



REMEDIAL ACTION WORK PLAN
65 ECKFORD STREET
BROOKLYN, NY
NYSDEC SITE C224218

PREPARED FOR
65-73 ECKFORD REALTY LLC
266 BROADWAY, SUITE 301
BROOKLYN, NEW YORK

PREPARED BY:

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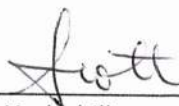
H & A of New York LLP, d/b/a Haley & Aldrich of New York

File No. 0202156-002

July 2022

Certification

I, Scott A. Underhill, certify that I am currently a NYS registered Professional Engineer and that this Remedial Action Work Plan was prepared in accordance with the applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

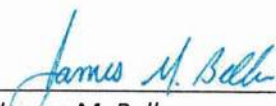
  

Scott A. Underhill
NYS Professional Engineer #075332

July 20, 2022

Date

I, James M. Bellew, certify that I am currently a Qualified Environmental Professional as defined in 6 NYCRR Part 375 and that that this Remedial Action Work Plan was prepared in accordance with the applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).



James M. Bellew

July 20, 2022

Date

Executive Summary

This Remedial Action Work Plan (RAWP) was developed by H & A of New York LLP, d/b/a Haley & Aldrich of New York (Haley & Aldrich) on behalf of 65-73 Eckford Realty LLC (the Volunteer) for the proposed development located at 65 Eckford Street (Block 2266 Lot 39) within the Greenpoint neighborhood of Brooklyn, New York (the Site).

In January 2017, 65-73 Eckford Realty LLC filed an application with the New York State Department of Environmental Conservation (NYSDEC) to amend the existing application (Site No. C224218) which included removal of the previous applicant and addition of new ownership information. The updated Brownfield Cleanup Program (BCP) application was approved by NYSDEC with 65-73 Eckford Realty LLC as the Volunteer. The Volunteer proposes to remediate and redevelop the Site for residential use.

This RAWP summarizes the nature and extent of contamination on the Site as determined from data gathered during the Remedial Investigation (RI) performed by Environmental Business Consultants (EBC) in December 2015 and during the Supplemental Remedial Investigation (SRI) performed by Haley & Aldrich from 27 December 2021 through 14 January 2022. It provides an evaluation of a Track 1 cleanup and other applicable remedial action alternatives, their associated costs, and the recommended and preferred remedy. The remedies described in this document are consistent with the procedures defined in NYSDEC Division of Environmental Remediation (DER) Program Policy: Technical Guidance for Site Investigation and Remediation (DER-10) and complies with applicable federal, state, and local laws, regulations, and requirements.

SITE DESCRIPTION AND SITE HISTORY

The Site, identified as Block 2698, Lot 26 on the New York City tax map, is 10,200-square feet and is bound to the north by a four-story residential building, to the east by Eckford followed by residential apartment buildings, to the south by a residential apartment building currently in construction (enrolled in the NYSDEC BCP Program as Site Number C224218), and to the west by a four-story residential building and a one-story industrial building. The Site location is shown on Figure 1. Existing Site features are shown on Figure 2. A site survey map is provided in Appendix A.

The Site is located in an urban area surrounded by commercial, residential, and industrial properties served by municipal water. The land is currently located within a MX-8 Special Mixed-Use District (MX) and zoned as M1-2/R6A for “medium-density apartment house districts,” which allows for residential use. The Site owner plans to continue site use for residential purposes consistent with current zoning. A copy of the zoning map is included in Appendix F.

The Site is listed with an environmental E-Designation, E-138 – Greenpoint/Williamsburg rezoning action (CEQR 04DCP003K). The requirements under the E-Designation program are satisfaction of the requirements for Hazardous Material components with the New York City Office of Environmental Remediation (NYCOER).

The Site was developed between 1905 and 1916 and improved with several one-story manufacturing buildings occupied by the Meisel Danowitz & Co. woodworking operation. The Site was redeveloped by 1916 with a 1-2 story building and had been utilized by several industrial operations including a machine shop, wood box manufacturing facility, automobile parking garage, and metal finishing facility. Records

indicate that former operations utilized underground gasoline storage tanks that were located in the northeast portion of the Site. The Site was occupied by the Carter Spray Finishing Corporation from 1960 to 2008 which used the building for metal finishing and spraying. The building was razed in 2015. The Site was subject to multiple subsurface investigations and construction of a five-story hotel on the Site began in 2018. Construction included excavation, transportation of soil for off-site disposal, and the installation of a secant pile wall along the perimeter of the Site. Construction of the hotel was not completed. Currently, the Site is excavated to approximately 5 to 6 feet below grade Site wide and remains vacant. The current owner, 65-73 Eckford Realty LLC, purchased the Site from Z65 Realty LLC in July 2016.

The area surrounding the Site was historically used for residential dwellings, light manufacturing, and warehousing from the late 1800s through the mid-2000s. From the mid-2000s, the area was primarily used for commercial/residential purposes.

SUMMARY OF SUPPLEMENTAL REMEDIAL INVESTIGATION FINDINGS

The SRI was completed in accordance with Title 6 of the New York Codes, Rules, and Regulations (6 NYCRR) Part 375, DER-10 and the NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (October 2006 and subsequent updates). The objective of the SRI was to determine the nature and extent of contamination in soil, groundwater, and soil vapor. The SRI was performed from 27 December 2021 through 14 January 2022.

The SRI consisted of the following:

- Advancement of twelve soil borings to 20 to 21 ft below sidewalk grade with samples collected at the current ground surface (approximately 4 to 5 ft below sidewalk grade), from the surface to 2 inches below current grade (variable throughout the Site) and from the native soil layer from 18 to 20 ft below sidewalk grade. A total of 24 soil samples were collected (plus quality assurance/quality control [QA/QC] samples) for laboratory analysis;
- Installation of five two-inch groundwater monitoring wells to a depth of 18 to 20 below sidewalk grade and the collection of five groundwater samples (plus QA/QC samples);
- Installation of five soil vapor probes to a depth of approximately 6 to 7 ft below sidewalk grade and the collection of five soil vapor samples.

A summary of environmental findings of the Supplemental Remedial Investigation includes the following:

1. The Site's stratigraphy, from the current ground surface down, consists of urban fill generally consisting of brown to dark brown, medium to fine silty sand with varying amounts of loose gravel, asphalt, brick, cinders, and plastic was observed from current grade to depths extending approximately 3 to 4 ft (approximately 8 to 9 ft below sidewalk grade). The urban fill layer was underlain by a potential native layer consisting of gray to dark gray medium to fine silty sand with varying amounts of coarse sand and clay to depths extending approximately 11 to 12 ft (16 to 17 ft below sidewalk grade). Following this native layer was an organic/peat layer observed up to the terminus depth of each soil boring, ranging from 15 to 16 ft (20 to 21 ft from sidewalk grade).

2. Groundwater was encountered at depths ranging from 9 to 10 ft from sidewalk grade, and groundwater beneath the Site generally flows to the west-northwest.
3. Soil analytical results were compared to UUSCOs and RRSCOs. Soil analytical results are summarized below:

Volatile Organic Compounds

Acetone (maximum concentration 0.8 mg/kg in SB-12 (18-20')) was identified above the UUSCO (0.5 mg/kg), but below the RRSCO (100 mg/kg), in eleven soil samples analyzed. 2-Butanone was identified in one soil sample, SB-12 (18-20'), at a concentration of 0.16 mg/kg, which is above the UUSCO (0.12 mg/kg), but below the RRSCO (100 mg/kg).

Two CVOCs, cis-1,2-dichloroethene and trichloroethene, were identified in SB-04 (0-2") at concentrations of 0.33 mg/kg and 0.5 mg/kg, respectively, which is above the UUSCOs (0.25 mg/kg and 0.47 mg/kg, respectively), but below the RRSCOs (100 mg/kg and 21 mg/kg, respectively).

No other VOC concentrations exceeded UUSCOs or RRSCOs in soil samples analyzed.

Semi-Volatile Organic Compounds

Two SVOCs including 3-methylphenol/4-methylphenol (maximum concentration 1.1 mg/kg in SB-06 (0-2")) and indeno(1,2,3-cd)pyrene (maximum concentration of 1.8 mg/kg in SB-10 (18-20')) were identified in several soil samples above UUSCOs (0.33 mg/kg and 0.5 mg/kg, respectively) and RRSCOs, (100 mg/kg and 0.5 mg/kg, respectively).

In addition, 1,2-dichlorobenzene was identified in one soil sample, SB-05 (0-2") at a concentration of 2.3 mg/kg, which is above the UUSCO (1.1 mg/kg), but below the RRSCO (100 mg/kg). Three SVOCs including benzo(a)anthracene (concentration of 3.4 mg/kg), benzo(a)pyrene (concentration of 2.7 mg/kg), and benzo(b)fluoranthene (concentration of 3.7 mg/kg) were identified in SB-10 (18-20') at concentrations above the RRSCOs (all 1 mg/kg). Two SVOCs, benzo(k)fluoranthene and chrysene, were also identified in SB-10 (18-20') at concentrations of 1 mg/kg and 3.4 mg/kg, respectively, which is above the UUSCOs (0.8 mg/kg and 1 mg/kg, respectively), but below the RRSCO (both 3.9 mg/kg). No other SVOC concentrations exceeded UUSCOs or RRSCOs in soil samples analyzed.

Metals

Metals including arsenic [maximum concentration of 40.2 mg/kg in SB-06 (0-2")]; lead [maximum concentration of 1,240 mg/kg in SB-01 (0-2")]; and mercury [maximum concentration of 73.1 mg/kg in SB-12 (18-20')] were detected above RRSCOs (16 mg/kg, 400 mg/kg and 0.81 mg/kg, respectively) in three or more soil samples analyzed (both shallow and deep). Copper was detected in SB-06 (0-2") at a concentration of 556 mg/kg exceeding the RRSCO (170 mg/kg) and identified in up to 11 soil samples at concentrations exceeding UUSCOs.

