary: Shelby (thin-wall) tube sampling is commonly used in cohesive soils (where splitspoon sampling results in an "N" value less than 15) to obtain relatively undisturbed samples. The thin-walled tube accepts the least frictional resistance as the soil moves up into the sampler. The sampler is advanced in a continuous and rapid motion without twisting on impact.

Procedure:

1. Clean borehole to the required sampling depth, using care not to disturb the material to be sampled during the cleaning process.
2. Prepare the sampler for use, verifying that the tube is round, smooth, not dented or scratched, rust-free, and that the cutting edge has been honed to proper dimensions.

3. Record dimensions of the sampler. Note that the length and diameter of the sampler can be varied depending on soil conditions.
4. Lower the sampler on the drill rods to the bottom of the hole.
5. Make a reference point on the drilling rig and measure a length on the rods equivalent to the sample tube length, minus 10% (this allows for slough in the hole).
6. Raise the water level in the hole to ground surface or above, if practical (this step likely may be omitted).
7. Push the sampler the required distance into the soil with continuous motion of consistent weight.
8. If the sampler cannot be advanced by pushing, note the length advanced and stop sampling.
9. Rotate the rods three revolutions, using a wrench to shear the sample. Allow the sampler to sit undisturbed for five minutes.
10. Withdraw the sampler slowly and pull rods evenly to retrieve the sample. Measure sample length and calculate recovery.
11. Clean out the rod end of the tube and discard disturbed slough. Trim cutting edge of the sampler. Use the cuttings for onsite description and, if required, a moisture content sample.
12. If sample length is recessed from either end, insert plug and seal with wax. If the tube is full, seal ends with caps and/or wax the ends, including the caps if possible.
13. Label the sample container and prepare sample for shipping and/or storage.
14. Store and transport sample(s) in an upright position.

Reference: *ASTM Standard Practice for Thin-Walled Tube Sampling of Fine-Grained Soils for Geotechnical Purposes D1587/D1587M-15*.

### 3.12 Direct Push Groundwater Sampling

Summary: A standard method of subsurface boring which enables the recovery of representative subsurface samples for groundwater screening.

Procedure:

1. A Screen Point Sampler 15 (SP15) groundwater sampler, or an equivalent unit, will be utilized to collect groundwater samples in direct push borings that intercept the groundwater table.
2. To collect groundwater samples, a clean sampler will be threaded onto the leading end of the probe rod and lowered or driven to the desired sampling interval (approximately 1 foot below the top of the water table). While the sampler is driven to depth, O-ring seals at the drive head and expendable drive point will provide a watertight system.
3. Once at the desired sampling depth, chase rods will be sent down-hole until the leading rod contacts the bottom of the sampler screen. The tool string will then be retracted while the screen is held in place by the chase rods. As the tool string is retracted, the expendable point is released from the sampler sheath. An O-ring on the screen head

maintains the seal at the top of the screen. As a result, any liquid entering the sampler during screen deployment must first pass through the screen.

4. The tool string and sheath may be retracted the full length of the screen or as little as a few inches if a small sampling interval is desired. The SP15 Sampler utilizes a screen with a standard slot size of 0.004 inches and an exposed length of 41 inches.
5. A minimum of 1 gallon of water will be purged from the sampler prior to sample collection with dedicated Teflon or polyethylene tubing of laboratory or food grade quality, and a check valve. The groundwater sample will be collected with dedicated Teflon or polyethylene tubing of laboratory or food grade quality, and a check valve.
6. Groundwater samples will be placed on ice and shipped to the laboratory under COC for analysis.
7. Upon the completion of the sampling, the sampler will be removed and the borehole will be backfilled with bentonite pellets and the surface will be repaired with similar material (i.e., concrete, asphalt or topsoil); and marked with spray paint.

Reference: *ASTM Standard Guide for Direct-Push Groundwater Sampling for Environmental Site Characterization D6001-05(2012)*.

### 3.13 Direct-Push Soil Sampling

Summary: A standard method of subsurface boring using hydraulically powered (static force plus percussion) soil-probing equipment that enables the recovery of representative subsurface samples for identification and laboratory testing.

Procedure:

1. Inspect the sampling equipment to ensure proper working condition.
2. Insert dedicated disposable acetate liner into the sampler and select additional components for the sampler as required (i.e., leaf spring core retainer for clays, or a sand trap for noncohesive sands).
3. Lower the sampler to the ground surface, or bottom of the hole previously made by the sampler, and check the depth against length of the rods and the sampler.
4. Attach the drive head assembly to the sample rods.
5. Push the sampler in increments up to 5 feet into the subsurface up to the desired depth with a hydraulic press.
6. Rotate the sampling rods clockwise and remove the sampler.
7. Split the sample lengthwise and screen the soil with a PID for volatile organic vapors.
8. Document all properties and sample locations in the field notebook, and later on the DirectPush Log form (Appendix A).
9. Abandon the direct-push boring by backfilling with bentonite pellets and hydrate with potable water or use concrete patch in impervious areas.

Reference: *ASTM Standard Guide for Direct Push Soil Sampling for Environmental Site Characterizations D6282/D6282M-14*.

### 3.13.1 Remote Direct-Push Soil Sampling

Summary: Standard equipment used for remote direct push sampling is the 420M Geoprobe® (or similar unit). This is a light weight and durable limited access machine designed to be deployed to hard-to-reach or limited access sampling locations. The machine is powered by a remote hydraulic source which is connected through auxiliary hydraulics.

Procedure:

1. Read and understand all safety, maintenance, and operations instructions regarding this machine before beginning operations.
2. Maneuver the probe unit to place the probe foot near the desired probing location.
3. Position the power source near the unit leaving sufficient distance so as not to be in the way of probing activities.
4. The probe unit is intended for operations on level surfaces. Do not use on slopes greater than 2 degrees due to decreased stability.
5. Connect hydraulic hoses to probe unit and power source.
6. Start the engine of the hydraulic power source to allow engine and hydraulics to warm sufficiently and ensure there is adequate ventilation for exhaust fumes.
7. Make sure everyone is clear of any moving parts before engaging the hydraulics of the probe unit. Check the emergency stop button for proper operation. If the emergency stop button doesn't work, cease operations.
8. Anchor the probe derrick to floor or ground surface as needed based on conditions.
9. Insert dedicated disposable acetate liner into the sampler and select additional components for the sampler as required (i.e., leaf spring core retainer for clays, or a sand trap for noncohesive sands).
10. Lower the sampler to the ground surface, or bottom of the hole previously made by the sampler, and check the depth against length of the rods and the sampler.
11. Attach the drive head assembly to the sample rods.
12. Push the sampler in increments up to 5 feet into the subsurface up to the desired depth with a hydraulic press.
13. Rotate the sampling rods clockwise and remove the sampler. Split the sample lengthwise and screen the soil with a PID for volatile organic vapors.
14. Document all properties and sample locations in the field notebook, and later on the DirectPush Log form (Appendix A).
15. Abandon the direct-push boring by backfilling with bentonite pellets and hydrate with potable water or use concrete patch in impervious areas.

Reference: *ASTM Standard Guide for Direct Push Soil Sampling for Environmental Site Characterizations D6282/D6282M-14*.

### 3.14 Bucket Auger Sampling

Summary: A standard method of shallow subsurface boring using a bucket auger that enables the recovery of representative subsurface samples for identification and laboratory testing.

Procedure:

1. Remove stones, vegetation, debris etc. from the ground surface in the sampling area.
2. Lay a section of plastic sheet adjacent to the soil sampling location.
3. Use a clean (decontaminated) bucket auger, required extension rods and "T" handle to collect a soil sample from the desired depth.
4. Monitor VOCs in the ambient air during soil collection.
5. Turn the auger in a clockwise direction with the "T" handle to remove soil until the desired soil sampling depth is reached. Place the excavated soil on the adjacent plastic. If possible, lay out the cuttings in stratigraphic order.
6. During auger advancement record observations made of the geologic features of the soil.
7. Stop advancing the auger when the top of the specified sampling depth has been reached. Decontaminate the auger.
8. Insert the auger into the borehole to the sample depth and collect the sample. Place sample on ice and ship overnight to the lab under COC custody.
9. Decontaminate the auger bucket and complete the preceding steps for sample collection from deeper depths.
10. When sampling is complete, place cuttings back in the borehole in the order in which they were removed if possible. Top off with hydrated bentonite pellets.

Reference: *ASTM Standard Practice for Sampling Soils and Contaminated Media with HandOperated Bucket Augers D6907-05(2016).*

### 3.15 Soil Vapor Implant Installation

Summary: A method for construction of soil vapor implants within unconsolidated material, which enables acquisition of soil vapor samples for laboratory testing. The soil vapor implants will be installed using the procedures described below.

Procedure:

1. Implants shall be 6 inches in length (e. g., Geoprobe® AT86 series) and are to be constructed of double woven stainless steel wire screen. Implants shall have a pore diameter of 0.0057 inch, which is equivalent to a 0.007 slot well screen. The bottom of the implants must have a post run tubing (PRT) style thread; the same fitting style used with Geoprobe® PRT vapor sampling tools. The top connection with the Teflon or polyethylene tubing shall be stainless steel Swagelok® or clamp fitting to prevent leakage during sample collection. The connection to the sampling Summa® canister shall be made through the use of 1/8th inch ID Teflon or polyethylene tubing.

2. Once the rods have been advanced to the desired depth, attach appropriate tubing to the implant to be installed. Allow at least 48 inches of tubing length longer than the required depth of the implant. Cover or plug the end of the tubing.
3. Remove the pull cap from the rods and lower the implant and tubing down inside the diameter of the rods until the implant hits the top of the Anchor/Drive Point. Note the length of the tubing to ensure proper depth has been reached.
4. Rotate tubing counterclockwise while exerting a gentle downward force to engage the PRT threads. Pull up on the tubing lightly to test the connection. DO NOT cut excess tubing.
5. Position a probe rod pull plate or manual probe rod jack on the top of the probe rod. Exert downward pressure on the tubing while pulling the probe rods up. Pull up about 12 inches.
6. Thread excess tubing through the bottom of a funnel and position funnel over top of probe rod. The funnel will be used to facilitate installation of sand into the borehole around the screened portion of the implant.
7. Pour sand into the funnel and down the inside diameter of the probe rods around the outside of the tubing and around the screen of the implant. Use tubing to “stir” sand into place. [NOTE: sand and bentonite can only be installed in the vadose zone (unsaturated zone above the water table)].
8. Lift up an additional 18 to 24 inches and insert a bentonite slurry above beads or sand.
9. Pull remaining rods out of the hole and complete with bentonite slurry.
10. Cut any excess tubing to allow approximately 8 to 12 inches to extend above the ground surface. Plug the tubing with a cap or plug.
11. Install a protective casing (road box) over the tubing and set it into concrete.
12. Document well construction in the field notebook and later on a Soil Vapor Implant Construction Detail diagram (Appendix A).

Reference: *ASTM Standard Practice for Active Soil Gas Sampling in the Vadose Zone for Vapor Intrusion Evaluations. D7663-12*.

### 3.16 Soil Vapor Implant Sampling

Summary: The soil vapor implants will not be sampled until a minimum of 24-hoRENU after installation has passed. To collect representative soil vapor samples, soil vapor implant tubing must be adequately sealed to prevent ambient air from being sampled. A helium tracer gas will be used to verify the integrity of the soil vapor implant seal. The soil vapor implants must be purged prior to sampling. Sampling should commence immediately after purging.

Procedure:

1. Inspect the existing tubing. Check for any signs of cracks, clogging or any other characteristics that may impact the collection of a representative sample.
2. Apply a bentonite slurry to the ground surface in an approximate 2-ft diameter circle. Place an approximately 2 ft. by 2 ft. square of plastic sheeting over the bentonite slurry.

Poke a hole, only as large as needed for the sampling tube to penetrate the plastic. Seal the plastic sheeting/tube interface with a small amount of bentonite slurry.

3. Place an enclosure over the well head, run well tubing through in the top outlet. Use plumber's putty to seal the interface between the tubing and the top of the enclosure.
4. Seal enclosure at the ground surface with a bentonite slurry.
5. Connect helium (99.999%) cylinder to side port of enclosure.
6. Release enough helium to displace any ambient air in enclosure. Continue flushing the inside of the enclosure with helium gas.
7. Connect the tubing to the vacuum pump. Use only new Teflon or HDPE tubing if needed for length and new silicone tubing for leak free unions. Do not reuse any tubing between sample locations.
8. Purge the soil vapor implant; remove one to three volumes of soil vapor. Flow rates for purging and sampling must not exceed 0.2 liters per minute (L/min) to minimize outdoor air infiltration during purging/sampling. Record start and stop time on the Summa Canister Sampling Field Data Sheet (Appendix A). Verify air is being drawn from the monitoring well by placing finger on the vacuum pump outlet tube to check for positive pressure. Helium cylinder should be open during the purge time, enough to cause a positive pressure within the enclosure.
9. After purging completed, disconnect the vacuum pump from the tubing.
10. Connect the Mark Helium Detector (Model 9822) to soil vapor implant tubing. Obtain readings. Absence of helium (< 10%) assures that the implant seal is competent and ambient air is not entering the soil vapor implant.

<u>Using Flow Controllers Without a Built in Pressure Gauge:</u>

1. Attach the pressure gauge provided by the laboratory to the Summa® canister, open valve completely, record reading on the Summa Canister Sampling Field Data Sheet (Appendix A), close valve completely, and remove the pressure gauge. If the canister does not show an initial vacuum of approximately 25 inches of mercury (in. Hg), do not use. Record the canister's serial number on the Summa Canister Sampling Field Data Sheet. Assign sample identification to the canister identification tag and record on the COC (Appendix A), and the Summa Canister Sampling Field Data Sheet.
2. Attach flow controller provided by the laboratory to the Summa® canister inlet (one for each Summa® canister). Do not reuse flow controllers between locations. Each flow controller is pre-set by the laboratory to collect the sample over a one hour period.
3. Attach tubing from the soil vapor implant to the flow controller on the Summa® canister. All tubing used in this step should be the same tubing that Project Work Plans used in the purging process.
4. Open canister valve to initiate sample collection and record start time and date on the canister identification tag and on the Summa Canister Sampling Field Data Sheet.
5. The helium cylinder should remain open during sampling set-up to cause a positive pressure in the enclosure. Because of the one-hour sampling time, more than one location may be sampled at the same time (with staggered starting times). When you are

ready to move onto the next location, stop the flow of the helium with the valve on the regulator, and seal ports on the enclosure to maintain the helium atmosphere within the enclosure.

6. After one hour, close the Summa® canister valve completely. Record the time on the Summa Canister Sampling Field Data Sheet.
7. Disconnect tubing.
8. Remove the flow controller, attach the pressure gauge to the Summa® canister, open valve completely, record reading, close valve completely, and remove the pressure gauge. Record the pressure reading on the Summa Canister Sampling Field Data Sheet. There should still be a slight vacuum in the Summa® canister. If no vacuum remains in the canister, do not send the canister for analysis. Retake the sample using the same procedure with a fresh canister.
9. If the canister does not show a significant net loss in vacuum after sampling, evaluate and document the problem. If necessary, use another Summa® canister to recollect the sample and contact the project manager immediately.
10. Connect the helium detector to soil vapor implant tubing. Obtain and record reading. Absence of helium (< 10%) assures that the conduit seal is competent and ambient air is not entering the soil vapor implant.
11. Ship canister standard overnight, with COC to the laboratory for analyses by USEPA Method TO-15 for VOCs with a minimum-reporting limit of 1 µg/m3.

Using Flow Controllers with a Built in Pressure Gauge:

1. Attach the flow controller provided by the laboratory to the Summa® canister inlet (you must have one for each canister). Do not reuse flow controllers between locations. Each flow controller is pre-set by the laboratory to collect the sample over a one hour period. Record the canister's serial number on the Summa Canister Sampling Field Data Sheet. Assign sample identification to the canister identification tag and record on the COC and the Summa Canister Sampling Field Data Sheet.
2. Attach tubing from the soil vapor implant to the flow controller on the Summa® canister. All tubing used in this step should be the same tubing that Project Work Plans used in the purging process.
3. Open Summa® canister valve completely and record the time and pressure on the Summa Canister Sampling Field Data Sheet. If the canister does not show an initial vacuum of approximately 25 in. Hg, do not use.
4. The helium cylinder should remain open during sampling set-up to cause a positive pressure in the enclosure. Because of the one hour sampling time, more than one location may be sampled at the same time (with staggered starting times). When you are ready to move onto the next location, stop the flow of the helium with the valve on the regulator, and seal ports on the enclosure to maintain the helium atmosphere within the enclosure.
5. After one hour, close the Summa® canister valve completely and record the time and pressure on the Summa Canister Sampling Field Data Sheet. There should still be a slight

vacuum in the Summa® canister. If no vacuum remains in the canister, do not send the canister for analysis. Retake the sample using the same procedure with a fresh canister.

6. If the canister does not show a significant net loss in vacuum after sampling, evaluate and document the problem. If necessary, use another Summa® canister to recollect the sample and contact the project manager immediately.
7. Connect the helium detector to soil-gas conduit tubing. Obtain and record readings. Absence of helium (< 10%) assures that the conduit seal is competent and ambient air is not entering the soil-gas conduit.
8. Disconnect tubing.

Reference: *ASTM Standard Practice for Active Soil Gas Sampling in the Vadose Zone for Vapor Intrusion Evaluations. D7663-12*.

### 3.17 Soil Vapor Implant Decommissioning Procedures

Procedure:
At each location the following will occur:

1. The soil vapor implant will be removed;
2. The flush-mount protective casing will be backfilled with concrete; and,
3. The concrete filled flush-mount protective casing will be removed during sidewalk flag replacement (See Section 3.29).

### 3.18 Disposal of Drill Cuttings and Soil Boring Spoils

Summary: Disposal of boring spoils will be performed in accordance with New York State Department of Environmental Conservation Technical and Administrative Guidance Memorandum (TAGM) HWR-89-4032, November 21, 1989.

Procedure:

1. Spoils will be stored on site in 1A2 open head 55-gallon steel drums.
2. These drums will be addressed in accordance with the protocols outlined in Section 3.30.

### 3.19 Groundwater Monitoring Well Construction Procedures

#### 3.19.1 Overburden Monitoring Well Construction Procedures

Summary: A method for construction of groundwater monitoring wells within unconsolidated material, which enables monitoring of groundwater elevation and acquisition of groundwater samples for laboratory testing. The groundwater monitoring wells and piezometers will be installed during this investigation using the procedures described below.

Procedure:

1. Advance subsurface boring to the desired depth by means of hollow-stem auger drilling.
2. While boring, collect split spoon samples on a continuous basis to geologically log the boring.

3. Remove center plug from augers and verify borehole depth using weighted measuring tape.
4. Add washed and graded medium sand as needed to base of borehole.
5. Insert the well screen and riser pipe into borehole through the hollow stem augers. Cap the riser to prevent well construction materials from entering the well.
6. Add sand to screen section of well while slowly removing augers. Sand pack should extend at least two feet above the top of the screen section. Measure with a tape.
7. Slowly add bentonite pellet seal to borehole as augers are slowly removed. The bentonite seal should extend at least two feet above the top of the sand pack section. Measure with tape.
8. Note: The rate of removal of the auger from the borehole should closely follow the rate that the sand pack and bentonite pellets fill the borehole.
9. If bentonite seal is placed above the groundwater level within the borehole, add water to the borehole to hydrate the bentonite pellets. Allow pellets to hydrate for at least 30 minutes.
10. Mix cement/bentonite grout per Manufacturer's specifications.
11. Add grout to borehole through tremie pipe or hose from the top of the bentonite seal to the ground surface.
12. Remove remaining augers from the borehole.
13. Top off grout in borehole. Grout should extend to approximately two feet below ground surface.
14. Cut well-riser pipe to about three feet above the ground surface for stickup type wells. Flush-mount well risers should be cut off just below surface grade.
15. Backfill the remaining two feet of the borehole with concrete.
16. Install a protective casing over the well riser pipe and set it into the concrete backfill.
17. Lock the protective casing cover.
18. Document well construction in the field notebook and later on a Well Construction Detail diagram (Appendix A).

Reference: *ASTM Standard Practice for Design and Installation of Groundwater Monitoring Wells D5092/D5092M-16*.

### 3.19.2 Bedrock Monitoring Well Construction Procedures

Summary: A method for construction of monitoring wells within bedrock, which enables monitoring of groundwater elevation and acquisition of groundwater samples for laboratory testing.

Procedure:

1. Collect soil samples while advancing to the top of bedrock. Follow the procedures in Sections 3.5 (HSA drilling), 3.6 (Rotosonic drilling), 3.10 (split-spoon sampling), or 3.13 (direct-push sampling) as applicable for field conditions.

2. Measure the depth to the top of bedrock from the ground surface using a weighted measuring tape.
3. At these boring locations collect a 3- to 5-foot NX- rock core sample from the top of rock.
4. Ream the core hole to approximately 8-inches in diameter.
5. Install a 6-inch carbon steel casing into the borehole and set it at least 3 feet into the bedrock. The casing should extend to the ground surface.
6. Remove the HSAs or casing and grout the annular space between the steel casing and borehole wall. Mix grout following procedures in Section 3.19.3. Allow grout to cure for at least 24 hours before continuing the boring.
7. Collect NX-rock core samples to desired depth in 5- or 10-foot increments. After coring, ream the core hole to approximately 6-inches in diameter.
8. Insert a riser cap (J-plug) into the well riser. Install an 8-inch curb box around the well casing by cementing the protective curb box around the well casing. Install lock on Jplug and seal the curb box.
9. Document well construction details in the field notebook and transfer the data onto the Bedrock Monitoring Well Construction Detail form (Appendix A).

Reference: *ASTM Standard Practice for Design and Installation of Groundwater Monitoring Wells D5092/D5092M-16*.

### *3.19.3 Monitoring Well Abandonment Procedures*

Well abandoning will be performed in accordance with New York State Department of Environmental Conservation (NYSDEC) CP-43, using the following steps:

1. Each well will be tremie grouted from the bottom of the well to within five feet of the ground surface to ensure a continuous grout column. Grout slurry composition should be the following:
    - 1.5 to 3.0 percent by weight - Bentonite (Quick Gel)
    - 40 to 60 percent by weight - Cement (Portland Type I)
    - 40 to 60 percent by weight - Water
2. The well casing will be removed at a depth of five feet below grade (if possible) and the outer protective casing "stick-up" and/or flush-mount curb box will be removed only after the well has been properly filled with grout.
3. A metal marker (PK Survey Spike) will be embedded in the top of the grout to indicate the location of the former monitoring well.
4. The uppermost five feet of the borehole will be filled with approved/clean backfill or topsoil.
5. The surface of the borehole will be restored to the condition of the area surrounding the borehole (crushed stone, asphalt, etc.). If the surrounding surface is a concrete sidewalk flag that flag will be replaced in accordance with Section 3.29 of this plan.
6. The solid waste should be handled is accordance with Section 3.30 of this plan.
7. Document well construction details in the field notebook and transfer the data onto the Well Decommissioning Record form (Appendix A).

Reference: *NYSDEC CP-43: Groundwater Monitoring Well Decommissioning Policy, November 3, 2009. ASTM Standard Guide for Decommissioning of Groundwater Wells, Vadose Zone Monitoring Devices, Boreholes, and Other Devices for Environmental Activities D5299/D5299M-17.*

### 3.19.4 Plugging/Abandoning Borehole and Grout Mixing Procedures

Summary: Boreholes that are not completed as monitoring wells, will be sealed (plugged) prior to abandonment to prevent downhole contamination. In addition, the annular space in monitoring wells need to be sealed after the installation of the sand pack and bentonite seal to prevent any downward migration of surface water into the well. Sealing can be achieved by backfilling the borehole with bentonite below the water table (hole plug or pellets) and/or with a cement/bentonite grout above the water table. The backfill material will be introduced from bottom to top using either a tremie pipe or the drill rods. Shallow borings will be sealed with bentonite (hole plug or pellets) the entire length of the boring.

Procedure:

1. Determine most suitable seal materials. Grout specifications generally have mixture ratios as follows:
   - Grout Slurry Composition (Percent Weight) 1.5 to 3.0 percent - Bentonite (Quick Gel)
   - 40 to 60 percent - Cement (Portland Type I)
   - 40 to 60 percent - Water

2. Calculate the volume of the borehole based on the bit or auger head diameter plus 10 percent and determine the volume of grout to be emplaced. Generally, the total mixed volume is the borehole volume plus 20 percent.
3. Identify the equipment to be used for preparing and mixing of the grout. Ensure the volume of the tanks to be used for mixing has been measured adequately. Document these volumes.
   - Identify the source of the water to be used for the grout and determine its suitability for use. In particular, water with high sulfate or chloride levels, or heated water, should not be used. These types of waters can cause operational difficulties or modify the set-up for the grout.
4. Identify the equipment to be used for emplacing the grout. Ensure that the pump to be used has adequate pressure to enable complete return to surface.
5. Identify the volumes to be pumped at each stage or in total if only one stage is to be used.
6. Prepare the borehole plugging plan and discuss the plan and activities with the drilling contractor prior to beginning any mixing activities.
7. Begin mixing the grout to be emplaced.
8. Record the type and amount of materials used during the mixing operation. Ensure that the ratios are within specification tolerance.

9. Begin pumping the grout through the return line bypass system to confirm that all pump and surface fittings are secure.
10. Initiate downhole pumping. Record the times and volumes emplaced on the form.
11. Document the borehole is completely filled with grout.
12. Clear and clean the surface near the borehole. Level the ground to about the pre-existing grade. Add grout or cement as necessary to the area near the borehole.

Note: On occasion, there may be some settling of the grout, which takes place over several days. If this settling occurs, the natural soil from the immediate vicinity is used to put the level at grade. A follow-up check at each site should be made within one week to 10 days of completion. Document the visit and describe any action taken.

### 3.20 Groundwater Monitoring Well Development Procedures

Summary: Following completion of groundwater monitoring well installation, each monitoring well will be developed by pumping until the discharged water is relatively sediment free and the indicator parameters (pH, temperature, and specific conductivity) have reached steady state. Developing the monitoring well not only removes any sediment but also may improve the hydraulic properties of the formation. The effectiveness of the development measures will be closely monitored in order to keep the volume of discharged water to the minimum necessary to obtain sediment-free samples. A portable turbidimeter will be used to monitor effectiveness of development. A turbidity reading of < 50 Nephelometric Turbidity Units (NTU) and steady state pH, temperature, and specific conductivity readings will be used as a guide for discontinuing well development.

Procedure:

1. An appropriate monitoring well development method should be selected, depending on water level depth, well productivity, and sediment content of water. Monitoring well development options include: (a) manual pumping; and (b) powered suction-lift or hydrolift pumping.
2. Equipment should be assembled, decontaminated (if necessary), and installed in the well. Care should be taken not to introduce contaminants to the equipment during installation.
3. Monitoring well development should proceed by repeated removal of water from the well until the discharged water is relatively sediment-free. All development waters will be containerized. Effectiveness of development should be monitored at regular intervals using a portable turbidimeter and water quality meter. Volume of water removed and turbidity, pH, temperature, and conductivity measurements will be recorded on a Well Development/Purging Log form (Appendix A).
4. Monitoring well development will be discontinued when the turbidity of the discharged water is below 50 NTU and the other indicator parameters have stabilized.

Reference: *ASTM Standard Practice for Design and Installation of Groundwater Monitoring Wells D5092/D5092M-16*.

## 3.21 Monitoring Well and Soil Vapor Implant Inspection and Maintenance

Summary: Periodic inspection and maintenance of monitoring well protective casings are required to keep the wells in good condition. The following procedure should be employed whenever the monitoring wells are opened for gauging and sampling.

Procedure:

1. Use the Monitoring Well Inspection Form or Soil Vapor Implant Inspection Form (Appendix A) to record the conditions of the various components of the monitoring well and protective casing including lock/hasp, hinge/lid, J-plug, gasket seal, and security bolts.
2. Coat security bolts with never seize to prevent seizure in the cast iron flush mount curb boxes.
3. Replace security bolts of the hexagonal head type with bolts that have pentagonal heads (5 sided) at the earliest opportunity. Pentagonal type bolts help prevent unauthorized access to the wells.
4. In wells, record depth to water, depth to bottom, and depths to the top and bottom of any light non-aqueous phase liquid (LNAPL) and dense non-aqueous phase liquid (DNAPL) layers.
5. Record any maintenance performed on the well and stencil as needed.
6. All sections of the inspection form should be completed and photographs taken before and after inspection and maintenance.

### 3.21.1 Road Box Replacement Procedures

Summary: Often during an inspection, it is determined that a monitoring well's road box is damaged and needs to be replaced. The following procedure should be employed whenever a road box is replaced.

Procedure:

1. Cut the pavement with a jackhammer and hand-excavate the surrounding soil to a depth of approximately 1 ft. below ground surface (bgs). If the surrounding surface is covered with asphalt instead of concrete, then hand cut the asphalt.
2. Any concrete (or asphalt) cuttings will be placed in a 1A2 open head 55-gallon steel drum.
3. Remove the damaged road box and install the new road box. The damaged road box will be placed in a 1A2 open head 55-gallon steel drum.
4. Backfill around the newly installed road box with the excavated soil, leaving enough room for a concrete pad/asphalt patch.
5. Construct a 2 ft. by 2 ft. square concrete pad/asphalt patch surrounding the new road box.
6. If using concrete in freezing temperatures, an anti-freeze agent will be added to the cement mixture and the concrete pad will be covered with a sheet of plastic to prevent the pad from freezing and cracking.

7. An orange cone will be placed near the monitoring well to prevent vehicles from driving over the newly repaired road box.
8. The drums will be addressed in accordance with the protocols outlined in Section 3.30.

### 3.22 Hydraulic Conductivity Testing

Summary: Hydraulic conductivity tests (slug tests) may be performed in newly installed wells. During any slug testing, gauging of fluid levels will be performed using a data logger/pressure transducer, and stainless steel slugs. Since the water table is shallow, only rising head (slug-out) tests will be performed. This test will consist of inserting a 'slug' of known volume into the well/piezometer, allowing the water level in to return to a steady state, removing the slug allowing the water level to return to static conditions. The transducer/data logger will record changes in water level. This data will be analyzed using the methods of Bouwer and Rice (1976) and Bouwer (1989).

Slug testing is a rapid and inexpensive procedure for estimating the horizontal hydraulic conductivity of an aquifer material screened by a monitoring well. Equipment consists of dedicated/disposable nylon rope, decontaminated stainless steel slug and a data logger/pressure transducer, and a water level indicator.

Procedure:

1. Measure dimensions of the slug to be used to displace water in the monitor and predetermine the volume of water, which will be displaced, and corresponding initial water level change, which will occur by adding or removing the slug.
2. Record initial water level in the wells (static water level).
3. Lower the pre-cleaned data logger/pressure transducer into wells to the wells bottom. Pull transducer up one foot.
4. Insert slug into well, below water table, with nylon rope. Allow water level in well to return to static condition.
5. Simultaneously initiate data logger/pressure transducer and rapidly remove the slug from the wells.
6. Monitor water level recovery in well with data logger/pressure transducer until static water level has been regained.
7. Download data logger/pressure transducer and record data in field notebook. Review data to verify slug test Project Work Plans successful.
8. Remove equipment from well and decontaminate.
9. Analyze data in office using computer.

### 3.23 Groundwater Sampling

Summary: To collect representative groundwater samples, groundwater wells must be adequately purged prior to sampling. New monitoring wells will not be purged until 72 hours after installation. Purging will require the removal of three to five volumes of standing water in rapidly recharging wells and at least one volume from wells with slow recharge rates. Shallow wells in which the screen intersects the water table should require a minimum amount of purging since the groundwater would flow through the screen and not be entrapped in the casing. Deeper wells should be purged more thoroughly since they may be located in confined aquifers and water may rise up into the casing. A thorough purging would require the removal of several volumes of this trapped water to ensure that representative groundwater is brought into the well for sampling. Sampling should commence immediately after purging as soon as adequate recharge has occurred.

### 3.23.1 Standard Monitoring Well Purging Procedure

Procedure:

1. The well cover will be unlocked and carefully removed to avoid having any foreign material enter the well. The interior of the riser pipe will be monitored for organic vapors using PID. If a reading of greater than 5 ppm is recorded, the well will be vented until levels are below 5 ppm before purging begins.
2. Using an electronic water level detector, the water level below top of casing will be measured. Knowing the total depth of the well, it will be possible to determine the volume of water in the well. The end of the probe will be soap-and-water-washed and deionized-water rinsed between wells.
3. Calibrate field instruments (e.g., pH, specific conductance, PID, turbidity).
4. Purge the required water volume (i.e., until stabilization of pH, temperature, specific conductivity, and turbidity). New dedicated equipment will be used for each well.
5. Purge well until the water quality parameters have stabilized. The stabilization criteria are: specific conductivity - 3% full scale range; pH - 0.10 pH unit; temperature - 0.2°C, and turbidity <50 NTU.
6. Purging of three well volumes is not necessary if the indicator parameters are stable. However, at least one (1) well volume must be purged before sampling can begin. During purging, it is permissible to by-pass the flow cell until the groundwater has cleared.
7. Indicator parameters of pH, conductivity, dissolved oxygen, oxygen/reduction potential, turbidity, and temperature must be measured continuously using the flow cell.
8. Well purging data are to be recorded in the field notebook and on the Well Purge Log (Appendix A).
9. Dispose of sampling equipment as per Section 3.30.

