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REMEDIAL INVESTIGATION WORK PLAN

55 ECKFORD ST LLC SITE
55 Eckford Street
Brooklyn, New York 11222
Block 2698, Lot 32
BCP Site No. C224168

November 2024
File No. 41.0163263.00

PREPARED FOR:
55 ECKFORD ST LLC
110-50 69th Avenue
Forest Hills, NY 11375

PREPARED BY:
GOLDBERG-ZOINO ASSOCIATES OF NEW YORK P.C.
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November 20, 2024
File No. 41.0163263.00

Jolene Lozewski, P.G.
Project Manager
New York State Department of Environmental Conservation
Division of Environmental Remediation - Remedial Bureau A, Section A
625 Broadway
Albany, NY 12233-7015

Re: Remedial Investigation Work Plan
55 Eckford St LLC Site
55 Eckford Street
Brooklyn, NY 11222
Block 2698, Lot 32
BCP Site No. C224168

Dear Ms. Lozewski:

On behalf of the 55 Eckford St LLC (Requestor/Owner), Goldberg-Zoino Associates of New York P.C. d/b/a GZA GeoEnvironmental of New York (GZA) is pleased to submit this revised Remedial Investigation Work Plan (RIWP) for the above-referenced property (Site). We have incorporated comments from your letter, dated October 23, 2024.

If you have any questions, please contact Victoria D. Whelan at (631) 793-8821.

Very truly yours,

GZA GEOENVIRONMENTAL OF NEW YORK

Reinbill P. Maniquez, CHMM
Senior Project Manager

Stephen M. Kline, P.E.
Consultant Reviewer

Victoria D. Whelan, P.G.
QEP/ Vice President

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CERTIFICATION

I, Victoria D. Whelan, P.G., certify that that I am a Qualified Environmental Professional (QEP) as defined in 6 NYCRR Part 375 and that this Remedial Investigation Work Plan (RIWP) for 55 Eckford Street, Brooklyn, New York, Block 2698, Lot 32, was prepared in accordance with applicable statutes and regulations and in substantial conformance with the DER-10 Technical Guidance for Site Investigation and Remediation (DER-10).

Victoria D. Whelan, P.G.

QEP Name

QEP Signature

November 20, 2024

Date

1.0 INTRODUCTION

This Remedial Investigation Work Plan (RIWP) for the property identified as 55 Eckford Street, Brooklyn, New York (Site) was prepared by Goldberg Zoino Associates of New York, P.C. d/b/a GZA GeoEnvironmental of New York (GZA) on behalf of 55 Eckford St LLC (Requestor /Owner). The Requestor intends to enter into the New York State Department of Environmental Conservation (NYSDEC), Division of Environmental Remediation (DER), Brownfield Cleanup Program (BCP) per Title 6 of the New York State Official Compilation of Codes, Rules, and Regulation (NYCRR) Part 375-3.4.

The Site is located in the Greenpoint neighborhood of Brooklyn, New York and identified as Block 2698, Lot 32 on the New York City (NYC) Department of Finance (DOF) Tax Map.

1.1 PROJECT OBJECTIVE

The previous investigations performed at the Site provided a preliminary understanding of the nature and extent of contamination, specifically volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) and metals in subsurface soils, groundwater, and soil vapor. The objective of this RIWP is to collect sufficient quantity of data to aid in the delineation of impacted areas that will need to be addressed during the remedial activities that will allow for the beneficial redevelopment of the property under the BCP.

1.2 SCOPE OF WORK

The RIWP describes the project objectives, details the Site information and location, relevant historical background, previous site investigations, and field methodologies that will be employed during the subsurface investigation. This RIWP was prepared by GZA for the Site in general accordance with the NYSDEC, DER *Technical Guidance for Site Investigation and Remediation (DER-10)*, dated May 2010. Appended to this RIWP are plans that detail the site-specific protocols to be followed during the investigation work, which include:

- Quality Assurance Project Plan (QAPP) and Field Sampling Plan (FSP)
- Health and Safety Plan (HASP)
- Community Air Monitoring Plan (CAMP)

2.0 SITE INFORMATION

The following section summarizes information provided by the Requestor such as survey plans, previous assessment and investigation reports related to the Site. These documents should be consulted for additional information and details not presented here. Previous documents include:

- *Phase I Environmental Site Assessment (ESA) Report, Hydro Tech Environmental Corp., October 27, 2011*
- *Phase II Environmental Sub Surface Investigation, EEA, INC., December 2011*
- *Phase II Environmental Site Assessment, Hydro Tech Environmental Corp., April 5, 2012*
- *Phase I Environmental Site Assessment Report, Hydro Tech Environmental Corp., June 3, 2013*
- *Phase I Environmental Site Assessment Report, Hydro Tech Environmental Corp., July 25, 2016*
- *Phase I Environmental Site Assessment Report, Hydro Tech Environmental Corp., October 8, 2019*

- *Phase I Environmental Site Assessment Report, Touchstone Environmental Geology, P.C.., October 10, 2023*

Previous plans and reports were transmitted to the NYSDEC as an attachment to the BCP Application Package provided under separate cover.

2.1 SITE LOCATION, DESCRIPTION, AND USE

The Site is identified 55 Eckford Street and is located in the Greenpoint-Williamsburg Special Mixed Use District (MX-8) of Brooklyn, New York in an area zoned for residential (R6A, R6B), light manufacturing (M1-2). The Site is identified as Block 2698, Lot 32 and 10,376 square feet (approximately 0.24 acres) in area.

The Site is bound to the north by a 5-story building (65 Eckford Street, BCP Site No. C224218), to the east by Eckford Street, to the south by a 3-story residential building (68 Engert Avenue) and eight interconnected 5-story residential buildings (49 Engert Avenue), and to the west by 1-story warehouse building (488 Leonard Street) and a parking garage. A topographic map showing the location of the Site is provided as **Figure 1**.

The Site contains a 6-story steel structure for an unfinished building with a partially constructed cellar with an elevator pit and unfinished foundation elements (e.g. spread footing, cellar slab, etc.). Some portions of cellar show bare soil with vegetation, while some portions were partially finished with concrete. The exterior portions (i.e., outside of the building structure) of the Site show bare soil with vegetation or gravel (near the entrance along Eckford Street) and where pre-cast concrete hollow core slabs (i.e. used for floor and roof decks) and metal structural beams are stored. (towards the entrance) is paved with concrete. **Figure 2** shows a Site Plan.

2.2 SITE AND AREA HISTORY

Records from 1887 show the Site as four abutting vacant undeveloped lots. By 1905, the Site is shown as being part of Meisel Danowitz & Co. woodworking operation and contained four 1- to 2-story buildings identified as “moulding shed”, “planning & moulding lumber racks” , “kiln house”, and an office. By 1916, the structures remain but were identified as “vacant and dilapidated”; by 1942 identified as “wool & rags sorting and baling”; and from 1951 until 1992 identified as “electric plating, storage, lacquer spraying”. NYC Department of Finance (DOF) records showed the Site was owned by the Berkman Family. Between 1993 and 2004, the structures remain but the use was unknown. By 2003, the Berkman Family sold the property to Blue Diamond Development, LLC. In August 2005, the NYC Department of Buildings (DOB) issued a demolition, and buildings were later demolished. By 2009, the property was sold to 55 Eckford Street Brooklyn LLC / Madison Realty Capital L.P. Between 2009 and 2015, construction permits were issued by NYCOB for the Site redevelopment into residential apartments. By 2016, a stop work order has been issued for the Site, and construction has been paused since then. According to the previous investigations performed at the Site (see Section 4.0), the Site was entered into the BCP under Site No. C224168 in 2017, with the Applicant, TCJ Construction, deemed a Volunteer, and withdrawn from the program. By the time of the BCP Application in June 2024, the Site contains a 6-story steel structure for an unfinished building and the property is surrounded by a construction fence.

The NYC Department of Finance (DOF) website lists the following ownership records and deed transfers:

Party 1	Party 2	Address	Date of Ownership or Operation
Eckford-Greenpoint LLC	55 Eckford St LLC	100 Jericho Quadrangle, Jericho, NY	04/24/2024 to present
55 Eckford Street Brooklyn LLC	Eckford-Greenpoint LLC	10 Glenville Street, Greenwich CT	12/28/20212 to 02/12/2013
Blue Diamond Development LLC	55 Eckford Street Brooklyn LLC	825 Third Avenue, New York, NY	06/22/2009 to 12/17/2009

Party 1	Party 2	Address	Date of Ownership or Operation
Berkman, Theodore as co-trustees of Arlyne Berkman Revocable Living Trust	Blue Diamond Development LLC	199 Lee St., Suite 287 Brooklyn, NY	09/16/2003 to 03/16/2004
Berkman, Donald	Berkman, Gerald	55 Eckford St., Brooklyn, NY	01/30/2002 to 02/25/2002
Berkman, Arlyne	Berkman, Arlyne Revocable Living Trust	6655 NY 15th St. Margate, FL	10/31/1995 to 12/21/1995
Berkman, Lillie	Berkman, Donald	71 Margaret Drive, Valley Stream, NY	03/04/1994 to 04/15/1994
Berkman, Lillie	Berkman, Donald	71 Margaret Drive, Valley Stream, NY	01/05/1972 to 01/05/1972
Berkman, Lillie	Berkman, Donald	71 Margaret Drive, Valley Stream, NY	12/27/1971 to 12/27/1971

Records from as early as 1887 show the surrounding areas to the north, west and east of the Site as subdivided vacant interspersed with 2- to 3-story dwellings. The property to the south of the Site is shown with several 1-to 2-story story buildings labeled as “Plastering Hair Manufacturing Co.”. By early 1900s until the mid-2000s, the surrounding vicinity saw denser development with multiple 2 to 3-story -story dwellings and several manufacturing and commercial facilities (e.g., cooperage, lumber yards, moving pictures, cab company, garage, printing, furniture manufacturing, etc.). By late 2000s, the manufacturing properties were redeveloped into multi-story residential apartments. By July 16, 2015, the property that abuts the Site to the north (Former Carter Spray Finishing Corp. at 65 Eckford Street), was entered into the BCP under Site No. C224218 with documented contamination in soil related to historical operations and fuel storage in underground tanks.

2.3 PROPOSED REDEVELOPMENT PLAN

The project development will include horizontal extension existing metal structure of 14,400 square feet to 20,000 sq. ft. Project will include 14-16 residential condominium units, which will be built across 5 story building. Condominium development will include recreation space and 6- 8 on-grade parking in the rear. Original plans were approved under R6 zoning, which allowed for taller height requirement and additional square footage. The proposed development plan is to reduce the structure to 5 floors to comply height requirements under R6B (new zoning) and make a wider footprint. The anticipated excavation depth for new extension will be between an estimated 8 to 9 feet. A copy of the proposed redevelopment plan is included in **Appendix A**.

In addition, the proposed redevelopment would entail construction excavation for the new building. The Requestor intends to remediate the Site during the redevelopment under the NYSDEC BCP. Assuming the Requestor’s application to join the BCP is accepted, the process will involve: (i) submission of this draft Remedial Investigation Work Plan (RIWP) to NYSDEC; (ii) a public comment period on the draft RIWP; (iii) a BCP Agreement between the Requestor and NYSDEC; (iv) NYSDEC’s approval of a final RIWP; (v) submission of a draft Community Participation Plan (CPP) and draft Remedial Investigation Report (RIR) and draft Remedial Work Plan (RWP) to NYSDEC; (vi) a public comment period on the draft RIR and draft RWP; (vii) NYSDEC’s approval of the draft CPP, RIR and RWP (vii) NYSDEC’s issuance of a remedy selection decision in a Decision Document; (viii) performance of the Remedial Work (which is expected to occur concurrently with the construction of the Proposed Project (a new residential building); (ix) submission of a Final Engineering Report (FER) and Site Management Plan (SMP) to NYSDEC; and (x) NYSDEC’s issuance of a Certificate of Completion.

3.0 ENVIRONMENTAL AND PHYSIOGRAPHIC SETTING

The following subsections provide information regarding the general physiographic, hydrologic, and soil conditions around the Site.

3.1 REGIONAL PHYSIOGRAPHY

As shown on **Figure 1**, the U.S. Geological Survey topographic map 2023 U.S Geologic Survey (USGS) Brooklyn, NY Quadrangle 7.5-Minute Series Map, the eastern portion of the Site is at an elevation between 15 and 20 feet above mean sea level (amsl) based on North American Vertical Datum of 1988 (NAVD88). The surface topography slopes downward towards the Bushwick Inlet / East River located approximately 0.54 miles northwest of the Site.

3.2 GEOLOGIC, HYDROGEOLOGIC, AND HYDROLOGIC CONDITIONS

Based on our review of the *1776-7 Original High and Low Grounds, Salt Marsh and Shorelines in the City of Brooklyn Map*, the Site lies within the edge of the shoreline (blue) of where the original salt marsh land (green) is located (i.e., the current McCarren Park). Based on our experience in the area, fill used to raise grades is underlain by clayey silts and silty sands.

Source: Map prepared to accompany report to the Board of Health 1875, New York Public Library

Based on *Bedrock Engineering Geologic Maps of New York County and Parts of Kings and Queens Counties, New York, and Parts of Bergen and Hudson Counties, New Jersey, dated 1990,* the bedrock near the Site consists of interbedded units of gray thinly laminated muscovite-biotite-quartz schist, and white to pinkish with light green weathering gneiss. We anticipate bedrock to be encountered at approximately El. -150 feet NAVD88, which is over 100 feet below ground surface (bgs).

Based on available information from investigations performed at the adjacent property to north (65 Eckford Street under BCP Site no. C224218), subsurface conditions generally consist of fill layer(comprised of brown to dark brown, medium to fine silty sand with varying amounts of gravel, asphalt, brick, cinders) that extends to depth of 8 to 9 feet bgs; underlain by a native sand layer consisting of gray to dark gray medium to fine silty sand with varying amounts of coarse sand and clay that extends to depths of approximately 16 to 17 feet bgs; underlain by a native organic clay / peat layer that extends to depths of approximately 20 feet bgs.

Previous investigations performed at the Site (see **Section 4.0**) and from an adjacent property documented variable groundwater elevations and flow directions. During the December 3, 2011 Phase II work, groundwater measurements range from approximately 7 to 13 feet bgs, which showed east southeasterly flow direction. During the February / March 2012 Phase II work, groundwater measurements range from 10.39 to 12.94 feet bgs (corresponding to elevations of 11.29 feet to 11.46), which showed southwesterly flow direction. In addition, the 2022 Supplemental RI from adjacent property to the north (65 Eckford Street, BCP Site No.

C224218), showed that groundwater measurements range from 9 to 10 feet bgs, which showed a west - northwesterly flow direction. The localized direction of groundwater flow near the Site might vary because of underground utilities, subsurface preferential pathways, variations in weather or heterogeneous geological and/or anthropogenic conditions.

4.0 PREVIOUS SITE INVESTIGATIONS

The following subsections document the previous site investigations were reviewed as part of this RIWP. GZA also performed a file review of the Site documents under the NYSDEC Document Repository for BCP Site No. C224168.

4.1 PHASE I ENVIRONMENTAL SITE ASSESSMENT – OCTOBER 2011

In October 2011, Hydro Tech Environmental, Corp. (HTE) of Hauppauge, NY performed a Phase I ESA for 55 Eckford Street Brooklyn LLC (former Owner) and found two Recognized Environmental Conditions (RECs) related to the Site. The first REC is the historical use of the Site as manufacturing facility and the undocumented removal of a 2,500-gallon #2 fuel oil aboveground storage tank (AST).

As a manufacturing facility, the property was known to use chemicals during its operations. The property was listed under NYSDEC Chemical Bulk Storage (CBS) facility no. 2-000058 with documented 500-gallon fiberglass reinforced plastic (FRP) tank that contained sodium hypochlorite. The CBS tank was reportedly closed in 1998.

The property was listed under NYSDEC Petroleum Bulk Storage (PBS) facility no. 2-268666 which identified the 2,500-gallon #2 fuel oil AST as being installed in 1976 and subsequently closed and removed in January 2005. The AST was located in contact with soil within a vault. On March 26, 1993, the property was listed under NYSDEC Spill Case No. 92-14462 for a release due to tank overfilling. The Spill was subsequently closed on March 31, 1993.

4.2 DRAFT PHASE II ENVIRONMENTAL SUBSURFACE INVESTIGATION – DECEMBER 2011

In December 2011, EEA Inc. of Garden City, NY, performed a Phase II Environmental Subsurface Investigation for Madison Realty Capital to address the RECs noted on the previous Phase I ESA. The phase II included the advancement of six (6) soil borings for the collection of soil samples and the installation of four (4) monitoring wells for the collection of groundwater samples.

Based upon visual, olfactory, and photoionization detector (PID) screening analysis, the soils were observed with strong solvent odors, grey staining and elevated PID readings (at max of 1,085 parts per million [ppm]) at or in close proximity to the groundwater interface.

Based upon their analysis of laboratory and field data, the Site soils were contaminated with VOCs and SVOCs and groundwater is contaminated with VOCs. The presence of these VOCs and SVOCs are due to releases from the lacquer spray facility once present on the Site. The Phase II also noted that the following four (4) VOCs detected at levels above guidelines in groundwater are typically used as coating agents or thinners in lacquer applying applications: sec-Butylbenzene, 2-isopropyltoluene, Isopropylbenzene, and tert- Butylbenzene.

Based upon analysis of laboratory and field data, the Site soils and groundwater are contaminated with Metals. These contaminants are due to releases from the former electroplating facility. Furthermore, such metals as mercury and arsenic were listed as past hazardous wastes produced at the Site and were detected above regulatory guidelines in soil and unfiltered groundwater (arsenic also found above guidelines in filtered groundwater).

4.3 PHASE II ENVIRONMENTAL SITE ASSESSMENT – APRIL 2012

In April 2012, HTE performed a Phase II ESA for Madison Realty Capital of New York, NY which included the advancement of nine (9) soil probes and the installation seven (7) monitoring wells and seven (7) soil vapor implants to collect soil, groundwater, and soil vapor samples for laboratory analyses.

The laboratory analytical results reported soil samples containing SVOCs (specifically benzo (a) anthracene [max of 2.25 micrograms per kilogram {ug/kg}], benzo (a) pyrene [max of 1.57 ug/kg], benzo(b)fluoranthene [max of 1.21ug.kg], benzo(k)fluoranthene[max of 1.81 ug/kg] and chrysene [max of 1.30 ug/kg]) and metals (specifically arsenic [max of 273 milligrams per kilogram {mg/kg}], barium [max of 605 mg/kg], cadmium [max of 4.62 mg/kg], trivalent chromium [max of 51.5 mg/kg], copper [max of 1,020 mg/kg], lead [max of 2,980 mg/kg], nickel [max of 1,030 mg/kg], and mercury [max of 27.4 mg/kg]) detected at concentrations that exceeded regulatory standards.

The laboratory analytical results revealed groundwater samples containing VOCs (specifically sec-butylbenzene [at max of 8.82 micrograms per liter {ug/L}] and tert-butylbenzene [max of 6.98 ug/L]) and metals (specifically arsenic [max of 0.564 milligrams per liter {mg/L}], iron [max of 123 mg/L], manganese [max of 0.822 mg/L], silver [max of 0.073 mg/L], and sodium [max of 298 mg/L]) at concentrations that exceeded regulatory standards.

The laboratory analytical results revealed soil vapor samples containing acetone (max of 2,400 micrograms per cubic meter [ug/m^3]), petroleum-related VOCs (specifically benzene [max of 19 ug/m^3], 1,3,5-trimethylbenzene [max of 40 ug/m^3], n-heptane [max of 28 ug/m^3], n-hexane [max of 95 ug/m^3], p & m-xylene [max of 33 ug/m^3], and toluene [max of 39 ug/m^3]) and chlorinated VOCs (specifically 1,1 dichloroethene [max of ug/m^3], cis-1,2 dichloroethene [max of 49 ug/m^3], methylene chloride [max of 33 ug/m^3], PCE [max of 84 ug/m^3] and TCE [max of 1,700 ug/m^3],). The maximum total VOC concentration in soil vapor is 4,344 micrograms per cubic meter [ug/m^3]. At the request of the client, HTE discussed with the NYC Office of Environmental Remediation (NYCOER) the potential to develop the site under the NYC OER Voluntary Cleanup Program (VCP). However, NYCOER indicated that due to the nature of the contamination identified during the Phase II, the development would require coordination with the NYSDEC. According HTE, they were not requested to pursue remedial approaches with the NYSDEC.

4.4 PHASE I ENVIRONMENTAL SITE ASSESSMENT REPORT – JUNE 2013

In June 2013, HTE performed a Phase I ESA for Olden Equities of Brooklyn, NY and identified five RECs in connection with the Site, namely:

- The historic use of the Site as a manufacturing facility;
- The presence of SVOC and metal-impacted soil at the Site;
- The presence of VOC and metal impacted groundwater at the Site;
- The presence of both petroleum and chlorinated solvent-impacted soil vapors at the Site; and
- The undocumented removal of an aboveground fuel oil storage tank.

4.5 PHASE I ENVIRONMENTAL SITE ASSESSMENT REPORT – JULY 2016

In July 2016, HTE performed a Phase I ESA for Madison Realty Capital of New York, NY and identified several RECs in connection with the Site, namely:

- The historic use of the Site as a manufacturing facility;
- The presence of SVOC and metal-impacted soil at the Site;
- The presence of VOC and metal impacted groundwater at the Site;
- The presence of both petroleum and chlorinated solvent-impacted soil vapors at the Site;
- The undocumented removal of an aboveground fuel oil storage tank;
- The presence of NYS BCP Site No. C224218 in the northern adjacent property;
- The presence of a petroleum and chlorinated potential vapor encroachment condition (PVEC) at the Site; and
- The presence of mold at the Site.

4.6 PHASE I ENVIRONMENTAL SITE ASSESSMENT REPORT – OCTOBER 2019

In October 2019, HTE performed a Phase I ESA for Avo Construction of New York, NY and identified several RECs in connection with the Site, namely:

- The historic use of the Site as a manufacturing facility;
- The presence of SVOC and metal-impacted soil at the Site;
- The presence of VOC and metal impacted groundwater at the Site;
- The presence of both petroleum and chlorinated solvent-impacted soil vapors at the Site;
- The undocumented removal of an aboveground fuel oil storage tank;
- The presence of NYS BCP Site No. C224218 in the northern adjacent property;
- The listing of the Site under BCP Site No. C224168.

The October 2019 Phase I ESA noted that the property was entered into the NYS BCP in 2017. The entrant, TCJ Construction Inc. (TCJ), was accepted into the program as a Volunteer.

4.7 PHASE I ENVIRONMENTAL SITE ASSESSMENT REPORT – OCTOBER 2023

In October 2023, Touchstone Environmental Geology, P.C. performed a Phase I ESA for the Requestor, Daniel Kaykov, and identified several RECs and Historical Recognized Environmental Condition (HRECs) in connection with the Site:

- The historic use of the Site as a manufacturing facility;
- The presence of SVOC and metal-impacted soil at the Site;
- The presence of VOC and metal impacted groundwater at the Site;
- The presence of both petroleum and chlorinated solvent-impacted soil vapors at the Site;
- The undocumented removal of an aboveground fuel oil storage tank;
- The presence of NYS BCP Site No. C224218 in the northern adjacent property;
- The listing of the Site under BCP Site No. C224168.

4.8 ADDITIONAL DOCUMENTATION

GZA also performed a file review of the documents at NYSDEC Document Repository under BCP Site No. C224168. The documents reviewed included the aforementioned investigation reports and two additional documents namely:

- <u>Remedial Investigation Work Plan - December 2018</u>

  HTE prepared a Remedial Investigation Work Plan for TCJ in accordance with the requirements of the BCP and proposed the advancement of ten (10) soil borings, installation of six (6) monitoring wells, and eight (8) soil vapor sampling points. No other information on the implementation of the RIWP is available in the NYSDEC Document Repository.

- <u>Brownfield Cleanup Program Application – March 4, 2020</u>

  A BCP Application was filed with the NYSDEC on March 4, 2020, by 55 Eckford Acquisition LLC (former Requestor). The document referenced the Site's environmental history and known contaminants as follows:

3. FOR EACH IMPACTED MEDIUM INDICATED ABOVE, INCLUDE A SITE DRAWING INDICATING:

- **SAMPLE LOCATION**
- **DATE OF SAMPLING EVENT**
- **KEY CONTAMINANTS AND CONCENTRATION DETECTED**
- **FOR SOIL, HIGHLIGHT IF ABOVE REASONABLY ANTICIPATED USE**
- **FOR GROUNDWATER, HIGHLIGHT EXCEEDANCES OF 6NYCRR PART 703.5**
- **FOR SOIL GAS/ SOIL VAPOR/ INDOOR AIR, HIGHLIGHT IF ABOVE MITIGATE LEVELS ON THE NEW YORK STATE DEPARTMENT OF HEALTH MATRIX**

THESE DRAWINGS ARE TO BE REPRESENTATIVE OF ALL DATA BEING RELIED UPON TO MAKE THE CASE THAT THE SITE IS IN NEED OF REMEDIATION UNDER THE BCP. DRAWINGS SHOULD NOT BE BIGGER THAN 11" X 17". THESE DRAWINGS SHOULD BE PREPARED IN ACCORDANCE WITH ANY GUIDANCE PROVIDED.

ARE THE REQUIRED MAPS INCLUDED WITH THE APPLICATION?* ☑ **Yes** ☐ **No**
(*answering No will result in an incomplete application)

4. INDICATE PAST LAND USES (CHECK ALL THAT APPLY):

☐ Coal Gas Manufacturing	☑ Manufacturing	☐ Agricultural Co-op	☐ Dry Cleaner
☐ Salvage Yard	☐ Bulk Plant	☐ Pipeline	☐ Service Station
☐ Landfill	☐ Tannery	☑ Electroplating	☐ Unknown

Other:____

Section III. Property's Environmental History

All applications **must include** an Investigation Report (per ECL 27-1407(1)). The report must be sufficient to establish contamination of environmental media on the site above applicable Standards, Criteria and Guidance (SCGs) based on the reasonably anticipated use of the property.

To the extent that existing information/studies/reports are available to the requestor, please attach the following (***please submit the information requested in this section in electronic format only***):

1. **Reports:** an example of an Investigation Report is a Phase II Environmental Site Assessment report prepared in accordance with the latest American Society for Testing and Materials standard (ASTM E1903). **Please submit a separate electronic copy of each report in Portable Document Format (PDF).**

2. SAMPLING DATA: INDICATE KNOWN CONTAMINANTS AND THE MEDIA WHICH ARE KNOWN TO HAVE BEEN AFFECTED. LABORATORY REPORTS SHOULD BE REFERENCED AND COPIES INCLUDED.

Contaminant Category	Soil	Groundwater	Soil Gas
Petroleum			
Chlorinated Solvents	X		X
Other VOCs			
SVOCs			
Metals	X	X	
Pesticides			
PCBs			
Other*			

The BCP Application also noted the change of ownership for 55 Eckford 1875 DNB LLC to 55 Eckford Acquisition LLC.

The historical soil contamination is shown in **Figure 3A and 3B.** The historical groundwater contamination is shown in **Figure 4.** The historical soil vapor contamination is shown in **Figure 5**.

5.0 REMEDIAL INVESTIGATION

The proposed Remedial Investigation (RI) field program will focus on collecting soil, groundwater, and soil gas data to delineate and characterize the contamination, and historic fill materials underlying the property. The scope of the RI will include the collection of sufficient Site investigation data so that the Site will be sufficiently characterized to support the development of the Site-wide Remedial Action Work Plan (RAWP).

To accomplish this, the scope of work for the RI will include the following:

- The advancement of soil borings, collection of soil samples, installation of permanent groundwater monitoring wells, collection of groundwater samples from new monitoring wells, installation of soil vapor points, and sampling of new soil vapor points;
- The collection of soil, groundwater, and soil vapor sufficient to define the nature and extent of impacted media and current Site conditions and offsite groundwater and/or soil vapor migration potential;
- The collection of a synoptic round of groundwater level measurements and the collection of additional land survey data as needed for developing a groundwater elevation contour map; and
- The performance of a qualitative human health exposure assessment (QHHEA) to identify existing and potential exposure pathways and evaluate contaminant fate and transport.

The proposed scope of work includes:

<u>Soil</u>

- Advancement of ten (10) soil borings to a maximum depth of 20 feet bgs. Seven (7) of the borings will be located at the exterior portion of the partially constructed building structure. Three (3) of the borings will be located within the cellar of the partially constructed building structure.
- Collection and laboratory analyses of up to six (6) soil samples from the exterior borings for a total of 42 samples, and up to three (3) samples from the interior borings for a total of 9 samples. All together 51 soil samples will be collected for laboratory analyses.

<u>Groundwater</u>

- Advancement of six (6) soil borings down to a maximum depth of 20 feet bgs that will be converted to permanent stick-up monitoring wells.
- Gauging and development of the permanent monitoring wells.
- Collection and laboratory analyses of six groundwater samples.

<u>Soil Gas</u>

- Advancement of eight (8) soil vapor points down to just 2 feet above the groundwater interface. If groundwater is deeper than 10 ft bgs, probes will be installed to 8 ft bgs (equivalent to cellar depth).
- Collection and laboratory analyses of eight soil vapor samples.

<u>Outdoor Air</u>

- Collection and laboratory analyses of two outdoor ambient air samples.

The sample summary and rationale are provided in **Table 1**. The proposed sample locations are shown on **Figure 6**. The following sections describe the methods, rationale, and proposed sampling schedule for the soil investigation activities summarized above. Sampling will be performed in accordance with the QAPP/FSP presented in **Appendix B**.

The remedial investigation will be conducted in accordance with the applicable requirements of the DER-10. The data will be produced in accordance with the New York State Department of Health (NYSDOH) Analytical Services Protocol (ASP) Category B deliverables and will be reviewed and validated by an independent data validator. The data validator will prepare a Data Usability Summary Report (DUSR) before data is incorporated into the RIR for the Site. The data will be submitted to NYSDEC in electronic format, in accordance with DER-10.

Real-time air monitoring for VOCs and particulate levels at the perimeter of the exclusion zone or work area will be performed in accordance with the health and safety protocols outlined in **Section 7.0**. Description of activities will be reported daily to NYSDEC and NYSDOH as outlined in **Section 8.0**.

5.1 SOIL INVESTIGATION

Soil Boring Installation

As shown on **Figure 6**, GZA proposes to advance 10 soil borings across the property. Seven (7) of the borings will be located outside of the footprint of the partially constructed building (i.e., identified as Exterior Borings GZ-01 to GZ-07) while three (3) of the borings will be located within the footprint of the partially constructed cellar (i.e., identified as Cellar Borings GZ-8 to GZ-10). The soil borings will be located with a GPS unit. GZA will subcontract with a drilling company to advance the soil borings using a direct-push technology (DPT) track-mounted rig to advance the Exterior Borings to a maximum depth of 20 feet bgs and the Cellar Borings to a maximum depth of 10 feet below the cellar slab (bcs). The drill rig will be equipped with a 2-inch inside diameter MacroCore® soil sampling unit with an acetate liner sleeve. If refusal is encountered in a soil boring due to subsurface obstructions (e.g., boulders, construction, and fill debris) above the target depth, the drillers will attempt up to two off-set locations for each boring location. An example soil boring log is included in **Appendix C**.

Soil Sample Collection

The borings will be performed under field observation of a GZA engineer or geologist. Soil samples will be obtained with a 5-foot steel MacroCore™ sampler using disposable acetate liners. We will collect soil samples continuously from grade to the target depth and observe/document the soil samples for staining and soil characteristics. We will screen the soil samples for total organic vapors with a hand-held, photoionization detector (PID) with 11.7 eV bulb (e.g. ppbRae 3000 or equivalent) and record lithological descriptions of the soil and field screening results on the soil boring logs. GZA's visual inspection will also document for evidence of contamination including staining and/or odors.

The GZA field representative will retain selected samples for laboratory analyses from the soil samples that indicate the comparatively highest impacts based on visual, olfactory, and PID screening results, and/or based on our evaluation of relevant Site features and conditions.

Discrete samples will be collected with an EnCore® sampler (or similar) in compliance with EPA Method 5035 from the 6-inch interval with the highest visual, olfactory and PID evidence of environmental impacts. Based on the NYSDEC and NYSDOH recommendation soil samples will be collected as follows:

- For the Exterior Borings (GZ-01 to GZ-07) that will be advanced to a maximum of 20 feet bgs, six(6) sample sets will be collected from each boring (for a total of 42 samples) and will be analyzed as follows:

Sample	Sample Depth	Laboratory analyses
○ A	○ 0-2 inches bgs (Surface soil)	○ Target compound list (TCL) VOCs by EPA Method 8260 (discrete) with TICs; ○ TCL SVOC by EPA Method 8270 with TICs, including 1,4 Dioxane; ○ Target analyte list (TAL) Metals by EPA Method 6010C / 7471B, including hexavalent chromium and total cyanide;
○ B	○ 0-2 feet bgs	○ TCL VOCs by EPA Method 8260 (discrete) with TICs; ○ TCL SVOC by EPA Method 8270 with TICs, including 1,4 Dioxane; ○ TAL Metals by EPA Method 6010C / 7471B, including hexavalent chromium and total cyanide; ○ TCL Pesticides by EPA Method 8081/ Herbicides by EPA Method 8151; ○ PCBs by EPA Method 8082A; and ○ Per- and Polyfluoroalkyl Substances (PFAS) by EPA Method 1633.
○ C	○ 4-6 feet bgs (or the mid-point between 2 feet bgs and the water table)	○ TCL VOCs by EPA Method 8260 (discrete) with TICs; ○ TCL SVOC by EPA Method 8270 with TICs, including 1,4 Dioxane; ○ TAL Metals by EPA Method 6010C / 7471B, including hexavalent chromium and total cyanide; ○ PFAS by EPA Method 1633.
○ D	○ 8-10 feet bgs (or just above the water table)	○ TCL VOCs by EPA Method 8260 (discrete) with TICs; ○ TCL SVOC by EPA Method 8270 with TICs, including 1,4 Dioxane; ○ TAL Metals by EPA Method 6010C / 7471B, including hexavalent chromium and total cyanide; ○ TCL Pesticides by EPA Method 8081/ Herbicides by EPA Method 8151; ○ PCBs by EPA Method 8082A; and ○ Per- and Polyfluoroalkyl Substances (PFAS) by EPA Method 1633.
○ E	○ 12-14 feet bgs (or the mid-point between the water table and the native clay layer)	○ TCL VOCs by EPA Method 8260 (discrete) with TICs; ○ TCL SVOC by EPA Method 8270 with TICs, including 1,4 Dioxane; ○ TAL Metals by EPA Method 6010C / 7471B, including hexavalent chromium and total cyanide;
○ F	○ 18-20 feet bgs (or native clay layer)	○ TCL VOCs by EPA Method 8260 (discrete) with TICs; ○ TCL SVOC by EPA Method 8270 with TICs, including 1,4 Dioxane; ○ TAL Metals by EPA Method 6010C / 7471B, including hexavalent chromium and total cyanide;

- For the Cellar Borings (GZ-08 to GZ-10) that will be advanced to a maximum of 10 feet below the cellar slab (bcs), three (3) sample sets (for a total of 9 samples) will be collected from each boring and will be analyzed as follows:

Sample	Sample Depth	Laboratory analyses
○ A	○ 0-2 feet bcs (or just above the water table)	○ TCL VOCs by EPA Method 8260 (discrete) with TICs; ○ TCL SVOC by EPA Method 8270 with TICs, including 1,4 Dioxane; ○ TAL Metals by EPA Method 6010C / 7471B, including hexavalent chromium and total cyanide; ○ TCL Pesticides by EPA Method 8081/ Herbicides by EPA Method 8151; ○ PCBs by EPA Method 8082A; and ○ Per- and Polyfluoroalkyl Substances (PFAS) by EPA Method 1633.
○ B	○ 4-6 feet bcs (or the mid-point between the water table and the native clay layer)	○ TCL VOCs by EPA Method 8260 (discrete) with TICs; ○ TCL SVOC by EPA Method 8270 with TICs, including 1,4 Dioxane; ○ TAL Metals by EPA Method 6010C / 7471B, including hexavalent chromium and total cyanide;
○ C	○ 8-10 feet bcs (or native clay layer)	○ TCL VOCs by EPA Method 8260 (discrete) with TICs; ○ TCL SVOC by EPA Method 8270 with TICs, including 1,4 Dioxane; ○ TAL Metals by EPA Method 6010C / 7471B, including hexavalent chromium and total cyanide;

Each sample set will be labeled, sealed, and placed in a cooler for shipment under standard chain-of-custody protocol to a NYSDOH Environmental Laboratory Approval Program (ELAP)-laboratory.

5.2 GROUNDWATER INVESTIGATION

Monitoring Well Installation

As shown on **Figure 6**, six soil borings will be converted into new permanent monitoring wells (designated GMW-01 through GMW-06). The permanent monitoring wells will be comprised of two-inch diameter PVC that will be installed to a maximum depth of approximately 20 feet bgs. Each well will consist of a 2-inch diameter PVC riser and at least 10 feet long of 0.02-inch slotted 2-inch diameter PVC screen with the screened interval designed to span across the water table to detect petroleum sheens or light non-aqueous phase liquids (LNAPL). A 2-foot bentonite plug will be placed above the filter pack. The remaining annular space will be filled with bentonite. The six wells will be completed with permanent stick-up and locking cap. An example of a monitoring well construction log is provided in **Appendix C**. The monitoring wells will be developed (i.e., the wells will be allowed to equilibrate for seven days prior to sampling) in accordance with applicable methods outlined in the QAPP/FSP presented in **Appendix B**.