Metals including nickel [maximum concentration of 48.6 mg/kg in SB-11 (18-20')] and zinc [maximum concentration of 576 mg/kg in SB-06 (0-2'')] were detected in multiple soil samples analyzed above UUSCOs (30 mg/kg and 109 mg/kg).

Emerging Contaminants

1,4-dioxane was not detected above laboratory detection limits in soil samples analyzed.

Concentrations of PFOA [(maximum 0.175 nanograms per kilogram (ng/g) in SB-09 (18-20')] was detected above detection limits in six soil samples analyzed. PFOS was detected at a concentration of 0.155 ng/g in SB-04 (0-2'') only.

The following PFAS compounds were detected above the laboratory detection limits in one or more the twenty-four soil samples analyzed:

- Perfluorobutanoic Acid (PFBA)
- 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)
- Perfluorodecanesulfonic Acid (PFDS)
- Perfluorohexanesulfonic Acid (PFHxS)
- Perfluorotetradecanoic Acid (PFTA)

Total PFOA/PFAS compounds detected ranged from 0.057 ng/g in SB-05 (0-2'') to 0.265 ng/g in SB-04 (0-2'').

4. Groundwater analytical results were compared to NYSDEC AWQS.

Volatile Organic Compounds

Five petroleum VOCs including isopropylbenzene (maximum concentration of 40 µg/L in MW-01, AWQS 5 µg/L); n-Propylbenzene (maximum concentration of 50 µg/L in MW-01, AWQS 5 µg/L); sec-Butylbenzene (maximum concentration of 36 µg/L in MW-01, AWQS 5 µg/L); tert-Butylbenzene (maximum concentration of 10 µg/L in MW-01, AWQS 5 µg/L); and 1,2,4,5-Tetramethylbenzene (maximum concentration of 41 µg/L in MW-01, AWQS 5 µg/L) were detected in two or more groundwater samples above their respective NY-AWQS. Two VOCs, n-Butylbenzene and 1,2,4-Trimethylbenzene, were also detected in MW-01 at concentrations of 14 µg/L and 31 µg/L, respectively, above NY-AWQS (both 5 µg/L).

The following five VOCs were identified in MW-05 only at concentrations at or exceeding NY-AWQS: benzene at 1 µg/L (AWQS 1 µg/L), cis-1,2-dichloroethene at 69 µg/L (AWQS 5 µg/L), p/m-xylene at 10 µg/L (AWQS 5 µg/L), trichloroethene at 6.2 µg/L (AWQS 5 µg/L), and vinyl chloride at 51 µg/L (AWQS 2 µg/L).

Semi Volatile Organic Compounds

The following six SVOCS, specifically PAHS, were identified in two groundwater samples, MW-03 and MW-05, at concentrations exceeding NY-AWQS: benzo(a)anthracene (maximum concentration of 0.07 µg/L in MW-05, AWQS 0.002 µg/L); benzo(a)pyrene (maximum concentration of 0.04 µg/L in MW-05, AWQS 0 µg/L); benzo(b)fluoranthene (maximum concentration of 0.06 µg/L in MW-05, AWQS 0.002 µg/L), and chrysene (maximum

concentration of 0.05 µg/L in MW-05, AWQS 0.002 µg/L). Chrysene was also detected in MW-02 and MW-04 at concentrations of 0.01 µg/L and 0.05 µg/L, respectively, exceeding NY-AWQS. The SVOC indeno(1,2,3-cd)pyrene was detected in MW-03 only at a concentration of 0.05 µg/L, exceeding NY-AWQS (0.002 µg/L). Benzo(k)fluoranthene was detected in MW-03 and MW-05 both at a concentration of 0.02 µg/L, exceeding the NY-AWQS (0.002 µg/L). Bis(2-ethylhexyl)phthalate was detected in MW-04 only at a concentration of 5.4 µg/L, exceeding NY-AWQS (5 µg/L).

Metals

Four metals were identified in groundwater samples at concentrations exceeding the NY AWQS in groundwater samples collected at the Site. Arsenic concentrations exceeded the NY AWQS (25 µg/L) in one groundwater sample collected from MW-04 and the field duplicate collected from the same location (maximum concentration of 79.9 µg/L in MW-04); iron exceeded the NY AWQS (300 µg/L) in all five groundwater samples analyzed and the duplicate sample from MW-04 (maximum concentration 21,200 µg/L in MW-04); manganese exceeded the NY AWQS (300 µg/L) in three groundwater samples analyzed (maximum concentration 920.07 µg/L in MW-05); and sodium concentrations exceeded the NY AWQS (20,000 µg/L in all five groundwater samples analyzed plus the duplicate sample of MW-04 (maximum concentration of 94,000 µg/L in MW-03).

Emerging Contaminants

A groundwater cleanup regulatory criterion does not exist for 1,4-dioxane in New York State. Concentrations of 1,4-dioxane were compared to New York State's drinking water MCL of 1 µg/L. PFAS compounds in groundwater are compared to the NYSDEC June 2021 guidance values of 0.01 µg/L for individual PFAS (not PFOA or PFOS) compounds and 0.5 µg/L for total concentrations of PFAS (including PFOA and PFOS).

1,4-dioxane was detected at concentrations exceeding New York State's drinking water MCL of 1 µg/L in groundwater samples MW-01 and MW-05, at concentrations of 2.78 µg/L and 1.2 µg/L, respectively.

Perfluorooctanoic Acid (PFOA) was detected at concentrations exceeding the NYSDEC June 2021 guidance value of 0.01 µg/L in all five groundwater samples collected (plus one duplicate sample collected from MW-04). The maximum concentration of PFOA was identified at a concentration of 0.11 µg/L in MW-05. Total PFOA/PFAS concentrations in groundwater samples ranged from 0.0303 µg/L in MW-02 to 0.113 µg/L in MW-05, below the NYSDEC June 2021 guidance value of 0.5 µg/L.

5. No standard currently exists for soil vapor samples in New York State. Soil vapor analytical results were compared to the NYSDOH Air Guideline Values (AGV) and NYSDOH Final Guidance on Soil Vapor Intrusion, May 2017, Matrix A, B, and C specified in the NYSDOH guidance document.

Total VOC concentrations in soil vapor samples ranged from 227.62 µg/m³ in sample SV-02 to 13,047.7 µg/m³ in sample SV-05. Total benzene, toluene, ethylbenzene, and xylenes (BTEX) concentrations ranged from 41.1 µg/m³ in sample SV-05 to 132.2 µg/m³ in sample SV-04.

CVOCs detected include TCE (maximum concentration of 9,670 $\mu\text{g}/\text{m}^3$), cis-1,2-dichloroethene (maximum concentration of 2,750 $\mu\text{g}/\text{m}^3$), and vinyl chloride (maximum concentration of 177 $\mu\text{g}/\text{m}^3$) were detected in all soil vapor samples, with the exception of SV-02. In addition, PCE was detected in soil vapor sample SV-05 at a concentration of 171 $\mu\text{g}/\text{m}^3$. In soil vapor samples SV-04 and SV-05, 1,1-dichloroethene was detected at concentrations of 12.9 $\mu\text{g}/\text{m}^3$ and 37.9 $\mu\text{g}/\text{m}^3$, respectively.

Other VOCs detected consist of the following:

- 1,1-dichloroethane detected in SV-02 (4.02 $\mu\text{g}/\text{m}^3$)
- 1,2,4-trimethylbenzene detected in all five samples (maximum concentration 27 $\mu\text{g}/\text{m}^3$ in SV-05)
- 1,3,5-trimethylbenzene detected in three samples (maximum concentration 9.83 $\mu\text{g}/\text{m}^3$ in SV-02)
- 1,3-butadiene detected in three samples (maximum concentration 4.42 $\mu\text{g}/\text{m}^3$ in SV-02)
- 2,2,4-trimethylpentane detected in SV-01 (71 $\mu\text{g}/\text{m}^3$)
- 2-butanone detected in four samples (maximum concentration of 24.6 $\mu\text{g}/\text{m}^3$ in SV-02)
- 4-ethyltoluene detected in two samples (maximum concentration 7.23 $\mu\text{g}/\text{m}^3$ in SV-04)
- acetone detected in all five samples (maximum concentration 72.7 $\mu\text{g}/\text{m}^3$ in SV-05)
- benzene detected in four samples, (maximum concentration 26 $\mu\text{g}/\text{m}^3$ in SV-04)
- carbon disulfide detected in four samples (maximum concentration of 15.8 $\mu\text{g}/\text{m}^3$ in SV-01)
- chloromethane detected in two samples (maximum concentration 1.85 $\mu\text{g}/\text{m}^3$ in SV-04)
- cyclohexane detected in SV-01 (24.2 $\mu\text{g}/\text{m}^3$)
- dichlorodifluoromethane detected in two samples (maximum concentration 2.43 $\mu\text{g}/\text{m}^3$ in SV-01)
- ethanol detected in two samples (maximum concentration of 52 $\mu\text{g}/\text{m}^3$ in SV-03)
- ethylbenzene detected in four samples (maximum concentration 14.3 $\mu\text{g}/\text{m}^3$ in SV-02)
- heptane detected in four samples (maximum concentration 20.3 $\mu\text{g}/\text{m}^3$ in SV-01)
- isopropanol detected in three samples (maximum concentration 21.3 $\mu\text{g}/\text{m}^3$ in SV-03)
- n-hexane detected in four samples (maximum concentration 50.8 $\mu\text{g}/\text{m}^3$ in SV-04)
- o-xylene detected in four samples (maximum concentration 16.4 $\mu\text{g}/\text{m}^3$ in SV-04)
- p/m-xylene detected in four samples (maximum concentration 40.3 $\mu\text{g}/\text{m}^3$ in SV-01)
- tertiary butyl alcohol detected in two samples (maximum concentration 10 $\mu\text{g}/\text{m}^3$ in SV-03)
- tetrahydrofuran detected in three samples (maximum concentration 14.7 $\mu\text{g}/\text{m}^3$ in SV-02)
- toluene detected in all five samples (maximum concentration 41.1 $\mu\text{g}/\text{m}^3$ in SV-05)
- trans,1,2-dichloroethene detected in four samples (maximum concentration 128 $\mu\text{g}/\text{m}^3$ in SV-05)