### 3.23.2 Low Flow Sampling Procedures

Summary: To collect groundwater samples that reflect the total mobile organic and inorganic loads (dissolved and colloidal sized fractions) transported through the subsurface under ambient flow conditions with minimal physical and chemical alterations from sampling operations. This methodology aims to minimize hydraulic stress at the well-aquifer interface by maintaining low water-level drawdown, and by using low pumping rates during purging and sampling operations. Indicator field parameters area monitored during purging to determine when sample collection may begin. Samples collected using this methodology are suitable for analysis of groundwater contaminants including VOCs, SVOCs, dissolved gases, pesticides, PCBs, metals, other inorganics, or naturally occurring analytes.

Procedure: Low-flow monitoring well purging and sampling will be completed using the technique as follows:

1. Use an appropriate adjustable rate, submersible or peristaltic pump with the pumps intake placed at the midpoint of a 10 foot or less well screen or open interval.
2. Review well installation information. Record the well depth, length of screen or open interval, and depth to the top of the well screen. If possible, determine the pumps intake depth (e.g., midpoint of the screen or open interval).
3. On the day of sampling, check the security of the well casing, perform safety checks, setup sampling and groundwater parameter monitoring equipment. If necessary, a canopy or equivalent may be set up to shade the pumps tubing and associated equipment to minimize sun light from heating the groundwater prior to sampling.
4. Unlock and carefully remove the well cover to avoid foreign material from entering the well. Monitor the concentration of VOCs in the interior of the riser pipe using a properly calibrated PID. If a reading greater than 5 ppm is recorded, the well will be vented until levels are below 5 ppm.
5. Check the well casing for a reference mark. If missing, make a reference mark by cutting a V-notch or using permanent ink.
6. Using an electronic interface probe/water level detector, the water level below top of casing will be measured. The depth of the well will be measured to determine the volume of water in the well. The top of the water column will be checked for LNAPL, and the bottom of the well will also be checked for DNAPL using the interface probe/water level indicator. The end of the probe will be decontaminated between wells. Measure depths to 0.01-foot precision. Record the information.
7. Calibrate field instruments to measure groundwater parameters (e.g., pH, specific conductance, turbidity, etc.).
8. Install the pump’s intake to the appropriate depth (e.g., midpoint) of the well screen or open interval.
9. Turn-on the pump and discharge the groundwater into a graduated waste bucket. Slowly increase the flow rate until the water level starts to drop. Reduce the flow rate slightly so the water level stabilizes. Record the pump settings. Calculate the flow rate using the graduated container and stopwatch. Record the flow rate. Do not let the water level drop below the top of the well screen.
    a. If the groundwater is highly turbid or discolored, continue to discharge the water into the bucket until the water clears (visual observation); this generally takes several minutes. If the water does not clear, then continue purging or continue to the next step.
    b. If the water level drops to the top of the well screen during purging, stop purging and wait for the well to recharge to sufficient volume so samples may be collected.

    The project manager will need to decide when samples should be collected and the rational recorded. A water level measurement must be performed and recorded before samples are collected. When samples are collected, the water level must not drop below the top of the screen or open interval. Collect the samples from the pumps tubing. Always collect the VOCs and dissolved gases samples first. Normally, the samples requiring a small volume are collected first in case there not sufficient water in the well to fill all the sample containers. All samples must be collected, preserved, and stored according to the analytical method. Remove the pump from the well and decontaminate the sampling equipment.

   c. If the water level has dropped 0.3 feet or less from the initial water level (prior to the pump being installed) proceed to step 10. If the water level has dropped more than 0.3 feet, calculate the volume of water between the initial water level and the stabilized water level. Add the volume of the water which occupies the pumps tubing to this calculation. This combined volume of water needs to be purged from the well after the water level has stabilized before samples are collected.

10. Attach the pump tubing to a “T” connector with a valve. The pumps tubing from the well casing to the “T” connector must be as short as possible to prevent the groundwater in the tubing from heating up from the sun light or ambient air. Attach a short piece of tubing to the other end of the “T” connector to serve as a sampling port for the turbidity samples. Attached the remaining end of the “T” connector to a short piece of tubing and connect the tubing to the flow through cell bottom port. To the top port, attached a small piece of tubing to direct the water into a calibrated waste bucket. Fill the cell with the groundwater and remove gas bubbles from the cell.
11. Turn on the monitoring probes and turbidity meter.
12. Record the temperature, pH, dissolved oxygen, specific conductance, and oxidation/reduction potential measurements. Open the valve on the “T” connector to collect a sample for the turbidity measurement, close the valve, and record the measurement. Calculate the pumps flow rate from the water exiting the flow through cell and record. Measure and record the water level.
13. Repeat Step 12 every 5 minutes or as appropriate until the monitoring parameters have stabilized. At least one flow through cell volume must be exchanged between readings. If not, the time interval between readings needs to be increased. Stabilization is achieved when three consecutive measurements are within the following limits:
    a. Turbidity: 10% for values greater than 5 NTUs. If 3 turbidity values are less than 5 NTUs, consider the values as stabilized.
    b. Dissolved O2: 10% fir values greater than 0.5 mg/L. If 3 dissolved O2 values are less than 0.5 mg/L, consider the values as stabilized.
    c. Specific Conductance: 3%
    d. Temperature: 3%
    e. pH: ±0.1 unit
    f. Oxidation/Reduction Potential: ±10 millivolts

If these stabilization requirements do not stabilize in a reasonable time, the probes may have been coated from the materials in the groundwater, from a buildup of sediment in the flow though cell or gas bubbles lodged in the probe(s). If so, the cell and probes need to be cleaned. Disconnect the tubing and continue to purge the well. Disassemble and clean according to the manufacturer's instructions, reassemble, and reconnect to the tubing and remove gas bubbles.

14. Following the stabilization of groundwater parameters, turn off the monitoring probes and disconnect the pump from the "T" connector. If using a centrifugal or peristaltic pump check the tubing to determine if it is filled with water (no air space). All samples must be collected and preserved according to the analytical method. VOCs and dissolved gas samples are generally collected first into pre-preserved containers unless specified otherwise. Fill all containers by allowing the pump to discharge to flow gently down the inside of the container with minimal turbulence. If the tubing is not filled and the samples are being collected for VOCs and/or dissolved gases, using a centrifugal or peristaltic pump, then do the following:
    a. All samples must be collected and preserved according to the analytical method. The VOCs and dissolved gases (e.g., methane, ethane, ethene, and carbon dioxide) samples are collected last. When time to collect these samples, increase the pumps flow rate until the tubing is completely filled, collect the samples, and record the flow rate.
15. Store the samples according to the analytical method.
16. Record the total purged volume and remove the pump from the well and decontaminate the sampling equipment.

### 3.23.3 Sample Collection Procedures

Procedure:

1. After well purging is completed, a sample will be collected into the appropriate containers.
2. Direct water flow toward the inside wall of the sample container to minimize volatilization. Fill volatile sample containers so no headspace (air bubbles) is present. If containers are pre-preserved, do not overfill sample containers. Note if effervescence is observed.
3. All sample bottles will be labeled in the field using a waterproof permanent marker (Section 7.0).
4. Samples will be collected into sample bottles (containing required preservatives) and placed on ice in coolers for processing (preservation and packing) prior to shipment to the

analytical laboratory. A chain-of-custody record will be initiated. The analytical laboratory will certify that the sample bottles are analyte-free prior to shipping.

5. Remove pump and disconnect valves and tubing, as necessary. If a submersible pump Project Work Plans used, it must be decontaminated prior to and between each use. Clean pump by flushing 10 gallons of potable water through the pump. Rinse with deionized water after flushing the pump.
6. Well sampling data are to be recorded in the field notebook and on the Well Purging Log (Appendix A).

Reference: *ASTM Standard Practice for Design and Installation of Groundwater Monitoring Wells D5092/D5092M-16*.

### 3.23.4 Sampling Through LNAPL

Procedure:

1. Measure the depth and thickness of the LNAPL layer per Section 3.25.
2. The groundwater sample from below the product will be collected through a 1-inch ID tremie pipe immersed below the LNAPL layer.
3. Insert a slip cap or similar device (i.e., J-plug) to plug the end of the 1” ID PVC pipe, and attach a tether to the device so it can be retrieved from the well after sampling is complete. The pipe will be lowered into the well and additional sections of 1” ID PVC pipe will be added as necessary.
4. Lower the 1” ID PVC pipe into the well with the slip cap/J-plug inserted in the bottom of the pipe. The bottom of the pipe should be lowered through and at least 2’ below the bottom of the LNAPL layer.
5. Brace the 1” ID pipe at the surface so it cannot fall further into the 2” well casing.
6. Smaller diameter rods or a weighted section of steel pipe attached to a rope will be used to push the slip cap off the end of the 1” ID PVC pipe. The attached tether will allow retrieval of the J-plug when the 1” tubing is retrieved from the well at the conclusion of sampling.
7. Proceed with sampling the well by inserting purging and sampling tubing through the 1” tubing.
8. When sampling is finished remove the 1” tubing and slip cap from the well. The 1” ID PVC pipe will be partially coated with LNAPL and should be discarded. The slip cap can be decontaminated or discarded.

### 3.23.5 Sampling LNAPL or DNAPL

Summary: When conducting groundwater sampling from monitoring wells, LNAPL and DNAPL may be collected. The following procedure will be used to collect samples of LNAPL and DNAPL.

Procedure:

1. Measure the depth and thickness of the LNAPL/DNAPL layer per Section 3.25.

2. Using a disposable Teflon or Teflon lined bailer attached to disposable poly twine, lower the bailer so the bottom of the bailer is at the same depth as the bottom of the LNAPL/DNAPL layer.
3. Upon reaching its target depth, raise the bailer with the LNAPL/DNAPL product and place the product in the laboratory supplied containers.
4. Repeat steps 2 and 3 until the laboratory supplied containers are full or there is no more product to remove.
5. Upon completion of the sampling, place the used bailer and twine in a 1A2 open head 55gallon steel drum.

### 3.24 Water Level Monitoring Procedures

Summary: Determination of groundwater depths in monitoring wells is necessary to calculate required purge volumes prior to groundwater sampling. Determination of groundwater depths in piezometers is necessary to determine the direction of groundwater flow.

Water levels in monitoring wells scheduled to be sampled during the field work will be measured using an electronic water level indicator. Initially, measurements will be taken following well development until the well has recovered to anticipated static conditions. Water levels will also be measured in the piezometers as specified in the Project Work Plan. Water level measurement procedures are presented below.

Procedure:

1. Clean the water level probe and the lower portion of cable following standard decontamination procedures (Section 6.0) and test water level meter to ensure that the batteries are charged.
2. Lower the probe slowly into the monitoring well until the audible alarm indicates water.
3. Read the depth to the nearest hundredth of a foot from the graduated cable using the V-notch on the riser pipe as a reference point.
4. Repeat the measurement for confirmation and record the water level.
5. Remove the probe from the well slowly, drying the cable and probe with a clean "Chem Wipe" or paper towel.
6. Replace the well cap and lock protective cap in place.
7. Decontaminate the water level meter (Section 6.0) if additional measurements are to be taken.

Reference: *ASTM Standard Test Method for Determining Subsurface Liquid Levels in a Borehole or Monitoring Well (Observation Well) D4750-87(2001)*.

### 3.25 LNAPL/DNAPL Water Level Monitoring Procedures

Summary: When conducting groundwater measurement from monitoring wells, the presence and thickness of LNAPL and DNAPL will be monitored. The following procedure will be used to determine the presence and thickness of LNAPL and DNAPL. LNAPLs, Light Non-Aqueous Phase Liquids (Lighter than water) are typically measured using an oil/water interface meter.

Procedure:

1. To meet safety requirements and protect electronics from damage, always ground the meter by attaching the ground clamp to the metal well casing.
2. Before beginning any measurement, check the electronics and battery condition by pressing the 'START/OFF' button. A brief tone and red light indicates the meter is functional. A flashing green light indicates the meter is on. NOTE: The meter will automatically shut off after 10 min to conserve battery life and will have to be turned back on.
3. Lower the probe end into the well and slowly lower until water or LNAPL is contacted. A steady tone and light indicates a non-conductive liquid (e.g. product). An intermittent tone and light indicates a conductive liquid (e.g. water).
4. For floating product (LNAPL), take the air/product interface measurement on the way into the liquid and the water/product interface on the way up. When passing through product into water, some product may adhere to the probe sensors due to surface tension. Therefore, when water is detected below the product, the probe should be raised and lowered rapidly in a short vertical motion to remove any product that may have been carried down with the probe.
5. The water/product interface should then be measured as the probe is raised very slowly back up. Once the interface is detected the probe can be raised and lowered in small increments to precisely determine the interface.
6. Repeat measurements to confirm water/product interface.
7. To determine the thickness of product, subtract the water/product interface from the product/air interface.
8. To determine if there is any sinking product (DNAPL) in the well, continue lowering the probe slowly. If steady signals activate, determine the top of the sinking layer by reading directly from the tape. Continue lowering the probe slowly until the tape slackens when the well bottom is reached. Read the level directly from the tape and subtract one from the other to determine thickness.
9. Upon completion of readings clean the tape and the probe.

### 3.26 Indoor Air Investigation

Indoor air investigations will generally include the following tasks at each residence: 1) conducting interviews with homeowners using air quality questionnaires provided by the New York State Department of Health (NYSDOH) (Appendix A); 2) conducting a brief survey of household chemicals present and evaluating their potential to affect air sample results; 3) collecting one indoor air sample each from the breathing zones of the first floor and basement areas, and; (4) collecting one soil vapor sample from beneath the basement concrete slab. In addition, one or two outdoor air samples will be collected from the residential sampling area for each day that sampling is taking place.

### 3.26.1 Indoor Air Quality Survey and Questionnaire

Once the homeowners have been contacted by the NYSDEC and/or NYSDOH, appointments will be made to conduct homeowner/occupant interviews and building inventory of household chemicals. Questionnaire and Building Inventory forms provided by the NYSDOH (Appendix A) will be used. Once the questionnaires have been completed, a brief inventory of household chemicals stored in the basement area will be prepared. The inventory will consist of a general description of areas where chemicals are stored and the types and approximate numbers of chemicals present. During this inventory, a ppbRAE photo ionization detector (PID) should be used to measure the presence of volatile organic compounds (VOCs) in those areas where the chemicals are found. Also during the inventory, a handout will be provided to the residents that list home activities that should be avoided prior to and during the air sampling. The general procedures to be followed during the surveys are summarized below:

- Identify all areas on the basement level that may be used for storage of chemical containers. Also record the general types and approximate quantities of chemicals stored and VOCs present in the atmosphere in the areas of chemical storage.
- Other potential sources that may influence air quality testing that should be noted and scanned with the PID include: new construction/remodeling/painting, new carpeting, and freshly drycleaned clothing.

### 3.26.2 Sub-Slab Air Sampling Procedures

One sub-slab air sample will be collected at each sampled residence. As directed by the NYSDEC, additional samples (up to a total of three) may be collected at some of the residences. A minimum of one sub-slab sample at each residence will be tested for an adequate surface seal before and after testing using the helium tracer gas test procedures outlined below.

The sub-slab air sampling procedures are summarized below:

1. Select and prepare the sub-slab sample collection point by observing the condition of the building floor slab for apparent penetrations such as concrete floor cracks, floor drains, or sump holes. The floor conditions will be noted and a potential location of a subsurface probe will be selected. The location will ideally be central to the building, and away from the foundation walls, apparent penetrations and buried pipes. Review all locations with the Homeowner prior to drilling any hole! Photograph and document all sample locations.
2. In locations where bare concrete is available, drill a 5/8-inch diameter hole about one-inch (1”) into the concrete using an electric hammer drill. Extend the hole through the remaining thickness of the slab using a ½ -inch drill bit. Lengthen the hole about three inches (3”) beyond the sub-slab using the drill bit.

3. Remove the concrete dust within the 5/8-inch drilled hole and around the hole using wire brushes and a brush and dust pan, then dabbing the surface with Sculpey brand clay, or equivalent substance (see below).
4. Insert a 5/8-inch outside diameter (OD) by ¼-inch inside diameter (ID) rubber stopper onto and three-inches beyond the end of a 1/4-inch OD by 1/8-inch ID Teflon tube. Insert the Teflon tube into the 5/8-inch hole so the stopper is seated into the top of the ½-inch drilled hole.
5. Seal the annular space between the 5/8-inch hole and the Teflon tubing with white Sculpey Brand modeling clay (or equivalent). Bring the clay above the floor's surface and around the tubing in a volcano-like shape.
6. In locations where only linoleum tile is available, AND THE OWNER AGREES, drill a small (1/4-inch best) hole through the tile and slab. Place the sample tubing into the hole and seal to the floor with clay.
7. Purge the sampling tube by connecting the Teflon tubing to the inlet of an air-sampling pump (GilAir 300 or 500) with 3/8-inch OD silicone tubing, and connecting a 1 liter (L) Tedlar bag to the outlet of the pump with silicone tubing. Purge approximately one liter (1L) of gas from the subsurface probe into the Tedlar bag, using the air-sampling pump. Analyze the 1L Tedlar bag containing the sub-slab purged air with a gas detector that records the concentrations of CH4, CO2 and O2. Record the purge times (start and stop) and the gas concentrations on a Summa Canister Sampling Field Data Sheet (Appendix A). Purging flow rates must not exceed 0.2 L/min.
8. Assign sample identification to the Summa® canister identification tag and record on chain of custody (COC), and the Summa Canister Sampling Field Data Sheet. Also record the Summa® canister's serial number on the Summa Canister Sampling Field Data Sheet.
9. Remove brass plug from canister fitting.
10. Attach a pre-calibrated/certified 24-hour flow controller, and particulate filter to the Summa® canister. Record the regulator serial number on the Summa Canister Sampling Field Data Sheet.
11. Attach the sample tube to the Summa® canister using a ¼-inch Swagelok® nut with appropriate ferrules, via the flow controller/particulate filter assembly.
12. Open canister valve to initiate sample collection and record sample start time, date and initial vacuum on the canister identification tag and on the Summa Canister Sampling Field Data Sheet. If the canister does not show sufficient vacuum (generally less than 25" Hg), do not use. Take a digital photograph of canister setup and surrounding area. Include in the photograph a dry erase board or similar display which presents sample ID and date.
13. After 24 hour, record sample end time and canister pressure on the Summa Canister Sampling Field Data Sheet, and close valve.
14. Disconnect the Teflon tubing and remove flow controller/particulate filter assembly from canister. Seal canister with brass plug.
15. Seal the hole in the basement slab with hydraulic cement patch.
16. Ship samples with COCs, overnight, to a NYSDOH approved laboratory, for TO-15 analysis.

Using Helium Tracer Gas to Test Floor Seals.

1. Drill the concrete floor and attach and seal the Teflon sample tubing to the floor as described above.
2. Place a 2-quart (or similar size) bucket over the floor seal after threading the Teflon sample tube through a hole in the top of the bucket. Seal the tube to the bucket with clay.
3. The bucket should also have a hole in the top for the injection of helium gas. An additional hole should be present in the side, near the bottom, to measure the concentration of helium gas in the bucket.
4. Connect helium (99.999%) cylinder tubing to the top port of bucket enclosure and seal with clay or other sealing material. Insert a helium detector probe to the bottom port of the bucket.
5. Release enough helium to displace any ambient air in the bucket until the concentration of helium reaches a minimum of 90%. Maintain this minimum concentration by testing with a helium detector. The helium cylinder should be open during the purge time to cause a slight positive pressure within the enclosure.
6. Connect the sample tubing to a GilAir vacuum pump or equivalent using 3/8-inch O.D. silicone tubing. Connect a 1-liter Tedlar bag to the outlet of the pump using silicone tubing and collect a 1-liter sample. Analyze the Tedlar bag for helium using a helium detector, and record the results on the Summa Canister Sampling Field Data Sheet. Also analyze the Tedlar bag for the presence of methane, H2S, CO2 and O2 and record the result on the Summa Canister Sampling Field Data Sheet. A concentration of helium 10% or greater indicates a poor seal of the sample tubing to the basement floor. The tubing must be resealed to the floor and another helium test conducted.
7. Purging flow rates must not exceed 0.2 L/min.
8. After purging, remove the bucket enclosure and assign sample identification to the Summa® canister identification tag and record on the COC, and the Summa Canister Sampling Field Data Sheet. Also record the Summa® canister's serial number on the Summa Canister Sampling Field Data Sheet.
9. Connect the 1/4-inch Teflon OD sample tubing to the Summa® canister regulator inlet using a ¼-inch Swagelok® nut with appropriate ferrules. Open the canister valve to initiate sample collection and record the start time and date and beginning vacuum on the canister identification tag and on the Summa Canister Sampling Field Data Sheet. If the canister does not show sufficient vacuum (generally less than 25" Hg), do not use.
10. After 24 hours, record sample end time and final vacuum on the Summa Canister Sampling Field Data Sheet and close the valve.
11. Disconnect the Teflon tubing from the Summa® canister and remove the flow controller/particulate-filter assembly from canister. Seal canister with brass plug.
12. Thread the Teflon sample tubing through the bucket enclosure and conduct a helium tracer gas test as described above. After purging, test the concentration of helium in the 1 liter Tedlar bag and record on the Summa Canister Sampling Field Data Sheet.

13. Remove the sample tubing, stopper and clay from the hole in the basement slab and seal with hydraulic cement patch.
14. Ship the samples, with COCs, overnight to Air Toxics, or other selected lab, for TO-15 analysis.

### 3.26.3 Indoor Air and Outdoor Air Sampling Procedure

Sampling procedures for the indoor samples and outdoor air sample are summarized below:

1. Place the basement and first floor Summa® canisters at breathing height in a high traffic location. The breathing height is defined as three to six feet above the floor. Place the outdoor air sample at least 2 to three feet above the ground.
2. Record the canister's serial number on the Summa Canister Sampling Field Data Sheet.
3. Assign sample identification to the canister identification tag (see Section 7.0 below) and record on the COC and the Summa Canister Sampling Field Data Sheet.
4. Remove brass plug from canister fitting.
5. Attach a pre-calibrated/certified 24-hour flow controller and particulate filter to the Summa® canister, open valve completely to initiate sampling, and record the sample start time and date, and beginning vacuum reading on the canister identification tag and the Summa Canister Sampling Field Data Sheet. Also record the regulator serial number on the Summa Canister Sampling Field Data Sheet. If the canister does not show sufficient vacuum (generally less than 25" Hg), do not use.
6. Take a digital photograph of canister setup and surrounding area. Include a dry erase board or similar display which presents sample ID and date.
7. After 24 hours, record end time and pressure on the Summa Canister Sampling Field Data Sheet, and close valve.
8. Disconnect flow controller/particulate filter assembly from canister.
9. Seal canister with brass plug.
10. Ship canister standard overnight, with COC, to a NYSDOH approved laboratory, for TO15 analysis.

### 3.26.4 Quality Control

Field duplicates for structure samples (10 percent) will be collected by attaching the T-fitting supplied by the laboratory to two Summa® canisters with attached regulators. The inlet for the T-fitting will then be attached to the sub-slab sample tubing. Indoor air and outdoor air duplicates will also use T-fittings connected to two Summa® canisters. Tubing will not be required unless needed to the raise the sampling point to the breathing zone. For sampling, both Summa® canister valves are opened and closed simultaneously.

### 3.26.5 Field Documentation

Field notebooks will be used during all on-site work. A dedicated field notebook will be maintained by the field technician overseeing the site activities. In addition to the notebook, any and all original sampling forms, purge forms and notebooks used during field activities will be submitted to the NYSDEC as part of the final report. Indoor air sampling procedures should be photo-documented.

The field sampling team will maintain sampling records that include the following data:

1. Sample Identification
2. Date and time of sample collection
3. Identity of samplers
4. Sampling methods and devices
5. Purge volumes (soil vapor)
6. Volume of soil vapor sample extracted
7. The Summa® canister vacuum before and after samples collected
8. Chain of Custody and shipping information

The proper completion of the following forms/logs will be considered correct procedure for documentation during the indoor air-sampling program:

1. Field Log Book - weather-proof hand-bound field book
2. Questionnaire and Building Inventory Form (Appendix A)
3. Summa Canister Sampling Field Data Sheet (Appendix A)
4. Chain of Custody Form (Appendix A)

Reference: *NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York*.

### 3.27 Removal of Underground Storage Tanks

#### 3.27.1 General

The contractor shall furnish all labor, materials, tools and equipment and remove an underground storage tank.

#### 3.27.2 Submittals

The following items shall be submitted to the RENU Project Manager for review and approval.

1. Detailed Work Plan: This plan shall be submitted by the Underground Storage Tank Contractor to RENU and will describe methods, equipment, and sequences of operations including, but not limited to:
    - Tank contents removal
    - Spill Prevention
    - Exploratory excavations
    - Tank purging procedure
    - Interior and exterior tank cleaning procedure
    - Wastewater Collection and Disposal
    - Removal or permanent closure of underground storage tank
    - Transportation and disposal of underground storage tank
    - Anticipated use, recycling or disposal of tank contents

2. Copies of manifests required to transport waste materials. These manifests shall be submitted within 24 hours following their preparation.
3. Documentation of acceptance of waste materials by a facility permitted to treat or dispose of those types of materials. These documentations shall be submitted no later than 7 days following a delivery of waste materials to the permitted facility.
4. Letters of acceptance from the permitted facility and haulers acknowledging agreement to accept the waste materials. These letters shall be submitted not more than 14 days before transporting waste materials.

### 3.27.3 Permit and License Requirements

1. Prior to the removal of the underground storage tank, all permits and licenses required to perform the work shall be obtained by the Contractor. Determining license and permit requirements shall be the responsibility of the Contractor.
2. The permit and notification requirements for underground storage tank removal or closure shall include, but not be limited to, the following:
    a. Storage tanks greater than 1,100 gallons capacity must be registered with the NYSDEC. If the tank is being closed, and it is not currently registered, the tank must be registered by the contractor before proceeding with his removal or closure activities. Thirty (30) days prior to initiation of closure activities, the contractor shall notify the NYSDEC (Region 2) of the intent to remove or close a storage tank.
    b. Storage tanks of 1,100 gallons or less do not require registration, or notification to the NYSDEC when closed unless a spill has occurred (see below).
    c. The Contractor shall comply with the requirements of 6 NYCRR Part 612, 6 NYCRR Part 613, 6 NYCRR Part 614, NYSDEC Memo #1, and NYSDEC SPOTS No. 14.

### 3.27.4 Applicable Standards

The publications are referenced by basic designation only and shall be the latest published version.

- American Petroleum Institute (API)
    - API Publ 1628 A Guide to the Assessment and Remediation of Underground Petroleum Releases
    - API Publ 2015 Safe Entry and Cleaning of Petroleum Storage Tanks, Planning and Managing Tank Entry from Decommissioning through Recommissioning
    - API Publ 2217 Guidelines for Confined Space Work in the Petroleum Industry
    - API Publ 2219 Safe Operating Guidelines of Vacuum Trucks in Petroleum Service
      API Publ 2003 Protection Against Ignitions Arising out of Static, Lightning and Stray Currents
- American Society for Testing and Materials (ASTM)
    - ASTM C94/C94M-17 Standard Specifications for Ready-Mixed Concrete

- Code of Federal Regulations (CFR)
    - CFR 40 Part 260 Hazardous Waste Management System: General
    - CFR 50 Part 261 Identification and Listing of Hazardous Waste
    - CFR 40 Part 262 Standards Applicable to Generators of Hazardous Waste
    - CFR 40 Part 263 Standards Applicable to Transporters of Hazardous Waste
    - CFR 40 Part 264 Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
    - CFR 40 Part 265 Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
    - CFR 40 Part 266 Standards for the Management of Specific Hazardous Waste and Specific Types of Hazardous Waste Management Facilities
    - CFR 40 Part 268 Land Disposal Restrictions
    - CFR 40 Part 280 Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks

- USEPA
    - USEPA SW-846 Test Methods for Evaluating Solid Waste, Physical/Chemical Methods

- New York City Fire Department
    - FP Directive 3-73 Division of Fire Protection
- NYSDEC
    - 6 NYCRR Part 357.6 Remedial Program Soil Cleanup Objectives
    - 6 NYCRR Part 612 Registration of Petroleum Storage Facilities
    - 6 NYCRR Part 613 Handling and Storage of Petroleum
    - 6 NYCRR Part 614 Standards for New and Substantially Modified Petroleum Storage Facilities
    - NYSDEC CP-51 Soil Cleanup Guidance Policy
    - NYSDEC SPOTS No.14 NYSDEC Spill Prevention Operations Technology Series (SPOTS) Document No. 14: Site Assessments at Bulk Storage Facilities
    - 6 NYCRR Part 372 Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities

### 3.27.5 Removal or Permanent Closure of Underground Storage Tanks

The procedures for removing the tank shall include, but not be limited to, the following:

1. All product that can be pumped out shall be removed.
2. Products shall be drained and flushed from the piping into the tanks.
3. Remaining liquid shall be removed from the tanks.
4. If the tank does not have manholes; the Contractor shall excavate in accordance with Section 3.3 and provide access to the tank upon completion of purging activities.

5. All piping and gauge lines, with the exception of any vent lines, shall be disconnected and capped.
6. The tank storage systems, including all tanks and piping, shall be purged of flammable vapors in accordance with Section 3.27.8.
7. The interior of the tank shall be cleaned with a high pressure rinse.
8. As shown on the Contract Drawings, tanks shall be removed and disposed corresponding to the New York State Department of Transportation (NYSDOT) Standard Specifications.
9. For method of cutting tanks, see API RP 2015.
10. The vent lines shall be capped at the tanks, cut flush at the roof and capped or removed and disposed of.
11. All openings to the tanks including, but not limited, to fill boxes, manholes and gauge boxes shall be filled with concrete flush with the finished floor.

### 3.27.6 Site Assessment

1. General: The Contractor shall perform a site assessment to determine if there is any contamination present at the site. The site assessment shall be conducted in accordance with NYSDEC SPOTS No. 14.
2. Equipment: The Contractor shall select the means and methods for performing drilling/sampling operations. The Contractor is solely responsible for determining the adequacy of his equipment to perform the intended work. If the Contractor's equipment is not adequate to perform the work, the Contractor shall replace it with suitable equipment at no additional cost to the NYSDEC.
3. Sampling Procedure-Tank Removed: In general, RENU will direct the Contractor to collect a minimum of five (5) soil samples in accordance with API Publ 1628 from any area around the removed tank that appears to be visually contaminated. Soil samples from the material surrounding piping will be taken at 20-foot intervals and at dispensers and fill boxes. If there are no visible areas of contaminated soil, then the Contractor shall collect 1 sample from each sidewall of the excavation and 2 samples from the bottom of the excavation. All samples collected for contamination will be screened using a PID. The samples showing the highest PID readings shall be sent to the lab for analysis.
4. If groundwater is within 5 feet of the bottom of the tank excavation, a ground water sample shall be collected.
5. Lab Analysis: Samples collected for analysis shall be sent to the RENU' standby laboratory. For tanks containing gasoline or solvents, the sample shall be analyzed for VOC's via USEPA method 8260C. For tanks containing diesel fuel or heating oil, samples will be analyzed via USEPA method 8270B.

### 3.27.7 Notification of Spills

1. Petroleum spills and most hazardous materials spills must be reported to DEC Hotline (1800-457-7362) within 2 hours of discovery.
2. Clean closure of excavated Underground Storage Tanks do not require notification to DEC if 1,100 gallons or less in size regardless of contents.

3. Clean closure of tanks of any size that stored motor fuels (gasoline or diesel) must be reported to the NYC Fire Department. The Contractors shall prepare an affidavit of permanent closure for each facility within 7 days of tank closure. The affidavit shall state the Contractor method of tank closure. The affidavit shall be prepared in a form acceptable to the New York City Fire Department and signed by the Contractors licensed underground storage tank system installer. The affidavit shall be submitted to the New York City Fire Department, Buried Tank Unit, Room 412, and 250 Livingston Street, Brooklyn, New York.

