From: Jesse Mausner, PG, LSRP
To: Spellman, John (DEC); fd@sesi.org
Cc: Chris Lynch; Perretta, Anthony C (HEALTH); Andy Maniglia
Subject: RE: Ludlow RIR submission, IRMWP
Date: Tuesday, October 11, 2022 12:52:32 PM
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IRMWP Ludlow-150 Downing_2022.09.28.pdf

John – Attached is the certified plan with the sentence in 3.5.4 removed.

Let us know if you need anything else. Thanks.

Regards,
Jesse

Please Note that We've Moved to our New Home at 959 Route 46E Floor 3, Suite 300, Parsippany, NJ 07054 – as of 7/25/2022.

SESI CONSULTING ENGINEERS
GEOTECHNICAL ENVIRONMENTAL SITE CIVIL

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From: Spellman, John (DEC) <john.spellman@dec.ny.gov>
Sent: Tuesday, October 11, 2022 10:44 AM
To: Jesse Mausner, PG, LSRP <jam@sesi.org>; Fuad Dahan, PE, L.S.R.P. <fd@sesi.org>
Cc: Chris Lynch <clynch@gdcllc.com>; Perretta, Anthony C (HEALTH) <anthony.perretta@health.ny.gov>; Andy

SESI
CONSULTING ENGINEERS

Interim Remedial Measures Workplan

For:

Former Ludlow Street Works
150 Downing Street, 58 Knowles Street, 1-3 Bridge Street
Yonkers, New York
NYSDEC BCP Site # C360158

Prepared for:

Ludlow Point Development, LLC
100 Summit Drive, 2nd Floor
Valhalla, New York 10595

Prepared by:
SESI CONSULTING ENGINEERS, D.P.C.
959 Route 46 E, Floor 3, Suite 300
Parsippany, NJ 07054

MAY 2022
REVISED SEPTEMBER 2022

CERTIFICATIONS

I, Fuad Dahan, certify that I am currently a NYS registered professional engineer as defined in 6 NYCRR Part 375 and that this Interim Remedial Measures Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10)

090531	10/11/2022	
NYS Professional Engineer #	Date	Signature

It is a violation of Article 130 of New York State Education Law for any person to alter this document in any way without the express written verification of adoption by any New York State licensed engineer in accordance with Section 7209(2), Article 130, New York State Education Law.

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FIGURES

APPENDICES

LIST OF ACRONYMS

Acronym	Definition
amsl	above mean sea level
AWQS	Ambient Water Quality Standards
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
bgs	Below ground surface
C/D	Construction and Demolition
CAMP	Community Air Monitoring Plan
CCR	Construction Completion Report
COC	Contaminant of Concern
CPP	Citizen Participation Plan
cy	Cubic yard
DER	Division of Environmental Remediation
DER-10	NYSDEC Technical Guidance for Site Investigation & Remediation
DMM	Division of Materials Management
DNAPL	Dense Non-Aqueous Phase Liquid
DPW	Department of Public Works
DUSR	Data Usability Summary Report
ELAP	Environmental Laboratory Accreditation Program
FER	Final Engineering Report
HASP	Health and Safety Plan
IRMWP	Interim Remedial Measures Work Plan
MGP	Manufactured Gas Plant
MSL	Mean Sea Level
MW	Monitoring Well
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PAH	Polyaromatic Hydrocarbons
PCB	Polychlorinated Biphenyls

Acronym	Definition
PFAS	Per- and Polyfluoroalkyl Substances
QAPP	Quality Assurance Project Plan
RAWP	Remedial Action Work Plan
RECs	Recognized Environmental Concerns
RI	Remedial Investigation
RIR	Remedial Investigation Report
RIWP	Remedial Investigation Work Plan
RRSCO	Restricted Residential Soil Cleanup Objectives
SCO	Soil Cleanup Objectives
SESI	SESI Consulting Engineers, DPC
SMP	Site Management Plan
SOE	Support of Excavation
SVOCs	Semi-Volatile Organic Compounds
SWPPP	Storm Water Pollution Prevention Plan
TAGM	Technical and Administrative Guidance Memorandum
TAL	Target Analyte List
TCL	Target Compound List
TOGS	Technical and Operations Guidance Series
USCO	Unrestricted Use Soil Cleanup Objectives
USEPA	United States Environmental Protection Agency
VOCs	Volatile Organic Compounds

1.0 INTRODUCTION

The New York State Department of Environmental Conservation (NYSDEC) entered into a Brownfield Cleanup Program (BCP) Agreement (BCA) with Ludlow Point Development, LLC, a Volunteer, for the property known as the Former Ludlow Street Works Site (BCP No. C360158) ("Site"), on October 31, 2018. A Site Location Map is presented as **Figure 1.1**. This document comprises an Interim Remedial Measure Work Plan (IRMWP) to be conducted on a portion of the Site, in order to expedite this portion of the Site's planned remediation and redevelopment. It includes a description of the Site, summary of the Site history and previous environmental investigations, a description of the Site's physical, geologic, hydrogeologic setting and subsurface features and a soil IRMWP.

This IRMWP has been prepared to achieve the following objectives:

- To describe the proposed IRM activities on the 150 Downing Street (Northern) portion of the Site with the objective of preparing for and removing all site soils exceeding the NYSDEC Unrestricted Use Soil Cleanup Objectives (USCOs) to achieve a soil Track 1 cleanup on part of Northern portion of the Site, and
- To describe addressing the small dense non-aqueous phase liquid (DNAPL) area located in southwestern corner of the proposed Northern building. This DNAPL area is physically separate from the other DNAPL source areas, which are located in a different portion of the Site at a considerably lower elevation.

Remediation of the other DNAPL areas will be addressed in the Site Remedial Action Work Plan (RAWP), which will be submitted at a future date.

This IRMWP is developed in general accordance with the Department's Remediation Technical Guidance for Site Investigation and Remediation (DER-10).

2.0 PROJECT BACKGROUND

2.1 SITE DESCRIPTION

The 2.89-acre irregularly shaped Site consists of three addresses--150 Downing Street, 151 Ludlow Street (aka 58 Knowles Street), and 1-3 Bridge Street--all located in the City of Yonkers, Westchester County, New York, and is identified as Tax Map/Parcel numbers 1-171-1.14, 1-168-1, and 1-167-3 on the Westchester County Tax Map. This IRMWP pertains only to the northern upland portion of Parcel 1-171-1.14, referred to as the Former Department of Public Works (DPW) lot (at 150 Downing Street).

The Site is located in a mixed industrial and residential area and is bound to the north by Anthony O'Boyle Memorial Park; to the south by Ludlow Street; to the east by Westchester Metal Works, MZ Movers, and residential properties; and to the west by Metro North Railroad. **Figure 2.1** presents a Site Plan.

Adjacent properties are tabulated on Table 1.1 below:

Table 1.1 – Surrounding Properties

Direction	Adjacent Property
North	Downing Street, Anthony O'Boyle Memorial Park
East	Residential properties, Westchester Metal Works, MZ Movers
South	Ludlow Street, commercial properties beyond
West	Metro North Railroad

The project is planned as a multi-story residential apartment building and a structured parking garage beneath the building.

2.2 SITE HISTORY

The northern portion of the 150 Downing Street property (1-171-1.14) to which this IRMWP pertains was previously used for manufacturing of celluloid toilet articles (1917), and contained garages used for private purposes (1951) as well as truck and bus storage (1956-1973), after which the garage was used by the City of Yonkers DPW. By 2004, the lot was used only as a

storage yard. Debris, road salt, and waste materials were stockpiled in large quantities on this lot, causing a significant change in elevation between this lot and the south-adjoining former manufactured gas plant (MGP) portion of the property.

The history of the other portions of the BCP site including the former MGP site is described in the Remedial Investigation Report (RIR).

2.3 PREVIOUS ENVIRONMENTAL INVESTIGATIONS

The following environmental reports were previously submitted to the Department in Appendix B of the RIWP, and the RIR was submitted to the Department in April 2022. The reports are summarized below or incorporated into other sections of this IRMWP:

A. Environmental Investigation, Prepared by Vollmuth & Brush, 1997;
B. Phase I Environmental Site Assessment, Department of Public Works Storage Yard, 150 Downing Street, Yonkers, NY, prepared by WCD Group, on behalf of Ginsburg Development Companies, LLC, March 2017;
C. Geotechnical Investigation Report, prepared by SESI Consulting Engineers, January 2018
D. Remedial Investigation Report, prepared by SESI Consulting Engineers, March 2022

2.3.1 ENVIRONMENTAL INVESTIGATION BY VOLLMUTH & BRUSH (1997)

In 1993, Vollmuth & Brush of Blue Point, New York performed a two-phase sampling and analysis program on the former MGP lot and DPW lot (Vollmuth and Brush, 1997). The first phase of the investigation included a soil gas survey, and the second phase included the sampling and analysis of subsurface soils. Eleven soil samples were collected from inside the former DPW garage building on the eastern abutting property and on the Site. Soil samples were analyzed for volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) from depths of 0 to 2 or 2 to 4 ft-bgs. Soil samples were analyzed for metals from depths of 0 to 2, 2 to 4, 6 to 8, or 10 to 12 ft-bgs. Vollmuth & Brush compared the detected concentrations of the VOCs and SVOCs to the corresponding NYSDEC Technical and Administrative Guidance Memorandum (TAGM) Soil Cleanup Objectives (SCOs) that applied at the time. Based on these comparisons, it was determined that concentrations of all VOCs and SVOCs detected were below their respective TAGM SCOs. Five (5) metals, namely copper, iron, lead, selenium and zinc, were detected at concentrations above their respective TAGM SCOs in at least one (1) soil sample.

2.3.2 PHASE I ESA BY WCD GROUP (MARCH 2017)

WCD Group performed a Phase I ESA of the 150 Downing Street property in March 2017 that included both the DPW Lot and MGP lot. The assessment identified the following Recognized Environmental Conditions (RECs):

- Documented and potential impacts from historical on-Site MGP and gas holders;
- Potential impacts from: other on-Site historical commercial activities, former storage tanks and spill events, fill of unknown quality and releases at off-site areas

The following Historical REC was also identified:

- Several closed NYSDEC spill events

In addition, the following "general environmental concerns" were noted:

- Potential demolition debris in subsurface; and
- Potential for impacts from adjoining petroleum bulk storage facilities

2.3.3 FIELD INVESTIGATION BY WCD (OCTOBER 2017-JANUARY 2018)

WCD completed seven (7) test pits, four (4) soil vapor samples, four (4) monitoring wells, and two (2) soil borings on the former DPW lot between October 2017 and January 2018. No report of the investigation was provided; only boring/well logs and data were provided.

Composite soil samples were collected from test pits, and discrete soil samples were collected from soil borings and monitoring well borings over 1 to 2-foot sample intervals. Groundwater samples from wells MW-12, MW-13, MW-14, and MW-15 were collected via low-flow sampling from the screened intervals between 40 and 50 ft-bgs. Soil vapor samples were collected between 3 and 4 ft-bgs.

The discrete soil sample results did not exceed USCOs for VOCs, SVOCs, or metals. The test pit (composite) soil samples contained metals including lead, copper, and zinc slightly exceeding USCOs.

Groundwater exceedances of the Ambient Water Quality Standards (AWQS) included one (1) pesticide (dieldrin), and three (3) metals (magnesium, manganese, sodium) with non-health based AWQS. No VOCs, SVOCs, or polychlorinated biphenyls (PCBs) were detected in the groundwater samples in excess of the AWQS.

Soil vapor results indicated one (1) sample (WSV-3) containing vinyl chloride and trichloroethylene at concentrations above the New York State Department of Health (NYSDOH) Matrix B/C Sub-slab Vapor Criteria for Evaluating Soil Vapor Intrusion, indicating a possible requirement to monitor and/or mitigate, depending on the corresponding indoor air concentrations. Other compounds of potential vapor intrusion concern that were detected in the samples included benzene, ethylbenzene, toluene, and trichloroacetic acid.

2.3.4 REMEDIAL INVESTIGATION BY SESI (MAY-JUNE 2020)

SESI conducted a remedial investigation on the DPW lot in May-June 2020, which included the advancement of 33 soil borings, sampling of four (4) existing monitoring wells, and the installation of nine (9) soil vapor sample points.

In soil, 19 polyaromatic hydrocarbons (PAH) compounds, eight (8) metals, six (6) pesticide compounds, two (2) VOCs and two (2) PCB compounds were detected in excess of their respective USCOs and/or restricted residential use soil cleanup objectives. The maximum exceedance depths were 19 ft-bgs for PAHs and VOCs, 25 ft-bgs for metals, 22 ft-bgs for pesticides, and 14 ft-bgs for PCBs. Perfluorooctanoic acid and perfluorooctanesulfonic acid did not exceed their respective guidance values (June 2021) in any samples. Soil sample exceedances are presented on **Figure 2.2**.

In groundwater, PAHs were detected exceeding the AWQS in one (1) well (MW-14), and naturally-occurring metals were detected above the AWQS in all four (4) wells on the lot. No VOCs, pesticides, PCBs, or per- and polyfluoroalkyl substances (PFAS) compounds exceeded the AWQS or guidance values. Groundwater sample exceedances are presented on **Figure 2.3**.

In soil vapor, numerous VOCs were detected in the nine (9) vapor samples. However, New York State does not have standards or guidance values pertaining solely to soil vapor concentrations. Soil vapor sample detections are presented on **Figure 2.4**.

2.4 GEOGLOGIC SETTING

SESI completed a geotechnical investigation at the Site in October and December 2017 consisting of test pits and soil borings. Based upon SESI's Geotechnical Investigation Report dated January 2018, uncontrolled fill was encountered below the surface in all the borings and test pits consisting of black/brown/gray coarse to fine sand with varying amounts of silt and gravel with cobbles, occasional boulders, asphalt, concrete, wood, plastic, brick, and metal wire. The uncontrolled fill ranges in depth from approximately 22 to 25 ft-bgs in the northern portion of the

BCP site with the thicker fill on the western side of the Site. Based on the test pits and visual observations, the western slope down to the railroad was filled in with boulder and granular fill after the previous building was razed.

Beneath the surface materials and uncontrolled fill are the natural soil deposits consisting primarily of brown sand with varying amounts of silt and gravel and clayish silt. This stratum extends to the top of rock at approximately 51 to 58 ft-bgs in the northern portion of the BCP Site, which correlates to elevations of -8 to -16 above mean sea level (amsl).

Bedrock in the vicinity of the Site is carbonate metamorphic rock of Ordovician or Cambrian age.

2.5 HYDROGEOLOGY

Based upon SESI's geotechnical field investigation, groundwater was encountered at approximately 30 ft-bgs in the northern portion of the Site. As shown on the *Summary of Groundwater Elevations,* prepared by Parsons, dated July 5, 2015, the groundwater ranged from 38 to 44 ft-bgs in the northern portion of the Site. Groundwater depths encountered during SESI's RI were similar to those measured by Parsons. Perched/trapped groundwater may be encountered in the uncontrolled fill and/or at the bedrock surface based on the time of year and amount of recent precipitation.

2.6 SUMMARY OF ENVIRONMENTAL ASSESSMENT

Based on the investigations conducted to date, the primary contaminants of concern (COCs) on the former DPW lot are SVOCs, pesticides, PCBs, and metals.

3.0 INTERIM REMEDIAL MEASURES (IRM)

3.1 PRE-IRM SITE PREPARATION

The proposed brownfield remediation project will remediate the environmental media at the Site; and then construct a transit-oriented apartment building with residences and a structured parking garage beneath the building. As there are no existing structures on the Site, demolition will not be required as part of site preparation activities. However, support-of-excavation (SOE) will be installed wherever necessary along the excavation perimeter for structural stability and to avoid compromising nearby structures or properties. In addition, fencing will be installed or repaired/maintained along all site boundaries to secure the Site. Any hard surfaces will be removed and the IRM area will be cleared and grubbed prior to commencing excavation.

3.2 WASTE CHARACTERIZATION SAMPLING

Preliminary soil waste characterization samples were collected in-situ in conjunction with implementation of the remedial investigation for the pre-approval of the disposal facilities. Disposal facility approval letters will be provided to the Department prior to the start of excavation**.** The Site was subdivided in grids based on an approximate volume of 750 cubic yards (CY) per grid. One (1) composite sample was collected per grid for the top eight (8) feet of soil. Deeper waste characterization samples were collected between eight (8) and 17 feet below grade in most cases. The data will be submitted to permitted disposal facilities for pre-approval. During the excavation remediation, the trucks will be direct loaded for off-Site disposal. All waste characterization samples were analyzed by a NYSDOH ELAP certified laboratory for Target Compound List (TCL) + 30/Target Analyte List (TAL) including VOCs by EPA Method 8260, SVOCs by EPA Method 8270, pesticides by EPA Method 8081, PCBs by EPA Method 8082, and TAL metals by EPA Methods 6010, 7471, and cyanide via EPA Method 9012. Additional waste characterization sampling may be required to obtain disposal facility approval, depending on the frequency/analytical sampling requirements of the facility(ies).

3.3 IRM CONTAMINATED SOIL EXCAVATION

The IRM will consist of excavating part of the former DPW lot portion of Site to remediate soil by removal of all the contaminated soils within the planned building footprint on this lot. The proposed excavation depths are based upon the required depth of foundation installation (elevation 28 ft-amsl); however, final excavation depths will be determined by post-excavation

endpoint sampling. The total estimated excavation volume is approximately 22,000 cubic yards (33,000 tons), of which 16,600 cubic yards (24,900 tons) is contaminated soil based on the deepest USCO exceedances from the RI plus one (1) additional foot.

Shallow groundwater was not encountered during prior investigations on the DPW lot and is not anticipated to be encountered during the IRM.

The proposed IRM actions in sequence are listed below:

1. All the contaminated soils within the proposed IRM area (**Figure 3.1**) will be excavated to clean endpoint samples. This excavation will remove all contaminated soils and/or DNAPL in these areas. Material from the DNAPL excavation will be stockpiled on plastic, segregated from other excavated materials, and will be handled and disposed of as hazardous material unless it is confirmed to be non-hazardous based on laboratory testing.
2. Documentation of all appropriate off-site disposal of all material removed from the Site in accordance with all Federal, State and local rules and regulations for handling, transport, and disposal.
3. Groundwater is not expected to be encountered during the proposed excavation based on the depth to groundwater encountered during the RI. However, during construction if dewatering is necessary, the water will be pumped for temporary storage into frac-tanks, which will be discharged of either into the sewer following on-site treatment or at an off-site facility.
4. All responsibilities associated with the IRM, including permitting requirements, will be addressed in accordance with all applicable Federal, State and local rules and regulations and overseen and certified by the SESI Remedial Engineer of Record described below.
5. Installation of a line of sheet pile SOE connecting boring locations B-32, B-31, and B-26 in order to contain the southern and eastern extent of the DNAPL Hotspot (Figure 3.1). The sheet pile SOE will serve to stabilize the DNAPL mass in this area and prevent migration of DNAPL from the MGP lot onto the DPW lot. The depth of the sheet pile SOE is assumed to be approximately 45 ft-bgs, but the actual SOE depths will be determined by advancing several remedial design borings along the proposed SOE line to depths below observed DNAPL. The type of SOE installed will allow for sealing, if needed. It is highly unlikely that any DNAPL will flow into the excavation underneath, through or around

the SOE during the IRM excavation. If DNAPL leakage is observed during the IRM excavation, the following emergency steps will be taken:

- The leak cause will be assessed. If the leak has occurred through the installed sheet piles, then grout will be used to seal the sheet piles. If the leak has occurred from migration around the sheet piles, then additional sheet piles will be installed to stop the leakage.
- The leaked DNAPL may be temporarily contained with soil berms within the excavation to minimize its impact to other surrounding soils, as an emergency stopgap measure.
- The DNAPL liquids and associated impacted soils will be excavated as soon as possible, post containment and mitigation of the leak, for off-site disposal. Impacted soils will be over-excavated until no visible soil impacts remain.

The installed sheet pile is not expected to be removed after the completion of the IRM excavation. The sheet pile will remain in the ground and will not be removed unless required for the construction of the remainder of the Site, which will happen after the RAWP approval and the remediation of the Site DNAPL. Therefore, because of the sheet piles and the planned DNAPL remediation, there is no risk of DNAPL flowing into the IRM excavation in the long term,

Remedial design borings will also be conducted at original boring locations B-20 and B-27 down to bedrock surface to verify the presence or absence of DNAPL at these locations.

Figure 3.2 presents the area planned for soil remediation to Track 1, the planned hotspot remediation area, and the area planned for remediation to Track 4. An RAWP for remediation of other areas of the site and other media will be provided in a separate RAWP after the completion of the IRM as described in this document.

3.3.1 REMEDIAL ENDPOINT SAMPLING

End point sampling from the excavation bottom will be performed in accordance with DER-10 sample frequency requirements. Bottom samples will be collected at a rate of one for every 900 square feet (i.e. approximate 30 by 30-foot grids). Post-excavation samples will generally be collected from the center of each grid as the excavation proceeds. The depth of initial endpoint sample collection will be the bottom of the construction excavation (Elevation 28 amsl), with the exception of the area of RI boring B-9, and the eastern edge of the excavation (see **Figure 3.1**). Excavation and sampling in the area of B-9 is detailed in Section 3.3.2 below. The eastern edge

of the IRM excavation will be excavated to the estimated contamination depth in borings B-1 and B-3 through B-5 (boring B-2 did not exceed USCOs) prior to endpoint sample collection. Sidewall endpoint samples will be collected from the DNAPL excavation at a frequency of one (1) per 30 linear feet of sidewall. Sidewall samples will not be collected from the boundaries of the IRM excavation area as they represent property boundaries or the boundary between planned Track 1 and Track 4 remediation areas. All endpoint samples will be analyzed for TCL+30/TAL which includes VOCs (USEPA Method 8260), metals (USEPA Methods 6010/7471), SVOC compounds (USEPA Method 8270), PCBs and pesticides (USEPA Methods 8081/8082). In addition, 20% of endpoint samples collected will be analyzed for PFAS compounds (EPA Method 537). If the endpoint sample exceeds the USCOs, the area will be excavated an additional foot and resampled for those constituents exceeding USCOs. Excavation will continue until all constituents meet USCOs. The Construction Completion Report (CCR) will provide a tabular and map summary of all end-point sample results. Chemical laboratories used for all end-point sample results and contingency sampling will be NYSDOH ELAP certified.

3.3.2 DEEPER ENDPOINT VERIFICATION SAMPLING

SESI advanced 20 soil borings within the IRM area during the RI, as shown on **Figure 3.1.** Vertical delineation of USCOs was achieved in 18 of 20 boring locations where at least one (1) soil sample beneath the deepest USCO-exceeding sample met USCOs, as shown in the table below:

Table 3.1 – Clean Sample Depths

RI Boring ID	Deepest USCO Exceedance (ft-bg)	Depth of Clean Sample(s) Meeting USCOs (ft-bg)
B-1	2-3	7-8, 13-14, 18-19
B-2	None	5-6, 9-10, 12-13, 16-17
B-3	5-5-6.5	13-14, 17-18
B-4	2-3	6-7, 12-13, 16-17
B-5	3-4	7-8, 13-14, 17-18
B-6	3-4	5-6, 11-12, 16-17
B-7	5.5-6	10-11, 16-17
B-8	18-19	None*
B-9	21-22	24-25
B-10	8-9	14-15, 17-18, 24-25
B-11	8-9	12-13, 17-18
B-12	7-8	13-14, 16-17
B-13	6-7	11-12, 17-18
B-14	7.5-8	13-14, 19-20
B-15	7-8	12-13, 18-19
B-16	3.5-4	12-13, 17-18
B-17	6-7	12-13, 18-19
B-18	6-7	12-13, 19-20
B-19	13-14	18-19, 24-25
B-20	16-17	None*

*Additional samples to be collected beneath excavation bottom to ensure deeper soils meet USCOs

The table above demonstrates that in most borings, there were multiple samples meeting USCOs beneath the deepest USCO exceedance, which sufficiently demonstrates that soils beneath the planned IRM excavation depth also meet USCOs; however, as noted in the table, two (2) boring locations (B-8 and B-20) lack a clean sample at depth. As the deepest USCO exceedances in these borings are just above the planned construction excavation depth, post-excavation endpoint samples collected at these locations as described in Section 3.3.1 should serve as clean endpoints. Additional samples will be collected at one (1) foot below the excavation depth in B-8 and B-20 to confirm that the remaining soil above bedrock meets the USCOs.

Boring B-9 is the only location with a USCO exceedance just beneath the planned excavation depth. Therefore, a 30-foot by 30-foot area surrounding this boring location will be excavated to 23 ft-bgs (or Elevation 25 ft-amsl). A sample at one (1) foot below the excavation depth will be collected in addition to the post-excavation sample to confirm that the soils left above the bedrock meet the USCOs.

3.4 STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

A SWPPP will be prepared for the Site by SESI. A Soil Erosion and Sediment Control Plan will be prepared for the Site and submitted to the City of Yonkers prior to being implemented at the Site during IRM activities.

3.5 SOIL/MATERIALS MANAGEMENT PLAN

3.5.1 SOIL SCREENING METHODS

Visual, olfactory and PID soil field screening and assessment will be performed by a qualified environmental professional during all remedial and development excavations into known or potentially contaminated material. Soil screening will be performed regardless of when the invasive work is done and will include all excavation and invasive work performed during the remedy and during development phase, such as excavations for foundations and utility work, prior to issuance of the Certificate of Completion.

3.5.2 STOCKPILE METHODS FOR CONTAMINATED SOILS

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

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

Soil stockpiles will be encircled with silt fences. Hay bales will be used as needed near catch basins, surface waters and other discharge points.

Material from the DNAPL “hotspot” excavation will be stockpiled on plastic, segregated from other excavated materials, and will be handled and disposed of as hazardous material unless it is confirmed to be non-hazardous based on laboratory testing.

3.5.3 MATERIALS EXCAVATION AND LOAD OUT

The Remediation Engineer or a qualified environmental professional under his/her supervision will oversee all invasive work and the excavation and load-out of all excavated material.

The Volunteer and its contractors are solely responsible for safe execution of all invasive and other work performed under this Plan.

The presence of utilities and easements on the Site has been investigated during the remedial investigation work and no utilities or easements are present. It has been determined that no risk or impediment to the planned work under this IRMWP is posed by utilities or easements on the Site.

Loaded vehicles leaving the Site will contain watertight boxes, securely covered with a solid cover, manifested, and placarded in accordance with appropriate Federal, State, local, and New York State Department of Transportation requirements (and all other applicable transportation requirements).In addition, all trucks carrying loads with high moisture content or potentially containing DNAPL/coal tar will be lined with polyethylene sheeting. Free liquids will not be loaded into trucks.

A tracking pad per the soil erosion plan will be installed at the egress of the construction work. A truck wash associated with construction activities will be operational during construction. Used wash water from cleaning trucks and equipment is to be collected for treatment and disposal.

The Remediation Engineer will be responsible for ensuring that all outbound trucks are not causing any off-site tracking of the contaminated soils. A Truck Staging Route will be established prior to commencement of trucking activities.

Locations where vehicles enter or exit the Site will be inspected daily for evidence of off-Site sediment tracking.

The Remediation Engineer will ensure that all egress points for truck and equipment transported from the Site will be clean of dirt and other materials derived from the Site during Site remediation and development. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to site-derived materials.

The Volunteer and associated parties preparing the remedial documents submitted to the State, and parties performing this work, are completely responsible for the safe performance of all invasive work, the structural integrity of excavations, and for structures that may be affected by excavations (such as building foundations and bridge footings).

The Remedial Engineer will ensure that Site development activities will not interfere with, or otherwise impair or compromise, remedial activities proposed in this IRMWP.

3.5.4 MATERIALS TRANSPORT OFF-SITE

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

All trucks loaded with Site materials will exit the vicinity of the Site using only approved truck routes.

Proposed in-bound and out-bound truck routes to the Site will take into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) limiting total distance to major highways; (d) promoting safety in access to highways; (e) overall safety in transport; and (f) community input, which will be sought via the Citizens Participation Plan (CPP), included in **Appendix A**.

Trucks will be prohibited from stopping and idling in any residential neighborhood outside the project Site.

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

Queuing of trucks will be performed on-Site whenever possible in order to minimize off-Site disturbance. Off-Site queuing will be minimized.

Material transported by trucks exiting the Site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited.

A tracking pad will be installed at the Site egress to ensure clean-up of the soils from the truck tires. Track tires will be washed. Truck wash waters will be contained in a basin near the

tracking pad, and will periodically be pumped out of the basin and discharged of either into the sewer following treatment (see Section 3.6) or at an off-site facility.

3.5.5 MATERIALS DISPOSAL OFF-SITE

Approval from appropriate disposal facilities will be received prior to start of work. Approval letters will be provided separately when available. The total quantity of contaminated soil expected to be disposed off-site is approximately 24,900 tons of soil and fill. All soil/fill/solid waste excavated and removed from the Site will be treated as contaminated and regulated material and will be disposed in accordance with all local, State (including 6NYCRR Part 360) and Federal regulations. If disposal of soil/fill from this Site is proposed for unregulated disposal (i.e. clean soil removed for development purposes), a formal request with an associated plan will be made to NYSDEC's Project Manager. Unregulated off-Site management of materials from this Site will not be undertaken without formal NYSDEC approval.

Material that does not meet Track 1 unrestricted SCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360-16 Registration Facility).

The following documentation will be obtained and reported by the Remedial Engineer for each disposal location used in this project to fully demonstrate and document that the disposal of material derived from the Site conforms with all applicable laws: (1) a letter from the Remedial Engineer or Volunteer to the receiving facility describing the material to be disposed and requesting formal written acceptance of the material. This letter will state that material to be disposed is contaminated material generated at an environmental remediation Site in New York State. The letter will provide the project identity and the name and phone number of the Remedial Engineer. The letter will include as an attachment a summary of all chemical data for the material being transported (including Site Characterization data); and (2) a letter from all receiving facilities stating it is in receipt of the correspondence (above) and is approved to accept the material. These documents will be included in the CCR.

Non-hazardous historic fill and contaminated soils taken off-Site will be handled, at minimum, as a Municipal Solid Waste per 6NYCRR Part 360-1.2

Historical fill and contaminated soils from the Site are prohibited from being disposed at Part 360-16 Registration Facilities (also known as Soil Recycling Facilities).

Soils that are contaminated but non-hazardous and are being removed from the Site are considered by the Division of Materials Management (DMM) in NYSDEC to be Construction and Demolition (C/D) materials with contamination not typical of virgin soils. These soils may be sent to a permitted Part 360 landfill. They may be sent to a permitted C/D processing facility without permit modifications only upon prior notification of NYSDEC Region 3 DMM. This material is prohibited from being sent or redirected to a Part 360-16 Registration Facility. In this case, as dictated by DMM, special procedures will include, at a minimum, a letter to the C/D facility that provides a detailed explanation that the material is derived from a NYSDEC remediation Site, that the soil material is contaminated and that it must not be redirected to on-site or off-site Soil Recycling Facilities. The letter will provide the project identity and the name and phone number of the Remedial Engineer. The letter will include as an attachment a summary of all chemical data for the material being transported.

The CCR will include an accounting of the destination of all material removed from the Site during this IRMWP, including excavated soil, contaminated soil, historic fill, solid waste, and hazardous waste, non-regulated material, and fluids. Documentation associated with disposal of all material must also include records and approvals for receipt of the material. This information will also be presented in a tabular form in the CCR.

Bill of Lading system or equivalent will be used for off-site movement of non-hazardous wastes and contaminated soils. This information will be reported in the Final Engineering Report.

Hazardous wastes, if any, derived from on-site will be stored, transported, and disposed of in full compliance with applicable local, State, and Federal 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. A truck staging area and truck route will be established.

Additional waste characterization sampling will be performed for off-site disposal in a manner suitable to the receiving facility and in conformance with applicable permits. All data available for soil/material to be disposed at a given facility must be submitted to the disposal facility with suitable explanation prior to shipment and receipt.

3.6 FLUIDS MANAGEMENT

If groundwater is encountered, it will be treated as contaminated groundwater unless it is demonstrated to be uncontaminated via sampling. The groundwater will be pumped into temporary storage frac-tanks, which will be discharged of either into the sewer following treatment or at an off-site facility. On-site groundwater treatment would be accomplished using a treatment system containing bag filtration and activated carbon. Appropriate permits will be obtained prior to discharge to the sewer. The off-site disposal of the groundwater will follow the requirements of disposal facility for sampling and characterization.

3.7 BACKFILL FROM OFF-SITE SOURCES

Material imported to be used on-Site as backfill will be sampled in accordance with DER-10 Section 5.4 (e).

All materials proposed for import onto the Site, will meet the USCO. A “Soil Reuse/Import” form will be submitted to the NYSDEC for pre-approval prior to importing any soils on -Site. Bills of Lading or equivalent documentation will be obtained to track the amount of soil arriving onto the Site and verify the source of soil being imported.

Material from industrial sites, spill sites, other environmental remediation sites or other potentially contaminated sites will not be imported to the Site.

The CCR will include the following certification by the Remedial Engineer: “I certify that all import of soils from off-Site, including source evaluation, approval and sampling, has been performed in a manner that is consistent with the methodology defined in the Interim Remedial Work Plan”.

Non-compliant soils will not be imported onto the Site without prior approval by NYSDEC. Nothing in the approved IRMWP or its approval by NYSDEC will be construed as an approval for this purpose.

Soils that meet “exempt” fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this Site, will not be imported onto the Site without prior approval by NYSDEC. Nothing in this IRMWP will be construed as an approval for this purpose.

Solid waste will not be imported onto the Site.

Trucks entering the Site with imported soils will be securely covered with tight fitting covers.

3.8 MATERIALS REUSE ON-SITE

The qualified environmental professional as defined in 6 NYCRR part 375 will ensure that procedures defined for materials reuse in this IRMWP are followed and that unacceptable material (i.e. contaminated) does not remain on-site. Contaminated on-site material, including historic fill and contaminated soil, that is acceptable for reuse on-site will be placed below the demarcation layer or impervious surface, and will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines.

Proposed materials for reuse on-site must be sampled for full suite analytical parameters including PFAS and 1,4-dioxane. The sampling frequency will be in accordance with DER-10 Table 5.4(e)10 unless prior approval is obtained from the NYSDEC project manager for modification of the sampling frequency. The analytical results of soil/fill material testing must meet the site use criteria presented in NYSDEC DER-10 Appendix 5 – Allowable Constituent Levels for Imported Fill or Soil for all constituents listed, and the NYSDEC Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances [June 2021] guidance values. Approvals for modifications to the analytical parameters must be obtained from the NYSDEC project manager prior to the sampling event.

Soil/fill material for reuse on-site will be segregated and staged as described in Section 3.5.2. The anticipated size and location of stockpiles will be provided in the 15-day notification to the NYSDEC project manager. Stockpile locations will be based on the location of site excavation activities and proximity to nearby site features. Material reuse on-site will comply with requirements of NYSDEC DER-10 Section 5.4(e)4. Any modifications to the requirements of DER-10 Section 5.4(e)4 must be approved by the NYSDEC project manager.

3.9 CONTINGENCY PLAN

If underground tanks or other previously unidentified contaminant sources are found during the SOE installation, sampling will be performed on product, sediment and surrounding soils, etc. Chemical analytical work will be for full scan parameters (TAL metals; TCL volatiles and semi-volatiles, TCL pesticides and PCBs, and emerging contaminants).

Identification of unknown or unexpected contaminated media identified by screening during invasive Site work will be promptly communicated by phone to NYSDEC's Project Manager. These findings will be also included in daily and periodic electronic media reports.

If grossly contaminated media is encountered, it will be separately stockpiled on plastic and covered. Waste characterization sampling of the stockpile will be conducted to determine an appropriate disposal facility. Waste characterization will be performed per the proposed facilities requirements. In addition, remedial investigation sampling or post excavation will be performed within and surrounding the grossly contaminated material to vertically and horizontally to delineate the extent of the contamination. Samples will be analyzed for a combination of full TCL and TAL analytes – which include VOCs (USEPA Method 8260), metals (USEPA Methods 6010/7471), SVOC compounds (USEPA Method 8270), PCBs and pesticides (USEPA Methods 8081/8082) – as well as PFAS (USEPA Method 537), and 1,4 dioxane (USEPA Method 8270). Duplicates, field blanks, equipment blanks and matrix spike/matrix duplicate samples will be analyzed as required for TCL/TAL PFAS and 1.4 dioxane. Trip blanks will accompany all samples analyzed for VOCs. These quality assurance/quality control (QA/QC) procedures are provided in the **Appendix B**.

3.10 ODOR, DUST, AND NUISANCE CONTROL PLAN

Odor, dust and nuisance control will be in accordance with the Site-specific Health and Safety Plan (HASP) and Community Air Monitoring Plan (CAMP). The HASP is discussed in Section 7.0 of this report and provided in **Appendix C**. The CAMP is discussed in Section 8.0 of this report and provided in **Appendix D**.