SUMMARY OF THE REMEDY

Alternative I, a Track 1 remedy, will include the following:

- Development and implementation of a CHASP and Community Air Monitoring Plan (CAMP) for the protection of on-site workers, community/residents, and the environment during remediation and construction activities.
- Design and construction of a support-of-excavation (SOE) system to facilitate the Track 1 remediation.
- Implementation of soil erosion, pollution, and sediment control measures in compliance with applicable laws and regulations.
- Removal of remaining miscellaneous debris on the Site.
- Decommission on-site monitoring wells in accordance with NYSDEC CP-43 Policy.
- Excavation, stockpiling, off-Site transport, and disposal of approximately 7,600 cubic yards of contaminated historical fill material that exceeds UUSCOs as defined by 6 NYCRR Part 375-6.8. Excavation will be to 25 ft below sidewalk grade (bottom of historical fill and soils impacted above UUSCOs) Site-wide. For development purposes, excavations are proposed to extend to about 25 ft below sidewalk grade in the roughly 10,200-square-foot building footprint.
- As part of waste characterization and for disposal purposes, a lateral and vertical delineation of hazardous lead centered on soil boring SB-05 (hazardous lead identified from the 18-20' sample) will be completed to facilitate off-site disposal of excavated soil/fill.
- If encountered, removal of USTs and/or associated appurtenances (e.g., fill lines, vent line, and electrical conduit) and decommissioning and off-Site disposal during redevelopment in accordance with DER-10, 6 NYCRR Part 613.9, NYSDEC CP-51, and other applicable NYSDEC UST closure requirements.
- Screening for indications of contamination (by visual means, odor, and monitoring PIDs) of excavated material during intrusive site work.
- Continuing operation of the existing dewatering and treatment system designed by Ground/Water Treatment & Technology, LLC (GWTT) during excavation and remediation activities.
- Appropriate off-site disposal of material removed from the Site in accordance with federal, state, and local rules and regulations for handling, transport, and disposal.
- Backfilling of excavated areas, as necessary for development, with certified-clean material (i.e., meeting UUSCOs), recycled concrete aggregate (RCA), or virgin, native crushed stone.
- Upon completion of Track 1 excavation, an *in situ* chemical reductant (ISCR) reagent (DARAMEND®) will be mixed with approved backfill at the base of the excavation in the vicinity of the elevated CVOCs near MW-05 at the proposed development depth of 30 ft bgs providing contact with groundwater impacted with CVOCs.
- Collection and analysis of confirmation soil samples from the excavation base and, to the extent possible, sidewalls of the excavation in accordance with DER-10, to document post-excavation conditions to confirm a Track 1 remedy was achieved.
- Installation of two post-remedy monitoring wells to replace the decommissioned well MW-05 and one well installed downgradient. Post remedy collection and analysis of groundwater samples for VOCs in accordance with DER-10 following remedial excavation activities to document groundwater quality below the Site.
- Completion of a Soil Vapor Intrusion (SVI) Evaluation to assess indoor air quality in accordance with DER-10 and NYSDOH Final Guidance on Soil Vapor Intrusion following remedial excavation activities and prior to occupancy.

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List of Acronyms and Abbreviations

A

amsl	Above mean sea level
AOC	Area of Concern
ASP	Analytical Services Protocol
AWQS	Ambient Water Quality Standards

B

BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
BTEX	Benzene, toluene, ethylbenzene, xylenes

C

CAMP	Community Air Monitoring Plan
CHASP	Construction Health & Safety Plan
cis-1,2-DCE	cis-1,2-Dichloroethylene
COC	Contaminant of Concern
CP-51	Commissioners Policy-51 (<i>specifically "October 2010 NYSDEC Commissioners Policy 51"</i>)
CPP	Citizen Participation Plan
CQAP	Construction Quality Assurance Plan
CSM	Conceptual Site Model
CVOC	Chlorinated Volatile Organic Compound

D

DER-10	Division of Environmental Remediation-10 (<i>specifically "May 2010 NYSDEC Technical Guidance for Site Investigation and Remediation"</i>)
DUSR	Data Usability Summary Report

E

EE	Environmental Easement
ELAP	Environmental Laboratory Approval Program

F

FER	Final Engineering Report
ft bgs	feet below ground surface

G

GWQS	Groundwater Quality Standard
GWTT	Ground/Water Treatment & Technology, LLC

H

Haley & Aldrich	Haley & Aldrich of New York
HAZWOPER	Hazardous Waste Operations and Emergency Response

List of Acronyms and Abbreviations (Continued)**I**

IC	Institutional Control
ISCR	<i>In situ</i> Chemical Reductant

M

mg/kg	milligrams per kilogram
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
µg/m ³	micrograms per cubic meter
ml/min	milliliter per minute

N

ng/L	nanograms per liter
NTU	Nephelometric Turbidity Unit
NYCRR	New York Codes, Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health

O

OSHA	Occupational Health and Safety Administration

P

PAH	Polycyclic Aromatic Hydrocarbon
PBS	Petroleum Bulk Storage
PCB	Polychlorinated Biphenyl
PCE	Perchloroethylene/Tetrachloroethene
Ph II/RI	Phase II Remedial Investigation Report
PHFxA	Perfluorohexanoic Acid
PFOA/PFAS	Per- and polyfluoroalkyl substances
PID	Photoionization Detector
PPE	Personal Protective Equipment

Q

QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
QHHEA	Qualitative Human Health Exposure Assessment

R

RA	Remedial Action
RAO	Remedial Action Objective
RAWP	Remedial Action Work Plan
RCA	Recycled Concrete Aggregate
RCRA	Resource Conservation and Recovery Act

List of Acronyms and Abbreviations (Continued)

RE	Resident Engineer
RI	Remedial Investigation
RIWP	Remedial Investigation Work Plan
RRSCO	Restricted Residential Soil Cleanup Objective

S

SCG	Standards, Criteria, and Guidelines
SCO	Soil Cleanup Objective
SDS	Safety Data Sheet
Site	65 Eckford Street, Brooklyn, New York
SMMP	Soil/Materials Management Plan
SMP	Site Management Plan
SOE	Support-of-Excavation
SRI	Supplemental Remedial Investigation
SVOC	Semi-Volatile Organic Compound
SWPPP	Stormwater Pollution Prevention Plan

T

TAL	Total Analyte List
TCE	Trichloroethylene
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TOGS 1.1.1	Technical and Operational Guidance Series 1.1.1 (<i>Specifically “June 1998 NYSDEC Division of Water Technical and Operational Guidance Series 1.1.1 Ambient Water Quality Standards and Guidance Values, Class GA for the protection of a source of drinking water modified per the April 2000 addendum”</i>)
TPH	Total Petroleum Hydrocarbons

U

USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
UUSCO	Unrestricted Use Soil Cleanup Objective

V

VC	Vinyl Chloride
VOC	Volatile Organic Compound

W

WQCA	Wastewater Quality Control Application

1. Introduction

This Remedial Action Work Plan (RAWP) was developed by H & A of New York LLP, d/b/a Haley & Aldrich of New York (Haley & Aldrich) on behalf of 65-73 Eckford Realty LLC (the Volunteer) for the proposed development located at 65 Eckford Street (Block 2698, Lot 26) within the Greenpoint neighborhood of Brooklyn, New York (the Site).

In January 2017, 65-73 Eckford Realty LLC filed an application with the New York State Department of Environmental Conservation (NYSDEC) to amend the existing application (Site No. C224218) which included removal of the previous applicant and addition of new ownership information. The updated Brownfield Cleanup Program (BCP) application was approved by NYSDEC with 65-73 Eckford Realty LLC as the Volunteer. The Volunteer proposes to remediate and redevelop the Site for residential use.

This RAWP summarizes the nature and extent of contamination on the Site as determined from data gathered during the Remedial Investigation (RI) performed by Environmental Business Consultants (EBC) in December 2015 and during the Supplemental Remedial Investigation (SRI) performed by Haley & Aldrich from 27 December 2021 through 14 January 2022. It provides an evaluation of a Track 1 cleanup and other applicable remedial action alternatives, their associated costs, and the recommended and preferred remedy. The remedies described in this document are consistent with the procedures defined in NYSDEC Division of Environmental Remediation (DER) Program Policy: Technical Guidance for Site Investigation and Remediation (DER-10) and complies with applicable federal, state, and local laws, regulations, and requirements.

1.1 SITE LOCATION AND DESCRIPTION

The Site, identified as Block 2698, Lot 26 on the New York City tax map, is 10,200-square feet and is bound to the north by a four-story residential building, to the east by Eckford followed by residential apartment buildings, to the south by a residential apartment building currently in construction (enrolled in the NYSDEC BCP Program as Site Number C224218), and to the west by a four-story residential building and a one-story industrial building. The Site location is shown on Figure 1. Existing Site features are shown on Figure 2. A site survey map is provided in Appendix A.

The Site is located in an urban area surrounded by commercial, residential, and industrial properties served by municipal water. The land is currently located within a MX-8 Special Mixed-Use District (MX) and zoned as M1-2/R6A for “medium-density apartment house districts,” which allows for residential use. The Site owner plans to continue site use for residential purposes consistent with current zoning. A copy of the zoning map is included in Appendix F.

The Site is listed with an environmental E-Designation, E-138 – Greenpoint/Williamsburg rezoning action (CEQR 04DCP003K). The requirements under the E-Designation program are satisfaction of the requirements for Hazardous Material components with the New York City Office of Environmental Remediation (NYCOER).