### 3.27.8 Tank Contents Removal and Disposal

1. General: The Contractor shall furnish all labor, materials, tools and equipment, and remove and dispose all industrial waste, as required by the Contract Documents.
2. Submittals: The following items shall be submitted to the Construction Manager for review and approval in accordance with Section 3.27.2.
    a. A detailed work plan describing the Contractor's proposed methods, equipment and sequence of operations for the removal and disposal of industrial waste from the site. The proposed procedures shall provide for safe conduct of the work and careful removal and disposal of materials.
    b. Copies of the analytical test results performed for disposal within five (5) working days after receipt of the results.
    c. Removal of Industrial waste
        i. Salvageable Fuels: All salvageable fuels shall be transferred by the Contractor to other tanks designated by the Construction manager. If storage capacity is not available, then salvageable fuels become property of the Contractor for beneficial use or disposal.
        ii. B. Sludge Materials and Contaminated Water: Sludge and contaminated water shall be collected in new or reconditioned 55-gallon drums or roll-off containers. Drums or containers shall be sealed (water-tight) to prevent rain infiltration and leakage of sludge or water. Chemical sampling and analyses of sludge and contaminated water shall be conducted by the Contractor in accordance with environmental regulatory requirements, as approved by the Construction Manager. Drums or containers shall be labeled in accordance with federal and state regulations.
3. Excavated and Demolished Materials: Excavated and demolished materials shall be collected in new or reconditioned rolloff containers or similar means as proposed by the Contractor and approved by the Construction Manager. Containers shall be sealed (water-tight) to prevent rain infiltration and leakage. Chemical sampling and analysis of the collected materials shall be conducted by the Contractor in accordance with environmental regulatory requirements, as approved by the Construction manager. Containers shall be labeled in accordance with federal and state regulations.

4. Flammable Vapors: Storage tank systems, including all tanks and piping, shall be purged of flammable vapors. If steam is to be used for either purging or cleaning a tank or other equipment, the steam discharge nozzle and all conductive insulated objects subject to impingement or condensation shall be bonded to the tank or be grounded to prevent static charge build-up on the nozzle of the steam jet. An affidavit of such purging, signed by the Contractor's licensed underground system installer, shall be filed by the Contractor with the Commissioner of the City's Fire Department, Division of Fire Prevention.

3.27.9 Disposal of Industrial Waste

1. All waste materials shall be disposed of in accordance with the requirements of the USEPA, NYSDEC, and New York City Department of Environmental Protection (NYCDEP).
2. Storage of Waste materials at the site will not be permitted.

### 3.28 DNAPL Removal/Recovery

Summary: Some monitoring wells have DNAPL. As part of routine site maintenance, DNAPL may be recovered from these wells. Follow all health and safety requirements in the HASP (URS, May 2017). The following procedure will be used to remove DNAPL.

Procedure:

1. Measure the depth and thickness of the DNAPL layer per Section 3.25.
2. Bailer Method:
    a. Using a disposable bailer attached to disposable nylon twine, lower the bailer so the bottom of the bailer is at the same depth as the bottom of the DNAPL layer.
    b. Upon reaching its target depth, raise the bailer with the DNAPL product and place the product in a 1A2 open head 55-gallon steel drum.
    c. Repeat steps a through b until there is no more product to remove.
    d. Upon completion of the removal, place the used bailer and twine in a separate 1A2 open head 55-gallon steel drum.
    e. These drums will be addressed in accordance with the protocols outlined in Section 3.30.
3. Peristaltic Pump Method (to be used if the bottom of the DNAPL layer is less than 25 feet below grade):
    a. Using disposable poly tubing, place one end at the bottom of the DNAPL layer, and the other end in a 1A2 open head 55-gallon steel drum, with a piece of disposable silicone tubing in the middle, attached to the pump head.
    b. Turn on the pump, and keep pumping until there is no more DNAPL product in the pump's effluent.
    c. Upon completion of the removal, place the used tubing in a separate 1A2 open head 55-gallon steel drum.
    d. These drums will be addressed in accordance with the protocols outlined in Section 3.30.

4. Waterra Pump Method:
    a. Attach a foot valve to one end of disposable poly tubing and place that end at the bottom of the DNAPL layer. Connect the remainder of the tubing to the Waterra pump, with the effluent
    b. Turn on the pump, and keep pumping until there is no more DNAPL product in the pump's effluent.
    c. Upon completion of the removal, place the used tubing in a separate 1A2 open head 55-gallon steel drum.
    d. These drums will be addressed in accordance with the protocols outlined in Section 3.30.

### 3.28.1 Surfactant Enhanced DNAPL Recovery

Summary: Surfactant Enhanced Product Recovery (SEPR) technology uses a reagent to mobilize DNAPL, typically a surfactant. The surfactant reduces surface tension between the DNAPL and the groundwater and promotes the formation of micelles that emulsifies the DNAPL, making it more mobile. Follow all health and safety requirements in the approved HASP and subsequent addendums (URS, May 2017). The following procedure will be used to remove DNAPL via SEPR technology.

Procedure:

1. Mix the surfactant solution in accordance with the proportions recommended by the Vendor.
2. Inject the solution into an upgradient well using a transfer pump at approximately 1 to 2 gallons per minute.
3. Groundwater and emulsified DNAPL will be recovered in the downgradient well by pumping out the well contents using peristaltic pump or Waterra hydrolift pump methods discussed above, at the rate of 1 to 2 gallons per minute, into a 1A2 open head 55-gallon steel drum.
4. Nearby wells will be closely monitored for the presence of DNAPL. Based on field observations, these wells may also be pumped or bailed for DNAPL recovery.
5. This process will continue as specified in the approved site-specific project work plan.
6. Upon completion of the removal, place the used tubing in a separate 1A2 open head 55gallon steel drum.
7. These drums will be addressed in accordance with the protocols outlined in Section 3.30.

## 3.29 Sidewalk Flag Replacement

Summary: If a sidewalk flag is damaged during investigation activities (i.e., drilling, etc.), the City of New York requires that it be replaced in accordance with NYSDOT standards.

Procedure:

Prior to removal of a sidewalk flag, the Flag Replacement Contractor will cut the perimeter of each flag to be replaced using a water-cooled pavement saw to reduce fugitive dust. The flags will be demolished, removed and disposed of by the Contractor. New flags will be replaced in kind with the surrounding flags. All work will be performed in accordance with Section 608 of NYSDOT Standard Specifications of May 6, 2010, specifically all sections that pertain to Portland concrete sidewalks and driveways. At locations where expansion joints were installed, the expansion joints will be covered with a non-shrinking/pliable sealant.

Details on each sidewalk flag replacement will be documented in Daily Construction Report forms (Appendix A).

### 3.30 Investigation Derived Waste Handling

Summary: Investigation Derived Waste (IDW) generated during field activities include, but is not limited to, the following:

- Purge water;
- Poly sheeting;
- Spent macrocore liners;
- PPE; and
- Drill cutting and soil boring spoils.

This IDW must be placed in 1A2 open head 55-gallon steel drums pending shipment off site for disposal.

Procedure:

Segregation

Drummed IDW is to be divided into the following categories:

- Drill cuttings and soil boring spoils (see Section 3.18);
- Purgewater from monitoring well development/sampling and DNAPL product; and,
- Solid waste other than drill cuttings and boring spoils (i.e., spent poly tubing, PPE, etc.).

Generator ID

Any IDW generated is assigned a specific USEPA Generator ID Number based on its origin. The table below identifies the USEPA Generator ID for each Work Assignment (WA).

| Site | USEPA Generator ID Number |
|---|---|
| Former Goodman Brothers Steel Drum Co. Site (WA #41) | TBD |

Hazardous/Non-Hazardous Classification

Any liquid waste generated is classified a listed hazardous waste under USEPA waste codes D0039 (DNAPL product – tetrachloroethylene) and/or F002 (spent halogenated solvents). The remaining waste generated from this project is presumed not to be a hazardous waste as defined in 40 CFR Part 261. Therefore, hazardous waste characterization sampling for disposal will only be performed if necessary.

Manifests

Waste manifests must accompany the IDW during shipment off site for disposal. For nonhazardous waste, a non-hazardous waste manifest must be completed. For hazardous waste, a Uniform Hazardous Waste Manifest (USEPA Form 8700-22) must be completed, along with a Land Disposal Restriction Notification Form 1. All IDW manifests must be signed by the generator or their agent.

## 4.0 FIELD DOCUMENTATION

Field notebooks will be used during all on-site work. A dedicated field notebook will be maintained by the field technician overseeing the site activities. In addition to the notebook, any and all original sampling forms, purge forms and notebooks used during field activities will be submitted as part of the final report.

The field sampling team will maintain a sample log sheet summarizing the following data:

1. Sample Identification
2. Date and time of sample collection
3. Sampling depth
4. Identity of samplers
5. Sampling methods and devices
6. Purge volumes (groundwater)
7. Groundwater purge parameters
8. Chain of custody and shipping information

Each subsurface boring will be logged in a bound field notebook during drilling by the supervising geologist. Field notes will include descriptions of subsurface materials encountered during drilling, sample numbers, and types of samples recovered from the borehole. Additionally, the geologist will note time and material expenditures for later verification of contractor invoices.

Upon completion of daily drilling activities, the geologist will complete the daily drilling record form and initiate chain-of-custody on any samples collected for chemical laboratory testing. Following completion of the drilling program, the geologist will transfer field notes onto standard forms for the Site Characterization Report.

On a weekly basis the project geologist will submit a summary report to the project manager containing at a minimum the following: (1) a summary of the daily drilling records; (2) progress report on field activities; and (3) a record of site visitors.

The supervising geologist will log the time and material expenditures for later verification of contractor invoices. Upon completion of daily drilling activities, the geologist will complete the Daily Drilling Record form. Following completion of the program, the geologist will transfer field notes onto standard forms for the investigation report.

The proper completion of the following forms/logs will be considered correct procedure for documentation during the drilling program:

1. Field Log Book - weather-proof hard-bound field book
2. Daily Drilling Records (Appendix A)
3. Boring Logs (Appendix A)
4. Overburden Monitoring Well Construction Detail Diagrams (Appendix A)

## 5.0 SURVEYING AND MAPPING

Project surveying will provide data necessary to plot groundwater monitoring wells, piezometers, and soil-gas monitoring well locations on the existing base map. All surveying will be performed under the supervision of a New York State licensed land surveyor, following the requirements of the Work Plan, and the HASP.

Control for this project shall be based upon site control which has been established for prior work. This control is referenced to the New York State plane coordinate System and North American vertical Datum of 1988 (NAVD 88).

## 6.0 SAMPLING EQUIPMENT CLEANING PROCEDURES

Summary: To assure that no outside contamination will be introduced into the samples/data, thereby invalidating the samples/data, the following cleaning protocols will apply for all equipment used to collect samples/data during the field investigations.

Procedure:

1. Thoroughly clean equipment with laboratory-grade soap and water, until all visible contamination is gone.
2. Rinse with water, until all visible evidence of soap is removed.
3. Rinse several times with deionized water.
4. Air dry before using.
5. If equipment will not be used immediately, wrap in aluminum foil.
6. Geoprobe equipment will be brush cleaned between locations.

## 7.0 SAMPLE LABELING

Summary: In order to prevent misidentification and to aid in the handling of environmental samples collected during the field investigation, the following procedures will be used:

Soil and Groundwater Sample Procedure:

1. Affixed to each sample container will be a non-removable (when wet) label. The following information will be written on each label with permanent marker:

- Site name
- Sample identification
- Project number
- Date/time
- Sampler's initials
- Sample preservation
- Analysis required

2. Each sample of each matrix will be assigned a unique identification alpha-numeric code. An example of this code and a description of its components are presented below:

Examples

- MW-1
  MW-1 = Monitoring Well 1

- SG-1
  SG-1 = Soil Gas Monitoring Well 1

List of Abbreviations
Monitor Type

- PZ = Piezometer
- MW = Monitoring Well

Sample Type

SO = Soil
GW = Groundwater
SG = Soil-gas
AB = Ambient Blank
TB = Trip Blank
RB = Rinse Blank
FD = Field Duplicate
MS = Matrix Spike
MSD = Matrix Spike Duplicate

Vapor Intrusion Samples Procedure:
Each indoor air sample will have the following information placed on the laboratory supplied sample label:

- Site name
- Sample identification – see below
- Date/time
- Sampler's initials

- Analysis required – TO-15

The serial number of the canister and regulator used during sampling will also be noted on the Summa® canister identification tag and on the COC.

## 8.0 SAMPLE SHIPPING

Summary: Proper documentation of sample collection and the methods used to control these documents are referred to as chain-of-custody procedures. Chain-of-custody procedures are essential for presentation of sample analytical chemistry results as evidence in litigation or at administrative hearings held by regulatory agencies. Chain-of-custody procedures also serve to minimize loss or misidentification of samples and to ensure that unauthorized persons do not tamper with collected samples.

The procedures used in this Remedial Design follow the chain-of-custody guidelines outlined in NEIC Policies and Procedures, prepared by the National Enforcement Investigations Center (NEIC) of the U.S. Environmental Protection Agency Office of Enforcement.

Procedure:

1. The chain-of-custody (COC) record (Appendix A) should be completely filled out, with all relevant information.
2. The original COC goes with the samples. It should be placed in a Ziploc bag and taped inside the sample cooler. The sampler should retain a copy of the COC.
3. Place inert cushioning material such as vermiculite or bubble-wrap in the bottom of the cooler.
4. Place the bottles in the cooler in such a way that they do not touch (use cardboard dividers or bubble-wrap).
5. Wrap VOA vials securely in bubble-wrap and tape. Place them in the center of the cooler.
6. With the exception of Summa® canisters, pack the cooler with ice in doubled Ziploc plastic bags.
7. Pack the cooler with cushioning material.
8. Tape the drain shut.
9. Wrap the cooler completely with strapping tape at two locations securing the lid. Do not cover any labels.
10. Place the lab address on top of cooler. For out-of-town laboratory, add the following: Put "This side up" labels on all four sides and "Fragile" labels on at least two sides. Affix numbered custody seals on front right and left of cooler. Cover seals with wide, clear tape.
11. Summa® canisters are shipped in the same boxes the laboratory used for shipping.
12. Ship samples via overnight carrier the same day that they are collected. Samples (except Summa® canisters) must be maintained at 4 degrees Celsius (C) ± 2ºC throughout the shipping duration.

## 9.0 FIELD SAMPLING INSTRUMENTATION

Rented field sampling equipment will require no maintenance beyond decontamination between sampling locations. Calibration procedures for electronic instruments can be found in the equipment operating manuals.

Maintenance procedures for the common instrumentation that will be used during field investigations are discussed in the equipment operating manuals. A copy of the manufacturer's operating manual for each instrument will be kept with the instrument or the operator. All field sampling equipment will be calibrated as recommended by the manufacturer. The calibration procedures and results will be recorded in the field notebook.

### 9.1 Preventative Maintenance

Table 9-1 presents the field instrumentation preventative maintenance summary. In case of an emergency, the equipment rental vendor, and/or the instrument manufacturer will be contacted.

**TABLE 9-1**
**FIELD INSTRUMENTATION PREVENTATIVE MAINTENANCE SUMMARY**

| Instrument | Maintenance Details |
|---|---|
| Photoionization Detector | Initiate factory checkout and calibration, yearly or when malfunctioning or after changing UV light source. Wipe down readout unit after each use. Clean UV light source window every month or as use and site conditions dictate. Clean the ionization chamber monthly. Recharge battery after each use. |
| TVA | Initiate factory checkout and calibration, yearly or when malfunctioning or after changing UV light source. Wipe down readout unit after each use. Check probe cable and Teflon tubing prior to and after each use. Inspect $H_2$ tank prior to filling and recharge battery after each use. |
| Micropurge Flow Cell | Calibrate the required parameters using appropriate factory-supplied standards and buffers on a daily basis. Store the sonde (probe) in a 2M KCl solution at the end of each work day. Factory calibrate annually. |

| | |
|---|---|
| LaMotte Turbidity Meter | Replace 9 volt battery when necessary. Clean lamp after each days use. Clean turbidity tubes after each reading and replace tubes when discoloration of glass occurs. |
| TSI DustTrak | Perform a zero check before each use. Clean inlet every 350 hours. Clean 2.5 µm calibration impactor before every use. Replace internal filters every 350 hours at 1 mg/m$^3$, or when indicated by the main screen filter error indicator. Every year, return to the factory for cleaning and calibration, including the replacement of the internal HEPA filters. |

## 10.0 SAMPLING FOR EMERGING CONTAMINANTS UNDER NYSDEC PART 375

As part of the NYSDECs requirement, sampling of the emerging contaminants including 1,4-Dioxane and per and poly-fluoroalkyl substances (PFAS) will be performed during the RI.

### 10.1 Specific Guidelines for PFAS

Soil endpoint samples collected will be analyzed by LC-MC/MS for PFAS using methodologies based on EPA method 537.1 and include the 21 PFAS compounds listed below:

| Group | Chemical Name | Abbreviation |
|---|---|---|
| Perfluoroalkyl sulfonates | Perfluorobutanesulfonic acid | PFBS |
| | Perfluorohexanesulfonic acid | PFHxS |
| | Perfluoroheptanesulfonic acid | PFHpS |
| | Perfluorooctanesulfonic acid | PFOS |
| | Perfluorodecanesulfonic acid | PFDS |
| Perfluoroalkyl carboxylates | Perfluorobutanoic acid | PFBA |
| | Perfluoropentanoic acid | PFPeA |
| | Perfluorohexanoic acid | PFHxA |
| | Perfluoroheptanoic acid | PFHpA |
| | Perfluorooctanoic acid | PFOA |
| | Perfluorononanoic acid | PFNA |
| | Perfluorodecanoic acid | PFDA |
| | Perfluoroundecanoic acid | PFUA/PFUdA |
| | Perfluorododecanoic acid | PFDoA |
| | Perfluorotridecanoic acid | PFTriA/PFTrDA |
| | Perfluorotetradecanoic acid | PFTA/PFTeDA |
| Fluorinated Telomer Sulfonates | 6:2 Fluorotelomer sulfonate | 6:2 FTS |
| | 8:2 Fluorotelomer sulfonate | 8:2 FTS |
| Perfluorooctanesulfonamides | Perfluroroctanesulfonamide | FOSA |
| Perfluorooctanesulfonamidoacetic acids | N-methyl perfluorooctanesulfonamidoacetic acid | N-MeFOSAA |
| | N-ethyl perfluorooctanesulfonamidoacetic acid | N-EtFOSAA |

### 10.2 PFAS Reporting Limits

Reporting limits for PFAS soil are to be 2 ng/L (ppt) and 1 ug/kg (ppb), respectively. If contract labs or work plans submitted by responsible parties indicate that they are not able to achieve these reporting limits for the entire list of 21 PFAS, site-specific decisions will need to be made by the DEC project manager in consultation with the DEC remedial program chemist.

The laboratory SOP for PFAS and method detection limits are included as Appendix B.

### 10.3 PFAS Specific Sampling Procedures

Sampling for PFAS via EPA Method 537 can be challenging due to the prevalence of these compounds in many consumer and sampling specific products. The following sampling procedures and guidelines are necessary to ensure the usability of PFAS analytical results:

- Clothing or boots should not contain Gore-Tex (wet weather gear made of polyurethane and PVC only);
- All safety boots should be made from polyurethane and PVC;
- No materials containing Tyvek;
- Do not use fabric softener on field clothing;
- Do not use cosmetics, moisturizers, hand cream, or other related products the morning of the sampling event;
- Do not use unauthorized sunscreen or insect repellant;
- All sample containers made of HDPE or polypropylene;
- Caps are unlined and made of HDPE or polypropylene (no Teflon lined caps);
- Equipment decontamination must utilize PFAS-free water onsite for sample equipment;
- Only Alconox and/or Liquinox can be used as decontamination materials;
- Food or drinks must be left in the staging areas;
- Sample for PFAS first, other containers/methods may have PFAS present on containers/equipment;
- Field equipment must not contain Teflon;
- Sampling materials must be made from stainless-steel, HDPE, acetate, silicon, or polypropylene;
- No waterproof field books;
- No plastic clipboards, binders, or spiral notebooks;
- No adhesives
- No sharpies/permanent markers. Must use regular ball point pens;
- No use of aluminum foil;
- Keep PFAS samples in a separate cooler filled with regular ice only (do not use chemical ice packs).
- Sampler must wash hands before wearing nitrile gloves to limit contamination during sampling.

### 10.4 Specific Guidelines for 1,4-Dioxane

Soil endpoint samples collected will be analyzed for 1,4-Dioxane using EPA Method 8270 SIM in order to achieve the minimum method reporting limit of 0.1 mg/Kg. Liquinox will not be used for decontamination during sampling for 1,4-dioxane.

# APPENDIX A

# FORMS AND LOGS

CASTLETON
ENVIRONMENTAL

## Soil Test Pit Field Log Form

**Project Number:**

**Client:**

**Address:**

**Castleton Representative:**

**Date:** **Time On-site:** **Time Off-site:**

**Contractor:**

**Weather Conditions:** **Date:** **Test Pit ID:**

**Method of Excavation:** **Time:** **Surface Cover:**

| Depth (feet) | Texture / Composition | Consistency | Color | Mottles / Contamination Features | Structure / Fill | Comments |
|---|---|---|---|---|---|---|
| | | | | | | |
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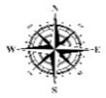
**Notes:**



Locations are approximate

| | | | | | |
|---|---|---|---|---|---|
| Boring # | | MW# | | Page: | of S |
| PROJECT ADDRESS: | | | | | |
| CASTLETON JOB # | | | | | |
| LOGGED BY: | | | | PRJ. MNGR.: | |
| CONTRACTOR: | | | | | |
| DRILL METHOD: | | | | | |
| DRILLER: | | | | | |
| Borehole diameter/drill bit type: | | | | total depth | **ft** |
| | | | | elevation | **NA** |
| **HAMMER WT:** | | **NA** | | DROP: | NA |
| START TIME: | | | | DATE: | |
| COMPLETION TIME: | | | | DATE: | |
| BACKFILL TIME: | | | | DATE: | |

| Sample Depth (ft) | Advance (ft) | Recovered (ft) | Soil Description Unified Soil Classification System | Notes | Casing depth: NA<br>Screen depth: NA |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
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# AIR SAMPLING LOGS

| Sample ID | Date | Canister ID | Flow ID | Start (hg) | End (hg) | Start Time | End Time | PID (ppm) |
|---|---|---|---|---|---|---|---|---|
| IAQ01 | | | | | | | | |
| IAQ02 | | | | | | | | |
| IAQ03 | | | | | | | | |
| IAQ04 | | | | | | | | |
| IAQ05 | | | | | | | | |
| IAQ06 | | | | | | | | |
| IAQ07 | | | | | | | | |
| OAQ01 | | | | | | | | |

Castleton Environmental

Project Number: ______________________________

Site: ______________________________

Date:

Weather: ______________________________

Scope of Work: ______________________________

| **Sample ID** | | | | | | |
|---|---|---|---|---|---|---|
| Can ID | | | | | | |
| Regulator ID | | | | | | |
| Can Size | | | | | | |
| Indoor(IN), Background (BK), Sub-Slab (SS) | | | | | | |
| Flow Controller readout (ml/min) | | | | | | |
| Can Pressure Start ("Hg) - LAB | | | | | | |
| Can Pressure Start ("Hg) - FIELD | | | | | | |
| Can Pressure End ("Hg) | | | | | | |
| Start Time | | | | | | |
| End Time | | | | | | |
| Temperature Start (°F) | | | | | | |
| Temperature End (°F) | | | | | | |
| **Sub-Slab Sampling** | | | | | | |
| Slab Thickness (") | | | | | | |
| Water present | | | | | | |
| PID Readings (PPM) | | | | | | |
| Helium in Sub-Slab Sample (ppm) | | | | | | |
| Sample Tube Purge, Gillian Pump (min)<br>(1/4" tubing Volume - 5.43 ml/ft) | | | | | | |

Sampling Notes: ______________________________

**Project Number:**

**Client:**

**Address:**

**Castleton Representative:**

**Date:** **Time On-site:** **Time Off-site:**

**Contractor:**

**Site Status:**

**Current Condition of Site:**

# APPENDIX C
## EXAMPLE (Minimum Requirements)
## WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name)______________________________
Well Number_________________Date_______________________
Field Personnel________________________________________
Sampling Organization____________________________________
Identify MP____________________________________________

Depth to ________/________ of screen
(below MP) top bottom
Pump Intake at (ft. below MP)_________
Purging Device; (pump type)__________
Total Volume Purged _______________

| Clock Time 24 HR | Water Depth below MP ft | Pump Dial[1] | Purge Rate ml/min | Cum. Volume Purged liters | Temp. °C | Spec. Cond.[2] µS/cm | pH | ORP[3] mv | DO mg/L | Turb-idity NTU | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | |
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| | | | | | | | | | | | |
| Stabilization Criteria | | | | | 3% | 3% | ±0.1 | ± 10 mv | 10% | 10% | |

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

## Soil Vapor Intrusion - Structure Sampling Building Questionnaire

**Structure ID :** ______________

**Site No.** : ______________________ **Site Name** : ____________________________________________

**Date:** ______________________ **Time:** ____________________________________________

**Structure Address** : ______________________________________________________________

**Preparer's Name & Affiliation** : ____________________________________________________________

**Residential ?** ☐ **Yes** ☐ **No** **Owner Occupied ?** ☐ **Yes** ☐ **No** **Owner Interviewed ?** ☐ **Yes** ☐ **No**

**Commercial ?** ☐ **Yes** ☐ **No** **Industrial ?** ☐ **Yes** ☐ **No** **Mixed Uses ?** ☐ **Yes** ☐ **No**

**Identify all non-residential use(s)** : ______________________________________________________

**Owner Name** : ________________________________________ **Owner Phone** : ( ) __________ - __________

**Secondary Owner Phone** : ( ) __________ - __________

**Owner Address** (if different) : ______________________________________________________

**Occupant Name** : ______________________________________ **Occupant Phone** : ( ) __________ - __________

**Secondary Occupant Phone** : ( ) __________ - __________

**Number & Age of All Persons Residing at this Location** : __________________________________________

**Additional Owner/Occupant Information** : ____________________________________________________

**Describe Structure** (style, number floors, size) : __________________________________________________

______________________________________________________________________________

Approximate **Year Built** : ______________________ Is the building **Insulated**? ☐ Yes ☐ No

**Lowest level :** ☐ Slab-on-grade ☐ Basement ☐ Crawlspace

**Describe Lowest Level** (finishing, use, time spent in space) : ________________________________________

______________________________________________________________________________

**Floor Type:** ☐ Concrete Slab ☐ Dirt ☐ Mixed : ____________________________________________

**Floor Condition** : ☐ Good (few or no cracks) ☐ Average (some cracks) ☐ Poor (broken concrete or dirt)

**Sumps/Drains**? ☐ Yes ☐ No Describe : ______________________________________

**Identify other floor penetrations & details** : ______________________________________________

______________________________________________________________________________

**Wall Construction** : ☐ Concrete Block ☐ Poured Concrete ☐ Laid-Up Stone

**Identify any wall penetrations** : ____________________________________________________________

______________________________________________________________________________

**Identify water, moisture, or seepage: location & severity** (sump, cracks, stains, etc) : ______________________________

______________________________________________________________________________

**Heating Fuel** : ☐ Oil ☐ Gas ☐ Wood ☐ Electric ☐ Other : ____________________________

**Heating System** : ☐ Forced Air ☐ Hot Water ☐ Other : ________________________________________

**Hot Water System** : ☐ Combustion ☐ Electric ☐ Boilermate ☐ Other: ____________________________

**Clothes Dryer** : ☐ Electric ☐ Gas Where is dryer **vented** to? ______________________________

**If combustion occurs, describe where air is drawn from** (cold air return, basement, external air, etc.) : __________________

______________________________________________________________________________

**Fans & Vents** (identify where fans/vents pull air from and where they vent/exhaust to) : ________________________________

______________________________________________________________________________

**Describe factors that may affect indoor air quality** (chemical use/storage, unvented heaters, smoking, workshop):

---

Attached garage ? ☐ Yes ☐ No Air fresheners ? ☐ Yes ☐ No

New carpet or furniture ? ☐ Yes ☐ No What/Where ? ______________________________

Recent **painting** or **staining** ? ☐ Yes ☐ No Where ? : ______________________________

Any **solvent** or **chemical-like** odors ? ☐ Yes ☐ No Describe : ______________________________

---

Last time **Dry Cleaned** fabrics brought in ? __________________ What / Where ? ______________________________

Do any building occupants use solvents at work ? ☐ Yes ☐ No Describe : ______________________

Any testing for Radon ? ☐ Yes ☐ No Results : ______________________________

Radon System/Soil Vapor Intrusion Mitigation System present ? ☐ Yes ☐ No If yes, describe below

---

## Lowest Building Level Layout Sketch

- Identify and label the locations of all sub-slab, indoor air, and outdoor air samples on the layout sketch.
- Measure the distance of all sample locations from identifiable features, and include on the layout sketch.
- Identify room use (bedroom, living room, den, kitchen, etc.) on the layout sketch.
- Identify the locations of the following features on the layout sketch, using the appropriate symbols:

| | | | |
|---|---|---|---|
| **B** or **F** | Boiler or Furnace | o | Other floor or wall penetrations (label appropriately) |
| **HW** | Hot Water Heater | **xxxxxxx** | Perimeter Drains (draw inside or outside outer walls as appropriate) |
| **FP** | Fireplaces | **######** | Areas of broken-up concrete |
| **WS** | Wood Stoves | ● SS-1 | Location & label of sub-slab vapor samples |
| **W/D** | Washer / Dryer | ● IA-1 | Location & label of indoor air samples |
| **S** | Sumps | ● OA-1 | Location & label of outdoor air samples |
| **@** | Floor Drains | ● PFET-1 | Location and label of any pressure field test holes. |

# Structure Sampling - Product Inventory

Page _____ of _____

**Homeowner Name & Address:** ________________________ **Date:** ________

**Samplers & Company:** ________________________ **Structure ID:** ________

**Site Number & Name:** ________________________ **Phone Number:** ________

**Make & Model of PID:** ________________________ **Date of PID Calibration:** ________

**Identify any Changes from Original Building Questionnaire :** ________________________

| Product Name/Description | Quantity | Chemical Ingredients | PID Reading | Location |
|---|---|---|---|---|
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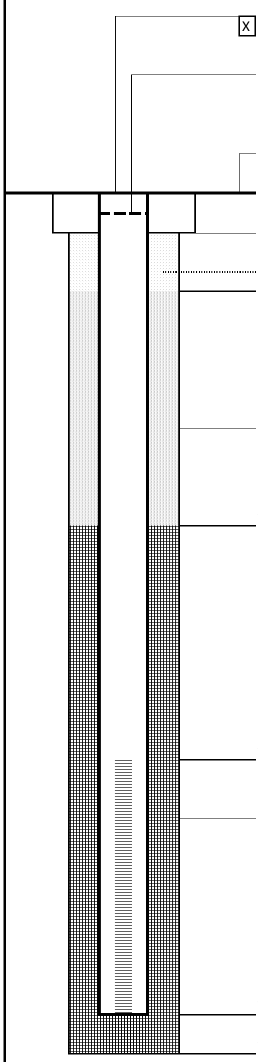
# SOIL VAPOR SAMPLING LOGS

| Sample ID | Date | Canister ID | Flow ID | Start (hg) | End (hg) | Start Time | End Time | Tracer Test results | PID (ppm) |
|---|---|---|---|---|---|---|---|---|---|
| SSV01 | | | | | | | | | |
| SSV02 | | | | | | | | | |
| SSV03 | | | | | | | | | |
| SSV04 | | | | | | | | | |
| SSV05 | | | | | | | | | |
| SSV06 | | | | | | | | | |
| SSV07 | | | | | | | | | |

# Monitoring Well

# Construction Log



Protective Casing
☒ Flush Mount ☐ Pop-up

Measuring Points

Land Surface

Concrete Pad

Bentonite/Cement Grout
ft.

Sand Seal
Grain Size #00 Sand

ft.

Material PVC

Slot Size. 0.01

Inch Diam. 2

ft. Top of Screen

Gravel Pack
Grain Size #02 Sand

ft. Bottom of Screen

ft.

Note: Drawing is not to scale.
Depths are given in feet below land surface.

Well No.

Project

Surveyor

Measuring Point Elevation

Installation Date

Pumping Duration

Well Purpose

Hydrogeologist

Company Name

Notes

**YORK**
ANALYTICAL LABORATORIES INC

York Analytical Laboratories, Inc.
120 Research Drive
Stratford, CT 06615
132-02 89th Ave Queens,
NY 11418
clientservices@yorklab.com
www.yorklab.com

# Field Chain-of-Custody Record - AIR

**NOTE:** YORK's Standard Terms & Conditions are listed on the back side of this document. This document serves as your written authorization for YORK to proceed with the analyses requested below. Your signature binds you to YORK's Standard Terms & Conditions.