3.10.1 ODOR CONTROL PLAN

This odor control plan is designed to control emissions of nuisance odors off-Site. If nuisance odors are identified, work will be halted, and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and of all other complaints about the project within 24 hours. Implementation of all odor controls, including the halt of work, will be the responsibility of the Volunteer's Remediation Engineer, who is responsible for certifying the Final Engineering Report (FER).

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

Where odor nuisances have developed during remedial work and cannot be corrected, or where the release of nuisance odors cannot otherwise be avoided due to on-Site conditions or close proximity to sensitive receptors, odor control will be achieved, as appropriate, by a combination of work stoppages, sheltering excavation and handling areas under tented containment structures equipped with appropriate air venting/filtering systems.

3.10.2 DUST CONTROL PLAN

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

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

Other Nuisances

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

A plan will be developed and utilized by the contractor for all remedial work and will conform, at a minimum, to local noise control standards.

4.0 DUSR

Following the completion of the laboratory analysis program, a Data Usability Summary Report (DUSR) will be completed for the lab data and included as part of the CCR. The DUSR will include available datasets from previous investigations, as well as data from this phase of Site characterization. The DUSR is carried out as specified in DER-10 to evaluate the quality control measures that were implemented during the field and laboratory analytical programs, with the objective of determining whether the reported analytical data are representative and usable for decision making. The DUSR will evaluate whether the data are technically defensible (i.e. were all analytical data requirements met and documented?). Data usability analysis reviews the Site data to determine whether they are adequate to draw conclusions regarding the nature and extent of contamination.

The items that will be reviewed as part of the DUSR will include the following:

- Completeness (number of samples collected and analyzed compared to plans)
- Chains of custody are complete and accurate
- Holding times
- Instrument calibration
- Relative percent difference between field duplicates
- Reasonableness of data (e.g. relationships between total and soluble analytes)
- Blank contamination

The DUSR will be conducted in accordance with guidelines provided under Appendix 2B of DER-10. The Site-specific QAPP is included in **Appendix B**.

5.0 CONSTRUCTION COMPLETION REPORT

The reporting of the IRM will be included in a CCR to be completed in accordance with DER-10 following the conclusion of IRM activities and submitted to NYSDEC. The CCR will also be attached to and referenced in the FER for the Site.

The CCR will include the following:

- A comprehensive account of the locations and characteristics of all material removed from the Site including the surveyed map(s) of all sources
- An accounting of the destination of all material removed from the Site, including excavated contaminated soil, historic fill, solid waste, hazardous waste, non-regulated material, and fluids. Documentation associated with disposal of all material will include records and approvals for receipt of the material
- As-built drawings for all constructed elements, certifications, manifests, and bills of lading
- A description of the changes in the IRM from the elements provided in this IRMWP and associated design documents
- A tabular summary of all performance evaluation sampling results and other sampling and chemical analysis performed as part of the IRM
- Written and photographic documentation of all remedial work performed under the IRM
- A thorough summary of all residual contamination left on the Site after the IRM is complete, if applicable, and an explanation for why the material was not removed as part of the IRM.

6.0 QUALITY ASSURANCE/QUALITY CONTROL

QA/QC is addressed in the QAPP included as **Appendix B**. The QAPP outlines procedures to be followed for sampling and analysis to ensure quality of the results. A DUSR will be prepared and submitted with the CCR to document the reliability of the sample results.

7.0 HEALTH AND SAFETY PLAN

A Site-specific HASP has been prepared and is included as **Appendix C**. All on-Site SESI personnel and their subcontractors/visitors involved in the IRM will be required to read and sign the HASP prior to entering the Site.

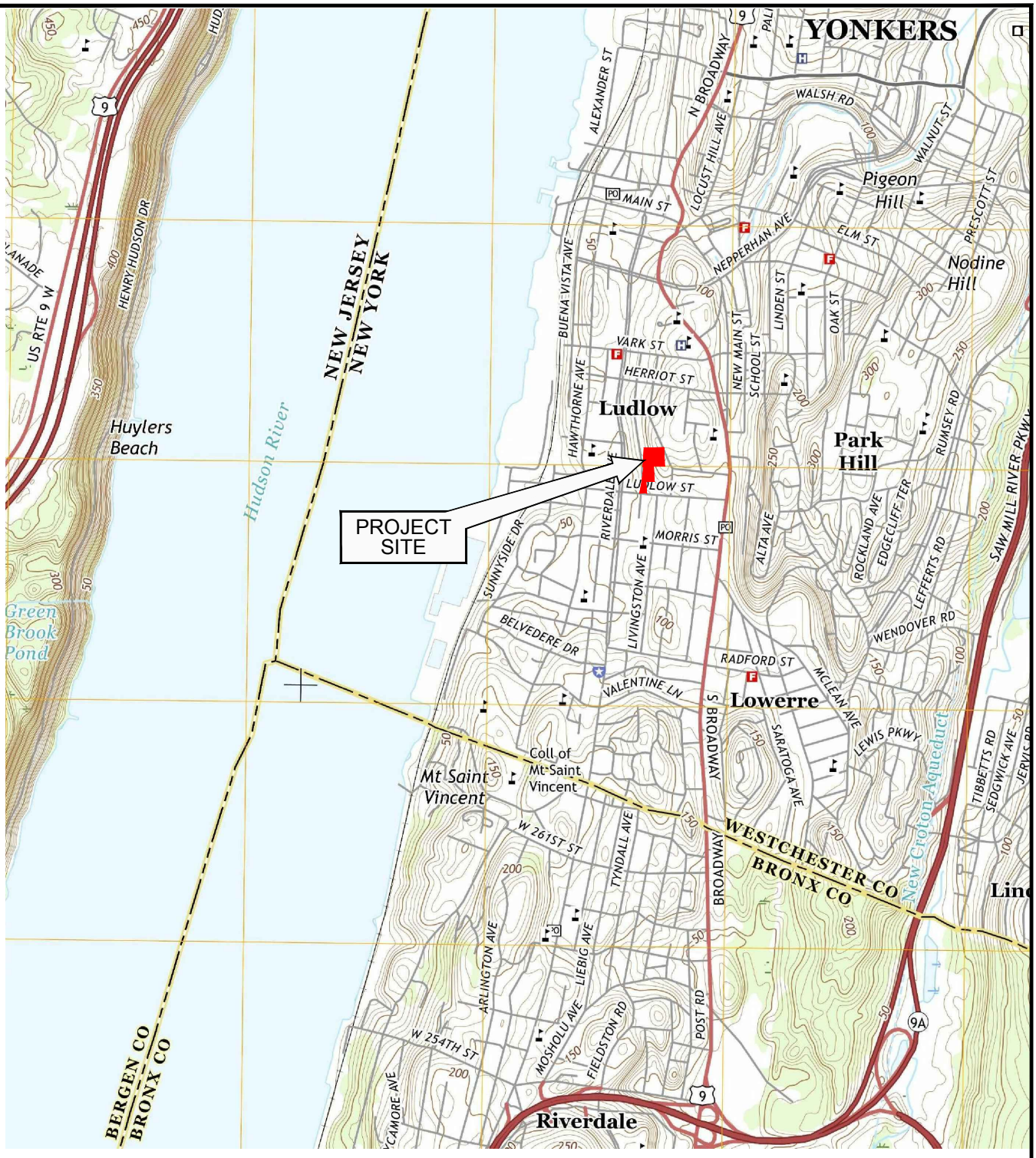
8.0 COMMUNITY AIR MONITORING

A CAMP is provided as **Appendix D**, in accordance with DER-10 requirements for remedial investigation. The CAMP sets forth air monitoring procedures that will be utilized to measure airborne emissions during the IRM, in order to minimize the release of contaminants to off-Site areas.

9.0 CITIZEN PARTICIPATION

Citizen participation activities will be performed throughout the IRM process to involve and inform the public. The specific citizen participation activities to be performed are outlined in the CPP, included as **Appendix A**.

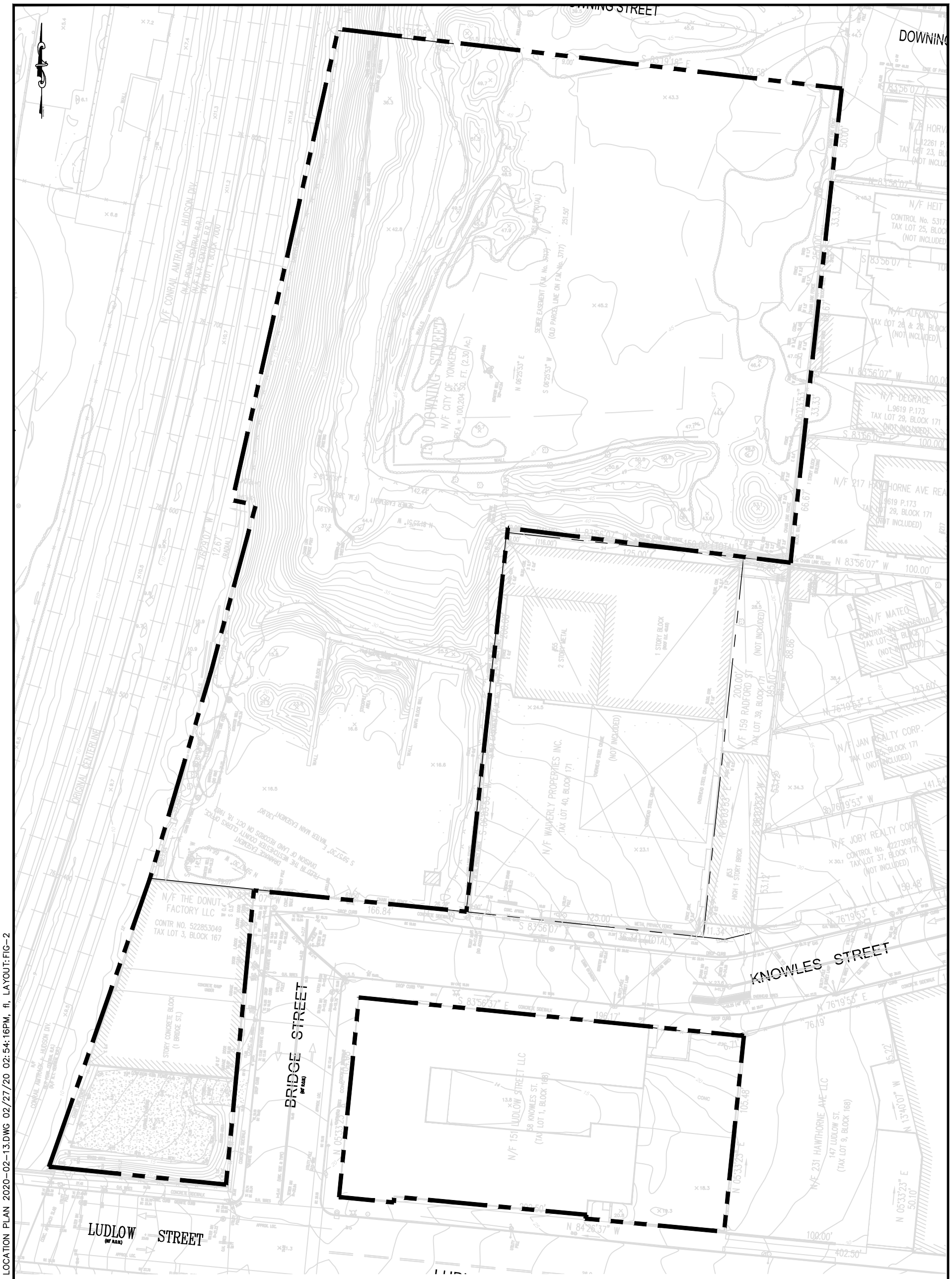
FIGURES



RIR LUDLOW POINT 150 DOWNING STREET YONKERS, NEW YORK	SESI CONSULTING ENGINEERS D.P.C. SOILS / FOUNDATIONS SITE DESIGN ENVIRONMENTAL 12A MAPLE AVE. PINE BROOK, N.J. 07058 PH: 973-808-9050
SITE LOCATION MAP	

FIG-1.1	
DRAWN BY:	yy
CHECKED BY:	JAM
SCALE:	AS NOTED
DATE:	12/20/19
JOB NO.:	10857

N:\ACAD\10857\RIWP REPORT\FIG-1 SITE LOCATION MAP.DWG 12/20/19 03:31:49PM, jenny, LAYOUT:FIG-1



NYS Education Law

Unauthorized alterations or additions to this plan are a violation of section 7209 (2) of the New York State Education Law. Copies of this map not having the seal of the engineer shall not be valid.

REFERENCE

SITE INFORMATION TAKEN FROM "TOPOGRAPHIC SURVEY OF PROPERTY" PREPARED BY CONTRACTORS' LINE & GRADE SOUTH LLC. DATED JULY 27, 2017.

SCALE: 1"=50'

0 50 100

RIR
LUDLOW POINT
150 DOWNING STREET
YONKERS, NEW YORK

SITE PLAN

SESI CONSULTING ENGINEERS D.P.C.
SOILS / FOUNDATIONS
SITE DESIGN
ENVIRONMENTAL
12A MAPLE AVE. PINE BROOK, N.J. 07058 PH: 973-808-9050

FIG-2.1

DRAWN BY: yy
CHECKED BY: JAM
SCALE: AS NOTED
DATE: 02/13/2020
JOB NO.: 10857

N:\ACAD\10857\RIWP REPORT\10857 RIWP SAMPLE LOCATION PLAN 2020-02-13.dwg, 2/27/2020 2:54:11 PM, DWG To PDF.pc3
N:\ACAD\10857\RIWP REPORT\10857 RIWP SAMPLE LOCATION PLAN 2020-02-13.DWG 02/27/20 02:54:16PM, fl, LAYOUT:FIG-2

Analyte	NYSDEC - Restricted Residential Use Soil Criteria	NYSDEC - Unrestricted Use Soil Criteria
Volatile Organics		
Acetone	100	0.05
Ethylbenzene	41	1
Xylenes, Total	100	0.26
Naphthalene	100	12
PCBs/Pesticides		
Aldrin	0.097	0.005
Dieldrin	0.2	0.005
4,4'-DDT	7.9	0.0033
4,4'-DDD	13	0.0033
4,4'-DDE	8.9	0.0033
cis-Chlordane	4.2	0.094
Aroclor 1260	1	0.1
PCBs, Total	1	0.1
SVOCs		
Benzo(a)anthracene	1	1
Benzo(a)pyrene	1	1
Benzo(b)fluoranthene	1	1
Benzo(k)fluoranthene	3.9	0.8
Chrysene	3.9	1
Dibenzo(a,h)anthracene	0.33	0.33
Indeno(1,2,3-cd)pyrene	0.5	0.5
Acenaphthene	100	20
Fluoranthene	100	100
Naphthalene	100	12
Acenaphthylene	100	100
Anthracene	100	100
Benzo(ghi)perylene	100	100
Fluorene	100	30
Phenanthrene	100	100
Pyrene	100	100
Dibenzofuran	59	7
Phenol	100	0.33
2-Methylphenol	100	0.33
3-Methylphenol/4-Methy	100	0.33
Total Metals		
Copper, Total	270	50
Lead, Total	400	63
Mercury, Total	0.81	0.18
Zinc, Total	10000	109
Barium, Total	400	350
Cadmium, Total	4.3	2.5
Arsenic, Total	16	13
PFAS		
PFOA/PFOS, Total		

Key	
🟨	Exceeds the NYSDEC Unrestricted Use (SCO)
🟥	Exceeds the NYSDEC Restricted Residential Use (SCO)

NOTE:
THIS PLAN IS FOR LOCATING BORING ONLY.
OTHER SITE WORK SHOWN HERE IS NOT
INTENDED FOR CONSTRUCTION.

REFERENCE
SITE INFORMATION TAKEN FROM "TOPOGRAPHIC SURVEY OF PROPERTY"
PREPARED BY CONTRACTORS' LINE & GRADE SOUTH LLC. DATED JULY 27, 2017.

Scale: 1"= 30'
0 15 30 60 90 120

N:\ACAD\10857\CAD\10857 RIWP SAMPLE LOCATION PLAN 2020-07-22.DWG 02/16/22 11:13:45AM, Pinnacle, LAYOUT:FIG-4.1

rev	date	description	by

drawn by: DWGBY
checked by: CHKBY
scale: AS NOTED
date: 01/28/2022

SESI
CONSULTING
ENGINEERS D.P.C.
SOILS / FOUNDATIONS
SITE DESIGN
ENVIRONMENTAL
12A MAPLE AVE. PINE BROOK, N.J. 07058 PH: 973-808-9050

ANTHONY CASTILLO, P.E.
PROFESSIONAL ENGINEER
N.Y. LIC. NO. 084421

FORMER LUDLOW STREET WORKS
150 DOWNING STREET YONKERS,
NEW YORK

drawing title:
SOIL SAMPLE EXCEEDANCE PLAN

job no. 10857
drawing no.
FIG-2.2
1 of

SESI-MW-102		
6/15/2020		
L2024975-01		
Analyte	Result	Q
Aluminum, Total	136000	
Arsenic, Total	27.82	
Barium, Total	4164	
Benzo(a)anthracene	0.28	
Benzo(a)pyrene	0.3	
Benzo(b)fluoranthene	0.39	
Benzo(k)fluoranthene	0.14	
Beryllium, Total	11.41	
Chromium, Total	209.4	
Chrysene	0.29	
Copper, Total	308.7	
Indeno(1,2,3-cd)pyrene	0.21	
Iron, Total	210000	
Lead, Total	603	
Magnesium, Total	42900	
Manganese, Total	39600	
Mercury, Total	2.36	
Nickel, Total	181.7	
Selenium, Total	40	
Sodium, Total	390000	
Thallium, Total	1.04	

SESI MW 104		
8/3/2021		
L2141444-02		
Analyte	Result	Q
Benzo(a)anthracene	0.57	
Benzo(a)pyrene	0.69	
Benzo(b)fluoranthene	0.68	
Benzo(k)fluoranthene	0.25	
Chrysene	0.56	
Indeno(1,2,3-cd)pyrene	0.42	

MW-5		
6/12/2020		
L2024743-04		
Analyte	Result	Q
1,2,4-Trimethylbenzene	33	
1,3,5-Trimethylbenzene	12	J
Acenaphthene	95	
Antimony, Total	39.06	J
Benzene	130	
Benzo(a)anthracene	1.1	
Benzo(a)pyrene	0.88	J
Benzo(b)fluoranthene	0.47	J
Benzo(k)fluoranthene	0.42	J
Cadmium, Total	7.33	
Chrysene	1.4	
Cyanide, Total	1400	
Ethylbenzene	43	
Indeno(1,2,3-cd)pyrene	0.33	J
Iron, Total	2530	
Lead, Total	631.1	
Manganese, Total	584.2	
Naphthalene	380	
Naphthalene	870	
o-Xylene	25	
p/m-Xylene	18	J
Phenanthrene	61	
Phenol	2.3	J
p-Isopropyltoluene	60	
Sodium, Total	1E+07	
Thallium, Total	5.87	J
Toluene	26	

MW-7		
6/15/2020		
L2024975-04		
Analyte	Result	Q
1,2,4-Trimethylbenzene	240	
1,2-Dichlorobenzene	140	
1,3,5-Trimethylbenzene	67	J
2,4-Dimethylphenol	10	
Acenaphthene	170	
Anthracene	73	
Benzene	3100	
Benzo(a)anthracene	28	
Benzo(a)pyrene	23	
Benzo(b)fluoranthene	13	J
Benzo(k)fluoranthene	10	J
Chrysene	35	
Ethylbenzene	700	
Fluoranthene	62	
Fluorene	150	
Indeno(1,2,3-cd)pyrene	7.8	J
Iron, Total	916	
Isopropylbenzene	40	J
Magnesium, Total	42400	
Manganese, Total	576.6	
Naphthalene	8400	
Naphthalene	7000	
o-Xylene	540	
p/m-Xylene	950	
Phenanthrene	280	
Phenol	11	
Pyrene	96	
Sodium, Total	3E+06	
Toluene	510	

SESI-MW-101		
6/12/2020		
L2024743-05		
Analyte	Result	Q
Iron, Total	16600	
Magnesium, Total	52200	
Manganese, Total	2375	
Sodium, Total	231000	

MW-3		
6/12/2020		
L2024743-03		
Analyte	Result	Q
Cyanide, Total	1280	
Iron, Total	18000	
Sodium, Total	9720000	

MW-15		
6/15/2020		
L2024975-03		
Analyte	Result	Q
Iron, Total	1190	
Magnesium, Total	65000	
Sodium, Total	662000	

Analyte	Units	NY-AWQS	NY-TOGS-GA
1,2,4-Trimethylbenzene	ug/L	5	5
1,2-Dichlorobenzene	ug/L	3	3
1,3,5-Trimethylbenzene	ug/L	5	5
2,4-Dimethylphenol	ug/L	50	2
Acenaphthene	ug/L	20	20
Aluminum, Total	ug/L		2000
Anthracene	ug/L	50	50
Antimony, Total	ug/L	3	6
Arsenic, Total	ug/L	25	50
Barium, Total	ug/L	1000	2000
Benzene	ug/L	1	1
Benzo(a)anthracene	ug/L	0.002	0.002
Benzo(a)pyrene	ug/L	0	0
Benzo(b)fluoranthene	ug/L	0.002	0.002
Benzo(k)fluoranthene	ug/L	0.002	0.002
Beryllium, Total	ug/L	3	3
Cadmium, Total	ug/L	5	10
Chromium, Total	ug/L	50	100
Chrysene	ug/L	0.002	0.002
cis-1,2-Dichloroethene	ug/L	5	5
Copper, Total	ug/L	200	1000
Cyanide, Total	ug/L	200	400
Dieldrin	ug/L	0.004	0.004
Ethylbenzene	ug/L	5	5
Fluoranthene	ug/L	50	50
Fluorene	ug/L	50	50
Indeno(1,2,3-cd)pyrene	ug/L	0.002	0.002
Iron, Dissolved	ug/L	300	600
Iron, Total	ug/L	300	600
Isopropylbenzene	ug/L	5	5
Lead, Total	ug/L	25	50
Magnesium, Total	ug/L	35000	35000
Manganese, Dissolved	ug/L	300	600
Manganese, Total	ug/L	300	600
Mercury, Total	ug/L	0.7	1.4
Naphthalene	ug/L	10	10
Nickel, Total	ug/L	100	200
o-Xylene	ug/L	5	5
p/m-Xylene	ug/L	5	5
Phenanthrene	ug/L	50	50
Phenol	ug/L	1	2
p-Isopropyltoluene	ug/L	5	5
Pyrene	ug/L	50	50
Selenium, Total	ug/L	10	20
Sodium, Dissolved	ug/L	20000	
Sodium, Total	ug/L	20000	
Thallium, Total	ug/L	0.5	0.5
Toluene	ug/L	5	5
Trichloroethene	ug/L	5	5

SESI MW 103		
8/3/2021		
L2141444-01		
Analyte	Result	Q
Benzo(a)anthracene	0.82	
Benzo(a)pyrene	0.82	
Benzo(b)fluoranthene	0.98	
Benzo(k)fluoranthene	0.42	
Chrysene	0.77	
cis-1,2-Dichloroethene	8.1	
Indeno(1,2,3-cd)pyrene	0.56	
Trichloroethene	8.6	

MW-14		
6/15/2020		
L2024975-02		
Analyte	Result	Q
Benzo(a)pyrene	0.04	J
Benzo(b)fluoranthene	0.07	J
Benzo(k)fluoranthene	0.06	J
Dieldrin	0.024	J
Indeno(1,2,3-cd)pyrene	0.1	J
Iron, Total	1660	
Magnesium, Total	39700	
Manganese, Total	795.8	
Sodium, Total	178000	

MW-13		
6/22/2020		
L2026127-02		
Analyte	Result	Q
Iron, Total	540	
Manganese, Total	941.6	
Sodium, Total	143000	

SESI MW 105		
8/3/2021		
L2141444-03		
Analyte	Result	Q
Benzo(a)anthracene	0.08	J
Benzo(a)pyrene	0.06	J
Benzo(b)fluoranthene	0.08	J
Benzo(k)fluoranthene	0.04	J
Chrysene	0.07	J
Indeno(1,2,3-cd)pyrene	0.05	J

MW-1		
6/12/2020		
L2024743-01		
Analyte	Result	Q
Benzene	1.2	
Iron, Total	1500	
Manganese, Total	1588	
Naphthalene	13	
Naphthalene	33	
Selenium, Total	10.1	
Sodium, Total	401000	
Thallium, Total	1.39	

MW-2		
6/12/2020		
L2024743-02		
Analyte	Result	Q
Aluminum, Total	4520	
Benzene	5.3	
Cyanide, Total	789	
Iron, Total	4230	
Lead, Total	35.28	
Mercury, Total	1.16	
Sodium, Total	529000	

MW-12		
6/22/2020		
L2026127-01		
Analyte	Result	Q
Aluminum, Total	3140	
Iron, Total	4800	
Magnesium, Total	39800	
Manganese, Total	1018	
Sodium, Total	222000	

Notes:
1. This plan is for locating groundwater sampling only. Other site work shown here is not intended for construction purposes.

Legend
Concentration excceds crtieria 14.4

LEGEND:
- SESI MONITORING WELL
- EXISTING MONITORING WELL
- PFAS SAMPLING PERFORMED

REFERENCE
SITE INFORMATION TAKEN FROM "TOPOGRAPHIC SURVEY OF PROPERTY"
PREPARED BY CONTRACTORS' LINE & GRADE SOUTH LLC. DATED JULY 27, 2017.

Scale: 1"= 50'
0 25 50 100 150 200

SESI CONSULTING ENGINEERS
CERT. OF AUTH. # 24GA27934700
SOILS / FOUNDATIONS
SITE DESIGN
ENVIRONMENTAL
12A MAPLE AVE. PINE BROOK, N.J. 07058 PH: 973-808-9050

date: 1/18/2022

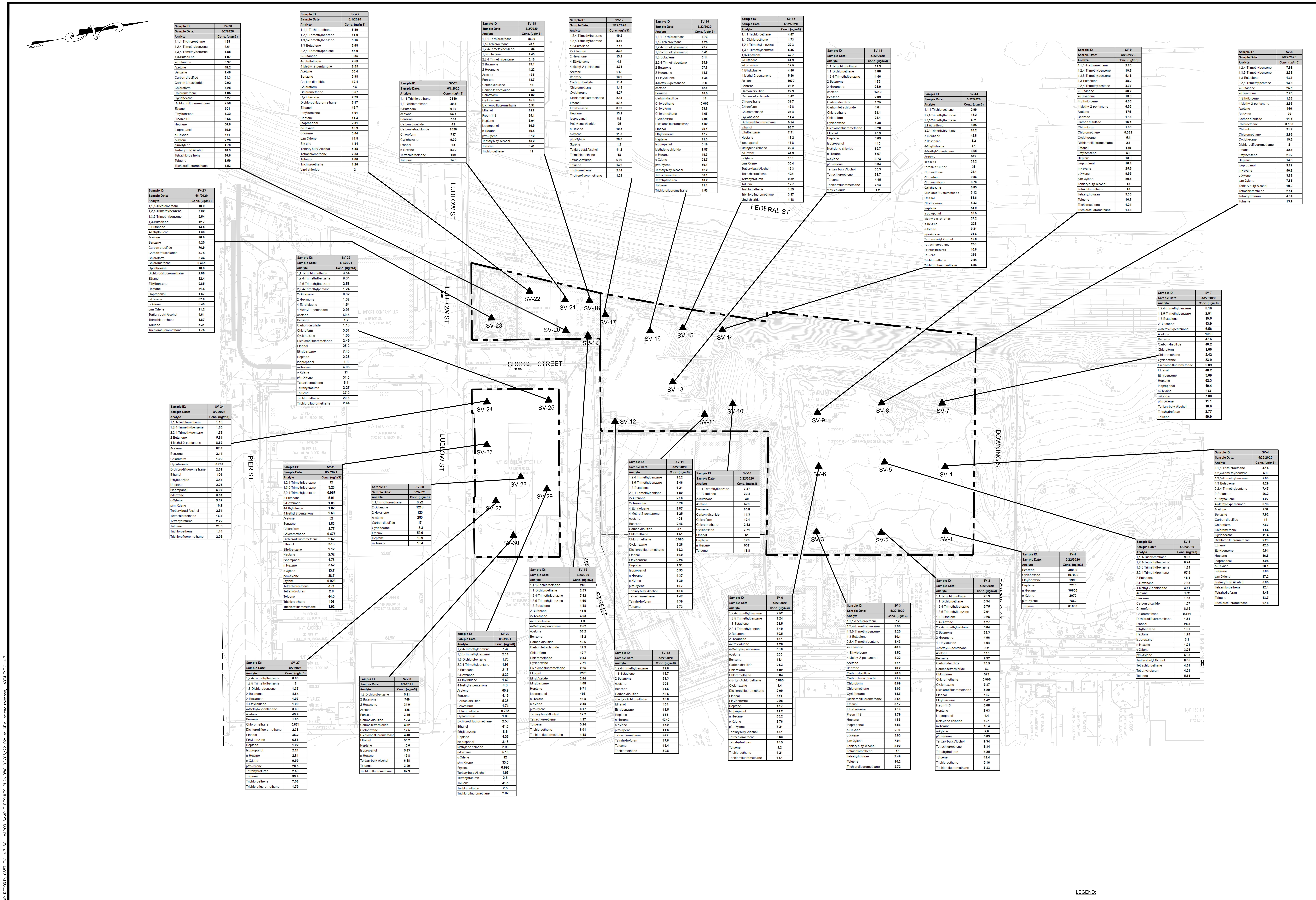
FORMER LUDLOW STREET WORKS
150 DOWNING STREET YONKERS,
NEW YORK

title: GROUNDWATER SAMPLING RESULTS PLAN

job no. 10857
drawing no.

FIG-2.3

1 of 1



Sample ID:	SV-20
Sample Date:	6/2/2020
Analyte	Conc. (ug/m3)
1,1,1-Trichloroethane	188
1,2,4-Trimethylbenzene	4.61
1,3,5-Trimethylbenzene	1.55
1,3-Butadiene	4.07
2-Butanone	8.97
Acetone	48.2
Benzene	9.46
Carbon disulfide	21.3
Carbon tetrachloride	2.02
Chloroform	7.28
Chloromethane	1.05
Cyclohexane	5.27
Dichlorodifluoromethane	2.56
Ethanol	501
Ethylbenzene	1.32
Freon-113	8.66
Heptane	56.6
Isopropanol	36.9
n-Hexane	111
o-Xylene	2.26
p/m-Xylene	4.78
Tertiary butyl Alcohol	16.9
Tetrachloroethene	26.6
Toluene	6.59
Trichlorofluoromethane	1.53

Sample ID:	SV-22
Sample Date:	6/1/2020
Analyte	Conc. (ug/m3)
1,1,1-Trichloroethane	8.89
1,2,4-Trimethylbenzene	11.9
1,3,5-Trimethylbenzene	5.16
1,3-Butadiene	2.68
2,2,4-Trimethylpentane	57.9
2-Butanone	9.35
4-Ethyltoluene	2.53
4-Methyl-2-pentanone	2.55
Acetone	30.4
Benzene	2.98
Carbon disulfide	12.4
Chloroform	14
Chloromethane	0.57
Cyclohexane	2.73
Dichlorodifluoromethane	2.17
Ethanol	49.7
Ethylbenzene	4.91
Heptane	11.4
Isopropanol	2.51
n-Hexane	13.9
o-Xylene	6.04
p/m-Xylene	14.8
Styrene	1.34
Tertiary butyl Alcohol	5.58
Tetrachloroethene	7.53
Toluene	4.86
Trichloroethene	1.26
Vinyl chloride	2

Sample ID:	SV-21
Sample Date:	6/1/2020
Analyte	Conc. (ug/m3)
1,1,1-Trichloroethane	2140
1,1-Dichloroethane	49.4
2-Butanone	9.97
Acetone	64.1
Benzene	7.51
Carbon disulfide	42
Carbon tetrachloride	1690
Chloroform	737
Cyclohexane	9.02
Ethanol	65
n-Hexane	5.32
Tetrachloroethene	109
Toluene	14.6

Sample ID:	SV-18
Sample Date:	6/2/2020
Analyte	Conc. (ug/m3)
1,1,1-Trichloroethane	8620
1,1-Dichloroethane	23.1
1,2,4-Trimethylbenzene	6.34
1,3-Butadiene	4.45
2,2,4-Trimethylpentane	3.16
2-Butanone	19.1
2-Hexanone	4.22
Acetone	135
Benzene	13.7
Carbon disulfide	16
Carbon tetrachloride	6.54
Chloroform	4.82
Cyclohexane	15.9
Dichlorodifluoromethane	3.51
Ethanol	872
Freon-113	35.1
Heptane	5.04
Isopropanol	66.9
n-Hexane	10.4
p/m-Xylene	8.12
Tertiary butyl Alcohol	15.2
Toluene	6.41
Trichloroethene	11

Sample ID:	SV-17
Sample Date:	5/22/2020
Analyte	Conc. (ug/m3)
1,2,4-Trimethylbenzene	19.5
1,3,5-Trimethylbenzene	5.46
1,3-Butadiene	7.17
2-Butanone	44.8
2-Hexanone	15.9
4-Ethyltoluene	4.1
4-Methyl-2-pentanone	3.38
Acetone	917
Benzene	13.9
Carbon disulfide	11.4
Chloromethane	1.48
Cyclohexane	4.27
Dichlorodifluoromethane	2.14
Ethanol	57.5
Ethylbenzene	6.99
Heptane	13.2
Isopropanol	8.6
Methylene chloride	25
n-Hexane	10.5
o-Xylene	11.5
p/m-Xylene	26.3
Styrene	1.2
Tertiary butyl Alcohol	11.8
Tetrachloroethene	18
Tetrahydrofuran	6.99
Toluene	14.9
Trichloroethene	2.14
Trichlorofluoromethane	1.23

Sample ID:	SV-16
Sample Date:	5/22/2020
Analyte	Conc. (ug/m3)
1,1,1-Trichloroethane	3.73
1,1-Dichloroethane	1.25
1,2,4-Trimethylbenzene	22.7
1,3,5-Trimethylbenzene	5.41
1,3-Butadiene	8.14
2,2,4-Trimethylpentane	35.9
2-Butanone	57.8
2-Hexanone	13.6
4-Ethyltoluene	4.38
4-Methyl-2-pentanone	3.8
Acetone	855
Benzene	10.5
Carbon disulfide	14
Chloroethane	0.602
Chloroform	23.8
Chloromethane	1.66
Cyclohexane	7.95
Dichlorodifluoromethane	5.59
Ethanol	70.1
Ethylbenzene	17.7
Heptane	21.3
Isopropanol	6.19
Methylene chloride	9.87
n-Hexane	19.3
o-Xylene	22.7
p/m-Xylene	59.1
Tertiary butyl Alcohol	12.2
Tetrachloroethene	56.1
Tetrahydrofuran	10.2
Toluene	11.1
Trichlorofluoromethane	1.53

Sample ID:	SV-15
Sample Date:	5/22/2020
Analyte	Conc. (ug/m3)
1,1,1-Trichloroethane	4.47
1,1-Dichloroethane	1.73
1,2,4-Trimethylbenzene	22.3
1,3,5-Trimethylbenzene	5.46
1,3-Butadiene	42.7
2-Butanone	64.9
2-Hexanone	12.5
4-Ethyltoluene	4.46
4-Methyl-2-pentanone	5.16
Acetone	1070
Benzene	23.2
Carbon disulfide	27.9
Carbon tetrachloride	1.47
Chloroethane	31.7
Chloroform	19.8
Chloromethane	26.4
Cyclohexane	14.4
Dichlorodifluoromethane	5.24
Ethanol	98.7
Ethylbenzene	7.91
Heptane	18.2
Isopropanol	11.8
Methylene chloride	20.4
n-Hexane	41.9
o-Xylene	13.1
p/m-Xylene	30.4
Tertiary butyl Alcohol	12.3
Tetrachloroethene	134
Tetrahydrofuran	9.32
Toluene	12.7
Trichloroethene	1.59
Trichlorofluoromethane	3.97
Vinyl chloride	1.48

Sample ID:	SV-13
Sample Date:	5/22/2020
Analyte	Conc. (ug/m3)
1,1,1-Trichloroethane	11.9
1,1-Dichloroethane	1.88
1,2,4-Trimethylbenzene	4.46
2-Butanone	172
2-Hexanone	28.9
Acetone	1310
Benzene	2.09
Carbon disulfide	1.25
Carbon tetrachloride	4.01
Chloroethane	31.1
Chloroform	23.1
Cyclohexane	1.38
Dichlorodifluoromethane	6.28
Ethanol	95.3
Heptane	3.63
Isopropanol	110
Methylene chloride	65.7
n-Hexane	5.67
o-Xylene	3.74
p/m-Xylene	6.34
Tertiary butyl Alcohol	33.3
Tetrachloroethene	39.7
Toluene	4.45
Trichlorofluoromethane	7.14
Vinyl chloride	1.2