Groundwater Sampling

Groundwater samples will be collected from the monitoring wells by peristaltic pump and with dedicated high-density polyethylene (HDPE) tubing. Prior to sample collection, groundwater will be purged from each well point with the pump intake placed at the approximate midpoint of the screened interval. At the ground surface, the water will pass through a sealed flow through cell containing probes which will measure the water temperature, pH, specific conductivity, turbidity, oxidation-reduction potential (ORP), and dissolved oxygen (DO). Samples will be collected via USEPA low-flow methodology. One groundwater sample will be collected after the water quality parameters have stabilized. Stabilization is defined by three successive readings that are within ± 0.1 for pH, ± 3% for conductivity, ± 10 mv for ORP, and ± 10% for DO. Purging will continue until stabilization is met and turbidity is <10 NTU. If turbidity < 10 NTU cannot be reasonably achieved, samples can be collected when turbidity is < 50 NTU. An example well purge log is provided in **Appendix C**.

The groundwater samples will be analyzed for the following parameters:

- TCL VOCs by EPA Method 8260 with TICs;
- TCL SVOC by EPA Method 8270 SIM with TICs including 1-4 Dioxane;
- Total and dissolved TAL Metals by EPA Method 6010C / 7471B, including hexavalent chromium and total cyanide;
- Pesticides by EPA Method 8081/ PCBs by EPA Method 8082A / Herbicides by EPA method 8151; and
- PFAS by EPA Method 1633

Samples for dissolved metals will be collected in unpreserved containers and will be filtered and preserved at the laboratory within 24 hours of sampling. One trip blank sample will accompany the groundwater sample (at a frequency of one per day of sampling with a sample submitted to the laboratory for TCL VOC analysis) and will be analyzed for TCL VOCs.

5.3 SOIL VAPOR AND OUTDOOR AIR INVESTIGATION

As shown on **Figure 6**, GZA proposes to install eight soil vapor probes (designated as GSV-1 to GSV-8) down to approximately 2 feet just above the groundwater interface (i.e., if groundwater is deeper than 10 ft bgs, probes will be installed to 8 ft bgs [equivalent to cellar depth]). GZA will collect each of the soil vapor samples using methods consistent with the NYSDOH Guidance for Evaluating Soil Vapor Intrusion, dated October 2006 (as amended). Soil vapor samples will be collected using a stainless-steel probe, consisting of a drive point and internal perforated sampling port with a retractable tip, connected to HDPE sampling tubing. GZA proposes to collect soil vapor samples in 6-liter Summa® canisters equipped with 2-hour flow regulators. The soil vapor samples will be submitted to a NYSDOH ELAP-accredited laboratory. The soil vapor samples will be submitted for Target Compound List (TCL) VOCs analysis via EPA Method TO-15. The analytical results will be compared to 8-hour exposure standards and NYSDOH-specified guidance values. Following soil vapor sample collection, the soil vapor sampling point materials will be removed from the ground. An example soil vapor sampling log is included in **Appendix C**.

GZA will also collect two outdoor ambient air samples to evaluate upwind and downwind vapor conditions. GZA will collect ambient samples in 6-liter Summa® canisters equipped with 2-hour flow regulators. The ambient air samples will be submitted to a NYSDOH ELAP-accredited laboratory for TCL VOC analysis via EPA Method TO-15.

5.4 QUALITY ASSURANCE /QUALITY CONTROL

As part of the field investigation, GZA will also collect Quality Assurance/Quality Control (QA/QC) samples in accordance with the QAPP, presented in **Appendix B**, to confirm the usability of the data. QA/QC samples include equipment rinsate/field blanks, trip blanks, sample duplicates and matrix spike/matrix spike duplicates (MS/MSDs).

When applicable, the sample result summary tables will list the laboratory method detection limit (MDL) at which a compound was non-detectable. The laboratory results will be reported to the sample-specific practical quantitation limit (PQL), equal to the sample-specific MDL, supported by the instrument calibrations. The reliability of laboratory data is supported by compliance with sample holding times and laboratory MDLs below cleanup criteria. Accuracy and precision of the laboratory analytical methods will be maintained by the use of calibration and calibration verification procedures, laboratory control samples, and surrogate, matrix, and analytical spikes.

5.5 DATA MANAGEMENT AND VALIDATION

GZA will coordinate with the laboratory to prepare the laboratory analytical reports in accordance with NYSDEC ASP Category B data deliverables, which include:

- Sample Delivery Group Narrative;
- Contract Lab Sample Information sheets;
- NYSDEC Data Package Summary Forms;
- Chain-of-custody forms; and,
- Test analyses results (including TICs for analysis of VOCs and SVOCs).

Plus, related QA/QC information and documentation consisting of:

- Calibration standards;
- Surrogate recoveries;
- Blank results;
- Spike recoveries
- Duplicate results;
- Confirmation (lab check/QC) samples;
- Internal standard area and retention time summary;
- Chromatograms;
- Raw data files; and

- Other specific information as described in the most current NYSDEC ASP

GZA will coordinate with the laboratory to prepare the results in Electronic Data Deliverables (EDDs) format compatible with EQuIS that can be uploaded into an EQuIS database for storage and development of tables or output to other data analysis tools and GIS as needed. GZA will have a data validate evaluate the data package for inclusion into a DUSR that will subsequently be prepared to document the usability of the data. Additional details regarding QA/QC and data management and validation are included in **Appendix B – QAPP/FSP**.

5.6 CHAIN OF CUSTODY AND SHIPPING

A chain-of-custody form will trace the path of sample containers from the Site to the laboratory. The project manager will notify the laboratory of upcoming field sampling events and the subsequent transfer of samples. This notification will include information concerning the number and type of samples, and the anticipated date of arrival. Insulated sample shipping containers (typically coolers) will be provided by the laboratory for shipping samples. All sample bottles within each shipping container will be individually labeled with an adhesive identification label provided by the laboratory. Project personnel receiving the sample containers from the laboratory will check each cooler for the condition and integrity of the bottles prior to field work.

The field sampler will indicate the sample designation/location number in the space provided on the chain-of-custody form for each sample. The chain of custody forms will be signed and placed in a sealed plastic Ziploc bag in the cooler. If sent via third party carrier, the shipping container will be closed for transport with nylon strapping, or a similar shipping tape, and a paper custody seals will be affixed to the lid. The seals must be broken to open the cooler and will indicate tampering if the seals are broken before receipt at the laboratory. A label may be affixed identifying the cooler as containing "Environmental Samples" and the cooler will be shipped via courier or by an overnight delivery service to the laboratory. When the laboratory receives the coolers, the custody seals will be checked, and lab personnel will sign the chain-of-custody form.

The following typical Chain-Of-Custody procedures will be implemented by GZA during the soil sampling:

A. The samples are under custody of the GZA field personnel, if:
    1. they are in his/her possession,
    2. they are in view after being in possession,
    3. they are locked up or sealed securely to prevent tampering, or
    4. they are in a designated secure area.

B. The original of the chain-of-custody form must accompany the samples at all times after collection, until receipt at the analytical laboratory. A copy of the chain-of-custody form will be kept by the sample collector until it is filed in the project file.

C. When the possession of samples is transferred, the individuals relinquishing and receiving the samples will sign, date, and note the time on the Chain-Of-Custody form.

D. When samples are shipped, the GZA personnel, or designated representative, will note the courier's name, and air bill number, if applicable, on the Chain-Of-Custody form. Prior to shipping, coolers will be secured with signed custody seals so the laboratory may confirm coolers were not opened during shipping.

The chain-of-custody form will contain information to distinguish each sample from any other sample. This information will include:

A. The project name and address for which sampling is being conducted;
B. The name(s) and signature(s) of sampler(s);

C. The matrix being sampled (groundwater, soil, etc.);
D. The sampling date and time;
E. The specific sampling location in sufficient detail to allow re-sampling at the same location;
F. The number of containers and the volume of sample collected, and
G. The analytical method to be performed.

5.7 STORAGE AND DISPOSAL OF INVESTIGATION-DERIVED WASTE

Investigation derived waste (IDW) generated during the RI will be containerized and properly characterized and disposed of. Containers, which are USDOT approved storage containers (55-gallon drums) or a small bulk roll-off container, will be properly labeled and grouped by environmental matrix (soil, water, PPE/plastic, etc.). All drums or roll-offs will be staged in a central location on-Site prior to off-Site disposal.

If drums are used, they will be tracked as they are filled and given unique identification codes based on the following:

- A prefix indicating the drum's contents: i.e., S – Soil, W – Water, P – PPE/Plastic, and C&D – Construction Debris.
- Following the prefix and a hyphen will be the origin of the drum's contents. For example, drum SB-1, SB-2, SB-3 is a generated drum filled with soil from soil boring locations SB-1, SB-2 and SB-3; drum MW-1 is water generated from monitoring well MW-1.
- As drums are generated, their identification code, date of generation, contents, source (i.e., drill cuttings from location x, purge water from well y), and date sampled will be entered on a tracking table.

The drums (or roll-off container) will be centrally stored on-Site. Subsequently, the waste soils and/or water will be characterized with laboratory analyses for proper disposal.

6.0 QUALITATIVE HUMAN HEALTH EXPOSURE ASSESSMENT

A QHHEA will be performed following the collection of all RI data. The Exposure Assessment (EA) will be performed in accordance with Section 3.3(c)4 of DER-10 and the NYSDOH guidance for performing a qualitative EA (DER-10; Appendix 3B). The QHHEA will characterize the exposure setting, identify potentially complete exposure pathways, and qualitatively evaluate potential fate and transport of constituents from one medium to another (i.e., soil-to-air or soil-to-groundwater).

An exposure pathway is considered complete when the following five conditions are met:

1. Source identified (i.e., metals in paint on exterior building surfaces);
2. Release and transport mechanism from source to environmental media (i.e., into the subsurface or volatilization to the air of an overlying building);
3. Point of human exposure (i.e., an occupied building or surface soil);
4. A route of exposure (ingestion, dermal contact, or inhalation), and
5. A receptor population (i.e., on-site workers).

Once potentially complete exposure pathways are identified, the QHHEA will characterize Site conditions to determine whether the Site poses an existing or potential future hazard to the potentially exposed population.

The evaluation will include a qualitative discussion of potential fate and transport mechanisms at the Site. The results of the QHHEA will be included as part of the RIR.

According to Section 3.10 of DER-10, and the Fish and Wildlife Resources Impact Analysis Decision Key in DER-10 Appendix 3C, a Fish and Wildlife exposure assessment will be performed (if needed) based on the results of the RI.

7.0 HEALTH AND SAFETY

The work outlined above will be completed under a GZA site-specific Health and Safety Plan (HASP)**,** attached as **Appendix D** in accordance with OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) regulations. A photoionization detector (PID) with 11.7 eV lamp (e.g. ppbRAE 3000 or equivalent) will be used to monitor the breathing zone of workers performing investigative activities in areas where there is a potential for the presence of organic vapors (i.e., groundwater and soil vapor sampling). A dust meter will also be used to screen for dust in the breathing zone that has the potential presence of metal contamination. GZA anticipates the work will be completed in Modified Level D personal protective equipment (PPE); however, workers will be prepared to elevate to more protective PPE based on the conditions encountered during field activities.

7.1 PROJECT KICKOFF AND UTILITY CLEARANCE

A project kick-off meeting will be held prior to initiating field work to orient field team members and subcontractors with the Site background, scope of work, potential hazards, health and safety requirements, emergency contingencies and other field procedures.

Prior to performing any subsurface work, a utility clearance survey will be performed in accordance with New York State Dig-Safe protocol. Sample locations will be screened using surface geophysical techniques such as electromagnetic (EM), ground penetrating radar (GPR) and/or radiofrequency (RF) techniques.

7.2 COMMUNITY AIR MONITORING PLAN (CAMP)

Real-time air monitoring for VOCs and particulate levels at the perimeter of the exclusion zone or work area will be performed in accordance with the CAMP (see **Appendix E**).

Continuous air monitoring will be required during ground intrusive activities and other activities where equipment is disturbing the ground surface. Ground intrusive activities include, but are not limited to, soil/fill excavation and handling, test pitting or trenching, grading of existing Site soils and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. Periodic monitoring during sample collection would generally consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well bailing/purging, and taking a reading prior to leaving a sample location.

VOC Monitoring, Response Levels, and Actions

VOCs will be monitored at the Site perimeter on a continuous basis during earthwork activities unless otherwise specified in the CAMP. Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The VOC monitoring work will be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment will be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment will be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities will be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities will resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities will be halted, the source of vapors will be identified, corrective actions will be taken to abate emissions, and monitoring will be continued. After these steps, work activities will resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet - is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities will be shut down until the source of the problem is identified and corrective action is taken to reduce organic vapor levels.

4. Fifteen-minute readings will be recorded and be available for State (NYSDEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes will also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations will be monitored at the Site perimeter and in work zones on a continuous basis during earthwork. The particulate monitoring will be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment will be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration will be visually assessed during all work activities. Visible dust from the work area will trigger the initiation of dust suppression procedures. Dust suppression equipment will be on Site, functional and available at the work zone prior to commencing work.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work will continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m3 above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m3 above the upwind level, work will be stopped, and a re-evaluation of activities initiated. Work will resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m3 of the upwind level and in preventing visible dust migration.

3. Readings will be recorded and be available for State (NYSDEC and NYSDOH) and County Health personnel to review.

8.0 REPORTING

Daily Field Reporting

Daily reports providing a general summary of activities for each day of active RI work will be emailed to the NYSDEC Project Manager by end of the following day. The daily reports will include:

- Project number and statement of the activities and an update of progress made, and locations of work performed;
- A summary of all citizen complaints, with relevant details (basis of complaint; actions taken; etc.);
- Emergencies related to the Site, if any;
- A summary of CAMP data, noting any action level exceedances, corrective actions taken; and,
- Photograph of notable Site conditions and activities.

Daily email reports are not intended to be the primary mode of communication for notification to NYSDEC of emergencies (accidents, spills), requests for changes to the RIWP or other sensitive or time critical information. However, such information will be included in the daily reports. Emergency conditions and changes to the RIWP will be communicated directly to the NYSDEC project manager by personal communication.

Remedial Investigation Report

Upon completion of the field activities, a Remedial Investigation Report (RIR) will be prepared to document the findings of the investigations performed at the Site and the proposed remedy. The RIR will be consistent with the specifications presented in the DER-10 document and will include:

- An executive summary;
- A site description and history;
- Summary information regarding previous investigations and remedial work performed at the Site;
- Descriptions of field activities performed;
- A summary of pertinent field observations, field measurements, and laboratory analytical data summarized in tabular format - analytical results will be compared to appropriate NYSDEC guidance and standards;
- Spider figures summarizing the laboratory analytical results and showing comparison to applicable NYSDEC guidance and standards;
- Plan view and cross-section figures presenting laboratory analytical data and field observations of surface and subsurface soil and groundwater impacts. A minimum of two profiles will be developed, one perpendicular to and one parallel with groundwater flow direction at the Site;
- A qualitative human health risk assessment which assesses the sources of impact, on and off-site human and ecological receptors, and exposure pathways;
- A data usability review and DUSRs for the laboratory data collected during the RI;

- An integration of field observations and measurements with laboratory analytical data to evaluate the nature and extent of impacts and to develop a site conceptual model of potential contaminant migration;
- A set of conclusions for the investigation; and
- Recommendations

Data collected during the RI will be submitted in the Department's Environmental Information Management System (EIMS) format for Electronic Data Delivery (EDD).

9.0 PROJECT SCHEDULE AND PROJECT PERSONNEL

Our anticipated schedule to perform the investigation activities described in this work plan is summarized below:

Description	Anticipated RI Schedule
Submission of BCP Application and RIWP to NYSDEC	2nd week of June 2024
Letter of Complete BCP Application	July 2024
RIWP Submittal and Comment Period	August 2024 to October 2024
Revised RIWP Submittal and Approval	November 2024
Performance of the RI	November 2024 to December 2024
Complete RIR and submit to NYSDEC	December 2024 to January 2025

For a full summary of the anticipated BCP Project Milestones refer to the schedule provided in **Appendix F**. We note that the proposed schedule may be adjusted if unforeseen delays occur due to inclement weather, Department of Transportation (DOT) permit approval (e.g. NYC holiday embargo), drill rig availability or other conditions that are beyond GZA's control.

The following GZA project personnel are proposed to be involved as part of the remedial investigation activities. Qualifications of personnel are provided in **Appendix G**. Drilling and laboratory subcontractors have not yet been retained.

Personnel	Role	Contact Information
Stephen M. Kline, P.E.	Consultant Reviewer	347-242-7109
Victoria D. Whelan, P.G.	Qualified Environmental Professional / Vice President	631-793-8821
Reinbill P. Maniquez	Senior Project Manager	347-443-1059
Jackson Bogach	Assistant Project Manager	332-215-6349
Mark Frey	Field Geologist	347-213-8324

Tables

Sample Name	Location	Sample / Boring Termination Depth (feet below ground level and cellar level)	Approximate Number of Samples	Rationale for Sampling	Laboratory Analysis
Soil					**Analyses**
GZ-01	Approximately 20 feet east and 10 feet south of the northwest property corner	20	5	To characterize soil conditions and delineate extent and depths of contamination outside of the existing structure	GZ-01(0-2 in) - Focused; GZ-01 (0-2 ft bgs) - Full suite; GZ-01 (4-6ft bgs) -Focused +PFAS; GZ-01 (8-10 ft bgs) - Full suite; GZ-01 (12-14 ft bgs) - Focused; and GZ-01 (18-20 ft bgs) - Focused
GZ-02	Approximately 35 feet south and 3 feet east of the northwest property corner	20	5		GZ-02(0-2 in) - Focused; GZ-02 (0-2 ft bgs) - Full suite; GZ-02 (4-6ft bgs) -Focused +PFAS; GZ-02 (8-10 ft bgs) - Full suite; GZ-02 (12-14 ft bgs) - Focused; and GZ-02 (18-20 ft bgs) - Focused
GZ-03	Approximately 18.5 feet east and 18.5 feet north from the southwest property corner	20	5		GZ-03(0-2 in) - Focused; GZ-03 (0-2 ft bgs) - Full suite; GZ-03(4-6ft bgs) -Focused +PFAS;GZ-03 (8-10 ft bgs) - Full suite; GZ-03 (12-14 ft bgs) - Focused; and GZ-03 (18-20 ft bgs) - Focused
GZ-04	Approximately 65 feet east and 5 feet north from the southwest property corner	20	5		GZ-04(0-2 in) - Focused; GZ-04 (0-2 ft bgs) - Full suite; GZ-04 (4-6ft bgs) -Focused +PFAS; GZ-04 (8-10 ft bgs) - Full suite; GZ-04 (12-14 ft bgs) - Focused; and GZ-04 (18-20 ft bgs) - Focused
GZ-05	Approximately 60 feet south and 12 feet west from the northeast property corner	20	5		GZ-05(0-2 in) - Focused; GZ-05 (0-2 ft bgs) - Full suite; GZ-05 (4-6ft bgs) -Focused +PFAS; GZ-05 (8-10 ft bgs) - Full suite; GZ-05 (12-14 ft bgs) - Focused; and GZ-05 (18-20 ft bgs) - Focused
GZ-06	Approximately 17 feet south and 17 feet west of the northeast property corner	20	5		GZ-06(0-2 in) - Focused; GZ-06 (0-2 ft bgs) - Full suite; GZ-06 (4-6ft bgs) -Focused +PFAS; GZ-06 (8-10 ft bgs) - Full suite; GZ-06 (12-14 ft bgs) - Focused; and GZ-06 (18-20 ft bgs) - Focused
GZ-07	Approximately 16.5 feet south and 40 feet west of the northeast property corner	20	5		GZ-07(0-2 in) - Focused; GZ-07 (0-2 ft bgs) - Full suite; GZ-07 (4-6ft bgs) -Focused +PFAS; GZ-07 (12-14 ft bgs) - Focused; and GZ-07 (18-20 ft bgs) - Focused
GZ-08	Approximately 30 feet south and 25 feet east of the northwest property corner	10	3	To characterize soil conditions and delineate extent and depths of contamination below existing cellar and structure.	GZ-08 (0-2 ft bcs) - Full Suite ; GZ-08 (4-6ft bcs) -Focused; and GZ-08 (8-10 ft bcs) - Focused
GZ-09	Approximately 43 feet west and 45 feet south of the northeast property corner	10	3		GZ-09 (0-2 ft bcs) - Full Suite ; GZ-09 (4-6ft bcs) -Focused; and GZ-09 (8-10 ft bcs) - Focused
GZ-10	Approximately 11 feet north and 20 feet west of the southeast property corner	10	3		GZ-10 (0-2 ft bcs) - Full Suite ; GZ-10 (4-6ft bcs) -Focused; and GZ-10 (8-10 ft bcs) - Focused

Soil Analysis Description

Full Suite : TCL VOCs + TICs, including 1-4 Dioxane (EPA Method SW 846 8260, isotope dilution for 1-4 Dioxane), TCL SVOCs + TICs (EPA Method 8270), TAL metals (EPA Methods SW 846 6010/6020/7470) + cyanide (EPA Method SW 846 9010/9012) and hexavalent chromium, pesticides/herbicides/PCBs (EPA Methods SW 846 8081/8151/8082), Per- and polyfluoroalkyl substances (EPA Method 1633)

Focused : TCL VOCs + TICs, including 1-4 Dioxane (EPA Method SW 846 8260, isotope dilution for 1-4 Dioxane), TCL SVOCs + TICs (EPA Method 8270), TAL metals (EPA Methods SW 846 6010/6020/7470) + cyanide (EPA Method SW 846 9010/9012) and hexavalent chromium

Notes:
ft bgs = feet below ground surface
ft bcs = feet below cellar slab
TCL = Target Compound List
TAL = Target Analyte List
VOCs + TICs = volatile organic compounds plus tentatively identified compounds
SVOCs + TICs = semi-volatile organic compounds plus tentatively identified compounds
PCBs = polychlorinated biphenyls
PFAS = per and polyfluoroalkyl substances

Table1 - Sample Summary and Rationale

Remedial Investigation Work Plan
55 Eckford Street
Brooklyn, New York

Sample Name	Location	Sample / Boring Termination Depth	Approximate Number of Samples	Rationale for Sampling	Laboratory Analysis
Soil Vapor					**Analysis**
GSV-01	Approximately 5.5 feet south and 25 feet east of northwest property corner	2 feet above water table	1	To characterize the soil vapor and delineate the extent of impacts	EPA Method TO-15 for VOCs
GSV-02	Approximately 35 feet south and 3 feet east of the northwest property corner	2 feet above water table	1		
GSV-03	Approximately 20 feet north and 25 feet east of southwest property corner	2 feet above water table	1		
GSV-04	Approximately 5 feet north and 65 feet east of southwest property corner	2 feet above water table	1		
GSV-05	Approximately 10 feet west and 58 feet south of northeast property corner	2 feet above water table	1		
GSV-06	Approximately 20 feet west and 5 feet south of northeast property corner	2 feet above water table	1		
GSV-07	Approximately 38 feet east and 48 feet north of southwest property corner	2 feet above water table	1		
GSV-08	Approximately 26 feet north and 67 feet east of southwest property corner	2 feet above water table	1		
Ambient Air/Indoor Air					**Analysis**
OA-01	Approximately 68 feet east and 50 feet north of southwest property corner	3 feet above ground surface	1	To characterize the concentration of VOCs in ambient air and analyze vapor intrusion of the existing cellar	EPA Method TO-15 for VOCs
OA-02	Approximately 8 feet east and 45 feet north of southwest property corner	3 feet above ground surface	1		

Sample Name	Location	Sample / Boring Termination Depth (feet below ground surface)	Approximate Number of Samples	Rationale for Sampling	Laboratory Analysis
Groundwater - Permanent Wells					**Analyses**
GMW-01	Approximately 20 feet east and 10 feet south of the northwest property corner	20	1	To characterize the groundwater conditions at the Site	Full Suite
GMW-02	Approximately 40 feet north and 6 feet west of the southeast property corner	20	1		Full Suite
GMW-03	Approximately 18.5 feet east and 18.5 feet north from the southwest property corner	20	1		Full Suite
GMW-04	Approximately 65 feet east and 5 feet north from the southwest property corner	20	1		Full Suite
GMW-05	Approximately 60 feet south and 12 feet west from the northeast property corner	20	1		Full Suite
GMW-06	Approximately 17 feet south and 17 feet west of the northeast property corner	20	1		Full Suite

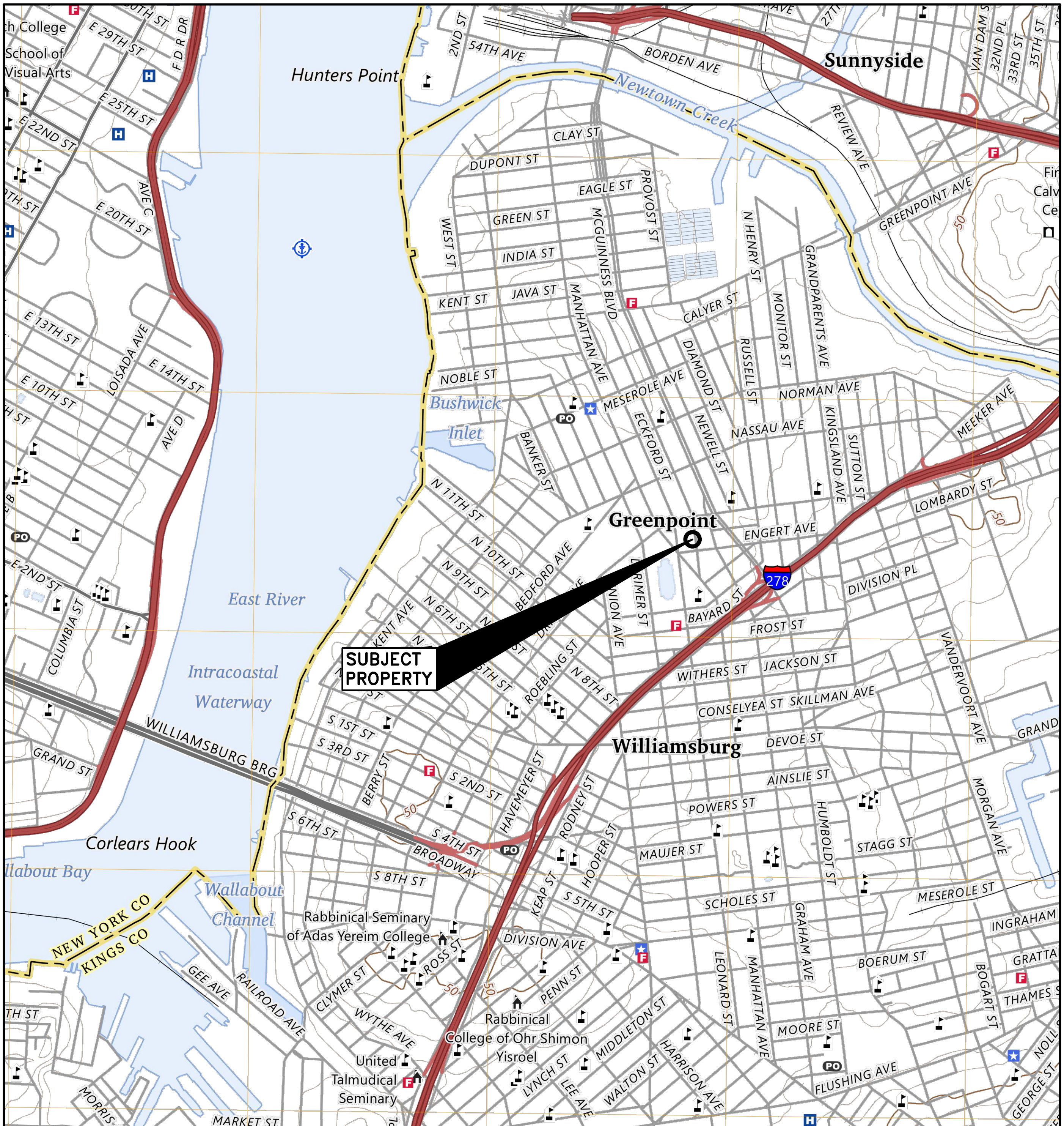
Notes:

Based on the Previous Phase II Reports, the water table is anticipated to be between 7 to 13 feet below ground surface, or 10 to 13 feet below ground surface.

Groundwater Analysis Description

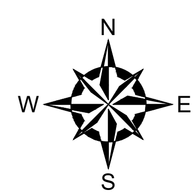
Full Suite: TCL VOCs + TICs, including 1-4 Dioxane (EPA Method SW 846 8260, isotope dilution for 1-4 Dioxane), TCL SVOCs + TICs (EPA Method SW 846 8270), pesticides/herbicides/PCBs (EPA Methods SW 846 8081/8151/8082), total and dissolved TAL metals (EPA Methods SW 846 6010/6020/7470), cyanide (EPA Method SW 846 9010/9012), and mercury (EPA Method SW 846 7471); PFAS (EPA Method 1633)

Figures



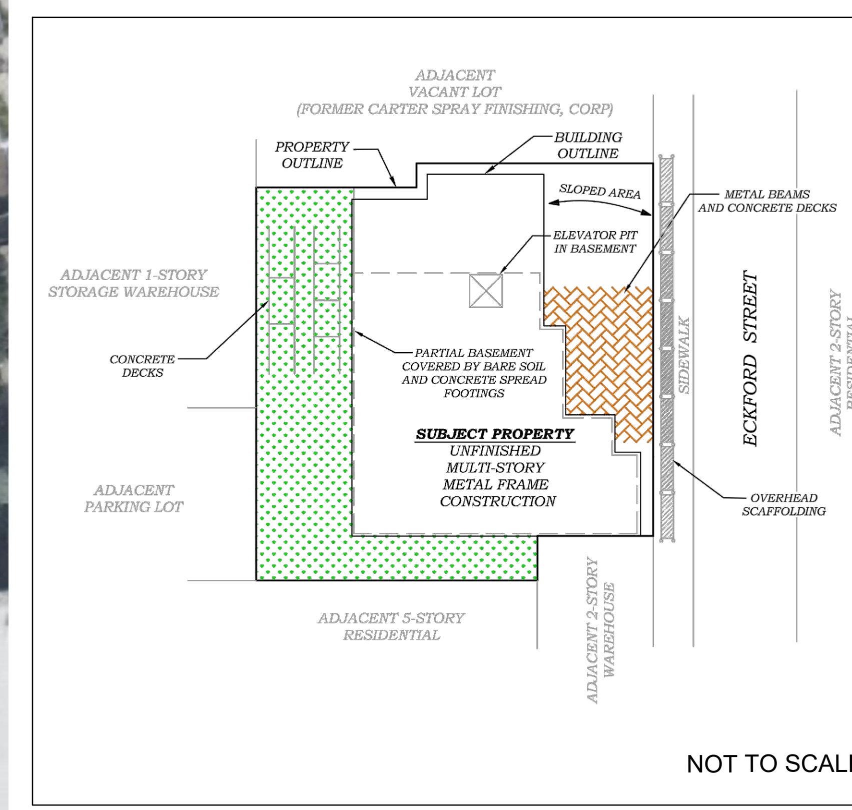
SOURCE:

USGS TOPOGRAPHIC MAPS: BROOKLYN, NEW YORK (2023). CONTOUR INTERVAL 10FT., NAVD-1988, ORIGINAL SCALE 1:24,000 (1IN.=2,000FT.).



55 ECKFORD STREET BROOKLYN, NEW YORK	PREPARED BY: **GZA** GeoEnvironmental of NY Engineers and Scientists www.gza.com	PREPARED FOR: 55 ECKFORD ST LLC

SITE LOCATION MAP	PROJ MGR: VW DESIGNED BY: VW DATE: NOVEMBER 2024	REVIEWED BY: SK DRAWN BY: NQ PROJECT NO. 41.0163263.00	CHECKED BY: SK SCALE: 1"=2000' REVISION NO. -	FIGURE 1 SHEET NO. 1 OF 1



GENERAL NOTES

1. AERIAL IMAGERY DEVELOPED FROM © 2024 MICROSOFT CORPORATION 2024 MAXAR CNES (2024) DISTRIBUTION AIRBUS DS.

LEGEND

APPROXIMATE SITE BOUNDARY

N
W E
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0 25 50 100
SCALE IN FEET

NO.	ISSUE/DESCRIPTION	BY	DATE

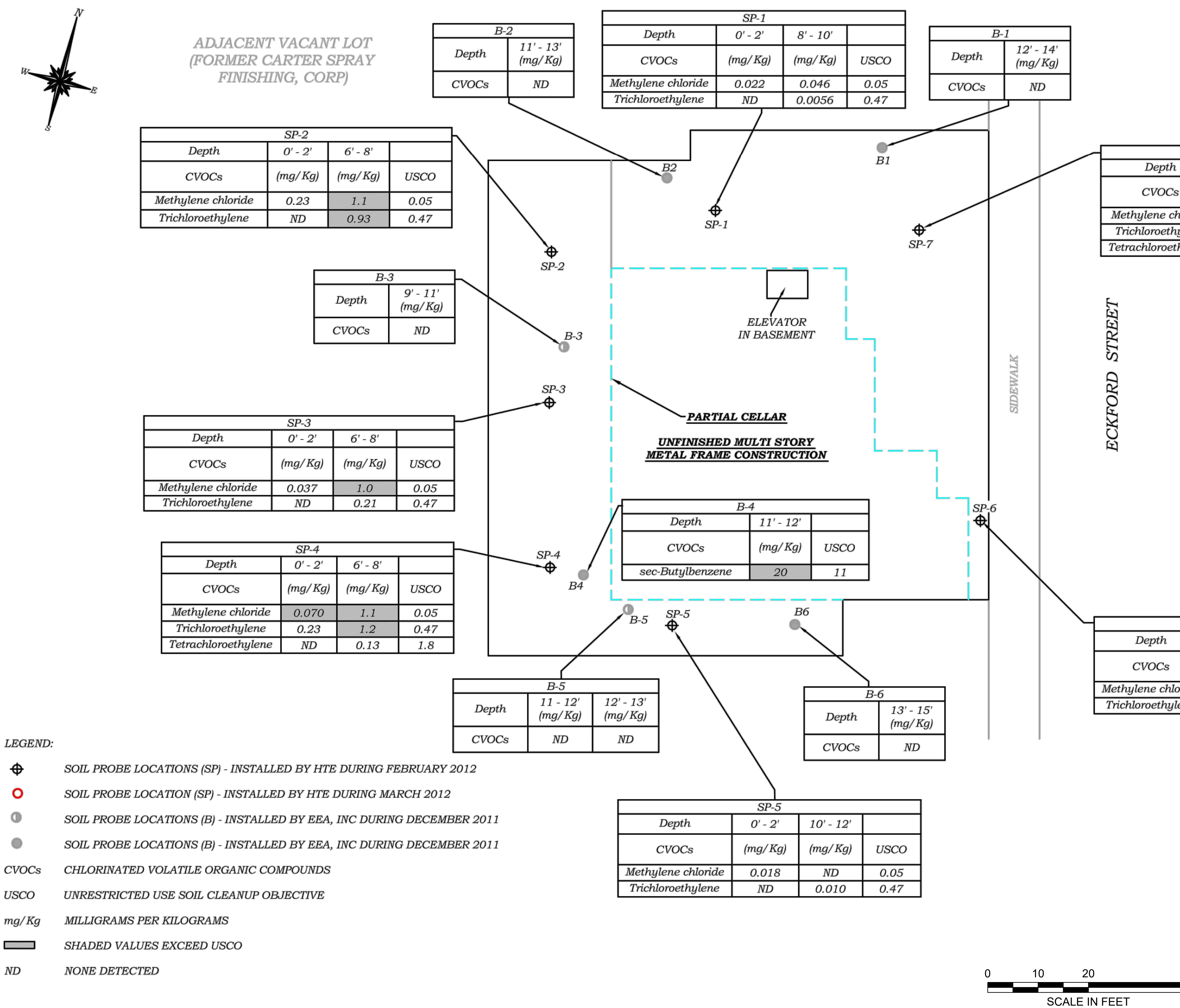
55 ECKFORD STREET
BROOKLYN, NEW YORK

SITE PLAN

PREPARED BY:
GZA GeoEnvironmental of NY
Engineers and Scientists
www.gza.com

PREPARED FOR:
BROOKLYN PUBLIC LIBRARY
WILLIAMSBURG

PROJ MGR: RM	REVIEWED BY: VW	CHECKED BY: VW	FIGURE
DESIGNED BY: RM	DRAWN BY: NQ	SCALE: 1"=50"	2
DATE: NOVEMBER 2024	PROJECT NO. 41.0163263.00	REVISION NO. -	SHEET NO. 1 OF 1



B-2	
Depth	11' - 13' (mg/Kg)
CVOCs	ND

SP-1			
Depth	0' - 2'	8' - 10'	
CVOCs	(mg/Kg)	(mg/Kg)	USCO
Methylene chloride	0.022	0.046	0.05
Trichloroethylene	ND	0.0056	0.47

B-1	
Depth	12' - 14' (mg/Kg)
CVOCs	ND

SP-2			
Depth	0' - 2'	6' - 8'	
CVOCs	(mg/Kg)	(mg/Kg)	USCO
Methylene chloride	0.23	1.1	0.05
Trichloroethylene	ND	0.93	0.47

SP-7			
Depth	0' - 2'	9' - 11'	
CVOCs	(mg/Kg)	(mg/Kg)	USCO
Methylene chloride	ND	0.021	0.05
Trichloroethylene	0.019	0.047	0.47
Tetrachloroethylene	ND	0.021	1.8

B-3	
Depth	9' - 11' (mg/Kg)
CVOCs	ND

SP-3			
Depth	0' - 2'	6' - 8'	
CVOCs	(mg/Kg)	(mg/Kg)	USCO
Methylene chloride	0.037	1.0	0.05
Trichloroethylene	ND	0.21	0.47