**YORK Project No.**

*Page* _____ *of* _____

| **YOUR Information** | **Report To:** | **Invoice To:** |
|---|---|---|
| Company: | Company: | Company: |
| Address: | Address: | Address: |
| Phone.: | Phone.: | Phone.: |
| Contact: | Contact: | Contact: |
| E-mail: | E-mail: | E-mail: |

**YOUR Project Number**

**YOUR Project Name**

**YOUR PO#:**

**Turn-Around Time**

| | |
|---|---|
| RUSH - Next Day | ☐ |
| RUSH - Two Day | ☐ |
| RUSH - Three Day | ☐ |
| RUSH - Four Day | ☐ |
| **Standard (5-7 Day)** | ☐ |

***Please print clearly and legibly. All information must be complete. Samples will not be logged in and the turn-around-time clock will not begin until any questions by YORK are resolved.***

Samples Collected by: (print your name above and sign below)

**Air Matrix Codes**

- AI - Indoor Ambient Air
- AO - Outdoor Amb. Air
- AE - Vapor Extraction Well/ Process Gas/Effluent
- AS - Soil Vapor/Sub-Slab

**Samples From**

| | |
|---|---|
| New York | ☐ |
| New Jersey | ☐ |
| Connecticut | ☐ |
| Pennsylvania | ☐ |
| Other | ☐ |

**Report / EDD Type** (circle selections)

| | | |
|---|---|---|
| Summary Report | CT RCP | Standard Excel EDD |
| QA Report | CT RCP DQA/DUE | EQuIS (Standard) |
| NY ASP A Package | NJDEP Reduced Deliv. | NYSDEC EQuIS |
| NY ASP B Package | NJDKQP | NJDEP SRP HazSite |
| Other: | | |

**YORK Reg. Comp.**

Compared to the following Regulation(s): (please fill in)

**Certified Canisters:** Batch ___ Individual ___

**Please enter the following REQUIRED Field Data**

**Reporting Units:** ug/m$^3$ ___ ppbv ___ ppmv ___

| **Sample Identification** | **Date/Time Sampled** | **Air Matrix** | **Canister Vacuum** Before Sampling (in Hg) | **Canister Vacuum** After Sampling (in Hg) | **Canister ID** | **Flow Cont. ID** | **Analysis Requested** |
|---|---|---|---|---|---|---|---|
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**Comments:**

**Detection Limits Required**

≤ 1 ug/m$^3$ _____ NYSDEC V1 Limits _____
Routine Survey _____ Other __________

**Sampling Media**

| | |
|---|---|
| 6 Liter Canister | ☐ |
| Tedlar Bag | ☐ |

| | | | | | |
|---|---|---|---|---|---|
| Samples Relinquished by / Company | Date/Time | Samples Received by / Company | Date/Time | Samples Relinquished by / Company | Date/Time |
| Samples Received by / Company | Date/Time | Samples Relinquished by / Company | Date/Time | Samples Received by / Company | Date/Time |
| Samples Relinquished by / Company | Date/Time | Samples Received by / Company | Date/Time | Samples Received in LAB by | Date/Time |

YORK
ANALYTICAL LABORATORIES INC

York Analytical Laboratories, Inc.
120 Research Drive
Stratford, CT 06615
132-02 89th Ave
Queens, NY 11418
clientservices@yorklab.com
www.yorklab.com

# *Field Chain-of-Custody Record*

**NOTE:** YORK's Standard Terms & Conditions are listed on the back side of this document.
This document serves as your written authorization for YORK to proceed with the analyses requested below.
Your signature binds you to YORK's Standard Terms & Conditions.

**YORK Project No.**

*Page* _____ *of* _____

| **YOUR Information** | **Report To:** | **Invoice To:** |
|---|---|---|
| Company: | Company: | Company: |
| Address: | Address: | Address: |
| Phone.: | Phone.: | Phone.: |
| Contact: | Contact: | Contact: |
| E-mail: | E-mail: | E-mail: |

**YOUR Project Number**

**YOUR Project Name**

**YOUR PO#:**

**Turn-Around Time**
- RUSH - Next Day ☐
- RUSH - Two Day ☐
- RUSH - Three Day ☐
- RUSH - Four Day ☐
- **Standard (5-7 Day)** ☐

***Please print clearly and legibly. All information must be complete. Samples will not be logged in and the turn-around-time clock will not begin until any questions by YORK are resolved.***

Samples Collected by: (print your name above and sign below)

**Matrix Codes**
- S - soil / solid
- GW - groundwater
- DW - drinking water
- WW - wastewater
- O - Oil ⋮ Other

**Samples From**
- New York ☐
- New Jersey ☐
- Connecticut ☐
- Pennsylvania ☐
- Other ☐

**Report / EDD Type** (circle selections)

| | | |
|---|---|---|
| Summary Report | CT RCP | Standard Excel EDD |
| QA Report | CT RCP DQA/DUE | EQuIS (Standard) |
| NY ASP A Package | NJDEP Reduced Deliverables | NYSDEC EQuIS |
| NY ASP B Package | NJDKQP | NJDEP SRP HazSite |
| | | Other: |

**YORK Reg. Comp.**
Compared to the following Regulation(s): (please fill in)

| **Sample Identification** | **Sample Matrix** | **Date/Time Sampled** | **Analysis Requested** | **Container Description** |
|---|---|---|---|---|
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**Comments:**

**Preservation:** (check all that apply)
HCl ___ MeOH ___ $HNO_3$ ___ $H_2SO_4$ ___ NaOH ___ ZnAc ___
Ascorbic Acid ___ Other: ____________

**Special Instruction**
Field Filtered _____
Lab to Filter _____

| | | | | | |
|---|---|---|---|---|---|
| Samples Relinquished by / Company | Date/Time | Samples Received by / Company | Date/Time | Samples Relinquished by / Company | Date/Time |
| Samples Received by / Company | Date/Time | Samples Relinquished by / Company | Date/Time | Samples Received by / Company | Date/Time |
| Samples Relinquished by / Company | Date/Time | Samples Received by / Company | Date/Time | Samples Received in LAB by Date/Time | **Temp. Received at Lab**<br>Degrees C |

# APPENDIX B

# LAB SOP FOR PFAS/1,4 DIOXANE

# Standard Operating Procedure - Summary
# PFAS in Groundwater, Surface water and Soils

## 1.0 Summary

Target PFAS compounds are prepared and analyzed using EPA Method 537.1 modified. Aqueous and Soil samples are fortified with isotopic surrogates of the target PFAS compounds, extracted and concentrated to a known volume. The extracts are then analyzed employing LC-MSMS techniques.

Each preparation batch (per matrix) includes a preparation blank, lab control sample (blank spike), sample matrix spike and matrix spike duplicate and up to 20 samples.

## 2.0 Sample Preparation

Sample preparation involves extraction/clean-up and final concentration to a known volume before analysis. Isotopic surrogates are added to all preparation batch samples/QC.

### 2.1 Aqueous Samples

A known volume of sample is spiked with isotopic surrogates and extracted using Solid Phase Extraction (SPE) techniques. The SPE tubes are eluted with solvent and the eluant is then concentrated using nitrogen evaporation to a final volume of 1.0 mL. The final concentrated extract is fortified with Internal Standard and analyzed by LC-MSMS.

### 2.2 Soil Samples

A known weight of sample is fortified with isotopic surrogates, mixed then extracted in methanolic potassium hydroxide employing vortex mixing, followed by orbital shaking and finally ultrasonic extraction.

The extract is centrifuged and the supernatant solvent is quantitatively poured off and a small volume of PFAS free water is added to the solvent. The solvent mixture is evaporated using nitrogen evaporation and the remaining aqueous extract is brought to a known volume with PFAS free water.

The aqueous extract is then pH adjusted to 6-8 using glacial acetic acid and the resulting aqueous solution is extracted using SPE techniques. The SPE tube is eluted with solvent and the eluant is then concentrated using nitrogen evaporation to a final volume of 2.0 mL. The final concentrated extract is fortified with Internal Standard and analyzed by LC-MSMS.

## 3.0 Analysis

Analysis is conducted utilizing an Agilent Infinity 1290 HPLC system interfaced to an Agilent 6470AAR LC-MSMS with an Agilent Jet Stream-ElectroSpray Ionization (AJS-ESI)interface. The system is operated in the dynamic MRM (multiple reaction monitoring) mode for specific PFAS target isotopes and native analogs.

Where possible, multiple MRM transitions are used for targets and isotopes. Some species only exhibit single MRM transitions. Precursors and product ions are used for Quantitative and Qualitative purposes respectively.

### 3.1 Initial Calibration

The LC-MSMS is calibrated with 7 standards of a total of 40 isotopes and analog target PFAS compounds. Calibration is conducted from 0.25 to 20 ng/mL. Calibration employs internal standard techniques and either average response factor or quadratic regression is used depending upon the best calibration model based upon accuracy across the calibration range.

### 3.2 Continuing Calibration Verification

Each analytical sequence includes an opening continuing calibration verification (CCV) and a CCV after every 10 injections and at the end of the analysis sequence.

The CCV acceptance criteria are ± 30% of the expected value. Internal Standard areas are acceptable when -50% to +50% of the average response in the initial calibration.

### 3.3 Isotopic Surrogates (Isotope Dilution Analytes (IDA)

18 IDAs are utilized for this procedure. These isotopes are used to correct for recovery of detected target analog PFAS compounds through the preparation/analysis processes. The recovery limits currently are 25-150 % recovery and these limits are adjusted based upon laboratory determined control limits when sufficent data points per matrix are available.

### 3.4 Method Blanks (MBLK)

Each preparation batch includes a laboratory method blank. Any result greater than the Reporting Limit or 2 ng/L (aqueous) or 0.5 ug/kG (soil) is "B" flagged according with the exception of any detection of PFOA, PFOS or PFNA above the RL will require re-extraction of the batch.

### 3.5 Blank Spike (LCS)

Each preparation batch includes and BS/LCS. Recoveries are calculated and based upon isotope dilution. Recovery acceptance limits are 50-150% with RPD of 30% for a BSD if performed.

### 3.6 Matrix Spike/Matrix Spike Duplicates (MS/MSD)

Each preparation batch includes and MS/MSD pair. Recoveries are calculated and based upon isotope dilution. Recovery acceptance limits are 25-150% with RPD of 35% for samples.

## 4.0 Data Review and Reporting

All quantitation reports and LIMS output files are generated using the Agilent Mass Hunter reporting programs. The Quant reports include all Quantitative data and MRM transition data which are reviewed. The LIMS output file is in a format that allows upload to Element LIMS.

Isotope Dilution calculations are performed using our custom PFAS.mdb program which automatically uploads to the LIMS output file for upload to Element LIMS.

Once uploaded to ELEMENT, any exceptions/outliers are noted, flagged and set to reviewed.

All data reported are isotopically corrected for all QC and samples.

## 5.0 Revision History

| | | |
|---|---|---|
| May 1, 2019 | Revision 1.0 | First Issue |

## 6.0 Approvals:

| | |
|---|---|
| Laboratory Director | Ben Gulizia |
| Corp. Technical Director | Robert Bradley |
| Corp. QA Officer | Sarah Widomski<br>Sarah Widomski |

# Appendix B

# Brian Barth

1/14/2019

## Senior Project Manager

Mr. Barth's ten-years of experience performing a wide variety of environmental projects allows him to effectively support our client's diverse needs and goals. His areas of expertise include conducting environmental site assessments for due diligence, remedial investigations and site characterization, executing federal, state, and local remedial actions, construction support and oversight, treatment system installation and operation, feasibility studies, and environmental mapping and modeling. Mr. Barth has extensive experience implementing geographic information systems, remote sensing, database development, and analysis techniques to better understand complex problems and help derive practical project solutions.

Contact Mr. Barth at bbarth@castletonenv.com

### PROFESSIONAL EXPERIENCE

| | |
|---|---|
| Castleton Environmental, DPC.<br>Babylon, NY | Jan 2018 – Present – Sr. Project Manager |
| P.W. Grosser Consulting, Inc.<br>Bohemia, NY | Sep 2008 – Jan 2018 – Project Manager |
| New York Institute of Technology<br>Manhattan, NY | Jan 2012 – Dec 2016 – Adjunct Professor |

### EDUCATION

**New York Institute of Technology**

Master of Science – Environmental Technology, May 2012

**State University at Albany**

Bachelor of Science – Environmental Science, May 2008

## CERTIFICATIONS

Environmental Professional per 40 CFR 312.10(b)
Geographic Information Systems and Spatial Analysis
OSHA HAZWOPER 40-Hr; OSHA HAZWOPER 8-Hr
OSHA Construction Site Safety 10-Hr
NYCOER Turbo Training
NYSDEC Endorsed Erosion and Sediment Control

## AREAS OF EXERTISE

Environmental Program Management
Site Assessment, Characterization, and Cleanup
Data Management, Analysis, and Interpretation
Environmental & Regulatory Compliance
Multi-Media Sampling

## AFFILIATIONS

Long Island Association of Professional Geologists, Member
New York State GIS Association / GISMO
Long Island GIS Association

## NOTABLE ASSIGNMENTS

### Site Assessments and Investigation

Mr. Barth has performed numerous environmental site investigations supporting real estate transactions and due diligence for a variety of clients. Support included performing Phase I and Phase II Environmental Site Assessments, developing work plans, cost estimates and project schedules, sample collection, documentation, data interpretation and dissemination, and reporting. Based upon the results, Mr. Barth can navigate the project through the myriad of post Phase II actions that may be necessary to ultimately meet the client's goals and objectives.

### Remedial Program Management and Site Development

Mr. Barth has been responsible for and supported the investigation and management of several remedial actions in support of site re-development. Often, these activities are performed under regulatory oversight or as volunteers to ensure compliance with applicable regulations and guidance. Besides navigating the complexity of federal, state, and local programs, voluntary efforts relay heavily on his construction and site re-development experience to develop appropriate site characterization and soil management plans. Mr. Barth has investigated and remediated sites that require soil excavation and disposal, long-term groundwater remediation, soil vapor extraction, and in-situ chemical treatments.

### Environmental Studies and Analysis

Mr. Barth has unique experience implementing geographic information systems, database and system development, remote sensing, GPS, and surface and subsurface modeling techniques to a broad range of projects. Using a variety of vector and raster-based toolsets to map, analyze, and visualize complex spatial patters, Mr. Barth has applied these skills to numerous complex projects including largescale superfund and brownfield remediation, groundwater contour and contaminant mapping, fate and transport, nitrogen load to groundwater, sewer feasibility studies, invasive species removal and management, bathymetric surveys, energy siting, and construction and mining support. These skills help our clients better understand the phenomena impacting a site and helps make informed decisions on how to advance a project towards its ultimate goals.

# Frank P Castellano

1/1/2019

## Principal and Founder

After 23 years leading one of the region's most accomplished and diverse environmental consulting firms, Mr. Castellano has founded Castleton Environmental, Inc. to focus on providing high value environmental consulting services specifically geared to the commercial lending and real estate investment/management industries. Leveraging his many years of experience, Mr. Castellano has earned a reputation for developing strategic approaches to the environmental challenges of complex real estate transactions and portfolio management. These approaches enable the transactions to proceed to closing while managing the risks of the involved stakeholders.

Contact Mr. Castellano at frankc@castletonenv.com

## PROFESSIONAL EXPERIENCE

| | |
|---|---|
| Castleton Environmental, Inc.<br>Babylon, NY | Founded 2015 |
| PW Grosser Consulting, Inc.,<br>Bohemia, NY | 1992 – 2015 - Last position held – Sr. Vice President/COO |
| H2M Group<br>Melville, NY | 1989-1992 - Last position held – Field Hydrogeologist |

## EDUCATION

**Adelphi University**

Master of Science – Hydrogeology, 1993

**State University of New York at Oneonta**

Bachelor of Science – Water Resources, 1989

## CERTIFICATIONS/QUALIFICATIONS

NYS Professional Geologist, (License No. 000705)
Environmental Professional per 40 CFR 312.10(b)
Licensed Professional Geologist, PA
Licensed Real Estate Sales Professional, NY
OSHA Health & Safety HAZWOPER

## AREAS OF EXERTISE

Real Property Transactions
Environmental Program Management
Real Estate Portfolio Management
Hazardous Waste Investigation and Cleanup
Environmental Risk Management

## AFFILIATIONS

Long Island Association of Professional Geologists, Member
Long Island Business Development Council, Board Member
Long Island Real Estate Group, Member

## NOTABLE ASSIGNMENTS

### GTJ REIT Portfolio Management

Mr. Castellano serves as the primary environmental consulting resource to a large Real Estate Investment Trust with holdings in suburban New York, New Jersey, Connecticut and Maryland. Working directly alongside the REIT management team, Mr. Castellano provides environmental due diligence guidance beginning at the contract negotiation phase through closing on new acquisitions. Providing Phase I and II Environmental Site Assessment support, Property Condition Assessments and evaluation of potential liabilities, Mr. Castellano works as part of the team to minimize risk while continuing to help the team add assets to their portfolio. Routine management of the portfolio requires Mr. Castellano's support during tenant lease negotiations, compliance activities and debt re-positioning.

### Paramount Assets Portfolio Management

Mr. Castellano serves as a trusted environmental resource to the management team of this real estate company, comprised largely of urban commercial and retail buildings throughout New Jersey. Navigating New Jersey's complex environmental regulatory framework, Mr. Castellano assists this client with pre-acquisition due diligence as well as compliance with the Industrial Site Recovery Act (ISRA).

## Phase II Environmental Assessments

For over 20 years, Mr. Castellano has been performing Phase II Environmental Site Assessments for a variety of private real estate clients and lending institutions. For these projects, Mr. Castellano utilizes his knowledge of various field sampling and testing techniques to meet the desired objective of characterizing potential environmental risks. Based on the Phase II findings, Mr. Castellano develops strategies to remedy identified problems and/or manage risks. The ultimate goal for every Phase II is to develop the appropriate strategy to advance the transaction while protecting the interests of those involved. Based on the quality of his work, Mr. Castellano has established many long-standing client relationships due to his ability to deliver clarity to real estate transactions mired in environmental turbidity.

## PUBLICATIONS

Case Studies Using USCG Oil Identification System for Petroleum Spill Source Identification (Petroleum Hydrocarbons & Organic Chemicals in Ground Water, Conference, TX, 1993

Intrusive Investigative Techniques for the Identification of DNAPL (Geology of LI/NY; LIAPG 1996)

Surface Water, Sediment & Fishery Survey, Nassau County Ponds (Geology of LI/NY 1997)

Not Just a Chemical Interaction: Complementary Roles of the Geologist & Engineer on Hazardous Waste Remediation Project (Geology of LI/NY 1997)

MTBE in Ground Water Cleanup Technology and Costs (NYIT – Emerging Problems for the New Century 2002)

DOE Brookhaven National Laboratory Transuranic & Legacy Waste Disposal (Waste Management 05 Conference, Tucson, AZ)

Is Your Real Estate Giving You the Vapors? A Look at Soil Vapor Intrusion Regulations and their Impact on Real Estate Transactions (Society of Chief Appraisers NY Conference, Oct 2018)

ADR Validation Software Training Consulting Clients Contact

# Key LDC Staff

**Richard M. Amano**
**Position: Principal Chemist**

**Experience:** Mr. Amano has over 30 years of combined environmental laboratory, QA/QC, laboratory auditing, and data validation experience. Prior to founding LDC in 1991, he directed two major laboratories; Analytical Technologies, Inc. (San Diego) and Brown and Caldwell. His experience includes oversight and direction of major QA/QC and data validation efforts for Superfund sites, DOE sites, Navy RI/FS projects, Army Corps of Engineers investigations, and AFCEE projects. He also has overseen several laboratory audits for major analytical testing programs.

Specifically, Mr. Amano has over 15 years experience with the validation of organic, inorganic, and radiochemical analyses using USEPA CLP (including Region III) functional guidelines and other applicable guidance documents.

**Scott Denzer**
**Position: Technical Director/Principal Chemist**

**Experience:** Mr. Denzer has over 27 years combined experience in environmental sampling, analyses, data validation, quality assurance, laboratory auditing, software design, implementation and training. Mr. Denzer’s experience includes sampling, analysis and data validation in support of Federal and State programs, including the Clean Water Act, the Clean Air Act, CERCLA, RCRA, and NIOSH.

Mr. Denzer has performed data verification, review and data validation for numerous Department of Defense projects, commercial projects, and is familiar with program-specific requirements as well as the Uniform Federal Policy for Quality Assurance Project Plans, the EPA Data Quality Objective Process, requirements of the Safe Drinking Water Act, the National Laboratory Accreditation Program, and quality control requirements of various analytical methods.

Prior to his experience at LDC and the Guam Environmental Protection Agency, Mr. Denzer held laboratory positions including GC Pesticides supervisor, GC chemist, and section leader. As Technical Director and Principal Chemist with Laboratory Data Consultants, Inc., Mr. Denzer currently oversees special data validation and software development projects and provides technical support to contractors by performing laboratory audits and technical review of Quality Assurance documents under various programs.

**Erlinda Rauto**
**Position: Senior Chemist/QA Officer, 1993 to present**

**Experience:** Ms. Rauto has over 20 years combined environmental laboratory, QA/QC, and data validation experience. Her experience includes performance of data validation in the GC, trace metals, and wet chemistry areas for major Federal projects. Her laboratory experience includes hands-on CLP and EPA ICP/GFAA analysis, pesticide/PCBs and wet chemistry analysis. Specifically, Ms. Rauto has over 11 years organic data validation and assessment experience using USEPA (including Region III) functional guidelines and other applicable documents.

As a senior chemist with Laboratory Data Consultants, Inc., Ms. Rauto specializes in the data validation and compliance screening of gas chromatography organic analyses. This validation includes EPA CLP, SW-846, and EPA Water and Wastewater methods. Over the past eight years, Ms. Rauto has performed USEPA Level 3 and Level 4 (including NFESC Level C and D) validation for projects including Southwest Division CLEAN 1 (Jacobs Engineering/IT Corporation/CH2M Hill), Southwest Division CLEAN 2 (Bechtel National), Pacific Northwest Division CLEAN (URS Greiner), Southern Division CLEAN (ABB Environmental), Atlantic Division CLEAN (EA Engineering), Southwest Division RAC (OHM Remediation), Pacific Division CLEAN (Earth Tech), DOE Atomic City (Jacobs Engineering Group), Army Corps of Engineers, Travis AFB (CH2M Hill), Army Corps of Engineers, Camp Navajo (Tetra Tech), AFCEE Mather AFB (Montgomery Watson), AFCEE Pease AFB (Bechtel Environmental), AFCEE England AFB (Law Environmental), Army

Corps of Engineers, Hawthorne Army Depot (Tetra Tech), Army Corps of Engineers, Fort Ord (Harding Lawson), Nevada Test Site (IT Corp), and AFCEE Beale AFB (Law/Crandall, Inc.).

### Stella V. Cuenco
### Position: Senior Chemist, 1996 to present

**Experience:** Ms. Cuenco has over 14 years combined environmental laboratory and data validation experience. Her experience includes performance of data validation in the GC and GC/MS areas for major Federal projects. Her laboratory experience includes hands-on CLP and EPA analysis of GC and GC/MS volatile organic compounds. Specifically, Ms. Cuenco has over 10 years organic data validation experience using USEPA (including Region III) functional guidelines and other applicable documents.

As senior chemist with Laboratory Data Consultants, Inc., Ms. Cuenco specializes in the data validation and contract compliance screening of gas chromatography-mass spectrometry analyses. She has a thorough knowledge and understanding of gas chromatography-mass spectrometry methods referenced in EPA CLP, SW-846, EPA 500 and 600 series documents. She has performed data validation under EPA Region IX ESAT.

### Pei Geng
### Position: Senior Chemist, 1996 to Present

**Experience:** Ms. Geng has over 15 years combined environmental laboratory and data validation experience. Her experience includes performance of data validation in the GC and GC/MS areas for major Federal projects. Her laboratory experience includes hands-on CLP and EPA analysis of GC and GC/MS volatile organic compounds. Specifically, Ms. Geng has over 8 years organic data validation experience using USEPA CLP (including Region III) functional guidelines and other applicable documents.

As a senior chemist with Laboratory Data Consultants, Inc., Ms. Geng specializes in the data validation and contract compliance screening of gas chromatography-mass spectrometry analyses as well as gas chromatography analyses. She has a thorough knowledge and understanding of gas chromatography and gas chromatography-mass spectrometry methods referenced in EPA CLP, SW-846, EPA 500 and 600 series documents. She has performed data validation under EPA Region IX ESAT.

# Appendix C

**NEW YORK STATE DEPARTMENT OF HEALTH**
**WADSWORTH CENTER**

Expires 12:01 AM April 01, 2022
Issued April 01, 2021
Revised April 13, 2021

# CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

*Issued in accordance with and pursuant to section 502 Public Health Law of New York State*

*MR. JON WALSH*
*YORK ANALYTICAL LABORATORIES, INC. (II)*
*132-02 89TH AVENUE SUITE 217*
*RICHMOND HILL, NY 11418*

*NY Lab Id No: 12058*

*is hereby APPROVED as an Environmental Laboratory in conformance with the National Environmental Laboratory Accreditation Conference Standards (2016) for the category*
*ENVIRONMENTAL ANALYSES POTABLE WATER*
*All approved analytes are listed below:*

**Perfluorinated Alkyl Acids**

| | |
|---|---|
| Perfluorooctanesulfonic acid (PFOS) | EPA 537 |
| | EPA 537.1 |
| Perfluorooctanoic acid (PFOA) | EPA 537 |
| | EPA 537.1 |

NEW YORK STATE OF OPPORTUNITY. Department of Health

Serial No.: 63520

Property of the New York State Department of Health. Certificates are valid only at the address shown, must be conspicuously posted, and are printed on secure paper. Continued accreditation depends on successful ongoing participation in the Program. Consumers are urged to call (518) 485-5570 to verify the laboratory's accreditation status.

NELAP RECOGNIZED TNI ACCREDITATION BODY

# Appendix D

# Analytical Method Information

Printed: 05/20/2021 12:12 pm

**Semi-Volatiles, 1,4-Dioxane 8270 SIM-Soil in Soil (EPA 8270D SIM)**

**Preservation:** Cool 4°C

**Container:** 06_4 oz. WM Clear Glass Cool to 4° C **Amount Required:** 250 mL **Hold Time:** 14 days

| Analyte | MDL | Reporting Limit | Surrogate %Rec | Duplicate RPD | ----Matrix Spike---- %Rec | RPD | --Blank Spike / LCS-- %Rec | RPD |
|---|---|---|---|---|---|---|---|---|
| 1,4-Dioxane | 3.70 | 10.0 ug/kg | | 30 | 40-130 | 30 | 40-130 | 30 |
| Surr: 1,4-Dioxane-d8 | 4.60 | | 39-127.5 | | | | | |
| 1,2-Dichlorobenzene-d4 | | | | | | | | |

# Standard Operating Procedure - Summary
# PFAS in Groundwater, Surface water and Soils

## 1.0 Summary

Target PFAS compounds are prepared and analyzed using EPA Method 537.1 modified. Aqueous and Soil samples are fortified with isotopic surrogates of the target PFAS compounds, extracted and concentrated to a known volume. The extracts are then analyzed employing LC-MSMS techniques.

Each preparation batch (per matrix) includes a preparation blank, lab control sample (blank spike), sample matrix spike and matrix spike duplicate and up to 20 samples.

## 2.0 Sample Preparation

Sample preparation involves extraction/clean-up and final concentration to a known volume before analysis. Isotopic surrogates are added to all preparation batch samples/QC.

### 2.1 Aqueous Samples

A known volume of sample is spiked with isotopic surrogates and extracted using Solid Phase Extraction (SPE) techniques. The SPE tubes are eluted with solvent and the eluant is then concentrated using nitrogen evaporation to a final volume of 1.0 mL. The final concentrated extract is fortified with Internal Standard and analyzed by LC-MSMS.

### 2.2 Soil Samples

A known weight of sample is fortified with isotopic surrogates, mixed then extracted in methanolic potassium hydroxide employing vortex mixing, followed by orbital shaking and finally ultrasonic extraction.

The extract is centrifuged and the supernatant solvent is quantitatively poured off and a small volume of PFAS free water is added to the solvent. The solvent mixture is evaporated using nitrogen evaporation and the remaining aqueous extract is brought to a known volume with PFAS free water.

The aqueous extract is then pH adjusted to 6-8 using glacial acetic acid and the resulting aqueous solution is extracted using SPE techniques. The SPE tube is eluted with solvent and the eluant is then concentrated using nitrogen evaporation to a final volume of 2.0 mL. The final concentrated extract is fortified with Internal Standard and analyzed by LC-MSMS.

## 3.0 Analysis

Analysis is conducted utilizing an Agilent Infinity 1290 HPLC system interfaced to an Agilent 6470AAR LC-MSMS with an Agilent Jet Stream-ElectroSpray Ionization (AJS-ESI)interface. The system is operated in the dynamic MRM (multiple reaction monitoring) mode for specific PFAS target isotopes and native analogs.

Where possible, multiple MRM transitions are used for targets and isotopes. Some species only exhibit single MRM transitions. Precursors and product ions are used for Quantitative and Qualitative purposes respectively.

### 3.1 Initial Calibration

The LC-MSMS is calibrated with 7 standards of a total of 40 isotopes and analog target PFAS compounds. Calibration is conducted from 0.25 to 20 ng/mL. Calibration employs internal standard techniques and either average response factor or quadratic regression is used depending upon the best calibration model based upon accuracy across the calibration range.

### 3.2 Continuing Calibration Verification

Each analytical sequence includes an opening continuing calibration verification (CCV) and a CCV after every 10 injections and at the end of the analysis sequence.

The CCV acceptance criteria are ± 30% of the expected value. Internal Standard areas are acceptable when -50% to +50% of the average response in the initial calibration.

### 3.3 Isotopic Surrogates (Isotope Dilution Analytes (IDA)

18 IDAs are utilized for this procedure. These isotopes are used to correct for recovery of detected target analog PFAS compounds through the preparation/analysis processes. The recovery limits currently are 25-150 % recovery and these limits are adjusted based upon laboratory determined control limits when sufficent data points per matrix are available.

### 3.4 Method Blanks (MBLK)

Each preparation batch includes a laboratory method blank. Any result greater than the Reporting Limit or 2 ng/L (aqueous) or 0.5 ug/kG (soil) is "B" flagged according with the exception of any detection of PFOA, PFOS or PFNA above the RL will require re-extraction of the batch.

### 3.5 Blank Spike (LCS)

Each preparation batch includes and BS/LCS. Recoveries are calculated and based upon isotope dilution. Recovery acceptance limits are 50-150% with RPD of 30% for a BSD if performed.

### 3.6 Matrix Spike/Matrix Spike Duplicates (MS/MSD)

Each preparation batch includes and MS/MSD pair. Recoveries are calculated and based upon isotope dilution. Recovery acceptance limits are 25-150% with RPD of 35% for samples.

## 4.0 Data Review and Reporting

All quantitation reports and LIMS output files are generated using the Agilent Mass Hunter reporting programs. The Quant reports include all Quantitative data and MRM transition data which are reviewed. The LIMS output file is in a format that allows upload to Element LIMS.

Isotope Dilution calculations are performed using our custom PFAS.mdb program which automatically uploads to the LIMS output file for upload to Element LIMS.

Once uploaded to ELEMENT, any exceptions/outliers are noted, flagged and set to reviewed.

All data reported are isotopically corrected for all QC and samples.