Sample ID:	SV-14
Sample Date:	5/22/2020
Analyte	Conc. (ug/m3)
1,1,1-Trichloroethane	2.99
1,2,4-Trimethylbenzene	18.2
1,3,5-Trimethylbenzene	4.71
1,3-Butadiene	3.85
2,2,4-Trimethylpentane	26.2
2-Butanone	42.8
2-Hexanone	8.2
4-Ethyltoluene	4.1
4-Methyl-2-pentanone	6.68
Acetone	527
Benzene	33.2
Carbon disulfide	38
Chloroethane	24.1
Chloroform	9.86
Chloromethane	6.73
Cyclohexane	6.85
Dichlorodifluoromethane	3.12
Ethanol	81.6
Ethylbenzene	4.33
Heptane	54.9
Isopropanol	10.5
Methylene chloride	37.2
n-Hexane	228
o-Xylene	9.21
p/m-Xylene	21.6
Tertiary butyl Alcohol	12.8
Tetrachloroethene	235
Tetrahydrofuran	10.6
Toluene	359
Trichloroethene	2.54
Trichlorofluoromethane	4.86

Sample ID:	SV-9
Sample Date:	5/22/2020
Analyte	Conc. (ug/m3)
1,1,1-Trichloroethane	2.23
1,2,4-Trimethylbenzene	19.6
1,3,5-Trimethylbenzene	5.16
1,3-Butadiene	35.2
2,2,4-Trimethylpentane	3.37
2-Butanone	50.7
2-Hexanone	13.6
4-Ethyltoluene	4.06
4-Methyl-2-pentanone	6.52
Acetone	375
Benzene	17.8
Carbon disulfide	16.1
Chloroform	1.08
Chloromethane	0.582
Cyclohexane	5.4
Dichlorodifluoromethane	2.1
Ethanol	130
Ethylbenzene	5.6
Heptane	13.9
Isopropanol	10.4
n-Hexane	25.3
o-Xylene	9.99
p/m-Xylene	20.4
Tertiary butyl Alcohol	13
Tetrachloroethene	10
Tetrahydrofuran	9.38
Toluene	16.7
Trichloroethene	1.21
Trichlorofluoromethane	1.86

Sample ID:	SV-8
Sample Date:	5/22/2020
Analyte	Conc. (ug/m3)
1,2,4-Trimethylbenzene	7.96
1,3,5-Trimethylbenzene	2.36
1,3-Butadiene	13.1
2,2,4-Trimethylpentane	14.6
2-Butanone	25.5
2-Hexanone	7.25
4-Ethyltoluene	1.33
4-Methyl-2-pentanone	2.93
Acetone	466
Benzene	20
Carbon disulfide	11.1
Chloroethane	0.538
Chloroform	21.9
Chloromethane	2.93
Cyclohexane	19.3
Dichlorodifluoromethane	2
Ethanol	32.4
Ethylbenzene	2.02
Heptane	14.3
Isopropanol	3.27
n-Hexane	50.8
o-Xylene	3.86
p/m-Xylene	7.86
Tertiary butyl Alcohol	10.9
Tetrachloroethene	2.54
Tetrahydrofuran	4.34
Toluene	13.7

Sample ID:	SV-23
Sample Date:	6/1/2020
Analyte	Conc. (ug/m3)
1,1,1-Trichloroethane	10.9
1,2,4-Trimethylbenzene	7.92
1,3,5-Trimethylbenzene	2.54
1,3-Butadiene	12.7
2-Butanone	13.5
4-Ethyltoluene	1.36
Acetone	96.9
Benzene	4.25
Carbon disulfide	76.9
Carbon tetrachloride	8.74
Chloroform	3.34
Chloromethane	0.465
Cyclohexane	10.6
Dichlorodifluoromethane	2.06
Ethanol	32.4
Ethylbenzene	2.85
Heptane	31.4
Isopropanol	1.67
n-Hexane	57.8
o-Xylene	5.43
p/m-Xylene	11.2
Tertiary butyl Alcohol	4.61
Tetrachloroethene	3.87
Toluene	5.31
Trichlorofluoromethane	1.75

Sample ID:	SV-25
Sample Date:	8/2/2021
Analyte	Conc. (ug/m3)
1,1,1-Trichloroethane	3.54
1,2,4-Trimethylbenzene	9.34
1,3,5-Trimethylbenzene	2.58
2,2,4-Trimethylpentane	1.24
2-Butanone	8.32
2-Hexanone	1.38
4-Ethyltoluene	1.54
4-Methyl-2-pentanone	2.93
Acetone	60.6
Benzene	1.7
Carbon disulfide	1.13
Chloroform	3.01
Cyclohexane	1.05
Dichlorodifluoromethane	2.49
Ethanol	25.2
Ethylbenzene	7.43
Heptane	2.35
Isopropanol	1.8
n-Hexane	4.05
o-Xylene	11
p/m-Xylene	31.3
Tetrachloroethene	5.1
Tetrahydrofuran	2.27
Toluene	37.2
Trichloroethene	20.3
Trichlorofluoromethane	2.44

Sample ID:	SV-24
Sample Date:	8/2/2021
Analyte	Conc. (ug/m3)
1,1,1-Trichloroethane	1.16
1,2,4-Trimethylbenzene	1.88
2,2,4-Trimethylpentane	1.73
2-Butanone	5.81
4-Methyl-2-pentanone	8.69
Acetone	87.4
Benzene	2.11
Chloroform	1.99
Cyclohexane	0.764
Dichlorodifluoromethane	2.39
Ethanol	104
Ethylbenzene	3.47
Heptane	2.25
Isopropanol	5.97
n-Hexane	3.51
o-Xylene	3.87
p/m-Xylene	10.9
Tertiary butyl Alcohol	2.51
Tetrachloroethene	16.7
Tetrahydrofuran	2.22
Toluene	21.3
Trichloroethene	1.14
Trichlorofluoromethane	2.03

Sample ID:	SV-26
Sample Date:	8/2/2021
Analyte	Conc. (ug/m3)
1,2,4-Trimethylbenzene	12
1,3,5-Trimethylbenzene	3.26
2,2,4-Trimethylpentane	0.967
2-Butanone	5.01
2-Hexanone	1.03
4-Ethyltoluene	1.82
4-Methyl-2-pentanone	2.68
Acetone	52
Benzene	1.83
Chloroform	3.77
Chloromethane	0.477
Dichlorodifluoromethane	2.52
Ethanol	37.3
Ethylbenzene	9.12
Heptane	2.32
Isopropanol	1.76
n-Hexane	3.52
o-Xylene	13.7
p/m-Xylene	38.7
Styrene	0.928
Tetrachloroethene	3.71
Tetrahydrofuran	2.8
Toluene	44.5
Trichloroethene	196
Trichlorofluoromethane	1.92

Sample ID:	SV-28
Sample Date:	8/2/2021
Analyte	Conc. (ug/m3)
1,1,1-Trichloroethane	6.22
2-Butanone	1210
2-Hexanone	120
Acetone	280
Carbon disulfide	17
Cyclohexane	13.3
Ethanol	52.6
Heptane	10.9
n-Hexane	16.4

Sample ID:	SV-11
Sample Date:	5/22/2020
Analyte	Conc. (ug/m3)
1,2,4-Trimethylbenzene	15.2
1,3,5-Trimethylbenzene	3.46
1,3-Butadiene	1.21
2,2,4-Trimethylpentane	1.82
2-Butanone	27.6
2-Hexanone	5.78
4-Ethyltoluene	2.87
4-Methyl-2-pentanone	3.25
Acetone	406
Benzene	2.46
Carbon disulfide	8.1
Chloroethane	4.51
Chloromethane	0.985
Cyclohexane	3.28
Dichlorodifluoromethane	12.2
Ethanol	46.9
Ethylbenzene	2.26
Heptane	1.91
Isopropanol	5.53
n-Hexane	4.37
o-Xylene	5.39
p/m-Xylene	10.7
Tertiary butyl Alcohol	10.3
Tetrachloroethene	1.47
Tetrahydrofuran	4.39
Toluene	5.73

Sample ID:	SV-10
Sample Date:	5/22/2020
Analyte	Conc. (ug/m3)
1,2,4-Trimethylbenzene	7.37
1,3-Butadiene	29.4
2-Butanone	49
Acetone	570
Benzene	65.8
Carbon disulfide	11.3
Chloroform	12.1
Chloromethane	2.52
Cyclohexane	7.71
Ethanol	61
Heptane	178
n-Hexane	937
Toluene	18.8

Sample ID:	SV-7
Sample Date:	5/22/2020
Analyte	Conc. (ug/m3)
1,2,4-Trimethylbenzene	8.16
1,3,5-Trimethylbenzene	2.51
1,3-Butadiene	15.6
2-Butanone	43.9
4-Methyl-2-pentanone	6.56
Acetone	1030
Benzene	47.6
Carbon disulfide	40.2
Chloroform	1.66
Chloromethane	2.42
Cyclohexane	33.9
Dichlorodifluoromethane	2.09
Ethanol	48.2
Ethylbenzene	3.69
Heptane	62.3
Isopropanol	10.4
n-Hexane	144
o-Xylene	7.08
p/m-Xylene	11.1
Tertiary butyl Alcohol	10.6
Tetrahydrofuran	2.77
Toluene	59.9

Sample ID:	SV-4
Sample Date:	5/22/2020
Analyte	Conc. (ug/m3)
1,1,1-Trichloroethane	4.14
1,2,4-Trimethylbenzene	5.8
1,3,5-Trimethylbenzene	2.03
1,3-Butadiene	4.29
2,2,4-Trimethylpentane	7.47
2-Butanone	26.2
4-Ethyltoluene	1.27
4-Methyl-2-pentanone	6.93
Acetone	200
Benzene	7.92
Carbon disulfide	14
Chloroform	7.67
Chloromethane	1.54
Cyclohexane	11.4
Dichlorodifluoromethane	2.29
Ethanol	42.6
Ethylbenzene	5.91
Heptane	36.6
Isopropanol	5.04
n-Hexane	28.1
o-Xylene	7.86
p/m-Xylene	17.2
Tertiary butyl Alcohol	6.85
Tetrachloroethene	12.4
Tetrahydrofuran	3.48
Toluene	13.7
Trichlorofluoromethane	6.18

Sample ID:	SV-1
Sample Date:	5/22/2020
Analyte	Conc. (ug/m3)
Benzene	39000
Cyclohexane	107000
Ethylbenzene	1990
Heptane	7210
n-Hexane	30600
o-Xylene	2070
p/m-Xylene	7860
Toluene	61000

Sample ID:	SV-5
Sample Date:	5/22/2020
Analyte	Conc. (ug/m3)
1,1,1-Trichloroethane	9.82
1,2,4-Trimethylbenzene	6.24
1,3,5-Trimethylbenzene	1.83
2,2,4-Trimethylpentane	57.5
2-Butanone	18.3
2-Hexanone	7.83
4-Methyl-2-pentanone	4.71
Acetone	172
Benzene	1.58
Carbon disulfide	1.57
Chloroform	8.45
Chloromethane	0.421
Dichlorodifluoromethane	1.51
Ethanol	28.8
Ethylbenzene	1.62
Heptane	1.28
Isopropanol	3.1
n-Hexane	1.01
o-Xylene	3.08
p/m-Xylene	5.95
Tertiary butyl Alcohol	8.85
Tetrachloroethene	4.31
Tetrahydrofuran	4.51
Toluene	5.65

Sample ID:	SV-2
Sample Date:	5/22/2020
Analyte	Conc. (ug/m3)
1,1,1-Trichloroethane	20.9
1,1-Dichloroethene	0.94
1,2,4-Trimethylbenzene	5.75
1,3,5-Trimethylbenzene	2.01
1,3-Butadiene	9.25
1,4-Dioxane	1.27
2,2,4-Trimethylpentane	5.04
2-Butanone	22.3
2-Hexanone	4.96
4-Ethyltoluene	1.04
4-Methyl-2-pentanone	3.2
Acetone	115
Benzene	9.97
Carbon disulfide	16.5
Carbon tetrachloride	43
Chloroform	571
Chloromethane	0.995
Cyclohexane	5.37
Dichlorodifluoromethane	5.29
Ethanol	162
Ethylbenzene	1.42
Freon-113	3.08
Heptane	8.03
Isopropanol	4.4
Methylene chloride	12.1
n-Hexane	16.4
o-Xylene	2.6
p/m-Xylene	5.69
Tertiary butyl Alcohol	9.34
Tetrachloroethene	8.34
Tetrahydrofuran	4.25
Toluene	12.4
Trichloroethene	5.16
Trichlorofluoromethane	5.33

Sample ID:	SV-3
Sample Date:	5/22/2020
Analyte	Conc. (ug/m3)
1,1,1-Trichloroethane	7.2
1,2,4-Trimethylbenzene	7.96
1,3,5-Trimethylbenzene	3.25
1,3-Butadiene	30.1
2,2,4-Trimethylpentane	9.43
2-Butanone	46.6
4-Ethyltoluene	1.52
4-Methyl-2-pentanone	4.22
Acetone	177
Benzene	10.2
Carbon disulfide	20.6
Carbon tetrachloride	21.4
Chloroform	6.69
Chloromethane	1.03
Cyclohexane	14.6
Dichlorodifluoromethane	8.51
Ethanol	37.7
Ethylbenzene	2.14
Freon-113	1.79
Heptane	112
Isopropanol	3.56
n-Hexane	269
o-Xylene	3.93
p/m-Xylene	7.91
Tertiary butyl Alcohol	8.22
Tetrachloroethene	15
Tetrahydrofuran	7.49
Toluene	10.2
Trichlorofluoromethane	2.72

Sample ID:	SV-6
Sample Date:	5/22/2020
Analyte	Conc. (ug/m3)
1,2,4-Trimethylbenzene	7.52
1,3,5-Trimethylbenzene	2.24
1,3-Butadiene	21.5
2,2,4-Trimethylpentane	7.19
2-Butanone	70.5
2-Hexanone	13.1
4-Ethyltoluene	1.28
4-Methyl-2-pentanone	5.16
Acetone	200
Benzene	13.1
Carbon disulfide	21.3
Chloroform	1.02
Chloromethane	0.84
cis-1,2-Dichloroethene	0.805
Cyclohexane	9.4
Dichlorodifluoromethane	2.09
Ethanol	151
Ethylbenzene	2.25
Heptane	15.7
Isopropanol	11.2
n-Hexane	35.2
o-Xylene	3.76
p/m-Xylene	7.21
Tertiary butyl Alcohol	13.1
Tetrachloroethene	3.63
Tetrahydrofuran	13.5
Toluene	9.2
Trichloroethene	1.21
Trichlorofluoromethane	13.1

Sample ID:	SV-19
Sample Date:	6/2/2020
Analyte	Conc. (ug/m3)
1,1,1-Trichloroethane	283
1,1-Dichloroethane	2.53
1,2,4-Trimethylbenzene	7.42
1,3,5-Trimethylbenzene	1.66
1,3-Butadiene	1.28
2-Butanone	11.9
2-Hexanone	4.63
4-Ethyltoluene	1.3
4-Methyl-2-pentanone	2.52
Acetone	58.2
Benzene	13.2
Carbon disulfide	12.6
Carbon tetrachloride	17.9
Chloroform	12.7
Chloromethane	0.83
Cyclohexane	7.71
Dichlorodifluoromethane	2.25
Ethanol	1270
Ethyl Acetate	2.64
Ethylbenzene	1.08
Heptane	9.71
Isopropanol	103
n-Hexane	16.5
o-Xylene	2.55
p/m-Xylene	6.17
Tertiary butyl Alcohol	12.2
Tetrachloroethene	1.37
Toluene	5.24
Trichloroethene	8.01
Trichlorofluoromethane	1.58

Sample ID:	SV-12
Sample Date:	5/22/2020
Analyte	Conc. (ug/m3)
1,2,4-Trimethylbenzene	12.6
1,3-Butadiene	13.7
2-Butanone	61.3
Acetone	323
Benzene	71.6
Carbon disulfide	58.5
cis-1,2-Dichloroethene	16.8
Ethanol	104
Ethylbenzene	11.5
Heptane	656
n-Hexane	1340
o-Xylene	15.2
p/m-Xylene	41.6
Tetrachloroethene	427
Tetrahydrofuran	17.6
Toluene	19.4
Trichloroethene	82.8

Sample ID:	SV-27
Sample Date:	8/2/2021
Analyte	Conc. (ug/m3)
1,2,4-Trimethylbenzene	6.88
1,3,5-Trimethylbenzene	2
1,3-Dichlorobenzene	1.37
2-Butanone	4.84
2-Hexanone	1.07
4-Ethyltoluene	1.09
4-Methyl-2-pentanone	3.39
Acetone	49.9
Benzene	1.85
Chloromethane	0.871
Dichlorodifluoromethane	2.38
Ethanol	36.2
Ethylbenzene	6.86
Heptane	1.92
Isopropanol	2.21
n-Hexane	2.81
o-Xylene	9.99
p/m-Xylene	28.5
Tetrahydrofuran	2.59
Toluene	33.4
Trichloroethene	7.58
Trichlorofluoromethane	1.75

Sample ID:	SV-30
Sample Date:	8/2/2021
Analyte	Conc. (ug/m3)
1,3-Dichlorobenzene	5.11
2-Butanone	749
2-Hexanone	34.9
Acetone	328
Benzene	3.45
Carbon disulfide	12.4
Carbon tetrachloride	4.82
Cyclohexane	17.5
Dichlorodifluoromethane	4.48
Ethanol	55.2
Heptane	15.6
Isopropanol	5.43
n-Hexane	15.8
Tertiary butyl Alcohol	6.88
Toluene	3.29
Trichlorofluoromethane	62.9

Sample ID:	SV-29
Sample Date:	8/2/2021
Analyte	Conc. (ug/m3)
1,2,4-Trimethylbenzene	7.37
1,3,5-Trimethylbenzene	2.14
1,3-Dichlorobenzene	1.76
2,2,4-Trimethylpentane	1.91
2-Butanone	21.7
2-Hexanone	8.32
4-Ethyltoluene	1.42
4-Methyl-2-pentanone	4.3
Acetone	60.8
Benzene	4.19
Carbon disulfide	5.36
Chloroform	1.74
Chloromethane	0.783
Cyclohexane	1.86
Dichlorodifluoromethane	2.55
Ethanol	41.3
Ethylbenzene	8.6
Heptane	4.39
Isopropanol	3.15
Methylene chloride	2.98
n-Hexane	5.18
o-Xylene	12
p/m-Xylene	33.5
Styrene	0.996
Tertiary butyl Alcohol	1.66
Tetrahydrofuran	2.6
Toluene	41.5
Trichloroethene	2.5
Trichlorofluoromethane	2.02

REFERENCE
SITE INFORMATION TAKEN FROM "TOPOGRAPHIC SURVEY OF PROPERTY"
PREPARED BY CONTRACTORS' LINE & GRADE SOUTH LLC. DATED JULY 27, 2017.

LEGEND:
▲ - SOIL VAPOR SAMPLING POINT

SCALE: 1"=50'
0 50 100

rev	date	description	by

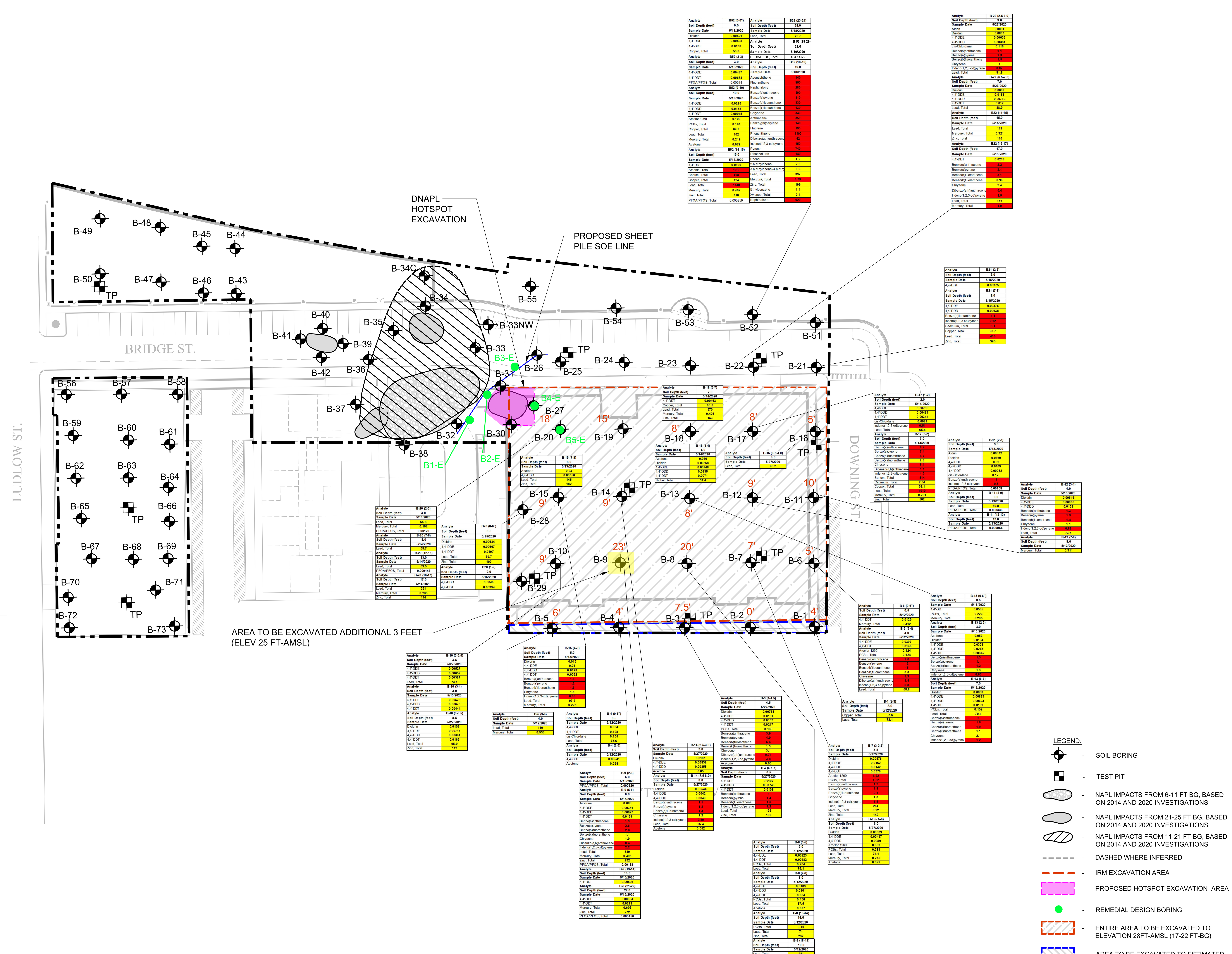
dwg by: yz
chk by: FL
scale: AS NOTED
date: 02/03/2022

SESI CONSULTING ENGINEERS D.P.C.
SOILS / FOUNDATIONS
SITE DESIGN
ENVIRONMENTAL
12A MAPLE AVE. PINE BROOK, N.J. 07058 PH: 973-808-9050

FORMER LUDLOW STREET WORKS
150 DOWNING STREET YONKERS,
NEW YORK

title: SOIL VAPOR SAMPLE RESULTS PLAN

job no. 10857
drawing no.
FIG-2.4
1 of 1



Analyte	NYSDEC - Restricted Residential Use Soil Criteria	NYSDEC - Unrestricted Use Soil Criteria
Volatile Organics		
Acetone	100	0.05
Ethylbenzene	41	1
Xylenes, Total	100	0.26
Naphthalene	100	12
PCBs/Pesticides		
Aldrin	0.097	0.005
Dieldrin	0.2	0.005
4,4'-DDT	7.9	0.0033
4,4'-DDD	13	0.0033
4,4'-DDE	8.9	0.0033
cis-Chlordane	4.2	0.094
Aroclor 1260	1	0.1
PCBs, Total	1	0.1
SVOCs		
Benzo(a)anthracene	1	1
Benzo(a)pyrene	1	1
Benzo(b)fluoranthene	1	1
Benzo(k)fluoranthene	3.9	0.8
Chrysene	3.9	1
Dibenzo(a,h)anthracene	0.33	0.33
Indeno(1,2,3-cd)pyrene	0.5	0.5
Acenaphthene	100	20
Fluoranthene	100	100
Naphthalene	100	12
Acenaphthylene	100	100
Anthracene	100	100
Benzo(ghi)perylene	100	100
Fluorene	100	30
Phenanthrene	100	100
Pyrene	100	100
Dibenzofuran	59	7
Phenol	100	0.33
2-Methylphenol	100	0.33
3-Methylphenol/4-Methy	100	0.33
Total Metals		
Copper, Total	270	50
Lead, Total	400	63
Mercury, Total	0.81	0.18
Zinc, Total	10000	109
Barium, Total	400	350
Cadmium, Total	4.3	2.5
Arsenic, Total	16	13
PFAS		
PFOA/PFOS, Total		

Key	
(yellow)	Exceeds the NYSDEC Unrestricted Use (SCO)
(red)	Exceeds the NYSDEC Restricted Residential Use (SCO)

NOTE:
THIS PLAN IS FOR LOCATING BORING ONLY. OTHER SITE WORK SHOWN HERE IS NOT INTENDED FOR CONSTRUCTION.

REFERENCE
SITE INFORMATION TAKEN FROM "TOPOGRAPHIC SURVEY OF PROPERTY" PREPARED BY CONTRACTORS' LINE & GRADE SOUTH LLC. DATED JULY 27, 2017.

LEGEND:
- SOIL BORING
- TEST PIT
- NAPL IMPACTS FROM 6-11 FT BG, BASED ON 2014 AND 2020 INVESTIGATIONS
- NAPL IMPACTS FROM 21-25 FT BG, BASED ON 2014 AND 2020 INVESTIGATIONS
- NAPL IMPACTS FROM 11-21 FT BG, BASED ON 2014 AND 2020 INVESTIGATIONS
- DASHED WHERE INFERRED
- IRM EXCAVATION AREA
- PROPOSED HOTSPOT EXCAVATION AREA
- REMEDIAL DESIGN BORING
- ENTIRE AREA TO BE EXCAVATED TO ELEVATION 28FT-AMSL (17-22 FT-BG)
- AREA TO BE EXCAVATED TO ESTIMATED CONTAMINATION DEPTH
- 9' ESTIMATED CONTAMINATION DEPTH IN FT-BG (DEEPEST USCO EXCEEDANCE FROM RI PLUS 1')

Scale: 1"= 30'
0 15 30 60 90 120

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12A MAPLE AVE. PINE BROOK, NJ 07058 PH 973-808-9050
SOILS / FOUNDATIONS
SITE DESIGN
ENVIRONMENTAL

drawn by: DWGBY
checked by: CHKBY
scale: AS NOTED
date: 05/25/2022

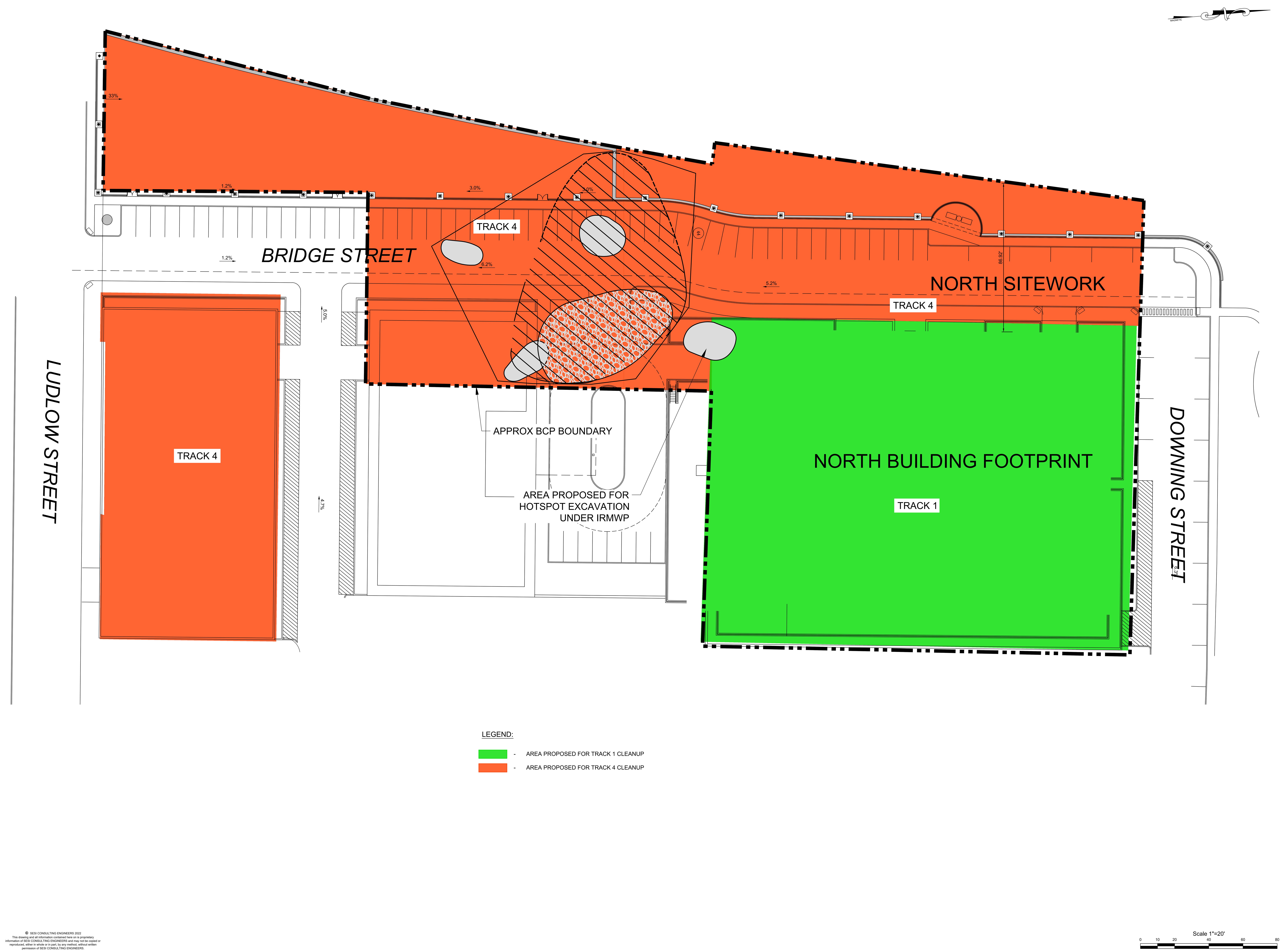
rev | date | description | by

ANTHONY CASTILLO, P.E.
PROFESSIONAL ENGINEER
N.Y. LIC. NO. 084421

LUDLOW POINT
150 DOWNING STREET
YONKERS, NEW YORK

drawing title:
IRM EXCAVATION PLAN

job no. 10857
drawing no.
FIG-3.1
1 of



drawn by: RDM
checked by: AC
scale: AS NOTED
date: 08/08/2022

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ANTHONY CASTILLO, P.E.
PROFESSIONAL ENGINEER
N.J. LIC. NO. 43112

BRIDGEWATER
150 DOWNING STREET
CITY OF YONKERS, WESTCHESTER COUNTY, NY

title: BCP CLEANUP PLAN

job no. 10857
drawing no.

FIG-3.2

of 1

APPENDIX A
Citizens Participation Plan

NEW YORK STATE OF OPPORTUNITY. Department of Environmental Conservation

Brownfield Cleanup Program

Citizen Participation Plan
for
Former Ludlow Street Works
150 Downing, 58 Knowles and 1 Bridge Streets

December 2019

C360158
Yonkers
Westchester County, New York

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: **Ludlow Point Development, LLC ("Applicant")**
Site Name: **Former Ludlow Street Works ("Site")**
Site Address: **150 Downing, 58 Knowles, and 1 Bridge Streets, Yonkers, NY**
Site County: **Westchester County**
Site Number: **C360158**

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 significant threat determination for the site had not yet been made.

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 • 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 • Publish above ENB content in local newspaper • Mail above ENB content to site contact list • 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 **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 • 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 • Public meeting by NYSDEC about proposed RWP (if requested by affected community or at discretion of NYSDEC project manager) • 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 • 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. **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.

The anticipated major issues of concern to the public will be potential impacts of dust or odor during the removal of affected soil at the Site, if required. Another example of a major issue of public concern would be the impact of increased truck traffic on the surrounding neighborhood. Construction safety issues will also be addressed. This work will be performed in accordance with procedures which will be specified under a detailed Remedial Program which considers and takes preventive measures for exposures to future residents of the property and those on adjacent properties during construction. Detailed plans to monitor the potential for exposure including a Health and Safety Plan (HASP) and a Community Air Monitoring Plan (CAMP) are required components of the remedial program. Implementation of these plans will be under the direct oversight of the NYSDEC and the New York State Department of Health (NYSDOH).

These plans will specify the following worker and community health and safety activities during remedial activity at the Site:

- On-site air monitoring for worker protection;
- Perimeter air monitoring for community protection;
- The use of odor, vapor, and dust controls, such as water or foam sprays, as needed;
- Monitoring and control of soil, generated during remediation, as needed; and
- Truck routes which best avoid or minimize use of residential streets.

4. Site Information

Appendix C contains a map identifying the location of the site.

Site Description

The property (hereafter referred to as the Site) consists of three tax lots located at 150 Downing Street, 58 Knowles Street, and 1 Bridge Street, City of Yonkers, Westchester County, New York (identified as City of Yonkers tax lot parcels: Section 1: Block 171, Lot 1.14; Block 168, Lot 1 and Block 167, Lot 3). The existing tax lot for 150 Downing Street (Section 1, Block 171, Lot 1.14) is comprised of three former tax lots: Section 1: Block 171, Lots 1 (162 Downing Street), 11 (152 Downing Street), and 14 (150 Downing Street). The portion of the Site comprising former Lot 1 (westernmost end), known as the Former Ludlow Street Works Site, is still subject to a NYSDEC Voluntary Cleanup

Agreement (VCP site ID: V00562), which will be terminated once a BCA is executed for this new, larger BCP Site encompassing this former Lot 1.

The Site is an irregular-shaped, 2.89-acre parcel, which has 273 feet of frontage on the southern side of Downing Street (unimproved street). Portions of Knowles Street and Bridge Street traverse the Site in an "L" shape from the eastern boundary to the southern boundary.

A brief description of current structures for each parcel comprising the Site presented below:

- 150 Downing Street - A gravel lot and a one-story, concrete block structure are located in the southern portion of the parcel. The parcel is utilized by the City of Yonkers Department of Public Works (DPW) as a storage area, inclusive of salt, vehicle and equipment storage. The northern portion of the parcel is currently vacant.
- 58 Knowles Street – A two-story, brick commercial building occupies the majority of the parcel with paved/parking areas in the central and eastern portions of the parcel.
- 1 Bridge Street – A two-story, concrete commercial building located in the northern portion of the parcel and a parking lot located in the southern portion of the parcel.

The Site is anticipated to be developed for residential and commercial purposes and remediated within the Brownfield Cleanup Program (BCP) program to comply with Restricted Residential Soil Cleanup Objectives (RR SCOs).

History of Site Use, Investigation, and Cleanup

Information regarding the environmental history of the Site was obtained from previous environmental reports, and historical maps, including information from a 2003 research document produced by GEI Consultants (Manufactured Gas Plant History, Ludlow Street Works, Yonkers, New York). The Site was developed sometime prior to 1886 and has a long history of commercial uses. Known historical uses for each parcel are presented below:

- 150 Downing Street – Information regarding the environmental history of the Site was obtained from previous environmental reports, and historical maps, including information from a 2003 research document produced by GEI Consultants (Manufactured Gas Plant History, Ludlow Street Works, Yonkers, New York).

The Site was developed sometime prior to 1886 and has a long history of commercial uses.

An excerpt of the Phase I ESA describing past uses is provided below:

"The southern portion of the property was operated as a manufactured gas plant (MGP) and then as a gas holder station between 1879 and 1936. Related structures included underground naphtha tanks, gas manufacturing facilities (retorts, purifiers, etc.) and several large capacity holder tanks. This portion of the property, as well as the western half of the northern portion, are currently being investigated under NYSDEC's Voluntary Cleanup Program (identified as the Ludlow Street, Yonkers MGP site, VCP ID: V00562).