1.2 REDEVELOPMENT PLAN

The proposed redevelopment plan includes construction of a five-story residential building. The proposed structure includes a two-level cellar and consists of the following: a sub-cellar that will be utilized as recreational space, a library/study room, and for storage, and a cellar that will be utilized as recreational space, offices, and will contain refuse and mechanicals rooms. The first floor will contain a lobby and bike room and the second through fifth floors will be comprised of residential units. A bulkhead will extend above the roof level to 60 feet above ground level followed by an elevator bulkhead that will extend 64 feet above ground level. On-grade parking will be located in the rear of the building and accessed via Eckford Street. It is anticipated that the building footprint will encompass a roughly 10,092 square foot area of the Site. The proposed elevator pit will extend to a depth of approximately 29 feet below ground level. The gross area of the first floor will be 2,491 square feet (sf), and the gross areas of the upper floors will be approximately 5,461 sf. The proposed use is consistent with existing zoning for the property. Copies of proposed development plans are included in Appendix B.

1.3 DESCRIPTION OF SURROUNDING PROPERTY

The Site is located in a mixed-use commercial, residential and industrial area. The Site is bound to the north by a four-story residential building, to the east by Eckford followed by residential apartment buildings, to the south by a residential apartment building currently in construction, and to the west by a four-story residential building and a one-story industrial building.

Two public schools, John Ericsson Middle School 126 and Northside Charter High School, are located at 424 Leonard Avenue (approximately 700 feet to the south of the Site). No hospitals or daycare facilities are located within a 500-foot radius of the Site.

Direction	Adjoining properties	Surrounding Properties
North	Residential apartment building	Commercial storefronts and Driggs Avenue
South	Residential apartment building currently in construction	Residential apartment buildings
East	Eckford Street	Residential apartment buildings and commercial storefronts
West	Residential apartment building and industrial building	Leonard Street, residential apartment buildings and McCarron Park

Additionally, the following sensitive receptors are located within a one-half mile radius including schools and day cares listed below:

School/Day Care Name	Approximate distance from Site in feet and (directional)	Administrator	Phone	Address
John Ericsson Middle School 126	700' S	Maria Ortega	(718) 782-2527	424 Leonard Street, Brooklyn, NY 11222
Northside Charter High School	700' S	Stanton Brown	(347) 390-1273	424 Leonard Street, Brooklyn, NY 11222
PS 110 – The Monitor	1750' E	Dana Raciunas	(718) 383-7600	124 Monitor Street, Brooklyn, NY 11222

A-Tech High School	1300' W	Neil Harris	(718) 218-9301	50 Bedford Avenue, Brooklyn, NY 11222
Ardor School for Passion-Based Learning	1550' W	N/A	N/A	29 Nassau Avenue, Brooklyn, NY 11222
French for Little Ones Playschool	1400' NW	N/A	(347) 263-6404	33 Nassau Avenue, Brooklyn, NY 11222
PS 34 – Oliver H. Perry Elementary	1500' N	Alain Beugoms	(718) 389-5842	131 Norman Avenue, Brooklyn, NY 11222
PS 031 – Samuel F. Dupont	2275' NW	Mary Scarlato	(718) 383-8998	75 Meserole Avenue, Brooklyn, NY, 11222

1.4 SITE HISTORY

The Site was developed between 1905 and 1916 and improved with several one-story manufacturing buildings occupied by the Meisel Danowitz & Co. woodworking operation. The Site was redeveloped by 1916 with a 1-2 story building and had been utilized by several industrial operations including a machine shop, wood box manufacturing facility, automobile parking garage, and metal finishing facility. Records indicate that former operations utilized underground gasoline storage tanks that were located in the northeast portion of the Site. The Site was occupied by the Carter Spray Finishing Corporation from 1960 to 2008 which used the building for metal finishing and spraying. The building was razed in 2015. The Site was subject to multiple subsurface investigations and construction of a five-story hotel on the Site began in 2018. Construction included excavation, transportation of soil for off-site disposal, and the installation of a secant pile wall along the perimeter of the Site. Construction of the hotel was not completed. Currently, the Site is excavated to approximately 5 to 6 feet below grade Site wide and remains vacant. The current owner, 65-73 Eckford Realty LLC, purchased the Site from Z65 Realty LLC in July 2016.

The area surrounding the Site was historically used for residential dwellings, light manufacturing, and warehousing from the late 1800s through the mid-2000s. From the mid-2000s, the area was primarily used for commercial/residential purposes.

1.5 PREVIOUS ENVIRONMENTAL REPORTS

The following reports were prepared for the Site prior to submission of the RAWP:

1. Phase II Environmental Site Assessment, prepared by EBC, February and April 2015
2. Remedial Investigation Report (RIR), prepared by EBC, June 2016
3. Interim Remedial Measure Work Plan (IRM WP), prepared by EBC, January 2016
4. Corrective Action Work Plan, prepared by Haley & Aldrich, August 2021
5. Supplemental Remedial Investigation Report (SRIR), prepared by Haley & Aldrich, February 2022 (summarized in Section 2.0)
6. Interim Construction Completion Report (ICCR), prepared by Haley & Aldrich, February 2022

The February SRIR is summarized in Section 2.0 and included in Appendix C. Other previous environmental reports are summarized below.

February and April 2015 – Limited Phase II Environmental Site Assessment (EBC)

An initial Limited Phase II Environmental Site Assessment performed by EBC in February 2015 and included the following scope of work:

1. Installed two soil borings and collected soil samples for chemical analysis from the soil borings to evaluate soil quality; and,
2. Collected one groundwater sample for chemical analysis to evaluate groundwater quality.

Additional sampling was performed by EBC in April 2015 and included the following scope of work:

1. Installed three soil borings and collected soil samples for chemical analysis from the soil borings to evaluate soil quality; and,
2. Collected three groundwater samples for chemical analysis to evaluate groundwater quality.

Shallow soil samples representing the depth interval 0 to 2 feet below grade were collected from the historic fill layer and were analyzed for polychlorinated biphenyls (PCBs) and Target Analyte List (TAL) metals. Soil samples representing the depth interval 11 to 13 feet below grade were collected from the water table interface and analyzed for volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs). The laboratory results identified petroleum related VOCs above Unrestricted Use SCOs and Protection of Groundwater SCOs within the samples collected from the water table interface, including n-Propylbenzene, sec-Butylbenzene, tert-Butylbenzene, and Toluene. Trichloroethene (TCE) (1,100 ug/kg) was detected within one of the samples at the water table interface.

Petroleum-related VOCs were detected in the groundwater samples above groundwater quality standards (GQS). Petroleum-related VOCs detected above GQS includes 2-Isopropyltoluene, Isopropylbenzene, n-Butylbenzene, n-Propylbenzene, sec-Butylbenzene, and tert-Butylbenzene.

SVOCs including Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Chrysene, and Indeno(1,2,3-cd)pyrene were reported above Restricted Residential Use SCOs within the soil sample from soil boring B2 (11-13 ft).

June 2016 – Remedial Investigation Report (EBC)

A Remedial Investigation (RI) performed by EBC included the following scope of work:

1. Installed ten soil borings (15SB1 – 15SB10) and collected 31 soil samples for chemical analysis to evaluate soil quality;
2. Installed eight groundwater monitoring wells (15MW1 – 15MW8) and collected eight groundwater samples for chemical analysis to evaluate groundwater quality; and,
3. Installed seven soil vapor probes and collected seven samples for chemical analysis to evaluate the potential for vapor intrusion.

Soil samples collected at both 0 to 2 and 2 to 4 feet below grade were analyzed for VOCs, SVOCs, pesticides, PCBs, and TAL metals. Soil samples collected at 11 to 13 feet below grade (groundwater interface) were analyzed for VOCs and SVOCs. Soil samples collected at 18 to 20 feet below grade (native soil layer) were analyzed for VOCs, SVOCs, pesticides, PCBs, and TAL metals. Groundwater

samples were analyzed for VOCs, SVOCs, pesticides, PCBs, and TAL metals and dissolved metals. Soil vapor samples were analyzed for VOCs by EPA Method TO-15.

A summary of the environmental findings of the Remedial Investigation includes the following:

1. A 5- to 6-foot thick zone of petroleum VOC contamination was identified at the groundwater interface across the Site.
2. TCE impacted soil with the highest concentrations was detected in the shallow soil samples collected from the western portion of the Site.
3. A historic fill material layer extending to depths as deep as 13 feet below grade contained SVOCs and metals exceeding the commercial SCOs.
4. A native soil layer approximately 18 to 20 feet below grade contained elevated concentrations of both arsenic and mercury.
5. Petroleum related VOCs were detected above GQS in six of the eight groundwater samples.
6. Low levels of petroleum related VOCs were detected in soil vapor samples in addition to elevated concentrations of the chlorinated VOCs, TCE and PCE.

January 2016 – Interim Remedial Measure Work Plan (EBC/AMC)

AMC Engineering, PLLC (AMC) submitted an Interim Remedial Measure Work Plan (IRMWP) in October 2015 and revised in January 2016 outlining remedial measures to address soil and groundwater contamination on the Site. The objectives of the IRMWP included the following remedial measures:

1. Waste classification sampling
2. Installation of erosion and sediment control measures and a stabilized construction entrance
3. Installation of support of excavation and a groundwater cutoff wall (i.e., secant pile wall)
4. Removal of underground storage tanks
5. Removal of unregulated construction debris and scrap metal
6. Excavation to approximately 15 feet below grade surface
 - a. Screening, segregation, transportation and disposal of historic fill
 - b. Screening, segregation and disposal of petroleum contaminated soil
 - c. Screening, segregation and disposal of native soil
7. Collection of confirmatory endpoint samples
8. Performance of community air monitoring
9. Submission of Electronic Data Deliverables and Data Usability Summary Reporting
10. Submission of a Construction Completion Report

August 2021 – Corrective Action Work Plan (Haley & Aldrich)

The objective of the Corrective Action Work Plan submitted by Haley & Aldrich in 2021 was to address the existing deficiencies in Site progression through the BCP and remedy non-compliant conditions at the Site derived from the incomplete execution of the IRM in 2018. The CAWP outlined the following tasks:

1. Establish soil erosion, pollution, and sediment control measures in compliance with applicable laws and regulations.

2. Restore the Site to pre-remediation conditions by removing vegetation and miscellaneous construction related debris.
3. Re-establishment of dewatering permit and dewatering system on the Site.
4. Collection of documentation samples.
5. Installation of a demarcation barrier.
6. Backfilling of the excavation to sidewalk grade.
7. Implementation of Community Air Monitoring during Corrective Action Measures.
8. Submission of DFRs to NYSDEC.