## 5.0 Revision History

| | | |
|---|---|---|
| May 1, 2019 | Revision 1.0 | First Issue |

## 6.0 Approvals:

| | |
|---|---|
| Laboratory Director | Ben Gulizia |
| Corp. Technical Director | Robert Bradley |
| Corp. QA Officer | Sarah Widomski<br>Sarah Widomski |

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# Appendix E

# York Analvtical Laboratories, Inc.

## Analytical Method Information

PFAS Target compounds by LC/MS-MS

**PFAS, NYSDEC Target List in Soil (EPA 537m)** Units: **ug/kg**

**Preservation:** Cool 4°C **Hold Time to Analysis** 28 days

**Container:** 10_250mL Plastic Cool to 4° C **Amount Required:** 250 mL **Hold Time to Extr.** 14 days

| Analyte | MDL | Reporting Limit | Surrogate %R | Duplicate RPD | Matrix Spike %R | Matrix Spike RPD | Blank Spike / LCS %R | Blank Spike / LCS RPD |
|---|---|---|---|---|---|---|---|---|
| 1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS) | 0.0256 | 0.250 ug/kg | | 30 | 25 - 150 | 35 | 50 - 130 | 30 |
| 1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS) | 0.0660 | 0.250 ug/kg | | 30 | 25 - 150 | 35 | 50 - 130 | 30 |
| N-EtFOSAA | 0.104 | 0.250 ug/kg | | 30 | 25 - 150 | 35 | 50 - 130 | 30 |
| N-MeFOSAA | 0.104 | 0.250 ug/kg | | 30 | 25 - 150 | 35 | 50 - 130 | 30 |
| Perfluoro-1-decanesulfonic acid (PFDS) | 0.0512 | 0.250 ug/kg | | 30 | 25 - 150 | 35 | 50 - 130 | 30 |
| Perfluoro-1-heptanesulfonic acid (PFHpS) | 0.0493 | 0.250 ug/kg | | 30 | 25 - 150 | 35 | 50 - 130 | 30 |
| Perfluoro-1-octanesulfonamide (FOSA) | 0.0467 | 0.250 ug/kg | | 30 | 25 - 150 | 35 | 50 - 130 | 30 |
| Perfluorobutanesulfonic acid (PFBS) | 0.350 | 0.250 ug/kg | | 30 | 25 - 150 | 35 | 50 - 130 | 30 |
| Perfluorodecanoic acid (PFDA) | 0.0512 | 0.250 ug/kg | | 30 | 25 - 150 | 35 | 50 - 130 | 30 |
| Perfluorododecanoic acid (PFDoA) | 0.0750 | 0.250 ug/kg | | 30 | 25 - 150 | 35 | 50 - 130 | 30 |
| Perfluoroheptanoic acid (PFHpA) | 0.0455 | 0.250 ug/kg | | 30 | 25 - 150 | 35 | 50 - 130 | 30 |
| Perfluorohexanesulfonic acid (PFHxS) | 0.0310 | 0.250 ug/kg | | 30 | 25 - 150 | 35 | 50 - 130 | 30 |
| Perfluorohexanoic acid (PFHxA) | 0.0659 | 0.250 ug/kg | | 30 | 25 - 150 | 35 | 50 - 130 | 30 |
| Perfluoro-n-butanoic acid (PFBA) | 0.183 | 0.250 ug/kg | | 30 | 25 - 150 | 35 | 50 - 130 | 30 |
| Perfluorononanoic acid (PFNA) | 0.0598 | 0.250 ug/kg | | 30 | 25 - 150 | 35 | 50 - 130 | 30 |
| Perfluorooctanesulfonic acid (PFOS) | 0.0438 | 0.250 ug/kg | | 30 | 25 - 150 | 35 | 50 - 130 | 30 |
| Perfluorooctanoic acid (PFOA) | 0.0772 | 0.250 ug/kg | | 30 | 25 - 150 | 35 | 50 - 130 | 30 |
| Perfluoropentanoic acid (PFPeA) | 0.0919 | 0.250 ug/kg | | 30 | 25 - 150 | 35 | 50 - 130 | 30 |
| Perfluorotetradecanoic acid (PFTA) | 0.0747 | 0.250 ug/kg | | 30 | 25 - 150 | 35 | 50 - 130 | 30 |
| Perfluorotridecanoic acid (PFTrDA) | 0.0435 | 0.250 ug/kg | | 30 | 25 - 150 | 35 | 50 - 130 | 30 |
| Perfluoroundecanoic acid (PFUnA) | 0.116 | 0.250 ug/kg | | 30 | 25 - 150 | 35 | 50 - 130 | 30 |

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# APPENDIX C

NEW YORK STATE OF OPPORTUNITY. | Department of Environmental Conservation

# Brownfield Cleanup Program

## Citizen Participation Plan
for
## Ace Suede and Leather

April 2019

Site No. C203072
808 East 139th Street
(Port Morris)
Bronx, NY 10454

## Contents

* * * * *

**Note:** The information presented in this Citizen Participation Plan was current as of the date of its approval by the New York State Department of Environmental Conservation. Portions of this Citizen Participation Plan may be revised during the site's investigation and cleanup process.

Applicant: **B&B First Holdings LLC ("Applicant")**
Site Name: **Ace Suede and Leather ("Site")**
Site Address: **808 East 139th Street**
Site County: **Bronx**
Site Number: **C203072**

## 1. What is New York's Brownfield Cleanup Program?

New York's Brownfield Cleanup Program (BCP) works with private developers to encourage the voluntary cleanup of contaminated properties known as "brownfields" so that they can be reused and developed. These uses include recreation, housing, and business.

A *brownfield* is any real property that is difficult to reuse or redevelop because of the presence or potential presence of contamination. A brownfield typically is a former industrial or commercial property where operations may have resulted in environmental contamination. A brownfield can pose environmental, legal, and financial burdens on a community. If a brownfield is not addressed, it can reduce property values in the area and affect economic development of nearby properties.

The BCP is administered by the New York State Department of Environmental Conservation (NYSDEC) which oversees Applicants who conduct brownfield site investigation and cleanup activities. An Applicant is a person who has requested to participate in the BCP and has been accepted by NYSDEC. The BCP contains investigation and cleanup requirements, ensuring that cleanups protect public health and the environment. When NYSDEC certifies that these requirements have been met, the property can be reused or redeveloped for the intended use.

For more information about the BCP, go online at:
http://www.dec.ny.gov/chemical/8450.html .

## 2. Citizen Participation Activities

### *Why NYSDEC Involves the Public and Why It Is Important*

NYSDEC involves the public to improve the process of investigating and cleaning up contaminated sites, and to enable citizens to participate more fully in decisions that affect their health, environment, and social well-being. NYSDEC provides opportunities for citizen involvement and encourages early two-way communication with citizens before decision makers form or adopt final positions.

Involving citizens affected and interested in site investigation and cleanup programs is important for many reasons. These include:

- Promoting the development of timely, effective site investigation and cleanup programs that protect public health and the environment

- Improving public access to, and understanding of, issues and information related to a particular site and that site's investigation and cleanup process

- Providing citizens with early and continuing opportunities to participate in NYSDEC's site investigation and cleanup process

- Ensuring that NYSDEC makes site investigation and cleanup decisions that benefit from input that reflects the interests and perspectives found within the affected community

- Encouraging dialogue to promote the exchange of information among the affected/interested public, State agencies, and other interested parties that strengthens trust among the parties, increases understanding of site and community issues and concerns, and improves decision making.

This Citizen Participation (CP) Plan provides information about how NYSDEC will inform and involve the public during the investigation and cleanup of the site identified above. The public information and involvement program will be carried out with assistance, as appropriate, from the Applicant.

### *Project Contacts*

Appendix A identifies NYSDEC project contact(s) to whom the public should address questions or request information about the site's investigation and cleanup program. The public's suggestions about this CP Plan and the CP program for the site are always welcome. Interested people are encouraged to share their ideas and suggestions with the project contacts at any time.

### *Locations of Reports and Information*

The locations of the reports and information related to the site's investigation and cleanup program also are identified in Appendix A. These locations provide convenient access to important project documents for public review and comment. Some documents may be placed on the NYSDEC web site. If this occurs, NYSDEC will inform the public in fact sheets distributed about the site and by other means, as appropriate.

### *Site Contact List*

Appendix B contains the site contact list. This list has been developed to keep the community informed about, and involved in, the site's investigation and cleanup process. The site contact list will be used periodically to distribute fact sheets that provide updates about the status of the project. These will include notifications of upcoming activities at the site (such as fieldwork), as well as availability of project documents and announcements about public comment periods.
The site contact list includes, at a minimum:

- Chief executive officer and planning board chairperson of each county, city, town and village in which the site is located;
- Residents, owners, and occupants of the site and properties adjacent to the site;
- The public water supplier which services the area in which the site is located;
- Any person who has requested to be placed on the site contact list;
- The administrator of any school or day care facility located on or near the site for purposes of posting and/or dissemination of information at the facility;
- Location(s) of reports and information.

The site contact list will be reviewed periodically and updated as appropriate. Individuals and organizations will be added to the site contact list upon request. Such requests should be submitted to the NYSDEC project contact(s) identified in Appendix A. Other additions to the site contact list may be made at the discretion of the NYSDEC project manager, in consultation with other NYSDEC staff as appropriate.

**Note:** The first site fact sheet (usually related to the draft Remedial Investigation Work Plan) is distributed both by paper mailing through the postal service and through DEC Delivers, its email listserv service. The fact sheet includes instructions for signing up with the appropriate county listserv to receive future notifications about the site. See http://www.dec.ny.gov/chemical/61092.html .

Subsequent fact sheets about the site will be distributed exclusively through the listserv, except for households without internet access that have indicated the need to continue to receive site information in paper form. Please advise the NYSDEC site project manager identified in Appendix A if that is the case. Paper mailings may continue during the investigation and cleanup process for some sites, based on public interest and need.

*CP Activities*

The table at the end of this section identifies the CP activities, at a minimum, that have been and will be conducted during the site's investigation and cleanup program. The flowchart in Appendix D shows how these CP activities integrate with the site investigation and cleanup process. The public is informed about these CP activities through fact sheets and notices distributed at significant points during the program. Elements of the investigation and cleanup process that match up with the CP activities are explained briefly in Section 5.

- **Notices and fact sheets** help the interested and affected public to understand contamination issues related to a site, and the nature and progress of efforts to investigate and clean up a site.

- **Public forums, comment periods and contact with project managers** provide opportunities for the public to contribute information, opinions and perspectives that have potential to influence decisions about a site's investigation and cleanup.

The public is encouraged to contact project staff at any time during the site's investigation and cleanup process with questions, comments, or requests for information.

This CP Plan may be revised due to changes in major issues of public concern identified in Section 3 or in the nature and scope of investigation and cleanup activities. Modifications may include additions to the site contact list and changes in planned citizen participation activities.

*Technical Assistance Grant*

NYSDEC must determine if the site poses a significant threat to public health or the environment. This determination generally is made using information developed during the investigation of the site, as described in Section 5.

If the site is determined to be a significant threat, a qualifying community group may apply for a Technical Assistance Grant (TAG). The purpose of a TAG is to provide funds to the qualifying group to obtain independent technical assistance. This assistance helps the TAG recipient to interpret and understand existing environmental information about the nature and extent of contamination related to the site and the development/implementation of a remedy.

An eligible community group must certify that its membership represents the interests of the community affected by the site, and that its members' health, economic well-being or enjoyment of the environment may be affected by a release or threatened release of contamination at the site.

As of the date the declaration (page 2) was signed by the NYSDEC project manager, the site poses a significant threat to public health and the environment.

To verify the significant threat status of the site, the interested public may contact the NYSDEC project manager identified in Appendix A.

For more information about TAGs, go online at
http://www.dec.ny.gov/regulations/2590.html

Note: The table identifying the citizen participation activities related to the site's investigation and cleanup program follows on the next page:

| Citizen Participation Activities | Timing of CP Activity(ies) |
|---|---|
| **Application Process:** | |
| • Prepare site contact list<br>• Establish document repository(ies) | At time of preparation of application to participate in the BCP. |
| • Publish notice in Environmental Notice Bulletin (ENB) announcing receipt of application and 30-day public comment period<br>• Publish above ENB content in local newspaper<br>• Mail above ENB content to site contact list<br>• Conduct 30-day public comment period | When NYSDEC determines that BCP application is complete. The 30-day public comment period begins on date of publication of notice in ENB. End date of public comment period is as stated in ENB notice. Therefore, ENB notice, newspaper notice, and notice to the site contact list should be provided to the public at the same time. |
| **After Execution of Brownfield Site Cleanup Agreement (BCA):** | |
| • Prepare Citizen Participation (CP) Plan | Before start of Remedial Investigation<br>**Note:** Applicant must submit CP Plan to NYSDEC for review and approval within 20 days of the effective date of the BCA. |
| **Before NYSDEC Approves Remedial Investigation (RI) Work Plan:** | |
| • Distribute fact sheet to site contact list about proposed RI activities and announcing 30-day public comment period about draft RI Work Plan<br>• Conduct 30-day public comment period | Before NYSDEC approves RI Work Plan. If RI Work Plan is submitted with application, public comment periods will be combined and public notice will include fact sheet. Thirty-day public comment period begins/ends as per dates identified in fact sheet. |
| **After Applicant Completes Remedial Investigation:** | |
| • Distribute fact sheet to site contact list that describes RI results | Before NYSDEC approves RI Report |
| **Before NYSDEC Approves Remedial Work Plan (RWP):** | |
| • Distribute fact sheet to site contact list about draft RWP and announcing 45-day public comment period<br>• Public meeting by NYSDEC about proposed RWP (if requested by affected community or at discretion of NYSDEC project manager)<br>• Conduct 45-day public comment period | Before NYSDEC approves RWP. Forty-five day public comment period begins/ends as per dates identified in fact sheet. Public meeting would be held within the 45-day public comment period. |
| **Before Applicant Starts Cleanup Action:** | |
| • Distribute fact sheet to site contact list that describes upcoming cleanup action | Before the start of cleanup action. |
| **After Applicant Completes Cleanup Action:** | |
| • Distribute fact sheet to site contact list that announces that cleanup action has been completed and that NYSDEC is reviewing the Final Engineering Report<br>• Distribute fact sheet to site contact list announcing NYSDEC approval of Final Engineering Report and issuance of Certificate of Completion (COC) | At the time the cleanup action has been completed.<br>**Note:** The two fact sheets are combined when possible if there is not a delay in issuing the COC. |

## 3. Major Issues of Public Concern

This section of the CP Plan identifies major issues of public concern that relate to the site. Additional major issues of public concern may be identified during the course of the site's investigation and cleanup process.

Based upon sampling performed during a 2013 Phase II Environmental Site Assessment (ESA), Site soil and groundwater is known to be impacted with hazardous volatile organic compounds (VOCs) including the chlorinated solvents perchloroethylene (PCE) and trichloroethylene (TCE). The contamination identified is understood to have been a result of leaking Underground Storage Tanks (USTs) that served the former dry-cleaning and leather making operations at the Site. The Site has not yet been evaluated for impact to soil-vapor.

The impact to soil was identified beneath the building at a depth of six to eight-feet below the building slab and groundwater in the area is not utilized for private or public potable water supply. Therefore, it is unlikely for a person to come in direct contact with impacted soil or groundwater. However, the potential for harmful vapors to enter and accumulate within the buildings and/or migrate offsite, poses a possible health risk to building occupants and neighbors.

The presence of known soil and groundwater contamination at the Site, the potential for groundwater to contribute to the migration of contamination offsite, and the potential for soil-vapor to impact the Site buildings and surrounding properties are the issues of major public concern associated with the Site. These conditions may negatively impact local economic development by impairing the ability to cleanup and redevelop the Site, reducing property values in the area, and impacting local business.

The Site is located in an Environmental Justice Area. Environmental justice is defined as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

Environmental justice efforts focus on improving the environment in communities, specifically minority and low-income communities, and addressing disproportionate adverse environmental impacts that may exist in those communities.

The site is located in an area with a sizable Hispanic-American and African-American population nearby. Therefore, all future fact sheets will be translated into Spanish.

For additional information, visit: https://statisticalatlas.com/tract/New-York/Bronx-County/001900/Race-and-Ethnicity

## 4. Site Information

Appendix C contains a map identifying the location of the site.

*Site Description*

The Site is located at 808 East 139th Street in the Port Morris neighborhood of the Bronx, and is comprised of one approximately 0.43-acre parcel. The parcel is improved with two contiguous buildings, one single-story and one two-story portions that occupy the majority of the Site. The Site is located in a densely urbanized area of the Bronx that is zoned for heavy industrial uses. The Site is bordered by East 139th Street to the north, a national railway/Amtrak easement passing to the east, and commercial and industrial properties to the south and west.

*History of Site Use, Investigation, and Cleanup*

The Site is zoned for industrial use and is currently occupied by one commercial tenant, a storage and moving company. Historically, the Site was operated as a dry-cleaning facility from the 1940's through the 1970's, and as a leather factory from the late 1970's to 2013. According to available records, seven USTs are present in the south-central portion of the building that served the former operations. The USTs were reported to have stored the chemical solvents Varnolene, and more recently Tetrachlorothylene (PCE). Varnolene was the brand name of a form of mineral spirits used historically in dry-cleaning and PCE is commonly used in many current industrial and commercial operations, including dry-cleaning and leather making.

Impact to Site soil and groundwater was identified during a December 2013 Phase II ESA performed by Environmental Business Consultants (EBC) in response to a Phase I ESA completed for the Site. The investigation indicated that the chemicals identified were related to the former Site operations and are likely a result of leaking USTs and/or their associated piping. As a result, the Site was assigned to the New York State Department of Environmental Conservations (NYSDEC) spills cleanup program (Spill Number: 1309303). Due to the nature of the chemicals identified, the Site was later listed as a NYSDEC Class 02 Inactive Hazardous Waste Site (Site Number: 203072). As of February 2019, the Site has been accepted and moved to the NYSDEC BCP to undergo investigation and cleanup.

Although chemicals such as these pose a potential health risk, they were identified several feet beneath the building in both soil and groundwater, minimizing the potential for direct contact with the public. Furthermore, groundwater at the Site and from the surrounding area are not utilized for private or public potable water supply. Impact to

Site soil-vapor has not yet been evaluated. The New York City Department of Envirnmental Protection provides water to NYC residents.

An offsite subsurface investigation in the area surrounding the Site was conducted by the NYSDEC and performed by EnviroTrac Ltd. in January 2015. The investigation consisted of the collection and analysis of soil, groundwater and soil-vapor samples. The investigation identified subsurface impacts from petroleum-related chemicals, and to a lesser extent, chlorinated compounds.

## 5. Investigation and Cleanup Process

### *Application*

The Applicant has applied for and been accepted into New York's Brownfield Cleanup Program as a Volunteer. This means that the Applicant was not responsible for the disposal or discharge of the contaminants or whose ownership or operation of the site took place after the discharge or disposal of contaminants. The Volunteer must fully characterize the nature and extent of contamination onsite, and must conduct a "qualitative exposure assessment," a process that characterizes the actual or potential exposures of people, fish and wildlife to contaminants on the site and to contamination that has migrated from the site.

The Applicant in its Application proposes that the site will be used for restricted purposes.

To achieve this goal, the Applicant will conduct an investigation and cleanup activities at the site with oversight provided by NYSDEC. The Brownfield Cleanup Agreement executed by NYSDEC and the Applicant sets forth the responsibilities of each party in conducting these activities at the site.

### *Investigation*

The Applicant will conduct an investigation of the site officially called a "remedial investigation" (RI). This investigation will be performed with NYSDEC oversight. The Applicant must develop a remedial investigation workplan, which is subject to public comment.

The site investigation has several goals:

1) Define the nature and extent of contamination in soil, surface water, groundwater and any other parts of the environment that may be affected;
2) Identify the source(s) of the contamination;
3) Assess the impact of the contamination on public health and the environment; and

4) Provide information to support the development of a proposed remedy to address the contamination or the determination that cleanup is not necessary.

The Applicant submits a draft “Remedial Investigation Work Plan” to NYSDEC for review and approval. NYSDEC makes the draft plan available to the public review during a 30-day public comment period.

When the investigation is complete, the Applicant will prepare and submit a report that summarizes the results. This report also will recommend whether cleanup action is needed to address site-related contamination. The investigation report is subject to review and approval by NYSDEC.

NYSDEC will use the information in the investigation report to determine if the site poses a significant threat to public health or the environment. If the site is a “significant threat,” it must be cleaned up using a remedy selected by NYSDEC from an analysis of alternatives prepared by the Applicant and approved by NYSDEC. If the site does not pose a significant threat, the Applicant may select the remedy from the approved analysis of alternatives.

### *Interim Remedial Measures*

An Interim Remedial Measure (IRM) is an action that can be undertaken at a site when a source of contamination or exposure pathway can be effectively addressed before the site investigation and analysis of alternatives are completed. If an IRM is likely to represent all or a significant part of the final remedy, NYSDEC will require a 30-day public comment period.

### *Remedy Selection*

When the investigation of the site has been determined to be complete, the project likely would proceed in one of two directions:

1. The Applicant may recommend in its investigation report that no action is necessary at the site. In this case, NYSDEC would make the investigation report available for public comment for 45 days. NYSDEC then would complete its review, make any necessary revisions, and, if appropriate, approve the investigation report. NYSDEC would then issue a “Certificate of Completion” (described below) to the Applicant.

**or**

2. The Applicant may recommend in its investigation report that action needs to be taken to address site contamination. After NYSDEC approves the investigation report, the Applicant may then develop a cleanup plan, officially called a “Remedial Work Plan”.

The Remedial Work Plan describes the Applicant's proposed remedy for addressing contamination related to the site.

When the Applicant submits a draft Remedial Work Plan for approval, NYSDEC would announce the availability of the draft plan for public review during a 45-day public comment period.

### *Cleanup Action*

NYSDEC will consider public comments, and revise the draft cleanup plan if necessary, before approving the proposed remedy. The New York State Department of Health (NYSDOH) must concur with the proposed remedy. After approval, the proposed remedy becomes the selected remedy. The selected remedy is formalized in the site Decision Document.

The Applicant may then design and perform the cleanup action to address the site contamination. NYSDEC and NYSDOH oversee the activities. When the Applicant completes cleanup activities, it will prepare a Final Engineering Report (FER) that certifies that cleanup requirements have been achieved or will be achieved within a specific time frame. NYSDEC will review the report to be certain that the cleanup is protective of public health and the environment for the intended use of the site.

### *Certificate of Completion*

When NYSDEC is satisfied that cleanup requirements have been achieved or will be achieved for the site, it will approve the FER. NYSDEC then will issue a Certificate of Completion (COC) to the Applicant. The COC states that cleanup goals have been achieved and relieves the Applicant from future liability for site-related contamination, subject to certain conditions. The Applicant would be eligible to redevelop the site after it receives a COC.

### *Site Management*

The purpose of site management is to ensure the safe reuse of the property if contamination will remain in place. Site management is the last phase of the site cleanup program. This phase begins when the COC is issued. Site management incorporates any institutional and engineering controls required to ensure that the remedy implemented for the site remains protective of public health and the environment. All significant activities are detailed in a Site Management Plan.

An *institutional control* is a non-physical restriction on use of the site, such as a deed restriction that would prevent or restrict certain uses of the property. An institutional control may be used when the cleanup action leaves some contamination that makes the site suitable for some, but not all uses.

An *engineering control* is a physical barrier or method to manage contamination. Examples include: caps, covers, barriers, fences, and treatment of water supplies.

Site management also may include the operation and maintenance of a component of the remedy, such as a system that pumps and treats groundwater. Site management continues until NYSDEC determines that it is no longer needed.

# Appendix A -
# Project Contacts and Locations of Reports and Information

## Project Contacts

For information about the site's investigation and cleanup program, the public may contact any of the following project staff:

### New York State Department of Environmental Conservation (NYSDEC):

Wendi Zheng
Project Manager
NYSDEC Region 2
Division of Environmental Remediation
One Hunters Point Plaza
47-40 21st Street
Long Island City, NY 11101
718-482-7541

Tom Panzone
Public Participation Specialist
NYSDEC Region 2
One Hunters Point Plaza
47-40 21st Street
Long Island City, NY 11101
718-482-4953

### New York State Department of Health (NYSDOH):

Dawn Hettrick
Project Manager
NYSDOH
Empire State Plaza
Corning Tower Room 1787
Albany, NY 12237
518-402-7860

## Locations of Reports and Information

The facilities identified below are being used to provide the public with convenient access to important project documents:

Mott Haven Library
321 East 140th Street
Bronx, New York
Attn: Mgr. Ms. Jeanie Thomas
Phone: 718-665-4878
Hours: Mon-Thu 10am-7pm, Fri-Sat 10am-5pm, Sun Closed.

Bronx Community Board 1
3024 3rd Avenue
Bronx, New York
Attn: District Mgr. Mr. Cedric Loftin
Phone: 718-585-7117
Hours: Mon-Fri 9am-5pm, Sat-Sun Closed.

NYSDEC Region 2 Office
One Hunters Point Plaza
47-40 21st Street
Long Island City, New York 11101
Attn: Ms. Wendi Zheng
Phone: 718-482-7541
Hours: Mon-Fri 9am-5pm, Sat-Sun
Closed, (call for appointment).

## Appendix B - Site Contact List

Municipal and Community Board Leaders:

New York City Mayor
Bill De Blasio
City Hall New York, NY 10007
Phone: 311 or 212-NEW-YORK

Hon. Scott Stringer
NYC Comptroller
1 Centre Street
New York, NY 10007

NYC Public Advocate
Attn: Jumaane Williams
1 Centre Street, 15th Floor
New York, NY 10007

NYC Councilman
Hon. Rafael Salamanca Jr.
1070 Southern Boulevard
Bronx, NY 10459

NYS Senator
Hon. Jose M. Serrano
1916 Park Avenue, Suite 202
New York, NY 10037

NYS Assembly
Hon. Carmen E. Arroyo
384 East 149th Street, Suite 301
Bronx, NY 10455

Hon. Charles Schumer
U.S. Senator
780 Third Avenue, Suite 2301
New York, NY 10017

Hon. Kirsten Gillibrand
U.S. Senator
780 Third Avenue, Suite 2601

New York, NY 10017
Hon. Jose E. Serrano
U.S. House of Representatives
1231 Lafayette Avenue, 4th Floor
Bronx, NY 10474

Luis M. Diaz
Bronx County Clerk
851 Grand Concourse, Room 118
Bronx, NY 10451

Julie Stein
Office of Environmental Planning & Assessment
NYC Dept. of Environmental Protection
96-05 Horace Harding Expressway
Flushing, NY 11373

Mark McIntyre
NYC Office of Environmental Remediation
100 Gold Street - 2nd Floor
New York, NY 10038

Marisa Lago
Commissioner, NYC Dept. of City Planning
120 Broadway, 31st Floor
New York, NY 10271

Bronx Borough President
Rubin Diaz Jr.
Office of the Bronx Borough President
851 Grand Concourse, 3rd Floor
Bronx, New York 10451
Phone: General Office: (718) 590-3500
Constituent Services: (718) 590-3554
Executive Office: (718) 590-3557
Email: webmail@bronxbp.nyc.gov

Bronx Borough Planning Board Chairperson
James Rausse
Phone: (718) 590 6815
Email: jrausse@bronxbp.nyc.gov

Bronx Community Board  #1  District Manager
Cedric Loften
3024 Third Avenue
Bronx, NY 10455
Phone: (718) 585-7117
email: brxcb1@optonline.net

Bronx District #1 Chairman
George Rodriguez
3024 Third Avenue
Bronx, NY 10455
Phone: (718) 585-7117
email: brxcb1@optonline.net

The Haven Project
C/O New York Restoration Project (NYRP)
254 West 31st Street, 10th Floor
New York, NY 10001

Site Owner/Operators:

Current Site Owner
Ace Suede-Life, Inc.
808 East 139th Street
Bronx, NY 10454

PO Box 327
Cliffside Park, NJ 07010

Current Site Operator/Tenant
Empire Movers
808 East 139th Street
Bronx, NY 10454

Adjacent Properties:

Marathon Enterprises
787-797 East 138th Street, Bronx, NY 10454

Apache Ii Realty Company
805 East 139h Street Bronx, NY, 10454

Penn Central Company/Amtrak
Rail Line

Local Water Supply:

New York City Department of Environmental Protection
Attn: Vincent Sapienza, Commissioner
59-17 Junction Boulevard
Flushing, NY, 11373
Phone: (212) 639 9675 if not in NY.
If in any borough of New York City dial 311

Schools and Day Care Centers:

Mother Hale Academy (Pre-K Services)
677 E 141st St. Bronx NY, 10454
Phone: 1 (718) 292 4628
Administration: Jasmin Gonzalez

Document Repositories:

Mott Haven Library
321 East 140th Street
Bronx, NY
Manager: Ms. Jeanine Thomas
Phone: (718) 665 4878
jeaninethomas@nypl.org

Bronx Community Board 1
3024 3rd Avenue
Bronx, New York
District Mgr. Mr. Cedric Loftin
Phone: 718-585-7117

Local Media Outlets:

The Bronx Chronicle
www.thebronxchronicle.com
25 Westchester Square
Suite 1
Bronx, NY 10462
Phone: (347) 224-7635

Sal J. Conforto J.D. Esq.
Publisher/CEO
Editor-In-Chief
sal@thebronxchronicle.com

NY 1 News
75 Ninth Avenue
New York, NY 10011

New York Daily News
4 New York Plaza
New York, NY 10004

New York Post
1211 Avenue of the Americas
New York, NY 10036

Hoy Nueva York
1 MetroTech Center, 18th Floor
Brooklyn, NY 11201

El Diario La Prensa
1 MetroTech Center, 18th Floor
Brooklyn, NY 11201

Impacto New York
225 West 35th Street, Suite 305
New York, NY 10001

La Voz Hispana NY
159 East 116th Street
New York, NY 10029

Bronx Times Reporter
900 East 132nd Street
Bronx, NY 10454

Inner City Press
P.O.Box 580188, Mount Carmel Station
Bronx, NY 10458

Mott Haven Herald
editor@motthavenherald.com

http://www.motthavenherald.com/

Community, Civic, Religious and Other Environmental Organizations:

Eric Soto, Director
Consolidated Edison Corporate Affairs
511 Theodore Fremd Avenue
Rye, NY 10580

Gabriel DeJesus, President
40th NYPD Police Precinct Council
257 Alexander Avenue
Bronx, NY 10454

Engine 83 Ladder 29
FDNY
618 East 138th Street
Bronx, NY 10454

South Bronx Unite
southbronxunite@gmail.com
http://southbronxunite.org/

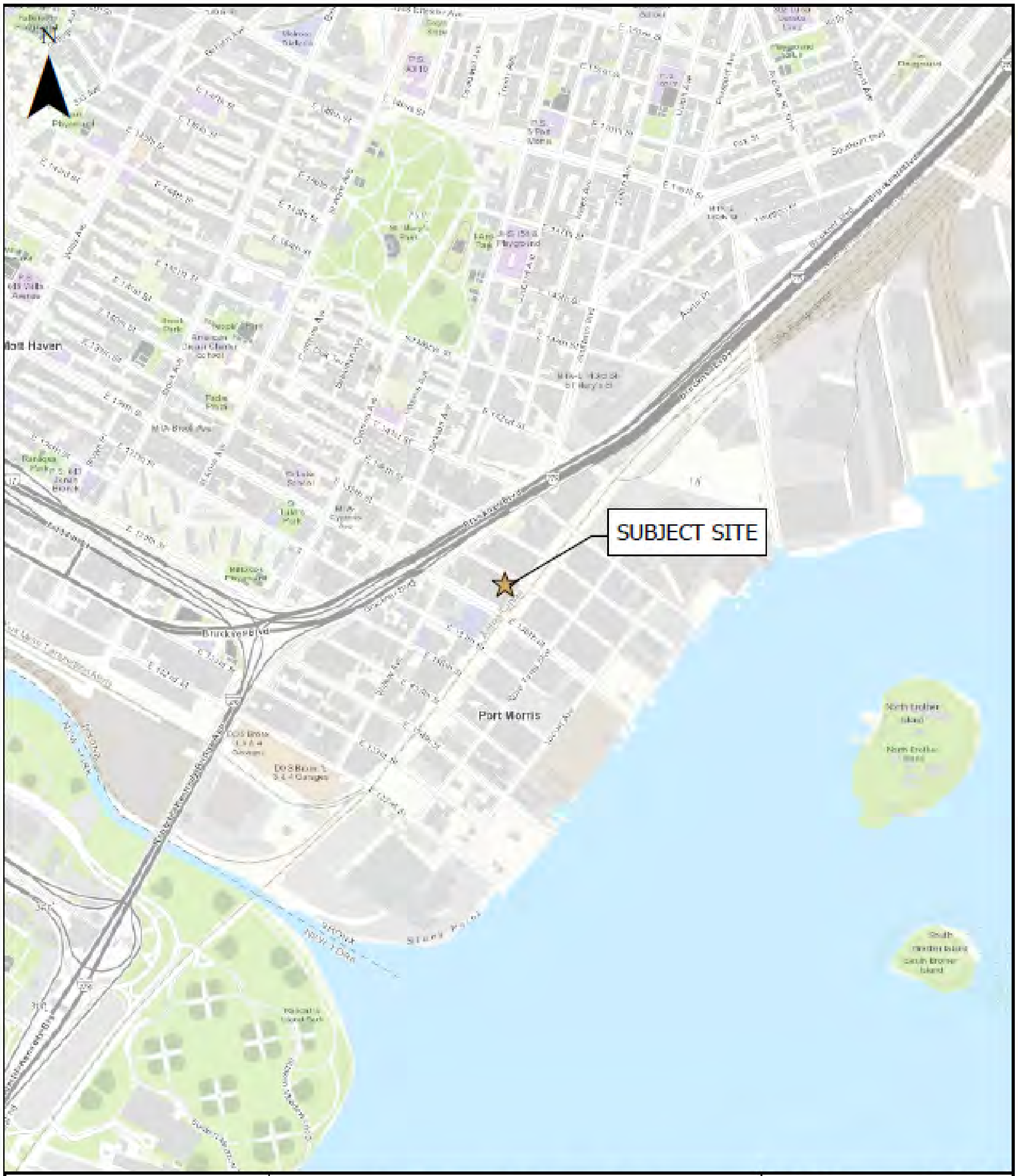
For A Better Bronx
Contact: Marian Feinberg, Executive Director
199 Lincoln Avenue, Suite 213/214
Bronx, NY 10454