Previous investigative activities performed at the VCP site document significant impacts from activities at the former MGP and gas holder facility, including dissolved organic compounds in groundwater and the presence of non-aqueous phase liquid (NAPL ["coal tar"]) in both shallow soils and in deeper areas. Impacts are restricted to the southern portion of the property and the southernmost area of the northern portion, at or near former structures.

The northeastern portion of the property historically contained a dwelling, which was converted to commercial use, and a subsequent large facility used for cleaning and dyeing (1930s), vehicle parking and storage (1946 until 1973), and as a City of Yonkers Department of Public Works facility. Historical commercial activities, and releases from former USTs, may have resulted in significant impacts at and near the former DPW building."

- 58 Knowles Street – Excerpts of the Phase I ESA describing past uses are provided below:

  "The subject property formerly contained a pond associated with off-site ice houses and was developed with the existing commercial building circa 1892. Historical industrial activities have included the manufacturing of medical supplies, metal gears, shampoo and power equipment.

  Historical commercial uses (e.g., Superex Electronics and/or Grand Painting & Decorating Company) have the potential to use and release contaminants and such releases have the potential to impact the subject property (current site uses are not considered to be a significant environmental concern). Given the industrial nature of the surrounding area, materials used to fill the former on-site

pond may have contained poor-quality materials, such as incinerator ash, coal, foundry slag, etc."

- 1 Bridge Street – Review of the Phase I ESA indicated the following past uses:

  Operations involving wool extract from rags (from at least 1886 until sometime before 1898), plastic products manufacturing (from at least 1971 until sometime before 1978), and an auto repair facility (from at least 1957 until sometime after 2004).

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 mixed commercial/residential purposes with an affordable housing component. To achieve this goal, the Applicant will conduct additional site investigation work 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 completed a Phase I ESA and a Phase II ESA before it entered into the BCP. For the partial site investigation, NYSDEC will determine if the data are useable. The Applicant will finalize a RIWP and complete the additional RI work, as required by NYSDEC. 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 cleanup activities. When the Applicant completes cleanup activities, it will prepare a final engineering report 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 final engineering report. 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):

John Spellman, P.E.
New York State Department of
Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, NY 12233-7014
(518) 402-9686
john.spellman@dec.ny.gov

Caryn Bower, Esq
New York State Department of
Environmental Conservation
Office of General Counsel
625 Broadway
Albany, NY 12233-7014
(518) 402-9686
caryn.bower@dec.ny.gov

New York State Department of Health (NYSDOH):

Christine Vooris
Project Manager
NYSDOH, Bureau of Env. Exp. Invest.
Empire State Plaza
Corning Tower R. 1787
Albany, NY 12237
518-402-7860
christine.vooris@health.ny.gov

Locations of Reports and Information

The facilities identified below are being used to provide the public with convenient access to important project documents:

Yonkers Public Library
Riverfront Branch
1 Larkin Center
Yonkers, NY 10701
Phone: 914-337-1500
Hours: Monday-Thursday: 9 am-8 pm
Friday & Saturday: 9 am-5 pm
Sunday: 12-5 pm

NYSDEC
625 Broadway
Albany, NY 12233-7014
Attn: Caryn Bower, Esq
Phone: (518) 402-9686
Hours: (call for appointment)

Appendix B - Site Contact List

Residents, Owners, and Occupants of Property and Adjoining Properties

Address Parcel Identification	Owner Name and Address	Current Operators/ Occupants (address)
Subject Property		
150 Downing Street 1.-171-1.14 15606601710010000000	City of Yonkers City Hall Yonkers NY 10701	Yonkers DPW (owner and occupant, owner address)
58 Knowles Street 1.-168-1 15606601680010000000	151 Ludlow Street LLC 508 E 78th St Apt 1-E New York NY 10075	Linoto - Linen Distributor (subject property address)
1 Bridge Street 1.-167-3 15606601670030000000	1 – 3 Pier LLC 100 Summit Drive, 2nd Fl. Valhalla, NY 10595	All Hands Kitchen Exhaust Cleaning, Amsco Construction, and Dunkin Donuts Commercial Kitchen (subject property address)
Adjoining Properties		
169 Hawthorne Avenue 1.-172-18 15606601720180000000	City of Yonkers City Hall Yonkers NY 10701	Anthony O'Boyle Memorial Park (owner and occupant, owner address)
199 Hawthorne Avenue 1.-171-23 15606701710230000000	Andrea M Horvath Ferenc Horvath Joan Horvath 199 Hawthorne Avenue Yonkers, NY 10705	Apartment (adjoining property address)
203 Hawthorne Avenue 1.-171-25 15606701710250000000	Warren Heit 10 Stewart Pl White Plains NY 10603	Apartment (adjoining property address)
207 Hawthorne Avenue 1.-171-26 15606701710260000000	Jose Alfonso Teresa Alfonso 207 Hawthorne Ave Yonkers NY 10705-1022	Apartment (adjoining property address)
209 Hawthorne Avenue 1.-171-28 15606701710280000000	Jose Alfonso Teresa Alfonso 207 Hawthorne Ave Yonkers NY 10705-1022	Garage (adjoining property address)
211 Hawthorne Avenue 1.-171-29 15606701710290000000	Adolph Degrace Virgini Degrace 211 Hawthorne Ave Yonkers NY 10705-1023	Apartment (adjoining property address)
215 Hawthorne Avenue 1.-171-31.32 15606701710310000000	217 Hawthorne Ave Realty 89 Delaware Rd Yonkers NY 10710	Apartment (adjoining property address)
219 Hawthorne Avenue 1.-171-33 15606701710330000000	Ricardo Mateo 219 Hawthorne Ave Yonkers NY 10705	3-Family Residence (adjoining property address)
227 Hawthorne Avenue 1.-171-37 15606701710370000000	Joby Realty Corp. 75A Lake Rd Ste 200 Congers NY 10920	Apartment (adjoining property address)
231 Hawthorne Avenue 1.-168-9 15606701680090000000	231 Hawthorne Avenue LLC 10 Lawrence Ave Sleepy Hollow NY 10591-0000	Unknown (adjoining property address)
53 Knowles Street 1.-171-39 15606601710390000000	159 Radford St Realty Corp 38 Aqueduct Pl Yonkers NY 10701	Unknown (adjoining property address)
55 Knowles Street 1.-171-40 15606601710400000000	Waverly Properties Inc. 55 Knowles St Yonkers NY 10705	Westchester Metal Works (adjoining property address)
9 Bridge Street 1.-166-5.15 15606601660050000000	JLJ Import Company LLC 170 Ludlow St Yonkers NY 10705	Unknown (adjoining property address)
166 Ludlow Street 1.-165-1 15606601650010000000	Lala Realty Ltd 166 Ludlow St Yonkers NY 10705	Daily Pita's Bakery (adjoining property address)

Address Parcel Identification	Owner Name and Address	Current Operators/ Occupants (address)
158 Ludlow Street 1.-165-4 15606601650040000000	Abeer, Samuel 127 Ludlow St Yonkers NY 10705	Class Action Interiors Inc. and Alryan Lubricants (adjoining property address)
148 Ludlow Street 1.-165-12 15606701650120000000	148-158 Ludlow St Corp., c/o Christina A. Samuel, 22 Briar Road, Yonkers, NY 10710	Ludlow Wholesale Cabinetry and Topps-All Products of Yonkers (adjoining property address)
Hudson River Division 1.-1-7000-1 15004370000010000000	Metro North Real Estate Dept 347 Madison Ave New York NY 10017-3759	Metro North Railroad (owner and occupant, owner address)
Information provided by Westchester County Municipal Tax Parcel viewer – http://giswww.westchestergov.com/taxmaps/default.aspx?sMun=Yonkers#		

Local Officials

Westchester County Executive:
George Latimer
148 Martine Ave, White Plains, NY 10601
(914) 995-2900

CEO (Mayor) of City of Yonkers:
Mayor Mike Spano
40 S Broadway, Yonkers, NY 10701
(914) 377-6300

City Council President:
Michael Khader
40 S Broadway, Yonkers, NY 10701
(914) 377-6060

Department of City Planning
and Development Commissioner:
Wilson Kimball
City Hall Annex, 87 Nepperhan Avenue, 3rd Fl., Yonkers, NY 10701
(914) 377-6150

City of Yonkers Council District 4:
John Rubbo
40 S Broadway, Yonkers, NY 10701
(914) 377-6314

City of Yonkers
Planning Board Chairman:
Roman Kozicky
87 Nepperhan Avenue
Yonkers, NY 10701
(914) 377-6150

Westchester County
Planning Board Chairman:
Richard Hyman
148 Maritine Avenue
White Plains, NY 10601
(914) 995-2000

News Media

The Journal News Media Group
1133 Westchester Avenue, Suite N110
White Plains, NY 10604
(914) 694-9300

NY Daily News
450 West 33rd Street
New York, NY 10001
(212) 949-2000

NY Post
1211 Avenue of the Americas
New York, NY 10036-8790
(212) 930-8000

NY Times
620 Eighth Avenue
New York, NY 10018
(212) 556-1234

Public Water Supplier

Thomas Meier, Commissioner
Yonkers Water Bureau
40 South Broadway
Yonkers, NY 10701
(914) 377-6270

Persons requesting to be placed on the contact list

None to date

Administrator for any nearby school or day care facility

Elda Perez-Mejia, Principal
Eugenio Maria De Hostos Microsociety School
75 Morris Street
(914) 376-8430

Marwan Sayegh, Principal
Pearls Hawthorne School
350 Hawthorne Avenue
(914) 376-8050

Magdaline Delany, Principal
Cedar Place Elementary School
20 Cedar Place
(914) 376-8969

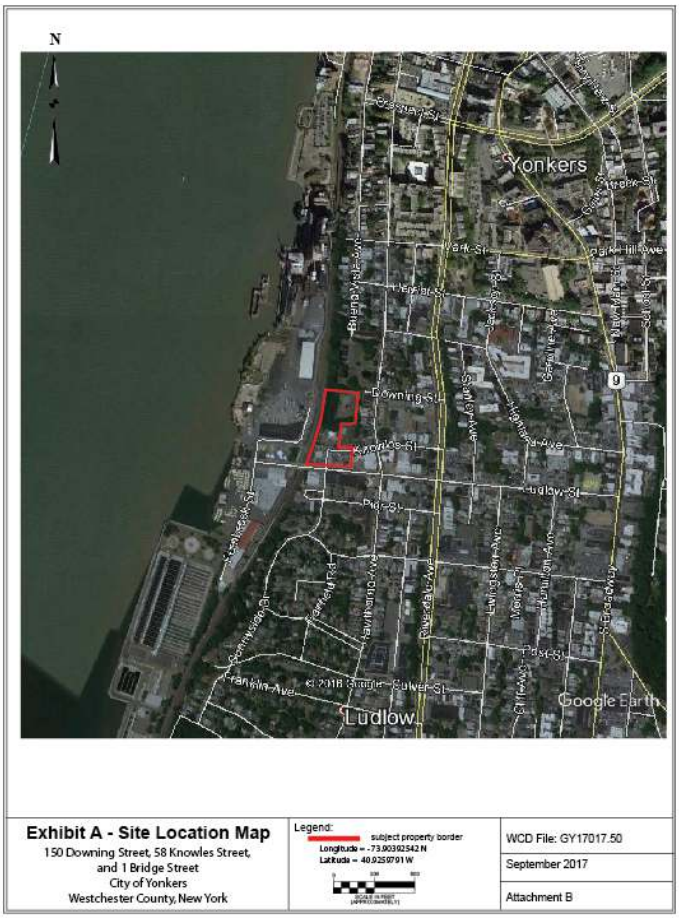
Sheila Alagia, Principal
St Peter's School
204 Hawthorne Avenue
(914) 963-2314

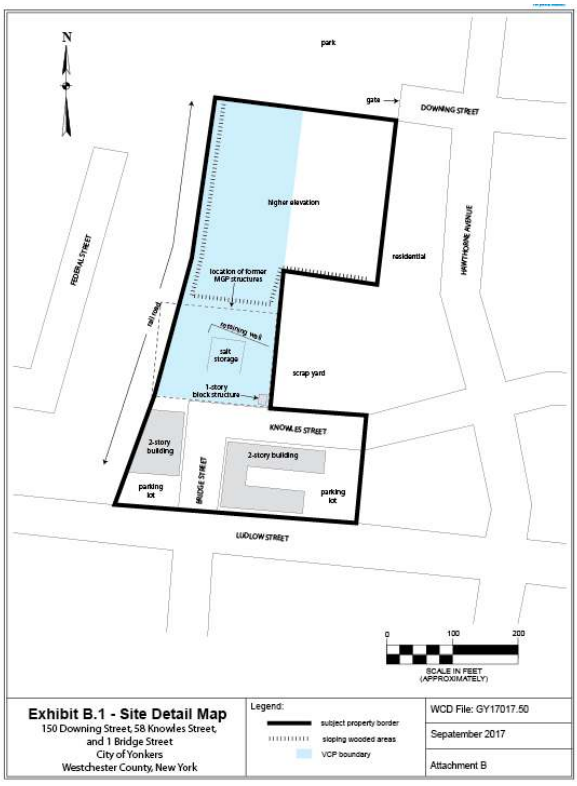
Barbara Berrios, Executive Director
Queen's Daughters Day Nursery
73 Buena Vista Avenue
914-969-4491

Community Board

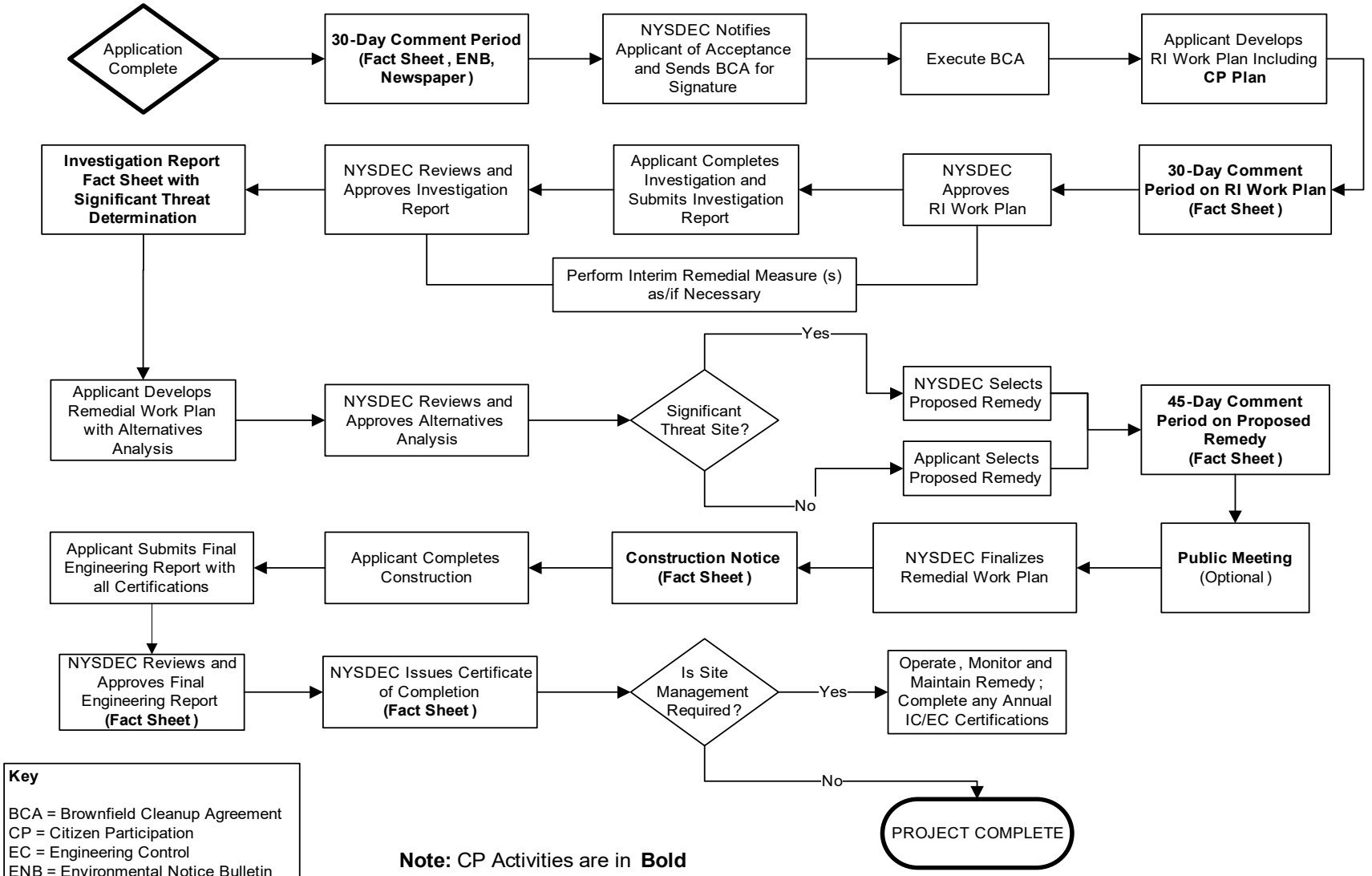
Not applicable

Appendix C - Site Location Map, Property Map and Site Detail Map





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**

NEW YORK STATE OF OPPORTUNITY. | Department of Environmental Conservation

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 <u>From</u> 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 <u>to</u> 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: Former Ludlow Street Works

Site Number: C360158

Site Address and County: 150 Downing, 58 Knowles and 1 Bridge Streets, Yonkers, NY

Remedial Party(ies): Ludlow Point Development, LLC, 100 Summit Drive, 2nd Floor, Valhalla, New York 10595, Attn: Andrew Maniglia

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.**
It is anticipated that the public will expect information on the structural integrity of remaining structures. The Volunteer will be working closely with the City Building Department to make the necessary evaluations.

How were these issues and/or information needs identified?
The City and the Volunteer are aware of Site conditions at 19 Academy Street as a result of the building's collapse.

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.
No information is currently needed from the Community

How were these information needs identified?
Not applicable

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.
Site conditions will be presented to the Community as the information becomes available. Environmental information will be presented in the Remedial Investigation Report (RIR).

How were these issues and/or information needs identified?
Not applicable

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:
Click here to enter text.

f. Other environmental issues significantly impacted/impacting the affected community?
☐ **Yes** ☒ **No**

Provide details if appropriate:
Click here to enter text.

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:**
Click here to enter text.

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: Click here to enter text. **Date:** Click here to enter text.

Reviewed/Approved By: Click here to enter text. **Date:** Click here to enter text.

APPENDIX B
QUALITY ASSURANCE PROJECT PLAN

Former Ludlow Street Works
150 Downing Street, 58 Knowles Street, 1-3 Bridge Street Yonkers, New York
NYSDEC BCP Site # C360158

Quality Assurance Project Plan (QAPP)

Prepared for:
Ludlow Point Development, LLC
100 Summit Drive, 2nd Floor
Valhalla, New York 10595

Prepared by:
SESI CONSULTING ENGINEERS, D.P.C.
12A Maple Avenue
Pine Brook, NJ 07058

MAY 2022

1.0 PROJECT DESCRIPTION

This document presents the Quality Assurance Project Plan (QAPP) for the Interim Remedial Measures Workplan (IRMWP) for the property formerly known as Ludlow Street Works Site (herein referred to as the "Site"), The Site has three (3) principal addresses: 150 Downing Street, 151 Ludlow Street (aka 58 Knowles Street), and 1-3 Bridge Street, all within the City of Yonkers, New York. The Site is located in a mixed industrial and residential area and is bound to the north by Anthony O'Boyle Memorial Park; to the south by Ludlow Street; to the east by Westchester Metal Works, MZ Movers, and residential properties; and to the west by Metro North Railroad. Figure 1.1 presents a Site Location Map. The Site acreage totals approximately 2.89 acres and currently consists of a mix of undeveloped, vacant/partially wooded land (northern lot and former MGP area), a vacant building (151 Ludlow Street), and active buildings (1-3 Bridge Street). **Figure 2.1** presents a Site Plan.

2.0 PROJECT ORGANIZATION

The IRMWP will be conducted by Soils Engineering Services, Inc. (SESI), on behalf of Ludlow Point Development, LLC. The organization of SESI's key project management and field staff, and respective areas of responsibility, is presented below.

2.1 Project Principal

Fuad Dahan PhD, P.E.

Provide technical and administrative oversight and guidance throughout the project, assist in securing company resources, participate in technical review of deliverables, and attend key meetings as needed.

2.2 Principal Engineer

Fuad Dahan, PhD, P.E.

Provide technical guidance and review of reports, analytical data. Will have key involvement in screening and development of remedial alternatives.

2.3 Project Manager

Jesse Mausner, PG

Responsible for maintaining the day-to-day schedule for completing the fieldwork and deliverables according to BCP program requirements and client expectations.

2.4 Interim Remedial Measure Program Manager

Jesse Mausner, PG

Responsible for coordinating and directing field efforts of SESI staff and subcontractors, and for maintaining that work is done according to QAPP specifications.

2.5 Field Team Leader

Jon Stuart

Responsible for overseeing field work during the RI and IRM, including observing subcontractors, maintaining field notes, and collecting samples of various environmental media, in accordance with the NYSDEC-approved Work Plan.

2.6 Quality Assurance Officer

Todd Kelly

Responsible for reviewing sampling procedures and certify that the data was collected and analyzed using the appropriate procedures.

3.0 QA/QC OBJECTIVES FOR MEASUREMENT OF DATA

In cases where NYSDOH ELAP Certification exists for a specific group or category of parameters, the laboratories performing analysis in connection with this project will have appropriate NYSDOH ELAP Certification. Analytical Service Protocol (2005) NYSDEC-ASP Category B deliverables are required for all samples.

Detection limits set by NYSDEC-ASP will be used for all sample analyses unless otherwise noted. If NYSDEC-ASP-dictated detection limits prove insufficient to assess project goals (i.e., comparison to drinking water standards or attainment of ARARs), then ASP Special Analytical Services (SAS) or other appropriate methods will be utilized.

The quality assurance/quality control objectives for all measurement data include completeness, representativeness, comparability, precision and accuracy.

3.1 Completeness

The analyses performed must be appropriate and inclusive. The parameters selected for analysis are chosen to meet the objectives of the study.

Completeness of the analyses will be assessed by comparing the number of parameters intended to be analyzed with the number of parameters successfully determined and validated. Data must meet QC acceptance criteria for 100 percent or more of requested determinations.

3.2 Representativeness

Samples must be taken of the population and, where appropriate, the population will be characterized statistically to express the degree to which the data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process, or environmental condition.

Non-dedicated sampling devices will be cleaned between sampling points by washing and rinsing with pesticide-grade methanol, followed by a thorough rinse with distilled water. Specific cleaning techniques are described in the Field Sampling Procedure. Two types of blank samples will accompany each sample set where Target Compound List (TCL) volatiles are to be analyzed (water matrix only). A trip blank, consisting of a 40 ml VOA vial of organic-free water prepared by the laboratory, will accompany each set of sample bottles from the laboratory to the field and back. This bottle will remain sealed throughout the shipment and sampling process. This blank will be analyzed for TCL volatile organic compounds along with the groundwater samples to ensure that contamination with TCL volatile compounds has not occurred during the bottle preparation, shipment and sampling phase of the project. In order to check for contaminant carryover when non-dedicated sampling equipment is used, a rinsate blank will be submitted to the laboratory. This blank will also be analyzed for TCL volatile organic compounds. The TCL compounds are identified in the United States Environmental Protection Agency (USEPA) Contract Laboratory Program dated October 2016.

The analysis results obtained from the determination of identical parameters in field duplicate samples can be used to further assess the representativeness of the sample data.

3.3 Comparability

Consistency in the acquisition, preparation, handling and analysis of samples is necessary in order for the results to be compared where appropriate. Additionally, the results obtained from analyses of the samples will be compared with the results obtained in previous studies, if available.

To ensure the comparability of analytical results with those obtained in previous or future testing, all samples will be analyzed by NYSDEC-approved methods. The NYSDEC-ASP mandated holding times for various analyses will be strictly adhered to.

3.4 Precision and Accuracy

The validity of the data produced will be assessed for precision and accuracy. Analytical methods which will be used include gas chromatography/mass spectrometry (GC/MS), gas chromatography (GC), colorimetry, atomic spectroscopy, gravimetric and titrametric techniques. The following outlines the procedures for evaluating precision and accuracy, routine monitoring procedures, and corrective actions to maintain

analytical quality control. All data evaluations will be consistent with NYSDEC-ASP procedures. Data will be 100 percent compliant with NYSDEC-ASP requirements.

The number of duplicate, spiked and blank samples analyzed will a minimum of 1 duplicate for every 20 samples per each medium of groundwater and soil. The inclusion and frequency of analysis of field blanks will be on the order of one per every 20 samples (soil) but not more than one per day. For the aqueous matrix field blanks will be collected at a frequency of one per day. Samples to be analyzed for volatile organic compounds will be accompanied by a trip blank for each shipment and field blanks (water matrix) or field blanks (soil).

Quality assurance audit samples will be prepared and submitted by the laboratory QA manager for each analytical procedure used. The degree of accuracy and the recovery of analyte to be expected for the analysis of QA samples and spiked samples is dependent upon the matrix, method of analysis, and compound or element being determined. The concentration of the analyte relative to the detection limit is also a major factor in determining the accuracy of the measurement. The lower end of the analytical range for most analyses is generally accepted to be five times the detection limit. At or above this level, the determination and spike recoveries for metals in water samples will be expected to range from 75 to 125 percent. The recovery of organic surrogate compounds and matrix spiking compounds determined by GC/MS will be compared to the guidelines for recovery of individual compounds as established by the United States Environmental Protection Agency Contract Laboratory Program dated 7/85 or as periodically updated.

The quality of results obtained for inorganic ion and demand parameters will be assessed by comparison of QC data with laboratory control charts for each test.

4.0 SAMPLING PROCEDURES

4.1 Sampling Program

The sampling program for this project will include soil, groundwater, and soil vapor. Soil samples will be collected from split spoon sampling or macrocore devices retrieved from soil borings. Groundwater samples will be collected from groundwater monitoring wells using low flow purging techniques. Soil vapor samples will be collected from vapor points screened in the vadose zone using Summa Canisters.

4.1.1 Drilling/Sampling Procedures

Soil and groundwater samples will be collected by means of a soil boring program. Soil borings shall be completed using the hollow stem auger drilling methods, direct push methods, or rotary drilling methods, whichever methods are determined to be best suited to site conditions by the SESI project manager and SESI field team leader.

Soil samples will be collected from soil borings and analyzed in accordance with the NYSDEC-approved Work Plan. Monitoring wells for groundwater sample collection will be installed in select completed soil borings. Either hollow stem auger (HSA) or direct push drilling methods may be utilized for monitoring well completion.

Samples of the encountered overburden materials shall be collected continuously during drilling so that a complete soil profile is examined and described by the SESI field geologist. The sampling method employed shall be ASTM D-1586/Split Barrel Sampling using a standard 2-foot long, 2-inch outside diameter split- spoon sampler with a 140-pound hammer, in cases where HSA methods are used. Upon retrieval of the sampling barrel, the collected sample shall be placed in glass jars and labeled, stored on site (on ice in a cooler if necessary), and transmitted to the appropriate testing laboratory or storage facility. Chain-of-custody procedures will be practiced following Section 15, EPA-600/4-82-029, Handbook for Sampling and Sample Preservation of Water and Waste Waters.

A geologist or engineer will be on site during the drilling operations to fully describe each soil sample, following the New York State Soil Description Procedure, and to retain representative portions of each sample.

The drilling contractor will be responsible for obtaining accurate and representative samples, informing the geologist of changes in drilling pressure, keeping a separate general log of soils encountered including blow counts [i.e., the number of blows from a soil sampling drive weight (140 pounds)] required to drive the split-spoon sampler in 6-inch increments, if applicable, and installing monitoring wells to levels directed by the supervising geologist following specifications further outlined in this protocol.

4.1.2 Monitoring Well Completion

Monitoring wells will be constructed of 0.010-inch slot size PVC well screen and riser casing. Other materials utilized for completion will be washed silica sand (Q-Rock No. 4 or approved equivalent) bentonite grout, Portland cement, and a protective steel locking well casing and cap with locks. The depth of the wells will be determined based on the depth to water, type of contaminant and field conditions encountered.

The monitoring well installation method for wells installed within unconsolidated sediments shall be to place the screen and riser assembly into the casing once the screen interval has been selected. At that time, a washed silica sand pack will be placed around the well screen if required to prevent screen plugging. If a sand pack is not warranted, the auger string will be pulled back to allow the native aquifer material to collapse 2 to 3 feet above the top of the screen. Bentonite pellets will then be added to the annulus between the casing and the inside auger to insure proper sealing. Cement/bentonite grout will continue to be added during the extraction of the augers until the entire aquifer thickness has been sufficiently sealed off from horizontal and/or

vertical flow above the screened interval. During placement of sand and bentonite pellets, frequent measurements will be made to check the height of the sand pack and thickness of bentonite layers by a weighted drop tape measure.

A bolt-down protective curb box will be installed, flush with the ground, or steel "stick-up" protective casing and secured by a Portland cement seal. The cement seal shall extend laterally at least 1 foot in all directions from the protective casing and shall slope gently away to drain water away from the well.

4.1.3 Well Development

All monitoring wells will be developed or cleared of all fine-grained materials and sediments that have settled in or around the well during installation so that the screen is transmitting representative portions of the groundwater. The development will be by one of two methods, pumping or bailing groundwater from the well until it yields relatively sediment-free water.

A decontaminated pump or bailer will be used and subsequently decontaminated after each use following procedures outlined in the Decontamination Protocol. Pumping or bailing will cease when the turbidity falls below 50 NTUs or until specific conductivity, pH, and temperature are stable (i.e., consecutive readings are within 10 percent with no overall upward or downward trends in measurements). Well development water will be contained in drums and properly disposed off-site.

4.1.4 Decontamination

All drilling equipment and associated tools including augers, drill rods, sampling equipment, wrenches and any other equipment or tools that have come in contact with contaminated materials will be decontaminated before any drilling on site begins, between each well, and prior to removing any equipment from the site. The preferred decontamination procedure will be to scrape the equipment from any residual soils and then rinse with water and Alconox®. Every effort will be made to minimize the generation of contaminated water, which will be drummed, to extent possible, for disposal.

4.2 Groundwater Sampling Program

4.2.1 Well Evacuation

Prior to sampling a monitoring well, the static water level will be recorded. All well data will be recorded on a field sampling record. The wells will be sampled in accordance with the USEPA guidelines for the Low Flow Purging Sampling (LFPS). The purpose of LFPS is to collect groundwater samples from monitoring wells that are

representative of ambient groundwater conditions in the aquifer. The LFPS method reduces turbidity which is needed particularly when sampling for metals.

4.2.2 Sampling Procedure

The wells will be sampled using the low flow technique, when possible. A flow rate of 100 ml to 250 ml per minute is used to purge the wells. Drawdown should not exceed 0.3 feet. At the initiation of low flow purging a water level is recorded as well as field parameters. Field parameters are then monitored every five minutes during low flow purging using a flow through cell. When three consecutive measurements of pH differ by 0.1 units or less, with ORP within 10 mv or less, turbidity varies 10 percent or less, conductivity differs by 3 percent or less and dissolved oxygen by 10 percent or less, sampling may begin. Flow through cells are used so continuous real time readings are made. When the parameters stabilize the flow through cell is disconnected and sample bottles are filled directly from the tubing. If the parameters of a well do not stabilize in a timely manner, the groundwater sample will be collected after emptying three well volumes from the well being sampled.

4.3 Soil Vapor Sampling

Soil vapor sampling will be conducted in accordance with NYSDOH Guidance for Evaluating Indoor Air Intrusion in New York State (October 2006). Soil vapor samples will be collected in the vadose zone from shallow (5 feet) well points. Each vapor point will be installed in a shallow boring drilled either by hand-operated equipment (e.g. hand auger or percussion hammer drill), or by a small truck-mounted drill rig. Drilling equipment used shall be based on soil conditions, and the method that provides the most practical approach.

Each vapor point will consist of an inert sampling tube (polyethylene, stainless steel, or Teflon®) with a 6-inch screened section at the bottom through which soil vapors can be sampled. The screen slot size will be 0.0075 inches. A sampling zone will be created around the screened section by backfilling with 1 to 2 feet of porous course sand or glass beads, and at least three feet of bentonite will be placed above the porous sampling zone to form a seal from the surface. Native clean soil will be packed around the remaining annulus to the ground surface.

Each designated soil vapor sampling location will be purged of a minimum of three volumes using a low volume pump, and then attached to a regulator, and secured with a clamp. The regulator will then be attached to a 1-liter summa canister.

The regulator will be set to collect a soil vapor sample at a flow rate of less than 0.2 liters per minute. After the summa canister is filled, the valve will be closed.

Each canister will be listed according to a specific sample I.D. on a chain of custody form. Sample canisters will be delivered to the laboratory within 24 hours and analyzed for VOCs by method TO-15. The detection limit for VOCs will be 1 µg/m^3 or less.

The soil vapor sampling effort will include the use of inert helium tracer gas to verify that the soil vapor samples are not diluted by ambient air. The atmosphere around the sampling tube will be enriched with the tracer gas, and the soil vapor sample will be collected in the presence of the enriched tracer atmosphere. This will be accomplished by placing an inverted plastic pail over the sampling point and filling the pail with the tracer gas via a small tube penetrating the site of the pail. Refer to NYSDOH Guidance for Evaluating Indoor Air Intrusion in New York State (October 2006).

Weather conditions in the 48 hours prior to the test, and during the test, will be noted, including average wind speed, precipitation, temperature, and barometric pressure.

4.4 Sample Preservation and Shipment

Since all bottles will contain the necessary preservatives as shown in Table 4.1, they need only be filled. The 40 ml VOA vials must be filled brim full with no air bubbles. The other bottles should be filled to within about 1 inch from the top.

The bottles will be sent from the laboratory in coolers which will be organized on a per site basis. Following sample collection, the bottles should be placed on ice in the shipping cooler. The samples will be cooled to 4°C, but not frozen.

Final packing and shipment of coolers will be performed in accordance with guidelines outlined in the ASP.

5.0 *SAMPLE CUSTODY*

The program for sample custody and sample transfer is in compliance with the NYSDEC-ASP, as periodically updated. If samples may be needed for legal purposes, chain-of-custody procedures, as defined by NEIC Policies and Procedures (USEPA-330/9-78-001-R, Revised June 1988) will be used. Sample chain-of-custody is initiated by the laboratory with selection and preparation of the sample containers. To reduce the chance for error, the number of personnel handling the samples should be minimized.

5.1 Field Sample Custody

A chain-of-custody record accompanies the samples from initial sample container selection and preparation at the laboratory, shipment to the field for sample containment

and preservation, and return to the laboratory. Two copies of this record follow the samples to the laboratory. The laboratory maintains one file copy and the completed original is returned to the site inspection team. Individual sample containers provided by the laboratory are used for shipping samples. The shipping containers are insulated and ice is used to maintain samples at approximately 4°C until samples are returned and in the custody of the laboratory. All sample bottles within each shipping container are individually labeled and controlled. Samples are to be shipped to the laboratory within 24-48 hours of the day of collection depending on parameter holding times.

Each sample shipping container is assigned a unique identification number by the laboratory. This number is recorded on the chain-of-custody record and is marked with indelible ink on the outside of the shipping container. The field sampler will indicate the sample designation/location number in the space provided on the appropriate chain-of-custody form for each sample collected. The shipping container is closed and a seal provided by the laboratory is affixed to the latch. This seal must be broken to open the container, and this indicates possible tampering if the seal is broken before receipt at the laboratory. The laboratory will contact the site interim remedial measure team leader and the sample will not be analyzed if tampering is apparent.

5.2 Laboratory Sample Custody

The site interim remedial measure team leader or Project Quality Assurance Officer notifies the laboratory of upcoming field sampling activities and the subsequent transfer of samples to the laboratory. This notification will include information concerning the number and type of samples to be shipped as well as the anticipated date of arrival.

The laboratory sample program meets the following criteria:

- The laboratory has designated a sample custodian who is responsible for maintaining custody of the samples and for maintaining all associated records documenting that custody.
- Upon receipt of the samples, the custodian will check the original chain-of-custody documents and compare them with the labeled contents of each sample container for correctness and traceability. The sample custodian signs the chain-of-custody record and records the date and time received.
- Care is exercised to annotate any labeling or descriptive errors. In the event of discrepant documentation, the laboratory will immediately contact the site interim remedial measure team leader as part of the corrective action process. A qualitative assessment of each sample container is performed to note any anomalies, such as broken or leaking bottles. This assessment is recorded as part of the incoming chain-of-custody procedure.

- The samples are stored in a secured area at a temperature of approximately 4°C until analyses are to commence.
- A laboratory chain-of-custody record accompanies the sample or sample fraction through final analysis for control.
- A copy of the chain-of-custody form will accompany the laboratory report and will become a permanent part of the project records.