B-4		
Depth	11' - 12'	
CVOCs	(mg/Kg)	USCO
sec-Butylbenzene	20	11

SP-4			
Depth	0' - 2'	6' - 8'	
CVOCs	(mg/Kg)	(mg/Kg)	USCO
Methylene chloride	0.070	1.1	0.05
Trichloroethylene	0.23	1.2	0.47
Tetrachloroethylene	ND	0.13	1.8

SP-6			
Depth	0' - 2'	8' - 10'	
CVOCs	(mg/Kg)	(mg/Kg)	USCO
Methylene chloride	0.019	0.045	0.05
Trichloroethylene	ND	0.007	0.47

B-5		
Depth	11 - 12' (mg/Kg)	12' - 13' (mg/Kg)
CVOCs	ND	ND

B-6	
Depth	13' - 15' (mg/Kg)
CVOCs	ND

SP-5			
Depth	0' - 2'	10' - 12'	
CVOCs	(mg/Kg)	(mg/Kg)	USCO
Methylene chloride	0.018	ND	0.05
Trichloroethylene	ND	0.010	0.47

GENERAL NOTES

1. BASE MAP DEVELOPED FROM DRAWING TITLED "FIGURE 1: MAP OF CHLORINATED COMPOUNDS OF CONCERN (CVOCs) IN SOIL", PREPARED BY "HYDRO TECH ENVIRONMENTAL ENGINEERING AND GEOLOGY DPC", ORIGINAL SCALE 1"=10', DATED 01/20/20.
2. EXPLORATION LOCATIONS SHOWN ARE BASED ON TAPE MEASUREMENTS FROM TOPOGRAPHICAL FEATURES. THE LOCATIONS SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.
3. ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)

LEGEND:

- SOIL PROBE LOCATIONS (SP) - INSTALLED BY HTE DURING FEBRUARY 2012
- SOIL PROBE LOCATION (SP) - INSTALLED BY HTE DURING MARCH 2012
- SOIL PROBE LOCATIONS (B) - INSTALLED BY EEA, INC DURING DECEMBER 2011
- SOIL PROBE LOCATIONS (B) - INSTALLED BY EEA, INC DURING DECEMBER 2011
- CVOCs CHLORINATED VOLATILE ORGANIC COMPOUNDS
- USCO UNRESTRICTED USE SOIL CLEANUP OBJECTIVE
- mg/Kg MILLIGRAMS PER KILOGRAMS
- SHADED VALUES EXCEED USCO
- ND NONE DETECTED

NO.	ISSUE/DESCRIPTION	BY	DATE

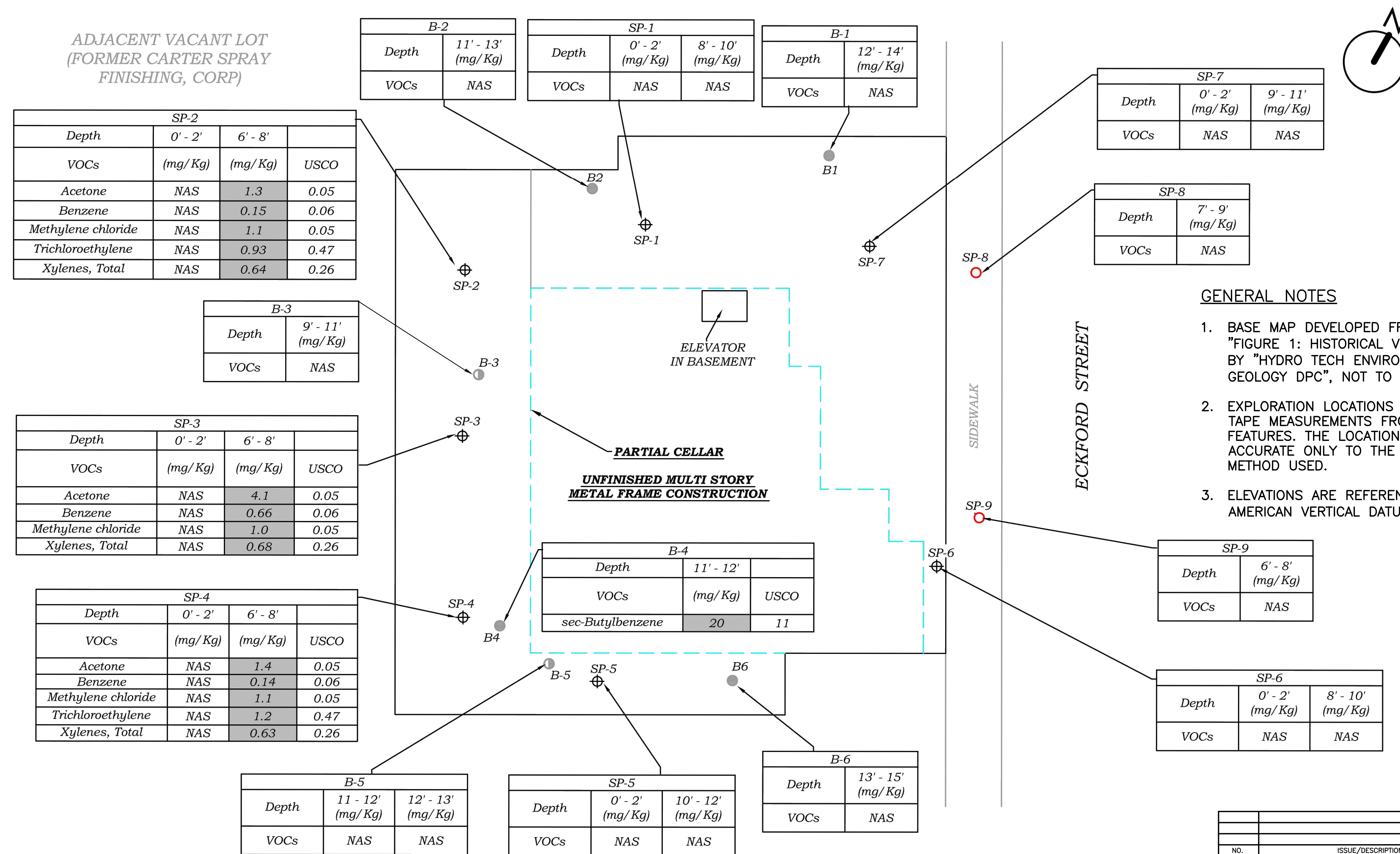
55 ECKFORD STREET
BROOKLYN, NEW YORK

HISTORICAL CVOCS IN SOIL

PREPARED BY: GZA GeoEnvironmental of NY, Engineers and Scientists, www.gza.com

PREPARED FOR: BROOKLYN PUBLIC LIBRARY WILLIAMSBURG

PROJ MGR: RM	REVIEWED BY: VW	CHECKED BY: VW	FIGURE 3A
DESIGNED BY: RM	DRAWN BY: NQ	SCALE: 1"=20'	
DATE: NOVEMBER 2024	PROJECT NO. 41.0163263.00	REVISION NO. -	SHEET NO. 1 OF 1



B-2

Depth	11' - 13' (mg/Kg)
VOCs	NAS

SP-1

Depth	0' - 2' (mg/Kg)	8' - 10' (mg/Kg)
VOCs	NAS	NAS

B-1

Depth	12' - 14' (mg/Kg)
VOCs	NAS

SP-7

Depth	0' - 2' (mg/Kg)	9' - 11' (mg/Kg)
VOCs	NAS	NAS

SP-2

Depth	0' - 2'	6' - 8'	
VOCs	(mg/Kg)	(mg/Kg)	USCO
Acetone	NAS	1.3	0.05
Benzene	NAS	0.15	0.06
Methylene chloride	NAS	1.1	0.05
Trichloroethylene	NAS	0.93	0.47
Xylenes, Total	NAS	0.64	0.26

SP-8

Depth	7' - 9' (mg/Kg)
VOCs	NAS

B-3

Depth	9' - 11' (mg/Kg)
VOCs	NAS

SP-3

Depth	0' - 2'	6' - 8'	
VOCs	(mg/Kg)	(mg/Kg)	USCO
Acetone	NAS	4.1	0.05
Benzene	NAS	0.66	0.06
Methylene chloride	NAS	1.0	0.05
Xylenes, Total	NAS	0.68	0.26

SP-9

Depth	6' - 8' (mg/Kg)
VOCs	NAS

B-4

Depth	11' - 12'	
VOCs	(mg/Kg)	USCO
sec-Butylbenzene	20	11

SP-4

Depth	0' - 2'	6' - 8'	
VOCs	(mg/Kg)	(mg/Kg)	USCO
Acetone	NAS	1.4	0.05
Benzene	NAS	0.14	0.06
Methylene chloride	NAS	1.1	0.05
Trichloroethylene	NAS	1.2	0.47
Xylenes, Total	NAS	0.63	0.26

SP-6

Depth	0' - 2' (mg/Kg)	8' - 10' (mg/Kg)
VOCs	NAS	NAS

B-5

Depth	11 - 12' (mg/Kg)	12' - 13' (mg/Kg)
VOCs	NAS	NAS

SP-5

Depth	0' - 2' (mg/Kg)	10' - 12' (mg/Kg)
VOCs	NAS	NAS

B-6

Depth	13' - 15' (mg/Kg)
VOCs	NAS

GENERAL NOTES

1. BASE MAP DEVELOPED FROM DRAWING TITLED "FIGURE 1: HISTORICAL VOCS IN SOIL", PREPARED BY "HYDRO TECH ENVIRONMENTAL ENGINEERING AND GEOLOGY DPC", NOT TO SCALE, DATED 12/04/18.
2. EXPLORATION LOCATIONS SHOWN ARE BASED ON TAPE MEASUREMENTS FROM TOPOGRAPHICAL FEATURES. THE LOCATIONS SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.
3. ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)

LEGEND:

⌖	SOIL PROBE LOCATIONS (SP) - INSTALLED BY HTE DURING FEBRUARY 2012
○	SOIL PROBE LOCATION (SP) - INSTALLED BY HTE DURING MARCH 2012
◑	SOIL PROBE LOCATIONS (B) - INSTALLED BY EEA, INC DURING DECEMBER 2011
●	SOIL PROBE LOCATIONS (B) - INSTALLED BY EEA, INC DURING DECEMBER 2011
VOCs	VOLATILE ORGANIC COMPOUNDS
USCO	UNRESTRICTED USE SOIL CLEANUP OBJECTIVE
mg/Kg	MILLIGRAMS PER KILOGRAMS
(shaded)	SHADED VALUES EXCEED USCO
NAS	NONE ABOVE STANDARDS

NO.	ISSUE/DESCRIPTION	BY	DATE

55 ECKFORD STREET
BROOKLYN, NEW YORK

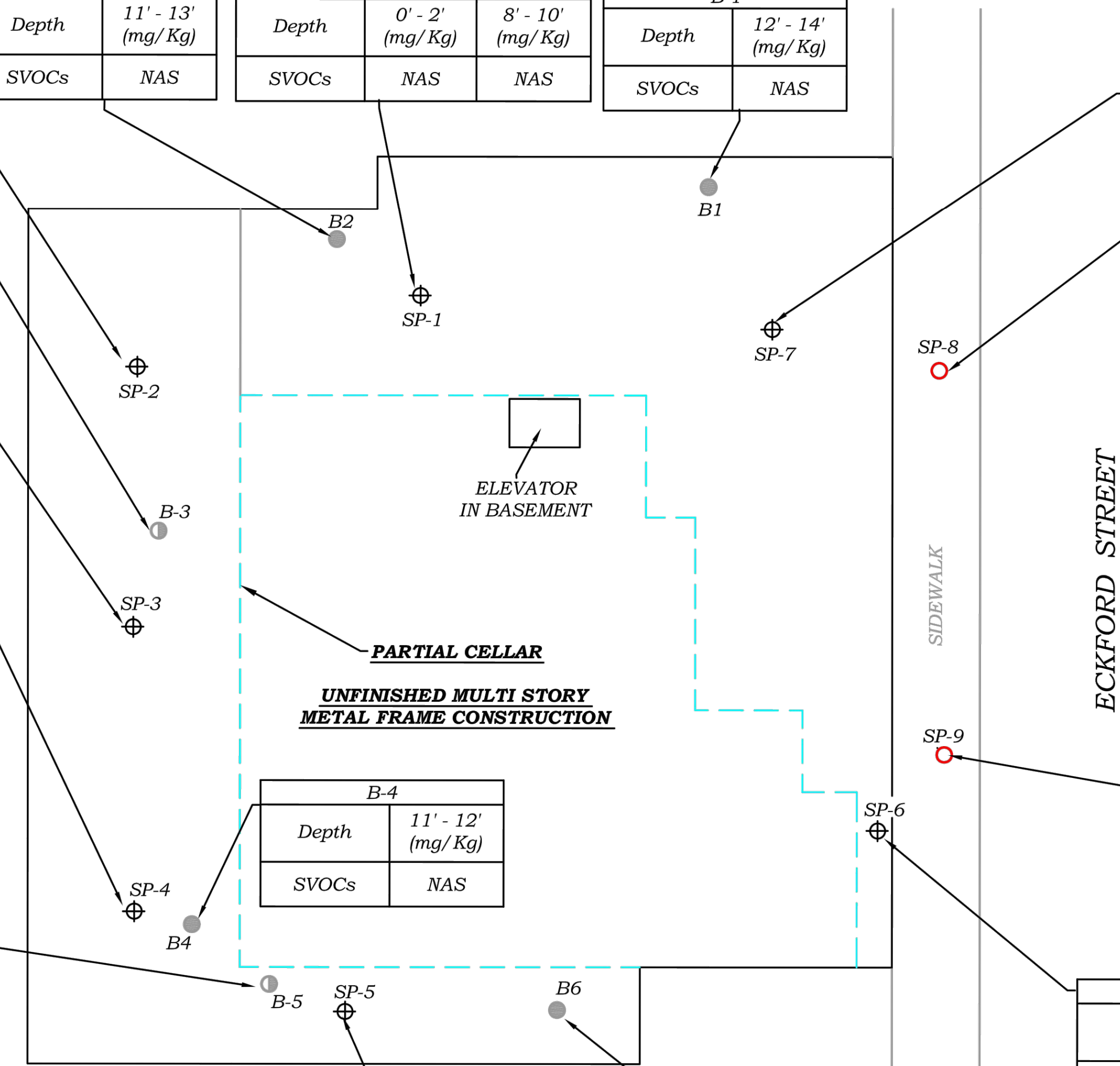
HISTORICAL VOCS IN SOIL

PREPARED BY: GZA GeoEnvironmental of NY, Engineers and Scientists, www.gza.com

PREPARED FOR: BROOKLYN PUBLIC LIBRARY WILLIAMSBURG

PROJ MGR: RM	REVIEWED BY: VW	CHECKED BY: VW	FIGURE
DESIGNED BY: RM	DRAWN BY: NQ	SCALE: 1"=20'	3B
DATE: NOVEMBER 2024	PROJECT NO. 41.0163263.00	REVISION NO. -	SHEET NO. 1 OF 1

ADJACENT VACANT LOT
(FORMER CARTER SPRAY
FINISHING, CORP)



B-2	
Depth	11' - 13' (mg/Kg)
SVOCs	NAS

SP-1		
Depth	0' - 2' (mg/Kg)	8' - 10' (mg/Kg)
SVOCs	NAS	NAS

B-1	
Depth	12' - 14' (mg/Kg)
SVOCs	NAS

SP-2		
Depth	0' - 2' (mg/Kg)	6' - 8' (mg/Kg)
SVOCs	NAS	NAS

SP-7				
Depth	0' - 2'	9' - 11'		
SVOCs	(µg/Kg)	(µg/Kg)	USCO	RSCO
Chrysene	1.06	NAS	1	1

B-3	
Depth	9' - 11' (mg/Kg)
SVOCs	NAS

SP-8	
Depth	7' - 9' (mg/Kg)
SVOCs	NAS

SP-3				
Depth	0' - 2'	6' - 8'		
SVOCs	(mg/Kg)	(mg/Kg)	USCO	RSCO
Chrysene	1.08	NAS	1	1

SP-4				
Depth	0' - 2'	6' - 8'		
SVOCs	(mg/Kg)	(mg/Kg)	USCO	RSCO
Benzo(a)anthracene	2.25	NAS	1	1
Benzo(a)pyrene	1.57	NAS	1	1
Benzo(b)fluoranthene	1.21	NAS	1	1
Benzo(k)fluoranthene	1.81	NAS	0.8	1
Chrysene	2.14	NAS	1	1

B-4	
Depth	11' - 12' (mg/Kg)
SVOCs	NAS

SP-9	
Depth	6' - 8' (mg/Kg)
SVOCs	NAS

B-5				
Depth	11' - 12'	12' - 13'		
SVOCs	(mg/Kg)	(mg/Kg)	USCO	RSCO
Benzo(a)anthracene	2.1	NAS	1	1
Benzo(a)pyrene	1.4	NAS	1	1
Benzo(b)fluoranthene	1.8	NAS	1	1
Chrysene	1.7	NAS	1	1

SP-6				
Depth	0' - 2'	8' - 10'		
SVOCs	(mg/Kg)	(mg/Kg)	USCO	RSCO
Benzo(a)anthracene	NAS	1.12	1	1
Chrysene	NAS	1.30	1	1

B-6	
Depth	13' - 15' (mg/Kg)
SVOCs	NAS

SP-5				
Depth	0' - 2'	10' - 12'		
SVOCs	(mg/Kg)	(mg/Kg)	USCO	RSCO
Chrysene	NAS	1.06	1	1

GENERAL NOTES

1. BASE MAP DEVELOPED FROM DRAWING TITLED "FIGURE 1: HISTORICAL SVOCS IN SOIL", PREPARED BY "HYDRO TECH ENVIRONMENTAL ENGINEERING AND GEOLOGY DPC", NOT TO SCALE, DATED 12/04/18.
2. EXPLORATION LOCATIONS SHOWN ARE BASED ON TAPE MEASUREMENTS FROM TOPOGRAPHICAL FEATURES. THE LOCATIONS SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.
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LEGEND:

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○	SOIL PROBE LOCATION (SP) - INSTALLED BY HTE DURING MARCH 2012
◐	SOIL PROBE LOCATIONS (B) - INSTALLED BY EEA, INC DURING DECEMBER 2011
●	SOIL PROBE LOCATIONS (B) - INSTALLED BY EEA, INC DURING DECEMBER 2011
SVOCs	SEMI VOLATILE ORGANIC COMPOUNDS
USCO	UNRESTRICTED USE SOIL CLEANUP OBJECTIVE
RSCO	RESTRICTED USE SOIL CLEANUP OBJECTIVE
mg/Kg	MILLIGRAMS PER KILOGRAMS
	SHADED VALUES EXCEED SCO
NAS	NONE ABOVE STANDARDS

0 10 20 40
SCALE IN FEET

NO.	ISSUE/DESCRIPTION	BY	DATE

55 ECKFORD STREET
BROOKLYN, NEW YORK

HISTORICAL SVOCS IN SOIL

PREPARED BY:
GZA GeoEnvironmental of NY
Engineers and Scientists
www.gza.com

PREPARED FOR:
BROOKLYN PUBLIC LIBRARY
WILLIAMSBURG

PROJ MGR: RM	REVIEWED BY: VW	CHECKED BY: VW	FIGURE
DESIGNED BY: RM	DRAWN BY: NQ	SCALE: N.T.S.	3C
DATE: NOVEMBER 2024	PROJECT NO. 41.0163263.00	REVISION NO. -	SHEET NO. 1 OF 1

B-2				
Depth	11' - 13'	USCO	RSCO
METALS	(mg/Kg)	(mg/Kg)	(mg/Kg)
Arsenic	86.3	13	16
Chromium, Trivalent	113	30	36
Lead	895	63	400
Mercury	0.19	0.18	0.81

SP-1				
Depth	0' - 2'	8' - 10'	USCO	RSCO
METALS	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)
Arsenic	NAS	81.2	13	16
Chromium, Trivalent	NAS	33.6	30	36
Copper	NAS	582	50	270
Lead	206	2,980	63	400
Nickel	NAS	652	30	140
Mercury	0.337	1.85	0.18	0.81

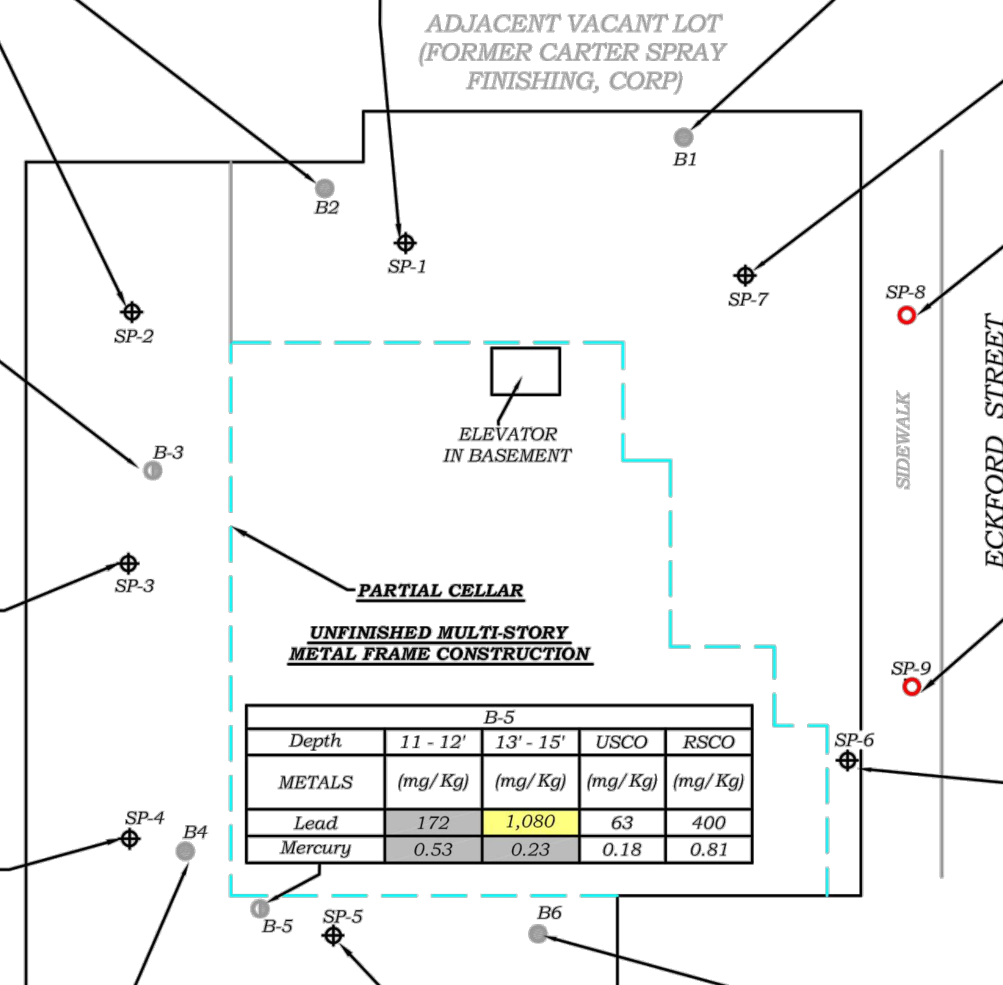
B-1			
Depth	12' - 14'	USCO	RSCO
METALS	(mg/Kg)	(mg/Kg)	(mg/Kg)
Arsenic	14.7	13	16
Lead	401	63	400
Mercury	2.15	0.18	0.81
Selenium	9.7	3.9	36

SP-2				
Depth	0' - 2'	6' - 8'	USCO	RSCO
METALS	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)
Arsenic	NAS	273	13	16
Cadmium	2.56	NAS	2.5	2.5
Chromium, Trivalent	38.3	42.1	30	36
Copper	NAS	482	50	270
Lead	160	1,430	63	400
Nickel	NAS	290	30	140
Mercury	0.19	1.37	0.18	0.81

SP-7				
Depth	0' - 2'	9' - 11'	USCO	RSCO
METALS	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)
Arsenic	72.2	57.6	13	16
Barium	352	356	350	350
Chromium, Trivalent	35.8	NAS	30	36
Copper	1,020	361	50	270
Lead	1,140	884	63	400
Nickel	1,030	376	30	140

SP-8			
Depth	7' - 9'	USCO	RSCO
METALS	(mg/Kg)	(mg/Kg)	(mg/Kg)
Lead	219	63	400
Mercury	27.4	0.18	0.81

B-3			
Depth	9' - 11'	USCO	RSCO
METALS	(mg/Kg)	(mg/Kg)	(mg/Kg)
Arsenic	63.3	13	16
Chromium, Trivalent	37.5	30	36
Lead	590	63	400
Mercury	1.77	0.18	0.81
Selenium	4.3	3.9	36



SP-8			
Depth	7' - 9'	USCO	RSCO
METALS	(mg/Kg)	(mg/Kg)	(mg/Kg)
Arsenic	29.8	13	16
Lead	358	63	400
Mercury	8.17	0.18	0.81

SP-3				
Depth	0' - 2'	6' - 8'	USCO	RSCO
METALS	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)
Arsenic	24.9	153	13	16
Chromium, Trivalent	34.9	NAS	30	36
Copper	154	590	50	270
Lead	411	1,660	63	400
Nickel	143	163	30	140

B-5				
Depth	11 - 12'	13' - 15'	USCO	RSCO
METALS	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)
Lead	172	1,080	63	400
Mercury	0.53	0.23	0.18	0.81

SP-6				
Depth	0' - 2'	8' - 10'	USCO	RRSCO
METALS	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)
Arsenic	139	77.5	13	16
Barium	464	NAS	350	350
Chromium, Trivalent	51.5	38.2	30	36
Copper	987	258	50	270
Lead	1,670	630	63	400
Nickel	1,240	608	30	140

SP-4				
Depth	0' - 2'	6' - 8'	USCO	RSCO
METALS	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)
Arsenic	88.2	102	13	16
Barium	605	NAS	350	350
Cadmium	4.62	NAS	2.5	2.5
Chromium, Trivalent	36.7	36.7	30	36
Copper	833	712	50	270
Lead	2,410	621	63	400
Nickel	462	637	30	140

B-6			
Depth	13' - 15'	USCO	RSCO
METALS	(mg/Kg)	(mg/Kg)	(mg/Kg)
Arsenic	53.9	13	16
Lead	547	63	400
Mercury	0.23	0.18	0.81

SP-5				
Depth	0' - 2'	10' - 12'	USCO	RSCO
METALS	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)
Arsenic	NAS	33	13	16
Barium	NAS	564	350	350
Copper	52.7	354	50	270
Lead	126	1,050	63	400
Nickel	42.6	126	30	140
Mercury	0.183	2.03	0.18	0.81

B-4			
Depth	10' - 12'	USCO	RSCO
METALS	(mg/Kg)	(mg/Kg)	(mg/Kg)
Lead	76	63	400
Mercury	0.90	0.18	0.81

LEGEND:

- SOIL PROBE LOCATIONS (SP) - INSTALLED BY HTE DURING FEBRUARY 2012
- SOIL PROBE LOCATION (SP) - INSTALLED BY HTE DURING MARCH 2012
- SOIL PROBE LOCATIONS (B) - INSTALLED BY EEA, INC DURING DECEMBER 2011
- SOIL PROBE LOCATIONS (B) - INSTALLED BY EEA, INC DURING DECEMBER 2011
- USCO — UNRESTRICTED USE SOIL CLEANUP OBJECTIVE
- RSCO — RESTRICTED USE SOIL CLEANUP OBJECTIVE
- mg/Kg — MILLIGRAMS PER KILOGRAMS
- SHADED VALUES EXCEED USCO
- SHADED VALUES EXCEED RSCO
- NAS — NONE ABOVE STANDARDS

GENERAL NOTES

1. BASE MAP DEVELOPED FROM DRAWING TITLED "FIGURE 4: HISTORICAL METALS IN SOIL", PREPARED BY "HYDRO TECH ENVIRONMENTAL CORP", NOT TO SCALE, DATED 12/04/18.
2. EXPLORATION LOCATIONS SHOWN ARE BASED ON TAPE MEASUREMENTS FROM TOPOGRAPHICAL FEATURES. THE LOCATIONS SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.
3. ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)

0 10 20 40

SCALE IN FEET

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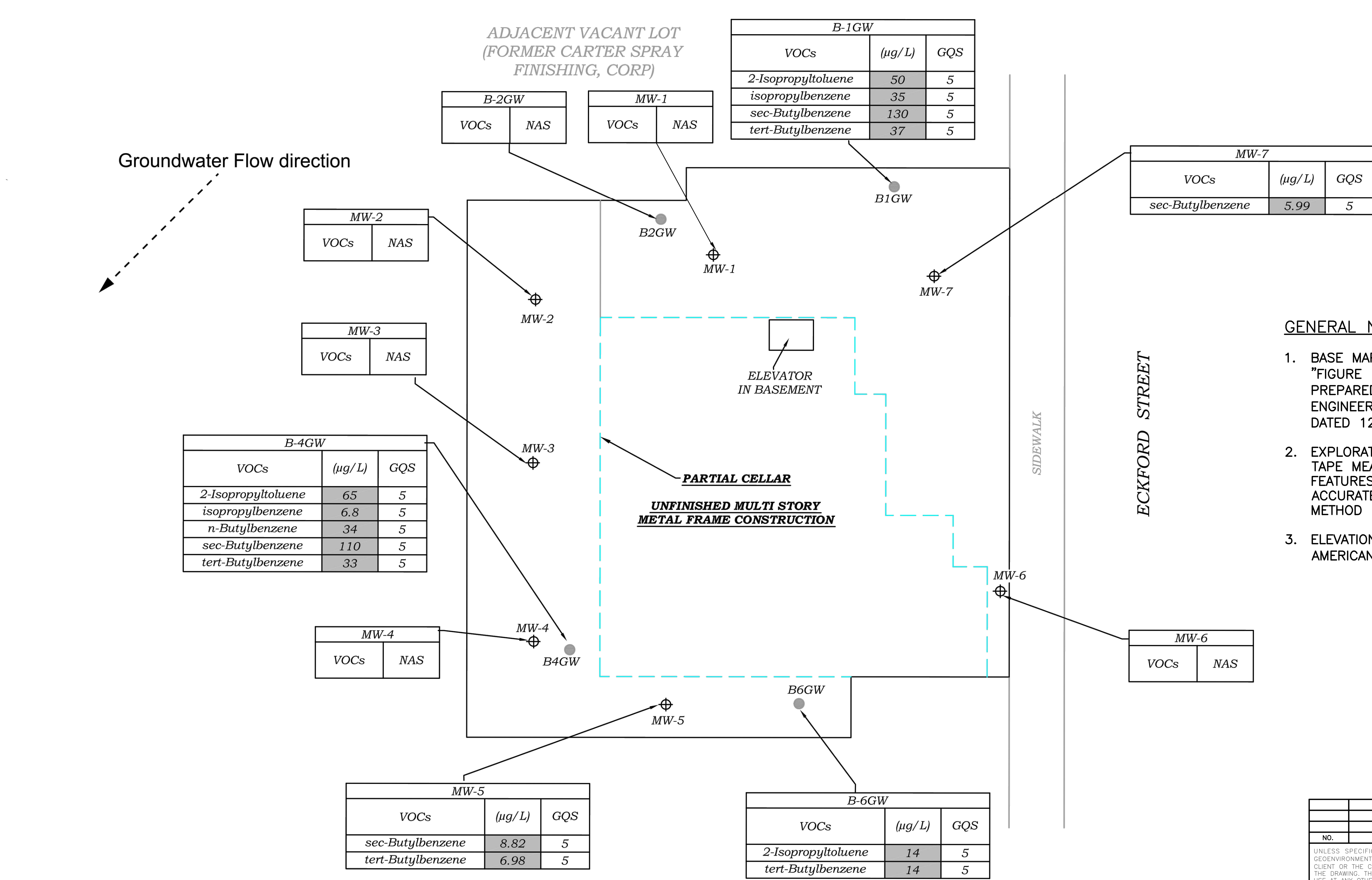
55 ECKFORD STREET
BROOKLYN, NEW YORK

HISTORICAL METALS IN SOIL

PREPARED BY:
GZA GeoEnvironmental of NY
Engineers and Scientists
www.gza.com

PREPARED FOR:
BROOKLYN PUBLIC LIBRARY
WILLIAMSBURG

PROJ MGR: RM	REVIEWED BY: VW	CHECKED BY: VW	FIGURE 3D
DESIGNED BY: RM	DRAWN BY: NQ	SCALE: 1"=20'	
DATE: NOVEMBER 2024	PROJECT NO. 41.0163263.00	REVISION NO. -	SHEET NO. 1 OF 1



B-2GW

VOCs	NAS

MW-1

VOCs	NAS

B-1GW

VOCs	(µg/L)	GQS
2-Isopropyltoluene	50	5
isopropylbenzene	35	5
sec-Butylbenzene	130	5
tert-Butylbenzene	37	5

MW-7

VOCs	(µg/L)	GQS
sec-Butylbenzene	5.99	5

MW-2

VOCs	NAS

MW-3

VOCs	NAS

B-4GW

VOCs	(µg/L)	GQS
2-Isopropyltoluene	65	5
isopropylbenzene	6.8	5
n-Butylbenzene	34	5
sec-Butylbenzene	110	5
tert-Butylbenzene	33	5

MW-4

VOCs	NAS

MW-6

VOCs	NAS

MW-5

VOCs	(µg/L)	GQS
sec-Butylbenzene	8.82	5
tert-Butylbenzene	6.98	5

B-6GW

VOCs	(µg/L)	GQS
2-Isopropyltoluene	14	5
tert-Butylbenzene	14	5

GENERAL NOTES

1. BASE MAP DEVELOPED FROM DRAWING TITLED "FIGURE 1: HISTORICAL VOCS IN GROUNDWATER", PREPARED BY "HYDRO TECH ENVIRONMENTAL ENGINEERING AND GEOLOGY DPC", NOT TO SCALE, DATED 12/04/18.
2. EXPLORATION LOCATIONS SHOWN ARE BASED ON TAPE MEASUREMENTS FROM TOPOGRAPHICAL FEATURES. THE LOCATIONS SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.
3. ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)

LEGEND:

⌖	MONITORING WELL (MW) - INSTALLED BY HTE DURING FEBRUARY 2012
●	MONITORING WELL LOCATIONS (GW) - INSTALLED BY EEA, INC DURING DECEMBER 2011
VOCs	VOLATILE ORGANIC COMPOUNDS
NAS	NONE ABOVE STANDARDS
GQS	GROUNDWATER QUALITY STANDARDS
µg/L	MICROGRAMS PER LITER
	SHADED VALUES EXCEED GQS

0 10 20 40
SCALE IN FEET

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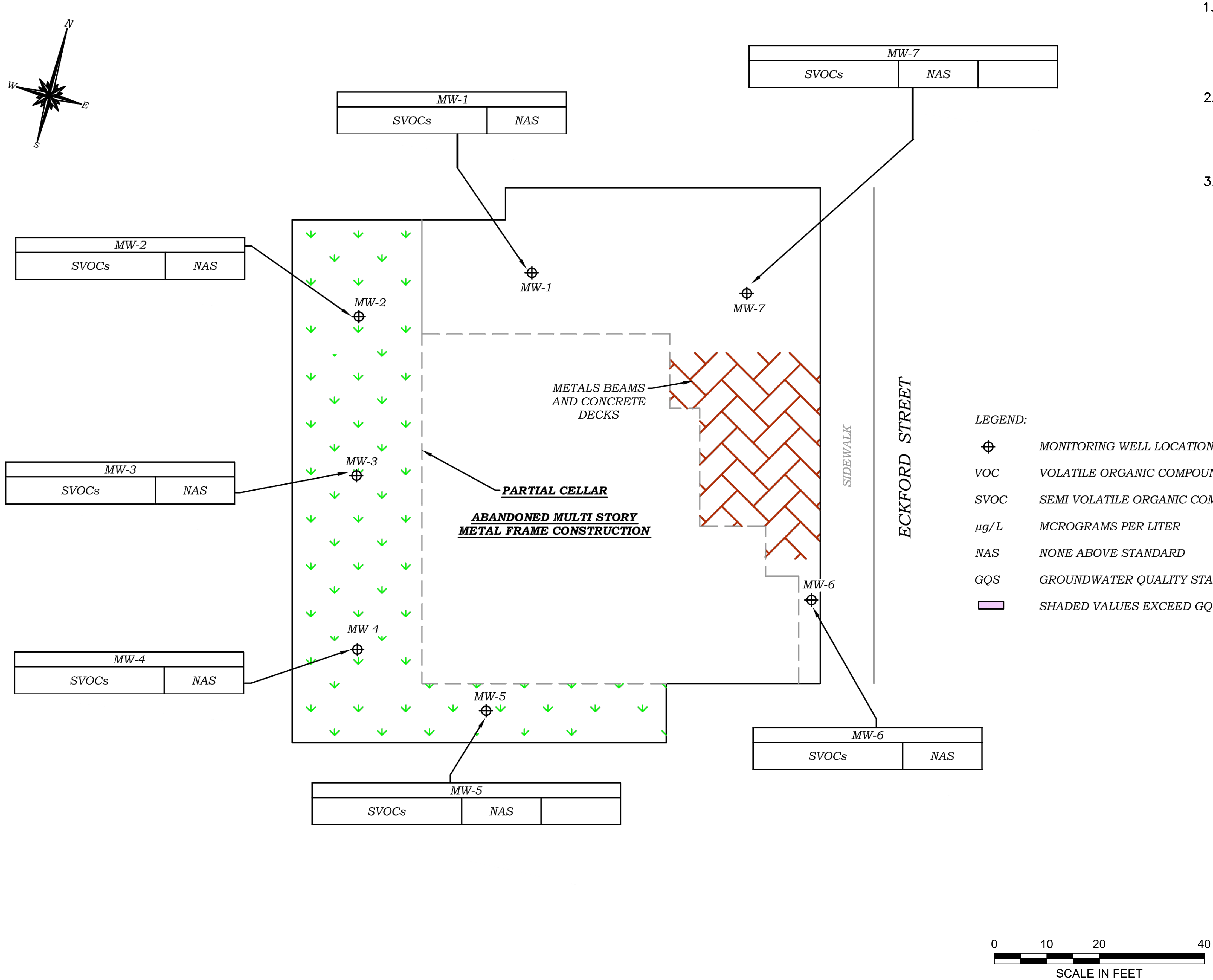
55 ECKFORD STREET
BROOKLYN, NEW YORK