Sustainable South Bronx
Jennifer Mitchell, Executive Director
1647 Macombs Road, Ground Floor
Bronx, NY 10453

South Bronx Overall Economic Development Corporation
555 Bergen Avenue
Bronx, NY 10455

South Bronx Community Congress
145 East 149th Street, 2nd Floor
Bronx, NY 10451

## Appendix C - Site Location Map



CASTLETON ENVIRONMENTAL
P: 631-482-1818
F: 631-321-4349
E: info@castletonenv.com
www.castletonenv.com

SITE LOCATION

808 East 139th Street
Bronx, New York

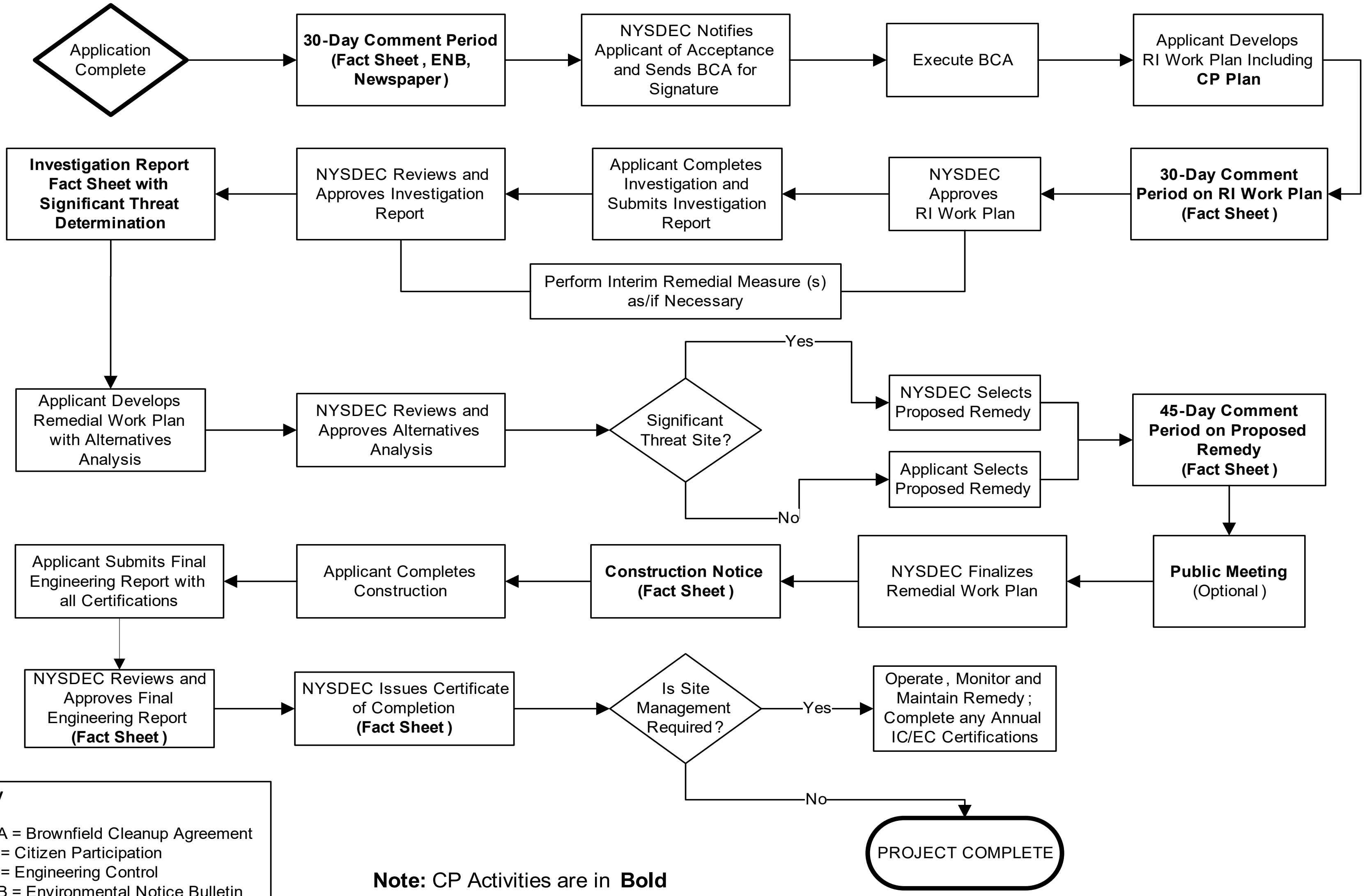
Miles
0 0.1 0.2 0.3 0.4

| | |
|---|---|
| PROJECT: | AJRC1701 |
| DATE: | 4/12/2019 |
| DRAWN BY: | BB |
| APPROVED BY: | FPC |

***FIGURE:***

**1**

# Appendix D– Brownfield Cleanup Program Process



**Key**

BCA = Brownfield Cleanup Agreement
CP = Citizen Participation
EC = Engineering Control
ENB = Environmental Notice Bulletin
IC = Institutional Control
RI = Remedial Investigation

**Note:** CP Activities are in **Bold**

**Division of Environmental Remediation**

# Remedial Programs
# Scoping Sheet for Major Issues of Public Concern

## Instructions

This Scoping Sheet assesses major issues of public concern; impacts of the site and its remedial program on the community; community interest in the site; information the public needs; and information needed from the public.

The information generated helps to plan and conduct required citizen participation (CP) activities, and to choose and conduct additional CP activities, if appropriate. The scoping sheet can be revisited and updated as appropriate during the site's remedial process to more effectively implement the site's CP program.

**Note: Use the information as an aid to prepare and update the Major Issues of Public Concern section of the site CP Plan.**

## General Instructions

- When to prepare: During preparation of the CP Plan for the site. It can be revisited and updated anytime during the site remedial process.
- Fill in site name and other information as appropriate.
- The Scoping Sheet may be prepared by DEC or a remedial party, but must be reviewed and approved by the DER site project manager or his/her designee.

## Instructions for Numbered Parts

Consider the bulleted issues and questions below and any others that may be unique or appropriate to the site and the community to help complete the five Parts of this Scoping Sheet. Identify the issue stakeholders in Parts 1 through 3 and adjust the site's contact list accordingly.

## Part 1. List Major Issues of Public Concern and Information the Community Wants.

- Is our health being impacted? (e.g. Are there problems with our drinking water or air? Are you going to test our water, yards, sumps, basements? Have health studies been done?)
- There are odors in the neighborhood. Do they come from the site and are they hazardous?
- Are there restrictions on what we may do (e.g. Can our children play outside? Can we garden? Must we avoid certain areas? Can we recreate (fish, hunt, hike, etc. on/around the site?)
- How and when were the site's contamination problems created?
- What contaminants are of concern and why? How will you look for contamination and find out where it is going? What is the schedule for doing that?
- The site is affecting our property values!
- How can we get more information (e.g. who are the project contacts?)
- How will we be kept informed and involved during the site remedial process?
- Who has been contacted in the community about site remedial activities?
- What has been done to this point? What happens next and when?
- The site is going to be cleaned up for restricted use. What does that mean? We don't want redevelopment on a "dirty" site.

## Part 2. List Important Information Needed From the Community, if Applicable.

- Can the community supplement knowledge about past/current uses of the site?
- Does the community have knowledge that the site may be significantly impacting nearby people, properties, natural resources, etc.?
- Are activities currently taking place at the site or at nearby properties that may need to be restricted?
- Who may be interested or affected by the site that has not yet been identified?
- Are there unique community characteristics that could affect how information is exchanged?
- Does the community and/or individuals have any concerns they want monitored?
- Does the community have information about other sources in the area for the contamination?

## Part 3. List Major Issues and Information That Need to be Communicated to the Community.

- Specific site investigation or remediation activities currently underway, or that will begin in the near future.
- The process and general schedule to investigate, remediate and, if applicable, redevelop the site.
- Current understanding about the site contamination and effects, if any, on public health and the environment.
- Site impacts on the community and any restrictions on the public's use of the site and/or nearby properties.
- Planned CP activities, their schedule, and how they relate to the site's remedial process.
- Ways for the community to obtain/provide information (document repositories, contacts, etc.).

## Part 4. Community Characteristics

**a. - e.** Obtain information from local officials, property owners and residents, site reports, site visits, "windshield surveys," other staff, etc.

**f.** Has the affected community experienced other **significant** present or past environmental problems unrelated to this site? Such experiences could significantly affect public concerns and perspectives about the site; how the community will relate to project staff; the image and credibility of project staff within the community; and the ways in which project staff communicate with the community.

**g.** In its remedial programs, DER seeks to integrate, and be consistent with, environmental justice principles set forth in *DEC Commissioner Policy 29 on Environmental Justice* and *DER 23 – Citizen Participation Handbook for Remedial Programs*. Is the site and/or affected community wholly or partly in an Environmental Justice (EJ) Area? Use the Search feature on DEC's public web site for "environmental justice". DEC's EJ pages define an EJ area, and link to county maps to help determine if the site and/or community are in an EJ area.

**h.** Consider factors such as:

- Is English the primary language of the affected community? If not, provisions should be considered regarding public outreach activities such as fact sheets, meetings, door-to-door visits and other activities to ensure their effectiveness.
- The age demographics of the community. For example, is there a significant number of senior citizens in the community? It may be difficult for some to attend public meetings and use document repositories. This may suggest adopting more direct interaction with the community with activities such as door-to-door visits, additional fact sheets, visits to community and church centers, nursing homes, etc.
- How do people travel about the community? Would most people drive to a public meeting or document repository? Is there adequate public transportation?

## Part 5. Affected/Interested Public.

Individuals and organizations who need or want information and input can change during the site's remedial process. This need is influenced by real, potential, or perceived impacts of the site or the remedial process. Some people may want information and input throughout the remedial process. Others may participate only during specific remedial stages, or may only be interested in particular issues.

It is important to revisit this question when reviewing this scoping sheet. Knowing who is interested in the site – and the issues that are important to them – will help to select and conduct appropriate outreach activities, and to identify their timing and the information to be exchanged.

Check all affected/interested parties that apply to the site. **Note: Adjust the site's contact list appropriately.** The following are some ways to identify affected/interested parties:

- Tax maps of adjacent property owners
- Attendees at public meetings
- Telephone discussions
- Letters and e-mails to DER, the remedial party, and other agencies
- Political jurisdictions and boundaries
- Media coverage
- Current/proposed uses of site and/or nearby properties (recreational, commercial, industrial)
- Discussions with community organizations: grass roots organizations, local environmental groups, environmental justice groups, churches, and neighborhood advisory groups

**Division of Environmental Remediation**

## Remedial Programs
## Scoping Sheet for Major Issues of Public Concern (see instructions)

**Site Name:** Ace Suede and Leather

**Site Number:** C203072

**Site Address and County:** 808 East 139th Street, Bronx, New York

**Remedial Party(ies):** B & B First Holdings LLC

**Note: For Parts 1. – 3. the individuals, groups, organizations, businesses and units of government identified should be added to the site contact list as appropriate.**

**Part 1.** List major issues of public concern and information the community wants. Identify individuals, groups, organizations, businesses and/or units of government related to the issue(s) and information needs. **Use this information as an aid to prepare or update the Major Issues of Public Concern section of the site Citizen Participation Plan.**
Major issues of concern include known soil and groundwater contamination, the potential for groundwater to contribute to the offsite migration of contaminants, and the unknown condition of soil-vapor. These conditions may affect the ability to develop the Site and surrounding area, reduce real estate value in the area, and negatively affect property and business owners.

The site is located in an Environmental Justice Area, in a neighborhood with a large Hispanic-American and African-American population. Therefore, all future fact sheets will be translated into Spanish.

How were these issues and/or information needs identified?
During Phase I and Phase II performed in 2013.

**Part 2.** List important information needed **from** the community, if applicable. Identify individuals, groups, organizations, businesses and/or units of government related to the information needed.
None.

How were these information needs identified?
NA

**Part 3.** List major issues and information that need to be communicated **to** the community. Identify individuals, groups, organizations, businesses and/or units of government related to the issue(s) and/or information.
The potential for exposure to hazardous chemicals and impact to the environment should be communicated to the public as necessary.

How were these issues and/or information needs identified?
During Phase I and Phase II performed in 2013.

**Part 4.** Identify the following characteristics of the affected/interested community. This knowledge will help to identify and understand issues and information important to the community, and ways to effectively develop and implement the site citizen participation plan (mark all that apply):

**a.** Land use/zoning at and around site:
☐ **Residential** ☐ **Agricultural** ☐ **Recreational** ☐ **Commercial** ☒ **Industrial**

**b.** Residential type around site:
☒ **Urban** ☐ **Suburban** ☐ **Rural**

**c.** Population density around site:
☒ **High** ☐ **Medium** ☐ **Low**

**d.** Water supply of nearby residences:
☒ **Public** ☐ **Private Wells** ☐ **Mixed**

**e.** Is part or all of the water supply of the affected/interested community currently impacted by the site?
☐ **Yes** ☒ **No**

Provide details if appropriate:
NA

**f.** Other environmental issues significantly impacted/impacting the affected community?
☐ **Yes** ☒ **No**

Provide details if appropriate:
Remedial investigation pending.

**g.** Is the site and/or the affected/interested community wholly or partly in an Environmental Justice Area?
☒ **Yes** ☐ **No**

**h.** Special considerations:
☒ **Language** ☐ **Age** ☐ **Transportation** ☐ **Other**

Explain any marked categories in **h:**
All future fact sheets will be translated into Spanish.

**Part 5.** The site contact list must include, at a minimum, the individuals, groups, and organizations identified in Part 2. of the Citizen Participation Plan under 'Site Contact List'. Are *other* individuals, groups, organizations, and units of government affected by, or interested in, the site, or its remedial program? (Mark and identify all that apply, then adjust the site contact list as appropriate.)

☒ **Non-Adjacent Residents/Property Owners:** Click here to enter text.

☒ **Local Officials:** Click here to enter text.

☒ **Media:** Click here to enter text.

☐ **Business/Commercial Interests:** Click here to enter text.

☐ **Labor Group(s)/Employees:** Click here to enter text.

☐ **Indian Nation:** Click here to enter text.

☒ **Citizens/Community Group(s):** Click here to enter text.

☒ **Environmental Justice Group(s):** Click here to enter text.

☒ **Environmental Group(s):** Click here to enter text.

☒ **Civic Group(s):** Click here to enter text.

☐ **Recreational Group(s):** Click here to enter text.

☐ **Other(s):** Click here to enter text.

**Prepared/Updated By:** Brian Barth **Date:** 2/27/2019

**ReviewedApproved By:** Thomas V. Panzone **Date:** 4/1/19

# APPENDIX D

# TABLE 1
808 East 139th Street,
Bronx, New York
Soil Analytical Results
Volatile Organic Compounds

| COMPOUND | NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives | NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives* | B1 6-8 µg/Kg | | B2 6-8 µg/Kg | | B3 6-8 µg/Kg | | B4 6-8 µg/Kg | | B5 6-8 µg/Kg | | B6 6-8 µg/Kg | | B7 6-8 µg/Kg | | B8 6-8 µg/Kg | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Result | RL | Result | RL | Result | RL | Result | RL | Result | RL | Result | RL | Result | RL | Result | RL |
| **1,1,1,2-Tetrachloroethane** | | | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **1,1,1-Trichloroethane** | 680 | 100,000 | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **1,1,2,2-Tetrachloroethane** | | | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **1,1,2-Trichloroethane** | | | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **1,1-Dichloroethane** | 270 | 26,000 | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **1,1-Dichloroethene** | 330 | 100,000 | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **1,1-Dichloropropene** | | | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **1,2,3-Trichlorobenzene** | | | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **1,2,3-Trichloropropane** | | | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **1,2,4-Trichlorobenzene** | | | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **1,2,4-Trimethylbenzene** | 3,600 | 52,000 | **46,000** | 6,300 | < 290 | 290 | < 290 | 290 | **360,000** | 30,000 | **260,000** | 29,000 | **190,000** | 31,000 | < 280 | 280 | < 290 | 290 |
| **1,2-Dibromo-3-chloropropane** | | | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **1,2-Dibromoethane** | | | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **1,2-Dichlorobenzene** | 1,100 | 100,000 | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **1,2-Dichloroethane** | 20 | 3,100 | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **1,2-Dichloropropane** | | | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **1,3,5-Trimethylbenzene** | 8,400 | 52,000 | **18,000** | 6,300 | < 290 | 290 | < 290 | 290 | **140,000** | 30,000 | **93,000** | 29,000 | **79,000** | 3,100 | < 280 | 280 | < 290 | 290 |
| **1,3-Dichlorobenzene** | 2,400 | 49,000 | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **1,3-Dichloropropane** | | | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **1,4-Dichlorobenzene** | 1,800 | 13,000 | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **2,2-Dichloropropane** | | | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **2-Chlorotoluene** | | | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **2-Hexanone** | | | < 32000 | 32,000 | < 1500 | 1,500 | < 1500 | 1,500 | < 15000 | 15,000 | < 15000 | 15,000 | < 15000 | 15,000 | < 1400 | 1,400 | < 1500 | 1,500 |
| **2-Isopropyltoluene** | | | < 6300 | 6,300 | **490** | 290 | **550** | 290 | **12,000** | 3,000 | **7,300** | 2,900 | **7,600** | 3,100 | < 280 | 280 | < 290 | 290 |
| **4-Chlorotoluene** | | | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **4-Methyl-2-pentanone** | | | < 32000 | 32,000 | < 1500 | 1,500 | < 1500 | 1,500 | < 15000 | 15,000 | < 15000 | 15,000 | < 15000 | 15,000 | < 1400 | 1,400 | < 1500 | 1,500 |
| **Acetone** | 50 | 100,000 | < 32000 | 32,000 | < 1500 | 1,500 | < 1500 | 1,500 | < 15000 | 15,000 | < 15000 | 15,000 | < 15000 | 15,000 | < 1400 | 1,400 | < 1500 | 1,500 |
| **Acrylonitrile** | | | < 13000 | 13,000 | < 580 | 580 | < 580 | 580 | < 6100 | 6,100 | < 5800 | 5,800 | < 6200 | 6,200 | < 560 | 560 | < 580 | 580 |
| **Benzene** | 60 | 4,800 | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **Bromobenzene** | | | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **Bromochloromethane** | | | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **Bromodichloromethane** | | | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **Bromoform** | | | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **Bromomethane** | | | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **Carbon Disulfide** | | | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **Carbon tetrachloride** | 760 | 2,400 | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **Chlorobenzene** | 1,100 | 100,000 | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **Chloroethane** | | | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **Chloroform** | 370 | 49,000 | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **Chloromethane** | | | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **cis-1,2-Dichloroethene** | 250 | 100,000 | **22,000** | 6,300 | < 290 | 290 | < 290 | 290 | **33,000** | 3,000 | **9,600** | 2,900 | **16,000** | 3,100 | < 280 | 280 | **320** | 290 |
| **cis-1,3-Dichloropropene** | | | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **Dibromochloromethane** | | | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **Dibromomethane** | | | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **Dichlorodifluoromethane** | | | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **Ethylbenzene** | 1,000 | 41,000 | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | **22,000** | 3,000 | **17,000** | 2,900 | **4,000** | 3,100 | < 280 | 280 | < 290 | 290 |
| **Hexachlorobutadiene** | | | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **Isopropylbenzene** | | | < 6300 | 6,300 | **480** | 290 | **1,200** | 290 | **20,000** | 3,000 | **17,000** | 2,900 | **8,300** | 3,100 | < 280 | 280 | < 290 | 290 |
| **m&p-Xylene** | | | **6,500** | 6,300 | < 290 | 290 | < 290 | 290 | **68,000** | 3,000 | **68,000** | 2,900 | **20,000** | 3,100 | < 280 | 280 | < 290 | 290 |
| **Methyl ethyl ketone** | 120 | 100,000 | < 32000 | 32,000 | < 1500 | 1,500 | < 1500 | 1,500 | < 15000 | 15,000 | < 15000 | 15,000 | < 15000 | 15,000 | < 1400 | 1,400 | < 1500 | 1,500 |
| **Methyl t-butyl ether (MTBE)** | 930 | 100,000 | < 13000 | 13,000 | < 580 | 580 | < 580 | 580 | < 6100 | 6,100 | < 5800 | 5,800 | < 6200 | 6,200 | < 560 | 560 | < 580 | 580 |
| **Methylene chloride** | 50 | 100,000 | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **Napthalene** | | | < 6300 | 6,300 | **460** | 290 | < 290 | 290 | **28,000** | 3,000 | **28,000** | 2,900 | **23,000** | 3,100 | < 280 | 280 | < 290 | 290 |
| **n-Butylbenzene** | 12,000 | 100,000 | **8,900** | 6,300 | **800** | 290 | **1,500** | 290 | **53,000** | 3,000 | **32,000** | 2,900 | **18,000** | 3,100 | **730** | 280 | < 290 | 290 |
| **n-Propylbenzene** | 3,900 | 100,000 | **10,000** | 6,300 | **720** | 290 | **2,500** | 290 | **45,000** | 3,000 | **31,000** | 2,900 | **17,000** | 3,100 | **660** | 280 | < 290 | 290 |
| **o-Xylene** | | | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | **42,000** | 3,000 | **44,000** | 2,900 | **20,000** | 3,100 | < 280 | 280 | < 290 | 290 |
| **p-Isopropyltoluene** | | | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | **43,000** | 3,000 | **27,000** | 2,900 | **23,000** | 3,100 | < 280 | 280 | < 290 | 290 |
| **sec-Butylbenzene** | 11,000 | 100,000 | **8,300** | 6,300 | **1,600** | 290 | **1,900** | 290 | **43,000** | 3,000 | **27,000** | 2,900 | **19,000** | 3,100 | **970** | 280 | < 290 | 290 |
| **Styrene** | | | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **tert-Butylbenzene** | | | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | **3,100** | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **Tetrachloroethene** | 1,300 | 19,000 | **10,000,000** | 3,200,000 | < 290 | 290 | **400** | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **Tetrahydrofuran (THF)** | | | < 13000 | 13,000 | < 580 | 580 | < 580 | 580 | < 6100 | 6,100 | < 5800 | 5,800 | < 6200 | 6,200 | < 560 | 560 | < 580 | 580 |
| **Toluene** | 700 | 100,000 | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | **4,700** | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **Total Xylenes** | 260 | 100,000 | **6,500** | 6,300 | < 290 | 290 | < 290 | 290 | **110,000** | 3,000 | **112,000** | 2,900 | **40,000** | 3,100 | < 280 | 280 | < 290 | 290 |
| **trans-1,2-Dichloroethene** | 190 | 100,000 | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **trans-1,3-Dichloropropene** | | | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **trans-1,4-dichloro-2-butene** | | | < 13000 | 13,000 | < 580 | 580 | < 580 | 580 | < 6100 | 6,100 | < 5800 | 5,800 | < 6200 | 6,200 | < 560 | 560 | < 580 | 580 |
| **Trichloroethene** | 470 | 21,000 | **570,000** | 63,000 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **Trichlorofluoromethane** | | | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **Trichlorotrifluoroethane** | | | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | < 290 | 290 |
| **Vinyl chloride** | 20 | 900 | < 6300 | 6,300 | < 290 | 290 | < 290 | 290 | < 3000 | 3,000 | < 2900 | 2,900 | < 3100 | 3,100 | < 280 | 280 | **590** | 290 |
| **Total CVOC Concentration** | | | **10,592,000** | | **0** | | **400** | | **33,000** | | **9,600** | | **16,000** | | **0** | | **910** | |
| **Total PVOC Concentration** | | | **97,700** | | **4,550** | | **7,650** | | **880,700** | | **654,400** | | **428,900** | | **2,360** | | **0** | |
| **Total VOCs Concentration** | | | **10,696,200** | | **4,550** | | **8,050** | | **1,023,700** | | **776,000** | | **484,900** | | **2,360** | | **910** | |

**Notes:**

** - 6 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives

ND - Not-detected

RL - Reporting Limit

**Bold/highlighted- Indicated exceedance of the NYSDEC UUSCO Guidance Value**

**Bold/highlighted- Indicated exceedance of the NYSDEC RRSCO Guidance Value**

TABLE 2
808 East 139th Street,
Bronx, New York
Soil Analytical Results
Semi-Volatile Organic Compounds

| COMPOUND | NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives | NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives* | B1 6-8 µg/Kg | | B2 6-8 µg/Kg | | B3 6-8 µg/Kg | | B4 6-8 µg/Kg | | B5 6-8 µg/Kg | | B6 6-8 µg/Kg | | B7 6-8 µg/Kg | | B8 6-8 µg/Kg | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Result | RL | Result | RL | Result | RL | Result | RL | Result | RL | Result | RL | Result | RL | Result | RL |
| Acenaphthene | 20,000 | 100,000 | < 2900 | 2,900 | < 270 | 270 | < 6700 | 6,700 | < 28000 | 28,000 | < 2700 | 2,700 | < 29000 | 29,000 | < 260 | 260 | < 270 | 270 |
| Acenaphthylene | 100,000 | 100,000 | < 2900 | 2,900 | < 270 | 270 | < 6700 | 6,700 | < 28000 | 28,000 | < 2700 | 2,700 | < 29000 | 29,000 | < 260 | 260 | < 270 | 270 |
| Anthracene | | | < 2900 | 2,900 | < 270 | 270 | < 6700 | 6,700 | < 28000 | 28,000 | < 2700 | 2,700 | < 29000 | 29,000 | < 260 | 260 | < 270 | 270 |
| Benz(a)anthracene | 1,000 | 1,000 | < 2900 | 2,900 | < 270 | 270 | < 6700 | 6,700 | < 28000 | 28,000 | < 2700 | 2,700 | < 29000 | 29,000 | < 260 | 260 | < 270 | 270 |
| Benzo(a)pyrene | 1,000 | 1,000 | < 2900 | 2,900 | < 270 | 270 | < 6700 | 6,700 | < 28000 | 28,000 | < 2700 | 2,700 | < 29000 | 29,000 | < 260 | 260 | < 270 | 270 |
| Benzo(b)fluoranthene | 1,000 | 1,000 | < 2900 | 2,900 | < 270 | 270 | < 6700 | 6,700 | < 28000 | 28,000 | < 2700 | 2,700 | < 29000 | 29,000 | < 260 | 260 | < 270 | 270 |
| Benzo(ghi)perylene | 100,000 | 100,000 | < 2900 | 2,900 | < 270 | 270 | < 6700 | 6,700 | < 28000 | 28,000 | < 2700 | 2,700 | < 29000 | 29,000 | < 260 | 260 | < 270 | 270 |
| Benzo(k)fluoranthene | 800 | 1,000 | < 2900 | 2,900 | < 270 | 270 | < 6700 | 6,700 | < 28000 | 28,000 | < 2700 | 2,700 | < 29000 | 29,000 | < 260 | 260 | < 270 | 270 |
| Chrysene | 1,000 | 1,000 | < 2900 | 2,900 | < 270 | 270 | **6,700** | 6,700 | < 28000 | 28,000 | < 2700 | 2,700 | < 29000 | 29,000 | < 260 | 260 | < 270 | 270 |
| Dibenz(a,h)anthracene | 330 | 330 | < 2900 | 2,900 | < 270 | 270 | < 6700 | 6,700 | < 28000 | 28,000 | < 2700 | 2,700 | < 29000 | 29,000 | < 260 | 260 | < 270 | 270 |
| Fluoranthene | 100,000 | 100,000 | **4,900** | 2,900 | < 270 | 270 | < 6700 | 6,700 | < 28000 | 28,000 | < 2700 | 2,700 | < 29000 | 29,000 | < 260 | 260 | < 270 | 270 |
| Fluorene | 30,000 | 100,000 | < 2900 | 2,900 | < 270 | 270 | < 6700 | 6,700 | < 28000 | 28,000 | < 2700 | 2,700 | < 29000 | 29,000 | < 260 | 260 | < 270 | 270 |
| Indeno(1,2,3-cd)pyrene | 500 | 500 | < 2900 | 2,900 | < 270 | 270 | < 6700 | 6,700 | < 28000 | 28,000 | < 2700 | 2,700 | < 29000 | 29,000 | < 260 | 260 | < 270 | 270 |
| Naphthalene | 12,000 | 100,000 | **12,000** | 2,900 | < 270 | 270 | < 6700 | 6,700 | **33,000** | 28,000 | **18,000** | 2,700 | < 29000 | 29,000 | < 260 | 260 | < 270 | 270 |
| Phenanthrene | 100,000 | 100,000 | **5,100** | 2,900 | < 270 | 270 | **8,600** | 6,700 | < 28000 | 28,000 | < 2700 | 2,700 | < 29000 | 29,000 | < 260 | 260 | < 270 | 270 |
| Pyrene | 100,000 | 100,000 | **4,600** | 2,900 | < 270 | 270 | **7,000** | 6,700 | < 28000 | 28,000 | < 2700 | 2,700 | < 29000 | 29,000 | < 260 | 260 | < 270 | 270 |

**Notes:**

** - 6 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives

ND - Not-detected

RL - Reporting Limit

**Bold/highlighted- Indicated exceedance of the NYSDEC UUSCO Guidance Value**

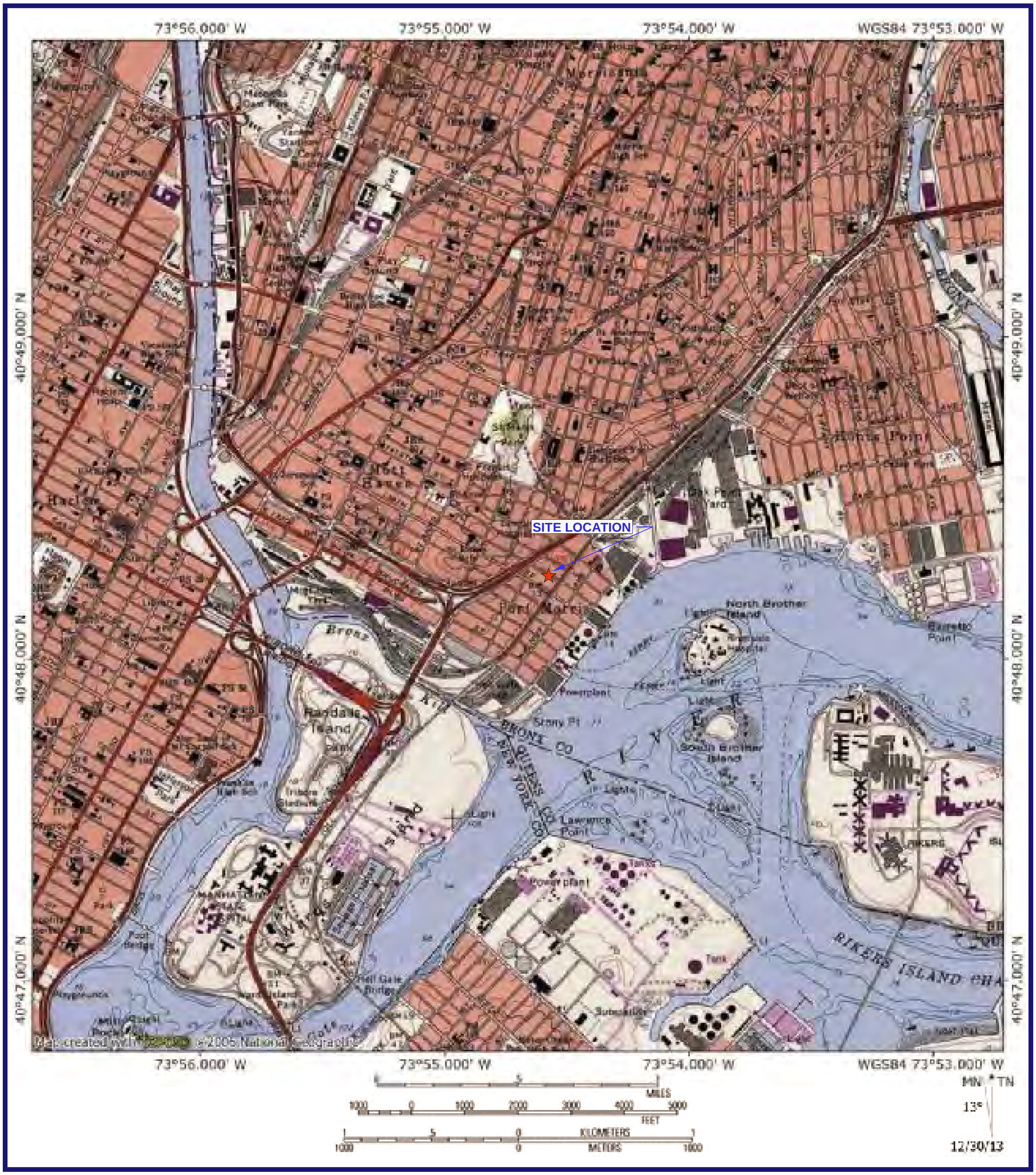
**Bold/highlighted- Indicated exceedance of the NYSDEC RRSCO Guidance Value**