5.3 Final Evidence Files

Final evidence files include all originals of laboratory reports and are maintained under documented control in a secure area.

A sample or an evidence file is under custody if:

- It is in your possession; it is in your view, after being in your possession.
- It was in your possession and you placed it in a secure area.
- It is in a designated secure area.

6.0 CALIBRATION PROCEDURES

Instruments and equipment used to gather, generate or measure environmental data will be calibrated with sufficient frequency and in such a manner that accuracy and reproducibility of results are consistent with the appropriate manufacturer's specifications or project specific requirements. The procedures for instrument calibration, calibration verification, and the frequency of calibrations are described in the ASP. The calibration of instruments used for the determination of metals will be as described in the appropriate CLP standard operating procedures.

Calibration of other instruments required for measurements associated with these analyses will be in accordance with the manufacturer's recommendations and the standard operating procedures of the laboratory.

7.0 ANALYTICAL PROCEDURES

Analytical procedures shall conform to the most recent revision of the NYSDEC-ASP and are summarized on Table 7.1. In the absence of USEPA or NYSDEC guidelines, appropriate procedures shall be submitted for approval by NYSDEC prior to use.

The procedures for the sample preparation and analysis for organic compounds are as specified in the NYSDEC-ASP. Analytical cleanups are mandatory where matrix interferences are noted. No sample shall be diluted any more than 1 to 5 times. The sample shall be either re-extracted, re-sonicated, re-stream distilled, etc. or be subjected

to any one analytical cleanup noted in SW846 or a combination thereof. The analytical laboratory shall expend such effort and discretion to demonstrate good laboratory practice and demonstrate an attempt to best achieve the method detection limit.

7.1 Volatile Organics (VOA)

For the analysis of water samples for Target Compound List (TCL), volatile organic compounds (VOCs), no sample preparation is required. The analytical procedure for volatiles is detailed in NYSDEC-ASP (Volume I, Section D-I). A measured portion of the sample is placed in the purge and trap apparatus and the sample analysis is performed by gas chromatography/mass spectrometry for the first round. USEPA Method 8260 will be used, plus tentatively identified compounds (TICs). USEPA Methods 8010 or 8020 (gas chromatography with different detectors) will be used if subsequent rounds with lower limits of detection are warranted.

7.2 Semi-Volatile Organic Compounds

The extraction and analytical procedures used for preparation of water, soil and sediment samples for the analysis of the TCL semi-volatile organic compounds are described in NYSDEC-ASP Volume I, Section D-III. USEPA Method 8270 will be used, plus tentatively identified compounds (TICs).

Instrument calibration, compound identification, and quantitation are performed as described in Section 6 of this document and in the NYSDEC-ASP.

7.3 Pesticide And PCB Compounds

The sample preservation procedures for gas chromatography for pesticides and PCB's will be as described in the NYSDEC-ASP methods (Section D-IV). The analysis of standard mixes, blanks and spiked samples will be performed at the prescribed frequency with adherence to the 72-hour requirement described in the method.

7.4 Metals

Water, soil and waste samples will be analyzed for the metals listed in Table 7.1. The detection limits for these metals are as specified in the NYSDEC-ASP, Section D-V. The instrument detection limits will be determined using calibration standards and procedures specified in the NYSDEC-ASP. The detection limits for individual samples may be higher due to the sample matrix. The procedures for these analyses will be as described in the NYSDEC-ASP.

The analyses for metals will be performed by atomic absorption spectroscopy (AAS) or inductively-coupled plasma emission spectroscopy (ICPES), as specified in the ASP with regard to AAS flame analysis.

7.5 Site Specificity Of Analyses

Work plans prepared for interim remedial measure waste sites contain recommendations for the chemical parameters to be determined for each site. Thus, some or all of the referenced methods will apply to the analysis of samples collected at the individual waste sites. Analyses of Target Compound List (TCL) analytes will be performed on all samples.

TABLE 4.1 – SAMPLE CONTAINERIZATION

PARAMETER & ANALYTICAL METHOD	NO.	BOTTLE TYPE	PRESERVATIVE(1)	HOLDING TIME
Aqueous Samples				
SVOCs (BNAs) – USEPA 8270C	2	1-liter amber glass bottle	None	7 days (until extraction) 40 days (extracted)
Pesticides – USEPA 8081A	2	1-liter amber glass bottle	None	7 days (until extraction) 40 days (extracted)
PCBs – USEPA 8082	2	1-liter amber glass bottle	None	7 days (until extraction) 40 days (extracted)
VOCs – USEPA 8260B	2	40 mL, glass vial with septum cap	Hydrochloric Acid to pH <2	14 days
Metals(2)	1	1-liter, plastic bottle	Nitric acid to pH <2	180 days Mercury: 28 days
Cyanide – SM 4500-CN-E	1	1-liter, plastic	Sodium Hydroxide to pH >12	14 days
PFAS Compounds – USEPA Method 537 Modified	2	250 mL plastic bottle	None	
Soil, Sediment, Solid Waste Samples				
VOCs – USEPA 8260B	3	15-gram EnCore samplers	None	14 days
SVOCs (BNAs) – USEPA 8270C	1	4-oz. glass jar with Teflon lid	None	7 days (until extraction, 40 days extracted)
Pesticides – USEPA 8081A	1	4-oz. glass jar with Teflon lid	None	7 days (until extraction) 40 days (extracted)
PCBs – USEPA 8082	1	4-oz. glass jar with Teflon lid	None	7 days (until extraction) 40 days (extracted)
Metals(2)	1	4-oz. glass jar with Teflon lid	None	180 days Cyanide: 14 days Mercury: 28 days
PFAS Compounds – USEPA Method 537 Modified	1	8-oz. plastic	None	
Soil Vapor / Indoor Air Samples				
VOCs – USEPA TO-15	1	Summa Canister	None	30 days

(1) All samples will be preserved with ice during collection and shipment.
(2) From verified time of sample receipt by the analytical laboratory (within 24 to 48 hours of collection).
(3) A complete list of compounds is provided on Table 7.1.

TABLE 4.2 – SAMPLING PROCEDURE FOR MONITORING WELLS USING VOLUME AVERAGED PURGING

1. Initial static water level recorded with an electric contact probe accurate to the nearest 0.1 foot.

2. Sampling device and electric contact probe decontaminated.
    a. Sampling device and probe are rinsed with pesticide-grade methanol and distilled water.
    b. Methanol is collected into a large funnel which empties into a five- gallon container.

3. Sampling device lowered into well.
    a. Bailer lowered by dedicated PVC or polypropylene line.

4. Sample taken.
    a. Sample is poured slowly from the open end of the bailer with the sample bottle tilted so that aeration and turbulence are minimized.
    b. Duplicate sample is collected when appropriate.

5. Samples are capped, labeled and placed in laboratory coolers with ice packs or bagged ice.

6. All equipment is cleaned with successive rinses of pesticide-grade methanol and distilled water.
    a. Dedicated line is disposed of or left at well site.

7. Equipment/wash blanks are collected when non-dedicated sampling equipment is used.

8. Chain-of-custody forms are completed in triplicate.
    a. The original and one carbon copy are put into a zip-lock bag and placed into the cooler.

9. The original will be returned following sample analysis.
    a. A second carbon copy is kept on file.

10. Cooler is sealed with strapping tape and chain-of-custody seals to assure integrity and to prevent tampering of sample.

TABLE 4.3 – SAMPLING PROCEDURE FOR MONITORING WELLS USING LOW-STESS (LOW-FLOW) METHODS

1. Initial static water level recorded with an electric contact probe accurate to the nearest 0.1 foot.

2. Sampling device is lowered into well. Slowly lower the pump, safety cable, tubing and electrical lines into the well to the depth specified for that well. Pump intake must be no less than 2 feet from the bottom of the well to prevent disturbance and resuspension of sediments which may be at the bottom of the well.

3. Measure water level again: Before starting the pump, measure the water level again with the pump in the well. Leave the water level measuring device in the well.

4. Purge Well: Start pumping the well at 200 to 500 milliliters per minute (ml/min). The water level should be monitored approximately every five minutes. Ideally, a steady flow rate should be maintained that results in a stabilized water level (drawdown of 0.3 ft or less). Pumping rates should, if needed, be reduced to the minimum capabilities of the pump to ensure stabilization of the water level. As noted above, care should be taken to maintain pump suction and to avoid entrainment of air in the tubing. Record each adjustment made to the pumping rate and the water level measured immediately after each adjustment.

5. Monitor Indicator Parameters: During purging of the well, monitor and record the field indicator parameters (turbidity, temperature, specific conductance, pH, Eh, and DO) approximately every five minutes. The well is considered stabilized and ready for sample collection when the indicator parameters have stabilized for three consecutive readings as follows (Puls and Barcelona, 1996):

    a. 0.1 for pH
    b. 3% for specific conductance (conductivity)
    c. 10 mv for redox potential
    d. 10% for DO and turbidity

6. Dissolved oxygen and turbidity usually require the longest time to achieve stabilization. The pump must not be removed from the well between purging and sampling.

7. Collect Samples: Collect samples at a flow rate between 100 and 250 ml/min and such that drawdown of the water level within the well does not exceed the maximum allowable drawdown of 0.3 ft. VOC samples must be collected first and directly into sample containers. All sample containers should be filled with minimal turbulence by allowing the ground water to flow from the tubing gently down the inside of the container.

8. Ground water samples to be analyzed for volatile organic compounds (VOCs) require pH adjustment. The appropriate EPA Program Guidance should be consulted to determine whether pH adjustment is necessary. If pH adjustment is necessary for VOC sample preservation, the amount of acid to be added to each sample vial prior to sampling should be determined, drop by drop, on a separate and

equal volume of water (e.g., 40 ml). Groundwater purged from the well prior to sampling can be used for this purpose.

9. Remove Pump and Tubing: After collection of the samples, the tubing, unless permanently installed, must be properly discarded or dedicated to the well for resampling by hanging the tubing inside the well.

10. Measure and record well depth.

11. Close and lock the well.

12. Samples are capped, labeled and placed in laboratory coolers with ice packs or bagged ice.

13. All equipment is cleaned with successive rinses of pesticide-grade methanol and distilled water.

    a. Dedicated line is disposed of or left at well site.

14. Equipment/wash blanks are collected when non-dedicated sampling equipment is used.

15. Chain-of-custody forms are completed in triplicate.

    a. The original and one carbon copy are put into a zip-lock bag and placed into the cooler. The original will be returned following sample analysis.
    b. A second carbon copy is kept on file.

16. Cooler is sealed with strapping tape and chain-of-custody seals to assure integrity and to prevent tampering of sample.

TABLE 7-1 – CONTRACT-REQUIRED QUANTITATION LEVELS AND ANALYTICAL METHODS FOR ASP INORGANICS, ASP VOLATILES, ASP SEMI-VOLATILES, ASP PESTICIDES, AND PCBS

Target Compound List (TCL) and Contract-Required Quantitation Limit

SECTION 1 - ASP INORGANICS Method: NYSDEC-ASP-91-4					
	PARAMETER	CONTRACT-REQUIRED DETECTION LEVEL* (µg/L)		PARAMETER	CONTRACT-REQUIRED DETECTION LEVEL* (µg/L)
1.	Aluminum	200	13.	Magnesium	5,000
2.	Antimony	60	14.	Manganese	15
3.	Arsenic	15	15.	Mercury	0.2
4.	Barium	200	16.	Nickel	40
5.	Beryllium	5	17.	Potassium	5,000
6.	Cadmium	5	18.	Selenium	35
7.	Calcium	5,000	19.	Silver	10
8.	Chromium	10	20.	Sodium	5,000
9.	Cobalt	50	21.	Thallium	25
10.	Copper	25	22.	Vanadium	50
11.	Iron	100	23.	Zinc	60
12.	Lead	10	24.	Cyanide	10

SECTION 2 – ASP ORGANICS (VOLATILES) Method: NYSDEC-ASP-91-1					
	VOLATILE	CONTRACT-REQUIRED QUANTITATION LIMIT** (µg/L)		VOLATILE	CONTRACT-REQUIRED QUANTITATION LIMIT** (µg/L)
1.	Chloromethane	5.0	18.	1,2-Dichloropropane	5.0
2.	Bromomethane	5.0	19.	cis-1,3-Dichloropropene	5.0
3.	Vinyl Chloride	5.0	20.	Trichloroethene	5.0
4.	Chloroethane	5.0	21.	Dibromochloromethane	5.0
5.	Methylene Chloride	5.0	22.	1,1,2-Trichloroethane	5.0
6.	Acetone	10.0	23.	Benzene	5.0
7.	Carbon Disulfide	5.0	24.	Trans-1.3-Dichloropropene	5.0
8.	1,1-Dichloroethylene	5.0	25.	Bromoform	5.0
9.	1,1-Dichloroethane	5.0	26.	2-Hexanone	10.0
10.	1,2-Dichloroethylene (total)	5.0	27.	4-Methyl, 1,2-Pentanone	10.0
11.	Chloroform	5.0	28.	Tetrachloroethylene	5.0
12.	1,2-Dichloroethane	5.0	29.	Toluene	5.0
13.	2-Butanone	10.0	30.	Chlorobenzene	5.0
14.	1,1,1-Trichloroethane	5.0	31.	Ethylbenzene	5.0
15.	Carbon Tetrachloride	5.0	32.	Styrene	5.0
16.	Bromodichloromethane	5.0	33.	Total Xylenes	5.0
17.	1,1,2,2-Tetrachloroethane	5.0			

SECTION 3 - ASP ORGANICS (SEMI-VOLATILES) Method: NYSDEC-ASP-91-2					
	SEMI-VOLATILE	**CONTRACT-REQUIRED QUANTITATION LIMIT (µg/l)**		**SEMI-VOLATILE**	**CONTRACT-REQUIRED QUANTITATION LIMIT (µg/l)**
1.	Phenol	5.0	33.	Acenaphthene	5.0
2.	Bis(2-chloroethyl)ether	5.0	34.	2,4-Dinitrophenol	10.0
3.	2-Chlorophenol	5.0	35.	4-Nitrophenol	10.0
4.	1,3-Dichlorobenzene	5.0	36.	Dibenzofuran	5.0
5.	1,4-Dichlorobenzene	5.0	37.	Dinitrotoluene	5.0
6.	1,2-Dichlorobenzene	5.0	38.	Diethylphthalate	5.0
7.	2-Methylphenol	5.0	39.	4-Chlorophenyl phenyl ether	5.0
8.	2,2'oxybis(1-Chloropropane)	5.0	40.	Fluorene	5.0
9.	4-Methylphenol	5.0	41.	4-Nitroanile	10.0
10.	N-Nitroso-dipropylamine	5.0	42.	4,6-Dinitro-2-methylphenol	10.0
11.	Hexachloroethane	5.0	43.	N-nitrosodiphenyl amine	5.0
12.	Nitrobenzene	5.0	44.	4-Bromophenyl phenyl ether	5.0
13.	Isophorone	5.0	45.	Hexachlorobenzene	5.0
14.	2-Nitrophenol	5.0	46.	Pentachlorophenol	10.0
15.	2,4-Dimethylphenol	5.0	47.	Phenanthrene	5.0
16.	Bis(2-Chloroethoxy) methane	5.0	48.	Anthracene	5.0
17.	2,4-Dichlorophenol	5.0	49.	Carbazole	5.0
18.	1,2,4-Trichlorobenzene	5.0	50.	Di-n-butyl phthalate	5.0
19.	Naphthalene	5.0	51.	Fluoranthene	5.0
20.	4-Chloroaniline	5.0	52.	Pyrene	5.0
21.	Hexachlorobutadiene	5.0	53.	Butyl benzyl phthalate	5.0
22.	4-Chloro-3-methylphenol	5.0	54.	3,3'-Dichloro benzidine	5.0
23.	2-Methylnaphthalene	5.0	55.	Benz(a)anthracene	5.0
24.	Hexachlorocyclopentadiene	5.0	56.	Chrysene	5.0
25.	2,4,6-Trichlorophenol	5.0	57.	Bis(2-ethylhexyl) phthalate	5.0
26.	2,4,5-Trichlorophenol	10.0	58.	Di-n-octyl phthalate	5.0
27.	2-Chloronapthalene	5.0	59.	Benzo(b)fluoranthene	5.0
28.	2-Nitroananiline	10.0	60.	Benzo(k)fluoranthene	5.0
29.	Dimethyl phthalate	5.0	61.	Benzo(a)pyrene	5.0
30.	Acenaphthylene	5.0	62.	Indeno(1,2,3-cd) pyrene	5.0
31.	2,6-Dinitrotoluene	5.0	63.	Dibenz(a,h) anthracene	5.0
32.	3-Nitroaniline	10.0	64.	Benzo(g,h,i)perylene	5.0

APPENDIX C
HEALTH AND SAFETY PLAN

SITE-SPECIFIC HEALTH AND SAFETY PLAN

Former Ludlow Street Works
Site No. C360158

150 Downing Street, 58 Knowles Street, 1 Bridge Street
Yonkers, New York

Prepared For:

Ludlow Point Development, LLC
100 Summit Drive, 2nd Floor
Valhalla, NY 10595

Prepared By:

SESI CONSULTING ENGINEERS
12A Maple Avenue
Pine Brook, NJ 07058

Project No.: 10857

May 2022

Disclaimer: *This Health and Safety Plan (HASP) is based upon information provided [and, if applicable, conditions discovered during a site visit], and is limited by the project scope.*

The HASP should be periodically reviewed and updated based on a number of factors, including but not limited to: (1) changes in applicable governmental requirements; (2) changes in procedures at the site; and (3) site conditions which were unknown to SESI Consulting Engineers (SESI) as of the time the HASP was prepared.

This HASP has been prepared for the sole and exclusive use of Ludlow Point Development, LLC, and may not be relied upon by any other person without the express written consent and authorization of SESI.

SITE-SPECIFIC HEALTH AND SAFETY PLAN

For

Former Ludlow Street Works
150 Downing Street, 58 Knowles Street, 1 Bridge Street
Yonkers, New York
BCP # C360158

Prepared by: _____ Date:

_____

Jesse Mausner, PG
SESI- Senior Project Manager

Approved by: _____ Date:

_____

Fuad Dahan
SESI-Principal

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LIST OF ACRONYMS AND ABBREVIATIONS

ACGIH	American Conference of Governmental Industrial Hygienists
COC	Constituent(s) of Concern
CRZ	Contamination Reduction Zone
EZ	Exclusion Zone
FS	Field Supervisor
GFCI	Ground Fault Circuit Interrupter
HASP	Health and Safety Plan
HSM	Health and Safety Manager
LEL	Lower Explosive Limit
MSDS	Material Safety Data Sheet
OSHA	Occupational Safety and Health Administration
PCB	Polychlorinated Biphenyls
PEL	Permissible Exposure Limit
PID	Photoionization Detector
PM	Project Manager
PO	Project Officer
PPE	Personal Protective Equipment
SESI	SESI Consulting Engineers
SSO	Site Safety Officer
SVOC	Semi-Volatile Organic Compound
SZ	Support Zone
TLV	Threshold Limit Value
USCG	United States Coast Guard
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound

HEALTH AND SAFETY PLAN SUMMARY

The chemical hazards associated with site operations are related to inhalation, ingestion, and skin exposure to site Chemicals of Concern (COCs). COCs at the site include metals, some VOC compounds, some SVOC compounds and some pesticides. Concentrations of airborne COCs during site tasks may be measurable and will require air monitoring during certain operations.

The potential for inhalation of site COCs is low. The potential for dermal contact with soils containing site COCs during remedial operations is moderate.

The following table summarizes airborne contaminant action levels that will be used to determine the procedures and protective equipment necessary based on conditions as measured at the site.

Parameter	Reading	Action
Dust	0 to .5 mg/m3	Normal operations
	0.5 to 1 mg/m3	Begin soil wetting procedure (Level C protection would be needed beyond this point)
	> 1 mg/m3	Stop work, fully implement dust control plan
Oxygen	≤ 19.5%	Stop work, evacuate confined spaces/work area, investigate cause of reading, and ventilate area
	> 19.5% to < 23.5%	Normal operations
	≥ 23.5%	Stop work, evacuate confined spaces/work area, investigate cause of reading, and ventilate area
Carbon Monoxide	0 ppm to ≤ 20 ppm	Normal operations
	> 20 ppm	Stop work, evacuate confined spaces/work area, investigate cause of reading, and ventilate area

The level of personal protection selected will be based on air monitoring of the work environment and an assessment by the Field Supervisor and Site Safety Officer. The following table presents a selection matrix to determine appropriate Personal Protective Equipment.

Task	Anticipated Level of Protection
Mobilization	Level D
Subsurface Intrusive Activities (Mass Excavation, Drilling, Soil Grouting)	Modified Level D/Level C
Earthwork/Grading	Level D
Additional Chemical Sampling / Delineation	Modified Level D/Level C
Decontamination	Modified Level D
Demobilization	Level D

1.0 INTRODUCTION

1.1 Objective

The objective of this Health and Safety Plan (HASP) is to provide a mechanism for establishing safe working conditions during activities at the Former Ludlow Street Works Site (BCP#C360158) ("Site"), 150 Downing Street, 58 Knowles Street, and 1 Bridge Street, Yonkers, New York (the Site). The safety organization, procedures, and protective equipment have been established based on an analysis of potential physical, chemical, and biological hazards. Specific hazard control methodologies have been evaluated and selected to minimize the potential of injury, illness, or other hazardous incident.

The HASP was written to meet the requirements of all applicable Federal, State, and local health and safety regulations, including 29 CFR 1910.120. The HASP is based on current knowledge regarding the specific chemical and physical hazards that are known or anticipated at the Site. This HASP is a dynamic document, for which changes and/or revisions may be realized as changes in scope and/or site conditions are encountered. Should revised documents be produced, said revised documents will refer to the specific changes and why they were made.

1.2 Site and Facility Description

The Site comprises 2.89-acres. The Site property is identified by the Westchester County Clerk as Tax Map/Parcel numbers 1 171-1.14, 1-168-1, and 1-167-3.

The site is bound to the north by Anthony O'Boyle Memorial Park, to the south by Ludlow Street, to the east by Westchester Metal Works, MZ Movers, and residential properties, and to the west by Metro North Railroad. The surrounding area is contains a mix of industrial and residential properties. Currently, the Site is vacant.

1.3 Policy Statement

The policy of SESI Consulting Engineers (SESI) is to provide a safe and healthful work environment. No aspect of operations is of greater importance than injury and illness prevention. A fundamental principle of safety management is that all injuries, illnesses, and incidents are preventable. SESI will take every reasonable step to eliminate or control hazards in order to minimize the possibility of injury, illness, or incident.

This HASP prescribes the procedures that must be followed by SESI personnel during activities at the site. Operational changes that could affect the health and safety of personnel, the community, or the environment will not be made without the prior approval of the Project Manager (PM) and the Health and Safety Manager (HSM). This document will be reviewed periodically by the HSM to ensure that it is current and technically correct. Any changes in site conditions and/or the scope of work will require a review and modification to this HASP. Such changes will be completed in the form of an addendum or a revision to the plan.

The provisions of this plan are mandatory for all SESI personnel and are advisory for all contractors, and subcontractors assigned to the project. ***Subcontractors will be responsible for preparing their own site-specific HASPs that meet the basic requirements outlined in this HASP.*** All visitors to SESI work areas at the site must abide by the requirements of this plan.

1.4 References

This HASP complies with applicable Occupational Safety and Health Administration (OSHA) regulations, United States Environmental Protection Agency (USEPA) regulations, and SESI health and safety policies and procedures. This plan follows the guidelines established in the following:

- *Standard Operating Safety Guides*, USEPA (Publication 9285.1-03, June 1992).
- *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*, NIOSH, OSHA, USCG, USEPA (86116, October 1985).
- *Title 29 of the Code of Federal Regulations* (CFR), Part 1910.
- *Title 29 of the Code of Federal Regulations* (CFR), Part 1926.
- *Pocket Guide to Chemical Hazards*, DHHS, PHS, CDC, NIOSH (2004).
- *Threshold Limit Values*, ACGIH (2005).
- *Guide to Occupational Exposure Values*, ACGIH (2005).
- *Quick Selection Guide to Chemical Protective Clothing*, Forsberg, K. and S.Z. Mansdorf, 2nd Ed. (1993).

1.5 Definitions

The following definitions (listed alphabetically) are applicable to this HASP:

- *Contamination Reduction Zone (CRZ)* - Area between the exclusion zone and support zone that provides a transition between contaminated and clean areas. Decontamination stations are located in this zone.
- *Exclusion Zone (EZ)* - Any portions of the site where hazardous substances are, or are reasonably suspected to be present, and pose an exposure hazard to on-site personnel.
- *Incident* - All losses, including first aid cases, injuries, illnesses, spills/leaks, equipment and property damage, motor vehicle accidents, regulatory violations, fires, and business interruptions.
- *On-Site Personnel* - All SESI and subcontractors involved with the project.
- *Project* - All on-site work performed under the scope of work.
- *Site* - The area described in Section 1.2, Site and Facility Description, where the work is to be performed by SESI personnel and subcontractors.
- *Support Zone (SZ)* - All areas of the site except the EZ and CRZ. The SZ surrounds the CRZ and EZ. Support equipment and break areas are located in this zone.
- *Subcontractor* - Includes contractor personnel hired by SESI.
- *Visitor* - All other personnel, except the on-site personnel.
- *Work Area* - The portion of the site where work activities are actively being performed. This area may change daily as work progresses and includes the SZ, CRZ, and EZ. If the work area is located in an area on the site that is not contaminated, or suspected of being contaminated, the entire work area may be a SZ.

2.0 PROJECT SCOPE OF WORK

This HASP contains information for the following tasks that SESI is anticipated to conduct at the Site. Should additional and/or different tasks be identified, amendments to this HASP will be required to address these changed items.

- Mobilization/Sample location stakeout;

- Soil Borings and Monitoring Well Installation;
- Soil Vapor Point Installation
- Excavation of contaminated soil “hot spots”;
- Earthwork and grading;
- Chemical sampling of soil and groundwater and soil vapor; and
- Decontamination and demobilization/site restoration.

3.0 ROLES AND RESPONSIBILITIES

3.1 All Personnel

All SESI project personnel must adhere to the procedures outlined in this HASP during the performance of their work. Each person is responsible for completing tasks safely and reporting any unsafe acts or conditions to their supervisor. No person may work in a manner that conflicts with these procedures. After due warnings, the PM will dismiss from the site any SESI employee or subcontractor who violates safety procedures.

All SESI project personnel will receive training in accordance with applicable regulations and be familiar with the requirements and procedures contained in this HASP prior to initiating site activities. In addition, all SESI personnel will attend an initial hazard briefing prior to beginning work at the site.

The roles of key safety personnel and subcontractors are outlined in the following sections. Key project personnel and contacts are summarized in Table 1.

3.2 Key Safety Personnel

3.2.1 Project Officer (PO)

The PO is responsible for providing resources to assure project activities are completed in accordance with this HASP, and for meeting all regulatory and contractual requirements.

3.2.2 Project Manager (PM)

The PM is responsible for verifying that project activities are completed in accordance with the requirements of this HASP. The PM is responsible for confirming that the Field Supervisor (FS) has the equipment, materials, and qualified personnel to fully implement the safety requirements of this HASP, and/or that subcontractors assigned to this project meet the requirements established by SESI. It is also the responsibility of the PM to:

- Consult with the HSM on site health and safety issues;
- Verify that subcontractors meet health and safety requirements prior to commencing work;
- Verify that all incidents are thoroughly investigated;
- Approve, in writing, addenda or modifications of this HASP; and
- Suspend work or modify work practices, as necessary, for personal safety, protection of property, and regulatory compliance.

3.2.3 Health and Safety Manager (HSM)

The HSM or his designee, the health and safety manager (HSM), has overall responsibility for the technical health and safety aspects of the project, including review and approval of this HASP. Inquiries regarding health and safety procedures, project procedures, and othertechnical or regulatory issues should be addressed to this individual. The HSM or his designee must approve changes or addenda to this HASP.

3.2.4 Site Safety Officer (SSO)

The SSO is responsible for field health and safety issues, including the execution of this HASP. Questions in the field regarding health and safety procedures, project procedures, and other technical or regulatory issues should be addressed to this individual. The SSO will advise the PM on health and safety issues and will establish and coordinate the project air-monitoring program if one is deemed necessary (see Section 5.1, Air Monitoring). The SSO is the primary site contact on health and safety matters. It is the responsibility of the SSO to:

- Provide on-site technical assistance, if necessary;
- Participate in all accident/incident reports and ensure that they are reported to the HSM, client, and PM within 24 hours;
- Coordinate site and personal air monitoring as required, including equipment maintenance and calibration;
- Conduct site safety orientation training and safety meetings;
- Verify that project personnel have received the required physical examinations and medical certifications;
- Review site activities with respect to compliance with this HASP;
- Maintain required health and safety documents and records; and
- Assist the FS in instructing field personnel on project hazards and protective procedures.

3.2.5 Field Supervisor (FS)

The FS is responsible for implementing this HASP, including communicating requirements to on-site personnel and subcontractors. The FS will be responsible for informing the PM of changes in the work plan, procedures, or site conditions so that those changes may be addressed in this HASP. Other responsibilities are to:

- Consult with the SSO on site health and safety issues;
- Stop work, as necessary, for personal safety, protection of property, and regulatory compliance;
- Obtain a site map and determine and post routes to medical facilities and emergency telephone numbers;
- Notify local public emergency representatives (as appropriate) of the nature of the site operations, and post their telephone numbers (i.e., local fire department personnel who would respond for a confined space rescue);
- Observe on-site project personnel for signs of ill health effects;
- Investigate and report any incidents to the SSO;
- Verify that all on-site personnel have had applicable training;
- Verify that on-site personnel are informed of the physical, chemical, and biological hazards associated with the site activities, and the procedures and protective equipment necessary to control the hazards; and
- Issue/obtain any required work permits (hot work, confined space, etc.).

3.2.6 Field Personnel (FP)

All SESI field personnel are responsible for following the Health and Safety procedures specified in this HASP and work practices specified in applicable operation procedures. Some specific responsibilities include, but are not limited to:

- Reading and understanding the HASP;
- Reporting all accidents, incidents, injuries, or illnesses to the FS;
- Complying with the requests of the SSO;
- Immediately communicating newly identified hazards or noncompliance issues to the FS or SSO; and
- Stopping work in cases of immediate danger.

3.3 Subcontractors

Subcontractors and their personnel must understand and comply with applicable regulations and site requirements established in this HASP. Subcontractors will prepare their own site-specific HASP that must be consistent with the requirements of this HASP.

All subcontractor personnel will receive training in accordance with applicable regulations and be familiar with the requirements and procedures contained in this HASP prior to initiating site activities. All subcontractor personnel will attend an initial hazard briefing prior to beginning work at the site. Additionally, on-site subcontractor personnel must conduct daily site safety meetings.

Subcontractors must designate individuals to function as the PM, HSM, SSO, and FS. In some firms the HSM to be carried out by the PM. This is acceptable provided the PM has the required knowledge, training, and experience to properly address all hazards associated with the work, and to prepare, approve, and oversee the execution of the site-specific HASP. A subcontractor may designate the same person to perform the duties of both the SSO and the FS. However, depending on the level of complexity of a contractor's scope of work, it may be infeasible for one person to perform both functions satisfactorily.

3.4 Stop Work Authority

Every SESI employee and subcontractor is empowered, expected, and has the responsibility to stop the work of another co-worker if the working conditions or behaviors are considered unsafe.

3.5 All On-Site Personnel

All on-site SESI personnel (including SESI subcontractors) must read and acknowledge their understanding of their respective HASPs before commencing work and abide by the requirements of the plans. All on-site SESI personnel shall sign their HASP Acknowledgement Form following their review of their HASP.

All SESI project personnel will receive training in accordance with applicable regulations and be familiar with the requirements and procedures contained in this HASP prior to initiating site activities. In addition, all on-site personnel will attend an initial hazard briefing provided by the SSO prior to beginning work at the site and conduct daily safety meetings thereafter.

On-site personnel will immediately report the following to the FS or SSO:

- Personal injuries and illnesses no matter how minor;
- Unexpected or uncontrolled release of chemical substances;
- Symptoms of chemical exposure;
- Unsafe or hazardous situations;
- Unsafe or malfunctioning equipment;
- Changes in site conditions that may affect the health and safety of project personnel;
- Damage to equipment or property; and
- Situations or activities for which they are not properly trained.

3.6 Visitors

All SESI personnel and subcontractors visiting the Site must check in with the FS. Visitors will be cautioned to avoid skin contact with surfaces, soils, groundwater, or other materials that may impacted or be suspected to be impacted by constituents of concern (COCs).

Visitors requesting to observe work at the site must don appropriate personal protective equipment (PPE) prior to entry to the work area and must have the appropriate training and medical clearances to do so. If respiratory protective devices are necessary, visitors who wish to enter the work area must have been respirator-trained and fit tested for a respirator within the past 12 months.

Table 1 – Key Safety Personnel

SESI Personnel		
Role	**Name**	**Address/Telephone No.**
Project Officer (PO)	Fuad Dahan	973-808-9050
Project Manager (PM)	Jesse Mausner	973-808-9050
Senior Project Engineer (SPE)	TBD	
Health and Safety Manager (HSM)	TBD	
Site Safety Officer (SSO)	TBD	
Field Supervisor (FS)	Ana Figueroa	973-808-9050
Field Personnel	Chris Malvicini	973-808-9050
Field Personnel	TBD	
Subcontractors		
Company/Role	**Name**	**/Telephone No.**
TBD	TBD	TE

4.0 PERSONAL PROTECTIVE EQUIPMENT

4.1 Levels of Protection

PPE is required to safeguard site personnel from various hazards. Varying levels of protection may be required depending on the levels of COCs and the degree of physical hazard. This section presents the various levels of protection and defines the conditions of use for each level. A summary of the levels is presented in Table 2 in this section.

4.1.1 Level D Protection

The minimum level of protection that will be required of project personnel at the site will be Level D, which will be worn when site conditions or air monitoring indicates no inhalation hazard exists. The following equipment will be used:

- Work clothing as prescribed by weather;
- Steel toe work boots, meeting American National Standards Institute (ANSI) Z41;
- Safety glasses or goggles, meeting ANSI Z87;
- Leather work gloves and/or nitrile surgical gloves;
- Hard hat, meeting ANSI Z89, when falling object hazards are present;
- Hearing protection (if noise levels exceed 85 dBA, then hearing protection with a USEPA NRR of at least 20 dBA must be used); and
- PFD if working on or near the water.

4.1.2 Modified Level D Protection

Modified Level D will be used when airborne contaminants are not present at levels of concern, but site activities present an increased potential for skin contact with contaminated materials. Modified Level D consists of:

- Nitrile gloves worn over nitrile surgical gloves;
- Latex/polyvinyl chloride (PVC) overboots when contact with COC-impacted media is anticipated;
- Steel toe work boots, meeting ANSI Z41;
- Safety glasses or goggles, meeting ANSI Z87;
- Face shield in addition to safety glasses or goggles when projectiles or splash hazards exist (e.g. during Power Washing activities);
- Hard hat, meeting ANSI Z89, when falling object hazards are present;
- Hearing protection (if noise levels exceed 85 dBA, then hearing protection with a USEPA NRR of at least 20 dBA must be used);
- Tyvek® suit (polyethylene coated Tyvek® suits for handling liquids) when body contact with COC-impacted media is anticipated; and
- PFD if working on or near the water.

4.1.3 Level C Protection

Level C protection will be required when the airborne concentration of COC reaches one- half of the OSHA Permissible Exposure Limit or ACGIH TLV. The following equipment will be used for Level C protection:

- Full-face, air-purifying respirator with combination organic vapor/HEPA cartridges;
- Polyethylene-coated Tyvek® suit, with ankles and cuffs taped to boots and gloves;
- Nitrile gloves worn over nitrile surgical gloves;
- Steel toe work boots, meeting ANSI Z41;
- Chemical-resistant boots with steel toes or latex/PVC overboots over steel toe boots;
- Hard hat, meeting ANSI Z89;
- Hearing protection (if noise levels exceed 85 dBA, then hearing protection with a USEPA NRR of at least 20 dBA must be used); and
- PFD if working on or near the water.

4.2 Selection of PPE

Equipment for personal protection will be selected based on the potential for contact, site conditions, ambient air quality, and the judgment of supervising site personnel and health and safety professionals. The PPE used will be chosen to be effective against the COCs present on the site.