HISTORICAL VOCS IN GRDOUNDWATER

PREPARED BY: GZA GeoEnvironmental of NY Engineers and Scientists www.gza.com

PREPARED FOR: BROOKLYN PUBLIC LIBRARY WILLIAMSBURG

PROJ MGR: RM	REVIEWED BY: VW	CHECKED BY: VW	FIGURE 4A
DESIGNED BY: RM	DRAWN BY: NQ	SCALE: 1"=20'	
DATE: NOVEMBER 2024	PROJECT NO. 41.0163263.00	REVISION NO. -	SHEET NO. 1 OF 1



GENERAL NOTES

1. BASE MAP DEVELOPED FROM DRAWING TITLED "FIGURE 5: ORGANICS PRESENT IN GROUNDWATER GREATER THAN GQS", PREPARED BY "HYDRO TECH ENVIRONMENTAL ENGINEERING AND GEOLOGY DPC", NOT TO SCALE, DATED 04/04/12.
2. EXPLORATION LOCATIONS SHOWN ARE BASED ON TAPE MEASUREMENTS FROM TOPOGRAPHICAL FEATURES. THE LOCATIONS SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.
3. ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)

LEGEND:

⌖	*MONITORING WELL LOCATION (MW)*
VOC	*VOLATILE ORGANIC COMPOUND*
SVOC	*SEMI VOLATILE ORGANIC COMPOUND*
µg/L	*MCROGRAMS PER LITER*
NAS	*NONE ABOVE STANDARD*
GQS	*GROUNDWATER QUALITY STANDARD*
▭	*SHADED VALUES EXCEED GQS*

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HISTORICAL SVOCS IN GROUNDWATER

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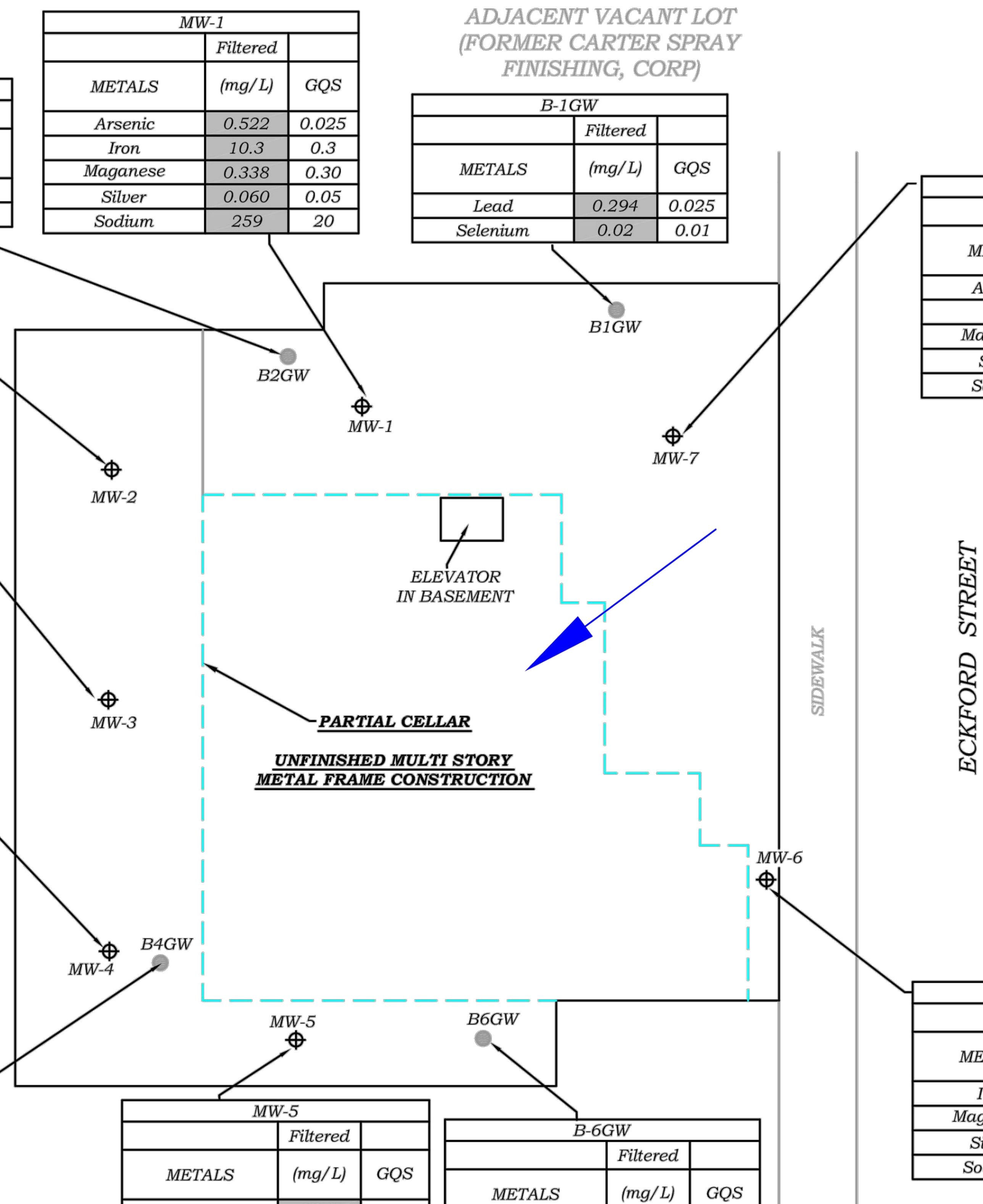
PREPARED FOR: BROOKLYN PUBLIC LIBRARY WILLIAMSBURG

PROJ MGR: RM	REVIEWED BY: VW	CHECKED BY: VW	FIGURE
DESIGNED BY: RM	DRAWN BY: NQ	SCALE: 1"=20'	4B
DATE: NOVEMBER 2024	PROJECT NO. 41.0163263.00	REVISION NO. -	SHEET NO. 1 OF 1



B-2GW

METALS	Filtered (mg/L)	GQS
Arsenic	2.36	0.025
Lead	0.061	0.025

MW-1

METALS	Filtered (mg/L)	GQS
Arsenic	0.522	0.025
Iron	10.3	0.3
Maganese	0.338	0.30
Silver	0.060	0.05
Sodium	259	20

B-1GW

METALS	Filtered (mg/L)	GQS
Lead	0.294	0.025
Selenium	0.02	0.01

MW-7

METALS	Filtered (mg/L)	GQS
Arsenic	0.056	0.025
Iron	18.2	0.3
Maganese	0.697	0.30
Silver	0.068	0.05
Sodium	244	20

MW-2

METALS	Filtered (mg/L)	GQS
Arsenic	0.564	0.025
Iron	13.4	0.3
Maganese	0.358	0.30
Silver	0.057	0.05
Sodium	220	20

MW-3

METALS	filtered (mg/L)	GQS
Arsenic	0.193	0.025
Iron	30.5	0.3
Maganese	0.530	0.30
Silver	0.060	0.05
Sodium	117	20

MW-4

METALS	Filtered (mg/L)	GQS
Arsenic	0.224	0.025
Iron	14.8	0.3
Maganese	0.783	0.30
Silver	0.059	0.05
Sodium	49.6	20

B-4GW

METALS	Filtered (mg/L)	GQS
Arsenic	0.12	0.025
Lead	0.065	0.025
Selenium	0.011	0.01

MW-5

METALS	Filtered (mg/L)	GQS
Iron	13.3	0.3
Maganese	0.724	0.30
Silver	0.073	0.05
Sodium	25.9	20

B-6GW

METALS	Filtered (mg/L)	GQS
Selenium	0.011	0.01

MW-6

METALS	Filtered (mg/L)	GQS
Iron	20.1	0.3
Maganese	0.784	0.30
Silver	0.062	0.05
Sodium	240	20

GENERAL NOTES

1. BASE MAP DEVELOPED FROM DRAWING TITLED "FIGURE 6: HISTORICAL METALS IN GROUNDWATER", PREPARED BY "HYDRO TECH ENVIRONMENTAL ENGINEERING AND GEOLOGY DPC", NOT TO SCALE, DATED 12/04/18.
2. EXPLORATION LOCATIONS SHOWN ARE BASED ON TAPE MEASUREMENTS FROM TOPOGRAPHICAL FEATURES. THE LOCATIONS SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.
3. ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)

0 10 20 40
SCALE IN FEET

NO.	ISSUE/DESCRIPTION	BY	DATE

55 ECKFORD STREET
BROOKLYN, NEW YORK

HISTORICAL METALS IN GROUNDWATER

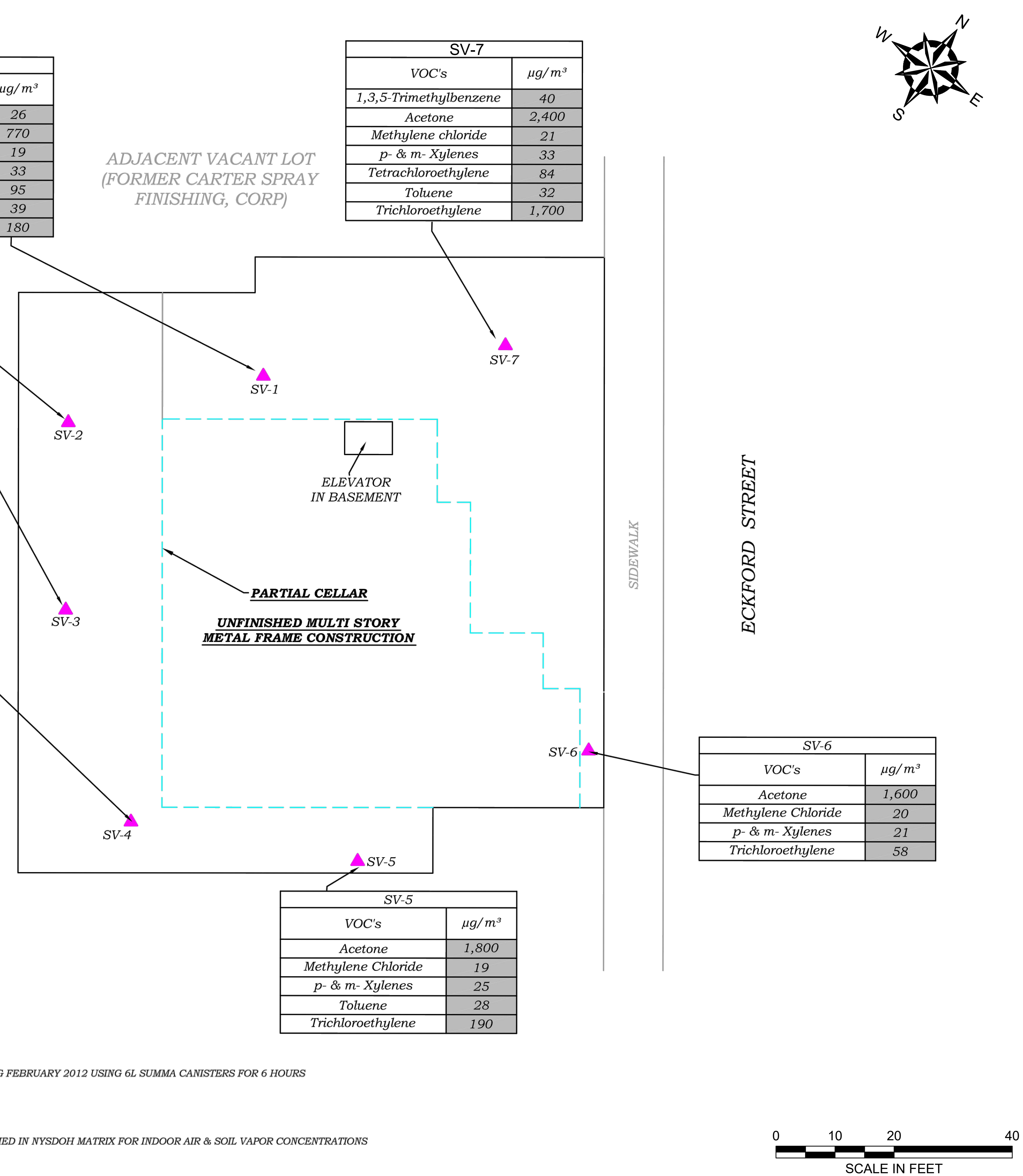
PREPARED BY: GZA GeoEnvironmental of NY, Engineers and Scientists, www.gza.com

PREPARED FOR: BROOKLYN PUBLIC LIBRARY WILLIAMSBURG

PROJ MGR: RM	REVIEWED BY: VW	CHECKED BY: VW	FIGURE
DESIGNED BY: RM	DRAWN BY: NQ	SCALE: 1"=20'	4C
DATE: NOVEMBER 2024	PROJECT NO. 41.0163263.00	REVISION NO. -	SHEET NO. 1 OF 1

GENERAL NOTES

1. BASE MAP DEVELOPED FROM DRAWING TITLED "FIGURE 7: HISTORICAL VOCS IN SOIL VAPOR", PREPARED BY "HYDRO TECH ENVIRONMENTAL CORP", NOT TO SCALE', DATED 12/04/18.
2. EXPLORATION LOCATIONS SHOWN ARE BASED ON TAPE MEASUREMENTS FROM TOPOGRAPHICAL FEATURES. THE LOCATIONS SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.
3. ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)



SV-1	
VOC's	µg/m³
1,1-Dichloroethene	26
Acetone	770
Benzene	19
Methylene Chloride	33
n-Hexane	95
Toluene	39
Trichloroethylene	180

SV-2	
VOC's	NAS

SV-3	
VOC's	µg/m³
Acetone	2,100
Methylene Chloride	17
p-&m-Xylenes	31
Tetrachloroethylene	53
Toluene	29
Trichloroethylene	780

SV-4	
VOC's	µg/m³
Acetone	2,300
Methylene chloride	30
n-Heptane	28
n-Hexane	49
p- & m- Xylenes	24
Toluene	25
Trichloroethylene	30

SV-5	
VOC's	µg/m³
Acetone	1,800
Methylene Chloride	19
p- & m- Xylenes	25
Toluene	28
Trichloroethylene	190

SV-6	
VOC's	µg/m³
Acetone	1,600
Methylene Chloride	20
p- & m- Xylenes	21
Trichloroethylene	58

SV-7	
VOC's	µg/m³
1,3,5-Trimethylbenzene	40
Acetone	2,400
Methylene chloride	21
p- & m- Xylenes	33
Tetrachloroethylene	84
Toluene	32
Trichloroethylene	1,700

LEGEND:

▲ SOIL GAS IMPLANT (SV) - INSTALLED & SAMPLED BY HTE DURING FEBRUARY 2012 USING 6L SUMMA CANISTERS FOR 6 HOURS

CVOCs CHLORINATED VOLATILE ORGANIC COMPOUNDS

µg/m³ MICROGRAMS PER CUBIC METER

SHADED VALUES EXCEED THE MITIGATION GUIDELINES SPECIFIED IN NYSDOH MATRIX FOR INDOOR AIR & SOIL VAPOR CONCENTRATIONS

NO.	ISSUE/DESCRIPTION	BY	DATE

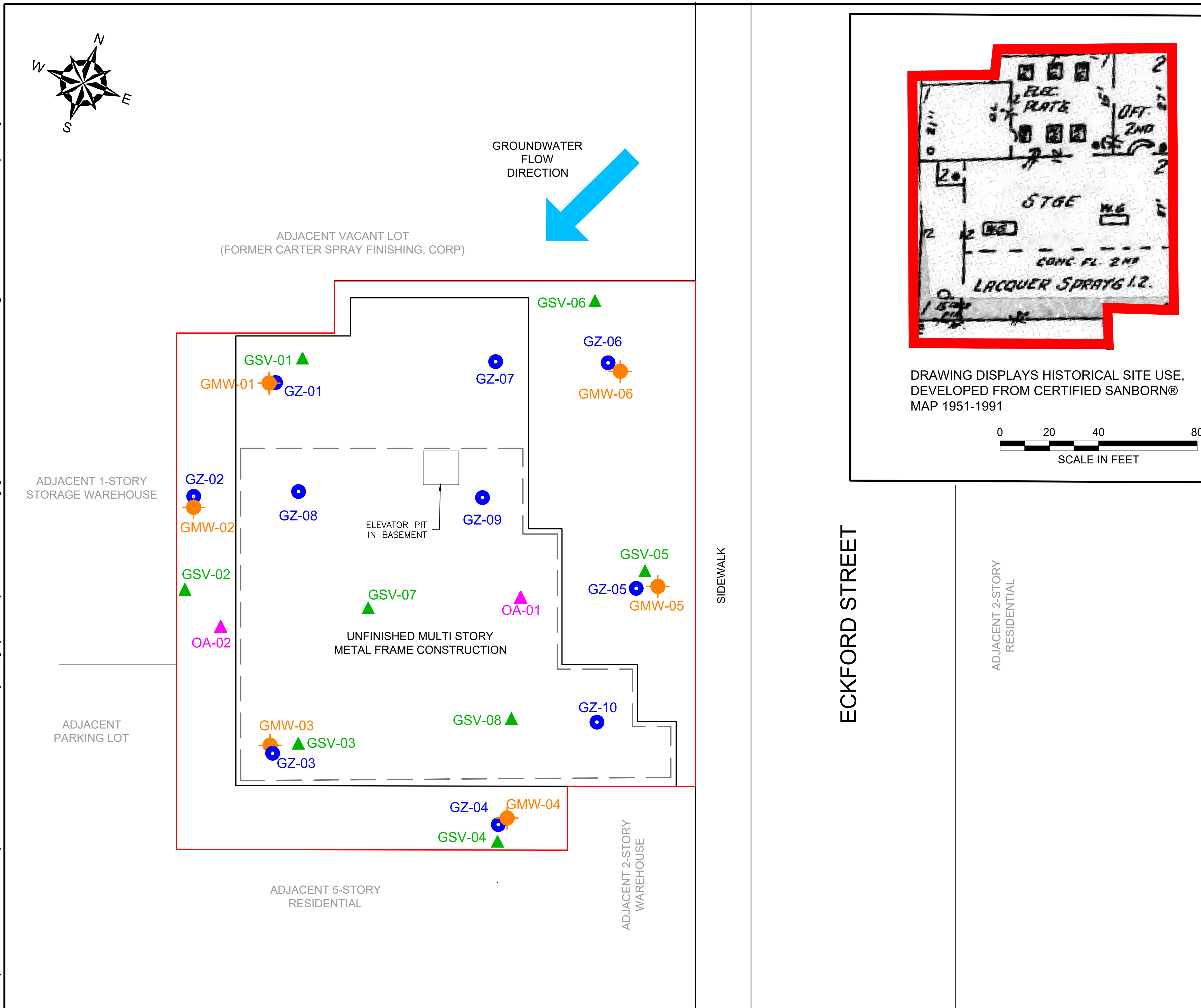
55 ECKFORD STREET
BROOKLYN, NEW YORK

HISTORICAL VOCS IN SOIL VAPOR

PREPARED BY: GZA GeoEnvironmental of NY, Engineers and Scientists, www.gza.com

PREPARED FOR: BROOKLYN PUBLIC LIBRARY WILLIAMSBURG

PROJ MGR: RM	REVIEWED BY: VW	CHECKED BY: VW	FIGURE
DESIGNED BY: RM	DRAWN BY: NQ	SCALE: 1"=20"	5
DATE: NOVEMBER 2024	PROJECT NO. 41.0163263.00	REVISION NO. -	SHEET NO. 1 OF 1



GENERAL NOTES

1. BASE MAP DEVELOPED FROM DRAWING TITLED "ADDITIONAL EXCAVATION AREA DIAGRAM, SKC–1", DATED AUGUST 30, 2024.
2. DRAWING DISPLAYS EXISTING BUILDING FOOTPRINT PROFILE AND PROPOSED CELLAR LAYOUT.

LEGEND

- APPROXIMATE SITE BOUNDARY
- BUILDING OUTLINE
- PARTIAL CELLAR
- GZ- APPROXIMATE SOIL BORING LOCATION
- GMW- APPROXIMATE MONITORING WELL LOCATION
- GSV- APPROXIMATE SOIL VAPOR SAMPLING LOCATION
- OA- APPROXIMATE AMBIENT AIR SAMPLING LOCATION
- 2012 PHASE II INFERRED GROUNDWATER FLOW DIRECTION

0 10 20 40
SCALE IN FEET

NO.	ISSUE/DESCRIPTION	BY	DATE

55 ECKFORD STREET
BROOKLYN, NEW YORK

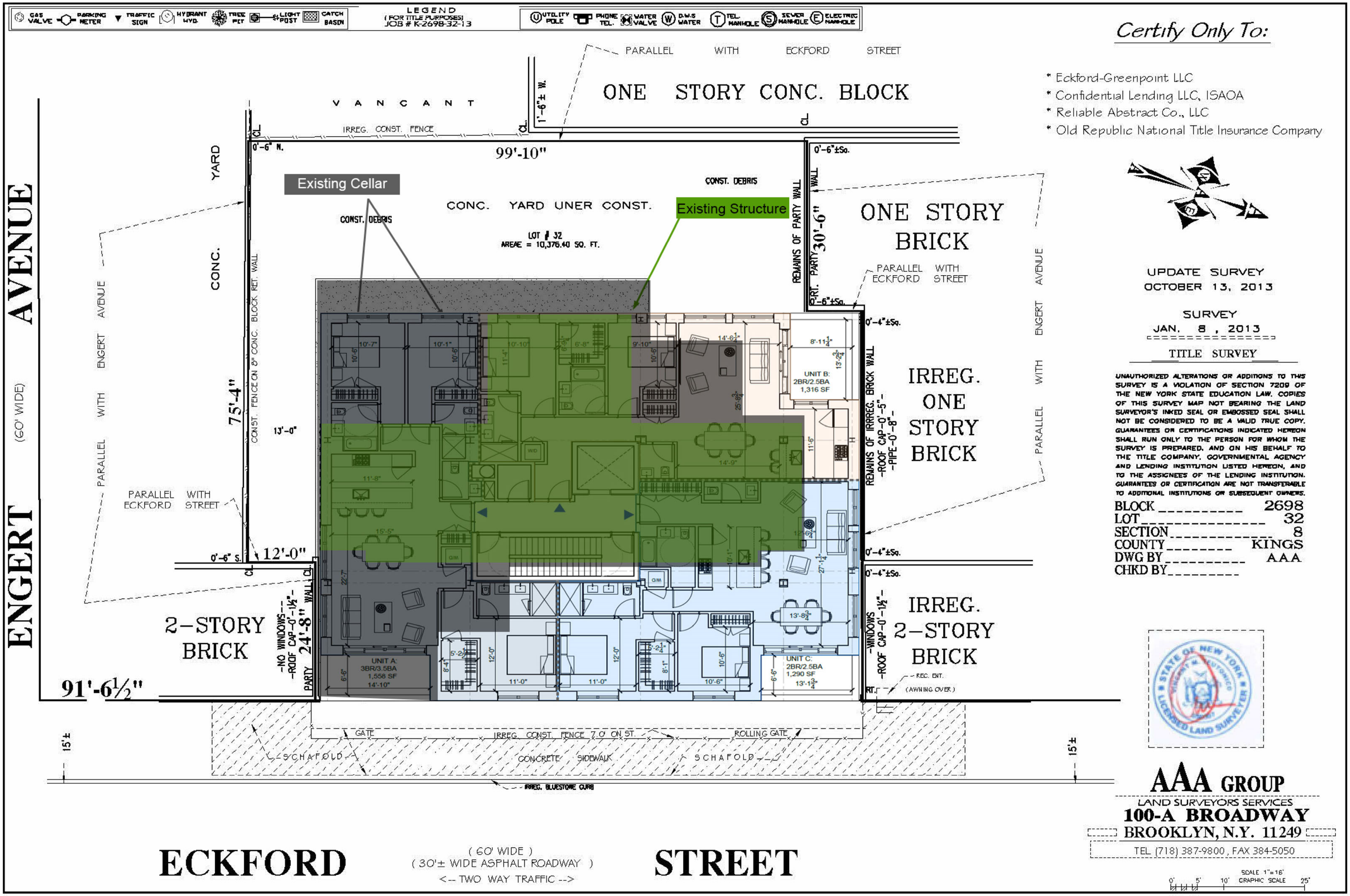
FIGURE 6 - REMEDIAL INVESTIGATION SAMPLE LOCATIONS

PREPARED BY: **GZA** GeoEnvironmental of NY Engineers and Scientists www.gza.com

PREPARED FOR: BROOKLYN PUBLIC LIBRARY WILLIAMSBURG

PROJ MGR: RM	REVIEWED BY: VW	CHECKED BY: VW	FIGURE
DESIGNED BY: RM	DRAWN BY: SG	SCALE: 1"= 20"	6
DATE: NOVEMBER 2024	PROJECT NO. 41.0163263.00	REVISION NO. -	SHEET NO.

Appendix A – Proposed Redevelopment Plans


LEGEND
(FOR TITLE PURPOSES)
JOB # K-2698-32-13
GAS VALVE
PARKING METER
TRAFFIC SIGN
HYDRANT HYD.
TREE PIT
LIGHT POST
CATCH BASIN
UTILITY POLE
PHONE TEL.
WATER VALVE
D.W.S. WATER
TEL. MANHOLE
SEWER MANHOLE
ELECTRIC MANHOLE
Certify Only To:
* Eckford-Greenpoint LLC
* Confidential Lending LLC, ISAOA
* Reliable Abstract Co., LLC
* Old Republic National Title Insurance Company
PARALLEL WITH ECKFORD STREET
ONE STORY CONC. BLOCK
VACANT
IRREG. CONST. FENCE
1'-6"± W.
99'-10"
0'-6" N.
0'-6"±So.
YARD
CONC.
Existing Cellar
Existing Structure
CONST. DEBRIS
CONC. YARD UNER CONST.
LOT # 32
AREAE = 10,376.40 SQ. FT.
ONE STORY BRICK
REMAINS OF PARTY WALL
30'-6"
PARALLEL ECKFORD WITH STREET
CONST. FENCE ON 8" CONC. BLOCK RET. WALL
75'-4"
13'-0"
PARALLEL WITH ENGERT AVENUE
(60' WIDE)
ENGERT AVENUE
UNIT B: 2BR/2.5BA 1,316 SF
UNIT A: 3BR/3.5BA 1,558 SF
UNIT C: 2BR/2.5BA 1,290 SF
IRREG. ONE STORY BRICK
REMAINS OF IRREG. BRICK WALL -ROOF CAP-0'-5" -PIPE-0'-8"
0'-4"±So.
12'-0"
0'-6" S.
2-STORY BRICK
-NO WINDOWS- -ROOF CAP-0'-1½" PARTY WALL 24'-8"
IRREG. 2-STORY BRICK
-WINDOWS- -ROOF CAP-0'-1½"
REC. ENT.
(AWNING OVER)
91'-6½"
GATE
IRREG. CONST. FENCE 7.0' ON ST.
ROLLING GATE
SCHAFOLD
CONCRETE SIDEWALK
15'±
IRREG. BLUESTONE CURB
ECKFORD STREET
(60' WIDE)
(30'± WIDE ASPHALT ROADWAY)
<-- TWO WAY TRAFFIC -->
UPDATE SURVEY
OCTOBER 13, 2013
SURVEY
JAN. 8, 2013
TITLE SURVEY
UNAUTHORIZED ALTERATIONS OR ADDITIONS TO THIS SURVEY IS A VIOLATION OF SECTION 7209 OF THE NEW YORK STATE EDUCATION LAW. COPIES OF THIS SURVEY MAP NOT BEARING THE LAND SURVEYOR'S INKED SEAL OR EMBOSSED SEAL SHALL NOT BE CONSIDERED TO BE A VALID TRUE COPY. GUARANTEES OR CERTIFICATIONS INDICATED HEREON SHALL RUN ONLY TO THE PERSON FOR WHOM THE SURVEY IS PREPARED, AND ON HIS BEHALF TO THE TITLE COMPANY, GOVERNMENTAL AGENCY AND LENDING INSTITUTION LISTED HEREON, AND TO THE ASSIGNEES OF THE LENDING INSTITUTION. GUARANTEES OR CERTIFICATION ARE NOT TRANSFERABLE TO ADDITIONAL INSTITUTIONS OR SUBSEQUENT OWNERS.
BLOCK 2698
LOT 32
SECTION 8
COUNTY KINGS
DWG BY AAA
CHKD BY
STATE OF NEW YORK LICENSED LAND SURVEYOR
AAA GROUP
LAND SURVEYORS SERVICES
100-A BROADWAY
BROOKLYN, N.Y. 11249
TEL (718) 387-9800, FAX 384-5050
SCALE 1"=16'
GRAPHIC SCALE
0' 5' 10' 25'

Appendix B – Quality Assurance Project Plan / Field Sampling Plan

Known for excellence.
Built on trust.

QUALITY ASSURANCE PROJECT PLAN (QAPP) / FIELD SAMPLING PLAN (FSP)

55 ECKFORD ST LLC SITE
55 Eckford Street
Brooklyn, New York 11222
Block 2698, Lot 32

Revised November 2024

PREPARED FOR:
55 Eckford St LLC
110-50 69th Avenue
Forest Hills, NY 11375

PREPARED BY:
Goldberg Zoino Associates of New York, P.C.
d/b/a GZA GeoEnvironmental of New York
104 West 29th Street, 10th Floor
New York, NY 10001

File No. 41.0163263.00

TABLE OF CONTENTS

FIGURES

TABLE

ATTACHMENTS

1.0 INTRODUCTION

This Quality Assurance Project Plan (QAPP) and Field Sampling Plan (FSP) presents the organization, objectives, planned activities, and specific quality assurance/quality control (QA/QC) procedures associated with the Remedial Investigation Work Plan (RIWP) at the 55 Eckford St, Brooklyn, NY (Site). **Figure 1** presents a Site location map.

This QAPP/FSP describes specific protocols for field sampling, sample handling and storage, chain-of-custody, laboratory analysis, and data handling and management. Preparation of the Plan was based on EPA Quality Assurance Project Plan guidance documents, including:

EPA Requirements for Quality Assurance Project Plans (EPA QA/R-5, March 2001); and

Guidance for Quality Assurance Project Plans (EPA QA/G-5, December 2002).

The data generated from the analysis of samples will be used to determine the extent of contamination, identify impacted targets, and to compare the results of the remedial actions to site-specific cleanup goals. Potential parameters to be analyzed, including their respective quantitation limits (QLs), and data quality levels (DQLs), are provided in **Tables 1A through 1C**.

2.0 PROJECT ORGANIZATION AND RESPONSIBILITY

A qualified person will coordinate and manage the Site sampling and analysis program, data reduction, QA/QC, data validation, analysis, and reporting. A Stephen M. Kline, P.E. is a qualified environmental professional (QEP), as defined by the New York State Department of Environmental Conservation (NYSDEC) and will direct the sampling activities and coordinate laboratory and drilling activities. The intent of this QAPP/FSP is to be performed the RI in accordance with the technical guidance applicable to Technical Guidance for Site Investigation and Remediation (DER-10), and Sampling, Analysis and Assessment of Per- and Polyfluoroalykly Substances (PFAS) under NYSDEC's Part 375 Remedial Programs dated April 2023.

A qualified person will ensure that the QA/QC plan is implemented and will oversee data validation. GZA's Senior Technical Specialist, Dr. Chunhua Liu will provide oversight and technical support for the sampling and analytical procedures followed acting as the project QA Officer. This individual has the broad authority to approve or disapprove project plans, specific analyses, and final reports. The QEP is independent from the data generation activities. In general, the QA officer will be responsible for reviewing and advising on all QA/QC aspects of this program.

Laboratories used will be New York State Department of Health Environmental (NYSDOH) Laboratory Approval Program (ELAP) certified laboratories. The laboratories will communicate directly with the sampler regarding the analytical results and reporting and will be responsible for providing all labels, sample containers, field blank water, trip blanks, shipping coolers, and laboratory documentation. Qualifications of the QA officer are provided in **Attachment A.**

3.0 QA OBJECTIVES FOR DATA MANAGEMENT

The analytical data will be provided by the laboratory using the NYSDEC Category B deliverable format. Analytical data collected for disposal characteristics that may be requested by off-site soil or wastewater disposal facilities will be provided in the format that the facility requests.

All analytical measurements will be made so that the results are representative of the media sampled and the conditions measured. Data will be reported in consistent dry weight units for solid samples [i.e., micrograms per kilogram (µg/kg) and/or milligram per kilogram (mg/kg), micrograms per liter (µg/L) or milligrams per liter (mg/L) for aqueous samples and in micrograms per cubic meter (µg/m^3) for soil vapor and air samples. **Table 2** presents the proposed samples, sampling and analytical parameters, analytical methods, sample preservation requirements and containers.

Quantitation Limits (QLs) are laboratory-specific and reflect those values achievable by the laboratory performing the analyses. Data Quality Levels (DQLs) are those reporting limits required to meet the objectives of the program (i.e., program action levels, cleanup standards, etc.). Data Quality Objectives (DQOs) define the quality of data and documentation required to support decisions made in the various phases of the data collection activities. The DQOs are dependent on the end uses of the data to be collected and are also expressed in terms of objectives for precision, accuracy, representativeness, completeness, and comparability.

The analytical methods to be used at this Site provide the highest level of data quality and can be used for purposes of risk assessment, evaluation of remedial alternatives and verification that cleanup standards have been met. However, in order to ensure that the analytical methodologies are capable of achieving the DQOs, measurement performance criteria have been set for the analytical measurements in terms of accuracy, precision, and completeness.

The overall QA objective is to develop and implement procedures for field sampling, chain-of-custody, laboratory analysis, and reporting which will provide results that are scientifically valid, and the levels of which are sufficient to meet DQOs. Specific procedures for sampling, chain of custody, laboratory instrument calibration, laboratory analysis, reporting of data, internal quality control, and corrective action are described in other sections of this QAPP/FSP.

Tables 3, **4**, and **5** present the precision and accuracy requirements for each parameter to be analyzed. For quantitation limits for parameters associated with soil, sediment, and solid waste samples, the laboratory will be required to attempt to meet or surpass the parameter-specific limits listed in 6 NYCRR Part 375.

For quantitation limits for parameters associated with groundwater samples, the laboratory will be required to attempt to meet or surpass the parameter-specific limits for groundwater from the Division of Water Technical and Operational Guidance Series (TOGS 1.1.1) Ambient Water Quality Standards and Guidance Values. In certain instances, if the TOGS criteria are not achievable due to analytical limitations, the laboratory will report the lowest possible quantitation limit.

For quantitation limits for parameters associated with soil gas samples, the laboratory will be required to meet the parameter-specific limits from EPA's Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance), Table 3c-SG:

Question 5 Soil Gas Screening Levels for Scenario-Specific Vapor Attenuation Factors (**α=**2H10^{-3}), November 2002. In certain instances, if these criteria are not achievable due to analytical limitations, the laboratory will report the lowest possible quantitation limits (see **Tables 1A through 1C** for affected analytes).

The QA objectives are defined as follows:

Accuracy is the closeness of agreement between an observed value and an accepted reference value. The difference between the observed value and the reference value includes components of both systematic error (bias) and random error.

Accuracy in the field is assessed through the adherence to all field instrument calibration procedures, sample handling, preservation, and holding time requirements, and through the collection of equipment blanks prior to the collection of samples for each type of equipment being used (e.g., split spoons, groundwater sampling pumps).

The laboratory will assess the overall accuracy of their instruments and analytical methods (independent of sample or matrix effects) through the measurement of "standards," materials of accepted reference value. Accuracy will vary from analysis to analysis because of individual sample and matrix effects. In an individual analysis, accuracy will be measured in terms of blank results, the percent recovery (%R) of surrogate compounds in organic analyses, or %R of spiked compounds in matrix spikes (MSs), matrix spike duplicates (MSDs) and/or laboratory control samples (LCSs). This gives an indication of expected recovery for analytes tending to behave chemically like the spiked or surrogate compounds. **Tables 3**, **4**, and **5** summarize the laboratory accuracy requirements.

Precision is the agreement among a set of replicate measurements without consideration of the "true" or accurate value: i.e., variability between measurements of the same material for the same analyte. Precision is measured in a variety of ways including statistically, such as calculating variance or standard deviation.

Precision in the field is assessed through the collection and measurement of field duplicates (one extra sample in addition to the original field sample). Field duplicates will be collected at a frequency of one per twenty investigative samples per matrix per analytical parameter, with the exception of the Toxicity Characteristic Leaching Procedure (TCLP) parameters and parameters associated with wastewater samples. Precision will be measured through the calculation of relative percent differences (RPDs). The resulting information will be used to assess sampling and analytical variability. Field duplicate RPDs must be $\leq$ 50 for soil samples and $\leq$ 30 for aqueous samples. These criteria apply only if the sample and/or duplicate results are >5x the quantitation limit; if both results are $\leq$ 5x the quantitation limit, the criterion will be doubled. Due to the uncertainty of available representative soil gas volume, field duplicates will not be collected for this matrix.