TABLE 3
808 East 139th Street,
Bronx, New York
Grounwater Analytical Results
Volatile Organic Compounds

| Compound | NYSDEC Groundwater Quality Standards | GW1 | | GW2 | | GW3 | | GW4 | | GW5 | | GW6 | | GW7 | | GW8 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | |
| | | Result | RL | Result | RL | Result | RL | Result | RL | Result | RL | Result | RL | Result | RL | Result | RL |
| 1,1,1,2-Tetrachlorothane | 5 | < 100 | 100 | < 5.0 | 5 | < 10 | 10 | < 20 | 20 | < 10 | 10 | < 20 | 20 | < 5.0 | 5 | < 2.0 | 2 |
| 1,1,1-Trichloroethane | 5 | < 100 | 100 | < 5.0 | 5 | < 10 | 10 | < 20 | 20 | < 10 | 10 | < 20 | 20 | < 5.0 | 5 | < 2.0 | 2 |
| 1,1,2,2-Tetrachloroethane | 5 | < 50 | 50 | < 2.5 | 2.5 | < 5.0 | 5 | < 10 | 10 | < 5.0 | 5 | < 10 | 10 | < 2.5 | 2.5 | < 1.0 | 1 |
| 1,1,2-Trichloroethane | 1 | < 100 | 100 | < 5.0 | 5 | < 10 | 10 | < 20 | 20 | < 10 | 10 | < 20 | 20 | < 5.0 | 5 | < 2.0 | 2 |
| 1,1-Dichloroethane | 5 | < 100 | 100 | < 5.0 | 5 | < 10 | 10 | < 20 | 20 | < 10 | 10 | < 20 | 20 | < 5.0 | 5 | < 2.0 | 2 |
| 1,1-Dichloroethene | 5 | **170** | 100 | < 5.0 | 5 | < 10 | 10 | < 20 | 20 | < 10 | 10 | < 20 | 20 | < 5.0 | 5 | < 2.0 | 2 |
| 1,1-Dichloropropene | | < 100 | 100 | < 5.0 | 5 | < 10 | 10 | < 20 | 20 | < 10 | 10 | < 20 | 20 | < 5.0 | 5 | < 2.0 | 2 |
| 1,2,3-Trichlorobenzene | | < 100 | 100 | < 5.0 | 5 | < 10 | 10 | < 20 | 20 | < 10 | 10 | < 20 | 20 | < 5.0 | 5 | < 2.0 | 2 |
| 1,2,3-Trichloropropane | | < 100 | 100 | < 5.0 | 5 | < 10 | 10 | < 20 | 20 | < 10 | 10 | < 20 | 20 | < 5.0 | 5 | < 2.0 | 2 |
| 1,2,4-Trichlorobenzene | | < 100 | 100 | < 5.0 | 5 | < 10 | 10 | < 20 | 20 | < 10 | 10 | < 20 | 20 | < 5.0 | 5 | < 2.0 | 2 |
| 1,2,4-Trimethylbenzene | 5 | **230** | 100 | **24** | 5 | **650** | 40 | **3,000** | 100 | **1,900** | 100 | **1,700** | 500 | **15** | 5 | < 2.0 | 2 |
| 1,2-Dibromo-3-chloropropane | | < 100 | 100 | < 5.0 | 5 | < 10 | 10 | < 20 | 20 | < 10 | 10 | < 20 | 20 | < 5.0 | 5 | < 2.0 | 2 |
| 1,2-Dibromoethane | | < 100 | 100 | < 5.0 | 5 | < 10 | 10 | < 20 | 20 | < 10 | 10 | < 20 | 20 | < 5.0 | 5 | < 2.0 | 2 |
| 1,2-Dichlorobenzene | | < 100 | 100 | < 5.0 | 5 | < 10 | 10 | < 20 | 20 | < 10 | 10 | < 20 | 20 | < 5.0 | 5 | < 2.0 | 2 |
| 1,2-Dichloroethane | 0.6 | < 60 | 60 | < 3.0 | 3 | < 6.0 | 6 | < 12 | 12 | < 6.0 | 6 | < 12 | 12 | < 3.0 | 3 | < 1.2 | 1.2 |
| 1,2-Dichloropropane | 0.94 | < 100 | 100 | < 5.0 | 5 | < 10 | 10 | < 20 | 20 | < 10 | 10 | < 20 | 20 | < 5.0 | 5 | < 2.0 | 2 |
| 1,3,5-Trimethylbenzene | 5 | < 100 | 100 | < 5.0 | 5 | **130** | 40 | **530** | 20 | **590** | 100 | **530** | 20 | **7.1** | 5 | < 2.0 | 2 |
| 1,3-Dichlorobenzene | | < 100 | 100 | < 5.0 | 5 | < 10 | 10 | < 20 | 20 | < 10 | 10 | < 20 | 20 | < 5.0 | 5 | < 2.0 | 2 |
| 1,3-Dichloropropane | | < 100 | 100 | < 5.0 | 5 | < 10 | 10 | < 20 | 20 | < 10 | 10 | < 20 | 20 | < 5.0 | 5 | < 2.0 | 2 |
| 1,4-Dichlorobenzene | | < 100 | 100 | < 5.0 | 5 | < 10 | 10 | < 20 | 20 | < 10 | 10 | < 20 | 20 | < 5.0 | 5 | < 2.0 | 2 |
| 2,2-Dichloropropane | | < 100 | 100 | < 5.0 | 5 | < 10 | 10 | < 20 | 20 | < 10 | 10 | < 20 | 20 | < 5.0 | 5 | < 2.0 | 2 |
| 2-Chlorotoluene | | < 100 | 100 | < 5.0 | 5 | < 10 | 10 | < 20 | 20 | < 10 | 10 | < 20 | 20 | < 5.0 | 5 | < 2.0 | 2 |
| 2-Hexanone (Methyl Butyl Ketone) | | < 500 | 500 | < 25 | 25 | < 50 | 50 | < 100 | 100 | < 50 | 50 | < 100 | 100 | < 25 | 25 | < 10 | 10 |
| 2-Isopropyltoluene | | < 100 | 100 | **38** | 5 | **82** | 40 | **42** | 20 | **28** | 10 | **43** | 20 | **26** | 5 | < 2.0 | 2 |
| 4-Chlorotoluene | | < 100 | 100 | < 5.0 | 5 | < 10 | 10 | < 20 | 20 | < 10 | 10 | < 20 | 20 | < 5.0 | 5 | < 2.0 | 2 |
| 4-Methyl-2-Pentanone | | < 500 | 500 | < 25 | 25 | < 50 | 50 | < 100 | 100 | < 50 | 50 | < 100 | 100 | < 25 | 25 | < 10 | 10 |
| Acetone | 50 | < 2500 | 2,500 | < 130 | 130 | < 250 | 250 | < 500 | 500 | < 250 | 250 | < 500 | 500 | < 130 | 130 | < 50 | 50 |
| Acrylonitrile | | < 500 | 500 | < 25 | 25 | < 50 | 50 | < 100 | 100 | < 50 | 50 | < 100 | 100 | < 25 | 25 | < 10 | 10 |
| Benzene | 1 | < 70 | 70 | < 3.5 | 3.5 | < 7.0 | 7 | **16** | 14 | **12** | 7 | < 14 | 14 | < 3.5 | 3.5 | **3.9** | 1.4 |
| Bromobenzene | | < 100 | 100 | < 5.0 | 5 | < 10 | 10 | < 20 | 20 | < 10 | 10 | < 20 | 20 | < 5.0 | 5 | < 2.0 | 2 |
| Bromochloromethane | 5 | < 100 | 100 | < 5.0 | 5 | < 10 | 10 | < 20 | 20 | < 10 | 10 | < 20 | 20 | < 5.0 | 5 | < 2.0 | 2 |
| Bromodichloromethane | | < 50 | 50 | < 2.5 | 2.5 | < 5.0 | 5 | < 10 | 10 | < 5.0 | 5 | < 10 | 10 | < 2.5 | 2.5 | < 1.0 | 1 |
| Bromoform | | < 100 | 100 | < 5.0 | 5 | < 10 | 10 | < 20 | 20 | < 10 | 10 | < 20 | 20 | < 5.0 | 5 | < 2.0 | 2 |
| Bromomethane | 5 | < 100 | 100 | < 5.0 | 5 | < 10 | 10 | < 20 | 20 | < 10 | 10 | < 20 | 20 | < 5.0 | 5 | < 2.0 | 2 |
| Carbon Disulfide | | < 500 | 500 | < 25 | 25 | < 50 | 50 | < 100 | 100 | < 50 | 50 | < 100 | 100 | < 25 | 25 | < 10 | 10 |
| Carbon tetrachloride | 5 | < 100 | 100 | < 5.0 | 5 | < 10 | 10 | < 20 | 20 | < 10 | 10 | < 20 | 20 | < 5.0 | 5 | < 2.0 | 2 |
| Chlorobenzene | | < 100 | 100 | < 5.0 | 5 | < 10 | 10 | < 20 | 20 | < 10 | 10 | < 20 | 20 | < 5.0 | 5 | < 2.0 | 2 |
| Chloroethane | | < 100 | 100 | < 5.0 | 5 | < 10 | 10 | < 20 | 20 | < 10 | 10 | < 20 | 20 | < 5.0 | 5 | < 2.0 | 2 |
| Chloroform | 7 | < 100 | 100 | < 5.0 | 5 | < 10 | 10 | < 20 | 20 | < 10 | 10 | < 20 | 20 | < 5.0 | 5 | < 2.0 | 2 |
| Chloromethane | | < 100 | 100 | < 5.0 | 5 | < 10 | 10 | < 20 | 20 | < 10 | 10 | < 20 | 20 | < 5.0 | 5 | < 2.0 | 2 |
| cis-1,2-Dichloroethene | 5 | **69,000** | 4,000 | **12** | 5 | **140** | 10 | **890** | 100 | **2,300** | 100 | **16,000** | 1,000 | < 5.0 | 5 | **2.2** | 2 |
| cis-1,3-Dichloropropene | | < 40 | 40 | < 2.0 | 2 | < 4.0 | 4 | < 8.0 | 8 | < 4.0 | 4 | < 8.0 | 8 | < 2.0 | 2 | < 0.80 | 0.8 |
| Dibromochloromethane | | < 50 | 50 | < 2.5 | 2.5 | < 5.0 | 5 | < 10 | 10 | < 5.0 | 5 | < 10 | 10 | < 2.5 | 2.5 | < 1.0 | 1 |
| Dibromoethane | | < 100 | 100 | < 5.0 | 5 | < 10 | 10 | < 20 | 20 | < 10 | 10 | < 20 | 20 | < 5.0 | 5 | < 2.0 | 2 |
| Dibromomethane | | < 100 | 100 | < 5.0 | 5 | < 10 | 10 | < 20 | 20 | < 10 | 10 | < 20 | 20 | < 5.0 | 5 | < 2.0 | 2 |
| Ethylbenzene | 5 | < 100 | 100 | **11** | 5 | **89** | 10 | **180** | 20 | **270** | 10 | **100** | 20 | < 5.0 | 5 | < 2.0 | 2 |
| Hexachlorobutadiene | | < 40 | 40 | < 2.0 | 2 | < 4.0 | 4 | < 8.0 | 8 | < 4.0 | 4 | < 8.0 | 8 | < 2.0 | 2 | < 0.80 | 0.8 |
| Isopropylbenzene | 5 | < 100 | 100 | **140** | 5 | **180** | 40 | **110** | 20 | **110** | 10 | **90** | 20 | **51** | 5 | < 2.0 | 2 |
| m&p-Xylenes | 5 | < 100 | 100 | < 5.0 | 5 | **59** | 10 | **460** | 20 | **760** | 100 | **340** | 20 | < 5.0 | 5 | < 2.0 | 2 |
| Methyl Ethyl Ketone (2-Butanone) | | < 500 | 500 | < 25 | 25 | < 50 | 50 | < 100 | 100 | < 50 | 50 | < 100 | 100 | < 25 | 25 | < 10 | 10 |
| Methyl t-butyl ether (MTBE) | | < 100 | 100 | < 5.0 | 5 | < 10 | 10 | < 20 | 20 | < 10 | 10 | < 20 | 20 | < 5.0 | 5 | **3.7** | 2 |
| Methylene chloride | | < 100 | 100 | < 5.0 | 5 | < 10 | 10 | < 20 | 20 | < 10 | 10 | < 20 | 20 | < 5.0 | 5 | < 2.0 | 2 |
| Naphthalene | 5 | < 100 | 100 | **180** | 25 | **30** | 10 | **210** | 20 | **270** | 100 | **380** | 20 | **11** | 5 | < 2.0 | 2 |
| n-Butylbenzene | 5 | < 100 | 100 | **54** | 5 | **250** | 40 | **140** | 20 | **71** | 10 | **100** | 20 | **55** | 5 | < 2.0 | 2 |
| n-Propylbenzene | 5 | < 100 | 100 | **270** | 25 | **400** | 40 | **210** | 20 | **190** | 10 | **160** | 20 | **110** | 5 | < 2.0 | 2 |
| o-Xylene | 5 | < 100 | 100 | < 5.0 | 5 | **77** | 10 | **340** | 20 | **370** | 10 | **340** | 20 | < 5.0 | 5 | < 2.0 | 2 |
| p-Isopropyltoluene | 5 | < 100 | 100 | < 5.0 | 5 | **67** | 40 | **120** | 20 | **85** | 10 | **130** | 20 | < 5.0 | 5 | < 2.0 | 2 |
| sec-Butylbenzene | 5 | < 100 | 100 | **85** | 5 | **240** | 40 | **130** | 20 | **76** | 10 | **100** | 20 | < 5.0 | 5 | **6.5** | 2 |
| Styrene | | < 100 | 100 | < 5.0 | 5 | < 10 | 10 | < 20 | 20 | **12** | 10 | < 20 | 20 | < 5.0 | 5 | < 2.0 | 2 |
| tert-Butylbenzene | 5 | < 100 | 100 | **17** | 5 | **12** | 10 | < 20 | 20 | **11** | 10 | < 20 | 20 | **12** | 5 | < 2.0 | 2 |
| Tetrachloroethene | 5 | **55,000** | 2,000 | **21** | 5 | **1,200** | 40 | **26** | 20 | **16** | 10 | < 20 | 20 | < 5.0 | 5 | < 2.0 | 2 |
| Tetrahydrofuran (THF) | | < 250 | 250 | < 13 | 13 | < 25 | 25 | < 50 | 50 | < 25 | 25 | < 50 | 50 | < 13 | 13 | < 5.0 | 5 |
| Toluene | 5 | < 100 | 100 | < 5.0 | 5 | **10** | 10 | **80** | 20 | **68** | 10 | **46** | 20 | < 5.0 | 5 | < 2.0 | 2 |
| Total Xylenes | 5 | < 200 | 200 | < 10 | 10 | **136** | 20 | **800** | 40 | **1,130** | 200 | **680** | 40 | < 10 | 10 | < 4.0 | 4 |
| trans-1,2-Dichloroethene | 5 | **120** | 100 | < 5.0 | 5 | < 10 | 10 | < 20 | 20 | < 10 | 10 | **38** | 20 | < 5.0 | 5 | < 2.0 | 2 |
| trans-1,3-Dichloropropene | | < 40 | 40 | < 2.0 | 2 | < 4.0 | 4 | < 8.0 | 8 | < 4.0 | 4 | < 8.0 | 8 | < 2.0 | 2 | < 0.80 | 0.8 |
| trabs-1,4-dichloro-2-butene | | < 500 | 500 | < 25 | 25 | < 50 | 50 | < 100 | 100 | < 50 | 50 | < 100 | 100 | < 25 | 25 | < 10 | 10 |
| Trichloroethene | 5 | **21,000** | 2,000 | < 5.0 | 5 | **170** | 10 | < 20 | 20 | < 10 | 10 | < 20 | 20 | < 5.0 | 5 | < 2.0 | 2 |
| Trichlorofluoromethane | | < 100 | 100 | < 5.0 | 5 | < 10 | 10 | < 20 | 20 | < 10 | 10 | < 20 | 20 | < 5.0 | 5 | < 2.0 | 2 |
| Trichlorotrifluoroethane | | < 100 | 100 | < 5.0 | 5 | < 10 | 10 | < 20 | 20 | < 10 | 10 | < 20 | 20 | < 5.0 | 5 | < 2.0 | 2 |
| Vinyl Chloride | 2 | **770** | 100 | < 5.0 | 5 | **29** | 10 | **32** | 20 | **130** | 10 | **310** | 20 | < 5.0 | 5 | **45** | 2 |
| Total PVOC Concentration | | 230 | | 819 | | 2,276 | | 5,568 | | 4,823 | | 4,059 | | 236 | | 14 | |
| Total CVOCs Concentration | | 146,060 | | 33 | | 1,539 | | 948 | | 2,446 | | 16,310 | | 0 | | 47 | |

**Notes:**
ND - Not detected
**Bold/highlighted- Indicated exceedance of the NYSDEC Groundwater Standard**

# ***FIGURES***



USGS Brooklyn Quadrangle 1995, Contour Interval = 10 feet

**EBC**

**ENVIRONMENTAL BUSINESS CONSULTANTS**

*Phone* 631.504.6000
*Fax* 631. 924 .2870

808 EAST 139TH STREET
BRONX, NY

**FIGURE 1** SITE LOCATION MAP

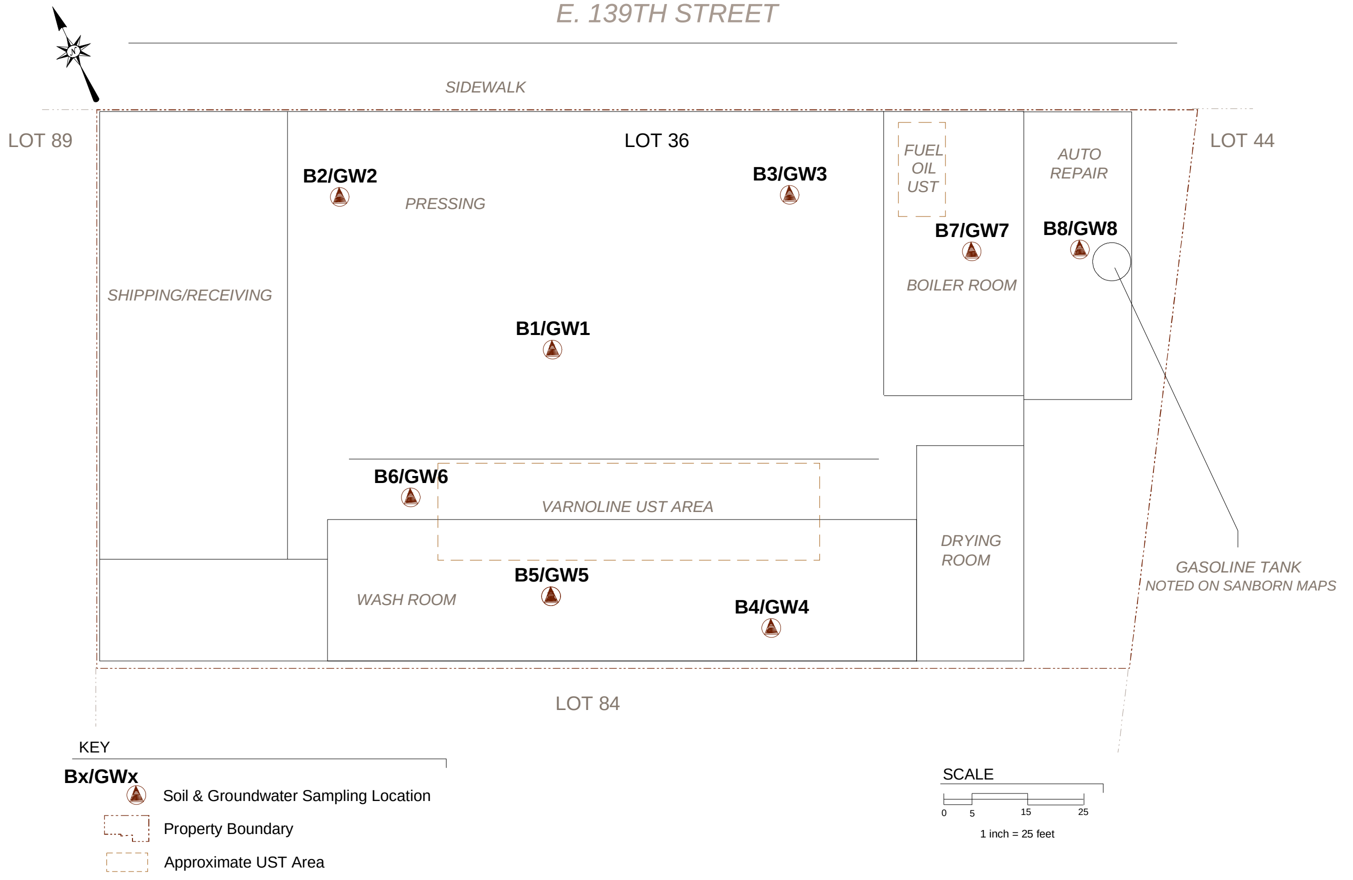


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Figure No.
2

Site Name: HISTORIC DRYCLEANER & AUTO REPAIR
Site Address: 808 E. 139TH STREET, BRONX, NY
Drawing Title: SITE PLAN

## Table 1
## Summary of Detected Compounds in Soil Samples

| Analytical Parameters | DEC-01<br>5-7'<br>8/13/2014 | DEC-02<br>5-7'<br>8/14/2014 | DEC-02<br>10-15'<br>8/14/2014 | DEC-03<br>5-7'<br>8/18/2014 | DEC-04<br>5-7'<br>8/18/2014 | DEC-05<br>3-5'<br>8/19/2014 | NYSDEC<br>Part 375<br>UUSCO |
|---|---|---|---|---|---|---|---|
| *VOCs (ppb)* | | | | | | | |
| **1,1,1-Trichloroethane** | 0.90 U | 1.1 U | 2.4 U | 0.99 U J | 0.95 U | 1.1 U | **680** |
| **1,1,2,2-Tetrachloroethane** | 0.90 U | 1.1 U | 2.4 U | 0.99 U | 0.95 U | 1.1 U | **NA** |
| **1,1,2-Trichloro-1,2,2-trifluoroethane** | 0.90 U | 1.1 U | 2.4 U | 0.99 U | 0.95 U | 1.1 U | **NA** |
| **1,1,2-Trichloroethane** | 0.90 U | 1.1 U | 2.4 U | 0.99 U J | 0.95 U | 1.1 U | **NA** |
| **1,1-Dichloroethane** | 0.90 U | 1.1 U | 2.4 U | 0.99 U | 0.95 U | 1.1 U | **270** |
| **1,1-Dichloroethene** | 0.90 U | 1.1 U | 2.4 U | 0.99 U | 0.95 U | 1.1 U | **330** |
| **1,2,3-Trichlorobenzene** | 0.90 U | 1.1 U | 2.4 U | 0.99 U J | 0.95 U | 1.1 U | **NA** |
| **1,2,4-Trichlorobenzene** | 0.90 U | 1.1 U | 2.4 U | 0.99 U J | 0.95 U | 1.1 U | **NA** |
| **1,2-Dichloropropane** | 0.90 U | 1.1 U | 2.4 U | 0.99 U | 0.95 U | 1.1 U | **NA** |
| **1,3-Dichlorobenzene** | 0.90 U | 1.1 U | 2.4 U | 0.99 U J | 0.95 U | 1.1 U | **2,400** |
| **1,4-Dichlorobenzene** | 0.90 U | 1.1 U | 2.4 U | 0.99 U J | 0.95 U | 1.1 U | **1,800** |
| **1,4-Dioxane** | 18 U | 22 U | 48 U | 20 U | 19 U | 22 U | **100** |
| **2-Butanone (MEK)** | 4.5 U J | 5.5 U | 12 U J | 4.9 U | 4.7 U | 5.5 U | **NA** |
| **2-Hexanone** | 4.5 U | 5.5 U | 12 U | 4.9 U | 4.7 U J | 5.5 U J | **NA** |
| **4-Methyl-2-pentanone (MIBK)** | 4.5 U | 5.5 U | 12 U | 4.9 U | 4.7 U J | 5.5 U J | **NA** |
| **Acetone** | 4.5 U J | 15 U | 63 U J | 8.5 U | 4.7 U | 5.5 U | **50** |
| **Benzene** | 0.90 U | 0.72 J | 0.89 J | 0.99 U | 0.49 J | 1.1 U | **60** |
| **Bromoform** | 0.90 U | 1.1 U | 2.4 U | 0.99 U J | 0.95 U | 1.1 U | **NA** |
| **Bromomethane** | 0.90 U | 1.1 U J | 2.4 U | 0.99 U J | 0.95 U | 1.1 U | **NA** |
| **Carbon disulfide** | 0.90 U | 1.1 U | 31 | 0.99 U | 0.95 U | 1.1 U | **NA** |
| **Carbon tetrachloride** | 0.90 U | 1.1 U | 2.4 U | 0.99 U | 0.95 U | 1.1 U | **760** |
| **Chlorobenzene** | 0.90 U | 1.1 U | 2.4 U | 0.99 U J | 0.95 U | 1.1 U | **1,100** |
| **Chlorobromomethane** | 0.90 U | 1.1 U | 2.4 U | 0.99 U J | 0.95 U | 1.1 U | **NA** |
| **Chlorodibromomethane** | 0.90 U | 1.1 U | 2.4 U | 0.99 U | 0.95 U | 1.1 U | **NA** |
| **Chloroethane** | 0.90 U | 1.1 U | 2.4 U | 0.99 U J | 0.95 U | 1.1 U | **NA** |
| **Chloroform** | 0.90 U | 1.1 U | 2.4 U | 0.99 U J | 0.95 U | 1.1 U | **370** |
| **Chloromethane** | 0.90 U | 1.1 U | 2.4 U | 0.99 U | 0.95 U | 1.1 U | **NA** |
| **cis-1,2-Dichloroethene** | 8.5 | 1.1 U | 2.4 U | 0.99 U J | 0.95 U | 1.1 U | **250** |
| **cis-1,3-Dichloropropene** | 0.90 U | 1.1 U | 2.4 U | 0.99 U J | 0.95 U | 1.1 U | **NA** |
| **Cyclohexane** | 0.90 U | 1.1 U | 2.4 U | 0.99 U | 0.95 U | 1.1 U | **NA** |
| **Dichlorobromomethane** | 0.90 U | 1.1 U | 2.4 U | 0.99 U J | 0.95 U | 1.1 U | **NA** |
| **Dichlorodifluoromethane** | 0.90 U | 1.1 U | 2.4 U | 0.99 U | 0.95 U | 1.1 U | **NA** |
| **Ethylbenzene** | 0.90 U | 1.1 U | 1.6 J | 0.99 U J | 0.24 J | 1.1 U | **1,000** |
| **Ethylene Dibromide** | 0.90 U | 1.1 U | 2.4 U | 0.99 U J | 0.95 U | 1.1 U | **NA** |
| **Isopropylbenzene** | 0.90 U | 1.1 U | 2.4 U | 0.99 U J | 0.95 U | 1.1 U | **NA** |
| **Methyl Acetate** | 4.5 U | 5.5 U | 12 U | 4.9 U | 4.7 U J | 5.5 U J | **NA** |
| **Methyl tert-butyl ether (MTBE)** | 0.90 U | 1.1 U | 2.4 U | 0.99 U J | 0.95 U | 1.1 U | **930** |
| **Methylcyclohexane** | 0.90 U | 1.1 U | 2.4 U | 0.99 U | 0.95 U | 1.1 U | **NA** |
| **Methylene chloride** | 0.90 U | 3.4 U | 2.4 U | 0.99 U | 0.95 U | 1.1 U | **60** |
| **m-Xylene & p-Xylene** | 0.90 U | 0.67 J | 5.6 | 0.99 U J | 0.95 U | 1.1 U | **260** |
| **o-Xylene** | 0.90 U | 0.38 J | 2.6 | 0.99 U J | 0.95 U | 1.1 U | **260** |
| **Styrene** | 0.90 U | 1.1 U | 2.4 U | 0.99 U J | 0.95 U | 1.1 U | **NA** |
| **Tetrachloroethene** | 11 | 5.1 | 2.4 U | 0.99 U J | 0.95 U | 1.1 U | **1,300** |
| **Toluene** | 0.90 U | 1.1 U | 2.4 U | 0.99 U J | 0.45 J | 1.1 U | **700** |
| **trans-1,2-Dichloroethene** | 0.33 J | 1.1 U | 2.4 U | 0.99 U J | 0.95 U | 1.1 U | **190** |
| **trans-1,3-Dichloropropene** | 0.90 U | 1.1 U | 2.4 U | 0.99 U J | 0.95 U | 1.1 U | **NA** |
| **Trichloroethene** | 11 | 1.1 U | 2.4 U | 0.99 U J | 0.95 U | 1.1 U | **470** |
| **Trichlorofluoromethane** | 0.90 U | 1.1 U | 2.4 U | 0.99 U J | 0.95 U | 1.1 U | **NA** |
| **Vinyl chloride** | 0.90 U | 1.1 U | 2.4 U | 0.99 U | 0.95 U | 1.1 U | **20** |
| **1,2-Dichloroethane** | 0.90 U | 1.1 U | 2.4 U | 0.99 U J | 0.95 U | 1.1 U | **20** |
| **1,2-Dichlorobenzene** | 0.90 U | 1.1 U | 2.4 U | 0.99 U J | 0.95 U | 1.1 U | **1,100** |
| **1,2-Dibromo-3-chloropropane** | 0.90 U | 1.1 U | 2.4 U | 0.99 U | 0.95 U J | 1.1 U J | **NA** |
| *SVOCs (ppb)* | | | | | | | |
| **Acenaphthene** | NS | NS | 2,800 U | NS | NS | NS | **20,000** |
| **Acenaphthylene** | NS | NS | 2,800 U | NS | NS | NS | **100,000** |
| **Anthracene** | NS | NS | 1,500 J | NS | NS | NS | **100,000** |
| **Benzo(a)anthracene** | NS | NS | **1,100** | NS | NS | NS | **1,000** |
| **Benzo(a)pyrene** | NS | NS | **1,000** | NS | NS | NS | **1,000** |
| **Benzo(b)fluoranthene** | NS | NS | 910 | NS | NS | NS | **1,000** |
| **Benzo(ghi)perylene** | NS | NS | 850 J | NS | NS | NS | **100,000** |
| **Benzo(k)fluoranthene** | NS | NS | 410 | NS | NS | NS | **800** |
| **Chrysene** | NS | NS | **1,100 J** | NS | NS | NS | **1,000** |
| **Dibenzo(a,h)anthracene** | NS | NS | 190 J | NS | NS | NS | **330** |
| **Fluoranthene** | NS | NS | 2,100 J | NS | NS | NS | **100,000** |
| **Fluorene** | NS | NS | 1,600 J | NS | NS | NS | **30,000** |
| **Indeno(1,2,3-cd)pyrene** | NS | NS | **830** | NS | NS | NS | **500** |
| **Naphthalene** | NS | NS | **23,000** | NS | NS | NS | **12,000** |
| **Phenanthrene** | NS | NS | 5,300 | NS | NS | NS | **100,000** |
| **Pyrene** | NS | NS | 2,400 J | NS | NS | NS | **100,000** |
| *PCBs (ppb)* | | | | | | | |
| **Polychlorinated biphentlys, Total** | NS | NS | 120 U | NS | NS | NS | **100** |

**Notes:**

1. NA = Not Applicable.
2. NYSDEC = New York State Department of Environmental Conservation.
3. ppb = parts per billion (µg/Kg).
4. VOCs = Volatile Organic Compounds.
5. SVOCs = Semi-Volatile Organic Compounds.
6. NS = Not sampled.
7. UUSCO = Unrestricted Use Soil Cleanup Objectives.
8. J = The analyte was positively identified; the associated numberical value is the approximate concentration of the analyte in the sample.
9. U J = The analyte was not detected above the sampling reporting limit; and the reporting limit is approximate.
10. U = The analyte was analyzed for, but was not detected above the sample reporting limit.
11. Highlighted cells indicate detections above limitations.