4.3 Site Respiratory Protection Program

Respiratory protection is an integral part of employee health and safety at the site due to potentially hazardous concentrations of airborne COCs. The site respiratory protection program will consist of the following (as a minimum):

- All on-site personnel who may use respiratory protection will have an assigned respirator.
- All on-site personnel who may use respiratory protection will have been fit tested and trained in the use of a full-face air-purifying respirator within the past 12 months. Documentation of the fit test must be provided to the SSO prior to commencement of work.
- All on-site personnel who may use respiratory protection must within the past year have been medically certified as being capable of wearing a respirator. Documentation of the medical certification must be provided to the SSO, prior to commencement of site work.
- Only cleaned, maintained, NIOSH-approved respirators will be used.
- If respirators are used, the respirator cartridge is to be properly disposed of at the end of each work shift, or when load-up or breakthrough occurs.
- Contact lenses are not to be worn when a respirator is worn.
- All on-site personnel who may use respiratory protection must be clean-shaven. Mustaches and sideburns are permitted, but they must not touch the sealing surface of the respirator.
- Respirators will be inspected, and a negative pressure test performed prior to each use.
- After each use, the respirator will be wiped with a disinfectant, cleansing wipe. When used, the respirator will be thoroughly cleaned at the end of the work shift. The respirator will be stored in a clean plastic bag, away from direct sunlight in a clean, dry location, in a manner that will not distort the face piece.

4.4 Using PPE

Depending upon the level of protection selected, specific donning and doffing procedures may be required. The procedures presented in this section are mandatory if Modified Level D or Level C PPE is used. All personnel entering the EZ must put on the required PPE in accordance with the requirements of this HASP. When leaving the EZ, PPE will be removed in accordance with the procedures listed, to minimize the spread of COCs.

4.4.1 Donning Procedures

These procedures are mandatory only if Modified Level D or Level C PPE is used on the site:

- Remove bulky outerwear. Remove street clothes and store in clean location;
- Put on work clothes or coveralls;
- Put on the required chemical protective coveralls;
- Put on the required chemical protective boots or boot covers;
- Tape the legs of the coveralls to the boots with duct tape;
- Put on the required chemical protective gloves;
- Tape the wrists of the protective coveralls to the gloves;
- Don the required respirator and perform appropriate fit check (Level C);

- Put hood or head covering over head and respirator straps and tape hood to facepiece (Level C); and
- Don remaining PPE, such as safety glasses or goggles and hard hat.

When these procedures are instituted, one person must remain outside the work area to ensure that each person entering has the proper protective equipment.

4.4.2 Doffing Procedures

The following procedures are only mandatory if Modified Level D or Level C PPE is required for the site. Whenever a person leaves the work area, the following decontamination sequence will be followed:

- Upon entering the CRZ, rinse contaminated materials from the boots or remove contaminated boot covers;
- Clean reusable protective equipment;
- Remove protective garments, equipment, and respirator (Level C). All disposable clothing should be placed in plastic bags, which are labeled with contaminated waste labels;
- Wash hands, face, and neck (or shower if necessary);
- Proceed to clean area and dress in clean clothing; and
- Clean and disinfect respirator for next use.

All disposable equipment, garments, and PPE must be bagged in plastic bags, labeled for disposal. See Section 7, Decontamination, for detailed information on decontamination stations.

4.5 Selection Matrix

The level of personal protection selected will be based on air monitoring of the work environment and an assessment by the FS and SSO of the potential for skin contact with COCs. The PPE selection matrix is presented in Table 2. This matrix is based on information available at the time this plan was written. The Airborne Contaminant Action Levels in Table 3, Airborne Contaminant Action Levels, should be used to verify that the PPE prescribed in these matrices is appropriate.

Table 2 – PPE Selection Matrix

Task	Anticipated Level of Protection
Mobilization	Level D
Subsurface Intrusive Activities (Excavation, Drilling)	Modified Level D/Level C
Earthwork/Grading	Level D
Chemical Sampling / Delineation	Modified Level D/Level C
Decontamination	Modified Level D
Demobilization	Level D

5.0 AIR AND NOISE MONITORING

5.1 Air Monitoring

Air monitoring, sampling, and testing will be conducted to determine employee exposure to airborne constituents. The monitoring results will dictate work procedures and the selection

of PPE. The SESI SSO will be responsible for defining appropriate air monitoring procedures and for utilizing the air monitoring results to determine appropriate procedures and PPE for project personnel. Air monitoring results should be recorded in field notebooks or on an air monitoring log (see Attachment 1 for a copy of the Air Monitoring Log). Any deviations from the procedures listed here should be documented and explained in the Air Monitoring Log.

The monitoring devices to be used are a PDR1000 particulate monitor (or equivalent) and a Rae Systems photoionization detector (PID with a 10.6 eV, or Multi-Rae a 11.7 eV lamp/oxygen/LEL/hydrogen sulfide sensors if flammable gasses are suspected). Colorimetric detector tubes may be utilized to estimate airborne concentrations of benzene and should be onsite during any activities that may result in elevated PID readings including drilling, excavating, and groundwater sampling.

Air monitoring will be conducted continuously with a particulate meter and PID or Multi-Rae during drilling in areas where flammable vapors or gases are suspect. All work activity must stop where tests indicate the concentration of flammable vapors exceeds 10% of the LEL at a location with a potential ignition source. Such an area must be ventilated to reduce the concentration to an acceptable level.

5.2 Noise Monitoring

Noise monitoring may be conducted as required. Hearing protection is mandatory for all employees in noise hazardous areas, such as around heavy equipment. As a general rule, sound levels that cause speech interference at normal conversation distance should require the use of hearing protection.

5.3 Monitoring Equipment Maintenance and Calibration

All direct-reading instrumentation calibrations should be conducted under the approximate environmental conditions the instrument will be used. Instruments must be calibrated before and after use, noting the reading(s) and any adjustments that are necessary. All air monitoring equipment calibrations, including the standard used for calibration, must be documented on a calibration log or in the field notebook. All completed health and safety documentation/forms must be reviewed by the SSO and maintained by the FS.

All air monitoring equipment will be maintained and calibrated in accordance with the specific manufacturer's procedures. Preventive maintenance and repairs will be conducted in accordance with the respective manufacturer's procedures. When applicable, only manufacturer-trained and/or authorized personnel will be allowed to perform instrument repairs or preventive maintenance.

If an instrument is found to be inoperative or suspected of giving erroneous readings, the SSO must be responsible for immediately removing the instrument from service and obtaining a replacement unit. If the instrument is essential for safe operation during a specific activity, that activity must cease until an appropriate replacement unit is obtained. The SSO will be responsible for ensuring a replacement unit is obtained and/or repairs are initiated on the defective equipment.

5.4 Action Levels

Table 3 presents airborne contaminant action levels that will be used to determine the procedures and protective equipment necessary based on conditions as measured at the site.

Table 3 – Airborne Contaminant Action Levels

Parameter	Reading	Action
Total Hydrocarbons	0 ppm to ≤ 1 ppm	Normal operations; continue hourly breathing zone monitoring
	> 1 ppm to 5 ppm	Increase monitoring frequency to every 15 minutes and use benzene detector tube to screen for the presence of benzene
	≥ 5 ppm to ≤ 50 ppm	Upgrade to Level C PPE; continue screening for benzene
	> 50 ppm	Stop work; investigate cause of reading
	At any reading > 5 ppm	Monitor perimeter per CAMP
Benzene	≥ 1 ppm to 5 ppm	Upgrade to Level C PPE
	> 5 ppm	Stop work; investigate cause of reading
Dust	0 to .05 mg/m3	Normal operations
	0.05 to 0.1 mg/m3	Begin soil wetting procedure (Level C protection would be needed beyond this point)
	> 0.15 mg/m3	Stop work, fully implement dust control plan
Oxygen	≤ 19.5%	Stop work, evacuate confined spaces/work area, investigate cause of reading, and ventilate area
	> 19.5% to < 23.5%	Normal operations
	≥ 23.5%	Stop work, evacuate confined spaces/work area, investigate cause of reading, and ventilate area
Carbon Monoxide	0 ppm to ≤ 20 ppm	Normal operations
	> 20 ppm	Stop work, evacuate confined spaces/work area, investigate cause of reading, and ventilate area
Hydrogen Sulfide	0 ppm to ≤ 5 ppm	Normal operations
	> 5 ppm	Stop work, evacuate confined spaces/work area, investigate cause of reading, and ventilate area
Flammable Vapors (LEL)	< 10% LEL	Normal operations
	≥ 10% LEL	Stop work, ventilate area, investigate source of vapors

6.0 WORK ZONES AND DECONTAMINATION

6.1 Work Zones

6.1.1 Authorization to Enter

Only personnel with the appropriate training and medical certifications (if respirators are required) will be allowed to work at the project site. The FS will maintain a list of authorized persons; only personnel on the authorized persons list will be allowed to enter the site work areas.

6.1.2 Site Orientation and Hazard Briefing

No person will be allowed in the work area during site operations without first being given a site orientation and hazard briefing. This orientation will be presented by the FS or SSO and will consist of a review of this HASP. This review must cover the chemical, physical, and biological hazards, protective equipment, safe work procedures, and

emergency procedures for the project. Following this initial meeting, daily safety meetings will be held each day before work begins.

All people entering the site work areas, including visitors, must document their attendance at this briefing, as well as the daily safety meetings on the forms included with this plan.

6.1.3 Certification Documents

A training and medical file may be established for the project and kept on site during all site operations. Specialty training, such as first aid/cardiopulmonary resuscitation (CPR) certificates, as well as current medical clearances for all project field personnel required to wear respirators, will be maintained within that file. All project personnel must provide their training and medical documentation to the SSO prior to starting work.

6.1.4 Entry Log

A log-in/log-out sheet will be maintained at the site by the FS. Personnel must sign in and out on a log sheet as they enter and leave the work area, and the FS may document entry and exit in the field notebook.

6.1.5 Entry Requirements

In addition to the authorization, hazard briefing, and certification requirements listed above, no person will be allowed in any SESI work area unless they are wearing the minimum PPE as described in Section 4.0.

6.1.6 Emergency Entry and Exit

People who must enter the work area on an emergency basis will be briefed of the hazards by the FS or SSO. All activities will cease in the event of an emergency. People exiting the work area because of an emergency will gather in a designated safe area for a head count. The FS is responsible for ensuring that all people who entered the work area have exited in the event of an emergency.

6.1.7 Contamination Control Zones

Contamination control zones are maintained to prevent the spread of contamination and to prevent unauthorized people from entering hazardous areas.

6.1.8 Exclusion Zone (EZ)

An EZ may consist of a specific work area or may be the entire area of potential contamination. All employees entering an EZ must use the required PPE and must have the appropriate training and medical clearance for hazardous waste work. The EZ is the defined area where there is a possible respiratory and/or contact health hazard. Cones, caution tape, or a posted site diagram will identify the location of each EZ.

6.1.9 Contamination Reduction Zone

The CRZ or transition area will be established, if necessary, to perform decontamination of personnel and equipment. All personnel entering or leaving the EZ will pass through this area to prevent any cross-contamination. Tools, equipment, and machinery will be decontaminated in a specific location. The decontamination of all personnel will be performed

on site adjacent to the EZ. Personal protective outer garments and respiratory protection will be removed in the CRZ and prepared for cleaning or disposal. This zone is the only appropriate corridor between the EZ and the support zone (SZ) discussed below.

6.1.10 Support Zone (SZ)

The SZ is a clean area outside the CRZ located to prevent employee exposure to hazardous substances. Eating and drinking will be permitted in the support area only after proper decontamination. Smoking may be permitted in the SZ, subject to site requirements.

6.1.11 Posting

Work areas will be prominently marked and delineated using cones, caution tape, or a posted site diagram.

6.1.12 Site Inspections

The FS will conduct a daily inspection of site activities, equipment, and procedures to verify that the required elements are in place.

6.2 Decontamination

6.2.1 Personnel Decontamination

All personnel wearing Modified Level D or Level C protective equipment in the EZ must undergo personal decontamination prior to entering the SZ. The personnel decontamination area will consist of the following stations at a minimum:

- *Station 1*: Personnel leaving the contaminated zone will remove the gross contamination from their outer clothing and boots.
- *Station 2*: Personnel will remove their outer garment and gloves and dispose of it in properly labeled containers. Personnel will then decontaminate their hard hats, and boots with an aqueous solution of detergent or other appropriate cleaning solution. These items are then hand carried to the next station.
- *Station 3*: Personnel will thoroughly wash their hands and face before leaving the CRZ. Respirators will be sanitized and then placed in a clean plastic bag.

6.2.2 Equipment Decontamination

All vehicles that have entered the EZ will be decontaminated at the decontamination pad prior to leaving the zone. If the level of vehicle contamination is low, decontamination may be limited to rinsing of tires and wheel wells with water. If the vehicle is significantly contaminated, steam cleaning or pressure washing of vehicles and equipment may be required.

6.2.3 Personal Protective Equipment Decontamination

Where and whenever possible, single-use, external protective clothing must be used for work within the EZ or CRZ. This protective clothing must be disposed of in properly labeled containers. Reusable protective clothing will be rinsed at the site with detergent and water. The rinseate will be collected for disposal.

When removed from the CRZ, the respirator will be thoroughly cleaned with soap and water. The respirator face piece, straps, valves, and covers must be thoroughly cleaned at the end of each work shift, and ready for use prior to the next shift. Respirator parts may be disinfected with a solution of bleach and water (mixed at 2% bleach by volume), or by using a spray disinfectant.

7.0 TRAINING AND MEDICAL SURVEILLANCE

7.1 Training

7.1.1 General

All on-site project personnel who work in areas where they may be exposed to site contaminants must be trained as required by OSHA Regulation 29 CFR 1910.120 (HAZWOPER). Field employees also must receive a minimum of three days of actual field experience under the direct supervision of a trained, experienced supervisor. Personnel who completed their initial training more than 12 months prior to the start of the project must have completed an eight-hour refresher course within the past 12 months. The FS must have completed an additional eight hours of supervisory training and must have a current first-aid/CPR certificate (See Attachment 2).

7.1.2 Basic 40-Hour Course

The following is a list of the topics typically covered in a 40-hour HAZWOPER training course:

- General safety procedures;
- Physical hazards (fall protection, noise, heat stress, cold stress);
- Names and job descriptions of key personnel responsible for site health and safety;
- Safety, health, and other hazards typically present at hazardous waste sites;
- Use, application, and limitations of PPE;
- Work practices by which employees can minimize risks from hazards;
- Safe use of engineering controls and equipment on site;
- Medical surveillance requirements;
- Recognition of symptoms and signs which might indicate overexposure to hazards;
- Worker right-to-know (Hazard Communication OSHA 1910.1200);
- Routes of exposure to contaminants;
- Engineering controls and safe work practices;
- Components of a health and safety program and a site-specific HASP;
- Decontamination practices for personnel and equipment;
- Confined-space entry procedures; and
- General emergency response procedures.

7.1.3 Supervisor Course

Management and supervisors must receive an additional eight hours of training, which typically includes:

- General site safety and health procedures;
- PPE programs; and
- Air monitoring techniques.

7.1.4 Site-Specific Training

Site-specific training will be accomplished by on-site personnel reading this HASP, and through a thorough site briefing by the PM, FS, or SSO on the contents of this HASP before work begins. The review must include a discussion of the chemical, physical, and biological hazards; the protective equipment and safety procedures; and emergency procedures.

7.1.5 Daily Safety Meetings

Daily safety meetings will be held to cover the work to be accomplished, the hazards anticipated, the PPE and procedures required to minimize site hazards, and emergency procedures. The FS or SSO should present these meetings prior to beginning the day's fieldwork. No work will be performed in an EZ before a daily safety meeting has been held. An additional safety meeting must also be held prior to new tasks, or if new hazards are encountered. The daily safety meetings will be logged in the field notebook.

7.1.6 First Aid and CPR

At least one employee current in first aid/CPR will be assigned to the work crew and will be on the site during operations. Site records will document the presence of this individual. Refresher training in first aid (triennially) and CPR (annually) is required to keep the certificate current. These individuals must also receive training regarding the precautions and protective equipment necessary to protect against exposure to blood-borne pathogens.

7.2 Medical Surveillance

7.2.1 Medical Examination

All personnel who are potentially exposed to site contaminants must participate in a medical surveillance program as defined by OSHA at 29 CFR 1910.120 (f).

7.2.2 Pre-placement Medical Examination

All potentially exposed personnel must have completed a comprehensive medical examination prior to assignment, and periodically thereafter as defined by applicable regulations. The pre-placement and periodic medical examinations typically include the following elements:

- Medical and occupational history questionnaire;
- Physical examination;
- Complete blood count, with differential;
- Liver enzyme profile;
- Chest X-ray, at a frequency determined by the physician;
- Pulmonary function test;
- Audiogram;
- Electrocardiogram for persons older than 45 years of age, or if indicated during the physical examination;
- Drug and alcohol screening, as required by job assignment;
- Visual acuity; and
- Follow-up examinations, at the discretion of the examining physician or the corporate medical director.

The examining physician provides the employee with a letter summarizing his findings and recommendations, confirming the worker's fitness for work and ability to wear a respirator. Documentation of medical clearance will be available for each employee during all project site work.

Subcontractors will certify that all their employees have successfully completed a physical examination by a qualified physician. The physical examinations must meet the requirements of 29 CFR 1910.120 and 29 CFR 1910.134. Subcontractors will supply copies of the medical examination certificate for each on-site employee.

7.2.3 Other Medical Examinations

In addition to pre-employment, annual, and exit physicals, personnel may be examined:

- At employee request after known or suspected exposure to toxic or hazardous materials; and
- At the discretion of the SSO, HSM, or occupational physician in anticipation of, or after known or suspected exposure to toxic or hazardous materials.

7.2.4 Periodic Exam

Following the placement examination, all employees must undergo a periodic examination, similar in scope to the placement examination. For employees potentially exposed over 30 days per year, the frequency of periodic examinations will be annual. For employees potentially exposed less than 30 days per year, the frequency for periodic examinations will be 24 months.

7.2.5 Medical Restriction

When the examining physician identifies a need to restrict work activity, the employee's supervisor must communicate the restriction to the employee and the SSO. The terms of the restriction will be discussed with the employee and the supervisor.

8.0 GENERAL SAFETY PRACTICES

8.1 General Safety Rules

General safety rules for site activities include, but are not limited to, the following:

- At least one copy of this HASP must be in a location at the site that is readily available to personnel, and all project personnel shall review the plan prior to starting work.
- Consume or use food, beverages, chewing gum, and tobacco products only in the SZ or other designated area outside the EZ and CRZ. Cosmetics shall not be applied in the EZ or CRZ.
- Wash hands before eating, drinking, smoking, or using toilet facilities.
- Wear all PPE as required and stop work and replace damaged PPE immediately.
- Secure disposable coveralls, boots, and gloves at the wrists and legs and ensure closure of the suit around the neck.
- Upon skin contact with materials that may be impacted by COCs, remove contaminated clothing and wash the affected area immediately. Contaminated clothing must be changed. Any skin contact with materials potentially impacted by

COCs must be reported to the FS or SSO immediately. If needed, medical attention should be sought.

- Practice contamination avoidance. Avoid contact with surfaces either suspected or known to be impacted by COCs, such as standing water, mud, or discolored soil. Equipment must be stored on elevated or protected surfaces to reduce the potential for incidental contamination.
- Remove PPE as required in the CRZ to limit the spread of COC-containing materials.
- At the end of each shift or as required, dispose of all single-use coveralls, soiled gloves, and respirator cartridges in designated receptacles designated for this purpose.
- Removing soil containing site COCs from protective clothing or equipment with compressed air, shaking, or any other means that disperses contaminants into the air is prohibited.
- Inspect all non-disposable PPE for contamination in the CRZ. Any PPE found to be contaminated must be decontaminated or disposed of appropriately.
- Recognize emergency signals used for evacuation, injury, fire, etc.
- Report all injuries, illnesses, and unsafe conditions or work practices to the FS or SSO.
- Use the "buddy system" during all operations requiring Level C PPE, and when appropriate, during Modified Level D operations.
- Obey all warning signs, tags, and barriers. Do not remove any warnings unless authorized to do so.
- Use, adjust, alter, and repair equipment only if trained and authorized to do so, and in accordance with the manufacturer's directions.
- Personnel are to perform only tasks for which they have been properly trained and will advise their supervisor if they have been assigned a task for which they are not trained.
- The presence or consumption of alcoholic beverages or illicit drugs during the workday, including breaks, is strictly prohibited. Notify your supervisor if you must take prescription or over-the-counter drugs that indicate they may cause drowsiness or, that you should not operate heavy equipment.
- Remain upwind during site activities whenever possible.

8.2 Buddy System

On-site personnel must use the buddy system as required by operations. Use of the "buddy system" is required during all operations requiring Level C to Level A PPE, and when appropriate, during Level D operations. Crewmembers must observe each other for signs of chemical exposure, and heat or cold stress. Indications of adverse effects include, but are not limited to:

- Changes in complexion and skin coloration;
- Changes in coordination;
- Changes in demeanor;
- Excessive salivation and pupillary response; and
- Changes in speech pattern.

Crewmembers must also be aware of the potential exposure to possible safety hazards, unsafe acts, or non-compliance with safety procedures.

Field personnel must inform their partners or fellow crewmembers of non-visible effects of exposure to toxic materials that they may be experiencing. The symptoms of such exposure may include, but are not limited to:

- Headaches;

- Dizziness;
- Nausea;
- Blurred vision;
- Cramps; and
- Irritation of eyes, skin, or respiratory tract.

If protective equipment or noise levels impair communications, prearranged hand signals must be used for communication. Personnel must stay within line of sight of another team member.

8.3 Heat Stress

Heat stress is caused by a number of interacting factors, including environmental conditions, clothing, workload, etc., as well as the physical and conditioning characteristics of the individual. Since heat stress is one of the most common illnesses associated with heavy outdoor work conducted with direct solar load and, in particular, because wearing PPE can increase the risk of developing heat stress, workers must be capable of recognizing the signs and symptoms of heat-related illnesses. Personnel must be aware of the types and causes of heat-related illnesses and be able to recognize the signs and symptoms of these illnesses in both themselves and their co-workers.

Heat rashes are one of the most common problems in hot work environments. Commonly known as prickly heat, a heat rash is manifested as red papules and usually appears in areas where the clothing is restrictive. As sweating increases, these papules give rise to a prickling sensation. Prickly heat occurs in skin that is persistently wetted by unevaporated sweat, and heat rash papules may become infected if they are not treated. In most cases, heat rashes will disappear when the affected individual returns to a cool environment.

Heat cramps are usually caused by performing hard physical labor in a hot environment. These cramps have been attributed to an electrolyte imbalance caused by sweating. It is important to understand that cramps can be caused both by too much or too little salt.

Cramps appear to be caused by the lack of water replenishment. Because sweat is a hypotonic solution (plus or minus 0.3% NaCl), excess salt can build up in the body if the water lost through sweating is not replaced. Thirst cannot be relied on as a guide to the need for water; instead, water must be taken every 15 to 20 minutes in hot environments.

Under extreme conditions, such as working for 6 to 8 hours in heavy protective gear, a loss of sodium may occur. Drinking commercially available carbohydrate electrolyte replacement liquids is effective in minimizing physiological disturbances during recovery.

Heat exhaustion occurs from increased stress on various body organs due to inadequate blood circulation, cardiovascular insufficiency, or dehydration. Signs and symptoms include pale, cool, moist skin; heavy sweating; dizziness; nausea; headache, vertigo, weakness, thirst, and giddiness. Fortunately, this condition responds readily to prompt treatment.

Heat exhaustion should not be dismissed lightly, however, for several reasons. One is that the fainting associated with heat exhaustion can be dangerous because the victim may be operating machinery or controlling an operation that should not be left unattended; moreover, the victim may be injured when he or she faints. Also, the signs and symptoms seen in heat exhaustion are similar to those of heat stroke, which is a medical emergency.

Workers suffering from heat exhaustion should be removed from the hot environment, be given fluid replacement, and be encouraged to get adequate rest.

Heat stroke is the most serious form of heat stress. Heat stroke occurs when the body's system of temperature regulation fails and the body's temperature rises to critical levels. This condition is caused by a combination of highly variable factors, and its occurrence is difficult to predict. Heat stroke is a medical emergency. The primary signs and symptoms of heat stroke are confusion; irrational behavior; loss of consciousness; convulsions; a lack of sweating (usually); hot, dry skin; and an abnormally high body temperature, e.g., a rectal temperature of 41°C (105.8°F). If body temperature is too high, it causes death. The elevated metabolic temperatures caused by a combination of workload and environmental heat load, both of which contribute to heat stroke, are also highly variable and difficult to predict.

If a worker shows signs of possible heat stroke, professional medical treatment should be obtained immediately. The worker should be placed in a shady area and the outer clothing should be removed. The worker's skin should be wetted and air movement around the worker should be increased to improve evaporative cooling until professional methods of cooling are initiated and the seriousness of the condition can be assessed. Fluids should be replaced as soon as possible. The medical outcome of an episode of heat stroke depends on the victim's physical fitness and the timing and effectiveness of first aid treatment.

Regardless of the worker's protestations, no employee suspected of being ill from heat stroke should be sent home or left unattended unless a physician has specifically approved such an order.

Proper training and preventive measures will help avert serious illness and loss of work productivity. Preventing heat stress is particularly important because once someone suffers from heat stroke or exhaustion, that person may be predisposed to additional heat injuries.

8.4 Heat Stress Safety Precautions

Heat stress monitoring and work rest cycle implementation should commence when the ambient adjusted temperature exceeds 72°F. A minimum work rest regimen and procedures for calculating ambient adjusted temperature are described in Table 4.

Table 4 – Work/Rest Schedule

Adjusted Temperature[b]	**Work/Rest Regimen Normal Work Ensemble[c]**	**Work/Rest Regimen Impermeable Ensemble**
90ºF (32.2ºC) or above	After each 45 minutes of work	After each 15 minutes of work
87.5º - 90ºF (30.8º-32.2ºC)	After each 60 minutes of work	After each 30 minutes of work
82.5º - 87.5ºF (28.1º - 30.8ºC)	After each 90 minutes of work	After each 60 minutes of work
77.5º - 82.5ºF (25.3º - 28.1ºC)	After each 120 minutes of work	After each 90 minutes of work
72.5º - 77.5ºF (30.8º - 32.2ºC)	After each 150 minutes of work	After each 120 minutes of work

a. For work levels of 250 kilocalories/hour (Light-Moderate Type of Work)

b. Calculate the adjusted air temperature (ta adj) by using this equation: ta adj °F = ta °F + (13 x % sunshine). Measure air temperature (ta) with a standard mercury-in-glass thermometer, with the bulb shielded from radiant heat. Estimate percent sunshine by judging what percent time the sun is not covered by clouds that are thick enough to produce a shadow. (100 percent sunshine = no cloud cover and a sharp, distinct shadow; 0 percent sunshine = no shadows.)
c. A normal work ensemble consists of cotton coveralls or other cotton clothing with long sleeves and pants.
d. The information presented above was generated using the information provided in the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLV) Handbook.

In order to determine if the work rest cycles are adequate for the personnel and specific site conditions, additional monitoring of individual heart rates will be conducted during the rest cycle. To check the heart rate, count the radial pulse for 30 seconds at the beginning of the rest period. If the heart rate exceeds 110 beats per minute, shorten the next work period by one third and maintain the same rest period.

Additionally, one or more of the following control measures can be used to help control heat stress and are mandatory if any site worker has a heart rate (measure immediately prior to rest period) exceeding 115 beats per minute:

- Site workers will be encouraged to drink plenty of water and electrolyte replacement fluids throughout the day.
- On-site drinking water will be kept cool (50 to 60°F).
- A work regimen that will provide adequate rest periods for cooling down will be established, as required.
- All personnel will be advised of the dangers and symptoms of heat stroke, heat exhaustion, and heat cramps.
- Cooling devices, such as vortex tubes or cooling vests, should be used when personnel must wear impermeable clothing in conditions of extreme heat.
- Employees should be instructed to monitor themselves and co-workers for signs of heat stress and to take additional breaks as necessary.
- A shaded rest area must be provided. All breaks should take place in the shaded rest area.
- Employees must not be assigned to other tasks during breaks.
- Employees must remove impermeable garments during rest periods. This includes white Tyvek-type garments.

All employees must be informed of the importance of adequate rest, acclimation, and proper diet in the prevention of heat stress disorders.

8.5 Cold Stress

Cold stress normally occurs in temperatures at or below freezing, or under certain circumstances, in temperatures of 40°F. Extreme cold for a short time may cause severe injury to exposed body surfaces or result in profound generalized cooling, causing death. Areas of the body that have high surface area-to-volume ratio, such as fingers, toes, and ears, are the most susceptible. Two factors influence the development of a cold weather injury: ambient temperature and the velocity of the wind. For instance, 10°F with a wind of 15 miles per hour (mph) is equivalent in chilling effect to still air at 18°F. An equivalent chill temperature chart relating the actual dry bulb temperature and wind velocity is presented in Table 5.

Table 5 – Wind Chill Temperature Chart

Estimated Wind Speed (in mph)	Actual Temperature Reading (ºF)											
	50	**40**	**30**	**20**	**10**	**0**	**-10**	**-20**	**-30**	**-40**	**-50**	**-60**
	Equivalent Chill Temperature (ºF)											
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	16	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	-148
(Wind speeds greater than 40 mph have little additional effect.)	**LITTLE DANGER Maximum danger of false sense of security.**				**INCREASING DANGER Danger from freezing of exposed flesh within one minute.**			**GREAT DANGER Flesh may freeze within 30 seconds.**				

Trench foot and immersion foot may occur at any point on this chart.

[This chart was developed by the U.S. Army Research Institute of Environmental Medicine, Natick, MA (Source: ACGIH Threshold Limit Values for Chemical Substances and Physical Agents)].

Local injury resulting from cold is included in the generic term frostbite. There are several degrees of tissue damage associated with frostbite. Frostbite of the extremities can be categorized into:

- *Frost Nip or Incipient Frostbite* - characterized by sudden blanching or whitening of skin.
- *Superficial Frostbite* - skin has a waxy or white appearance and is firm to the touch, but tissue beneath is resilient.
- *Deep Frostbite* - tissues are cold, pale, and solid; extremely serious injury.

Systemic hypothermia is caused by exposure to freezing or rapidly dropping temperature. It can be fatal. Its symptoms are usually exhibited in five stages: 1) shivering; 2) apathy, listlessness, sleepiness, and (sometimes) rapid cooling of the body to less than 95°F; 3) unconsciousness, glassy stare, slow pulse, and slow respiratory rate; 4) freezing of the extremities; and 5) death. Trauma sustained in freezing or sub-zero conditions requires special attention because an injured worker is predisposed to secondary cold injury. Special provisions must be made to prevent hypothermia and secondary freezing of damaged tissues in addition to providing for first aid treatment. To avoid cold stress, site personnel must wear protective clothing appropriate for the level of cold and physical activity. In addition to protective clothing, preventive safe work practices, additional training, and warming regimens may be utilized to prevent cold stress.

8.6 Safety Precautions for Cold Stress Prevention

For air temperature of 0°F or less, mittens should be used to protect the hands. For exposed skin, continuous exposure should not be permitted when air speed and temperature results in a wind chill temperature of -25°F.

At air temperatures of 36°F or less, field personnel who become immersed in water or whose clothing becomes wet must be immediately provided with a change of clothing and be treated for hypothermia.

If work is done at normal temperature or in a hot environment before entering the cold, the field personnel must ensure that their clothing is not wet as a consequence of sweating. Wet field personnel must change into dry clothes prior to entering the cold area.

If the available clothing does not give adequate protection to prevent hypothermia or frostbite, work must be modified or suspended until adequate clothing is made available or until weather conditions improve.

Field personnel handling evaporative liquid (e.g., gasoline, alcohol, or cleaning fluids) at air temperatures below 40°F must take special precaution to avoid soaking of clothing or gloves with the liquids because of the added danger of cold injury due to evaporative cooling.

8.7 Safe Work Practices

Direct contact between bare skin and cold surfaces (< 20°F) should be avoided. Metal tool handles and/or equipment controls should be covered by thermal insulating material.

For work performed in a wind chill temperature at or below 10°F, workers should be under constant protective observation (buddy system). The work rate should be established to prevent heavy sweating that will result in wet clothing. For heavy work, rest periods must be taken in heated shelters and workers should be provided with an opportunity to change into dry clothing if needed.

Field personnel should be provided the opportunity to become accustomed to cold-weather working conditions and required protective clothing. Work should be arranged in such a way that sitting or standing still for long periods is minimized.

During the warming regimen (rest period), field personnel should be encouraged to remove outer clothing to permit sweat evaporation or to change into dry work clothing. Dehydration, or loss of body fluids, occurs insidiously in the cold environment and may increase susceptibility to cold injury due to a significant change in blood flow to the extremities. Fluid replacement with warm, sweet drinks and soups is recommended. The intake of coffee should be limited because of diuretic and circulatory effects.

8.8 Biological Hazards

Biological hazards may include poison ivy, snakes, thorny bushes and trees, ticks, mosquitoes, spiders, and other pests.

8.8.1 Tick Borne Diseases

Lyme Disease - The disease commonly occurs in summer and is transmitted by the bite of infected ticks. “Hot spots” in the United States include New York, New Jersey, Pennsylvania, Massachusetts, Connecticut, Rhode Island, Minnesota, and Wisconsin.

Erlichiosis - The disease also commonly occurs in summer and is transmitted by the bite of infected ticks. “Hot spots” in the United States include New York, Massachusetts, Connecticut, Rhode Island, Minnesota, and Wisconsin.

These diseases are transmitted primarily by the deer tick, which is smaller and redder than the common wood tick. The disease may be transmitted by immature ticks, which are small and hard to see. The tick may be as small as a period on this page.

Symptoms of Lyme disease include a rash or a peculiar red spot, like a bull's eye, which expands outward in a circular manner. The victim may have headache, weakness, fever, a stiff neck, and swelling and pain in the joints, and eventually, arthritis. Symptoms of erlichiosis include muscle and joint aches, flu-like symptoms, but there is typically no skin rash.

Rocky Mountain Spotted Fever (RMSF) - This disease is transmitted via the bite of an infected tick. The tick must be attached 4 to 6 hours before the disease-causing organism (Rickettsia rickettsii) becomes reactivated and can infect humans. The primary symptom of RMSF is the sudden appearance of a moderate-to-high fever. The fever may persist for two to three weeks. The victim may also have a headache, deep muscle pain, and chills. A rash appears on the hands and feet on about the third day and eventually spreads to all parts of the body. For this reason, RMSF may be confused with measles or meningitis. The disease may cause death, if untreated, but if identified and treated promptly, death is uncommon.

Control - Tick repellant containing diethyltoluamide (DEET) should be used when working in tick-infested areas, and pant legs should be tucked into boots. In addition, workers should search the entire body every three or four hours for attached ticks. Ticks should be removed promptly and carefully without crushing, since crushing can squeeze the disease- causing organism into the skin. A gentle and steady pulling action should be used to avoid leaving the head or mouth parts in the skin. Hands should be protected with surgical gloves when removing ticks.

8.8.2 Poisonous Plants

Poisonous plants may be present in the work area. Personnel should be alerted to its presence and instructed on methods to prevent exposure.

Control - The main control is to avoid contact with the plant, cover arms and hands, and frequently wash potentially exposed skin. Particular attention must be given to avoiding skin contact with objects or protective clothing that have touched the plants. Treat every surface that may have touched the plant as contaminated, and practice contamination avoidance. If skin contact is made, the area should be washed immediately with soap and water and observed for signs of reddening.

8.8.3 Snakes

The possibility of encountering snakes exists, specifically for personnel working in wooded/vegetated areas. Snake venoms are complex and include proteins, some of which have enzymatic activity. The effects produced by venoms include neurotoxic effects with sensory, motor, cardiac, and respiratory difficulties; cytotoxic effects on red blood cells, blood vessels, heart muscle, kidneys, and lungs; defects in coagulation; and effects from local release of substances by enzymatic actions. Other noticeable effects of venomous snakebites include swelling, edema, and pain around the bite, and the development of ecchymosis (the escape of blood into tissues from ruptured blood vessels).

Control - To minimize the threat of snakebites, all personnel walking through vegetated areas must be aware of the potential for encountering snakes, and the need to avoid actions potentiating encounters, such as turning over logs, etc. If a snakebite occurs, an attempt should be made to safely identify the snake via size and markings. The victim must be transported to the nearest hospital within 30 minutes; first aid consists of applying a constriction band and washing the area around the wound to remove any unabsorbed venom.

8.8.4 Spiders

Personnel may encounter spiders during work activities.

Two spiders are of concern, the black widow and the brown recluse. Both prefer dark sheltered areas such as basements, equipment sheds and enclosures, and around woodpiles or other scattered debris. The black widow is shiny black, approximately one inch long, and found throughout the United States. There is a distinctive red hourglass marking on the underside of the black widow's body. The bite of a black widow is seldom fatal to healthy adults, but effects include respiratory distress, nausea, vomiting, and muscle spasms. The brown recluse is smaller than the black widow and gets its name from its brown coloring and behavior. The brown recluse is more prevalent in the southern United States. The brown recluse has a distinctive violin shape on the top of its body. The bite of the brown recluse is painful and the bite site ulcerates and takes many weeks to heal completely.