Precision in the laboratory is assessed through the calculation of RPD for duplicate samples. For organic soil, sediment and water analyses, laboratory precision will be assessed through the analysis of MS/MSD samples and field duplicates. For the inorganic analyses, laboratory precision will be assessed through the analysis of matrix duplicates and field duplicates. For soil gas analyses, laboratory precision will be assessed through the analysis of matrix duplicates. MS/MSD samples or matrix duplicates will be performed at a frequency of one per twenty investigative samples per matrix per parameter. **Tables 3**, **4**, and **5** summarize the laboratory precision requirements.

Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount that was expected to be obtained under normal conditions. “Normal conditions” are defined as the conditions expected if the sampling plan was implemented as planned.

Field completeness is a measure of the amount of (1) valid measurements obtained from all the measurements taken in the project and (2) valid samples collected. The field completeness objective is greater than 90 percent.

Laboratory completeness is a measure of the amount of valid measurements obtained from all valid samples submitted to the laboratory. The laboratory completeness objective is greater than 95 percent.

Representativeness is a qualitative parameter that expresses the degree to which data accurately and precisely represent either a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition within a defined spatial and/or temporal boundary. To ensure representativeness, the sampling locations have been selected to provide coverage over a wide area and to highlight potential trends in the data. In addition, field duplicate samples will provide an additional measure of representativeness at a given location.

Representativeness is dependent upon the proper design of the sampling program and will be satisfied by ensuring that the Work Plans and QAPP are followed, and that proper sampling, sample handling, and sample preservation techniques are used.

Representativeness in the laboratory is ensured by using the proper analytical procedures, appropriate methods, and meeting sample holding times.

Comparability expresses the confidence with which one data set can be compared to another. Comparability is dependent upon the proper design of the sampling program and will be satisfied by ensuring that the Work Plans and QAPP are followed and that proper sampling techniques are used. Maximization of comparability with previous data sets is expected because the sampling design and field protocols are consistent with those previously used.

Comparability is dependent on the use of recognized EPA or equivalent analytical methods and the reporting of data in standardized units. Laboratory procedures are consistent with those used for previous sampling efforts.

4.0 SAMPLING PLAN

Environmental sampling may include soil, groundwater, soil vapor and sediment sampling. Additionally, wastes generated during remediation or development will be sampled and tested for characterization for disposal. Direct push drilling (GeoProbe®), sonic drilling, and/or test pit excavations will be the preferred methods for obtaining subsurface soil samples. However, other drilling methods including mud rotary and drive and wash may also be used if warranted by site conditions. Hand auger and/or hand-held sampling equipment will be the preferred method for collecting surficial and/or shallow soil samples. Groundwater samples will be collected using bailers or peristaltic, bladder or submersible pumps. Soil vapor samples will be collected in SUMMA® canisters. Performing grab or composite sampling using appropriate hand-held sampling equipment will be the preferred method for waste characterization sampling.

4.1. Utility Clearance

New York State law requires that New York 811 be notified at least three working days prior to subsurface work is conducted to initiate the utility locating activities. Companies with subsurface utilities present will locate and mark out subsurface utility lines. However, New York 811 contractors will only locate utilities on public property and rights-of-way.

Electric lines, gas lines, storm and sanitary sewers, and communication lines will need to be located by survey and geophysical survey prior to subsurface investigations. If additional subsurface utility locating is considered necessary, a private locating company will be contracted to locate on-site utilities that have not been identified by New York 811 contractors or the Owner.

4.2. Test Pit Soil Sampling

Test pitting and/or excavating may be conducted during the RI, if necessary. Test pits will allow for visual characterization of subsurface soil conditions and the collection of grab soil samples. Prior to soil sample collection, headspace screening will be conducted to evaluate whether analysis of soil samples is warranted, and if so, which soils should be collected.

Prior to completing a test pit or excavation, underground utilities should be identified as discussed in **Section 4.1**. Should active, underground utilities be located in the vicinity of the intended excavation, hand or vacuum excavation methods should be employed, as appropriate, to confirm the location and depth prior to initiating the excavation.

The size and type of excavator used to complete the test pits will be selected based on the anticipated depth and overall size of the excavation required to meet the project objectives. At no time will field personnel enter a test pit/excavation unless it has been deemed safe to enter by an Excavation Competent person based on training and experience required by 29CFR 1926.652.

Grab soil/solid samples will be collected from the material or interval in question by retrieving a volume for analysis using a clean stainless steel, aluminum, or mild steel/ disposable scoop, trowel, spoon, or bucket auger and placing the soil in a cleaned stainless steel pan for homogenization before inserting into the sample container. Samples collected for analysis for volatile organic compounds and total organic halides will not be homogenized. Samples for volatile organics analysis and total organic halides will be placed directly into the sample container.

Composite samples will be collected in the same manner described above, except that the discrete sample volumes will be placed in a clean stainless steel pan and mixed to form the composite. Composite sampling will be performed for the following objectives:

- Waste characterization;
- Determination of the suitability of the soil for on-site re-use; and
- Evaluation of health and safety requirements for workers that will disturb the soil during subsequent construction work.

4.3. Direct Push Drilling Soil Sampling

This drilling method is typically used to collect shallow overburden soils and create boreholes for temporary monitoring well installations, or soil vapor sampling points. Sampling will be performed using four or five-foot-long acetate sleeves that will be advanced continuously to the desired depth below the surface. Soil samples from each sleeve will be screened using a photoionization detector (PID) to detect possible organic vapors. Organic vapor screening will be performed by slicing open the acetate sleeve, making a small slice in the soil column with a clean knife or sampling tool, inserting the PID probe and pushing the slice closed, and monitoring the soil for approximately 5 to 10 seconds. This procedure will be repeated at intervals along the soil column at the field geologist's discretion.

The samples will be examined for staining, discoloration, odors, and debris indicative of contamination (ash, coal fragments, wood chips, cinders, petroleum staining, etc.). Samples for laboratory analysis will be collected from the six-inch interval most likely to be contaminated, based on PID readings, discoloration, staining, and the field geologist's judgment (field conditions may require a section longer than six inches to make sufficient sample; however, this decision will be field-based).

The samples will be collected by cutting the soil in two places with a decontaminated steel, stainless steel, or aluminum trowel, spoon, or knife and homogenized in a decontaminated stainless steel pan before being placed in the sample bottles. Samples collected for analysis for VOCs and total organic halides will be placed directly into the sample containers without homogenization (as per EPA sampling method 5035A). Samplers will wear phthalate-free gloves such as nitrile (no latex will be used) and will avoid contact of the gloves with the sample. Clean metal/disposable instruments will be used to transfer samples. If there is insufficient soil volume in the spoon, then this will be made up by attempting a second direct push sleeve at the same depth, or by using the next immediate sample interval above or below this depth, if appropriate. If there is no recovery, then the sample depth will be skipped, and drilling will progress to the next depth interval.

Soil samples will be collected in laboratory provided containers and transported to a NYSDOH ELAP certified laboratory, under proper chain of custody procedures for analysis. Once the sample containers are filled, they will be immediately placed in the cooler with ice (in Ziploc plastic bags to prevent leaking) or synthetic ice packs to maintain the samples at below 4^{o}C.

4.4. Sonic Drill Rig Soil Sampling

The sonic drilling system employs simultaneous high frequency vibration and low speed rotational motion along with down pressure to advance the cutting shoes of the drill string. This technique provides a continuous soil core and generates minimal cuttings. Due to the continuous sampling of the system, accurate depictions of the stratigraphy and lithology of the overburden are obtained (minimal sloughing). Additionally, few cuttings are mobilized to the surface. Most of the formation material enters the core barrel, except small amounts, which are pushed into the borehole wall.

Drilling operations take place from the drill platform, which is about 4 feet above ground. Steel drill casing and core barrel are connected to the head from the work platform/support truck and are then hoisted to vertical in the derrick. Tool joints are connected and broken by a hydraulic vise/wrench that is in the base of the derrick. The sonic head is able to pivot 90 degrees to facilitate connection of the drilling rods.

The sonic drilling system uses an override core barrel system and can create a 4- or 6-inch diameter borehole. This is followed by the override casing drilled to the same depth as the core barrel cutting shoe. The core barrel is then removed, and cores are extruded into plastic sleeves. The outer casing prevents cross contamination and formation mixing and allows for a very controlled placement of wells.

GZA proposes to use a track-mounted sonic drill rig collecting soil continuously from either five-foot long or 10-foot long cores. Samples will be extruded from the core barrel into polyethylene sleeves. Once the plastic sleeve is cut open, soil will be screened using a PID to detect possible organic vapors. Organic vapor screening will be performed by making a small slice in the soil column with a clean knife or sampling tool, inserting the PID probe and pushing the slice closed, and monitoring the soil for approximately 5 to 10 seconds. This procedure will be repeated at intervals along the soil column at the field geologist's discretion.

The samples will be examined for staining, discoloration, odors, and debris indicative of contamination (ash, coal fragments, wood chips, cinders, petroleum staining, etc.) Samples for laboratory analysis will be collected from the six-inch interval most likely to be contaminated, based on PID readings, discoloration, staining, and the field geologist's judgment (field conditions may require a section longer than six inches to make sufficient sample; however, this decision will be field-based).

The samples will be collected by cutting the soil in two places with a decontaminated steel, stainless steel, or aluminum trowel, spoon, or knife and homogenized in a decontaminated stainless steel pan before being placed in the sample bottles. Samples collected for analysis for VOCs and total organic halides will be placed directly into the sample containers without homogenization (as per EPA sampling method 5035A). Samplers will wear phthalate-free gloves such as nitrile (no latex will be used) and will avoid contact of the gloves with the sample. Clean metal/disposable instruments will be used to transfer samples. If there is insufficient soil volume in the spoon, then this will be made up by attempting a second direct push sleeve at the same depth, or by using the next immediate sample interval above or below this depth, if appropriate. If there is no recovery, then the sample depth will be skipped, and drilling will progress to the next depth interval.

Soil samples will be collected in laboratory provided containers and transported to a NYSDOH ELAP certified laboratory, under proper chain of custody procedures for analysis. Once the sample containers are filled, they will be immediately placed in the cooler with ice (in Ziploc plastic bags to prevent leaking) or synthetic ice packs to maintain the samples at below 4°C.

4.5. Temporary Well Point Installation and Sampling

If proposed for site characterization, temporary well points will be immediately installed in drilled soil direct-push soil borings by placing a one-inch diameter PVC screen and riser pipe directly into the borehole. No additional materials will be placed around the annual space. The screen will be set so as to straddle the water table. Temporary wells will not be purged prior to sample collection. Depth to water will be measured in each well point to provide data to approximate groundwater flow direction.

Groundwater samples will be collected from the temporary well point using a dedicated microbailer. The samples will be collected in sample bottles (pre-preserved, if appropriate), placed in iced coolers and removed from light immediately after collection. In addition, all sample bottles must be filled to the top so that no aeration of the samples occurs during transport. All bottles will be filled to avoid cascading and aeration of the samples, the goal being to minimize any precipitation of colloidal matter. Samples for dissolved metals will be collected in unpreserved containers and will be filtered and preserved at the laboratory within 24 hours of sampling. Samples will be transported to a NYSDOH ELAP certified laboratory under proper chain of custody procedures for analysis.

Screen and riser pipes will be removed from the borehole and the borehole will be backfilled.

4.6. Permanent Well Installation and Sampling

Groundwater sampling of permanent monitoring wells is described according to the following distinct phases of this work: well installation/construction, well development, well purging, and well sampling.

4.6.1. *Well Installation/Construction*

To collect representative groundwater samples, soil borings drilled with the direct-push technology (DPT) drilling method will be converted into permanent two-inch diameter monitoring wells. Groundwater monitoring wells will be constructed of threaded two-inch diameter PVC well casing and 20-slot well screen (to investigate the potential of floating product). The 10-foot screen will be set seven feet below the measured water table. Clean silica sand, Morie No. 1 or equivalent, will be placed in the annular space around the well to a minimum of one foot above the top of the well screen, two feet being optimal. Solid PVC riser, attached to the well screen, will extend to grade or above if the well is a stick-up. For a two-inch diameter well, the annular space for the filter pack should be 4 inches thick. A two-foot thick bentonite seal will then be placed above the sand pack and moistened with potable water for a minimum of 15 minutes before backfilling the remaining space with a cement-bentonite grout. If warranted by depth, filling will be completed using a tremie pipe placed below the surface of the grout. A stick-up or flush-mount protective casing with a locking well cap will then be installed, and a measuring point marked on each PVC well riser. Well construction diagrams will be prepared for each well.

4.6.2. Well Development

Following installation, the groundwater monitoring wells will be developed using a two-inch diameter submersible pump(s) (or equivalent) until the water is reasonably free of turbidity and field readings (pH, conductivity, temperature, and dissolved oxygen) sufficiently stabilize. Fifty nephelometric turbidity units (NTUs) or less will be the turbidity goal but not an absolute value. The wells will be developed aggressively to remove fines from the formation and sand pack. The wells will be allowed to equilibrate for seven days prior to sampling. The volume of water removed, the well development time, and field instrument readings will be recorded in the logbook.

4.6.3. Well Purging

The objective is to purge monitoring wells until turbidity stabilizes to a level as low as possible and this parameter will be given the greatest weight in determining when groundwater sampling may begin. With this objective in mind, a low-flow pump will be used to avoid entrainment of particulates within the well or from the formation. Groundwater from each well will be purged until parameters have stabilized. A turbidity level of fifty NTUs or less is the well purging goal, but not an absolute value before sampling. Other field parameters including temperature, conductivity, pH, and dissolved oxygen (DO) will also be monitored. As practical, all field measurements will be taken from the flow cell and will be recorded during and after purging, and before sampling. Field parameters should generally be within ±10 percent for three consecutive readings, one minute apart, prior to sampling.

Upon opening each monitoring well and point, the concentration of VOCs in the headspace will be measured using a PID and water level measurements will be recorded using an electronic interface probe. The depth to product (if present), depth to water, and the total depth will be measured from the top of the marked PVC casings. Water level and free product measurements will first be made and the volume of water in the well determined. The volume of water in the well will be calculated so that the number of well volumes purged and an estimate of the time required to purge the well can be made. Before sampling, the wells will be purged utilizing a low-flow submersible stainless steel pump using dedicated high-density polyethylene (HDPE) tubing connected to a flow cell. Very low purging rates are proposed, on the order of 100 ml/minute to 500 ml/minute, to minimize suspension of particulate matter in the well.

Purging will be done with the pump intake placed at the midpoint of the well screen or the midpoint of the water column (to be determined based on the depth and length of the screen interval) to ensure that all stagnant water in the well is removed, while not stirring up sediment that may have accumulated on the bottom of the well. Equipment will be lowered into the well very carefully to prevent suspension of bottom sediment and subsequent entrainment onto sampling equipment. Surging will be avoided. Tubing will be replaced between each well. Pumps must be carefully cleaned between wells according to the procedures specified in **Section 4.15,** below. It is anticipated that no more than three well volumes will be purged in order for turbidity to reach a minimum and the other parameters to stabilize. Ideally, pumping rates will be at a rate so that no drawdown of the groundwater level occurs (i.e., pumping rate is less than recharge rate). During purging, the sampler will actively monitor and track the volume of water purged and the field parameter readings. Data will be recorded in the field logbook. For example, the sampler will record the running total volume purged from each well and note the readings for the corresponding field parameters.

4.6.4. Well Sampling

Samples will be collected via USEPA low-flow methodology. One groundwater sample will be collected after the water quality parameters have stabilized. Stabilization is defined by three successive readings that are within ± 0.1 for pH, ± 3% for conductivity, ± 10 mv for ORP, and ± 10% for DO. Purging will continue until stabilization is met and turbidity is <10 NTU. If turbidity < 10 NTU cannot be reasonably achieved, samples can be collected when turbidity is < 50 NTU.

Once groundwater conditions have stabilized and groundwater levels have recovered, samples will be collected from the low-flow peristaltic pump. All non-disposable/non-dedicated (re-usable) sampling equipment will be cleaned according to the procedures specified in **Section 4.15**.

The samples will be collected in sample bottles (pre-preserved, if appropriate), placed in iced coolers and removed from light immediately after collection. In addition, all sample bottles must be filled to the top so that no aeration of the samples occurs during transport. All bottles will be filled to avoid cascading and aeration of the samples, the goal being to minimize any precipitation of colloidal matter. Samples will be transported to a NYSDOH ELAP certified laboratory under proper chain of custody procedures for analysis. Samples for dissolved metals will be collected in unpreserved containers and will be filtered and preserved at the laboratory within 24 hours of sampling.

4.7. <u>Borehole Abandonment</u>

Soils extracted during the advancement of the borings will be used to backfill the borings, provided that the borings are not to be used for installation of permanent monitoring wells. However, soils that exhibit "gross" contamination, as evidenced by staining or free-phase product, or any visual, olfactory, or PID readings greater than 100 ppm above background, will be managed in accordance with **Section 9**. In this event, bentonite chips or pellets to within 0.5 feet below ground surface. The ground surface will be restored to a similar condition as the surrounding grade (e.g., topsoil, asphalt, or concrete).

4.8. <u>Monitoring Well Abandonment</u>

There may be occasions when monitoring wells will require abandonment. For temporary monitoring wells, the approach will be to pull the PVC well materials from the borehole and backfill the remaining open portion of the borehole with cement/bentonite grout to approximately 0.5 feet below the ground surface. The ground surface will be restored to a similar condition as the surrounding grade (e.g., topsoil, asphalt, or concrete). For permanent overburden and bedrock monitoring wells, depending on the site-specific subsurface geologic conditions and nature of contamination, the abandonment approach will be in accordance with NYSDEC Policy CP-43 – Groundwater Monitoring Well Decommissioning Policy.

4.9. Soil Reuse and Worker Health & Safety Sampling

Soil reuse sampling may be performed to determine whether the soil can be reused elsewhere on the Site, or to determine whether contaminant levels in the soil would warrant OSHA 40-hour HAZWOPER training for workers disturbing the soil during post-remediation construction activities. This sampling would consist of compositing discrete soil samples from borings advanced by direct push (see **Section 4.3**), or during test pits following the procedures outlined in **Section 4.2**.

4.10. Waste Characterization Sampling

Waste classification sampling may be conducted to characterize soil, liquids and/or groundwater for the purpose of proper off-site waste disposal. Specific methods for sampling liquid and solid wastes are briefly discussed below.

4.10.1. Solid Waste

Solid sampling methods include utilizing dedicated stainless steel or HDPE scoops/shovels, triers, and thiefs. Scoops and shovels are the preferred method for sampling solids from piles or containers. Stainless steel triers are similar to a scoop and are used for the collection of a core sample of a solid material.

4.10.2. Liquid Waste

Liquid sampling methods include utilizing dedicated dippers, glass tube samplers, pump and tubing, kemmerer bottles, and Bacon Bomb samplers. Dippers are used to collect samples from the surface of the liquid and are appropriate for wastes that are homogeneous. Glass tube samplers consist of glass tubes of varying length and diameter used to collect a full-depth liquid sample from a drum or similar container. Pump and tubing (e.g., bladder pump or peristaltic pump) are used to collect liquid samples from a depth (up to approximately 20 feet below grade), and are typically relied upon for sampling subsurface structures, such as underground storage tanks. To minimize the loss of volatile organic components in the liquid, the lowest achievable flow rate is utilized for collecting the sample by this method. Kemmerer bottles and Bacon Bomb samplers are discrete-depth samplers. These samplers are lowered into the liquid and opened to collect a sample at a desired depth.

4.10.3. Grab versus Composite Sampling

Waste characterization of a liquid or a solid can involve grab or composite sampling depending upon the homogeneity and the volume of the waste. Grab sampling consists of collecting a discrete sample or samples of a material and submitting each sample for separate analysis. Grab sampling is appropriate for characterizing small quantities of waste as well as waste streams of varying content (e.g., drums of different contents). Composite sampling consists of taking discrete grab samples of a material and combining them into a smaller number of samples for analysis. Composite sampling generally is appropriate for large volumes of a homogenous waste material, such as a pile of soil or construction debris. The specific number of composite and grab samples largely will depend upon the size and nature of the waste pile (i.e., cubic yards) as well as the analysis required for characterization of the waste.

4.11. Soil Gas Sampling

A direct-push drill rig will be utilized to drive rods with a decontaminated stainless steel probe to the desired sample depth, which will be a minimum of 5 feet bgs or two feet above the water table if groundwater is present at 5 feet. The soil gas probe will then be purged at a flow rate not greater than 0.2 liters/minute to evacuate one to three volumes using a photoionization detector (PID) with an integrated vacuum pump (MiniRAE 3000 or appropriate alternate). Peak and stabilized PID readings will be recorded prior to sample collection. Following the stabilization period, each probe will be connected to an evacuated laboratory-supplied 6-liter SUMMA® canister. SUMMA® canisters are passivated stainless steel vessels that have been cleaned and certified contaminant-free by the contract laborer. After connecting the SUMMA® canister to the soil gas probe, a regulator valve on the canister will be opened and the vacuum will slowly draw the sample into the canister over a period of 20 minutes. The samples will not be drawn at greater than 0.2 liters per minute. Quantitation limits for all analytes range between 1.6 ppbV and 4.0 ppbV, depending on the compound. After collecting the soil gas sample, the valve will be closed and disconnected from the soil gas probe. The soil-gas samples will be transported to a NYSDOH ELAP certified laboratory for TO-15 analysis.

Prior to sample collection, helium will be used as a tracer gas to evaluate the potential for infiltration of outdoor air into the sample. Subsequent rounds of soil gas sampling would include the use of tracer gas only if the initial round of sampling indicates that outdoor air has the potential to influence soil gas sample results.

When soil vapor samples are collected, the following conditions that may influence the interpretation of results will be documented:

- Identification of any nearby commercial or industrial buildings that likely uses volatile organic compounds;
- A sketch of the Site, showing streets, neighboring commercial or industrial facilities (with estimated distances to the Site, and soil-gas sampling locations);

- Weather conditions (e.g., precipitation, outdoor temperature, barometric pressure, wind speed and direction); and
- Any pertinent observations, such as odors or readings from field instrumentation.

4.12. Ambient Air Sampling

Ambient air samples will be collected with an evacuated laboratory-supplied 6-liter SUMMA® canister. SUMMA® canisters are passivated stainless steel vessels that have been cleaned and certified contaminant-free by the contract laborer. The sample will be set at an elevation of approximately 4 to 5 feet above grade, to represent breathing zone air quality conditions. The samples will not be drawn at greater than 0.2 liters per minute. After collecting the ambient air sample, the valve will be closed, and the canister will be labeled with the necessary information. The soil-gas samples will be transported to a NYSDOH ELAP certified laboratory for TO-15 analysis.

When ambient air samples are collected, the following conditions that may influence the interpretation of results will be documented:

- Identification of any nearby commercial or industrial buildings that likely uses volatile organic compounds;
- A sketch of the Site, showing streets, neighboring commercial or industrial facilities (with estimated distances to the Site, and soil-gas sampling locations);
- Weather conditions (e.g., precipitation, outdoor temperature, barometric pressure, wind speed and direction); and
- Any pertinent observations, such as odors or readings from field instrumentation.

4.13. QC Sample Collection

QC samples will include equipment blanks, trip blanks, field duplicates and MS/MSDs.

Equipment blanks will consist of distilled water and will be used to check for potential contamination of the equipment that may cause sample contamination. Equipment blanks will be collected by routing the distilled water through the sampling equipment prior to sample collection. Equipment blanks will be submitted to the laboratory at a frequency of one per day per matrix per type of equipment being used per parameter. Equipment blanks will not be collected with samples for analysis for TCLP parameters, parameters associated with wastewater samples, samples collected for disposal purposes, soil gas samples, chip samples, wipe samples and samples collected for grain size analyses.

Trip blanks will consist of distilled water (supplied by the laboratory) and will be used to assess the potential for volatile organic compound contamination of groundwater samples due to contaminant migration during sample shipment and storage. Trip blanks will be transported to the site unopened, stored with the investigative samples, and kept closed until analyzed by the laboratory. Trip blanks will be submitted to the laboratory at a frequency of one per cooler that contains groundwater samples for analysis for VOCs.

Field duplicates are an additional aliquot of the same sample submitted for the same parameters as the original sample. Field duplicates will be used to assess the sampling and analytical reproducibility. Field duplicates will be collected by alternately filling sample bottles from the source being sampled. Field duplicates will be submitted at a frequency of one per 20 samples for all matrices and all parameters with the exception of TCLP parameters, parameters associated with wastewater samples, samples collected for waste characterization purposes, chip samples, wipe samples and samples collected for grain size analyses. Soil gas field duplicates will be obtained by using a tubing a T-splitter.

MSs and MSDs are two additional aliquots of the same sample submitted for the same parameters as the original sample. However, the additional aliquots are spiked with the compounds of concern. Matrix spikes provide information about the effect of the sample matrix on the measurement methodology. MS/MSDs will be submitted at a frequency of one per 20 investigative samples per matrix for organic parameters for soil, sediment, and groundwater. MSs will be submitted at a frequency of one per 20 investigative samples per matrix for inorganic parameters.

4.14. Sample Preservation and Containerization

The analytical laboratory will supply the sample containers for the chemical samples. These containers will be cleaned by the manufacturer to meet or exceed all analyte specifications established in the latest U.S. EPA's *Specifications and Guidance for Contaminant-Free Sample Containers*. Certificates of analysis are provided with each bottle lot and maintained on file to document conformance to EPA specifications. The containers will be pre-preserved, where appropriate (see **Table 2**).

Table 6 presents a summary of QC sample preservation and container requirements.

4.15. Equipment Decontamination

Re-usable HDPE, stainless steel, and aluminum sampling equipment shall be cleaned between each use in the following manner:

- Wash/scrub with a biodegradable degreaser ("Simple Green") if there is oily residue on equipment surface
- Tap water rinse
- Wash and scrub with Alconox and water mixture
- Tap water rinse
- Distilled/deionized water rinse

- Air dry

Cleaned equipment shall be wrapped in aluminum foil if not used immediately after air-drying.

Groundwater sampling pumps will be cleaned by washing and scrubbing with an Alconox/water mixture, rinsing with tap water and irrigating with distilled/deionized water.

5.0 DOCUMENTATION AND CHAIN-OF-CUSTODY

5.1. <u>Sample Collection Documentation</u>

5.1.1. Field Notes

Field team members will keep a field logbook to document all field activities. Field logbooks will provide the means of recording the chronology of data collection activities performed during the remediation. As such, entries will be described in as much detail as possible so that a particular situation could be reconstructed without reliance on memory.

The logbook will be a bound notebook with water-resistant pages. Logbook entries will be dated, legible, and contain accurate and inclusive documentation of the activity. The title page of each logbook should contain the following:

- Person to whom the logbook is assigned
- The logbook number
- Project name and number
- Site name and location
- Project start date
- End date

Entries into the logbook will contain a variety of information. At the beginning of each entry, the date, start time, weather, and names of sampling team members present will be entered. Each page of the logbook will be signed and dated by the person making the entry. All entries will be made in permanent ink, signed, and dated and no erasures or obliterations will be made. If an incorrect entry is made, the information will be crossed out with a single strike mark that is signed and dated by the sampler. The correction shall be written adjacent to the error.

Field activities will be fully documented. Information included in the logbook should include, but may not be limited to, the following:

- Chronology of activities, including entry and exit times
- Names of all people involved in sampling activities
- Level of personal protection used

- Any changes made to planned protocol
- Names of visitors to the site during sampling and reason for their visit
- Sample location and identification
- Changes in weather conditions
- Dates (month/day/year) and times (military) of sample collection
- Measurement equipment identification (model/manufacturer) and calibration information
- Sample collection methods and equipment
- Sample depths
- Whether grab or composite sample collected
- How sample composited, if applicable
- Sample description (color, odor, texture, etc.)
- Sample identification code
- Tests or analyses to be performed
- Sample preservation and storage conditions
- Equipment decontamination procedures
- QC sample collection
- Unusual observations
- Record of photographs
- Sketches or diagrams
- Signature of person recording the information

Field logbooks will be reviewed on a daily basis by the Field Team Leader. Logbooks will be supported by standardized forms.

5.1.2. Chain-of-Custody Records

On a regular basis (daily or on such a basis that all holding times will be met), samples will be transferred to the custody of the respective laboratories, via third-party commercial carriers or via laboratory courier service.

Chain-of-custody records are initiated by the samplers in the field. The field portion of the custody documentation should include: (1) the project name; (2) signatures of samplers; (3) the sample number, date and time of collection, and whether the sample is grab or composite; (4) signatures of individuals involved in sampling; and (5) if applicable, air bill or other shipping number. Sample receipt and log-in procedures at the laboratory are described in **Section 5.2.2** of this Plan.

5.1.3. Sample Labeling

Immediately upon collection, each sample will be labeled with a pre-printed adhesive label, which includes the date and time of collection, sampler's initials, tests to be performed, preservative (if applicable), and a unique identifier.

A. The following identification scheme will be used:

<u>Soil borings</u> will be assigned sequential numbers. For soil samples collected from soil borings, sample numbers will be assigned as follows:

GZ-#(sampling interval)

<u>Example:</u>
Sample GZ-4(4-6') = soil sample collected from soil boring #4 at a depth of 5-6' below grade.

<u>Groundwater wells</u> will be assigned sequential numbers. Groundwater samples will be identified by the well that the sample was collected from.

<u>Examples:</u>
GMW-01 = groundwater sample collected from permanent well point #1

<u>Sub-slab soil vapor/soil vapor/ambient air</u> will be assigned numbers coordinating with the adjacent soil boring or a sequential number due to sample names being identical to a previous Site sampling event. Vapor samples will be identified by the soil gas point that the sample was collected from.

<u>Examples:</u>
GSV-01 = Soil vapor sample collected from the soil gas point
OA-01 = Outdoor ambient air sample

Duplicate samples will be labeled as blind duplicates by giving them sample numbers indistinguishable from a normal sample.

Blanks should be spelled out and identify the associated matrix, e.g., Equipment Blank, Soil

MS/MSDs will be noted in the Comments column of the COC.

B. The analysis required will be indicated for each sample.

<u>Example</u>: SVOC

C. Date taken will be the date the sample was collected, using the format: MM-DD-YY.

<u>Example</u>: 04-22-22

D. Time will be the time the sample was collected, using military time.

<u>Example</u>: 14:30

E. The sampler's name will be printed in the "Sampled By" section.

F. Other information relevant to the sample.

Example: Equipment Blank

An example sample label is presented below:

Job No:	XXXXXXXXX
Client:	Name
Sample No:	GZ-01(5-5.5')
Matrix:	Soil
Date Taken:	5/22/24
Time Taken:	14:30
Sampler:	B. Smith
Analysis:	SVOC

Job No. ______________________________
Client: ______________________________
Sample Number ______________________________
Date ________________ Sample Time ________________
Sample Matrix ______________________________
Grab or Composite (explain) ______________________________
Preservatives ______________________________
Analyses ______________________________
Sampler Signature______________________________

This sample label contains the authoritative information for the sample. Inconsistencies with other documents will be settled in favor of the vial or container label unless otherwise corrected in writing from the field personnel collecting samples or the QEP.

5.2. Sample Custody

Custody is one of several factors that are necessary for the admissibility of environmental data as evidence in a court of law. Custody procedures help to satisfy the two major requirements for admissibility: relevance and authenticity. Sample custody is addressed in three parts: field sample collection, laboratory analysis, and final evidence files.

A sample or evidence file is considered to be under a person's custody if

- the item is in the actual possession of a person

- the item is in the view of the person after being in actual possession of the person
- the item was in the actual physical possession of the person but is locked up to prevent tampering
- the item is in a designated and identified secure area

5.2.1. Field Custody Procedures

Samples will be collected following the sampling procedures documented in **Section 4.0** of this Plan. Documentation of sample collection is described in **Section 5.1** of this Plan. Sample chain-of-custody and packaging procedures are summarized below. These procedures are intended to ensure that the samples will arrive at the laboratory with the chain-of-custody intact.

- The field sampler is personally responsible for the care and custody of the samples until they are transferred or dispatched properly. Field procedures have been designed such that as few people as possible will handle the samples.

- All bottles will be identified by the use of sample labels with sample numbers, sampling locations, date/time of collection, and type of analysis.

- Sample labels will be completed for each sample using waterproof ink unless prohibited by weather conditions. For example, a logbook notation would explain that a pencil was used to fill out the sample label because the pen would not function in wet weather.

- Samples will be accompanied by a properly completed chain-of-custody form. The sample numbers and locations will be listed on the chain-of-custody form. When transferring the possession of samples, the individuals relinquishing and receiving will sign, date, and note the time on the record. This record documents the transfer of custody of samples from the sampler to another person, to a mobile laboratory, to the permanent laboratory, or to/from a secure storage location.

- All shipments will be accompanied by the chain-of-custody record identifying the contents. The original record will accompany the shipment, and copies will be retained by the sampler and placed in the project files.

- Samples will be properly packaged for shipment and dispatched to the appropriate laboratory for analysis, with a separate signed custody record enclosed in and secured to the inside top of each sample box or cooler. If third party commercial carriers are used for transfer to the laboratory, shipping containers will be secured with strapping tape and custody seals prior to shipment. The custody seals will be attached to the front right and back left of the cooler and covered with clear plastic tape after being signed by field personnel. The cooler will be strapped shut with strapping tape in at least two locations.

- If the samples are sent by third party commercial carrier, the air bill will be used. Air bills will be retained as part of the permanent documentation. Commercial carriers are not required to sign off on the custody forms since the custody forms will be sealed inside the sample cooler and the custody seals will remain intact.

- Samples remain in the custody of the sampler until transfer of custody is completed. This consists of delivery of samples to the laboratory courier or sample custodian, and signature of the laboratory courier or sample custodian on chain-of-custody document as receiving the samples and signature of sampler as relinquishing samples.

5.2.2. Laboratory Custody Procedures

Samples will be received and logged in by a designated sample custodian or his/her designee. Upon sample receipt, the sample custodian will

- Examine the shipping containers to verify that the custody tape is intact,
- Examine all sample containers for damage,
- Determine if the temperature required for the requested testing program has been maintained during shipment and document the temperature on the chain-of-custody records,
- Compare samples received against those listed on the chain-of-custody,
- Verify that sample holding times have not been exceeded,
- Examine all shipping records for accuracy and completeness,
- Determine sample pH (if applicable) and record on chain-of-custody forms,
- Sign and date the chain-of-custody immediately (if shipment is accepted) and attach the air bill,
- Note any problems associated with the coolers and/or samples on the cooler receipt form and notify the Laboratory Project Manager, who will be responsible for contacting the QEP,
- Attach laboratory sample container labels with unique laboratory identification and test, and
- Place the samples in the proper laboratory storage.

Following receipt, samples will be logged in according to the following procedure:

- The samples will be entered into the laboratory tracking system. At a minimum, the following information will be entered: project name or identification, unique sample numbers (both client and internal laboratory), type of sample, required tests, date and time of laboratory receipt of samples, and field ID provided by field personnel.
- The Laboratory Project Manager will be notified of sample arrival.
- The completed chain-of-custody, air bills, and any additional documentation will be placed in the final evidence file.

6.0 CALIBRATION PROCEDURES

6.1. <u>Field Instruments</u>

Field instruments will be calibrated according to the manufacturer's specifications. Calibration procedures performed will be documented in the field logbook and will include the date/time of calibration, name of person performing the calibration, reference standard used, temperature at which the readings were taken, and the readings.

6.2. Laboratory Instruments

Calibration procedures for a specific laboratory instrument will consist of initial calibrations, initial calibration verifications, and/or continuing calibration verification. Detailed descriptions of the calibration procedures for a specific laboratory instrument are included in the laboratory's standard operating procedures (SOPs), which describe the calibration procedures, their frequency, acceptance criteria, and the conditions that will require recalibration. These procedures are as required in the respective analytical methodologies (summarized in **Table 2** of this Plan). The initial calibration associated with all analyses must contain a low-level calibration standard which is less than or equal to the quantitation limit.

7.0 SAMPLE PREPARATION AND ANALYTICAL PROCEDURES

No field analyses are anticipated for this program. If site conditions were to warrant field analysis, the responsible contractor will prepare an addendum establishing the field analytical procedures. Analyses of all samples will be performed by NYSDOH ELAP certified laboratories. **Table 2** summarizes the analytical methods to be used during the remediation.

8.0 DATA REDUCTION, VALIDATION, AND REPORTING

Appropriate QC measures will be used to ensure the generation of reliable data from sampling and analysis activities. Proper collection and organization of accurate information followed by clear and concise reporting of the data is a primary goal in this project. Complete data packages suitable for data validation will be provided by the analytical laboratory.

For all analyses, the laboratory will report results that are below the laboratory's reporting limit; these results will be qualified as estimated (J) by the laboratory. The laboratory may be required to report tentatively identified compounds (TICs) for the VOC and SVOC analyses; this will be requested by the sampler on an as-needed basis. A Data Usability Summary Report (DUSR) will be prepared and will be included in the Remedial Investigation Report (RIR). Qualifications of the DUSR preparer can be found in **Attachment A.**

8.1. Data Evaluation/Validation

8.1.1. Field Data Evaluation

Measurements and sample collection information will be transcribed directly into the field logbook or onto standardized forms. If errors are made, results will be legibly crossed out, initialed and dated by the person recording the data, and corrected in a space adjacent to the original (erroneous) entry. Daily reviews of the field records by the Field Team Leader will ensure that:

- Logbooks and standardized forms have been filled out completely and that the information recorded accurately reflects the activities that were performed.
- Records are legible and in accordance with good record keeping procedures, i.e., entries are signed and dated, data are not obliterated, changes are initialed, dated, and explained.
- Sample collection, handling, preservation, and storage procedures were conducted in accordance with the protocols described in the Plan, and that any deviations were documented and approved by the appropriate personnel.