February 2022 - Supplemental Remedial Investigation Report (Haley & Aldrich)

Summarized in Section 2.0.

February 2022 – Interim Construction Completion Report (Haley & Aldrich)

An Interim Remedial Measure was submitted by Haley & Aldrich which included the following information:

1. Documentation of work performed under the Interim Remedial Measure Work Plan (by others) from 2018.
2. Summary of measures performed by the Site contractor to bring the Site into compliance with the NYSDEC and NYCDOB.

2. Description of Supplemental Remedial Investigation Findings

The SRI was completed in accordance with Title 6 of the New York Codes, Rules, and Regulations (6 NYCRR) Part 375, DER-10 and the NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (October 2006 and subsequent updates). The objective of the SRI was to determine the nature and extent of contamination in soil, groundwater, and soil vapor. The SRI was performed from 27 December 2021 through 14 January 2022.

2.1 SUPPLEMENTAL REMEDIAL INVESTIGATION

The SRI consisted of the following:

- Advancement of twelve soil borings to 20 to 21 ft below sidewalk grade with samples collected at the surface, from the surface to 2 inches below current grade (variable throughout the Site) and from the native soil layer from 18 to 20 ft below sidewalk grade. A total of 24 soil samples were collected (plus quality assurance/quality control [QA/QC] samples) for laboratory analysis;
- Installation of five two-inch groundwater monitoring wells to a depth of 18 to 20 below sidewalk grade and the collection of five groundwater samples (plus QA/QC samples);
- Installation of five soil vapor probes to a depth of approximately 6 to 7 ft below sidewalk grade and the collection of five soil vapor samples.

2.1.1 Soil Investigation

Twelve borings were advanced to 20 to 21 ft below sidewalk grade using a track-mounted direct-push drill rig (Geoprobe®) operated by a licensed operator of Lakewood, the drilling subcontractor. Samples were collected from acetate liners using a stainless-steel trowel or sampling spoon. The soil was screened for visual, olfactory, and instrumental evidence of environmental impacts and was visually classified for soil type, grain size, texture, and moisture content. Soils were logged continuously by an engineer. The presence of staining, odors, and PID response was noted.

Generally, soil samples were collected from the surface at 0 to 2 inches below current grade (variable throughout the Site) and from the native soil layer from 18 to 20 ft below sidewalk grade. Soil borings SB-01 through SB-12 were sampled at various intervals (i.e. shallow and deep) and analyzed for toxicity characteristic leaching procedure (TCLP) lead. Soil boring SB-01 from 0 to 2 inches bgs and soil boring SB-10 from 18 to 20 ft bgs were also analyzed for TCLP mercury.

2.1.2 Groundwater Investigation

Five two-inch diameter monitoring wells were installed to 18 to 20 ft below sidewalk grade at each monitoring well location. Monitoring wells have a 2-inch annular space and were installed using certified clean sand fill and were installed with 10-foot-long slotted PVC screens to straddle the water table. Groundwater was encountered at depths ranging from approximately 9 to 10 ft below sidewalk grade. Monitoring wells were developed by surging a pump in the well several times to pull fine-grained material from the well. Development was not completed until the water turbidity was 50 nephelometric turbidity units (NTU) or less, or 10 well volumes were removed, if possible.

2.1.3 Soil Vapor Investigation

NYSDEC DER-10 requires an assessment of soil vapor for contaminated sites to evaluate the health risk associated with potential exposure to VOCs through vapor intrusion into occupied spaces. Five soil vapor probes were installed to assess soil vapor conditions.

Five soil vapor probes (SV-01 through SV-05) were installed by Lakewood Environmental Solutions using a direct-push drilling rig (Geoprobe®) to advance the stainless-steel probes to a depth of approximately 6 ft below sidewalk grade. The stainless-steel soil vapor probes were sealed with bentonite, and a tracer gas was used in accordance with NYSDOH protocols to serve as a QA/QC measure to verify the integrity of the soil vapor probe seal. In addition, one to three implant volumes were purged prior to the collection of the soil vapor samples. Sampling occurred for the duration of two hours. At the conclusion of the sampling round, tracer monitoring was performed a second time to confirm the integrity of the probe seals.

2.2 SAMPLES COLLECTED

During the SRI, a total of 24 soil samples (plus one duplicate for QA/QC) were collected from the surface at 0 to 2 inches below current grade (variable throughout the Site) and from the native soil layer from 18 to 20 feet below sidewalk grade. Samples were collected using laboratory-provided clean bottle ware, and VOC grab samples were collected using terra cores.

A total of five groundwater samples, one from each monitoring well, were collected for laboratory analysis. A field blank, one trip blank, a duplicate sample, and a MS/MSD sample were also collected for QA/QC purposes. Groundwater monitoring wells were sampled using low-flow sampling methods. Monitoring wells were purged, and physical and chemical parameters stabilized before samples were taken.

A total of five soil vapor samples were collected for laboratory analysis, one from each soil vapor probe. Samples were collected in appropriately sized Summa canisters that were certified clean by the laboratory. Sampling occurred for the duration of two hours.

QA/QC samples included equipment rinsate/field blanks, trip blanks, sample duplicates, and matrix spike/matrix spike duplicates (MS/MSDs).

Soil, groundwater, and soil vapor samples were submitted for laboratory analysis to Alpha Analytical Inc., an NYSDOH Environmental Laboratory Approval Program (ELAP)-certified laboratory located in Westborough, Massachusetts.

2.3 CHEMICAL ANALYSIS

The laboratory analyses performed on the soil, groundwater, and soil vapor samples are summarized below.

Soil samples were analyzed for the following parameters:

- Target Compound List (TCL) VOCs using EPA Method 8260B

- TCL SVOCs using EPA Method using 8270C
- Total Metals by EPA Method 6010
- Per- and polyfluoroalkyl substances (PFAS) using EPA Method 537.1
- 1,4-dioxane using EPA Method 8270 SIM

Groundwater samples collected were analyzed for the following parameters:

- TCL VOCs using EPA Method 8260B;
- TCL SVOCs using EPA Method 8270C;
- Total Metals using EPA Methods 6010/7471;
- PFAS by EPA using 537; and
- 1,4-dioxane using EPA Method 8260B

Soil vapor samples were analyzed for VOCs using USEPA Method TO-15.

2.4 SUPPLEMENTAL REMEDIAL INVESTIGATION FINDINGS SUMMARY

A summary of environmental findings of the Supplemental Remedial Investigation includes the following:

1. The Site's stratigraphy, from the surface down, consists of urban fill generally consisting of brown to dark brown, medium to fine silty sand with varying amounts of loose gravel, asphalt, brick, cinders, and plastic was observed from current grade to depths extending approximately 3 to 4 ft (approximately 8 to 9 ft below sidewalk grade). The urban fill layer was underlain by a potential native layer consisting of gray to dark gray medium to fine silty sand with varying amounts of coarse sand and clay to depths extending approximately 11 to 12 ft (16 to 17 ft from sidewalk grade). Following this native layer was an organic/peat layer observed up to the terminus depth of each soil boring, ranging from 15 to 16 ft (20 to 21 ft from sidewalk grade).
2. Groundwater was encountered at depths ranging from 9 to 10 ft from sidewalk grade, and groundwater beneath the Site generally flows to the west-northwest.
3. Soil analytical results were compared to UUSCOs and RRSCOs. Soil analytical results are summarized below and shown in Figure 3:

Volatile Organic Compounds

Acetone (maximum concentration 0.8 mg/kg in SB-12 (18-20') was identified above the UUSCO (0.5 mg/kg), but below the RRSCO (100 mg/kg), in eleven soil samples analyzed. 2-Butanone was identified in one soil sample, SB-12 (18-20'), at a concentration of 0.16 mg/kg, which is above the UUSCO (0.12 mg/kg), but below the RRSCO (100 mg/kg).

Two CVOCs, cis-1,2-dichloroethene and trichloroethene, were identified in SB-04 (0-2") at concentrations of 0.33 mg/kg and 0.5 mg/kg, respectively, which is above the UUSCOs (0.25 mg/kg and 0.47 mg/kg, respectively), but below the RRSCOs (100 mg/kg and 21 mg/kg, respectively).

No other VOC concentrations exceeded UUSCOs or RRSCOs in soil samples analyzed.

Semi-Volatile Organic Compounds

Two SVOCs including 3-methylphenol/4-methylphenol (maximum concentration 1.1 mg/kg in SB-06 (0-2") and indeno(1,2,3-cd)pyrene (maximum concentration of 1.8 mg/kg in SB-10 (18-20') were identified in several soil samples above UUSCOs (0.33 mg/kg and 0.5 mg/kg, respectively) and RRSCOs, (100 mg/kg and 0.5 mg/kg, respectively).