Control - To minimize the threat of spider bites, all personnel walking through vegetated areas must be aware of the potential for encountering these arachnids. Personnel need to avoid actions that may result in encounters, such as turning over logs, and placing hands in dark places such as behind equipment or in corners of equipment sheds or enclosures. If a spider bite occurs, the victim must be transported to the nearest hospital as soon as possible; first aid consists of applying ice packs and washing the area around the wound to remove any unabsorbed venom.

8.9 Noise

Exposure to noise over the OSHA action level can cause temporary impairment of hearing; prolonged and repeated exposure can cause permanent damage to hearing. The risk and severity of hearing loss increases with the intensity and duration of exposure to noise. In addition to damaging hearing, noise can impair voice communication, thereby increasing the risk of accidents on site.

Control - All personnel must wear hearing protection, with a Noise Reduction Rating (NRR) of at least 20, when noise levels exceed 85 dBA. When it is difficult to hear a co-worker at normal conversation distance, the noise level is approaching or exceeding 85 dBA, and hearing protection is necessary. All site personnel who may be exposed to noise must also receive baseline and annual audiograms and training as to the causes and prevention of hearing loss. Noise monitoring is discussed in Section 5.2, Noise Monitoring.

Whenever possible, equipment that does not generate excessive noise levels will be selected for this project. If the use of noisy equipment is unavoidable, barriers or increased distance will be used to minimize worker exposure to noise, if feasible.

8.10 Spill Control

All personnel must take every precaution to minimize the potential for spills during site operations. All on-site personnel shall immediately report any discharge, no matter how small, to the FS.

Spill control equipment and materials will be located on the site at locations that present the potential for discharge. All sorbent materials used for the cleanup of spills will be containerized and labeled appropriately. In the event of a spill, the FS will follow the provisions in Section 10.0, Emergency Procedures, to contain and control released materials and to prevent their spread to off-site areas.

8.11 Sanitation

Site sanitation will be maintained according to OSHA requirements.

8.11.1 Break Area

Breaks must be taken in the SZ, away from the active work area after site personnel go through decontamination procedures. There will be no smoking, eating, drinking, or chewing gum or tobacco in any area other than the SZ.

8.11.2 Potable Water

The following rules apply to all field operations:

- An adequate supply of potable water will be provided at each project site. Potable water must be kept away from hazardous materials or media, and contaminated clothing or equipment.
- Portable containers used to dispense drinking water must be capable of being tightly closed and must be equipped with a tap dispenser. Water must not be consumed directly from the container (drinking from the tap is prohibited) nor may it be removed from the container by dipping.
- Containers used for drinking water must be clearly marked and shall not be used for any other purpose.
- Disposable drinking cups must be provided. A sanitary container for dispensing cups and a receptacle for disposing of used cups is required.

8.11.3 Sanitary Facilities

Access to facilities for washing before eating, drinking, or smoking, or alternate methods such as waterless hand-cleaner and paper towels will be provided.

8.11.4 Lavatory

If permanent toilet facilities are not available, an appropriate number of portable chemical toilets will be provided. This requirement does not apply to mobile crews or to normally unattended site locations so long as employees at these locations have transportation immediately available to nearby toilet facilities.

8.12 Emergency Equipment

Adequate emergency equipment for the activities being conducted on site and as required by applicable sections of 29 CFR 1910 and 29 CFR 1926 will be on site prior to the

commencement of project activities. Personnel will be provided with access to emergency equipment, including, but not limited to, the following:

- Fire extinguishers of adequate size, class, number, and location as required by applicable sections of 29 CFR 1910 and 1926;
- Industrial first aid kits of adequate size for the number of personnel on site; and
- Emergency eyewash and/or shower if required by operations being conducted on site.

8.13 Lockout/Tagout Procedures

Only fully qualified and trained personnel will perform maintenance procedures. Before maintenance begins, lockout/tagout procedures per OSHA 29 CFR 1910.147 will be followed.

Lockout is the placement of a device that uses a positive means, such as lock, to hold an energy or material-isolating device such that the equipment cannot be operated until the lockout device is removed. If a device cannot be locked out, a tagout system shall be used. Tagout is the placement of a warning tag on an energy or material isolating device indicating that the equipment controls may not be operated until the personnel who attached the tag remove the tag.

8.14 Electrical Safety

Electricity may pose a particular hazard to site workers due to the use of portable electrical equipment. If wiring or other electrical work is needed, a qualified electrician must perform it.

General electrical safety requirements include:

- All electrical wiring and equipment must be a type listed by Underwriters Laboratories (UL), Factory Mutual Engineering Corporation (FM), or other recognized testing or listing agency.
- All installations must comply with the National Electrical Safety Code (NESC), the National Electrical Code (NEC), or USCG regulations.
- Portable and semi-portable tools and equipment must be grounded by a multi-conductor cord having an identified grounding conductor and a multi-contact polarized plug-in receptacle.
- Tools protected by an approved system of double insulation, or its equivalent, need not be grounded. Double insulated tools must be distinctly marked and listed by UL or FM.
- Live parts of wiring or equipment must be guarded to prevent persons or objects from touching them.
- Electric wire or flexible cord passing through work areas must be covered or elevated to protect it from damage by foot traffic, vehicles, sharp corners, projections, or pinching.
- All circuits must be protected from overload.
- Temporary power lines, switchboxes, receptacle boxes, metal cabinets, and enclosures around equipment must be marked to indicate the maximum operating voltage.
- Plugs and receptacles must be kept out of water unless of an approved submersible construction.
- All extension cord outlets must be equipped with ground fault circuit interrupters (GFCI).

- Attachment plugs or other connectors must be equipped with a cord grip and be constructed to endure rough treatment.

- Extension cords or cables must be inspected prior to each use and replaced if worn or damaged. Cords and cables must not be fastened with staples, hung from nails, or suspended by bare wire.
- Flexible cords must be used only in continuous lengths without splice, with the exception of molded or vulcanized splices made by a qualified electrician.

8.15 Lifting Safety

Using proper lifting techniques may prevent back strain or injury. The fundamentals of proper lifting include:

- Consider the size, shape, and weight of the object to be lifted. A mechanical lifting device or additional persons must be used to lift an object if it cannot be lifted safely alone.
- The hands and the object should be free of dirt or grease that could prevent a firm grip.
- Gloves must be used, and the object inspected for metal slivers, jagged edges, burrs, or rough or slippery surfaces.
- Fingers must be kept away from points that could crush or pinch them, especially when putting an object down.
- Feet must be placed far enough apart for balance. The footing should be solid and the intended pathway should be clear.
- The load should be kept as low as possible, close to the body with the knees bent.
- To lift the load, grip firmly and lift with the legs, keeping the back as straight as possible.
- A worker should not carry a load that he or she cannot see around or over.
- When putting an object down, the stance and position are identical to that for lifting; the legs are bent at the knees, and the back is straight as the object is lowered.

8.16 Ladder Safety

When portable ladders are used for access to an upper landing surface, the ladder side rails shall extend at least 3 feet (9 m) above the upper landing surface to which the ladder is used to gain access; or, when such an extension is not possible because of the ladder's length, then the ladder shall be secured at its top to a rigid support that will not deflect, and a grasping device, such as a grabrail, shall be provided to assist employees in mounting and dismounting the ladder. In no case shall the extension be such that ladder deflection under a load would, by itself, cause the ladder to slip off its support.

- Ladders shall be maintained free of oil, grease, and other slipping hazards.
- Ladders shall not be loaded beyond the maximum intended load for which they were built, or beyond their manufacturer's rated capacity.
- Ladders shall be used only for the purpose for which they were designed.
- Non-self-supporting ladders shall be used at an angle such that the horizontal distance from the top support to the foot of the ladder is approximately one-quarter of the working length of the ladder (the distance along the ladder between the foot and the top support).
- Wood job-made ladders with spliced side rails shall be used at an angle such that the horizontal distance is one-eighth the working length of the ladder.

- Fixed ladders shall be used at a pitch no greater than 90 degrees from the horizontal, as measured to the back side of the ladder.
- Ladders shall be used only on stable and level surfaces unless secured to prevent accidental displacement.
- Ladders shall not be used on slippery surfaces unless secured or provided with slip-resistant feet to prevent accidental displacement. Slip-resistant feet shall not be used as a substitute for care in placing, lashing, or holding a ladder that is used upon slippery surfaces, including, but not limited to, flat metal or concrete surfaces that are constructed so they cannot be prevented from becoming slippery.
- Ladders placed in any location where they can be displaced by workplace activities or traffic, such as in passageways, doorways, or driveways, shall be secured to prevent accidental displacement, or a barricade shall be used to keep the activities or traffic away from the ladder.
- The area around the top and bottom of ladders shall be kept clear.
- The top of a non-self-supporting ladder shall be placed with the two rails supported equally unless it is equipped with a single support attachment.
- Ladders shall not be moved, shifted, or extended while occupied.
- Ladders shall have non-conductive side rails if they are used where the employee or the ladder could contact exposed energized electrical equipment.
- The top, top step, or the step labeled that it or any step above it should not be used as a step.
- Cross-bracing on the rear section of stepladders shall not be used for climbing unless the ladders are designed and provided with steps for climbing on both front and rear sections.
- Ladders shall be inspected by the HSM for visible defects on a daily basis and after any occurrence that could affect their safe use.
- Portable ladders with structural defects, such as, but not limited to, broken or missing rungs, cleats, or steps; broken or split rails; corroded components; or other faulty or defective components shall either be immediately marked in a manner that readily identifies them as defective or be tagged with “Do Not Use” or similar language and shall be withdrawn from service.
- Fixed ladders with structural defects, such as, but not limited to, broken or missing rungs, cleats, or steps; broken or split rails; or corroded components; shall be withdrawn from service.
- Ladder repairs shall restore the ladder to a condition meeting its original design criteria, before the ladder is returned to use.
- Single-rail ladders shall not be used.
- When ascending or descending a ladder, the user shall face the ladder.
- Each employee shall use at least one hand to grasp the ladder when progressing up and/or down the ladder.
- An employee shall not carry any object or load that could cause the employee to lose balance and fall.

8.17 Traffic Safety

The project site may be located adjacent to a public roadway where exposure to vehicular traffic is likely. Traffic may also be encountered as vehicles enter and exit the area. To minimize the likelihood of project personnel and activities being affected by traffic, the following procedures will be implemented.

Cones must be placed along the shoulder of the roadway starting 100 feet from the work area to alert passing motorists to the presence of personnel and equipment. A "Slow" or "Men Working" sign must be placed at the first cone. Barricades with flashing lights should be placed between the roadway and the work area.

During activities along a roadway, equipment will be aligned parallel to the roadway to the extent feasible, facing into the oncoming traffic so as to place a barrier between the work crew and the oncoming traffic. All crewmembers must remain behind the equipment and the traffic barrier.

All site personnel who are potentially exposed to vehicular traffic must wear an outer layer of orange warning garments, such as vests, jackets, or shirts. If work is performed in hours of dusk or darkness, workers will be outfitted with reflective garments either orange, white (including silver-coated reflective coatings or elements that reflect white light), yellow, fluorescent red-orange, or fluorescent yellow-orange.

The flow of traffic into and out of the adjacent business must be assessed, and precautions taken to warn motorists of the presence of workers and equipment. Where possible, vehicles should be aligned to provide physical protection of people and equipment.

9.0 SITE-SPECIFIC HAZARDS AND CONTROL MEASURES

9.1 Evaluation of Hazards

The evaluation of hazards is provided as a quick reference as to the known conditions for the Site, wherein the level of detail for each of the subsections is identified.

9.1.1 Hazard Characteristics

Existing information for Site:
__X__ Detailed _____ Preliminary _____ None

Hazardous/Contaminated Material Form(s):
__X__ Solid __X__ Liquid _____ Sludge ___ Gas X Vapor

Containment Type(s):
_____ Drum ____ Tank _____ Pit __X__ Debris
_____ Pond _____ Lagoon Other: X

Hazardous Material Characteristics:
__X__ Volatile _____ Corrosive _____ Reactive _____ Radioactive
_____ Ignitable __X__ Toxic __X__ Unknown

Routes of Exposure:
__X__ Oral __X__ Dermal __X__ Eye __X__ Respiratory

9.1.2 Potential Health and Safety Hazards

__X__ Heat _____ Congested areas
__X__ Cold __X__ General Construction
_____ Confined space entry __X__ Physical injury

_____ Oxygen depletion	____ Electrical hazards
_____ Asphyxiation	_____ Handling and product transfer
__X__ Excavation	__X__ Fire
__X__ Cave-ins	__X__ Explosion
__X__ Falls, slippage	__X__ Biological Hazards
	__X__ Plants – Poison Ivy, Poison Oak
	__X__ Insects – Ticks
	__X__ Insects – Mosquitoes
	__X__ Insects – Bees and Wasps
	__X__ Rats and Mice
__X__ Heavy equipment	_____ Non-ionizing Radiation (i.e. UV, IR, etc.)
_____ Other: Potential Ignition Hazard.	

9.2 Field Activities, Hazards, and Control Procedures

The following task-specific safety analyses identify potential health, safety, and environmental hazards associated with each type of field activity. Because of the complex and changing nature of field projects, supervisors must continually inspect the site to identify hazards that may affect on-site personnel, the community, or the environment. The FS must be aware of these changing conditions and discuss them with the PM whenever these changes impact employee health, safety, the environment, or performance of the project. The FS will keep on-site personnel informed of the changing conditions, and the PM will write and/or approve addenda or revisions to this HASP as necessary.

9.2.1 Mobilization/Construction Stakeout

Description of Tasks

Site mobilization will include establishing excavation locations, determining the location of utilities and other installations, and establishing work areas. Mobilization will also include setting up equipment and establishing a temporary site office. A break area will be set up outside of regulated work areas. Mobilization may involve clearing areas for the SZ and CRZ. During this initial phase, project personnel will walk the site to confirm the existence of anticipated hazards and identify safety and health issues that may have arisen since the writing of this plan.

Hazard Identification

The hazards of this phase of activity are associated with heavy equipment operation, manual materials handling, installation of temporary on-site facilities, and manual site preparation.

Manual materials handling and manual site preparation may cause blisters, sore muscles, and joint and skeletal injuries; and may present eye, contusion, and laceration hazards. Installation of temporary field office and support facilities may expose personnel to electrical hazards, underground and overhead utilities, and physical injury due to the manual lifting and moving of materials. The work area presents slip, trip, and fall hazards from scattered debris and irregular walking surfaces. Rainy weather may cause wet, muddy, slick walking surfaces, and unstable soil. Freezing weather hazards include frozen, slick, and irregular walking surfaces.

Environmental hazards include plants, such as poison ivy and poison oak; aggressive fauna, such as ticks, fleas, mosquitoes, wasps, spiders, and snakes; weather, such as

sunburn, lightning, rain, and heat- or cold-related illnesses; and pathogens, such as rabies, Lyme disease, and blood-borne pathogens.

Controls
Control procedures for these hazards are discussed in Section 8.0, General Safety Practices.

9.2.2 Demolition/Site Clearing

Description of Tasks
Site clearance will involve manual or mechanical removal of objects impeding access to the construction footprint. These obstructions are both natural and man-made items and will include, but not be limited to, fabricated metal and concrete structures, trees, vegetation, rubble, and miscellaneous trash/debris.

Hazard Identification
Hazards associated with demolition and site clearance include personnel working in and around potentially unstable structures, or locations of potential contact with hazardous chemicals, utilities, and/or falling objects. This task will involve manual, as well as mechanical demolition/clearance efforts so exertion and equipment hazards exist.

Controls
PPE – Personnel shall be protected from hazards of irritant and toxic plants and suitably instructed in the first aid treatment available.

Preparatory Operations – Prior to permitting employees to start demolition operations, an engineering survey shall be made, by a licensed Professional Engineer, of the structure to determine the stability of the structure. Any adjacent structure shall where personnel may be exposed shall also be similarly checked. The PO shall have in writing evidence that such a survey has been performed. All structural instabilities shall be shored or braced, under the supervision of a licensed Professional Engineer, prior to access by an FP.

Utilities – All electric, gas, water, steam, sewer, and other service lines shall be shut off, caped, or otherwise controlled, outside the building line before demolition work is started. In each case, any utility company that is involved shall be notified in advance. If it is necessary to maintain any power, water or other utilities during demolition, such lines shall be temporarily relocated, as necessary.

Hazardous Substances – It shall also be determined if any type of hazardous chemicals, gases, explosives, flammable materials, or similarly dangerous substances have been used in any pipes, tanks, or other equipment on the property. When the presence of any such substances is apparent or suspected, testing and purging shall be performed and the hazard eliminated before demolition is started.

Falling Debris/Objects – No material shall be dropped to any point lying outside the exterior walls of the structure unless the area is effective protected. Access to the area where falling objects/debris may be encountered must be gated and controlled.

Structural Collapse – Structural or load supporting members on any floor shall not be cut or removed until all stories above such a floor have been demolished and removed. Walls, which are to serve as retaining walls against which debris will be piled, shall not be so used unless capable of safely supporting the imposed load. Mechanical equipment shall not be

used on floors or working surfaces unless such floors or surfaces are not of sufficient strength to support the imposed load.

Rollover Guards – All equipment used in site clearing operations shall be equipped with rollover guards meeting the applicable requirements. In addition, rider-operated equipment shall be equipped with an overhead and rear canopy guard meeting the applicable requirements.

Inspections – During demolition, continuing inspections by a licensed Professional Engineer shall be made as the work progresses to detect hazards resulting from weakened or deteriorated floors, walls, or loosened material. No FP shall be permitted to work where such hazards exist until they are corrected by shoring, bracing, or other effective means.

9.2.3 Excavation and Cut/Fill Operations

9.2.3.1 Excavation/Trenching

Description of Tasks

This task includes the excavation of contaminated soils and superficial debris. Excavation depths vary across the site.

Hazard Identification

The hazards of this activity are associated with heavy equipment operation, subsurface intrusion, manual materials handling, stockpiling, and disposal. Subsurface intrusion presents hazards associated with negotiating buried utilities, cave-ins of the excavated areas, and regress methods for personnel working inside the excavated areas. Disruption of contaminated soil also presents a health hazard.

Controls

Underground Utilities – The estimated locations of utility installations, such as sewer, telephone, fuel, electric, water lines, or any other underground installations that reasonably may be expected to be encountered during the excavation work, shall be determined prior to opening an excavation. Utility companies or owners shall be contacted ("Call Before You Dig") within established or customary local response times, advised of the proposed work, and asked to establish the location of the utility underground installations prior to the start of actual excavation.

When excavation operations approach the estimated location of underground installations, the exact location of the installations shall be determined by save and acceptable means. While the excavation is open, underground installations shall be protected, supported, or removed, as necessary, to safeguard site personnel.

Cave-Ins – Project personnel in an excavation shall be protected from cave-ins by an adequate protective system, except when:

- Excavations are made entirely in stable rock or excavations are less than five feet in depth and examination of the ground by the SSO provides no indication of a potential cave-in.
- Protective systems shall have the capacity to resist, without failure, all loads that are intended or could reasonably be expected to be applied or transmitted to the system.

Project personnel shall be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavations. Protection shall be provided by placing and keeping such materials or equipment at least two feet from the edge of excavations, or by the use of retaining devices that are sufficient to prevent materials or equipment from falling or rolling into excavations, or by a combination of both if necessary.

Daily inspections of excavations, the adjacent areas, and protective systems shall be made by the SSO for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection shall be conducted by the SSO prior to the start of work and as needed throughout operations. Inspections shall also be made after every rainstorm or other hazard-increasing occurrence. These inspections are only required when project personnel exposure can be reasonably anticipated.

Where the SSO finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed personnel shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

Excavation Egress – A stairway, ladder, ramp, or other safe means of egress shall be located in trench excavations that are four feet or more in depth so as to require no more than 25 feet or lateral travel for project personnel.

9.2.3.2 Heavy Equipment Operation

Description of Tasks
Heavy equipment to be used for this task include, but are not limited to, excavators, dozers, dump trucks, and water sprayers (if required).

Hazard Identification
The most common type of accident that occurs in material handling operations is the "caught between" situation when a load is being handled and an object gets caught between two moving parts of the equipment. Operation of the heavy construction equipment may produce harmful noise.

Controls
Equipment Inspection – All vehicles in use shall be checked prior to operation to ensure that all parts, equipment, and accessories that affect safe operations are in proper operating condition and free from defects. All defects shall be corrected before the vehicle is placed in service.

Ground Guides – No personnel shall use any motor vehicle, earthmoving, or compacting equipment having an obstructed view to the rear, unless:

- The vehicle has a reverse signal alarm distinguishable from the surrounding noise level; or
- The vehicle is backed up only when an observer signals that it is safe to do so.

Blocking – Heavy machinery, equipment, or parts thereof that are suspended or held aloft shall be substantially blocked to prevent falling or shifting before employees are permitted to work under or between them.

Noise – Control measures for noise are addressed in Section 4.9.

Traffic – Control measures for traffic are addressed in Section 8.17.

9.2.3.3 Disturbance/Handling of Contaminated Material

Description of Tasks
After the contaminated soil is excavated from below the Site's surface, the material will be stockpiled, dried, and either transported offsite or relocated and backfilled on site.

Hazard Identification
The hazards associated with materials handling include contact of the contaminated material with project personnel, or cross contamination with other site soil.

Controls
Cross Contamination – Following excavation, contaminated soil stockpiles will be placed on a structure constructed to separate the material from the site soil and collect any groundwater leachate. The material shall be covered to prevent storm water erosion or migration of contaminants through storm water.

Air Monitoring – Air and particulate monitoring will be conducted during soil excavation activities to assess the potential for exposure to airborne COCs. If the results of air monitoring indicate the presence of organic vapors or particulates in a concentration causing concern, personnel will upgrade to Level C protection. Refer to Section 5.1, Air Monitoring, for a description of air monitoring requirements and action levels. A description of each level of personal protection is included in Section 4.0, Personal Protective Equipment.

Traffic – Control measures for traffic are addressed in Section 8.17.

9.2.4 Drilling/Subsurface Intrusion Activities

Description of Tasks
This component of work includes the project tasks of delineation and sampling the petroleum hydrocarbon and metals impacted soil and groundwater, and an archeological survey.

Hazard Identification

The primary physical hazards for this activity are associated with the use of soil boring and grouting equipment. The equipment is hydraulically powered and uses static force and dynamic percussion force to advance sampling and penetrating tubes.

Accidents can occur as a result of improperly placing the equipment on uneven or unstable terrain or failing to adequately secure the equipment prior to the start of operations. Overhead utility lines can create hazardous conditions if contacted by the equipment. Underground installations such as electrical lines, conduit, and product lines pose a significant hazard if contacted.

Controls

Geoprobe and Drill Rig Safety Procedures - The operator of the equipment must possess required state or local licenses to perform such work. All members of the crew shall receive site-specific training prior to beginning work.

The operator is responsible for the safe operation of the rig, as well as the crew's adherence to the requirements of this HASP. The operator must ensure that all safety equipment is in proper condition and is properly used. The members of the crew must follow all instructions of the operator, wear all personal protective equipment, and be aware of all hazards and control procedures. The operator and crew must participate in the Daily Safety Meetings and be aware of all emergency procedures.

Equipment Inspection - Each day, prior to the start of work, the rig and associated equipment must be inspected by the operator. The following items must be inspected:

- Vehicle condition;
- Proper storage of equipment;
- Condition of all hydraulic lines;
- Fire extinguisher; and
- First aid kit.

Equipment Set Up - The drill rig must be properly blocked and leveled prior to raising the derrick. The wheels which remain on the ground must be chocked. The leveling jacks shall not be raised until the derrick is lowered. The rig shall be moved only after the derrick has been lowered.

All well sites will be inspected by the driller prior to the location of the rig to verify a stable surface exists. This is especially important in areas where soft, unstable terrain is common.

The drill rig must be properly blocked and leveled prior to raising the derrick. Blocking provides a more stable drilling structure by evenly distributing the weight of the rig. Proper blocking ensures that differential settling of the rig does not occur.

When the ground surface is soft or otherwise unstable, wooden blocks, at least 24" by 24" and 4" to 8" thick shall be placed between the jack swivels and the ground. The emergency brake shall be engaged, and the wheels that are on the ground shall be chocked.

Rules for Intrusive Activity - Before beginning any intrusive activity, the existence and location of underground pipe, conduit, electrical equipment, and other installations will be

determined. This will be done, if possible, by contacting the appropriate client representative to mark the location of the lines. "Call Before You Dig" will verify the potential for encountering subsurface utilities. If the client's knowledge of the area is incomplete, an appropriate device, such as a magnetometer, will be used to locate the line.

Combustible gas readings of the general work area will be made regularly in areas where and/or during operations when the presence of flammable vapors or gases is suspected, such as during intrusive activities (see Section 5.1). Operations must be suspended and corrective action taken if the airborne flammable concentration reaches 10% of the LEL in the immediate area (a one-foot radius) of the point of drilling, or near any other ignition sources.

Overhead Electrical Clearances - If equipment is operated in the vicinity of overhead power lines, the power to the lines must be shut off or the equipment must be positioned and blocked such that no part, including cables, can come within the minimum clearances as follows:

Nominal System Voltage	**Minimum Required Clearance**
0-50kV	10 feet
51-100kV	12 feet
101-200kV	15 feet
201-300kV	20 feet
301-500kV	25 feet
501-750kV	35 feet
751-1,000kV	45 feet

When the drill rig is in transit, with the boom lowered and no load, the equipment clearance must be at least 4 feet for voltages less than 50kV, 10 feet for voltages of 50 kV to 345 kV, and 16 feet for voltages above 345 kV.

Hoisting Operations - Drillers should never engage the rotary clutch without watching the rotary table, and ensuring it is clear of personnel and equipment.

Unless the drawworks is equipped with an automatic feed control, the brake should not be left unattended without first being tied down.

Drill pipe, auger strings or casing should be picked up slowly. Drill pipe should not be hoisted until the driller is sure that the pipe is latched in the elevator, or the derrickman has signaled that he may safely hoist the pipe.

During instances of unusual loading of the derrick or mast, such as when making an unusually hard pull, only the driller should be on the rig floor; no one else should be on the rig or derrick.

The brakes on the drawworks of the drill rig should be tested by the driller each day. The brakes should be thoroughly inspected by a competent individual each week.

A hoisting line with a load imposed should not be permitted to be in direct contact with any derrick member or stationary equipment, unless it has been specifically designed for line contact.

Workers should never stand near the borehole whenever any wire line device is being run.

Hoisting control stations should be kept clean and controls labeled as to their functions.

Catline Operations - Only experienced workers will be allowed to operate the cathead controls. The kill switch must be clearly labeled and operational prior to operation of the catline. The cathead area must be kept free of obstructions and entanglements.

The operator should not use more wraps than necessary to pick up the load. More than one layer of wrapping is not permitted.

Personnel should not stand near, step over, or go under a cable or catline which is under tension.

Employees rigging loads on catlines shall:

- Keep out from under the load;
- Keep fingers and feet where they will not be crushed;
- Be sure to signal clearly when the load is being picked;
- Use standard visual signals only and not depend on shouting to coworkers; and
- Make sure the load is properly rigged, since a sudden jerk in the catline will shift or drop the load.

Wire Rope - When two wires are broken or rust or corrosion is found adjacent to a socket or end fitting, the wire rope shall be removed from service or re-socketed. Special attention shall be given to the inspection of end fittings on boom support, pendants, and guy ropes.

Wire rope removed from service due to defects shall be cut up or plainly marked as being unfit for further use as rigging.

Wire rope clips attached with U-bolts shall have the U-bolts on the dead or short end of the rope; the clip nuts shall be re-tightened immediately after initial load carrying use and at frequent intervals thereafter.

When a wedge socket fastening is used, the dead or short end of the wire rope shall have a clip attached to it or looped back and secured to itself by a clip; the clip shall not be attached directly to the live end.

Protruding ends of strands in splices on slings and bridles shall be covered or blunted. Except

for eye splices in the ends of wires and for endless wire rope slings, wire rope used in hoisting, lowering, or pulling loads, shall consist of one continuous piece without knot or splice.

An eye splice made in any wire rope shall have not less that five full tucks.

Wire rope shall not be secured by knots. Wire rope clips shall not be used to splice rope.

Eyes in wire rope bridles, slings, or bull wires shall not be formed by wire clips or knots.

Pipe/Auger Handling - Pipe and auger sections shall be transported by cart or carried by two persons. Individuals should not carry auger or pipe sections without assistance.

Workers should not be permitted on top of the load during loading, unloading, or transferring of pipe or rolling stock.

Employees should be instructed never to try to stop rolling pipe or casing; they should be instructed to stand clear of rolling pipe.

Slip handles should be used to lift and move slips. Employees are not permitted to kick slips into position.

When pipe is being hoisted, personnel should not stand where the bottom end of the pipe could whip and strike them.

Pipe and augers stored in racks, catwalks or on flatbed trucks should be secured to prevent rolling.

9.2.5 Subsurface Chemical Sample Collection/Analysis

Description of Tasks

This sub-task consists of the collection of soil samples for subsequent field and laboratory analysis. The physical hazards of soil sampling are primarily associated with the sample collection methods, procedures utilized, and the environment itself.

Hazard Identification

Incidental contact with COCs is the primary hazard associated with sampling the stabilized material. This contact may occur through the manipulation of sample media and equipment, manual transfer of media into sample containers, and proximity of operations to the breathing zone. The primary hazards associated with these sampling procedures are not potentially serious; however, other operations in the area, or the conditions under which samples must be collected, may present chemical and physical hazards. The hazards directly associated with sampling procedures are generally limited to strains/sprains and potential eye hazards. Potential chemical hazards may include contact with media containing site COCs and potential contact with chemicals used for equipment decontamination.

Controls

PPE – To control dermal exposure during sampling activities, a minimum of Level D protection will be worn. If necessary, based on field observations and site conditions, air monitoring may be conducted during sediment sampling activities. If the results of air monitoring indicate the presence of airborne contaminants in a concentration causing concern, personnel will upgrade to Level C protection. Refer to Section 5.1, Air Monitoring, for a description of air monitoring requirements and action levels. A description of each level of personal protection is included in Section 4.0, Personal Protective Equipment.

9.2.6 UST Closure

9.2.6.1 Working in Confined Spaces

Description of Tasks

The project may involve the closure of USTs.

Hazard Identification

Closure activities may require the entrance into confined spaces to facilitate cleaning and removal of the USTs.

Controls

All personnel required to enter into confined or enclosed spaces must be instructed as to the nature of the hazards involved, the necessary precautions to be taken, and in the use of required protective and emergency equipment. The PO shall comply with all specific regulations that apply to work in dangerous or potentially dangerous areas.

9.2.6.2 Working with Compressed Air

Description of Tasks

The proposed method of purging the USTs includes the injection of compressed gas into the tank and attached piping network.

Hazard Identification

Uncontrolled release of the highly pressured air can cause injury to FP during this task. Cylinders must also be properly managed to ensure they are not compromised during storage and/or use.

Controls

Pressure Regulation – Compressed air used for cleaning purposes shall be reduced to less than 30 pounds per square inch and then only with effective chip guarding and personal protective equipment.

Cylinder Storage – Valve protection caps shall be in place and secured when compressed gas cylinders are transported, moved, or stored. Cylinder valves shall be closed when work is finished and when cylinders are empty or are moved. Compressed gas cylinders shall be secured in an upright position at all times, except if necessary for short periods of time when cylinders are actually being hoisted or carried. Cylinders shall be placed in a location where they cannot become part of an electrical circuit.

9.2.7 Decontamination

All equipment will be decontaminated before leaving the site. Personnel involved in decontamination activities may be inadvertently exposed to skin contact with contaminated materials and chemicals brought from the EZ. Personnel involved in decontamination activities must wear PPE that is, at a minimum, one level below the level worn by personnel working in the EZ.

9.2.8 Demobilization

Demobilization involves the removal of all tools, equipment, supplies, and vehicles brought to the site. The hazards of this phase of activity are associated with heavy equipment operation and manual materials handling.

Manual materials handling may cause blisters, sore muscles, and joint and skeletal injuries; and may present eye, contusion, and laceration hazards. Heavy equipment operation presents noise and vibration hazards, and hot surfaces, to operators. Personnel in the vicinity of heavy equipment operation may be exposed to physical hazards resulting in fractures, contusions, and lacerations and may be exposed to high noise levels. The work area presents slip, trip, and fall hazards from scattered debris and irregular walking surfaces. Rainy weather may cause wet, muddy, slick walking surfaces, and unstable soil. Freezing weather hazards include frozen, slick, and irregular walking surfaces.

Environmental hazards include plants, such as poison ivy and poison oak; aggressive fauna, such as ticks, fleas, mosquitoes, wasps, spiders, and snakes; weather, such as sunburn, lightning, rain, and heat-or cold-related illnesses; and pathogens, such as rabies, Lyme disease, and blood-borne pathogens.

Control procedures for these hazards are discussed in Section 8.0, General Safety Practices.

9.3 Chemical Hazards

The chemical hazards associated with site operations are related to inhalation, ingestion, and skin exposure to site COCs. Concentrations of airborne COCs during site tasks may be measurable and will require air monitoring during certain operations. Air monitoring requirements for site tasks are outlined in Section 5.1.

COCs at the site include heavy metals, some VOC compounds, some SVOC compounds and potentially other industrial chemicals including PCBs and pesticides.

The potential for inhalation of site COCs is low. The potential for dermal contact with soils containing site COCs during remedial operations is moderate. Table 6 lists the primary contaminants that have been identified at the Site and the media in which they are present.

Table 6 – List of Primary Contaminants

Media: Soil		
Volatile Organic Compounds	**Highest Concentration Previously Detected Units = mg/kg**	**Applicable Monitoring Instrument**
Benzene	**210**	**PID**
Ethylbenzene	**540**	**PID**
Toluene	**510**	**PID**
Xylenes (total)	**690**	**PID**
Semi-Volatile Organic Compounds	**Highest Concentration Previously Detected Units = mg/kg**	**Applicable Monitoring Instrument**
Acenaphthene	**320**	**PID**
Acenaphthylene	**370**	**PID**
Anthracene	**370**	**PID**
Benzo(k)fluoranthene	**32**	**PID**
Benzo(a)anthracene	**220**	**PID**
Benzo(a)pyrene	**150**	**PID**
Benzo(b)fluoranthene	**97**	**PID**
Chrysene	**220**	**PID**
Dibenzo(a,h)anthracene	**12**	**PID**
Fluoranthene	**400**	**PID**
Fluorene	**550**	**PID**
Phenanthrene	**1500**	**PID**
Pyrene	**640**	**PID**
Indeno(1,2,3-cd)pyrene	**37**	**PID**
Metals	**Highest Concentration Previously Detected Units = mg/kg**	**Applicable Monitoring Instrument**
Arsenic	**51.1**	**NA**
Barium	**1,340**	**NA**
Cadmium	**57.3**	**NA**
Copper	**809**	**NA**
Lead	**462**	**NA**
Mercury	**6.2**	**NA**
Nickel	**48.6**	**NA**
Zinc	**8,230**	**NA**

Media: Groundwater		
Volatile Organic Compounds	**Highest Concentration Previously Detected Units = µg/L**	**Applicable Monitoring Instrument**
Acetone	**320**	**PID**
Benzene	**1,200**	**PID**
Ethylbenzene	**270**	**PID**
Toluene	**310**	**PID**

Xylenes (total)	**610**	**PID**
Isopropylbenzene	**24**	**PID**
Chloromethane	**69**	**PID**
Semi-Volatile Organic Compounds	**Highest Concentration Previously Detected Units =µg/L**	**Applicable Monitoring Instrument**
Biphenyl	**36.2**	PID
Phenol	**3.2**	PID
Acenaphthene	**47.1**	PID
Benzo(a)anthracene	**14.8**	PID
Benzo(a)pyrene	**12.2**	PID
Benzo(b)fluoranthene	**8.2**	PID
Chrysene	**14.6**	PID
Fluorene	**65.1**	PID
Naphthalene	**3,900**	PID
Phenanthrene	**110**	PID
Metals	**Highest Concentration Previously Detected Units = µg/L**	**Applicable Monitoring Instrument**
Antimony	**12.1**	NA
Arsenic	**206**	NA
Barium	**2,170**	NA
Beryllium	**7.1**	NA
Cadmium	**25**	NA
Chromium	**352**	NA
Copper	**822**	NA
Iron	**520,000**	NA
Lead	**10,700**	NA
Magnesium	**59,800**	NA
Manganese	**6,820**	NA
Mercury	**20.18**	NA
Nickel	**689**	NA
Selenium	**26**	NA
Thallium	**5.2**	NA
Zinc	**5,910**	NA
Cyanide	**299**	NA

Media: Soil Vapor		
Volatile Organic Compounds	**Highest Concentration Previously Detected Units = µg/m^3**	**Applicable Monitoring Instrument**
Tetrachloroethene	100	**PID**
Trichloroethene	**23**	**PID**
1,1,1-Trichloroethane	**11**	**PID**
Vinyl Chloride	**8.4**	**PID**

10.0 EMERGENCY PROCEDURES

10.1 General

Prior to the start of operations, the work area will be evaluated for the potential for fire, contaminant release, or other catastrophic event. Unusual conditions or events, activities, chemicals, and conditions will be reported to the FS/SSO immediately.