8.1.2. Data Usability

A Data Usability Summary Report (DUSR) will be prepared in accordance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

The data usability evaluation will include reviewing the quality assurance/quality control (QA/QC) information including: (1) chain-of-custody; (2) the summary QA/QC information provided by the laboratory; and (3) the project narrative.

For each data package the following questions will be evaluated:

- Is the data package complete as defined under the requirements for the NYSDEC ASP Category B, USEPA CLP deliverables or other standards/guidance?
- Have all holding times and preservation requirements been met?
- Do the quality control (QC) data fall within the laboratory and project established limits and specifications?

8.2. <u>Identification and Treatment of Outliers</u>

Any data point which deviates markedly from others in its set of measurements will be investigated; however, the suspected outlier will be recorded and retained in the data set. One or both of the following tests will be used to identify outliers.

Dixon's test for extreme observations is an easily computed procedure for determining whether a single very large or very small value is consistent with the remaining data. The one-tailed t-test for difference may also be used in this case. It should be noted that these tests are designed for testing a single value. If more than one outlier is suspected in the same data set, other statistical sources may be consulted and the most appropriate test of hypothesis will be used and documented, if warranted.

Since an outlier may result from unique circumstances at the time of sample analysis or data collection, those persons involved in the analysis and data reduction will be consulted. This may provide an experimental reason for the outlier. Further statistical analysis may be performed with and without the outlier to determine its effect on the conclusions. In many cases, two data sets may be reported, one including, and one excluding the outlier.

In summary, every effort will be made to include the outlying values in the reported data. If the value is rejected, it will be identified as an outlier, reported with its data set and its omission noted.

9.0 INTERNAL QUALITY CONTROL

The subcontracting laboratories' Quality Assurance Project Plans will identify the supplemental internal analytical quality control procedures to be used. At a minimum, this will include:

- Matrix spike and/or matrix spike duplicate samples
- Matrix duplicate analyses
- Laboratory control samples
- Instrument calibrations
- Instrument tunes for SW-846 8260B and 8270C and EPA Method TO-15 analyses
- Method and/or instrument blanks
- Surrogate spikes for organic analyses
- Internal standard spikes for SW-846 8260B and 8270C and EPA Method TO-15 analyses
- Quantitation limit determination and confirmation by analysis of low-level calibration standard

As outline on **Table 5** and summarized in **Section 4.13**, field quality control samples will include:

- Equipment blanks
- Field duplicate samples
- Trip blanks
- MS/MSDs

10.0 CORRECTIVE ACTION

The entire sampling program will be under the direction of the QEP. The emphasis in this program is on preventing problems by identifying potential errors, discrepancies, and gaps in the data-collection-laboratory-analysis-interpretation process. Any problems identified will be promptly resolved. Likewise, follow-up corrective action is always an option in the event that preventative corrective actions are not totally effective.

The acceptance limits for the sampling and analyses to be conducted in this program will be those stated in the method or defined by other means in the Plan. Corrective actions are likely to be immediate in nature and most often will be implemented by the contracted laboratory analyst or the Program Manager. The corrective action will usually involve recalculation, reanalysis, or resampling.

10.1. Immediate Corrective Action

Corrective action in the field may be needed when the sample network is changed (i.e., more/less samples, sampling locations other than those specified in the Plan), or when sampling procedures and/or field analytical procedures require modification, etc. due to unexpected conditions. The field team may identify the need for corrective action. The Field Team Leader will approve the corrective action and notify the Program Manager. The Program Manager will approve the corrective measure. The Field Team Leader will ensure that the corrective measure is implemented by the field team.

Corrective actions will be implemented and documented in the field logbook. Documentation will include:

- A description of the circumstances that initiated the corrective action,
- The action taken in response,
- The final resolution, and
- Any necessary approvals

No staff member will initiate corrective action without prior communication of findings through the proper channels.

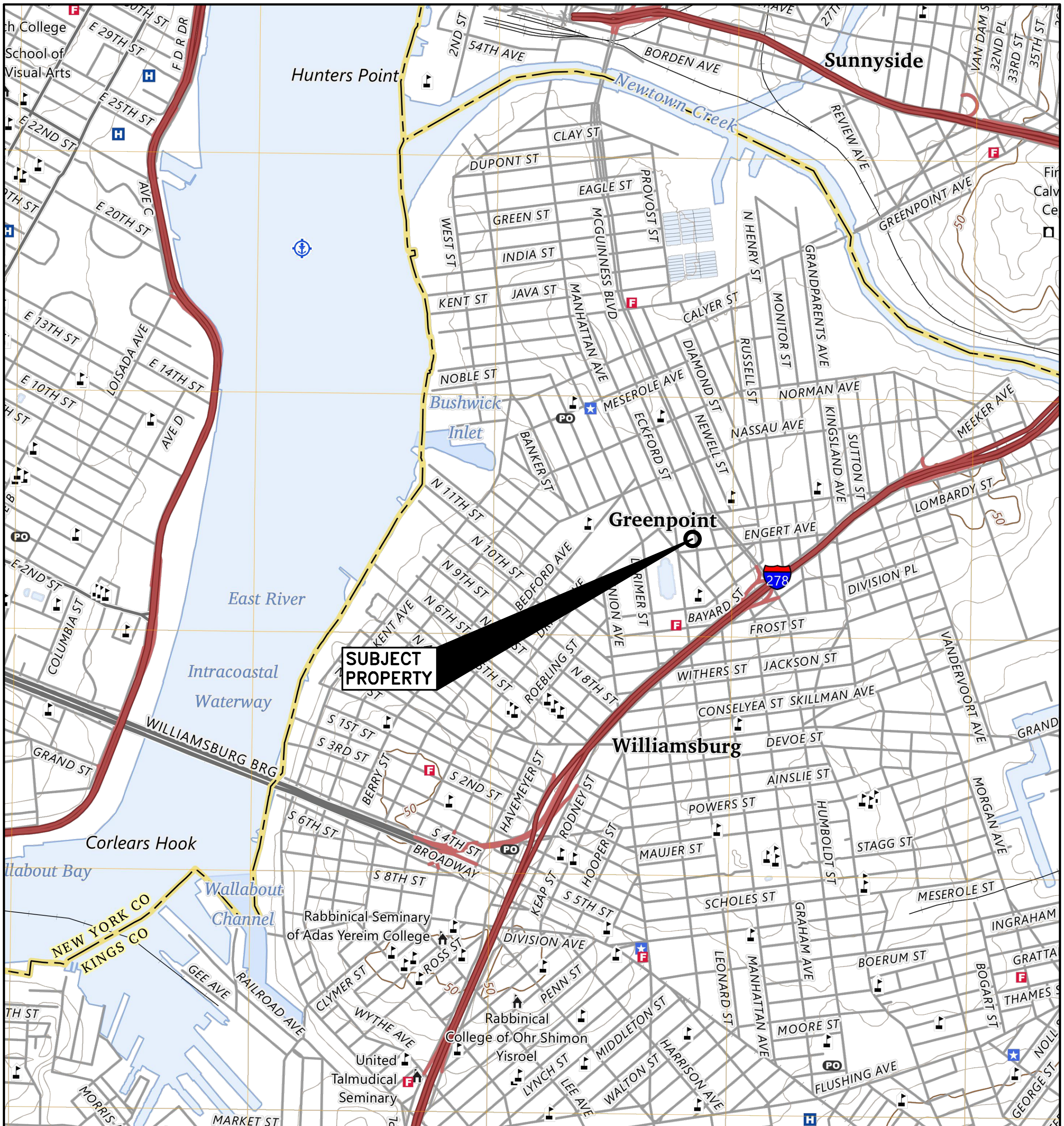
Corrective action in the laboratory may occur prior to, during, and after initial analyses. A number of conditions such as broken sample containers, omissions or discrepancies with chain-of-custody documentation, low/high pH readings, and potentially high concentration samples may be identified during sample log-in or just prior to analysis. Following consultation with laboratory analysts and Laboratory Section Leaders, it may be necessary for the Laboratory QA Manager to approve the implementation of corrective action. The laboratory SOPs specify some conditions during or after analysis that may automatically trigger corrective action or optional procedures. These conditions may include dilution of samples, additional sample extract cleanup, automatic reinjection/reanalysis when certain QC criteria are not met, loss of sample through breakage or spillage, etc.

The analyst may identify the need for corrective action. The Laboratory Section Leader, in consultation with the staff, will approve the required corrective action to be implemented by the laboratory staff. The Laboratory QA Manager will ensure implementation and documentation of the corrective action. If the nonconformance causes project objectives not to be achieved, the QEP will be notified. The QEP will notify the Program Manager, who in turn will contact all levels of project management for concurrence with the proposed corrective action.

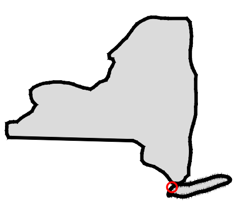
These corrective actions are performed prior to release of the data from the laboratory. The corrective action will be documented in both the laboratory's corrective action files, and the narrative data report sent from the laboratory to the Program Manager. If the corrective action does not rectify the situation, the laboratory will contact the Program Manager, who will determine the action to be taken and inform the appropriate personnel.

If potential problems are not solved as an immediate corrective action, the contractor will apply formalized long-term corrective action, if necessary.

FIGURES



NEW YORK



QUADRANGLE LOCATION

SOURCE:

USGS TOPOGRAPHIC MAPS: BROOKLYN, NEW YORK (2023). CONTOUR INTERVAL 10FT., NAVD-1988, ORIGINAL SCALE 1:24,000 (1IN.=2,000FT.).

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55 ECKFORD STREET BROOKLYN, NEW YORK	PREPARED BY: GZA GeoEnvironmental of NY Engineers and Scientists www.gza.com	PREPARED FOR: 55 ECKFORD ST LLC

SUBJECT PROPERTY LOCATION MAP	PROJ MGR: VW DESIGNED BY: VW DATE: JUNE 2024	REVIEWED BY: SK DRAWN BY: NQ PROJECT NO. 41.0163263.00	CHECKED BY: SK SCALE: 1"=2000' REVISION NO. -	FIGURE 1 SHEET NO. 1 OF 10

TABLES

Table 1 A
Soil Criteria Table

55 Eckford Street
Brooklyn, New York
BCP Site No. C224168
QAPP/FSP

Contaminant	Protection of Public Health					Protection of Ecological Resources[n]	Protection of Groundwater
	Unrestricted Use	Residential	Restricted-Residential	Commercial	Industrial		
All soil cleanup objectives (SCOs) are in parts per million (ppm); approximately equivalent to mg/kg.							
Metals							
Arsenic	13[m]	16[f]	17[f]	18[f]	19[f]	13[f]	16[f]
Barium	350[m]	350[f]	400	400	10,000[d]	433	820
Beryllium	7.2	14	72	590	2,700	10	47
Cadmium	2.5[m]	2.5[f]	4.3	9.3	60	4	7.5
Chromium, hexavalent[h]	1[l]	22	110	400	800	1[e]	19
Chromium, trivalent[h]	30[m]	36	180	1,500	6,800	41	NS
Copper	50	270	270	270	10,000[d]	50	1,720
Total Cyanide[h]	27	27	27	27	10,000[d]	NS	40
Lead	63[m]	400	400	1,000	3,900	63[f]	450
Manganese	1600[m]	2,000[f]	2,000[f]	10,000[d]	10,000[d]	1600[f]	2,000[f]
Total Mercury	0.18[m]	0.81[j]	0.81[j]	2.8[j]	5.7[j]	0.18[f]	0.73
Nickel	30	140	310	310	10,000[d]	30	130
Selenium	3.9[m]	36	180	1,500	6,800	3.9[f]	4[f]
Silver	2	36	180	1,500	6,800	2	8.3
Zinc	109[m]	2200	10,000[d]	10,000[d]	10,000[d]	109[f]	2,480
PCBs/Pesticides							
2,4,5-TP Acid (Silvex)	3.8	58	100[a]	500[b]	1,000[c]	NS	3.8
4,4'-DDE	0.0033[l]	1.8	8.9	62	120	0.0033[e]	17
4,4'-DDT	0.0033[l]	1.7	7.9	47	94	0.0033[e]	136
4,4'-DDD	0.0033[l]	2.6	13	92	180	0.0033[e]	14
Aldrin	0.005[m]	0.019	0.097	0.68	1.4	0.14	0.19
alpha-BHC	0.02	0.097	0.48	3.4	6.8	0.04[g]	0.02
beta-BHC	0.036	0.072	0.36	3	14	0.6	0.09
Chlordane (alpha)	0.094	0.91	4.2	24	47	1.3	2.9
delta-BHC	0.04	100[a]	100[a]	500[b]	1,000[c]	0.04[g]	0.25
Dibenzofuran	7	14	59	350	1,000[c]	NS	210
Dieldrin	0.005[m]	0.039	0.2	1.4	2.8	0.006	0.1
Endosulfan I	2.4	4.8[i]	24[i]	200[i]	920[i]	NS	102
Endosulfan II	2.4	4.8[i]	24[i]	200[i]	920[i]	NS	102
Endosulfan sulfate	2.4	4.8[i]	24[i]	200[i]	920[i]	NS	1,000[c]
Endrin	0.014	2.2	11	89	410	0.014	0.06
Heptachlor	0.042	0.42	2.1	15	29	0.14	0.38
Lindane	0.1	0.28	1.3	9.2	23	6	0.1
Polychlorinated biphenyls	0.1	1	1	1	25	1	3.2
Semivolatiles							
Acenaphthene	20	100[a]	100[a]	500[b]	1,000[c]	20	98
Acenapthylene	100[k]	100[a]	100[a]	501[b]	1,000[c]	NS	107
Anthracene	100[k]	100[a]	100[a]	502[b]	1,000[c]	NS	1,000[c]
Benz(a)anthracene	1[m]	1[f]	1[f]	5.6	11	NS	1[f]
Benzo(a)pyrene	1[m]	1[f]	1[f]	1[f]	1.1	2.6	22
Benzo(b)fluoranthene	1[m]	1[f]	1[f]	5.6	11	NS	1.7
Benzo(g,h,i)perylene	100	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Benzo(k)fluoranthene	0.8[m]	1	3.9	56	110	NS	1.7
Chrysene	1[m]	1[f]	3.9	56	110	NS	1[f]
Dibenz(a,h)anthracene	0.33[l]	0.33[e]	0.33[e]	0.56	1.1	NS	1,000[c]
Fluoranthene	100[k]	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Fluorene	30	100[a]	100[a]	500[b]	1,000[c]	30	386
Indeno(1,2,3-cd)pyrene	0.5[m]	0.5[f]	0.5[f]	5.6	11	NS	8.2
m-Cresol	0.33[l]	100[a]	100[a]	500[b]	1,000[c]	NS	0.33[e]
Naphthalene	12	100[a]	100[a]	500[b]	1,000[c]	NS	12
o-Cresol	0.33[l]	100[a]	100[a]	500[b]	1,000[c]	NS	0.33[e]
p-Cresol	0.33[l]	34	100[a]	500[b]	1,000[c]	NS	0.33[e]
Pentachlorophenol	0.8[l]	2.4	6.7	6.7	55	0.8[e]	0.8[e]
Phenanthrene	100	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Phenol	0.33[l]	100[a]	100[a]	500[b]	1,000[c]	30	0.33[e]
Pyrene	100	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]

Table 1 A
Soil Criteria Table

55 Eckford Street
Brooklyn, New York
BCP Site No. C224168
QAPP/FSP

Contaminant	Protection of Public Health					Protection of Ecological Resources[n]	Protection of Groundwater
	Unrestricted Use	Residential	Restricted-Residential	Commercial	Industrial		
All soil cleanup objectives (SCOs) are in parts per million (ppm); approximately equivalent to mg/kg.							
Volatiles							
1,1,1-Trichloroethane	0.68	100 [a]	100 [a]	500 [b]	1,000 [c]	NS	0.68
1,1-Dichloroethane	0.27	19	26	240	480	NS	0.27
1,1-Dichloroethene	0.33	100 [a]	100 [a]	500 [b]	1,000 [c]	NS	0.33
1,2-Dichlorobenzene	1.1	100 [a]	100 [a]	500 [b]	1,000 [c]	NS	1.1
1,2-Dichloroethane	0.02 [m]	2.3	3.1	30	60	10	0.02 [f]
cis-1,2-Dichloroethene	0.25	59	100 [a]	500 [b]	1,000 [c]	NS	0.25
trans-1,2-Dichloroethene	0.19	100 [a]	100 [a]	500 [b]	1,000 [c]	NS	0.19
1,3-Dichlorobenzene	2.4	17	49	280	560	NS	2.4
1,4-Dichlorobenzene	1.8	9.8	13	130	250	20	1.8
1,4-Dioxane	0.1 [l]	9.8	13	130	250	0.1 [e]	0.1 [e]
Acetone	0.05	100[a]	100[b]	500 [b]	1,000 [c]	2.2	0.05
Benzene	0.06	2.9	4.8	44	89	70	0.06
Butylbenzene	12	100[a]	100[a]	500 [b]	1,000 [c]	NS	12
Carbon tetrachloride	0.76	1.4	2.4	22	44	NS	0.76
Chlorobenzene	1.1	100[a]	100[a]	500 [b]	1,000 [c]	40	1.1
Chloroform	0.37	10	49	350	700	12	0.37
Ethylbenzene	1	30	41	390	780	NS	1
Hexachlorobenzene	0.33 [l]	0.33[e]	1.2	6	12	NS	3.2
Methyl ethyl ketone	0.12	100 [a]	100 [a]	500 [b]	1,000 [c]	100 [a]	0.12
Methyl tert-butyl ether	0.93	62	100 [a]	500 [b]	1,000 [c]	NS	0.93
Methylene chloride	0.05	51	100 [a]	500 [b]	1,000 [c]	12	0.05
n-Propylbenzene	3.9	100 [a]	100 [a]	500 [b]	1,000 [c]	NS	3.9
sec-Butylbenzene	11	100 [a]	100 [a]	500 [b]	1,000 [c]	NS	11
tert-Butylbenzene	5.9	100 [a]	100 [a]	500 [b]	1,000 [c]	NS	5.9
Tetrachloroethene	1.3	5.5	19	150	300	2	1.3
Toluene	0.7	100 [a]	100 [a]	500 [b]	1,000 [c]	36	0.7
Trichloroethene	0.47	10	21	200	400	2	0.47
1,2,4-Trimethylbenzene	3.6	47	52	190	380	NS	3.6
1,3,5- Trimethylbenzene	8.4	47	52	190	380	NS	8.4
Vinyl chloride	0.02	0.21	0.9	13	27	NS	0.02
Xylene (mixed)	0.26	100 [a]	100 [a]	500 [b]	1,000 [c]	0.26	1.6
Per-and Polyfluoroalkyl Substances (PFAs)[o]							
PFOA	0.00066	0.0066	0.033	0.5	0.6	NS	0.0011
PFOS	0.00088	0.0088	0.044	0.44	0.44	NS	0.0037

Notes:
[a] The SCOs for residential, restricted-residential and ecological resources use were capped at a maximum value of 100 ppm
[b] The SCOs for commercial use were capped at a maximum value of 500 ppm
[c] The SCOs for industrial use and the protection of groundwater were capped at a maximum value of 1000 ppm
[d] The SCOs for metals were capped at a maximum value of 10,000 ppm.
[e] For constituents where the calculated SCO was lower than the contract required quantitation limit (CRQL), the CRQL is used as the SCO value
[f] For constituents where the calculated SCO was lower than the rural soil background concentration as determined by the Department and Department of Health rural soi survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site.
[g] This SCO is derived from data on mixed isomers of BHC.

[h] The SCO for this specific compound (or family of compounds) is considered to be met if the analysis for the total species of this contaminant is below the specific SCO.
[i] This SCO is for the sum of endosulfan I, endosulfan II, and endosulfan sulfate
[j] This SCO is the lower of the values for mercury (elemental) or mercury (inorganic salts)
[k] The SCOs for unrestricted use were capped at a maximum value of 100 ppm.
[l] For constituents where the calculated SCO was lower than the contract required quantitation limit (CRQL), the CRQL is used as the Track 1 SCO value
[m] For constituents where the calculated SCO was lower than the rural soil background concentration, as determined by the Department and Department of Health rura soil survey, the rural soil background concentration is used as the Track 1 SCO value for this use of the site.
[n] Protection of ecological resources SCOs were not developed for contaminants identified in Table 375-6.8(b) with "NS". Where such contaminants appear in Table 375 6.8(a), the applicant may be required by the Department to calculate a protection of ecological resources SCO according to the TSD.
[o] SCOs for PFAs are taken from the NYSDEC Sampling, Analysis, and Assessment of Per-and-Polyfluoroalkyl Substances (PFAS) under NYSDEC's Part 375 Remedial Programs dated April 2023.

Table 1B
Groundwater Criteria Table
55 Eckford Street, Brooklyn, NY
BCP Site No. C224168
QAPP/FSP

Contaminant	Aqueous Water Quality Standards[1], ug/L
Metals	
Antimony	3
Arsenic	---
Arsenic	25
Barium	1,000
Beryllium	3
Cadmium	5
Chromium, hexavalent	---
Chromium, trivalent	50
Copper	200
Cyanide	---
Iron	300
Lead	25
Magnesium	35,000
Manganese	300
Mercury	0.7
Nickel	100
Selenium	10
Silver	50
Sodium	20,000
Thallium	0.5
Zinc	2000
PCBs/Pesticides	
alpha-BHC	0.01
2,4,5-TP Acid (Silvex)	---
4,4'-DDD	0.3
4,4'-DDE	0.2
4,4'-DDT	0.2
Aldrin	---
beta-BHC	0.04
Chlordane (alpha)	---
Dibenzofuran	---
Dieldrin	0.004
Endosulfan I	0.12
Endosulfan II	0.12
Endosulfan sulfate	0.12
Endrin	---
Endrin aldehyde	5
Endrin ketone	5
gamma-BHC (Lindane)	0.05

Table 1B
Groundwater Criteria Table
55 Eckford Street, Brooklyn, NY
BCP Site No. C224168
QAPP/FSP

Contaminant	Aqueous Water Quality Standards[1], ug/L
PCBs/Pesticides, Con't.	
gamma-Chlordane	0.12
Heptachlor	0.04
Heptachlor epoxide	0.03
Lindane	---
Methoxychlor	35
Polychlorinated biphenyls	---
Toxaphene	0.06
Semivolatiles	
1,1’-Biphenyl	5
2,2’-oxybis(1-Chloropropane)	5
2,4,5-Trichlorophenol	1
2,4-Dichlorophenol	1
2,4-Dimethylphenol	50
2,4-Dinitrophenol	10
2,4-Dinitrotoluene	5
2,6-Dinitrotoluene	5
2-Chloronaphthalene	10
2-Chlorophenol	1
2-Methylnaphthalene	502
2-Methylphenol	1
2-Nitroaniline	5
2-Nitrophenol	1
3,3’-Dichlorobenzidine	5
3-Nitroaniline	5
4-Chloro-3-methylphenol	1
4-Chloroaniline	5
4-Methylphenol	1
4-Nitroaniline	5
4-Nitrophenol	1
Acenaphthene	20
Acenapthylene	202
Anthracene	50
Atrazine	7.5
Benz(a)anthracene	0.002
Benzo(a)pyrene	---
Benzo(b)fluoranthene	0.002
Benzo(g,h,i)perylene	52
Benzo(k)fluoranthene	0.002
bis(2-Chloroethoxy)methane	5

Table 1B
Groundwater Criteria Table
55 Eckford Street, Brooklyn, NY
BCP Site No. C224168
QAPP/FSP

Contaminant	Aqueous Water Quality Standards[1], ug/L
Semivolatiles, Con't.	
Bis(2-Chloroethyl)ether	1
bis(2-Ethylhexyl)phthalate	5
Butylbenzylphthalate	50
Chrysene	0.002
Dibenz(a,h)anthracene	502
Dibenzofuran	52
Diethylphthalate	50
Dimethylphthalate	50
Di-n-butylphthalate	50
Di-n-octylphthalate	50
Fluoranthene	50
Fluorene	50
Hexachlorobenzene	0.04
Hexachlorobutadiene	0.5
Hexachlorocyclopentadiene	5
Hexachloroethane	5
Indeno(1,2,3-cd)pyrene	0.002
Isophorone	50
m-Cresol	---
Naphthalene	10
Nitrobenzene	0.4
N-Nitrosodiphenylamine	50
o-Cresol	---
p-Cresol	---
Pentachlorophenol	1
Phenanthrene	50
Phenol	1
Pyrene	50
Volatiles	
1,1,1-Trichloroethane	5
1,1,2,2-Tetrachloroethane	5
1,1,2-Trichloro-1,2,2-trifluoroethane	5
1,1,2-Trichloroethane	1
1,1-Dichloroethane	5
1,1-Dichloroethene	5
1,1-Dichloroethylene	---
1,2,4-Trichlorobenzene	---

Table 1B
Groundwater Criteria Table
55 Eckford Street, Brooklyn, NY
BCP Site No. C224168
QAPP/FSP

Contaminant	Aqueous Water Quality Standards[1], ug/L
Volatiles, Con't.	
1,2,4-Trimethylbenzene	5
1,2-Dibromo-3-chloropropane	0.04
1,2-Dibromoethane	0.0006
1,2-Dichlorobenzene	3
1,2-Dichloroethane	0.6
1,2-Dichloropropane	1
1,3,5- Trimethylbenzene	---
1,3-Butadiene	---
1,3-Dichlorobenzene	3
1,3-Dichlorobenzene	---
1,4-Dichlorobenzene	3
1,4-Dichlorobenzene	---
1,4-Dioxane	1[2]
2-Butanone	50
2-Hexanone	50
4-Methyl-2-pentanone	502
Acetone	50
Benzene	1
Bromodichloromethane	50
Bromoform	50
Bromomethane	5
Butylbenzene	---
Carbon Disulfide	60
Carbon tetrachloride	5
Chlorobenzene	5
Chloroethane	5
Chloroform	7
Chloromethane	5
Cis- 1,3-Dichloropropene	0.4
cis-1,2-Dichloroethene	5
cis-1,2-Dichloroethylene	---
Cyclohexane	---
Dibromochloromethane	50
Dichlorodifluoromethane	5
Ethyl Acetate	---
Ethylbenzene	5
Freon 113	---
Hexachlorobenzene	---

Table 1B
Groundwater Criteria Table
55 Eckford Street, Brooklyn, NY
BCP Site No. C224168
QAPP/FSP

Contaminant	Aqueous Water Quality Standards[1], ug/L
Volatiles, Con't.	
Hexachlorobutadiene	---
Hexane	---
Isopropylbenzene	5
m,p-Xylene	---
m-Dichlorobenzene	---
Methyl Acetate	NS
Methyl ethyl ketone	---
Methyl Isobutyl Ketone	---
Methyl tert-butyl ether	10
Methylcyclohexane	---
Methylene chloride	5
n-Propylbenzene	---
o-Dichlorobenzene	---
o-Xylene	---
p-Dichlorobenzene	---
sec-Butylbenzene	---
Styrene	5
tert-Butylbenzene	---
Tertiary Butyl Alcohol	---
Tetrachloroethene	5
Toluene	5
trans-1,2-Dichloroethene	5
trans-l,3-Dichloropropene	0.4
Trichloroethene	5
Trichlorofluoromethane	5
Vinyl Acetate	---
Vinyl Chloride	2
Xylene (mixed)	5
Per- and Polyfluoroalkyl Substances (PFAS)	
PFOA	0.01[2]
PFOS	0.01[2]

Notes:

[1] - Division of Water Technical and Operational Guidance Values (TOGS) Ambient Water Quality Standards and Guidance Values (AWQS), ug/L

[2] - Guidance value for 1,4-Dioxane, PFOA, and PFOS is from the NYSDEC Guidance to Regulate PFOA, PFOS, and 1,4-Dioxane in State Waters, dated October 5, 2021

ug/L - micro gram per liter

Table 1C
Soil Vapor Criteria Table
55 Eckford Street, Brooklyn, NY
BCP Site No, C224168
QAPP/FSP

Volatile Organics in Air	CAS No.	NYSDOH Soil Vapor Intrusion Guidance Criteria				Toxicity	Decision Matrices
		1	2	3	4		A, B, C, D, E, and F
1,1,1-Trichloroethane	71556	2.5	20.6	-	-	L	B
1,1,2,2-Tetrachloroethane	79345	0.4	-	-	-	M	TD
1,1,2-Trichloroethane	79005	0.4	<1.5	-	-	H	TD
1,1-Dichloroethane	75343	0.4	<0.7	-	-	L	TD
1,1-Dichloroethene	75354	0.4	<1.4	-	-	M	A
1,2,4-Trichlorobenzene	120821	0.5	<6.8	-	-	NA	TD
1,2,4-Trimethylbenzene	95636	9.8	9.5	-	-	NA	D
1,2-Dibromoethane	106934	0.4	<1.5	-	-	H	TD
1,2-Dichlorobenzene	95501	0.5	<1.2	-	-	M	TD
1,2-Dichloroethane	107062	0.4	<0.9	-	-	H	TD
1,2-Dichloropropane	78875	0.4	<1.6	-	-	M	TD
1,3,5-Trimethybenzene	108678	3.9	3.7	-	-	M	D
1,3-Butadiene	106990	-	<3.0	-	-	H	TD
1,3-Dichlorobenzene	541731	0.5	<2.4	-	-	M	TD
1,4-Dichlorobenzene	106467	1.2	5.5	344	-	M	TD
1,4-Dioxane	123911	-	-	-	-	M	TD
2,2,4-Trimethylpentane	540841	5	-	-	-	M	D
2-Butanone	78933	16	12	-	-	M	TD
2-Hexanone	591786	-	-	-	-	NA	TD
3-Chloropropene	107051	-	-	-	-	M	TD
4-Ethyltoluene	622968	-	3.6	-	-	NA	TD
4-Methyl-2-pentanone	108101	1.9	6	-	-	M	TD
Acetone	67641	115	98.9	45.8	-	L	TD
Benzene	71432	13	9.4	10	-	H	D
Benzyl chloride	100447	-	<6.8	-	-	H	TD
Bromodichloromethane	75274	-	-	-	-	M	TD
Bromoform	75252	-	-	-	-	M	TD
Bromomethane	74839	0.5	<1.7	-	-	M	TD
Carbon disulfide	75150	-	4.2	-	-	M	TD
Carbon tetrachloride	56235	1.3	<1.3	1.1	-	H	A
Chlorobenzene	108907	0.4	<0.9	-	-	M	TD
Chloroethane	75003	0.4	<1.1	-	-	L	TD
Chloroform	67663	1.2	1.1	6.34	-	H	TD
Chloromethane	74873	4.2	3.7	-	-	M	TD
cis-1,2-Dichloroethene	156592	0.4	<1.9	-	-	M	A
cis-1,3-Dichloropropene	10061015	0.4	<2.3	-	-	NA	TD
Cyclohexane	110827	6.3	-	-	-	L	D

Table 1C
Soil Vapor Criteria Table
55 Eckford Street, Brooklyn, NY
BCP Site No, C224168
QAPP/FSP

Volatile Organics in Air	CAS No.	NYSDOH Soil Vapor Intrusion Guidance Criteria				Toxicity	Decision Matrices
		1	2	3	4		A, B, C, D, E, and F
Dibromochloromethane	124481	-	-	-	-	NA	TD
Dichlorodifluoromethane	75718	10	16.5	-	-	NA	TD
Ethanol	64175	1300	210	-	-	L	TD
Ethyl Acetate	141786	-	5.4	-	-	M	TD
Ethylbenzene	100414	6.4	5.7	7.62	-	M	D
Freon-113	76131	2.5	3.5	-	-	L	TD
Freon-114	76142	0.4	<6.8	-	-	NA	TD
Heptane	142825	18	-	-	-	M	E
Hexachlorobutadiene	87683	0.5	<6.8	-	-	M	TD
Isopropanol	67630	-	-	-	-	M	TD
Methyl tert butyl ether	1634044	14	11.5	36	-	M	TD
Methylene chloride	75092	16	10	7.5	60	NA	B
Napthalene	91203	-	20.9	-	-	M	D
n-Hexane	110543	14	10.2	-	-	M	E
o-Xylene	95476	7.1	7.9	7.24	-	M	D
p/m-Xylene	179601231	11	22.2	22.2	-	M	E
Styrene	100-42-5	1.4	1.9	5.13	-	M	TD
Tertiary butyl Alcohol	75-65-0	-	-	-	-	NA	TD
Tetrachloroethene (PCE)	127184	2.5	15.9	6.01	30	H	B
Tetrahydrofuran	109999	0.8	-	-	-	M	TD
Toluene	108883	57	43	39.8	-	L	F
trans-1,2-Dichloroethene	156605	-	-	-	-	NA	TD
trans-1,3-Dichloropropene	10061026	NC	<1.3	-	-	NA	TD
Trichloroethene	79016	0.5	4.2	1.36	2	H	A
Trichlorofluoromethane	75694	12	18.1	-	-	L	TD
Vinyl bromide	593602	-	-	-	-	H	TD
Vinyl chloride	75014	0.4	<1.9	-	-	H	C

Notes:
ND - Non-detect
TD -To be determined based on the NYSDOH VI Decision
Results are shown as micgrograms per cubic meter (ug/m^3)

NYSDOH Soil Vapor Intrusion Guidance Criteria
1 - Table C-1 2003 Upper Fence Study of Volatile Organic Chemicals in air of Fuel Oil Heated Homes for Indoor Air
2 - Table C-2 2001 USEPA BASE 90th Percentile for Indoor Air
3 -Table C-5 2005 Health Effects Institute 95th Percentile for Indoor Air
4 -NYSDOH Air Guidance Value

Toxicities from 6NYCRR Part 212 - DAR-1 Appendix C/SCG/ACG
(H) HIGH Toxicity Contaminant.
(M) MODERATE Toxicity Contaminant.
(L) LOW Toxicity Contaminant. ‌ Reasonable - Take reasonable/practical actions to identify source/reduce exposure

NYSDOH Decision Matrices :

Matrix A: Sub-Slab >6 , Indoor Air >1
Matrix B: Sub-Slab >100 , Indoor Air > 10
Matrix C: Sub-Slab >6 , Indoor Air > 0.2
Matrix D: Sub-Slab >60 , Indoor Air >10
Matrix E: Sub-Slab >200 , Indoor Air >20
Matrix F: Sub-Slab > 300 , Indoor Air >50

Table 2
Typical Analytical Parameters, Methods, Preservation, Holding Time and Container Requirements
55 Eckford Street, Brooklyn, NY
BCP Site No. C224168
QAPP/FSP

Sample Matrix	Analytical Parameter	Sample Type[1]	No. of Samples[2]	EPA Analytical Method	Sample Preservation	Holding Time[3]	Sample Container[4]
Soil	VOCs (TCL)	Discrete	74	SW-846 Method 8260C/5035	1 - Methanol, 2 - Water; Cool to 4° C; no headspace	14 days to analysis	(3) Vial
Soil	VOCs with Tentatively Identified Compounds (TICs) (TCL)	Discrete	8	SW-846 Method 8260C/5035	1 - Methanol, 2 - Water; Cool to 4° C; no headspace	14 days to analysis	(3) Vial
Soil	PCBs	Composite	52	SW-846 Method 8082A	Cool to 4^0 C	365 days to analysis	(1) 250 mL amber glass jar
Soil	Pesticides (TCL)	Composite	52	SW-846 Method 8081A	Cool to 4^0 C	14 days to extraction	(1) 250 mL amber glass jar
Soil	SVOCs (TCL)	Composite	74	SW-846 Method 8270D	Cool to 4° C	14 days to extraction	(1) 250 mL amber glass jar
Soil	SVOCs with TICs (TCL)	Composite	8	SW-846 Method 8270D	Cool to 4° C	14 days to extraction	(1) 250 mL amber glass jar
Soil	1,4-Dioxane	Composite	8	SW-846 Method 8270D	Cool to 4° C	7 days to extraction	(2) 250 mL amber glass jars
Soil	Metals (TAL)	Composite	82	SW-846 Method 6010DSeries	Cool to 4^0 C	180 days to analysis	(1) 60 mL glass jar
Soil	Mercury	Composite	52	SW-846 Method 7471B	Cool to 4^0 C	28 days to analysis	(1) 60 mL glass jar
Soil	Cyanide	Composite	52	SW-846 Method 9010C/9012B	Cool to 4^0 C	14 days to analysis	(1) 250 mL amber glass jar
Soil	Herbicides	Composite	52	SW-846 Method 8151A	Cool to 4^0 C	14 days to extraction	(1) 250 mL amber glass jar
Soil	PFAs	Composite	8	EPA Method 1633	Cool to 4^0 C	14 Days	(1) 250 mL plastic container
Groundwater	VOCs (TCL)	Grab	5	SW-846 Method 8260C	HCl; Cool to 4^0 C; no headspace	14 days to analysis	(3) Vial
Groundwater	VOCs with TICs, including 1,4-Dioxane (TCL)	Grab	4	SW-846 Method 8260C	HCl; Cool to 4^0 C; no headspace	14 days to analysis	(3) Vial
Groundwater	1,4-Dioxane	Grab	4	SW-846 Method 8270D	Cool to 4^0 C	7 days to analysis	(2) 250 mL amber glass jar
Groundwater	SVOCs (TCL)	Grab	5	SW-846 Method 8270D	Cool to 4^0 C	7 days to extraction	(2) 250 mL amber glass jar
Groundwater	SVOCs with TICs (TCL)	Grab	4	SW-846 Method 8270D	Cool to 4^0 C	7 days to extraction	(2) 250 mL amber glass jar
Groundwater	Metals- total (TAL)	Grab	9	SW-846 Method 6020B/7470A Series	HNO_3; Cool to 4° C	28 days to analysis for Hg; 180 days to analysis for other	(1) 500 mL plastic container
Groundwater	Metals-dissolved (TAL)	Grab	9	SW-846 Method 6020B/7470A Series	HNO3; Cool to 4° C	28 days to analysis for Hg; 180 days to analysis for other metals	(1) 500 mL plastic container
Groundwater	Pesticides (TCL)	Grab	9	SW-846 Method 8081B	Cool to 4^0 C	7 days to extraction	(2) 120 mL amber glass jar
Groundwater	Herbicides (TCL)	Grab	9	SW-846 Method 8151A	Cool to 4^0 C	7 days to extraction	(2) 1000 mL amber glass jar
Groundwater	PCBs	Grab	9	SW-846 Method 8082A	Cool to 4^0 C	365 days to analysis	(1) 250 mL amber glass jar
Groundwater	Cyanide	Grab	9	SW-846 Method 9012A	Cool to 4^0 C	14 days to analysis	(1) 250 mL amber glass jar
Groundwater	Mercury	Grab	9	SW-846 Method 7470 A	HNO3; Cool to 4° C	28 days to analysis	(1) 250 mL plastic container
Groundwater	PFAs	Grab	4	EPA Method 1633	Cool to 4^0 C	14 Days	(1) 250 mL plastic container
Soil Gas	VOCs	Grab	6	EPA Method TO-15	None	14 days to analysis	(1) Evacuated 6-Liter SUMMA® canister