In addition, 1,2-dichlorobenzene was identified in one soil sample, SB-05 (0-2" at a concentration of 2.3 mg/kg, which is above the UUSCO (1.1 mg/kg), but below the RRSCO (100 mg/kg). Three SVOCs including benzo(a)anthracene (concentration of 3.4 mg/kg), benzo(a)pyrene (concentration of 2.7 mg/kg), and benzo(b)fluoranthene (concentration of 3.7 mg/kg) were identified in SB-10 (18-20') at concentrations above the RRSCOs (all 1 mg/kg). Two SVOCs, benzo(k)fluoranthene and chrysene, were also identified in SB-10 (18-20') at concentrations of 1 mg/kg and 3.4 mg/kg, respectively, which is above the UUSCOs (0.8 mg/kg and 1 mg/kg, respectively), but below the RRSCO (both 3.9 mg/kg). No other SVOC concentrations exceeded UUSCOs or RRSCOs in soil samples analyzed.

Metals

Metals including arsenic [maximum concentration of 40.2 mg/kg in SB-06 (0-2")]; lead [maximum concentration of 1,240 mg/kg in SB-01 (0-2")]; and mercury [maximum concentration of 73.1 mg/kg in SB-12 (18-20')] were detected above RRSCOs (16 mg/kg, 400 mg/kg and 0.81 mg/kg, respectively) in three or more soil samples analyzed (both shallow and deep). Copper was detected in SB-06 (0-2") at a concentration of 556 mg/kg exceeding the RRSCO (170 mg/kg) and identified in up to 11 soil samples at concentrations exceeding UUSCOs.

Metals including nickel [maximum concentration of 48.6 mg/kg in SB-11 (18-20')] and zinc [maximum concentration of 576 mg/kg in SB-06 (0-2")] were detected in multiple soil samples analyzed above UUSCOs (30 mg/kg and 109 mg/kg).

Emerging Contaminants

1,4-dioxane was not detected above laboratory detection limits in soil samples analyzed.

Concentrations of PFOA [(maximum 0.175 nanograms per kilogram (ng/g) in SB-09 (18-20')] was detected above detection limits in six soil samples analyzed. PFOS was detected at a concentration of 0.155 ng/g in SB-04 (0-2") only.

The following PFAS compounds were detected above the laboratory detection limits in one or more the twenty-four soil samples analyzed:

- Perfluorobutanoic Acid (PFBA)
- 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)
- Perfluorodecanesulfonic Acid (PFDS)
- Perfluorohexanesulfonic Acid (PFHxS)
- Perfluorotetradecanoic Acid (PFTA)

Total PFOA/PFAS compounds detected ranged from 0.057 ng/g in SB-05 (0-2") to 0.265 ng/g in SB-04 (0-2").

4. Groundwater analytical results were compared to NYSDEC AWQS. Groundwater analytical results are summarized below and shown in Figures 4 and 5:

Volatile Organic Compounds

Five petroleum VOCs including isopropylbenzene (maximum concentration of 40 µg/L in MW-01, AWQS 5 µg/L); n-Propylbenzene (maximum concentration of 50 µg/L in MW-01, AWQS 5 µg/L); sec-Butylbenzene (maximum concentration of 36 µg/L in MW-01, AWQS 5 µg/L); tert-Butylbenzene (maximum concentration of 10 µg/L in MW-01, AWQS 5 µg/L); and 1,2,4,5-Tetramethylbenzene (maximum concentration of 41 µg/L in MW-01, AWQS 5 µg/L) were detected in two or more groundwater samples above their respective NY-AWQS. Two VOCs, n-Butylbenzene and 1,2,4-Trimethylbenzene, were also detected in MW-01 at concentrations of 14 µg/L and 31 µg/L, respectively, above NY-AWQS (both 5 µg/L).

The following five VOCs were identified in MW-05 only at concentrations exceeding NY-AWQS: benzene at 1 µg/L (AWQS 1 µg/L), cis-1,2-dichloroethene at 69 µg/L (AWQS 5 µg/L), p/m-xylene at 10 µg/L (AWQS 5 µg/L), trichloroethene at 6.2 µg/L (AWQS 5 µg/L), and vinyl chloride at 51 µg/L (AWQS 2 µg/L).

Semi Volatile Organic Compounds

The following six SVOCS, specifically PAHS, were identified in two groundwater samples, MW-03 and MW-05, at concentrations exceeding NY-AWQS: benzo(a)anthracene (maximum concentration of 0.07 µg/L in MW-05, AWQS 0.002 µg/L); benzo(a)pyrene (maximum concentration of 0.04 µg/L in MW-05, AWQS 0 µg/L); benzo(b)fluoranthene (maximum concentration of 0.06 µg/L in MW-05, AWQS 0.002 µg/L), and chrysene (maximum concentration of 0.05 µg/L in MW-05, AWQS 0.002 µg/L). Chrysene was also detected in MW-02 and MW-04 at concentrations of 0.01 µg/L and 0.05 µg/L, respectively, exceeding NY-AWQS. The SVOC indeno(1,2,3-cd)pyrene was detected in MW-03 only at a concentration of 0.05 µg/L, exceeding NY-AWQS (0.002 µg/L). Benzo(k)fluoranthene was detected in MW-03 and MW-05 both at a concentration of 0.02 µg/L, exceeding the NY-AWQS (0.002 µg/L). Bis(2-ethyl(hexyl)phthalate was detected in MW-04 only at a concentration of 5.4 µg/L, exceeding NY-AWQS (5 µg/L).

Metals

Four metals were identified in groundwater samples at concentrations exceeding the NY AWQS in groundwater samples collected at the Site. Arsenic concentrations exceeded the NY AWQS (25 µg/L) in one groundwater sample collected from MW-04 and the field duplicate collected from the same location (maximum concentration of 79.9 µg/L in MW-04); iron exceeded the NY AWQS (300 µg/L) in all five groundwater samples analyzed and the duplicate sample from MW-04 (maximum concentration 21,200 µg/L in MW-04); manganese exceeded the NY AWQS (300 µg/L) in three groundwater samples analyzed (maximum concentration 920.07 µg/L in MW-05); and sodium concentrations exceeded the NY AWQS (20,000 µg/L in all five groundwater samples analyzed plus the duplicate sample of MW-04 (maximum concentration of 94,000 µg/L in MW-03).

Emerging Contaminants

A groundwater cleanup regulatory criterion does not exist for 1,4-dioxane in New York State. Concentrations of 1,4-dioxane were compared to New York State's drinking water MCL of 1 µg/L. PFAS compounds in groundwater are compared to the NYSDEC June 2021 guidance values of 0.01 µg/L for individual PFAS (not PFOA or PFOS) compounds and 0.5 µg/L for total concentrations of PFAS (including PFOA and PFOS).

1,4-dioxane was detected at concentrations exceeding New York State's drinking water MCL of 1 µg/L in groundwater samples MW-01 and MW-05, at concentrations of 2.78 µg/L and 1.2 µg/L, respectively.

Perfluorooctanoic Acid (PFOA) was detected at concentrations exceeding the NYSDEC June 2021 guidance value of 0.01 µg/L in all five groundwater samples collected (plus one duplicate sample collected from MW-04). The maximum concentration of PFOA was identified at a concentration of 0.11 µg/L in MW-05. Total PFOA/PFAS concentrations in groundwater samples ranged from 0.0303 µg/L in MW-02 to 0.113 µg/L in MW-05, below the NYSDEC June 2021 guidance value of 0.5 µg/L.

5. No standard currently exists for soil vapor samples in New York State. Soil vapor analytical results are summarized below and shown in Figure 6. Total VOC concentrations in soil vapor samples ranged from 227.62 µg/m³ in sample SV-02 to 13,047.7 µg/m³ in sample SV-05. Total benzene, toluene, ethylbenzene, and xylenes (BTEX) concentrations ranged from 41.1 µg/m³ in sample SV-05 to 132.2 µg/m³ in sample SV-04.

CVOCs detected include TCE (maximum concentration of 9,670 µg/m³), cis-1,2-dichloroethene (maximum concentration of 2,750 µg/m³), and vinyl chloride (maximum concentration of 177 µg/m³) were detected in all soil vapor samples, with the exception of SV-02. In addition, PCE was detected in soil vapor sample SV-05 at a concentration of 171 µg/m³. In soil vapor samples SV-04 and SV-05, 1,1-dichloroethene was detected at a concentration of 12.9 µg/m³ and 37.9 µg/m³, respectively.

Other VOCs detected at the Site included:

- 1,1-dichloroethane detected in SV-02 (4.02 µg/m³)
- 1,2,4-trimethylbenzene detected in all five samples (maximum concentration 27 µg/m³ in SV-05)
- 1,3,5-trimethylbenzene detected in three samples (maximum concentration 9.83 µg/m³ in SV-02)
- 1,3-butadiene detected in three samples (maximum concentration 4.42 µg/m³ in SV-02)
- 2,2,4-trimethylpentane detected in SV-01 (71 µg/m³)
- 2-butanone detected in four samples (maximum concentration of 24.6 µg/m³ in SV-02)
- 4-ethyltoluene detected in two samples (maximum concentration 7.23 µg/m³ in SV-04)
- acetone detected in all five samples (maximum concentration 72.7 µg/m³ in SV-05)
- benzene detected in four samples, (maximum concentration 26 µg/m³ in SV-04)

- carbon disulfide detected in four samples (maximum concentration of 15.8 $\mu\text{g}/\text{m}^3$ in SV-01)
- chloromethane detected in two samples (maximum concentration 1.85 $\mu\text{g}/\text{m}^3$ in SV-04)
- cyclohexane detected in SV-01 (24.2 $\mu\text{g}/\text{m}^3$)
- dichlorodifluoromethane detected in two samples (maximum concentration 2.43 $\mu\text{g}/\text{m}^3$ in SV-01)
- ethanol detected in two samples (maximum concentration of 52 $\mu\text{g}/\text{m}^3$ in SV-03)
- ethylbenzene detected in four samples (maximum concentration 14.3 $\mu\text{g}/\text{m}^3$ in SV-02)
- heptane detected in four samples (maximum concentration 20.3 $\mu\text{g}/\text{m}^3$ in SV-01)
- isopropanol detected in three samples (maximum concentration 21.3 $\mu\text{g}/\text{m}^3$ in SV-03)
- n-hexane detected in four samples (maximum concentration 50.8 $\mu\text{g}/\text{m}^3$ in SV-04)
- o-xylene detected in four samples (maximum concentration 16.4 $\mu\text{g}/\text{m}^3$ in SV-04)
- p/m-xylene detected in four samples (maximum concentration 40.3 $\mu\text{g}/\text{m}^3$ in SV-01)
- tertiary butyl alcohol detected in two samples (maximum concentration 10 $\mu\text{g}/\text{m}^3$ in SV-03)
- tetrahydrofuran detected in three samples (maximum concentration 14.7 $\mu\text{g}/\text{m}^3$ in SV-02)
- toluene detected in all five samples (maximum concentration 41.1 $\mu\text{g}/\text{m}^3$ in SV-05)
- trans,1,2-dichloroethene detected in four samples (maximum concentration 128 $\mu\text{g}/\text{m}^3$ in SV-05)

2.5 SIGNIFICANT THREAT

The NYSDEC and NYSDOH have determined that this Site poses a significant threat to human health and the environment.