The FS/SSO will establish evacuation routes and assembly areas for the site. All personnel entering the site will be informed of this route and the assembly area.

10.2 Emergency Response

If an incident occurs, the following steps will be taken:

- The FS/SSO will evaluate the incident and assess the need for assistance and/or evacuation;
- The FS/SSO will call for outside assistance as needed;
- The FS/SSO will ensure the PM is notified promptly of the incident; and
- The FS/SSO will take appropriate measures to stabilize the incident scene.

10.2.1 Fire

In the case of a fire at the site, the FS/SSO will assess the situation and direct fire-fighting activities. The FS/SSO will ensure that the PM is immediately notified of any fires. Site personnel will attempt to extinguish the fire with available extinguishers, if safe to do so. In the event of a fire that site personnel are unable to safely extinguish with one fire extinguisher, the local fire department will be summoned.

10.2.2 Contaminant Release

In the event of a contaminant release, the following steps will be taken:

- Notify FS/SSO immediately;
- Evacuate immediate area of release;
- Conduct air monitoring to determine needed level of PPE; and
- Don required level of PPE and prepare to implement control procedures.

The FS/SSO has the authority to commit resources as needed to contain and control released material and to prevent its spread to off-site areas.

10.3 Medical Emergency

All employee injuries must be promptly reported to the SSO/FS, who will:

- Ensure that the injured employee receives prompt first aid and medical attention;
- In emergency situations, the worker is to be transported by appropriate means to the nearest urgent care facility (normally a hospital emergency room); and
- If the injured person is a SESI employee, notify SESI at 973-808-9050.

10.3.1 Emergency Care Steps

Survey the scene. Determine if it is safe to proceed. Try to determine if the conditions that caused the incident are still a threat. Protect yourself from exposure before attempting to rescue the victim.

- Do a primary survey of the victim. Check for airway obstruction, breathing, and pulse. Assess likely routes of chemical exposure by examining the eyes, mouth, nose, and skin of the victim for symptoms.
- Phone Emergency Medical Services (EMS). Give the location, telephone number used, caller's name, what happened, number of victims, victim's condition, and help being given.
- Maintain airway and perform rescue breathing as necessary.
- Perform CPR as necessary.
- Do a secondary survey of the victim. Check vital signs and do a head-to-toe exam.

Treat other conditions as necessary. If the victim can be moved, take him/her to a location away from the work area where EMS can gain access.

10.4 First Aid - General

All persons must report any injury or illness to their immediate supervisor or the FS. Trained personnel will provide first aid. Injuries and illnesses requiring medical treatment must be documented. The FS and SSO must fill out an accident/incident report as soon as emergency conditions no longer exist and first aid and/or medical treatment has been ensured. The report must be completed and submitted to the PM within 24 hours after the incident.

If first-aid treatment is required, first aid kits are kept at the CRZ. If treatment beyond first aid is required, the injured person(s) should be transported to the medical facility. If the injured person is not ambulatory or shows any sign of not being in a comfortable and stable condition for transport, then an ambulance/paramedics should be summoned. If there is any doubt as to the injured worker's condition, it is best to let the local paramedic or ambulance service examine and transport the worker.

10.4.1 First Aid - Inhalation

Any employee complaining of symptoms of chemical overexposure as described in Section 4, General Site Safety Procedures, will be removed from the work area and transported to the designated medical facility for examination and treatment.

10.4.2 First Aid - Ingestion

Call EMS and consult a poison control center for advice. If available, refer to the MSDS for treatment information. If the victim is unconscious, keep them on their side and clear the airway if vomiting occurs.

10.4.3 First Aid - Skin Contact

Project personnel who have had skin contact with contaminants will, unless the contact is severe, proceed through the CRZ, to the wash area. Personnel will remove any contaminated clothing, and then flush the affected area with water for at least 15 minutes. The worker should be transported to the medical facility if he/she shows any sign of skin reddening, irritation, or if he/she requests a medical examination.

10.4.4 First Aid - Eye Contact

Project personnel who have had contaminants splashed in their eyes or who have experienced eye irritation while in the EZ, must immediately proceed to the eyewash station in the CRZ. Do not decontaminate prior to using the eyewash. Remove whatever protective clothing is necessary to use the eyewash. Flush the eye with clean running water for at least 15 minutes. Arrange prompt transport to the designated medical facility.

10.5 Reporting Injuries, Illnesses, and Safety Incidents

Injuries and illnesses, however minor, will be reported to the FS immediately. The FS will complete an injury report and submit it to the HSM, and the PM by end of shift.

10.6 Emergency Information

The means to summon local public response agencies such as police, fire, and ambulance will be reviewed in the daily safety meeting. These agencies are identified in Table 7.

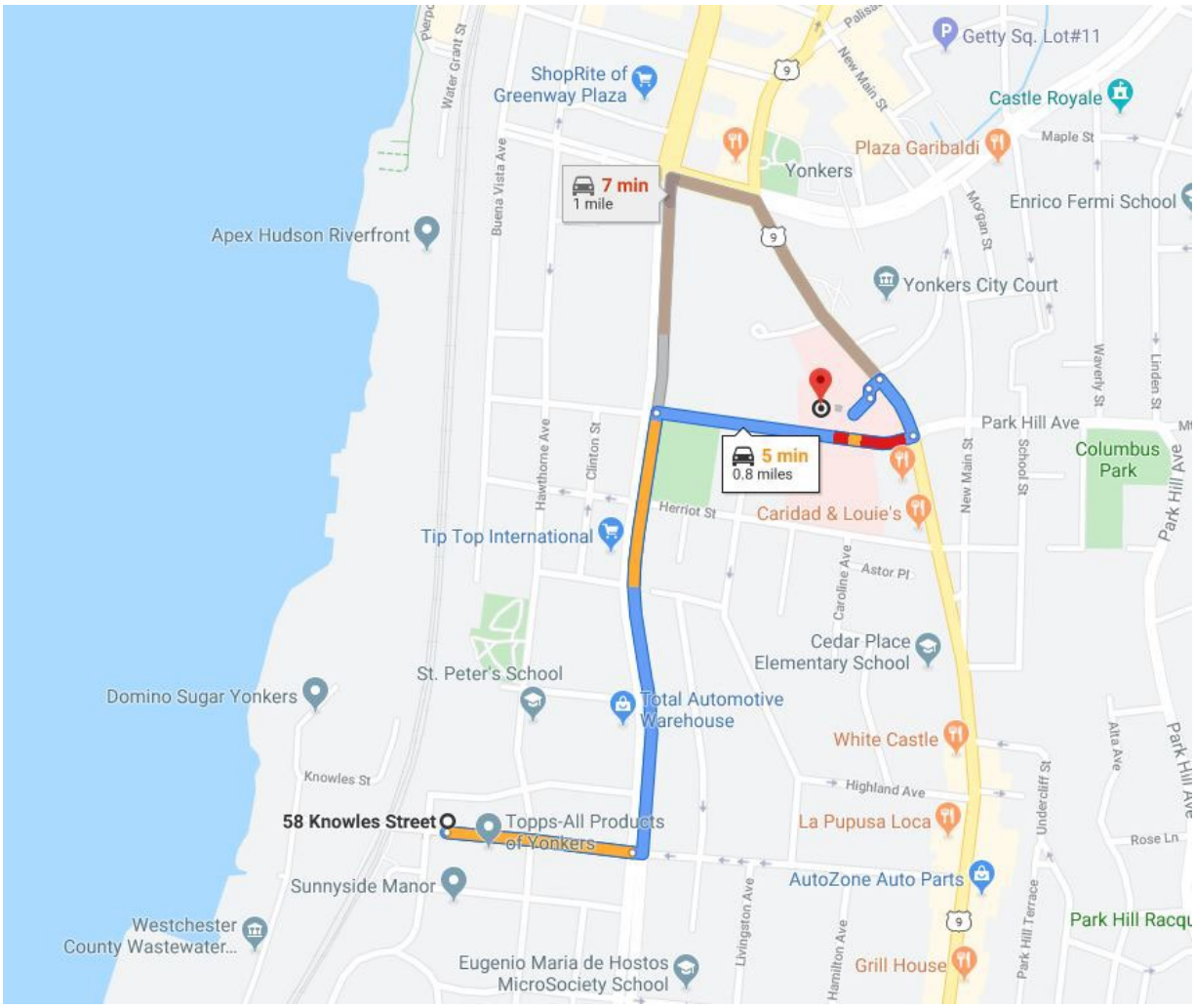
Table 7 – Emergency Contacts

Local Emergency Contacts	**Telephone No.**
EMERGENCY	911
St. Joseph's Medical Center	(914) 378-7000
Police Emergency	911
Rescue Squad	911
Ambulance	911
Miscellaneous Contacts	**Telephone No.**
N.Y. Poison Control Center	(800) 222-1222
National Response Center and Terrorist Hotline	(800) 424-8802
Center for Disease Control	(800) 311-3435
Utility Mark-Out	(800) 962-7962

10.6.1 Directions to Hospital

St. Joseph's Medical Center
127 South Broadway
Yonkers, New York 10701
(914) 378-7000

Directions to Hospital:
See Map on next page



11.0 LOGS, REPORTS, AND RECORD KEEPING

The following is a summary of required health and safety logs, reports, and record keeping for the operations at the subject site.

11.1 HASP Field Change Request

To be completed for initiating a change to the HASP. PM approval is required. The original will be kept in the project file (See Attachment 3).

11.2 Medical and Training Records

The HSM must obtain and keep a log of personnel meeting appropriate training and medical qualifications for the site work. The log will be kept in the project file. Each company's Human Resources Department will maintain medical records, in accordance with 29 CFR 1910.1020.

11.3 Exposure Records

Any personnel monitoring results, laboratory reports, calculations, and air sampling data sheets are part of an employee exposure record. These records will be kept in accordance with 29 CFR 1910.1020. For SESI employees, the originals will be sent to the Human Resources Manager. For subcontractor employees, the original file will be sent to the subcontractor employer with a copy maintained in the SESI project file.

11.4 Accident/Incident Report

Any accident/incident reports must be completed following procedures given in Section 10.5 of this HASP. The originals will be sent to the HSM for maintenance. A copy of the forms will be kept in the project file. (See Attachment 4)

11.5 OSHA Form 200

An OSHA Form 200 (Log of Occupational Injuries and Illnesses) will be kept at the project site. All recordable injuries or illnesses will be recorded on this form. At the end of the project, the original will be sent to the Human Resources Manager for maintenance. Subcontractor employees must also meet the requirements of maintaining an OSHA 200 Form. The accident/incident report meets the requirements of the OSHA Form 101 (Supplemental Record), which must be maintained with the OSHA Form 200 for all recordable injuries or illnesses.

11.6 On-Site Health and Safety Field Logbooks

The HSM or designee will maintain an on-site health and safety log book in which daily Site conditions, activities, personnel, and significant events will be recorded. Calibration records and personnel monitoring results, if available, will also be recorded in the field logbook. The original logbook will be kept in the project file.

Whenever any personnel monitoring is conducted onsite, the monitoring results will be noted in the filed logbook. These will become part of the exposure records file and will be maintained by the HSM.

A signatory page is included (See Attachment 5) and is to be signed by those working on and/or visiting the site.

11.7 Material Safety Data Sheets

Material Safety Data Sheets (MSDS) will be obtained and kept on file at the project site for each hazardous chemical brought to, use, or stored at the Site (See Attachment 6).

ATTACHMENT 1

AIR MONITOR LOG

Air Monitoring: Sample Collection and Analysis

Date & Time of Monitoring	Task / Operation Being	Substance(s)/ Hazard(s) Being	Monitoring Location	Type/Method of Monitoring (separate lines for	Monitoring Results	Exposure Limits	Required Action

ATTACHMENT 2

OSHA POSTER

Job Safety and Health

It's the law!

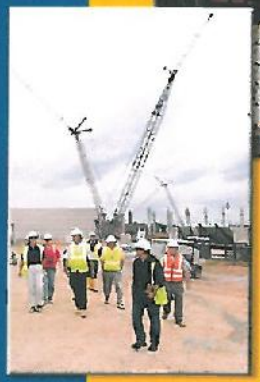
OSHA®
Occupational Safety and Health Administration
U.S. Department of Labor

EMPLOYEES:

- You have the right to notify your employer or OSHA about workplace hazards. You may ask OSHA to keep your name confidential.
- You have the right to request an OSHA inspection if you believe that there are unsafe and unhealthful conditions in your workplace. You or your representative may participate in that inspection.
- You can file a complaint with OSHA within 30 days of retaliation or discrimination by your employer for making safety and health complaints or for exercising your rights under the *OSH Act*.
- You have the right to see OSHA citations issued to your employer. Your employer must post the citations at or near the place of the alleged violations.
- Your employer must correct workplace hazards by the date indicated on the citation and must certify that these hazards have been reduced or eliminated.
- You have the right to copies of your medical records and records of your exposures to toxic and harmful substances or conditions.
- Your employer must post this notice in your workplace.
- You must comply with all occupational safety and health standards issued under the *OSH Act* that apply to your own actions and conduct on the job.

EMPLOYERS:

- You must furnish your employees a place of employment free from recognized hazards.
- You must comply with the occupational safety and health standards issued under the *OSH Act*.



This free poster available from OSHA –
The Best Resource for Safety and Health

Free assistance in identifying and correcting hazards or complying with standards is available to employers, without citation or penalty, through OSHA-supported consultation programs in each state.

1-800-321-OSHA (6742)
www.osha.gov

OSHA 3165-02 2012R

ATTACHMENT 3

HASP FIELD CHANGE REQUEST FORM

HEALTH & SAFETY PLAN
CHANGE NOTICE

Pages _____ of _____

Project: H&S-CN

1) HASP VERSION: _____ SECTION: _____ PAGE (s): _____

RE: --- Change to existing HASP Anticipated Revision Date: _____
--- Addition to existing HASP
--- Other: _____
_____CONT._____

2) PROPOSED CHANGE: _____
_____
_____
_____

3) REASON FOR PROPOSED CHANGE(s):
--- Required by SPEC or Change Order --- Other: _____
--- Disposition of Deficiency _____CONT._____
--- Change in Regulatory or Other Requirements
--- Operational Experience

4) EXHIBITS ATTACHED ____ NO ____ YES (If YES, describe) _____
_____CONT._____

5) PMK APPROVALS PROJECT MANAGER: _____ Date: _____
SITE MANAGER: _____ Date: _____
H&S MANAGER: _____ Date: _____

Client Approval Required: ____ NO ____ YES (If YES, date submitted) _____

6) CLIENT APPROVAL _____ APPROVED _____ REMANDED _____ REJECTED

Comments: _____
_____
_____ CONT._____

Client Representative: _____Date: _____

7) DISTRIBUTION AFTER APPROVAL

X HASP UPDATE LIST --- OTHER: _____
X CLIENT _____
X PROJECT FILES _____

8) PREPARED BY: _____Date: _____
Title: _____

ATTACHMENT 4

INCIDENT REPORT

OSHA's Form 301
Injury and Illness Incident Report

Attention: This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.

U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

This *Injury and Illness Incident Report* is one of the first forms you must fill out when a recordable work-related injury or illness has occurred. Together with the *Log of Work-Related Injuries and Illnesses* and the accompanying *Summary*, these forms help the employer and OSHA develop a picture of the extent and severity of work-related incidents.

Within 7 calendar days after you receive information that a recordable work-related injury or illness has occurred, you must fill out this form or an equivalent. Some state workers' compensation, insurance, or other reports may be acceptable substitutes. To be considered an equivalent form, any substitute must contain all the information asked for on this form.

According to Public Law 91-596 and 29 CFR 1904, OSHA's recordkeeping rule, you must keep this form on file for 5 years following the year to which it pertains.

If you need additional copies of this form, you may photocopy and use as many as you need.

Completed by _____

Title _____

Phone (_____) _____ -- _____ Date ___/___/___

Information about the employee

1) Full name _____

2) Street _____

City _____ State _____ ZIP _____

3) Date of birth ___/___/___

4) Date hired ___/___/___

5) ☐ Male
☐ Female

Information about the physician or other health care professional

6) Name of physician or other health care professional _____

_____

7) If treatment was given away from the worksite, where was it given?

Facility _____

Street _____

City _____ State _____ ZIP _____

8) Was employee treated in an emergency room?
☐ Yes
☐ No

9) Was employee hospitalized overnight as an in-patient?
☐ Yes
☐ No

Information about the case

10) Case number from the *Log* _____ *(Transfer the case number from the Log after you record the case.)*

11) Date of injury or illness ___/___/___

12) Time employee began work _____ AM / PM

13) Time of event _____ AM / PM ☐ Check if time cannot be determined

14) ***What was the employee doing just before the incident occurred?*** Describe the activity, as well as the tools, equipment, or material the employee was using. Be specific. *Examples:* "climbing a ladder while carrying roofing materials"; "spraying chlorine from hand sprayer"; "daily computer key-entry."

15) ***What happened?*** Tell us how the injury occurred. *Examples:* "When ladder slipped on wet floor, worker fell 20 feet"; "Worker was sprayed with chlorine when gasket broke during replacement"; "Worker developed soreness in wrist over time."

16) ***What was the injury or illness?*** Tell us the part of the body that was affected and how it was affected; be more specific than "hurt," "pain," or sore." *Examples:* "strained back"; "chemical burn, hand"; "carpal tunnel syndrome."

17) ***What object or substance directly harmed the employee?*** *Examples:* "concrete floor"; "chlorine"; "radial arm saw." *If this question does not apply to the incident, leave it blank.*

18) ***If the employee died, when did death occur?*** Date of death ___/___/___

OSHA's Form 300 (Rev. 01/2004)

Log of Work-Related Injuries and Illnesses

Attention: This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.

Year 20__ __

U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

You must record information about every work-related death and about every work-related injury or illness that involves loss of consciousness, restricted work activity or job transfer, days away from work, or medical treatment beyond first aid. You must also record significant work-related injuries and illnesses that are diagnosed by a physician or licensed health care professional. You must also record work-related injuries and illnesses that meet any of the specific recording criteria listed in 29 CFR Part 1904.8 through 1904.12. Feel free to use two lines for a single case if you need to. You must complete an Injury and Illness Incident Report (OSHA Form 301) or equivalent form for each injury or illness recorded on this form. If you're not sure whether a case is recordable, call your local OSHA office for help.

Establishment name ______________

City ______________ State ______________

Identify the person			Describe the case			Classify the case: CHECK ONLY ONE box for each case based on the most serious outcome for that case:				Enter the number of days the injured or ill worker was:		Check the "Injury" column or choose one type of illness: (M)					
(A) Case no.	(B) Employee's name	(C) Job title (*e.g., Welder*)	(D) Date of injury or onset of illness	(E) Where the event occurred (*e.g., Loading dock north end*)	(F) Describe injury or illness, parts of body affected, and object/substance that directly injured or made person ill (*e.g., Second degree burns on right forearm from acetylene torch*)	Death (G)	Days away from work (H)	Remained at Work: Job transfer or restriction (I)	Remained at Work: Other record-able cases (J)	Away from work (K)	On job transfer or restriction (L)	(1) Injury	(2) Skin disorder	(3) Respiratory condition	(4) Poisoning	(5) Hearing loss	(6) All other illnesses
			/ month/day			☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
			/ month/day			☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
			/ month/day			☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
			/ month/day			☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
			/ month/day			☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
			/ month/day			☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
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			/ month/day			☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
					Page totals ➤	___	___	___	___	___	___	___ (1) Injury	___ (2) Skin disorder	___ (3) Respiratory condition	___ (4) Poisoning	___ (5) Hearing loss	___ (6) All other illnesses

Be sure to transfer these totals to the Summary page (Form 300A) before you post it.

Public reporting burden for this collection of information is estimated to average 14 minutes per response, including time to review the instructions, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any other aspects of this data collection, contact: US Department of Labor, OSHA Office of Statistical Analysis, Room N-3644, 200 Constitution Avenue, NW, Washington, DC 20210. Do not send the completed forms to this office.

OSHA's Form 300A (Rev. 01/2004)

Summary of Work-Related Injuries and Illnesses

Year 20__ __

U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

All establishments covered by Part 1904 must complete this Summary page, even if no work-related injuries or illnesses occurred during the year. Remember to review the Log to verify that the entries are complete and accurate before completing this summary.

Using the Log, count the individual entries you made for each category. Then write the totals below, making sure you've added the entries from every page of the Log. If you had no cases, write "0."

Employees, former employees, and their representatives have the right to review the OSHA Form 300 in its entirety. They also have limited access to the OSHA Form 301 or its equivalent. See 29 CFR Part 1904.35, in OSHA's recordkeeping rule, for further details on the access provisions for these forms.

Number of Cases

Total number of deaths	Total number of cases with days away from work	Total number of cases with job transfer or restriction	Total number of other recordable cases
_____	_____	_____	_____
(G)	(H)	(I)	(J)

Number of Days

Total number of days away from work	Total number of days of job transfer or restriction
_____	_____
(K)	(L)

Injury and Illness Types

Total number of . . .

	(M)		
(1) Injuries	_____	(4) Poisonings	_____
		(5) Hearing loss	_____
(2) Skin disorders	_____	(6) All other illnesses	_____
(3) Respiratory conditions	_____		

Post this Summary page from February 1 to April 30 of the year following the year covered by the form.

Establishment Information

Your establishment name _____

Street _____

City _____ State _____ ZIP _____

Industry description (*e.g., Manufacture of motor truck trailers*)

_____

Standard Industrial Classification (SIC), if known (*e.g., 3715*)

__ __ __ __

OR

North American Industrial Classification (NAICS), if known (e.g., 336212)

__ __ __ __ __ __

Employment Information *(If you don't have these figures, see the Worksheet on the back of this page to estimate.)*

Annual average number of employees _____

Total hours worked by all employees last year _____

Sign here

Knowingly falsifying this document may result in a fine.

I certify that I have examined this document and that to the best of my knowledge the entries are true, accurate, and complete.

_____ _____
Company executive Title

( ) - / /
Phone Date

ATTACHMENT 5

SIGNATORY PAGE

Attachment 4 – Site-Specific Health and Safety Orientation Signatory Page
HEALTH AND SAFETY PLAN

Title	Name	Signature
Project Manager:	TBD	
Health and Safety Manager:	TBD	

I have read the attached Health and Safety Plan (HASP) and have received site-specific information and orientation regarding the identified physical, chemical, and biological hazards anticipated at this site. My signature certifies that I understand the procedures, equipment, and restrictions applicable to this project site and agree to abide by them.

Signature	Printed Name	Company	Date

Attachment 4 – Health and Safety Orientation Signatory Page (continued)

Signature	Printed Name	Company	Date

ATTACHMENT 6

SAFETY DATA SHEETS

SAFETY DATA SHEET

Version 5.4
Revision Date 09/11/2015
Print Date 05/12/2016

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Benzo(A)pyrene sol, 1x1ml,100UG/ml,CH2Cl2

Product Number : 49473-U
Brand : Supelco

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : (314) 776-6555

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Acute toxicity, Oral (Category 4), H302
Skin irritation (Category 2), H315
Eye irritation (Category 2A), H319
Carcinogenicity (Category 2), H351

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Warning

Hazard statement(s)
H302 Harmful if swallowed.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H351 Suspected of causing cancer.

Precautionary statement(s)
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P280 Wear protective gloves/ eye protection/ face protection.

P301 + P312	IF SWALLOWED: Call a POISON CENTER or doctor/ physician if you feel unwell.
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P321	Specific treatment (see supplemental first aid instructions on this label).
P330	Rinse mouth.
P332 + P313	If skin irritation occurs: Get medical advice/ attention.
P337 + P313	If eye irritation persists: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures

Hazardous components

Component		Classification	Concentration
Methylene chloride			
CAS-No. EC-No. Index-No.	75-09-2 200-838-9 602-004-00-3	Skin Irrit. 2; Eye Irrit. 2A; Carc. 2; STOT SE 3; STOT RE 2; H315, H319, H335, H336, H351, H373, H373	>= 90 - <= 100 %
Benzo[a]pyrene			
CAS-No. EC-No. Index-No.	50-32-8 200-028-5 601-032-00-3	Skin Sens. 1; Muta. 1B; Carc. 1B; Repr. 1B; Aquatic Acute 1; Aquatic Chronic 1; H317, H340, H350, H360, H410	< 0.1 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides, Hydrogen chloride gas
Carbon oxides, Hydrogen chloride gas

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
	Remarks	Potential Occupational Carcinogen See Appendix A		
Methylene chloride	75-09-2	TWA	50.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Carboxyhemoglobinemia Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Confirmed animal carcinogen with unknown relevance to humans		
		TWA	50 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Carboxyhemoglobinemia Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Confirmed animal carcinogen with unknown relevance to humans		
		Substance listed; for more information see OSHA document 1910.1052		

		Substance listed; for more information see OSHA document 1910.1052		
		See Table Z-2		
		PEL	25.000000 ppm	OSHA Specifically Regulated Chemicals/Carcinogens
		1910.1052 This section applies to all occupational exposures to methylene chloride (MC), Chemical Abstracts Service Registry Number 75-09-2, in general industry, construction and shipyard employment. Methylene chloride (MC) means an organic compound with chemical formula, CH2Cl2. Its Chemical Abstracts Service Registry Number is 75-09-2. Its molecular weight is 84.9 g/mole OSHA specifically regulated carcinogen		
		STEL	125.000000 ppm	OSHA Specifically Regulated Chemicals/Carcinogens
		1910.1052 This section applies to all occupational exposures to methylene chloride (MC), Chemical Abstracts Service Registry Number 75-09-2, in general industry, construction and shipyard employment. Methylene chloride (MC) means an organic compound with chemical formula, CH2Cl2. Its Chemical Abstracts Service Registry Number is 75-09-2. Its molecular weight is 84.9 g/mole OSHA specifically regulated carcinogen		

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Methylene chloride	75-09-2	Dichloromethane	0.3000 mg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift (As soon as possible after exposure ceases)			

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type AXBEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	-97 °C (-143 °F)
f)	Initial boiling point and boiling range	40 °C (104 °F)
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	353.1 hPa (264.8 mmHg) at 20 °C (68 °F)
l)	Vapour density	No data available
m)	Relative density	No data available
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information

No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity

No data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available

10.4 Conditions to avoid

No data available

10.5 Incompatible materials

Strong oxidizing agents

10.6 Hazardous decomposition products

Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
Inhalation: No data available

Dermal: No data available

No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

IARC:	2B - Group 2B: Possibly carcinogenic to humans (Methylene chloride)
NTP:	Reasonably anticipated to be a human carcinogen (Methylene chloride)
OSHA:	OSHA specifically regulated carcinogen (Methylene chloride)

Reproductive toxicity
No data available
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: Not available

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Blood - Irregularities - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence

12. ECOLOGICAL INFORMATION

12.1 Toxicity
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1593 Class: 6.1 Packing group: III
Proper shipping name: Dichloromethane, solution
Reportable Quantity (RQ): 1000 lbs

Poison Inhalation Hazard: No

IMDG
UN number: 1593 Class: 6.1 Packing group: III EMS-No: F-A, S-A
Proper shipping name: DICHLOROMETHANE, SOLUTION

IATA
UN number: 1593 Class: 6.1 Packing group: III
Proper shipping name: Dichloromethane, solution

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Methylene chloride	75-09-2	2007-07-01
Benzo[a]pyrene	50-32-8	2007-03-01

SARA 311/312 Hazards
Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Methylene chloride	75-09-2	2007-07-01
Benzo[a]pyrene	50-32-8	2007-03-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Methylene chloride	75-09-2	2007-07-01
Benzo[a]pyrene	50-32-8	2007-03-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Methylene chloride	75-09-2	2007-07-01

California Prop. 65 Components

WARNING! This product contains a chemical known to the	CAS-No.	Revision Date
State of California to cause cancer.	75-09-2	2007-09-28
Methylene chloride		
Benzo[a]pyrene	50-32-8	1990-01-01

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Carc.	Carcinogenicity
Eye Irrit.	Eye irritation
H302	Harmful if swallowed.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.
H340	May cause genetic defects.
H350	May cause cancer.
H351	Suspected of causing cancer.
H360	May damage fertility or the unborn child.
H373	May cause damage to organs (/$/*_ORG_REP_ORAL/$/) through prolonged or repeated exposure if swallowed.
H410	Very toxic to aquatic life with long lasting effects.
Muta.	Germ cell mutagenicity
Repr.	Reproductive toxicity
Skin Irrit.	Skin irritation
Skin Sens.	Skin sensitisation
STOT RE	Specific target organ toxicity - repeated exposure

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	0
Reactivity Hazard:	0

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.4 Revision Date: 09/11/2015 Print Date: 05/12/2016

SAFETY DATA SHEET

Version 6.1
Revision Date 07/25/2018
Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Benzo[<I>b</>]fluoranthene

Product Number : 275336
Brand : Aldrich
Index-No. : 601-034-00-4

CAS-No. : 205-99-2

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 Spruce Street
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Carcinogenicity (Category 1B), H350

Acute aquatic toxicity (Category 1), H400

Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H350 May cause cancer.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P273	Avoid release to the environment.
P281	Use personal protective equipment as required.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms : 3,4-Benzofluoranthene
Benz[e]acephenanthrylene
2,3-Benzfluoranthene
3,4-Benz[e]acephenanthrylene
Benzo[b]fluoranthene
Benzo[e]fluoranthene
NSC 89265

Formula : $C_{20}H_{12}$
Molecular weight : 252.31 g/mol
CAS-No. : 205-99-2
EC-No. : 205-911-9
Index-No. : 601-034-00-4

Hazardous components

Component	Classification	Concentration
Benz[e]acephenanthrylene		
	Carc. 1B; Aquatic Acute 1; Aquatic Chronic 1; H350, H410	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.
Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
Components with workplace control parameters
Contains no substances with occupational exposure limit values.

	Remarks	Cancer Substances for which there is a Biological Exposure Index or Indices (see BEI® section), see BEI® for Polycyclic Aromatic Hydrocarbons (PAHs) Exposure by all routes should be carefully controlled to levels as low as possible. Suspected human carcinogen

Hazardous components without workplace control parameters
Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Benz[e]acephenanthrylene	205-99-2	1-Hydroxypyrene		Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift at end of workweek			

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection

Impervious clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: solid
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 163 - 165 °C (325 - 329 °F) - lit.

f)	Initial boiling point and boiling range	No data available
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	No data available
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
TDLo Oral - Mouse - 7.57 mg/kg
Remarks: Liver:Changes in liver weight. Endocrine:Changes in thymus weight.
Inhalation: No data available
Dermal: No data available
No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity
This product is or contains a component that has been reported to be probably carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.
Possible human carcinogen

IARC:	2B - Group 2B: Possibly carcinogenic to humans (Benz[e]acephenanthrylene)
NTP:	RAHC - Reasonably anticipated to be a human carcinogen (Benz[e]acephenanthrylene)
OSHA:	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: Not available

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to daphnia and other aquatic invertebrates	Immobilization EC50 - Daphnia magna (Water flea) - > 1.024 mg/l - 24 h(Benz[e]acephenanthrylene)

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available(Benz[e]acephenanthrylene)

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Very toxic to aquatic life.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
Not dangerous goods

IMDG
UN number: 3077 Class: 9 Packing group: III EMS-No: F-A, S-F
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Benz[e]acephenanthrylene)
Marine pollutant : yes

IATA
UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Benz[e]acephenanthrylene)

Further information
EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Benz[e]acephenanthrylene	205-99-2	2007-03-01

SARA 311/312 Hazards
Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Benz[e]acephenanthrylene	205-99-2	2007-03-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Benz[e]acephenanthrylene	205-99-2	2007-03-01

	CAS-No.	Revision Date
Benz[e]acephenanthrylene	205-99-2	2007-03-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Benz[e]acephenanthrylene	205-99-2	2007-03-01

California Prop. 65 Components

	CAS-No.	Revision Date
WARNING! This product contains a chemical known to the State of California to cause cancer.	205-99-2	2007-09-28

Benz[e]acephenanthrylene

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H350	May cause cancer.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956
Version: 6.1 Revision Date: 07/25/2018 Print Date: 06/28/2019

SDS preview

LEAD

DANGER

7439-92-1

by Fisher Scientific

Synonyms

C.I. 77575, C.I. Pigment Metal 4, EINECS 231-100-4, Glover, HSDB 231, Lead flake, Olow, Plumbum, CI 77575, Plumbum metallicum, Blei, CI pigment metal 4, EC 231-100-4, KS-4, Lead, Lead element, Lead S2, Olow [Polish], Omaha & grant, Pb-S 100, Rough lead bullion, CCRIS 1581, Lead metal, Lead S 2, SSO 1, UNII-2P299V784P

Hazard statements

Harmful if inhaled
Harmful if swallowed
May cause cancer
May cause damage to organs through prolonged or repeated exposure
May cause drowsiness or dizziness

Precautions

Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Use personal protective equipment as required
Do not eat, drink or smoke when using this product
Use only outdoors or in a well-ventilated area
Rinse mouth
Store locked up

Hazard category

Acute toxicity, inhalation, Acute toxicity, oral, Carcinogenicity, Specific target organ toxicity, repeated exposure, Specific target organ toxicity, single exposure; Narcotic effects

:200View GHS Label8&param1=ZmRwLjFfNzE0NjEwMDNORQ==&unique=1525284976)

The information contained herein is based on data compiled from the chemical components of the (M)SDS and may not accurately represent the safety hazards for the product. Only the manufacturer of the product can make actual representations about the hazard profile of a chemical product. No warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof.

APPENDIX D
COMMUNITY AIR MONITORING PLAN

COMMUNITY AIR MONITORING PLAN

Former Ludlow Street Works
150 Downing Street, 58 Knowles Street, 1-3 Bridge Street
Yonkers, New York
NYSDEC BCP Site # C360158

1.0 INTRODUCTION

This document presents a Community Air Monitoring Plan (CAMP) for the interim remedial measure work plan (IRMWP) for the proposed development at 150 Downing Street, 58 Knowles Street, and 1-3 Bridge Street, Yonkers, New York (the Site). The Site is approximately a 2.89-acre lot which currently consists of a mix of undeveloped, vacant/partially wooded land (northern lot and former MGP area), a vacant building (151 Ludlow Street), and active buildings (1-3 Bridge Street). The Site is located in a mixed industrial and residential area and is bound to the north by Anthony O'Boyle Memorial Park; to the south by Ludlow Street; to the east by Westchester Metal Works, MZ Movers, and residential properties; and to the west by Metro North Railroad.

2.0 OBJECTIVES

The objective of the CAMP is to provide a measure of protection for the downwind community from potential airborne contaminant releases that may arise during all ground intrusive activities, and potentially contaminated soil and material handling and staging. In addition, the CAMP is intended to ensure that dust and contaminants are not leaving the work zone.

3.0 METHODS

The CAMP will include continuous monitoring for particulate matter (e.g., airborne "dust") and volatile organic compounds (VOCs) during the planned remedial excavation and construction activities. Any CAMP exceedances will be reported to the NYSDEC and NYSDOH on the same business day and as soon as possible. Notification of the exceedance will be sent via email along with the reason for the exceedance, the measure(s) taken to address the exceedance, and if the exceedance was resolved.

3.1 CONTINUOUS MONITORNG

Continues monitoring for particulates and VOCs will be conducted during all ground intrusive activities including soil borings, monitoring well installations, and archaeological excavations.

3.2 PERIODIC MONITORNG

Periodic monitoring for VOCs will be conducted 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 consists 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.

4.0 VOC MONITORNG, RESPONSE LEVELS, AND ACTIONS

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. The monitoring work will be performed using a photoionization detector (PID) equipped with a 10.6 ev lamp. The equipment will 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.

- 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 the15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per

instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

- If 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.
- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

All 15-minute readings must be recorded and be available for State (DEC and DOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

5.0 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.

- 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 must be employed, including water spraying. Water may be sourced from a nearby hydrant or from a water truck. Work may 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 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/m3 of the upwind level and in preventing visible dust migration.

All readings must be recorded and be available for State (DEC and DOH) personnel to review.

6.0 SPECIAL REQUIREMENTS FOR WORK WITHIN 20 FEET OF POTENTIALLY EXPOSED INDIVIDUAL 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/m3 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.