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# Table 2

## Summary of Detected Compounds in Groundwater Samples

| Analytical Parameter | DEC-01<br>9/10/2014 | DEC-02<br>9/10/2014 | DEC-03<br>9/10/2014 | DEC-04<br>9/9/2014 | DEC-05<br>9/9/2014 | EW-1<br>8/13/2014 | EW-2<br>8/13/2014 | NYSDEC Groundwater Quality Standards/Values (GA) |
|---|---|---|---|---|---|---|---|---|
| *VOCs (µg/L)* | | | | | | | | |
| **1,1,1-Trichloroethane** | 1 U | 5 U | 20 U | 1 U | 1 U | 1 U | 1 U | **5** |
| **1,1,2,2-Tetrachloroethane** | 1 U | 5 U | 20 U | 1 U | 1 U | 1 U | 1 U | **5** |
| **1,1,2-Tricholo-1,2,2-trifluoroethane** | 1 U | 5 U | 20 U | 1 U | 1 U | 1 U | 1 U | **5** |
| **1,1,2-Trichloroethane** | 1 U | 5 U | 20 U | 1 U | 1 U | 1 U | 1 U | **1** |
| **1,1-Dichloroethane** | 1 U | 5 U | 20 U | 1 U | 1 U | 1 U | 1 U | **5** |
| **1,1-Dichloroethene** | 1 U | 5 U | 20 U | 1 U | 1 U | 1 U | 1 U | **5** |
| **1,2,3-Trichlorobenzene** | 1 U | 5 U | 20 U | 1 U | 1 U | 1 U | 1 U | **5** |
| **1,2,4-Trichlorobenzene** | 1 U | 5 U | 20 U | 1 U | 1 U | 1 U | 1 U | **5** |
| **1,2-Dichloropropane** | 1 U | 5 U | 20 U | 1 U | 1 U | 1 U | 1 U | **1** |
| **1,3-Dichlorobenzene** | 1 U | 5 U | 20 U | 1 U | 1 U | 1 U | 1 U | **3** |
| **1,4-Dichlorobenzene** | 1 U | 5 U | 20 U | 1 U | 1 U | 1 U | 1 U | **3** |
| **1,4-Dioxane** | 50 U | 250 U | 1,000 U | 50 U | 50 U | 50 U | 50 U | **NA** |
| **2-Butanone (MEK)** | 5 U | 25 U | 100 U | 5 U | 5 U | 5 U | 5 U | **50** |
| **2-Hexanone** | 5 U | 25 U | 100 U | 5 U | 5 U | 5 U | 5 U | **50** |
| **4-Methyl-2-pentanone (MIBK)** | 5 U | 25 U J | 100 U J | 5 U J | 5 U | 5 U | 5 U | **NA** |
| **Acetone** | 5 U | 25 U | 100 U | 6.9 U | 5 U | 5 U | 5 U | **50** |
| **Benzene** | 1 U | **290** | **22** | 0.60 J | 1 U | 1 U | **22** | **1** |
| **Bromoform** | 1 U | 5 U | 20 U | 1 U | 1 U | 1 U | 1 U | **50** |
| **Bromomethane** | 1 U | 5 U | 20 U | 1 U | 1 U | 1 U | 1 U | **5** |
| **Carbon Disulfide** | 1 U | 13 | 20 U | 0.25 J | 1 U | 1 U | 1 U | **60** |
| **Carbon tetrachloride** | 1 U | 5 U | 20 U | 1 U | 1 U | 1 U | 1 U | **5** |
| **Chlorobenzene** | 1 U | 5 U | 20 U | 1 U | 1 U | 1 U | 1 U | **5** |
| **Chlorobromomethane** | 1 U | 5 U | 20 U | 1 U | 1 U | 1 U | 1 U | **NA** |
| **Chlorodibromomethane** | 1 U | 5 U | 20 U | 1 U | 1 U | 1 U | 1 U | **NA** |
| **Chloroethane** | 1 U | 5 U | 20 U | 1 U | 1 U | 1 U | 1 U | **5** |
| **Chloroform** | 1 U | 5 U | 20 U | 1 U | 1 U | 1 U | 1 U | **7** |
| **Chloromethane** | 1 U | 5 U | 20 U | 1 U | 1 U | 1 U | 1 U | **NA** |
| **cis-1,2-Dichloroethene** | 0.41 J | 1.6 J | 20 U | 1 U | 1 U | 0.39 J | 0.30 J | **5** |
| **cis-1,3-Dichloropropene** | 1 U | 5 U | 20 U | 1 U | 1 U | 1 U | 1 U | **NA** |
| **Cyclohexane** | 3.5 | 5 U | 20 U | 8.7 | 1 U | 0.45 J | 5.6 | **NA** |
| **Dichlorobromomethane** | 1 U | 5 U | 20 U | 1 U | 1 U | 1 U | 1 U | **5** |
| **Dichlorodifluoromethane** | 1 U | 5 U | 20 U | 1 U | 1 U | 1 U | 1 U | **5** |
| **Ethylbenzene** | 1 U | **67** | **410** | 1 U | 1 U | 1 U | **5** | **5** |
| **Ethylene Dibromide** | 1 U | 5 U | 20 U | 1 U | 1 U | 1 U | 1 U | **0.0006** |
| **Isopropylbenzene** | 1 U | 3.4 J | **53** | 2.1 | 1 U J | 1 U | **6.2** | **5** |
| **Methyl acetate** | 5 U | 25 U J | 100 U J | 5 U J | 5 U | 5 U | 5 U | **NA** |
| **Methyl tert-butyl ether (MTBE)** | 0.46 J | 1.6 J | 20 U | 0.32 J | 0.73 J | 1.1 | 1.3 | **10** |
| **Methylcyclohexane** | 1.1 | 0.70 J | 20 U | 5.8 | 1 U | 1 U | 4.9 | **NA** |
| **Methylene chloride** | 1 U | 5 U | 20 U | 1 U | 1 U | 1 U | 1 U | **5** |
| **m-Xylene & p-Xylene** | 1 U | **240** | **92** | 0.30 J | 1 U | 1 U | 1 | **5** |
| **o-Xylene** | 1 U | **99** | **94** | 0.19 J | 1 U | 1 U | 0.20 J | **5** |
| **Styrene** | 1 U | **7** | 20 U | 1 U | 1 U | 1 U | 1 U | **5** |
| **Tetrachloroethene** | 3.5 | 5 U | 20 U | 0.10 J | 1 U | 1 U | 1 U | **5** |
| **Toluene** | 1 U | **90** | **16 J** | 0.33 J | 1 U | 1 U | 0.60 J | **5** |
| **trans-1,2-Dichloroethene** | 1 U | 5 U | 20 U | 1 U | 1 U | 1 U | 1 U | **5** |
| **trans-1,3-Dichloropropene** | 1 U | 5 U | 20 U | 1 U | 1 U | 1 U | 1 U | **0.4** |
| **Trichloroethene** | 0.88 J | 5 U | 20 U | 1 U | 1 U | 1 U | 1 U | **5** |
| **Trichlorofluoromethane** | 1 U | 5 U | 20 U | 1 U | 1 U | 1 U | 1 U | **5** |
| **Vinyl chloride** | 1 U | 5 U | 20 U | 1 U | 1 U | 0.30 J | 0.23 J | **2** |
| **1,2-Dichloroethane** | 1 U | 5 U | 20 U | 1 U | 1 U | 1 U | 1 U | **0.6** |
| **1,2-Dichlorobenzene** | 1 U | 5 U | 20 U | 1 U | 1 U | 1 U | 1 U | **3** |
| **1,2-Dibromo-3-chloropropane** | 1 U | 5 U | 20 U | 1 U J | 1 U | 1 U | 1 U | **0.04** |

**Notes:**

1. NYSDEC = New York State Department of Environmental Conservation.
2. µg/L = micrograms per liter.
3. VOCs = Volatile Organic Compounds.
4. SVOCs = Semi Volatile Organic Compounds.
5. NA = Not applicable.
6. NS = Not sampled.
7. J = The analyte was positively identified; the associated numberical value is the approximate concentration of the analyte in the sample.
8. U J = The analyte was not detected above the sampling reporting limit; and the reporting limit is approximate.
9. U = The analyte was analyzed for, but was not detected above the sample reporting limit.
10. Highlighted cells indicate detections above limitations.

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## Table 2

Summary of Detected Compounds in Groundwater Samples

| Analytical Parameter | DEC-01<br>9/10/2014 | DEC-02<br>9/10/2014 | DEC-03<br>9/10/2014 | DEC-04<br>9/9/2014 | DEC-05<br>9/9/2014 | EW-1<br>8/13/2014 | EW-2<br>8/13/2014 | NYSDEC Groundwater Quality Standards/Values (GA) |
|---|---|---|---|---|---|---|---|---|
| *SVOCs (µg/L)* | | | | | | | | |
| 1,1'-Biphenyl | NS | **54 J** | **50 J** | NS | NS | NS | NS | 5 |
| 1,2,4,5-Tetrachlorobenzene | NS | 210 U | 210 U | NS | NS | NS | NS | 5 |
| 2,2'-oxybis (1-chloropropane) | NS | 210 U | 210 U | NS | NS | NS | NS | 5 |
| 2,3,4,6-Tetrachlorophenol | NS | 210 U | 210 U | NS | NS | NS | NS | NA |
| 2,4,5-Trichlorophenol | NS | 210 U | 210 U | NS | NS | NS | NS | NA |
| 2,4,6-Trichlorophenol | NS | 210 U | 210 U | NS | NS | NS | NS | NA |
| 2,4-Dichlorophenol | NS | 210 U | 210 U | NS | NS | NS | NS | 5 |
| 2,4-Dimethylphenol | NS | **240** | 210 U | NS | NS | NS | NS | 50 |
| 2,4-Dinitrophenol | NS | 630 U | 630 U | NS | NS | NS | NS | 10 |
| 2,4-Dinitrotoluene | NS | 42 U | 42 U | NS | NS | NS | NS | 5 |
| 2,6-Dinitrotoluene | NS | 42 U | 42 U | NS | NS | NS | NS | 5 |
| 2-Chloronaphthalene | NS | 210 U | 210 U | NS | NS | NS | NS | 10 |
| 2-Chlorophenol | NS | 210 U | 210 U | NS | NS | NS | NS | NA |
| 2-Methylnaphthalene | NS | 460 | 410 | NS | NS | NS | NS | NA |
| 2-Methylphenol (o-cresol) | NS | 150 J | 210 U | NS | NS | NS | NS | NA |
| 2-Nitroaniline | NS | 420 U | 420 U | NS | NS | NS | NS | 5 |
| 2-Nitrophenol | NS | 210 U | 210 U | NS | NS | NS | NS | NA |
| 3,3'-Dichlorobenzidine | NS | 420 U | 420 U | NS | NS | NS | NS | 5 |
| 3-Nitroaniline | NS | 420 U | 420 U | NS | NS | NS | NS | 5 |
| 4,6-Dinitro-2-methylphenol | NS | 630 U | 630 U | NS | NS | NS | NS | NA |
| 4-Bromophenyl phenyl ether | NS | 210 U | 210 U | NS | NS | NS | NS | NA |
| 4-Chloro-3-methylphenol | NS | 210 U | 210 U | NS | NS | NS | NS | NA |
| 4-Chloroaniline | NS | 21 U | 21 U | NS | NS | NS | NS | 5 |
| 4-Chlorophenyl phenyl ether | NS | 210 U | 210 U | NS | NS | NS | NS | NA |
| 4-Methylphenol | NS | 250 | 210 U | NS | NS | NS | NS | NA |
| 4-Nitroaniline | NS | 420 U | 420 U | NS | NS | NS | NS | 5 |
| 4-Nitrophenol | NS | 630 U | 630 U | NS | NS | NS | NS | NA |
| Acenaphthene | NS | **59 J** | **190 J** | NS | NS | NS | NS | 20 |
| Acenaphthylene | NS | 93 J | 210 U | NS | NS | NS | NS | NA |
| Acetophenone | NS | 210 U | 210 U | NS | NS | NS | NS | NA |
| Anthracene | NS | 21 J | 210 U | NS | NS | NS | NS | 50 |
| Atrazine | NS | 210 U | 210 U | NS | NS | NS | NS | 3 |
| Benzaldehyde | NS | 210 U | 210 U | NS | NS | NS | NS | NA |
| Benzo(a)anthracene | NS | 21 U | 21 U | NS | NS | NS | NS | 0.002 |
| Benzo(a)pyrene | NS | 21 U | 21 U | NS | NS | NS | NS | 0 |
| Benzo(b)fluoranthene | NS | 21 U | 21 U | NS | NS | NS | NS | 0.002 |
| Benzo(ghi)perylene | NS | 210 U | 210 U | NS | NS | NS | NS | NA |
| Benzo(k)fluoranthene | NS | 21 U | 21 U | NS | NS | NS | NS | 0.002 |
| Bis(2-chloroethoxy)methane | NS | 210 U | 210 U | NS | NS | NS | NS | 5 |
| Bis(2-chloroethyl)ether | NS | 21 U | 21 U | NS | NS | NS | NS | 1 |
| Bis(2-ethylhexyl)phthalate | NS | 210 U | 210 U | NS | NS | NS | NS | 5 |
| Butyl benzyl phthalate | NS | 210 U | 210 U | NS | NS | NS | NS | 50 |
| Caprolactum | NS | 210 U J | 210 U J | NS | NS | NS | NS | NA |
| Carbazole | NS | 130 J | 210 U | NS | NS | NS | NS | NA |
| Chrysene | NS | 210 U | 210 U | NS | NS | NS | NS | 0.002 |
| Dibenz(a,h)anthracene | NS | 21 U | 21 U | NS | NS | NS | NS | NA |
| Dibenzofuran | NS | 80 J | 210 U | NS | NS | NS | NS | NA |
| Diethyl phthalate | NS | 210 U | 210 U | NS | NS | NS | NS | 50 |
| Dimethylphthalate | NS | 210 U | 210 U | NS | NS | NS | NS | 50 |
| Di-n-butylphthalate | NS | 210 U | 210 U | NS | NS | NS | NS | 50 |
| Di-n-octylphthalate | NS | 210 U | 210 U | NS | NS | NS | NS | 50 |
| Fluoranthene | NS | 210 U | 210 U | NS | NS | NS | NS | 50 |
| Fluorene | NS | **92 J** | **61 J** | NS | NS | NS | NS | 50 |
| Hexachlorobenzene | NS | 21 U | 21 U | NS | NS | NS | NS | 0.04 |
| Hexachlorobutadiene | NS | 42 U | 42 U | NS | NS | NS | NS | 0.5 |
| Hexachlorocyclopentadiene | NS | 210 U | 210 U | NS | NS | NS | NS | 5 |
| Hexachloroethane | NS | 21 U | 21 U | NS | NS | NS | NS | 5 |
| Indeno(1,2,3-cd)pyrene | NS | 21 U | 21 U | NS | NS | NS | NS | 0.002 |
| Isophorone | NS | 210 U | 210 U | NS | NS | NS | NS | 50 |
| Naphthalene | NS | **3,400** | **3,000** | NS | NS | NS | NS | 10 |
| Nitrobenzene | NS | 21 U | 21 U | NS | NS | NS | NS | 0.4 |
| N-Nitrosodi-n-propylamine | NS | 21 U | 21 U | NS | NS | NS | NS | NA |
| N-Nitrosodiphenylamine | NS | 210 U | 210 U | NS | NS | NS | NS | 50 |
| Pentachlorophenol | NS | 630 U | 630 U | NS | NS | NS | NS | 1 |
| Phenanthrene | NS | **110 J** | **80 J** | NS | NS | NS | NS | 50 |
| Phenol | NS | **62 J** | 210 U | NS | NS | NS | NS | 1 |
| Pyrene | NS | 210 U J | 210 U J | NS | NS | NS | NS | 50 |

**Notes:**

1. NYSDEC = New York State Department of Environmental Conservation.
2. µg/L = micrograms per liter.
3. VOCs = Volatile Organic Compounds.
4. SVOCs = Semi Volatile Organic Compounds.
5. NA = Not applicable.
6. NS = Not sampled.
7. J = The analyte was positively identified; the associated numberical value is the approximate concentration of the analyte in the sample.
8. U J = The analyte was not detected above the sampling reporting limit; and the reporting limit is approximate.
9. U = The analyte was analyzed for, but was not detected above the sample reporting limit.
10. Highlighted cells indicate detections above limitations.

EnviroTrac
Environmental Services

# Table 3

## Well Gauging Data

| Well Location | Top of Casing Elevation (ft. amsl.) | Date Measured | Depth to Water (ft. bc.) | Depth to Bottom (ft. bc.) | Depth to Product (ft. bc.) | Water Table Elevation (ft. amsl.) |
|---|---|---|---|---|---|---|
| DEC-01 | 11.4369 | 8/22/2014 | 8.34 | 17.00 | ND | 3.10 |
| | | 9/9/2014 | 8.48 | 16.92 | ND | 2.96 |
| | | 10/17/2014 | 8.45 | 16.92 | ND | 2.99 |
| DEC-02 | 7.8629 | 8/21/2014 | 5.02 | 17.00 | Trace | 2.84 |
| | | 9/9/2014 | NM | NM | Trace | NM |
| | | 10/17/2014 | 4.98 | 17.00 | Approx. 1-inch on probe | 2.88 |
| DEC-03 | 8.4579 | 8/21/2014 | 6.75 | 17.05 | Trace | 1.71 |
| | | 9/9/2014 | NM | NM | Trace | NM |
| | | 10/17/2014 | 5.73 | 17.04 | Trace | 2.73 |
| DEC-04 | 10.4729 | 8/22/2014 | 7.48 | 16.91 | ND | 2.99 |
| | | 9/9/2014 | 7.60 | 16.90 | ND | 2.87 |
| | | 10/17/2014 | 7.62 | 16.92 | ND | 2.85 |
| DEC-05 | 22.2519 | 8/22/2014 | 9.00 | 26.00 | ND | 13.25 |
| | | 9/9/2014 | 11.25 | 26.55 | ND | 11.00 |
| | | 10/17/2014 | 11.16 | 26.23 | ND | 11.09 |
| EW-01 | 8.7739 | 8/13/2014 | 5.45 | 14.18 | ND | 3.32 |
| | | 10/17/2014 | 5.81 | 15.38 | ND | 2.96 |
| EW-02 | 8.3029 | 8/13/2014 | 5.24 | 12.84 | ND | 3.06 |
| | | 10/17/2014 | 5.37 | 13.08 | ND | 2.93 |

**Notes:**

1. Ft. amsl. - feet above mean sea level
2. Ft. bc. - feet below casing
3. NM - Not Measured
4. ND - Not Detected

EnviroTrac
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## Table 4

## Summa Canister Sampling Field Data Sheet

| | |
|---|---|
| Site: | Ace Suede and Leather, Bronx, NY |
| Samplers: | Ashley Pace/Lenny Darmiento |
| Date: | Septmeber 9 and 10, 2014 |

| Sample # | SG-01 | SG-02 | SG-03 | SG-04 | SG-05 | SG-06 | Ambient Air |
|---|---|---|---|---|---|---|---|
| Notes | | | Sample unobtainable | | | Duplicate sample of SG-04 | Taken near SG-03 |
| Summa Canister ID | 93232 | 93121 | | S-1492 | 1014N | 93083 | DL879 |
| Flow Controller ID | K421 | K289 | | K480 | K405 | K429 | K096 |
| Additional Tubing Added | NO | NO | | NO | NO | NO | NO |
| Purge Time (Start) | 14:12 | 12:10 | | 12:10 | 10:20 | 12:12 | 9:10 |
| Purge Time (Stop) | 14:18 | 12:15 | | 12:15 | 10:25 | 12:17 | 9:15 |
| Total Purge Time (min) | 5 | 5 | | 5 | 5 | 5 | 5 |
| Purge Volume | 1 liter | 1 liter | | 1 liter | 1 liter | 1 liter | 1 liter |
| Initial Tracer Gas Results | 0 ppm | 0 ppm | | 0 ppm | 25 ppm | 0 ppm | 0 ppm |
| Pressure Gauge - before sampling (Hg) | >-30 | >-30 | | -29.5 | -29.5 | >-30 | >-30 |
| Sample Time (Start) | 14:22 | 12:30 | | 12:20 | 10:31 | 12:20 | 9:22 |
| Sample Time (Stop) | 15:45 | 13:55 | | 13:20 | 11:31 | 13:30 | 10:42 |
| Total Sample Time (min) | 83 | 85 | | 60 | 60 | 60 | 80 |
| Pressure Gauge - after sampling (Hg) | -6 | -5 | | -5 | -4.5 | -5 | -5 |
| Sample Volume | 5 liters | 5 liters | | 5 liters | 5 liters | 5 liters | 5 liters |
| Canister Pressure Went To Ambient Pressure? | NO | NO | | NO | NO | NO | NO |
| Final Tracer Gas Results | NA | NA | | NA | NA | NA | NA |
| Weather 24 hours before and during sampling | Cloudy and cool | | | | | | |
| General Comments: | Regarding air sample SG-03, attempted to collect sample with two different flow controllers. Air pressure was evident in summa canister. Additionally, attemped to troubleshoot with TestAmerica which was unsuccessful. | | | | | | |

EnviroTrac
Environmental Services

## Table 5

Summary of Detected Compounds in
Soil Vapor Samples

| Analytical Parameter<br>VOCs TO-15 (ug/m$^3$) | SG-01 Soil Vapor 9/9/2014 | SG-02 Soil Vapor 9/10/2014 | SG-04 Soil Vapor 9/9/2014 | SG-05 Soil Vapor 9/9/2014 | Ambient Air 9/10/2014 |
|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | 64 U | 17 J | 20 U | 0.44 U | 0.44 U |
| 1,1,2,2-Tetrachloroethane | 80 U | 14 U | 25 U | 0.55 U | 0.55 U |
| 1,1,2-Trichloroethane | 64 U | 11 U | 20 U | 0.44 U | 0.44 U |
| 1,1,2-Trichlorotrifluoroethane | 89 U | 15 U | 28 U | 0.61 U | 0.61 U |
| 1,1-Dichloroethane | 47 U | 8.1 U | 15 U | 0.32 U | 0.32 U |
| 1,1-Dichloroethene | 46 U | 7.9 U | 14 U | 0.32 U | 0.32 U |
| 1,2,4-Trichlorobenzene | 87 U | 15 U | 27 U | 0.59 U | 0.59 U |
| 1,2,4-Trimethylbenzene | 57 U | 24 | 18 U | 32 | 0.65 |
| 1,2-Dibromoethane | 90 U | 15 U | 28 U | 0.61 U | 0.61 U |
| 1,2-Dichlorobenzene | 70 U | 12 U | 22 U | 0.48 U | 0.48 U |
| 1,2-Dichloroethane | 47 U | 8.1 U | 15 U | 0.32 U | 0.32 U |
| 1,2-Dichloropropane | 54 U | 9.2 U | 17 U | 0.37 U | 0.37 U |
| 1,2-Dichlorotetrafluoroethane | 81 U | 14 U | 25 U | 0.56 U | 0.56 U |
| 1,3,5-Trimethylbenzene | 57 U | 9.8 U | 18 U | 4.8 | 0.39 U |
| 1,3-Dichlorobenzene | 70 U | 12 U | 22 U | 0.48 U | 0.48 U |
| 1,4-Dichlorobenzene | 70 U | 12 U | 22 U | 0.85 | 0.48 U |
| 1,4-Dioxane | 110 U | 18 U | 33 U | 0.72 U | 0.72 U |
| 2,2,4-Trimethylpentane | 140 U | 23 U | 42 U | 0.93 U | 0.93 U |
| 2-Butanone | 140 U | 24 U | 43 U | 7.7 | 1.4 |
| 4-Methyl-2-pentanone (MIBK) | 120 U | 20 U | 37 U | 1.5 | 1.3 |
| Benzene | 37 U | 6.4 U | 12 U | 0.26 U | 0.81 |
| Benzyl chloride | 120 U | 21 U | 38 U | 0.83 U | 0.83 U |
| Bromodichloromethane | 78 U | 13 U | 24 U | 0.54 U | 0.54 U |
| Bromoform | 120 U | 21 U | 38 U | 0.83 U | 0.83 U |
| Bromomethane | 45 U | 7.8 U | 14 U | 0.38 J | 0.31 U |
| Carbon tetrachloride | 37 U | 6.3 U | 11 U | 0.25 U | 0.43 |
| Chlorobenzene | 54 U | 9.2 U | 17 U | 0.37 U | 0.37 U |
| Chloroethane | 31 U | 5.3 U | 9.6 U | 0.69 | 0.21 U |
| Chloroform | 57 U | 9.8 U | 100 | 1.4 | 0.39 U |
| Chloromethane | 60 U | 10 U | 19 U | 2.4 | 0.97 |
| cis-1,2-Dichloroethene | 54 | 7.9 U | 14 U | 0.32 U | 0.32 U |
| cis-1,3-Dichloropropene | 53 U | 9.1 U | 17 U | 0.36 U | 0.36 U |
| Cyclohexane | 100 U | 17 U | 31 U | 0.69 U | 0.69 U |
| Dibromochloromethane | 99 U | 17 U | 31 U | 0.68 U | 0.68 U |
| Dichlorodifluoromethane | 58 U | 9.9 U | 18 U | 1.6 | 2.4 |
| Ethanol | 320 | 38 U | 69 U | 5.3 | 35 |
| Ethylbenzene | 51 U | 200 | 1,400 | 54 | 0.99 |
| Hexachlorobutadiene | 120 U | 21 U | 39 U | 0.85 U | 0.85 U |
| Hexane | 160 | 18 U | 32 U | 0.70 U | 1.2 |
| Methyl tert-butyl ether (MTBE) | 84 U | 14 U | 26 U | 0.58 U | 0.58 U |
| Methylene Chloride | 540 | 17 U | 32 U | 0.69 U | 1.4 |
| m-Xylene & p-Xylene | 51 U | 950 | 3,100 | 170 | 2.2 |
| o-Xylene | 51 U | 210 | 1,700 | 54 | 0.76 |
| Styrene | 50 U | 8.5 U | 15 U | 0.87 | 0.34 U |
| t-Butyl alcohol | 140 U | 24 U | 44 U | 0.97 U | 0.97 U |
| Tetrachloroethene | 15,000 | 2,300 | 190 | 12 | 0.54 U |
| Toluene | 300 | 11 U | 21 U | 1 | 4 |
| trans-1,2-Dichloroethene | 46 U | 7.9 U | 14 U | 0.32 U | 0.32 U |
| trans-1,3-Dichloropropene | 53 U | 9.1 U | 17 U | 0.36 U | 0.36 U |
| Trichloroethene | 1,200 | 5.4 U | 9.8 U | 0.21 U | 0.21 U |
| Trichlorofluoromethane | 65 U | 11 U | 20 U | 3.2 | 1.4 |
| Vinyl Chloride | 30 U | 5.1 U | 9.3 U | 0.20 U | 0.20 U |

Notes:

1. ug/m$^3$ - micrograms per cubic meter.
2. J - The analyte was positively identified; the associated numberical value is the approximate concentration of the analyte in the sample.
3. U - The analyte was analyzed for, but was not detected above the sample reporting limit.

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# APPENDIX E

CASTLETON
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54 George Street, Babylon, NY 11702
631-482-1818 OFFICE
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# Community Air Monitoring Plan

# Former Ace Suede and Leather
# Site No. C203072
# 808 East 139th Street
# Port Morris, Bronx, NY

## June 2021

Prepared for:
Mr. Andrew Bullaro
B&B First Holdings LLC.
334 Faile Street
Bronx, New York 10474
Incr1934@gmail.com

CASTLETON
ENVIRONMENTAL

# COMMUNITY AIR MONITORING PLAN
ACE SUEDE AND LEATHER
808 EAST 139TH STREET,
BRONX, NY
NYSDEC SITE NO: C203072
JUNE 2021

## Table of Contents

## Appendices

Appendix A – New York State Department of Health Generic Community Air Monitoring Plan
Appendix B – New York State Department of Health Special Requirements for Work Within 20-Feet of Potentially Exposed Individuals or Structures

## 1.0 INTRODUCTION

Renu Engineering Technologies, PC. Castleton Environmental Geologic Services DPC (Castleton), has prepared this Community Air Monitoring Plan (CAMP) for the property located 808 East 139th Street in the Port Morris section of the Bronx, New York (the site). The site is listed on the New York State Department of Environmental Conservation's (NYSDEC) Environmental Site Remediation Database as Ace Suede and Leather under site code C203072.

This CAMP describes the methods to be used for the real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter(s) of designated work areas (exclusion zones) when certain activities are in progress at contaminated sites.

The CAMP will follow the procedures outlined in New York State Department of Health (NYSDOH) *Generic Community Air Monitoring Plan*, contained in DER-10/Technical Guidance for Site Investigation and Remediation, May 2010, a copy of which is included in Appendix A.

## 2.0 Community Air Monitoring

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

Particulate concentrations will be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring will be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment will be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work will continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m3 above the upwind level and provided that no visible dust is migrating from the work area.
- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m3 above the upwind level, work will be stopped and a re-evaluation of activities initiated. Work will resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m3 of the upwind level and in preventing visible dust migration.

## 3.0 Odor, Dust, and Nuisance Control

### 3.1 Odor Control

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

This odor control plan is capable of controlling emissions of nuisance odors. If nuisance odors are identified, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. Implementation of all odor controls, including halt of work, will be the responsibility of the representative's preparing the Completion Report.

### 3.2 Dust Control

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

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

This dust control plan is capable of controlling emissions of dust. If nuisance dust emissions are identified, work will be halted and the source of dusts will be identified and corrected. Work will not resume until all nuisance dust emissions have been abated. Implementation of dust controls, including halt of work, will be the responsibility of the representative's responsible for preparing the Remedial Closure Report.

### 3.3 Nuisance Control

Noise control will be exercised during the remedial program. Remedial work will conform, at a minimum, to local noise control standards. Rodent control will be provided, during Site clearing and grubbing, and during the remedial program, as necessary, to prevent nuisances.

# Appendix A

# Appendix 1A
# New York State Department of Health
# Generic Community Air Monitoring Plan

## Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

## Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

> **Continuous monitoring** will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.
>
> **Periodic monitoring** for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. “Periodic” monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities 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.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m$^3$) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m$^3$ above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m$^3$ above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m$^3$ of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009

# Appendix 1B
# Fugitive Dust and Particulate Monitoring

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:

(a) Objects to be measured: Dust, mists or aerosols;

(b) Measurement Ranges: 0.001 to 400 mg/m3 (1 to 400,000 :ug/m3);

(c) Precision (2-sigma) at constant temperature: +/- 10 :g/m3 for one second averaging; and +/- 1.5 g/m3 for sixty second averaging;

(d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);

(e) Resolution: 0.1% of reading or 1g/m3, whichever is larger;

(f) Particle Size Range of Maximum Response: 0.1-10;

(g) Total Number of Data Points in Memory: 10,000;

(h) Logged Data: Each data point with average concentration, time/date and data point number

(i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;

(j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;

(k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;

(l) Operating Temperature: -10 to $50^{o}$ C (14 to $122^{o}$ F);

(m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.

5. The action level will be established at 150 ug/m3 (15 minutes average). While conservative,

# Appendix B

## Special Requirements for Work Within 20 Feet of Potentially Exposed Individuals or Structures

When work areas are within 20 feet of potentially exposed populations or occupied structures, the continuous monitoring locations for VOCs and particulates must reflect the nearest potentially exposed individuals and the location of ventilation system intakes for nearby structures. The use of engineering controls such as vapor/dust barriers, temporary negative-pressure enclosures, or special ventilation devices should be considered to prevent exposures related to the work activities and to control dust and odors. Consideration should be given to implementing the planned activities when potentially exposed populations are at a minimum, such as during weekends or evening hours in non-residential settings.

- If total VOC concentrations opposite the walls of occupied structures or next to intake vents exceed 1 ppm, monitoring should occur within the occupied structure(s). Depending upon the nature of contamination, chemical-specific colorimetric tubes of sufficient sensitivity may be necessary for comparing the exposure point concentrations with appropriate pre-determined response levels (response actions should also be pre-determined). Background readings in the occupied spaces must be taken prior to commencement of the planned work. Any unusual background readings should be discussed with NYSDOH prior to commencement of the work.

- If total particulate concentrations opposite the walls of occupied structures or next to intake vents exceed 150 mcg/m$^3$, work activities should be suspended until controls are implemented and are successful in reducing the total particulate concentration to 150 mcg/m$^3$ or less at the monitoring point.

- Depending upon the nature of contamination and remedial activities, other parameters (e.g., explosivity, oxygen, hydrogen sulfide, carbon monoxide) may also need to be monitored. Response levels and actions should be pre-determined, as necessary, for each site.

## Special Requirements for Indoor Work With Co-Located Residences or Facilities

Unless a self-contained, negative-pressure enclosure with proper emission controls will encompass the work area, all individuals not directly involved with the planned work must be absent from the room in which the work will occur. Monitoring requirements shall be as stated above under “Special Requirements for Work Within 20 Feet of Potentially Exposed Individuals or Structures” except that in this instance “nearby/occupied structures” would be adjacent occupied rooms. Additionally, the location of all exhaust vents in the room and their discharge points, as well as potential vapor pathways (openings, conduits, etc.) relative to adjoining rooms, should be understood and the monitoring locations established accordingly. In these situations, it is strongly recommended that exhaust fans or other engineering controls be used to create negative air pressure within the work area during remedial activities. Additionally, it is strongly recommended that the planned work be implemented during hours (e.g. weekends or evenings) when building occupancy is at a minimum.