Notes:
[1] For soil samples, a six-inch sampling interval is the preferred sample size; however, sample volume recovery, analytical method requirements, and field conditions can affect the actual sample interval size. For these reasons, the actual sampling interval may change in order to obtain adequate volume.
[2] Actual number of samples may vary depending on field conditions, sample material availability, and field observations. See RIWP for estimates.
[3] Holding times listed are method holding time calculated from time of collection and not NYSDEC ASP holding times.
[4] MS/MSDs require duplicate volume for all parameters for solid matrices; MS/MSDs require triplicate volume for organic parameters for aqueous matrices and duplicate volume for inorganic parameters for aqueous matrices

Table 3
Typical Laboratory Data Quality Objectives
Soil Samples
55 Eckford Street, Brooklyn, NY
BCP Site No. C224168
QAPP/FSP

Parameter	Method	Matrix	Accuracy Control Limits	Accuracy Frequency Requirements	Precision (RPD) Control Limits	Precision Frequency Requirements
VOCs (TCL)	SW-846 Methods 8260B/5035	Soil	Surrogates % Rec. 1,2-Dichloroethane-d4 70-130 4-Bromofluorobenzene 70-130 Dibromofluoromethane 70-130 Toluene-d8 70-130 2-Chloroethoxyethane 70-130 Matrix Spikes 30-151% recovery	Surrogates: All samples, standards, QC samples Matrix Spikes: One per 30 per matrix type	Field Duplicates RPD <30 MS/MSDs (RPD) RPD <30	Field Duplicates: One per 20 per soils MS/MSDs: One per 30 per matrix type
VOCs with Tentatively Identified Compounds (TICs)	SW-846 Method 8260C	Soil	Surrogates % Rec. 1,2-Dichloroethane-d4 70-130 4-Bromofluorobenzene 70-130 Dibromofluoromethane 70-130 Toluene-d8 70-130 Matrix Spikes 36-162 % recovery	Surrogates: All samples, standards, QC samples Matrix Spikes: One per 20	Field Duplicates RPD <30 MS/MSDs RPD RPD<30	Field Duplicates: One per 20 MS/MSDs: One per 20
PCBs	SW-846 Method 8082A	Soil	Surrogates % Rec. 2,4,5,6-Tetrachloro-m-xylene 30-150 Decachlorobiphenyl 30-150 Matrix Spikes 40-140% recovery	Surrogates: All samples, standards, QC samples Matrix Spikes: One per 20 per matrix type	Field Duplicates RPD <50 MS/MSDs (RPD) RPD<50	Field Duplicates: One per 20 per soils MS/MSDs: One per 20 per matrix type
SVOCs	SW-846 Method 8270D	Soil	Surrogates % Rec. Phenol-d6 10-120 2-Fluorophenol 25-120 2,4,6-Tribromophenol 10-136 Nitrobenzene-d5 23-120 2-Fluorobiphenyl 30-120 4-Terphenyl-d14 18-120 Matrix Spikes 14-144% recovery	Surrogates: All samples, standards, QC samples Matrix Spikes: One per 50 per matrix type	Field Duplicates RPD <50 MS/MSDs (RPD)	Field Duplicates: One per 20 per soils MS/MSDs: One per 20 per matrix type
SVOCs with TICs	SW-846 Method 8270D	Soil	Surrogates % Rec. Phenol-d5 10-120 2-Fluorophenol 21-120 2,4,6-Tribromophenol 10-120 Nitrobenzene-d5 23-120 2-Fluorobiphenyl 15-120 4-Terphenyl-d14 41-149 Matrix Spikes 14-144%	Surrogates: All samples, standards, QC samples Matrix Spikes: One per 20	Field Duplicates RPD <50 MS/MSDs RPD RPD<50	Field Duplicates: One per 20 MS/MSDs: One per 20
1,4-Dioxane	SW-846 Method 8270D	Soil	Surrogates % Rec. 1,4-Dioxane-d8 15-110 Matrix Spikes 40-140% recovery	Surrogates: All samples, standards, QC samples	Field Duplicates RPD <30 MS/MSDs (RPD) RPD<30	Field Duplicates: One per 20 per soils MS/MSDs: One per 20
Pesticides (TCL)	SW-846 Method 8081A	Soil	Surrogates % Rec. Decachlorobiphenyl 30-150 Tetrachloro-m-xylene 30-150 Matrix Spikes 30-150% Recovery	Surrogates: All samples, standards, QC samples Matrix Spikes: One per 20 per matrix type	Field Duplicates RPD <50 MS/MSDs (RPD) RPD<50	Field Duplicates: One per 20 per soils MS/MSDs: One per 20 per matrix type
Total Petroleum Hydrocarbons	SW-846 Method 8015B	Soil	Surrogates % Rec. o-Terphenyl 27-153 Tetracosane-d50 28-148 5α-androstane 27-148 TPH-DRO 10-149	Surrogates: All samples, standards, QC samples One per 20 per matrix type	Field Duplicates RPD <50 TPH-DRO 44	Field Duplicates: One per 20 per soils One per 20 per matrix type
Herbicides	SW-846 Method 8151A	Soil	Surrogates % Rec. 2,4-DCAA 30-150 Matrix Spikes 30-150% Recovery	Surrogates: All samples, standards, QC samples Matrix Spikes: One per 20 per matrix type	Field Duplicates RPD <50 MS/MSDs (RPD) RPD<50	Field Duplicates: One per 20 per soils MS/MSDs: One per 20 per matrix type
Metals (TAL)	SW-846 Method 6010D	Soil	Surrogates % Rec. Matrix Spikes 75-125% recovery	Surrogates: Matrix Spikes: One per 20 per matrix type	Field Duplicates RPD <20 MS/MSDs (RPD) RPD <20	Field Duplicates: One per 20 per soils MS/MSDs: One per 20 per matrix type

Table 3
Typical Laboratory Data Quality Objectives
Soil Samples
55 Eckford Street, Brooklyn, NY
BCP Site No. C224168
QAPP/FSP

Parameter	Method	Matrix	Accuracy Control Limits	Accuracy Frequency Requirements	Precision (RPD) Control Limits	Precision Frequency Requirements
PFAs	LCMSMS- Isotope Dilution	Soil	Surrogates % Rec. Perfluoro[13C4]Butanoic Acid (MPFBA) 61-135 Perfluoro[13C4]Butanoic Acid (MPFBA) 58-132 Perfluoro[13C5]Pentanoic Acid (M5PFPEA) 62-163 Perfluoro[13C5]Pentanoic Acid (M5PFPEA) 58-150 Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS) 70-131 Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS) 74-139 Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA) 57-129 Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA) 66-128 Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA) 60-129 Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA) 71-129 Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS) 71-134 Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS) 78-139 Perfluoro[13C8]Octanoic Acid (M8PFOA) 62-129 Perfluoro[13C8]Octanoic Acid (M8PFOA) 75-130 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS) 14-147 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS) 20-154 Perfluoro[13C9]Nonanoic Acid (M9PFNA) 59-139 Perfluoro[13C9]Nonanoic Acid (M9PFNA) 72-140 Perfluoro[13C8]Octanesulfonic Acid (M8PFOS) 79-136 Perfluoro[13C8]Octanesulfonic Acid (M8PFOS) 69-131 Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA) 75-130 Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA) 62-124 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS) 19-175 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS) 10-162 N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) 24-116 N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) 31-134 Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA) 61-155 Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA) 55-137 Perfluoro[13C8]Octanesulfonamide (M8FOSA) 10-112 Perfluoro[13C8]Octanesulfonamide (M8FOSA) 10-117 N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA) 34-137 N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA) 27-126 Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA) 48-131 Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA) 54-150 Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA) 22-136 Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA) 24-159 Matrix Spikes 46-182% recovery	Surrogates: All samples, standards, QC samples Matrix Spikes: One per 20 per matrix type	Field Duplicates RPD <30 MS/MSDs (RPD) RPD <30	Field Duplicates: One per 20 per soils MS/MSDs: One per 20 per matrix type
Mercury	SW-846 Method 7471B	Soil	Surrogates % Rec. Matrix Spikes 80-125% recovery	Surrogates: Matrix Spikes: One per 20 per matrix type	Field Duplicates RPD <20 MS/MSDs (RPD) RPD <20	Field Duplicates: One per 20 per soils MS/MSDs: One per 20 per matrix type
Cyanide	SW-846 Method 9012A	Soil	Surrogates % Rec. Matrix Spikes 75-125% Recovery	Surrogates: Matrix Spikes: One per 35 per matrix type	Field Duplicates RPD <35 MS/MSDs (RPD) RPD <35	Field Duplicates: One per 20 per soils MS/MSDs: One per 20 per matrix type

Recovery criteria for laboratory control samples must be at least as stringent as MS/MSD criteria.
Laboratory control limits are periodically updated. The latest control limits will be utilized at the time of sample analysis.

Table 4
Typical Laboratory Data Quality Objectives
Groundwater Samples
55 Eckford Street, Brooklyn, NY
BCp Site No. C224168
QAPP/FSP

Parameter	Method	Matrix	Accuracy Control Limits	Accuracy Frequency Requirements	Precision (RPD) Control Limits	Precision Frequency Requirements
VOCs (TCL)	SW-846 Method 8260C	Groundwater	Surrogates % Rec. 1,2-Dichloroethane-d4 70-130 4-Bromofluorobenzene 70-130 Dibromofluoromethane 70-130 Toluene-d8 70-130 Matrix Spikes 36-162 % recovery	Surrogates: All samples, standards, QC samples Matrix Spikes: One per 20	Field Duplicates RPD <20 MS/MSDs RPD RPD <20	Field Duplicates: One per 20 MS/MSDs: One per 20
VOCs with Tentatively Identified Compounds (TICs)	SW-846 Method 8260C	Groundwater	Surrogates % Rec. 1,2-Dichloroethane-d4 70-130 4-Bromofluorobenzene 70-130 Dibromofluoromethane 70-130 Toluene-d8 70-130 Matrix Spikes 36-162 % recovery	Surrogates: All samples, standards, QC samples Matrix Spikes: One per 20	Field Duplicates RPD <20 MS/MSDs RPD RPD <20	Field Duplicates: One per 20 MS/MSDs: One per 20
SVOCs TCL	SW-846 Method 8270D	Groundwater	Surrogates % Rec. Phenol-d5 10-120 2-Fluorophenol 21-120 2,4,6-Tribromophenol 10-120 Nitrobenzene-d5 23-120 2-Fluorobiphenyl 15-120 4-Terphenyl-d14 41-149 Matrix Spikes 14-144%	Surrogates: All samples, standards, QC samples Matrix Spikes: One per 20	Field Duplicates RPD <50 MS/MSDs RPD RPD <50	Field Duplicates: One per 20 MS/MSDs: One per 20
SVOCs with TICs	SW-846 Method 8270D	Groundwater	Surrogates % Rec. Phenol-d5 10-120 2-Fluorophenol 21-120 2,4,6-Tribromophenol 10-120 Nitrobenzene-d5 23-120 2-Fluorobiphenyl 15-120 4-Terphenyl-d14 41-149 Matrix Spikes 14-144%	Surrogates: All samples, standards, QC samples Matrix Spikes: One per 20	Field Duplicates: RPD <50 MS/MSDs RPD RPD <50	Field Duplicates: One per 20 MS/MSDs: One per 20
1,4-Dioxane	SW-846 Method 8270D	Groundwater	Surrogates % Rec. 1,4-Dioxane-d8 15-110 Matrix Spikes 40-140% recovery	Surrogates: All samples, standards, QC samples	Field Duplicates RPD <30 Matrix Duplicates RPD<30	Field Duplicates: One per 20 per soils MS/MSDs: One per 20
Metals (Total and Dissolved)	SW-846 Methods 6020B	Groundwater	Matrix Spikes 75-125% recovery	Surrogates: All samples, standards, QC samples Matrix Spikes: One per 20	Field Duplicates RPD <20 Matrix Duplicates RPD <20	Field Duplicates: One per 20 MS/MSDs: One per 20
Mercury (Total and Dissolved)	SW-846 Methods 7470A	Groundwater	Matrix Spikes 75-125% recovery	Surrogates: All samples, standards, QC samples Matrix Spikes: One per 20	Field Duplicates RPD <35 (dissolved) RPD<20 (Total) Matrix Duplicates RPD <35 (dissolved) RPD<20 (Total)	Field Duplicates: One per 20 MS/MSDs: One per 20
PCBs	SW-846 Method 8082A	Groundwater	Surrogates % Rec. 2,4,5,6-Tetrachloro-m-xylene 30-150 Decachlorobiphenyl 30-150 Matrix Spikes 40-140% recovery	Surrogates: All samples, standards, QC samples Matrix Spikes: One per 20 per matrix type	Field Duplicates RPD <50 MS/MSDs (RPD) RPD<50	Field Duplicates: One per 20 MS/MSDs: One per 20 per matrix type
Herbicides	SW-846 Method 8151A	Groundwater	Surrogates % Rec. 2,4-DCAA 30-150 Matrix Spikes 30-150% Recovery	Surrogates: All samples, standards, QC samples Matrix Spikes: One per 20 per matrix type	Field Duplicates: RPD <50 MS/MSDs (RPD) RPD<50	Field Duplicates: One per 20 MS/MSDs: One per 20 per matrix type

Table 4
Typical Laboratory Data Quality Objectives
Groundwater Samples
55 Eckford Street, Brooklyn, NY
BCp Site No. C224168
QAPP/FSP

Parameter	Method	Matrix	Accuracy Control Limits	Accuracy Frequency Requirements	Precision (RPD) Control Limits	Precision Frequency Requirements
Pesticides (TCL)	SW-846 Method 8081B	Groundwater	Surrogates % Rec. Decachlorobiphenyl 15-142 2,4,5,6-Tetrachloro-m-xylene 36-126 Matrix Spikes 30-150% recovery	Surrogates: All samples, standards, QC samples Matrix Spikes: One per 20	Field Duplicates RPD <30 MS/MSDs RPD RPD <30	Field Duplicates: One per 20 MS/MSDs: One per 20
PFAs	EPA Method 1633	Grounwater	Surrogates Perfluoro[13C4]Butanoic Acid (MPFBA) Perfluoro[13C4]Butanoic Acid (MPFBA) Perfluoro[13C5]Pentanoic Acid (M5PFPEA) Perfluoro[13C5]Pentanoic Acid (M5PFPEA) Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS) Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS) Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA) Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA) Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA) Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA) Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS) Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS) Perfluoro[13C8]Octanoic Acid (M8PFOA) Perfluoro[13C8]Octanoic Acid (M8PFOA) 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2- 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2- Perfluoro[13C9]Nonanoic Acid (M9PFNA) Perfluoro[13C9]Nonanoic Acid (M9PFNA) Perfluoro[13C8]Octanesulfonic Acid (M8PFOS) Perfluoro[13C8]Octanesulfonic Acid (M8PFOS) Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA) Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA) 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2- 1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2- N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA) Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA) Perfluoro[13C8]Octanesulfonamide (M8FOSA) Perfluoro[13C8]Octanesulfonamide (M8FOSA) N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5- N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5- Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA) Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA) Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA) Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA) Matrix Spikes 46-182% recovery	Surrogates: All samples, standards, QC samples Matrix Spikes: One per 20 per matrix type	Field Duplicates RPD <30 MS/MSDs (RPD) RPD <30	Field Duplicates: One per 20 MS/MSDs: One per 20 per matrix
Cyanide	EPA Method 9012B	Groundwater	Matrix Spikes 75-125% recovery	Surrogates: All samples, standards, QC samples Matrix Spikes: One per 35	Field Duplicates RPD <35 Matrix Duplicates RPD <35	Field Duplicates: One per 20 Matrix Duplicates: One per 20

Recovery criteria for laboratory control samples must be at least as stringent as MS/MSD criteria.

Laboratory control limits are periodically updated. The latest control limits will be utilized at the time of sample analysis.

Table 5
Typical Laboratory Data Quality Objectives
Soil Vapor Samples
55 Eckford Street, Brooklyn, NY
BCP Site No. C224168
QAPP/FSP

Parameter	Method	Matrix	Accuracy Control Limits	Accuracy Frequency Requirements	Precision (RPD) Control Limits	Precision Frequency Requirements
VOCs	EPA Method TO-15	Soil Gas	Surrogates % Rec 4-Bromofluorobenzene 78-124	Surrogates: All samples, standards, QC samples	Matrix Duplicates RPD £30	Matrix Duplicates One per 20

Table 6
QC Sample Preservation and Container Requirements
55 Eckford Street, Brooklyn, NY
BCP Site No. C224168
QAPP/FSP

Sample Matrix	Analytical Parameter	Sample Type	No. of Samples	EPA Analytical Method	Sample Preservation	Holding Time[1]	Sample Container
Soil	VOCs (TCL)	Discrete	4	SW-846 Method 8260C/5035	1 - Methanol, 2 - Water; Cool to 4° C; no headspace	14 days to analysis	(3) Vial Preserved
Soil	VOCs with Tentatively Identified (TCL)	Discrete	1	SW-846 Method 8260C/5035	1 - Methanol, 2 - Water; Cool to 4° C; no headspace	14 days to analysis	(3) Vial Preserved
Soil	PCBs	Composite	3	SW-846 Method 8082A	Cool to 4^{0} C	365 days to analysis	(1) 250 mL amber glass jar
Soil	Pesticides (TCL)	Composite	3	SW-846 Method 8081A	Cool to 4^{0} C	14 days to extraction	(1) 250 mL amber glass jar
Soil	SVOCs (TCL)	Composite	4	SW-846 Method 8270D	Cool to 4˚ C	14 days to extraction	(1) 250 mL amber glass jar
Soil	SVOCs with TICs (TCL)	Composite	1	SW-846 Method 8270D	Cool to 4˚ C	14 days to extraction	(1) 250 mL amber glass jar
Soil	1,4-Dioxane	Composite	1	SW-846 Method 8270D	Cool to 4˚ C	7 days to extraction	(2) 250 mL amber glass jars
Soil	Metals (TAL)	Composite	5	SW-846 Method 6010DSeries	Cool to 4^{0} C	180 days to analysis	(1) 60 mL glass jar
Soil	Mercury	Composite	3	SW-846 Method 7471B	Cool to 4^{0} C	28 days to analysis	(1) 60 mL glass jar
Soil	Cyanide	Composite	3	SW-846 Method 9010C/9012B	Cool to 4^{0} C	14 days to analysis	(1) 250 mL amber glass jar
Soil	Herbicides	Composite	3	SW-846 Method 8151A	Cool to 4^{0} C	14 days to extraction	(1) 250 mL amber glass jar
Soil	Pesticides	Composite	3	SW-846 Method 8141A[6]	Cool to 4^{0} C	14 days to extraction	(1) 300 mL amber glass jar
Soil	PFAs	Composite	1	EPA Method 1633	Cool to 4^{0} C	14 Days	(1) 250 mL plastic container

Table 6
QC Sample Preservation and Container Requirements
55 Eckford Street, Brooklyn, NY
BCP Site No. C224168
QAPP/FSP

Groundwater	VOCs (TCL)	Grab	1	SW-846 Method 8260C	HCl; Cool to 4^0 C; no headspace	14 days to analysis	(3) Vial
Groundwater	VOCs with TICs, including 1,4-Dioxane (TCL)	Grab	1	SW-846 Method 8260C	HCl; Cool to 4^0 C; no headspace	14 days to analysis	(3) Vial
Groundwater	1,4-Dioxane	Grab	1	SW-846 Method 8270D	Cool to 4^0 C	7 days to analysis	(2) 250 mL amber glass jar
Groundwater	SVOCs (TCL)	Grab	1	SW-846 Method 8270D	Cool to 4^0 C	7 days to extraction	(2) 250 mL amber glass jar
Groundwater	SVOCs with TICs (TCL)	Grab	1	SW-846 Method 8270D	Cool to 4^0 C	7 days to extraction	(2) 250 mL amber glass jar
Groundwater	Metals- total (TAL)	Grab	1	SW-846 Method 6020B/7470A Series	HNO_3; Cool to 4° C	28 days to analysis for Hg; 180 days to analysis for other metals	(1) 500 mL plastic container
Groundwater	Metals-dissolved (TAL)	Grab	1	SW-846 Method 6020B/7470A Series	HNO3; Cool to 4° C	28 days to analysis for Hg; 180 days to analysis for other metals	(1) 500 mL plastic container
Groundwater	Pesticides (TCL)	Grab	1	SW-846 Method 8081B	Cool to 4^0 C	7 days to extraction	(2) 120 mL amber glass jar
Groundwater	Herbicides (TCL)	Grab	1	SW-846 Method 8151A	Cool to 4^0 C	7 days to extraction	(2) 1000 mL amber glass jar
Groundwater	PCBs	Grab	1	SW-846 Method 8082A	Cool to 4^0 C	365 days to analysis	(1) 250 mL amber glass jar
Groundwater	Cyanide	Grab	1	SW-846 Method 9012A	Cool to 4^0 C	14 days to analysis	(1) 250 mL amber glass jar
Groundwater	Mercury	Grab	1	SW-846 Method 7470 A	HNO3; Cool to 4° C	28 days to analysis	(1) 250 mL plastic container
Groundwater	PFAs	Grab	1	EPA Method 1633	Cool to 4^0 C	14 Days	(1) 250 mL plastic container
Soil Gas	VOCs	Grab	1	EPA Method TO-15	None	14 days to analysis	(1) Evacuated 6-Liter SUMMA® canister

Notes:
1 Holding times listed are method holding time calculated from time of collection and not NYSDEC ASP holding times.

ATTACHMENTS

RESUME

Chunhua Liu

Senior Technical Specialist

Education

B.E., 1992, Environmental Engineering, Tsinghua University, Beijing, China
M.E., 1995, Environmental Engineering, Tsinghua University, Beijing, China
M.S., 1998, Environmental Health, Harvard School of Public Health
D.S., 2000, Environmental Chemistry, Harvard School of Public Health

Affiliations

- Member, LSP Association
- Member, Society for Risk Analysis
- Certified EIT in Massachusetts

Areas of Specialization

- Human Health Risk Assessment
- Ecological Risk Assessment
- Data Usability Evaluation
- Project Quality Control and Assurance
- Fate and Transport Modeling

Summary of Experience

Dr. Liu is a senior chemist with more than 10 years of experience in analytical chemistry, data validation and management, and quality control and quality assurance for remedial investigations and remedial actions. Her experience includes laboratory chemical analysis, EPA Region I and Region II data validation and data usability evaluation, data usability evaluation for Massachusetts Contingency Plan (MCP), sampling and analysis plan development in accordance with the NYSDEC Analytical Service Protocol and Massachusetts Compendium of Quality Assurance and Quality Control Requirements (QA/QC) and Performance Standards for Selected Analytical Methods, and quality control and quality assurance for Superfund and MCP projects.

Dr. Liu majored in environmental chemistry and during her doctoral study at Harvard School of Public Health, she researched analytical methods for sediment and evaluated metal fate and transport in sediment. Dr. Liu worked at Parsons for over seven years and at Gradient for one year before joining GZA. At Parsons, Dr. Liu led the quality control and assurance and data management efforts from developing Quality Assurance Project Plan (QAPP) to assuring implementation of QA/QC requirements and from field sampling preparation and arrangement to chemical data management. Dr. Liu was responsible for the QA/QC and data validation and data usability evaluation for a 10,000-acre BRAC and Superfund NPL site in New York and assisted in the successful transfer of over 8,000 acres of land. Dr. Liu performed data usability evaluation for various Massachusetts Contingency Plan sites at Gradient and GZA.

Relevant Project Experience

Senior Technical Specialist - Leads GZA human health risk assessment efforts for federal and state level superfund and MCP projects. Dr. Liu is also responsible for data usability evaluation for various projects.

Technical Director - Directed preparation and submittal of the Site-Wide Sampling and Analysis Plan (SAP) and the Site-Wide Quality Assurance Project Plan (QAPP) for a 10,000-acre Superfund site in New York in accordance with the Department of Defense (DOD), NYSDEC ASP, EPA Region II and EPA guidance. Directed project field sampling and data management. Supervised data validation in accordance with EPA Region II SOPs and NYSDEC ASP based on the NYSDEC ASP Category B deliverables. Identified laboratories qualified for project chemical analyses and interfaced with various analytical laboratories to address analytical deficiencies. Submitted data summary report to EPA Region II on a quarterly basis.

Lead Chemist and Risk Assessor- Led data usability evaluation and supported the successful closure of a 125-acre Hingham Annex Guaranteed Fixed Price Remediation Project. Dr. Liu also led the risk assessment effort and the effort of evaluating pesticide fate and transport at the site and successfully demonstrated that the pesticide conditions at the site were related to the past normal use of pesticides and therefore were not associated with the release at the Site.

Technical Director - Directed preparation and submittal of the SAP and the QAPP for various Formerly Used Defense (FUD) Sites. Supervised field sampling and data validation in accordance with guidance from various EPA regions. Reviewed data validation and data usability report.

Chunhua Liu

Senior Technical Specialist

Technical Director – Directed data validation for various Superfund sites in EPA Region I and Region II in accordance with the EPA regional and state SOPs and the EPA Functional Guidelines. Led data validation for numerous MCP sites for various analytical analyses including metal, VOC, SVOC, pesticide, PCB, EPH, VPH, and TPH analyses.

Project Chemist – Evaluated different analytical methods for hexavalent chromium analysis. Compared analytical methods developed by NJDEP and EPA and identified the appropriate method for a CERCLA site in New Jersey.

Project Chemist – Evaluated quantitatively potential impacts to metal data usability by interference caused by common metals in environmental samples for a CERCLA site in New York.

Project Chemist – Performed data validation for indoor air samples for various CERCLA and MCP Sites to assist evaluation of potential vapor intrusion pathway.

Project Chemist – Performed Level IV data validation for a Superfund site in New York for various analytical analyses including metal, VOC, SVOC, pesticide, and PCB analyses. Reviewed TIC identification and quantitation and assessed chromatograms and mass spectrums for VOCs and SVOCs.

Project Chemist – Provided technical support, prepared QAPPs, established proper data quality objectives (DQOs) for various projects, maintained project quality control, trained junior scientists, coordinated project field sampling and laboratory analyses, addressed non-conformance issues associated with the data produced by the laboratory, conducted statistical analysis, and prepared data validation reports on numerous RCRA/CERCLA and MCP projects.

Publications

Liu, C., J. Jay, T. Ford. Evaluation of Environmental Effects on Metal Transport from Capped Contaminated Sediment under Conditions of Submarine Groundwater Discharge. Env. Sci. Tech. 2001 35: 4549-4555.

Liu, C., J. Jay, R. Ika, S. James, and T. Ford. Capping efficiency for metal-contaminated marine sediment under conditions of groundwater inflow. Env. Sci. Tech. 2001 35: 2334-2340.

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Blanchet, R., Liu, C., Bowers, T. Estimation of Average Exposure Point Concentrations for Pesticides Assuming Accumulation and Degradation in the Environment. Abstract accepted at SEATEC Conference, November, 2001

Seeley, M.R., Schettler, S., Liu, C., Blanchet, R.J., Bowers, T.S. Assessing Cancer Risks Due to Use of Insecticides to Control the Mosquito-borne West Nile Virus: Use of the Margin of Exposure Approach. Abstract accepted at Society of Toxicology, 41st Annual Meeting, March 17-21, 2002.

Chunhua Liu, Jennifer Jay, Ravi Ika, Shine James, Timothy Ford. Capping Efficiency for Metal-Contaminated Marine Sediment under Conditions of Submarine Groundwater Discharge. Poster presentation at Conference on Dredged Material Management: Options and Environmental Considerations. December 3-6, 2000

Chunhua Liu, Jennifer Jay, Timothy Ford. Evaluation of Environmental Effects on Metal Transport from Capped Contaminated Sediment Under Conditions of Submarine Groundwater Discharge. Poster presentation at Conference on Dredged Material Management: Options and Environmental Considerations. December 3-6, 2000

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Wei Lin, Chunhua Liu, Guowei Fu. 1995. Environmental conflict analysis and its application in environmental planning and management: siting of public facilities. Chin. J. Environ. Sci. 1995 16(6): 36-39

Chunhua Liu, Yongfeng Nie, Wei Lin. 1995. Application prospects of landfill gas utilization technique in China. Pollution Control Technology 1995 8(3): 143-145

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Wei Lin, Chunhua Liu. 1994. Rudimentary study on countermeasure to comprehensively control air pollution caused by motor vehicles in China. Pollution Control Technology 1994 7(4): 1-3

Xiurong Zhang, Chunhua Liu, Yanru Yang, Qingzhong Bai. 1993. Environmental impact report of wastewater treatment plant project

Chunhua Liu

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in Xuanhua City, China.

Chunhua Liu, Yongfeng Nie. 1993. Water balance evaluation in Hongmei hazardous waste landfill. In: Environmental Impact Assessment of Hongmei Hazardous Waste Landfill: 25-33

Chunhua Liu. 1992. Modeling landfill leachate production and migration. Bachelor Thesis. Tsinghua University, Beijing, P.R.China

Chunhua Liu. 1991. A discussion with the author of "clean water extraction from ocean water". Technology of Water Purification 1991(1): 39-41

Appendix C – Field Forms

GZA GEOENVIRONMENTAL OF NEW YORK
Engineers and Scientists

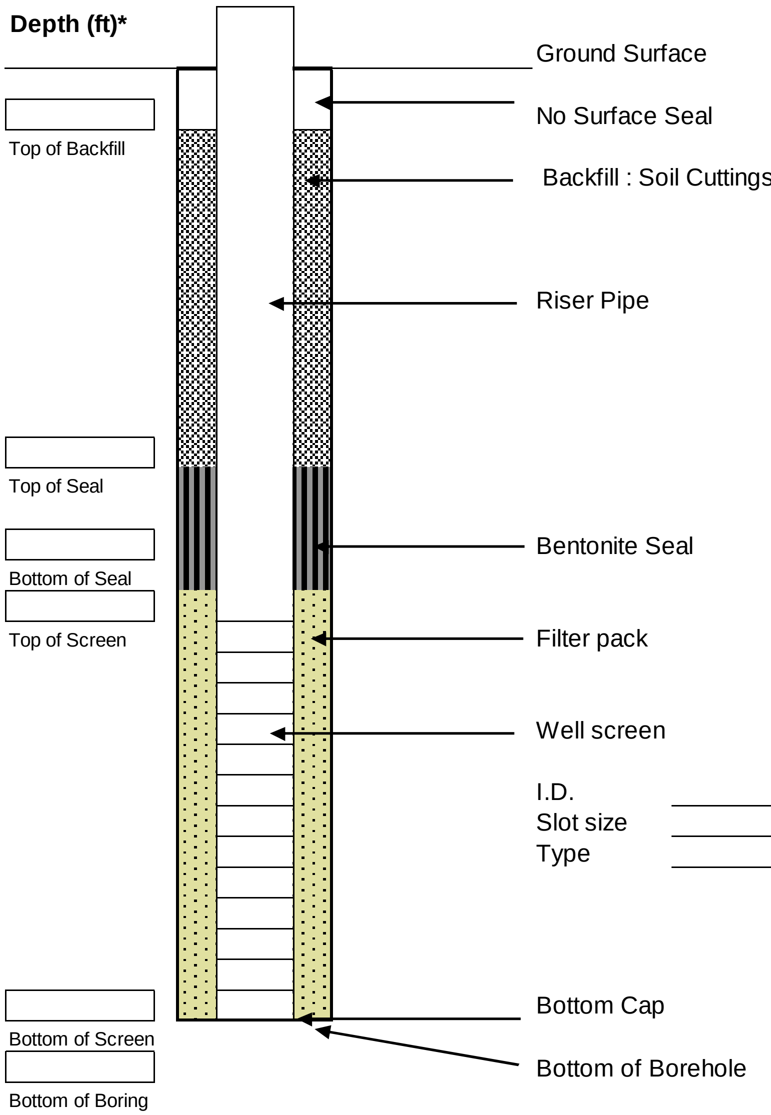
Well No.

Project:		Page 1 of 1		
Project No.:	Contractor:	Water Levels		
Surface Elevation:	Driller:	Date	Time	Depth*
Top of PVC Casing Elevation:	GZA Rep:			
Datum:	Date of Completion:			

Temporary Well Installation

Borehole diameter (in.): ___________

Depth (ft)*



I.D. _______________ inches
Slot size _______________ inches
Type _______________

* measurement is relative to the ground surface not the stickup.

GZA GeoEnvironmental of New York *Engineers and Scientists* **104 West 29th St., 10th Fl.** **New York, NY 10001**		**Boring No.** **Sheet:** **File No.:** **Reviewed By:**
Logged By: **Drilling Co. :** **Foreman**	**Geoprobe Location:** **Ground Surface Elevation (ft.):** **Final Geoprobe Depth (ft.):** **Date : Start Finish**	**Horizontal Datum:** **Vertical Datum:**
Type of Rig: **Rig Model:** **Drilling Method:**	**Sampler Type:** **Sampler O.D. (in.):** **Sampler Length (in.)** **Rock Core Size**	

Groundwater Depth (ft.)			
Date	**Time**	**Water Depth**	**Stab. Time**

	Macro No.	Macro Depth (ft.)	Pen. (in.)	Rec. (in.)		Sample Description Modified Burmister Classification	Remark	Depth (ft.)	Stratum Description	Elevation (ft.)

Field Screening performed with a photoionization detector (PID) with a 10.5 eV lamp span calibrated to 100 ppm via isobutylene gas.
See Log key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil types.
Actual transition maybe gradual. Water level readings ahave been made at the times and under conditions stated. Fluctuations of groundwater
may occur due to other factors than those present at the times the measurements were made

Boring No.

SOIL VAPOR SAMPLE FIELD LOG

PROJECT NAME: ______________________ DATE : ______________________

LOCATION: ______________________ FILE NO.: ______________________

GZA Engineer: __________ Contractor/Lab: __________

Weather: __________ Analytical Method: __________ Depth to Water: __________

Operator: __________ Ground Elevation: __________

Barometric Pressure: __________ PID Calibration: __________ Water Elevation: __________

Sample ID	Canister No.	Regulator No.	Sample Depth (ft)	Vacuum Pressure (in.Hg)		Purge Time			Sample Date	Sample Time		PID Reading (ppm)	Container Type	Surface Cover	Driving Effort	Remark
				Start	End	Purge Start	Purge Stop	Elapsed Time		Start	End					

ABBREVIATIONS:

ft. - feet

in.Hg- Inches of mercury

l./min. - liters per minute

cu. Ft. - cubic feet

ppm - parts per million

NA - not applicable

CONTAINER TYPE	SURFACE COVER	PROBE DRIVING EFFORT	SOIL MOISTURE CONTENT
TB -Tedlar Bag	SO - Soil	E - Easy	D- Dry
SC- Suma Canister	GIL - Grass/Loam	M - Moderate	M- Moderate
ST- Sorbant Tube	Asph - Asphalt	D - Difficult	W - Wet
	Cncrt - Concrete	R - Rellisal	S - Saturated

REMARKS:

WELL PURGE DATA SHEET

WELL ID: MW-

CLIENT:
SITE:
WEATHER:

PROJECT NO:
DATE:
SAMPLER(S):

COLUMN OF WATER IN WELL:

T = Depth to Bottom (ft) - Static Water Level (ft)

= ________ - ________

Water Column (T) = __________ (ft)

TOTAL VOLUME PURGED:

Design = __________ (gallons)

Actual = __________ [1] (gallons)

PURGE RATE: Variable (mL / min)

PURGE METHOD: Peristaltic Pump, Low Flow Sampling

GALLONS OF WATER PER WELL VOLUME:

Well Volume = Water Column (T) (ft) x Multiplier

= ________ x ________

Well Volume (V) = ________ (Gallons)

well diameter	multiplier
1	0.041
1.5	0.092
2	0.163
4	0.653
6	1.469

SCREENED INTERVAL: approximately to ft bgs

WATER QUALITY:

Time	Elapsed Time (Mins)	Purged Volume (gal)	Depth to Water (ft)	pH (SU)	Specific Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/l)	Temp (^{0}C)	ORP	Notes
										Start

UNITS:

gal. - gallons
ft. - feet
SU - standard units
ORP - Oxygen Reduction Potential
mS/cm - millisiemens per centimeter
NTU -nephelometric turbidity units
mg/l -milligrams per liter
^{0}C - degrees Celsius
bgs - below ground surface
NA - not applicable

NOTES AND OBSERVATIONS:

1. Purged volume was estimated.

Appendix D – Health and Safety Plan

GZA SITE-SPECIFIC HEALTH, SAFETY & ACCIDENT PREVENTION STANDARD-PLAN

1. CLIENT/SITE/PROJECT INFORMATION		
Client: 55 Eckford St LLC		
Site Address: 55 Eckford Street, Brooklyn, NY		
Site Description (be sure to list pertinent site features, chemicals used at the facility, and other potential hazard sources): The property contains 6-story steel structure for an unfinished building and the property is surrounded by a construction fence.		
Work Environment (active manufacturing, office, vacant site, undeveloped property, etc.): Construction roperty		
Job/Project #: 41.0163263.00	Field Start Date: TBD	Field Finish Date: TBD
Site is Covered by the Following Regulations:	OSHA HAZWOPER Standard ☒	Mine Safety and Health Administration ☐
	OSHA Construction Regulations ☒	

2. EMERGENCY INFORMATION		
Hospital Name: NYC Health + Hospitals / Woodhull		Hospital Phone: 718-963-8000
Hospital Address: 706 Broadway, Brooklyn, NY		Directions and Street Map Attached: ☒ Yes
Local Fire #: 911	Local Ambulance #: 911	Local Police #: 911
WorkCare Incident Intervention Services:	**For non-emergencies, if an employee becomes hurt or sick call 888-449-7787**	
Other Emergency Contact(s): Reinbill Maniquez	Phone #'s: 347-443-1059	
Site-Specific Emergency Preparedness/Response Procedures/Concerns: See Site Access Safety Addendum (attached)		

owning ZERO

accidents – injuries - illnesses

- All EHS Events must be reported immediately to the Project Manager and to the GZA People-Based Safety mobile app.
- In the event of a chemical release greater than 5 gallons, site personnel will evacuate the affected area and relocate to an upwind location. The GZA Field Safety Officer and client site representative shall be contacted immediately.
- Site work shall not be conducted during severe weather, including high winds and lightning. In the event of severe weather, stop work, lower any equipment (drill rigs), and evacuate the affected area.