2.6 GEOLOGY AND HYDROGEOLOGY

2.6.1 Historical Fill Material

The Site is underlain by a layer of urban historic fill, predominantly consisting of brown to dark brown, medium to fine silty sand with varying amounts of loose gravel, asphalt, brick, cinders, and plastic. The urban fill material extended to a depth of approximately 3 to 4 ft (approximately 8 to 9 ft below sidewalk grade) at each boring location. PID readings above background levels were observed during soil sampling activities.

2.6.2 Native Soil

The historic urban fill material is underlain by a potential native layer consisting of gray to dark gray medium to fine silty sand with varying amounts of coarse sand and clay to depths extending approximately 11 to 12 ft (approximately 16 to 17 ft from sidewalk grade) at each boring location. Underlain by this layer is an organic/peat layer ranging from approximately 15 to 16 ft (20 to 21 ft from sidewalk grade) at each boring location.

2.6.3 Bedrock

Bedrock was not encountered during the SRI. Depth to bedrock is greater than 100 ft bgs. According to the USGS Bedrock and Engineering Geologic Maps of New York County and Parts of Kings and Queens

Counties, New York, dated 1994, bedrock beneath the Site is an igneous intrusive classified as Ravenswood grano-diorite of middle Ordovician to middle Cambrian age.

2.6.4 Hydrogeology

Groundwater was encountered at depths ranging from approximately 9 to 10 ft below sidewalk grade. Groundwater is inferred to flow to the west-northwest. A groundwater contour map is included as Figure 7.

2.7 CONTAMINANT CONDITIONS

2.7.1 Conceptual Site Model

A conceptual site model (CSM) was developed based on the findings of the SRI performed from 27 December 2021 through 14 January 2022 under the BCP program. The CSM provides a framework for distribution of impacted materials sitewide and potential migration/exposure pathways.

2.7.2 Potential Sources of Contamination

Based on the analytical results of the SRI, the primary contaminants of concern for the Site are metals, SVOCs (specifically PAHs), and VOCs (specifically chlorinated compounds) in soil; SVOCs, VOCs, and metals in groundwater; and CVOCs in soil vapor.

Based on the identified contaminants, the source of contamination to soil, groundwater, and soil vapor is likely the results of both historical metals finishing and spraying processes at the Site and placement of historical urban fill from an unknown source.

The surrounding area was formerly used for industrial operations, which could indicate additional source areas off-Site with migrating impacts. In addition, the lack of petroleum contamination in soil above the groundwater interface and the evenly distributed concentrations of petroleum related VOCs in groundwater Site-wide suggests an off-Site source(s) possibly associated with historic spill incidents at both 55 Eckford Street and 498 Leonard Street.

2.7.3 Description of AOCs

Based on site observations, site development history, and the findings of the previous environmental reports, five AOCs were identified. This section discusses the results of the SRI with respect to the AOCs.

2.7.4 AOC 1 – Site-Wide Urban Fill

The Site was developed between 1905 and 1916 and improved with several one-story manufacturing buildings before being redeveloped in 1916 with a 1-2-story building that was primarily occupied by the Carter Spray Finishing Corporation, a metal finishing and spraying company. During the SRI, a historical fill layer of unknown origin was identified from current grade (approx. 5 ft bgs) extending to depths between 10 and 13 ft below sidewalk grade across the Site. Fill material predominantly consists of brown to dark brown, medium to fine silty sand with varying amounts of loose gravel, asphalt, brick,

cinders, and plastic. Based on soil sampling performed during the SRI, the urban fill interval from current grade to at least 13 ft below sidewalk grade is impacted with SVOCs (specifically PAHs), metals including arsenic, copper, lead, mercury, and zinc which are present at concentrations above NYSDEC Part 375 UUSCOs and/or RRSCOs. Metals concentrations were generally consistent Site-wide and the highest SVOC concentrations in soil were primarily identified in the central-northern portion of the Site.

Data reported in the June 2016 RI completed by EBC also identified PAH and metals contamination in historical fill material throughout the Site to depths as great as 13 ft bgs.

2.7.5 AOC 2 – CVOCs in Soil

Cis,1,2-dichloroethene and TCE were identified in one soil sample collected from the historical urban fill interval [SB-04 (0-2'')] at concentrations of 0.33 mg/kg and 0.5 mg/kg, respectively, exceeding the UUSCOs.

Data reported in the June 2016 RI completed by EBC identified the CVOC TCE detected above UUSCOs within shallow soil samples collected from 0-2 ft and 2-4 ft intervals Site-wide. The highest concentrations were detected within the rear of the former building (i.e. the western portion of the Site). It should be noted that the Site is currently excavated to approximately 5 ft bgs Site-wide, therefore, a majority of the CVOC-impacted shallow soil has been removed and disposed of off-Site as part of the 2018 IRM.

2.7.6 AOC 3 – Metals in Deep Native Soil

Metals including arsenic [maximum concentration of 14.9 mg/kg in SB-09 (18-20')], mercury [maximum concentration of 73.1 mg/kg in SB-12 (18-20')], lead [maximum concentration of 266 mg/kg in SB-01 (18-20')], and zinc [maximum concentration of 301 mg/kg in SB-01 (18-20')] were identified in the deep intervals Site-wide at concentrations above NYSDEC Part 375 UUSCOs and/or RRSCOs.

2.7.7 AOC 4 – Chlorinated and Petroleum VOCs in Groundwater.

Several CVOCs including cis-1,2-dichloroethene, trichloroethene, and vinyl chloride were detected in MW-05 only at concentrations of 69 µg/L, 6.2 µg/L, and 51 µg/L, respectively, exceeding NY-AWQS. Petroleum related VOCs including isopropylbenzene (maximum concentration of 40 µg/L in MW-01); n-Propylbenzene (maximum concentration of 50 µg/L in MW-01); sec-Butylbenzene (maximum concentration of 36 µg/L in MW-01); tert-Butylbenzene (maximum concentration of 10 µg/L in MW-01); and 1,2,4,5-Tetramethylbenzene (maximum concentration of 41 µg/L in MW-01) were detected in two or more groundwater samples above NY-AWQS. The absence of petroleum contamination within soil above the groundwater interface and the evenly distributed concentration of petroleum related VOCs in groundwater Site-wide suggests an off-Site source(s), possibly associated with historic spill incidents at both 55 Eckford Street and 498 Leonard Street.

2.7.8 AOC 3 – Soil Vapor Impacts

Detected CVOCs including cis-1,2-dichloroethene (maximum concentration of 2750 µg/m³ in SV-05), trichloroethene (maximum concentration of 9670 µg/m³ in SV-05), and vinyl chloride (maximum concentration of 177 µg/m³ in SV-05) were detected in four soil vapor samples. Soil vapor sample SV-05,

collected from the northeast portion of the Site, also contained a PCE concentration of $171 \mu\text{g}/\text{m}^3$. Cis-1,2-dichloroethene, TCE, and vinyl chloride were identified in a co-located groundwater sample collected during the SRI (MW-05). Based on the data collected during this SRI, CVOCs are present in soil vapor Site-wide likely attributed to the former metal finishing and spraying operation.

2.8 QUALITATIVE HUMAN EXPOSURE ASSESSMENT

A qualitative exposure assessment consists of characterizing the exposure setting (including the physical environment and potentially exposed human and ecological resource populations), identifying exposure pathways, and evaluating chemical fate and transport. An exposure pathway describes the means by which an individual or ecological resource may be exposed to contaminants originating from a site. An exposure pathway has the following five elements:

1. Receptor population
2. Contaminant source
3. Contaminant release and transport mechanism
4. Point of exposure
5. Route of exposure

An exposure pathway is complete when all five elements of an exposure pathway are documented; a potential exposure pathway exists when any one or more of the five elements comprising an exposure pathway is not documented but could reasonably occur. An exposure pathway may be eliminated from further evaluation when any one of the five elements comprising an exposure pathway does not exist in the present and will not exist in the future.

2.8.1 Receptor Population

The receptor population includes the people or ecological resources who are or may be exposed to contaminants at a point of exposure. The identification of potential receptors is based on the characteristics of the Site, the surrounding land uses, and the probable future land uses. The Site is currently excavated to approximately 5 to 6 ft Site-wide and secured with a 10' high construction fence. Since the Site is vacant, individual receptors would currently only include construction/maintenance workers that may be employed to perform work on the property.