GZA SITE-SPECIFIC HEALTH, SAFETY & ACCIDENT PREVENTION STANDARD-PLAN

3. SCOPE OF WORK	
General project description, and phase(s) or work to which this H&S Plan applies.	Remedial Investigation, Field Sampling
Specific Tasks Performed by GZA:	Drilling Observation, soil sampling, groundwater sampling, soil vapor sampling, soil handling, and field logging
Concurrent Tasks to be Performed by GZA-hired Subcontractors (List Subcontractors by Name):	TBD Drillers - Drilling, soil sampling, groundwater sampling, soil vapor sampling, soil handling
Concurrent Tasks to be Performed by Others:	N/A

Any OSHA PERMIT-REQUIRED CONFINED SPACE entry? ☐ YES ☒ NO IF YES, ADD CONFINED SPACE ENTRY PERMIT FOR THAT PORTION OF THE WORK	Any INDOOR fieldwork? ☐ YES ☒ NO IF YES, EXPLAIN:

4. SUB-SURFACE WORK, UNDERGROUND UTILITY LOCATION	
Will subsurface explorations be conducted as part of this work (drilling or excavation)?	☒ Yes ☐ No
Will GZA personnel be required to use a hand-auger as part of this work?	☐ Yes ☒ No
Site property ownership where underground explorations will be conducted on: 55 Eckford St LLC	Public Access Property ☐ Yes ☒ No Private Property ☒ Yes ☐ No
Have Necessary Underground Utility Notifications for Subsurface Work Been Made?	☐ Yes ☒ Yet to be conducted
Specify Clearance Date & Time, Dig Safe Clearance I.D. #, And Other Relevant Information: GZA will review utility clearance with driller prior to field work.	
IMPORTANT! For subsurface work, prior to the initiation of ground penetrating activities, GZA personnel to assess whether the underground utility clearance (UUC) process has been completed in an manner that appears acceptable, based on participation/ confirmation by other responsible parties (utility companies, subcontractor, client, owner, etc.), for the following:	

Electric:	☒ Yes	☐ No	☐ NA	☐ Other________
Fuel (gas, petroleum, steam):	☒ Yes	☐ No	☐ NA	☐ Other________
Communication:	☒ Yes	☐ No	☐ NA	☐ Other________
Water:	☒ Yes	☐ No	☐ NA	☐ Other________
Sewer:	☒ Yes	☐ No	☐ NA	☐ Other________
Other:________	☐ Yes	☐ No	☐ NA	☐ Other________

Comments: GZA to confirm mark outs prior to commencing work. Contractor to determine exact location of test boring.

GZA SITE-SPECIFIC HEALTH, SAFETY & ACCIDENT PREVENTION STANDARD-PLAN

5. HAZARD ASSESSMENT (CHECK ALL THAT APPLY AND ADDRESS EACH HAZARD IN SECTION 6)

A. GENERAL FIELDWORK HAZARDS

☐ Confined Space Entry (Add Confined Space Entry Permit)	☒ Overhead Hazards (i.e. falling objects, overhead power lines)
☒ Abandoned or vacant building/Enclosed Spaces	☒ Portable Hand Tools or Power Tools
☒ Significant Slip/Trip/Fall Hazards	☒ Significant Lifting or Ergonomic Hazards
☐ Unsanitary/Infectious Hazards	☒ Electrical Hazards (i.e. Equipment 120 Volts or Greater, Work Inside Electrical Panels, or Maintenance of Electrical Equipment)
☐ Poisonous Plants	☐ Other Stored energy Hazards (i.e. Equipment with High Pressure or Stored Chemicals)
☒ Biting/Stinging Insects	☐ Fire and/or Explosion Hazard
☐ Feral Animal Hazards	☒ Elevated Noise Levels
☐ Water/Wetlands Hazards	☒ Excavations/Test Pits
☐ Remote Locations/Navigation/Orientation hazards	☐ Explosives or Unexploded Ordinance/MEC
☐ Heavy Traffic or Work Alongside a Roadway	☐ Long Distance or Overnight Travel
☒ Weather-Related Hazards	☐ Personal Security or High Crime Area Hazards
☒ Motor vehicle operation Hazards	☐ Working Alone
☒ Heavy Equipment Hazards	☐ Ionizing Radiation or Non-Ionizing Radiation
☒ Structural Hazards (i.e. unsafe floors/stairways/roof)	☒ Chemical/Exposure Hazards (See Part B for Details)
☐ Demolition/Renovation	☒ Other: COVID-19, Underground Utilities, Soil Handling
☐ Presence of Pedestrians or the General Public	

B. CHEMICAL/EXPOSURE HAZARDS (CONTAMINANTS ARE CONTAINED IN X SOIL, WATER, X GROUNDWATER)

☐ No chemical hazards anticipated	☐ Methane
☐ Hydrogen Sulfide (H2S)	☐ Chemicals Subject to OSHA Hazard Communication (attach Safety Data Sheet for each chemical GZA brings to the site)
☐ Cyanides, Hydrogen Cyanide (HCN)	☐ Containerized Waste, Chemicals in Piping & Process Equipment
☐ Carbon Monoxide	☐ Emissions from Gasoline-, Diesel-, Propane-fired Engine, Heater, Similar Equipment
☐ Herbicides, Pesticide, Fungicide, Animal Poisons	☐ General Work Site Airborne Dust Hazards Volatile
☒ Metals, Metal Compounds:	☒ Organic Compounds (VOCs), BTEX Chlorinated Organic
☐ Corrosives, Acids, Caustics, Strong Irritants	☒ Compounds
☐ Polychlorinated Biphenyls (PCBs)	☒ Fuel Oil, Gasoline, Petroleum Products, Waste Oil
☒ Polycyclic Aromatic Hydrocarbons (PAHs)	☐ Asbestos
☐ Compressed Gases	☐ Oxygen Deficiency, Asphyxiation Hazards
☐ Flammable/Combustible Liquids	☒ Other: Silica Final AWQGVs dated March 2023 for PFOA = 6.7 ppt, PFOS = 2.7 ppt and 1,4-dioxane = 0.35 ppb.
☐ Radiation Hazards (i.e. radioactive sealed/open source, x-rays, ultra violet, infrared, radio-frequency, etc.)	

6. SITE-SPECIFIC OVERVIEW OF H&S HAZARDS/MITIGATIONS (NOTE: Based on Hazard Assessment, Section 5)	
Describe the major hazards expected to be present at the jobsite, and describe the safety measures to be implemented for worker protection (refer to items checked in Section 5 above). Use brief abstract statements or more detailed narrative as may be appropriate.	
ON-SITE HAZARDS:	**HAZARD MITIGATIONS:**
Task Hazard Analyses	Task 21.1 – General Outdoor Field Work Task 4.1 – Drilling Observations Task 4.5 – Soil-Gas Sampling Task 20.11 – Field Sampling COVID-19
Owning Zero	Ensure all GZA personnel on-site have downloaded the People Based Safety app to their mobile phones and are familiar with using it to report safety events. Prior to work each day, review Owning Zero rules with all onsite personnel during morning safety meeting.
COVID-19	Check-in daily to the GZA COVID-19 app. Observe social distancing, i.e. stay 6 feet away from others where possible. If exhibiting any symptoms (cough, fever, prolonged shortness of breath), please stay home. Notify PM (Dharmil S. Patel **646-929-8908**) for rescheduling site visits. Wash hands for 20 seconds after touching any shared equipment. The situation is rapidly developing, so keep up to date by checking guidelines from GZA's Pandemic Flu Response Team at: Notify PM for rescheduling site visits. See attached JHA and Follow Client specific work procedures related to Covid19 prevention if applicable
Abandoned or vacant building/Enclosed Spaces	Ask the client to validate that the building is structurally safe to enter. Constantly scan surroundings for integrity of floors and stairs and stay alert to debris on the ground or unsafe objects. Do not walk under ceilings or structures showing signs of distress and wear hard hats at all times within structures. Be alert for other people and / or animals in the building. Bring flashlights in case of poor lighting and a charged cell phone for communication. Inform your PM to let her/him know your anticipated hours of work on the site, and call them when you leave the site for the day. Leave the site if it is unsafe for any reason.
Biting and Stinging Insects	Ticks carry risk of Lyme and other Diseases. Tick season is basically any field day above 40 degrees F. Tuck pants into long socks and apply DEET (or permethrin pre-treatment) to clothing in season to control exposure to ticks. Check clothing for ticks frequently. Check whole body immediately upon returning from field and shower. Be aware of intermittent seasonal reports of mosquito borne diseases, such as West Nile disease and Eastern Equine Encephalitis (EEE), and their locations relative to your field site. Use DEET or other mosquito repellant. Be aware of potential cavity, suspended or ground nesting bee/wasp/hornet nests. Avoid undue disturbance or approach with appropriate safety clothing protection and netting. See attached Policy - GZA policy 03-3019 Lyme Disease.
Slip, Trips, and Falls	Inspect work area prior to starting work. Mark out or remove any potential hazards. Be aware and inspect area for uneven surface. Wear sturdy shoes with ankle support and good tread. Look for potential natural depressions/holes/or other obstructions in the area of work and travel. Personnel will be wearing appropriate boots with good tread to prevent slips and falls. Maintain one free hand to break falls. Provide adequate space for each employee to work safely with sound footing. Watch for equipment on ground and slippery surfaces. Keep work area clean, no running, be mindful of changing weather conditions that may change footing conditions. Store any hand tools used for sampling in their proper storage location when not in use. Do not perform work if adequate lighting is not available. Maintain an exit pathway away from the rig at all times.

Weather-Related Hazards	Weather conditions will be assessed prior to on-site work and forecast examined for anticipated period of work. If weather permits fieldwork, then workers will dress appropriately. Should inclement weather be encountered, the project scope may be reduced or rescheduled. Breaks will be taken to reduce exposure to the elements. If conditions change and lightning or thunder is observed, work will be suspended immediately, and workers will seek shelter. Work may resume if thunder and/or lightning cease for 30 minutes. In the case of cold weather, proper warm gear should be worn to minimize cold exposure. Hand warmers (e.g. "Hot Hands") should be used when appropriate to keep extremities warm and multiple breaks within a warm area (vehicle with heat) should be taken. Review the signs of heat stress and dehydration before the start of fieldwork. Water, sunscreen, hardhat, tinted safety sunglasses, rain gear (if necessary) and periodic breaks should all be planned for. Be sure to consume plenty of liquids on hot summer days and stay out of direct sunlight for extended periods of time to the extent possible. Use protective ointments such as sunscreen and chap stick, and consult the OSHA Heat Safety App daily.
Motor Vehicle Operation Hazard	Check blind spots before backing up. Use a spotter when maneuvering vehicle in tight locations. Obey speed limits and wear seatbelts. No active hand-held or hands-free cell phone use while driving.
Underground Utilities	Confirm that underground utility clearance procedures have been completed in accordance with GZA Policy # 04-0301 Responsibility for Utility Clearance of Exploration Locations for clearing utility locations prior to breaking ground. Hand clear as necessary prior to commencement of drilling activities.
Heavy Equipment Hazards	All personnel working in proximity to heavy equipment will be familiarized with the locations and operations of emergency kill switches prior to equipment start-up. A first-aid kit and fire extinguisher (10 # Class B/C, minimum) will be available at all times. No loose clothing, jewelry, or unsecured long hair is permitted near the rig. Keep hands and feet away from all moving parts while drilling is in-progress. Persons shall not pass under or over a moving drill tools. Watch for moving vehicles and equipment. Stay out of equipment radius while drilling and excavation is in-progress. Maintain visibility and eye contact with operators when walking around trucks and excavators. Wear reflective vests to enhance visibility. Stay clear of drill rig or excavator (minimum of 6 feet) while operating and do not approach unless equipment has been stopped and eye contact/coordination is made with equipment operator for personnel to approach rig to make observations or collect samples. GZA personnel shall not climb onto or approach rig or excavator while operating or while drill rods are being attached or removed. GZA staff should verify that the onsite equipment has been routinely inspected. GZA staff should also maintain a safe working distance from the equipment while it is maneuvering around the site. GZA staff are not authorized to operate the drill rig or excavator, however, they should be familiar with the location and operation of the emergency shutoff in the event the main operator is unable to operate this control in the event of an emergency. Personnel are not allowed on a mast while drilling is in operation. While a drill rig or excavator is moved from one location to another, drill steel, tools, and other equipment shall be secured and the mast placed in a safe position. All borings and test pits will be adequately covered and/or barricaded if left unattended for any period of time to prevent injury. Working around heavy equipment, personnel shall be aware of pinch points, rotating equipment, and winch operated equipment. Maintain safe working distance and never walk underneath overhead projection of the equipment. Always maintain eye contact and communication with the operator. Follow GZA safe drilling and field work procedures.
Struck by, caught by, run over by equipment	Do not stand near or where equipment operators cannot see you. Always be in line of sight. Do not make sudden moves and always let the operator know of your intentions. Wear high-visibility safety vest, hard hat, eye protection, steel toe boots and use common sense and good housekeeping practices to avoid injury. Stay within sight of rig/excavator operator but at least 6-10 feet away from rig and excavator swing area. Maintain clear lines of communication (verbal and/or visual) with the operator. Stand clear of exhaust from operating equipment and stay out of the swing radius of heavy equipment. Be aware of overhead equipment and potential for falling objects (i.e. tree branches). Avoid any “pinch points” where one could become trapped between the equipment and other objects. Maintain awareness of general rig movement/operation and communication with drill crew. Do not conduct soil classification/sampling directly adjacent to the drill rig. Hearing protection shall be worn when working near operating equipment.

	Equipment should be situated so that at full extension of bucket arm, the equipment is at least 10 feet away from overhead lines.
Overhead Hazards (i.e. Falling Objects, Overhead Power Lines)	Mechanical raising and falling weights and equipment are typical around drill rig. Stand clear of drill rig when possible. Observe proposed exploration locations for possible overhead utility lines/tree branches and avoid these if applicable. Check for overhead lines at each work location and between locations and keep equipment at least 25 feet from overhead utilities. Wear steel toed boots, hardhat and safety glasses/goggles. If stacked materials appear unstable inform the site representative. Be aware while equipment is advancing into soil / sediment. Do not stand directly in immediate vicinity of equipment in case equipment malfunction occurs. Maintain safe working distance and maintain eye contact and communication with operator. Never stand under elevated loads or equipment.
Significant Lifting or Ergonomic Hazards	Proper lifting techniques (lifting with the legs, carrying the load at a reasonable height to allow for proper posture during the carry, and avoiding twisting while carrying loads) should be followed at all times. Caution should be used when lifting equipment. Be aware of hand position during all stages of the lift, transport and placement of equipment. Review equipment to be moved prior to lifting to prevent moving parts from crushing fingers or otherwise pinching skin. Do not stack items prior to carrying, but rather transport one item at a time to prevent shifting during carrying. Follow GZA Safe Lifting SOP.
Elevated Noise Levels	Always use ear protection when drill rig is in operation. In accordance with 29 CFR 1910.95(b)(1) When employees are subjected to sound exceeding those listed in Table G-16, feasible administrative or engineering controls shall be utilized. If such controls fail to reduce sound levels within the levels of Table G-16, personal protective equipment shall be provided and used to reduce sound levels within the levels of the table. TABLE G-16 - PERMISSIBLE NOISE EXPOSURES (1) <u>Duration per day (hours) | Sound level dBA slow response</u> 8...................................... | 90 6......................................| 92 4......................................| 95 3......................................| 97 2......................................| 100 1 1/2 ....| 102 1.......................................| 105 1/2 ....| 110 1/4 or less.........................| 115 Hearing protection in the form of disposable ear plugs will be worn during field work with sound levels anticpated above those listed in Table G-16. Use sound meter app on phone to assess required PPE. Be aware that hearing protection can diminish warning sounds - do not stand with back to operating equipment and be alert for changing conditions.
Soil Handling	Be aware that soil jars may have been broken during transport and properly cushion sample jars to prevent breakage. Do not eat, smoke or apply cosmetics (e.g. Chapstick, sunscreen) in the work area. Wear nitrile gloves during sampling to avoid common hazards associated with soil handling. Do not have skin contact with/ingest soils. Wash hands and face before eating or drinking.
Portable Hand Tools	Appropriate personal protective equipment (i.e.: safety glasses, face shield, safety goggles, gloves, etc.) shall be worn to protect from hazards that may be encountered while using portable power tools and hand tools
Silica Dust	Primary health effects of silica exposure include silicosis. raining will be provided to employees potentially exposed over the PEL for silica prior to them beginning work with silica, and will be updated on a regular basis. Depending on the levels of total and/or respirable dust in the employee's breathing zone, air monitoring will be performed for particulates. Ample ventilation will be provided to GZA workers.

7. AIR MONITORING ACTION LEVELS – Make sure air monitoring instruments are in working order, calibrated before use, and 'bump-checked' periodically throughout the day and/or over multiple days of use

Is air monitoring to be performed for this project? Yes ☒ No ☐

ACTION LEVELS FOR OXYGEN DEFICIENCY AND EXPLOSIVE ATMOSPHERIC HAZARDS (Action levels apply to occupied work space in general work area)

☐ Applicable, See Below. ☒ Not Applicable

Parameter	Response Actions for Elevated Airborne Hazards
Oxygen	At 19.5% or below – Exit area, provide adequate ventilation, or proceed to Level B, or discontinue activities Verify presence of adequate oxygen (approx. 12% or more) before taking readings with LEL meter. Note: If oxygen levels are below 12%, LEL meter readings are not valid.
LEL	Less than 10% LEL – Continue working, continue to monitor LEL levels Greater than or Equal to 10% LEL – Discontinue work operations and immediately withdraw from area. Resume work activities ONLY after LEL readings have been reduced to less than 10% through passive dissipation, or through active vapor control measures.

ACTION LEVELS FOR INHALATION OF TOXIC/HAZARDOUS SUBSTANCES (Action levels are for sustained breathing zone concentrations)

☒ Applicable, See Below. ☐ Not Applicable

Air Quality Parameters (Check all that apply)	Remain in Level D or Modified D	Response Actions for Elevated Airborne Hazards
☒ VOCs	0 to 5 ppm	From 5 ppm to 10 ppm: Proceed to Level C, or Ventilate, or Discontinue Activities If greater than 5 ppm: Discontinue Activities and consult EHS Team
☐ Carbon Monoxide	0 to 35 ppm	At greater than 35 ppm, exit area, provide adequate ventilation, proceed to Level B, or discontinue activities.
☐ Hydrogen Sulfide	0 to 10 ppm	At greater than 10 ppm, exit area, provide adequate ventilation, proceed to Level B, or discontinue activities
☒ Dust	0 to 150 ug/m^3	If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 ug/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 ug/m3 of the upwind level and in preventing visible dust migration
☐	0 to	

SPECIAL INSTRUCTIONS/COMMENTS REGARDING AIR MONITORING (IF APPLICABLE)

8. HEALTH AND SAFETY EQUIPMENT AND CONTROLS

AIR MONITORING INSTRUMENTS

- ☒ PID Type: Lamp Energy: 11.7 eV
- ☐ FID Type:
- ☐ Carbon Monoxide Meter
- ☐ Hydrogen Sulfide Meter
- ☐ O_2/LEL Meter
- ☒ Particulate (Dust) Meter
- ☒ Calibration Gas Type - Isobutylene
- ☐ Others:

OTHER H&S EQUIPMENT & GEAR

PERSONAL PROTECTIVE EQUIPMENT

- ☐ Respirator – Type
- ☐ Respirator - Cartridge Type:
- ☒ Hardhat
- ☒ Outer Gloves Type: Nitrile
- ☒ Inner Gloves Type: nitrile
- ☒ Steel-toed boots/shoes
- ☐ Coveralls – Type
- ☐ Outer Boots – Type
- ☒ Eye Protection with side shields
- ☐ Face Shield

☒ Fire Extinguisher	☒ Traffic Vest
☒ Caution Tape	☐ Personal Flotation Device (PFD)
☒ Traffic Cones or Stanchions	☐ Fire Retardant Clothing
☐ Warning Signs or Placards	☐ EH (Electrical Hazard) Rated Boots, Gloves, etc.
☐ Decon Buckets, Brushes, etc.	☒ Noise/Hearing Protection
☐ Portable Ground Fault Interrupter (GFI)	☒ Others: Face Covering (COVID—19)
☐ Lockout/Tagout Equipment	**Discuss/Clarify, as Appropriate:** face mask covering when social distancing cannot be readiliy practiced
☐ Ventilation Equipment	
☒ Others: First Aid Kit, Cell Phone, Water, Soap	

9. H&S TRAINING/QUALIFICATIONS FOR FIELD PERSONNEL

☒ Project-Specific H&S Orientation (Required for All Projects/Staff)	☐ Lockout/Tagout Training
☒ OSHA 40-Hour HAZWOPER/8 Hour Refreshers	☐ Electrical Safety Training
☐ Hazard Communication (for project-specific chemical products)	☐ Bloodborne Pathogen Training
☒ First Aid/CPR (required for HAZWOPER for at least one individual on site)	☒ Safe Drilling SOP
☐ Current Medical Clearance Letter (required for HAZWOPER)	☐
☒ OSHA 10-hour Construction Safety Training	☐
☐ Fall Protection Training	☐
☐ Trenching & Excavation	☐

Discuss/Clarify, as needed:

10. PERSONNEL AND EQUIPMENT DECONTAMINATION (SECTION ONLY REQUIRED FOR HAZWOPER SITES)

Describe personnel decontamination procedures for the project site, including “dry decon” (simple removal of PPE)	Dry Decon, wash hands and other exposed skin before taking breaks or leaving site. Change PPE before leaving site.

11. PROJECT PERSONNEL - ROLES AND RESPONSIBILITIES

GZA ON-SITE PERSONNEL:

Name(s)	Project Title/Assigned Role	Telephone Numbers
Reinbill Maniquez	Site Supervisor	Work: 212-594-8140 Cell: 347-443-1059
Jackson Bogach	Field Safety Officer	Work: 212-594-8140 Cell: 332-215-6349
Reinbill Maniquez	First Aid Personnel	Work: 212-594-8140 Cell: 332-215-6349
Jackson Bogach	GZA Project Team Members	Work: 212-594-8140 Cell: 332-215-6349

Site Supervisors and Project Managers (SS/PM): Responsibility for compliance with GZA Health and Safety programs, policies, procedures and applicable laws and regulations is shared by all GZA management and supervisory personnel. This includes the need for effective oversight and supervision of project staff necessary to control the Health and Safety aspects of GZA on-site activities.

Field Safety Officer (FSO): The FSO is responsible for implementation of the Site Specific Health and Safety Plan.

First Aid Personnel: At least one individual designated by GZA who has current training and certification in basic first aid and cardiopulmonary resuscitation (CPR) must be present during on-site activities involving multiple GZA personnel at HAZWOPER sites.

GZA Project Team: Follow instructions relayed by the HASP and GZA manager on-site.

OTHER PROJECT PERSONNEL:

Name	Project Title/Assigned Role	Telephone Numbers
Victoria D. Whelan	Principal-in-Charge	Work: (212) 594-8140 Cell: (631) 793-8821
Reinbill Maniquez	Project Manager	Work: (212) 594-8140 Cell: (347) 443-1059
Reinbill Maniquez	Office Safety Coordinator	Work: (212) 594-8140 Cell: (347) 443-1059
Richard Ecord	GZA EHS Director	Work: 781-278-3809 Cell: 404-234-2834

Principal-in-Charge: Responsible of overall project oversight, including responsibility for Health and Safety.

Project Manager: Responsible for day-to-day project management, including Health and Safety.

Health and Safety Coordinator: General Health and Safety guidance and assistance.

GZA EHS Director: H &S technical and regulatory guidance, assistance regarding GZA H&S policies and procedures.

12. PLAN ACKNOWLEDGEMENT AND APPROVALS		
GZA Project Site Worker Plan Acknowledgement		
I have read, understood, and agree to abide by the information set forth in this Safety and Accident Prevention Plan. I will follow guidance in this plan and in the GZA Health and Safety Program Manual. I understand the training and medical monitoring requirements covered by the work outlined in this plan and have met those requirements.		
GZA Employee Name	GZA Employee Signature	Date
Subcontractor Site Worker Plan Acknowledgement		
GZA has prepared this plan solely for the purpose of protecting the health and safety of GZA employees. Subcontractors, visitors, and others at the site must refer to their organization's health and safety program or site-specific HASP for their protection. Subcontractor employees may use this plan for general informational purposes only. Subcontractor firms are obligated to comply with safety regulations applicable to their work, and understand this plan covers GZA activities only.		
Subcontractor Employee Name	Subcontractor Employee Signatures	Date
GZA HASP Approval Signatures		
The following individuals indicate their acknowledgement and/or approval of the contents of this Site Specific H&S Plan based on their understanding of project work activities, associated hazards and the appropriateness of health and safety measures to be implemented. A signed copy of this document must be present at the project site at all times work is being performed.		
GZA Author/Reviewer Role	Signature	Date
Jackson Bogach **HASP Preparer**	Jackson Bogach	**05/21/2024**
Todd Bown **EHS Reviewer**	Todd S. Bown	**5/21/2024**
Stephen M. Kline **Principal in Charge**	Stephen M Kline	**5/24/2024**

Google Maps

55 Eckford St, Brooklyn, NY 11222 to NYC Health + Hospitals/Woodhull

Drive 1.9 miles, 19 min

Map data ©2024 Google 1000 ft

via Leonard St 19 min

Best route, despite much heavier traffic than usual 1.9 miles

via Leonard St and Humboldt St 19 min

Heavy traffic, as usual 2.0 miles

via Graham Ave 20 min

Heavier traffic than usual 1.9 miles

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Appendix E – Community Air Monitoring Program (CAMP)

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Appendix E
New York State Department of Health
Generic Community Air Monitoring Plan
Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. A periodic monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well bailing/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued.

After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m_3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m_3 above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/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.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

Appendix F – BCP Project Milestones

BROWNFIELD CLEANUP PROGRAM

55 ECKFORD ST. LLC SITE

Project Milestones	Start	End	2024							2025												2026											
			Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
BCP Application and RIWP Submission to NYSDEC	6/21/2024	7/19/2024																															
NYSDEC BCP Application Review and Determination of Completeness	7/22/24	8/19/2024																															
Revisions to BCP Application and RIWP	8/20/2024	9/13/2024																															
30-Day Public Comment for BCP Application	9/16/2024	10/15/2024																															
BCA Execution	10/21/2024	10/21/2024																															
CPP Submission and Review	10/21/2024	10/25/2024																															
NYSDEC and NYSDOH Review of RIWP and Submission of Revisions	9/16/2024	10/31/2024																															
RIWP Implementation	11/1/2024	12/13/2024																															
RIR Preparation	12/16/2024	1/17/2025																															
RAWP Preparation	1/6/2025	1/31/2025																															
NYSDEC and NYSDOH Review of RIR and RAWP, Submission of Revisions and 45-Day Comment Period	2/3/2025	4/14/2025																															
Approval of the RIR and RAWP, Issuance of Decision Document	4/15/2025	5/14/2025																															
Pre-construction Meeting with NYSDEC	5/16/2025	5/16/2025																															
Construction and RAWP Implementation, Documentation of Engineering Controls	5/19/2025	9/22/2026																															
Preparation of FER and SMP	7/13/2026	9/30/2026																															
NYSDEC Review of FER and SMP	10/1/2026	11/30/2026																															
Issuance of COC	12/16/2026	12/16/2026																															

* The chart above presents a schedule for the proposed BCP Project Implementation and Reporting. If the schedule for remediation and development activities changes, it will be updated and submitted to NYSDEC, as necessary.

Appendix G - Personnel Qualifications

Victoria Whelan, PG, QEP

Associate Principal

Education

B.S., Geology, State University of New York at Oswego, 2001-2005; James Cook University 2004-2005

Licenses & Registrations

Registered Professional Geologist – 2017, New York, # 000318

Certified Professional Geologist, New York State

Qualified Environmental Professional, Institute of Professional Environmental Practice

Areas of Specialization

- Geology
- NYCOER VCP
- NYSBCP
- Environmental Assessments
- Environmental Site Investigation and Remediation
- UST Closures/Assessments
- Regulatory Compliance Planning and Permitting

Summary of Experience

Ms. Whelan is a Certified Professional Geologist and Qualified Environmental Professional with nearly 20 years of experience in environmental assessment. She has performed and managed field investigations and remedial activities at numerous sites on Long Island and throughout the Metro New York area. She has skillfully conducted all aspects of environmental investigations and remediation. Her primary focus is to accurately assess, investigate, remediate, and maintain environmental integrity for real estate transactions and the redevelopment of brownfield or similarly environmental impaired properties.

She manages all aspects of projects with the New York State Department of Environmental Conservation (NYSDEC) Brownfield (BCP) and Voluntary Cleanup Program (VCP), the New York City Office of Environmental Remediation (NYC OER), the New York City Department of Environmental Protection (NYCDEP) and the United States Environmental Protection Agency (USEPA).

Relevant Project Experience

NYCOER PROJECTS

Project Manager, Chester Street Brooklyn Supportive Housing Project, Brooklyn, New York. Managed all aspects of environmental project from due diligence investigation services, Phase I Environmental Site Assessment, and Phase II Environmental Site Investigation services to assisting client through NYCOER Voluntary Cleanup Program (VCP). Submitted and received approval for remedial investigation work plan, remedial investigation report, remedial action work plan, and construction health and safety plan, including a community air monitoring program. Managed removal of 12 buried aboveground storage tanks (ASTs). Managed waste characterization study to evaluate various soil types for disposal. Cost effectively utilized the NYC Clean Soil Bank as a disposal site and backfill source. Secured grant funding after receiving Notice of Satisfaction (NOS) for a Track 1 Cleanup.

Environmental Project Manager, Manhattan Avenue, Affordable Housing Project, Brookyn, New York. Member of team that helped Ownership develop a new seven-story residential building on former factory site. Proposed development covered nearly 8,000 square feet of the property, including affordable housing with amenities such as a rear yard, recreation space, and children's play place. Site's contaminants included heavy metals and semi-volatile organic compounds. Hazardous and non-hazardous waste and non-hazardous was removed from the property as part of remediation efforts to address source material. Goal Soil Cleanup Objectives (SCOs) could not be achieved after remediation due to shallow groundwater. A track 4 Cleanup was achieved on this site by installing a composite cover inclusive of a vapor barrier. The project was completed on-time and on budget for the client to receive a NOS.

Project Manager, Bronx Community Development Project, Bronx, New York. Provided environmental services as client purchased, investigated, and remediated site for 81-unit community development, parking area and recreational area. The project is enrolled in NYC OER's VCP. Completed a Phase I ESA, VEA, Phase II ESI, RAWP and RAR.

Victoria Whelan, PG, QEP

Associate Principal

During remediation perimeter air monitoring was performed as per the CAMP. Designed oversaw removal of contaminated soil and installation of chemical vapor barrier during redevelopment.

NYSDEC BROWNFIELD PROJECTS

Principal-in-Charge, Former Auto Wreckers Site, Bronx, New York. Project is in the NYSDEC BCP with a planned Track 1 Cleanup. The site was successfully rezoned, and the proposed project will include 212 affordable housing apartments, 22,000 square feet (sf) of retail space, and parking. As remedial excavation was conducted it was quickly determined that the initial remedial plan would not satisfy the requirements for the project. As PIC, worked with the ownership, architect, accountant and construction team to steer the project towards new remedial goals without impacting project schedule. Remedial elements include a large-scale groundwater treatment system to address petroleum impacted groundwater and excavation of all source material ranging from depths of 2 to 15 feet below grade.

Environmental Project Manager, Confidential Residential Development, Bronx, New York. The 1.5-acre property was enrolled in the NYSDEC Brownfield Cleanup Program. Remedial components included excavation of soil exceeding the Site-specific Track 4 SCOs ranging from 2-22 feet, construction and maintenance of a composite cover system, removal of multiple underground storage tanks (USTs) and injection of Regenox and ORC Advanced (ISCO treatment) into the groundwater. Remediation also involved implementation of a CAMP. The site building was equipped with a vapor barrier and an active sub-slab depressurization system (SSDS). Throughout the process, assisted with design, maintaining a schedule and development of a Site Management Plan (SMP) and Final Engineering Report (FER).

Principal-in-Charge, Clay Street, NYCOER to NYSBCP Site, Brooklyn New York. Project consists of three parcels that share a property boundary and is in an area known to have heavy contamination. As the Principal-in-Charge, guided a team including ownership, developer and architect from the NYCOER VCP to the NYSDEC BCP based on contamination identified during the initial Remedial Investigation. Strategically conducted additional investigation to get multiple parts of the project eligible for the program and to maximize the tax credits available. Development will include a much-needed community facility in the way of a medical center, an indoor children's play center, and residential house.

USEPA PROJECTS

Project Manager, Remediation System, Confidential Client, Hicksville, New York. Managed this USEPA Superfund site for nearly 15 years through the operations and maintenance phase including a long-term groundwater treatment program, off-site soil vapor intrusion evaluations, and a large-scale groundwater sampling program. Contaminants of concern included PCBs and volatile organic compounds (VOCs). The site was complicated by multiple overlapping plumes of groundwater contamination. Collaborated with multiple property owners and their consultants to successfully drive the remediation.

NYS SPILLS PROJECTS

Project Manager, Spill Investigation and Remediation Services, Hempstead, New York. Performed a Phase I Environmental Site Assessment (ESA) that identified a gas station on the Site from 1940 through 1962, until redevelopment in the 1970s as a current commercial building. A subsequent Phase II Environmental Site Investigation (ESI) identified petroleum impacted soils, groundwater, and the presence of light non-aqueous phase liquids (LNAPL). A NYSDEC Spill Case was opened, and a Spill Investigation Work Plan was approved. Managed the spill investigation activities which included a work plan of Vacuum Enhanced Fluid Recovery (VEFR) events to evaluate feasibility of collecting residual petroleum contamination from beneath the Site building using VEFR. As part of long-term remedial plan, Monitored Natural Attenuation (MNA) and biodegradation to assess MNA is viable remedial strategy for the Site after the remediation of the LNAPL.

Certifications/Training

- 40-Hour OSHA HAZWOPER Training and 8-Hour Refreshers
- 10-Hour OSHA Construction Safety Course

Victoria Whelan, PG, QEP

Associate Principal

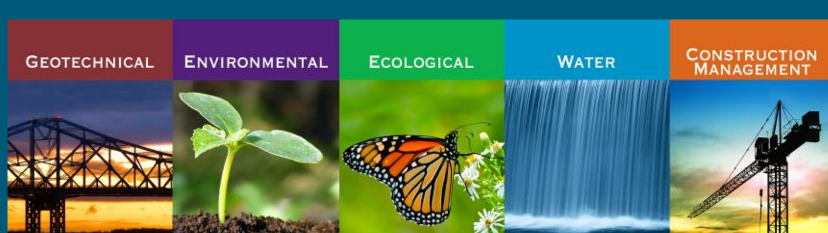
- First Aid/CPR Training
- LIRR Roadway Worker Training required by 49 CFR Part 214 Subpart C
- ARC Flash Training
- Confined Space Entry

Affiliations/Memberships

- Board Member - New York City Brownfield Partnership (NYCBP) 2022- present
- Committee Chair - Small Business Committee (NYCBP) 2022- present
- Member, New York State Council of Professional Geologists (NYSCPG)
- Member, American Council of Engineering Companies
- Member, Long Island Association of Professional Geologist

Honors & Awards

- Big Apple Brownfield Award - Hour Apartment House III
- Supportive Living Affordable Housing Award - Putnam Court
- Who's Who in Green Award - Atlantic Terrace



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