Exposure routes on a vacant and undeveloped site would include direct contact activities, although soil vapor and groundwater contamination may impact off-Site properties. The reasonably anticipated future use of the Site is for residential purposes which is consistent with surrounding property use and zoning. At full development, the majority of the Site will be covered by concrete, asphalt, or a building with a full basement such that no ecological resources will foreseeably be exposed to contaminants remaining at the Site. The roughly 560-square-foot rear yard will have a 2-ft minimum clean cover installed following remediation. Therefore, exposed receptors under the future use scenario will be comprised of individual residents, indoor workers, outdoor workers (e.g., groundskeepers or maintenance staff), and construction workers who may be employed at or perform work on the property. Site visitors may also be considered receptors; however, their exposure would be similar to that of the residents and employees but at a lesser frequency and duration. In addition, residents or employees in off-Site adjoining buildings may be exposed to soil vapors.

2.8.2 Contaminant Sources

The source of contamination is defined as either the source of contaminant release to the environment (such as a waste disposal area or point of discharge) or the impacted environmental medium (i.e., soil, soil vapor, groundwater) at the point of exposure. Sections 4.0 and 5.0 discuss the contaminants of concern (COCs) present in the Site media at elevated concentrations. In general, these include SVOCs (specifically PAHs), VOCs, and metals including arsenic, copper, lead and mercury in historical urban fill, metals, SVOCs, and VOCs in groundwater, and CVOCs in soil vapor.

2.8.3 Exposure Routes and Mechanisms

The point of exposure is a location where actual or potential human contact with a contaminated medium may occur. Based on the exceedances of UUSCOs/RRSCOs for SVOCs (specifically PAHs), VOCs, and metals in soil, exceedances of AWQS for SVOCs, VOCs, and metals in groundwater, and elevated CVOCs VOCs in soil vapor, the point of exposure is defined as the whole Site.

The route of exposure is the manner in which a contaminant actually enters or contacts the human body (e.g., ingestion, inhalation, dermal absorption). Based on the types of receptors and points of exposure identified above, potential routes of exposure are listed below:

Current Use Scenario: The Site is currently excavated to approximately 5 to 6 ft Site-wide and secured with a 10' high construction fence. Exposure to contaminated surface soil and contaminated groundwater is possible during subsurface investigations or other activities that disturb the subsurface. Release and transport mechanisms include contaminated surface soil transported as dust, contaminated groundwater flow, and volatilization of contaminants from soil and/or groundwater into vapor phase.

- Occupant/Employee/Visitor – skin contact, inhalation, and incidental ingestion
- Construction/Utility Worker – skin contact, inhalation, and incidental ingestion

Construction/Remediation Scenario: In the continued absence of engineering and institutional controls, there will be continued exposure pathways during construction/remediation specifically related to surface soil. Construction/Remedial activities include excavation and off-site disposal of soil and potential localized dewatering of impacted groundwater to facilitate the construction of the foundation elements. Release and transport mechanisms include disturbed and exposed soil during excavation, contaminated soil transported as dust, contaminated groundwater flow (localized dewatering), inhalation of dust from contaminated soil, and volatilization of contaminants from soil and/or groundwater into vapor phase.

- Construction/Utility Worker – skin contact, inhalation, and incidental ingestion

Future Use Scenario: The anticipated remedial approach includes excavation of contaminated soil, dewatering of groundwater accumulated in excavations (if required), and installation of a composite cover system as part of construction. In the absence of engineering and institutional controls, release and transport mechanisms include contaminated groundwater and volatilization of contaminants from soil and/or groundwater into the vapor phase. Routes of future exposure include cracks in the foundation or slab or emergency repairs to the foundation walls or slab.

- Construction/Utility Worker – skin contact, inhalation, and incidental ingestion
- Occupant/Employee/Visitor – inhalation
- Public Adjacent to the Site – inhalation

Contaminant release and transport mechanisms carry contaminants from the source to points where people may be exposed and are specific to the type of contaminant and Site use. For the CVOCs present in soil vapor, the potential exists for exposure through pathways associated with soil vapor migration. This would include the indoor vapor intrusion pathway also referred to as “soil vapor intrusion”). Additional pathways could include skin contact, inhalation, and incidental ingestion of VOCs present in soil and groundwater when and where construction workers are involved in subsurface activities where volatiles are present at elevated concentrations.

Concerning the indoor air pathway, the NYSDOH has issued a guidance document for assessing potential impacts to indoor air via soil vapor intrusion. Concerning skin contact, inhalation, and incidental ingestion of volatile organics present in soil and groundwater, the potential exists for exposure to VOCs for construction workers involved in subsurface activities where volatiles are present at elevated concentration. Concerning the future use, a soil vapor intrusion evaluation will be conducted post remedy.

2.8.4 Exposure Assessment

Based on the above, we determine the following Qualitative Human Health Exposure Assessment (QHHEA) conclusions for current conditions, construction/remediation conditions and future use conditions as listed below.

Current Use Scenario

Site contamination includes SVOCs (specifically PAHs), VOCs, and metals impacts to soil related to historic fill of unknown origin and native deeper soil and CVOC impacts to soil vapor likely due historic Site operations and/or migrating from an off-site source. Under current conditions, the likelihood of exposure to soil or groundwater is limited, as the Site is affixed with a perimeter fence secured with a lock. Site access is only granted to personnel associated with the planned development. Potable water for Kings County will continue to be sourced from reservoirs in the Catskill and Delaware Watersheds. All intrusive work on the Site will be performed in accordance with a Site-Specific Health and Safety Plan (HASP) and donning of appropriate PPE.

Construction/Remediation Scenario

The exposure element exists for all elements during the construction and remediation phase. The overall risk will be minimized by the implementation of a Site-Specific Construction Health and Safety Plan (CHASP), localized monitoring of organic vapors, community air monitoring on the Site perimeter for particulates and VOCs, vapor and dust suppression techniques, installation of a stabilized entrance, cleaning truck tires and undercarriages and donning of appropriate PPE. Additionally, the Site will be remediated pursuant to a NYSDEC-approved Remedial Action Work Plan which will include a Soil Materials Management Plan that will highlight measures for PPE, covering of stockpiles, housekeeping,

suppression techniques (particulates and vapor) and measures to prevent off-site migration of contaminants.

Future Use Scenario

Under the proposed future condition (after construction/remediation), residual contaminants may remain on-site depending on the remedy. The remaining contaminants would include those listed in the current conditions. If contaminants remain on site after construction/remediation, the route of exposure will be mitigated by proper installation of engineering controls such as Site capping system foundation and implementation of institutional controls such as land use and groundwater use restrictions.

2.9 REMEDIAL ACTION OBJECTIVES

The following Remedial Action Objectives (RAOs) have been identified for the Site.

2.9.1 Soil

RAOs for Public Health Protection:

- Prevent ingestion/direct contact with contaminated soil
- Prevent inhalation of, or exposure to, contaminants volatilizing from contaminated soil or contaminated soil in particulate form

RAOs for Environmental Protection:

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

2.9.2 Groundwater

RAOs for Public Health Protection:

- Prevent ingestion of groundwater with contamination levels exceeding drinking water standards
- Prevent contact with, or inhalation of, volatiles from contaminated groundwater
- Remove source of groundwater or surface contamination

2.9.3 Soil Vapor

RAOs for Public Health Protection:

- Mitigate the risk of impacts to public health resulting from existing, or the potential for, soil vapor migration off-Site, or intrusion into the proposed development at the Site

2.9.4 Protection of Human Health and the Environment

Alternative I – The remedy would significantly reduce the potential for each of the identified pathways of exposure to on-site contaminated media. Remediating the Site to Track 1 standards would result in

the elimination of Site soil that exceeds UUSCOs. Encountered underground storage tanks (USTs) would be decommissioned, removed, and disposed off-site, and petroleum-impacted material, if encountered, would be excavated and disposed off-Site. The RAOs for public health and environmental protection would be met through the removal of contaminated media at the Site to meet UUSCOs and PGW SCOs, which would significantly reduce the potential for exposure pathways via possible ingestion, inhalation, or dermal contact.

Since no engineering or institutional controls will be required for this remedy to maintain the Site in the future, this remedy is the most protective of human health and the environment.

Alternative II – The Track 2 remedy will provide similar overall protection to public health and the environment as Alternative I. Remediating the Site to Track 2 standards will result in the removal of Site soil that exceeds RRSCOs. Encountered USTs would be decommissioned, removed, and disposed off-Site, and petroleum-impacted material, if encountered, would be excavated, and disposed off-Site. The RAOs for public health and environmental protection would be met through the removal of contaminated media at the Site to meet RRSCOs, which would significantly reduce the potential for exposure pathways via possible ingestion, inhalation, or dermal contact.

Since no engineering and institutional controls will be required for this remedy to maintain the Site in the future, this remedy is protective of human health and the environment.

Public health will be protected during remediation under both remedial alternatives by implementing and enforcing dust, odor, and organic vapor control and monitoring procedures when needed.

3. Summary of Remedial Action

This section presents an analysis of the proposed remedial alternatives that could potentially be achieved under the BCP. The proposed SCOs under Alternative I would be the Part 375 UUSCOs under a Track 1 cleanup. Alternative II would utilize Part 375 RRSCOs under a Track 2 cleanup. Both alternatives would achieve the established RAOs outlined in Section 2.9. Following evaluation, Alternative II was selected as the preferred remedy.

3.1 ALTERNATIVE I – TECHNICAL DESCRIPTION

Alternative I, a Track 1 remedy, will include the following:

- Development and implementation of a CHASP and Community Air Monitoring Plan (CAMP) for the protection of on-site workers, community/residents, and the environment during remediation and construction activities.
- Design and construction of a support-of-excavation (SOE) system to facilitate the Track 1 remediation.
- Implementation of soil erosion, pollution, and sediment control measures in compliance with applicable laws and regulations.
- Removal of remaining miscellaneous debris on the Site.
- Decommission on-site monitoring wells in accordance with NYSDEC CP-43 Policy.
- Excavation, stockpiling, off-Site transport, and disposal of approximately 7,600 cubic yards of contaminated historical fill material that exceeds UUSCOs as defined by 6 NYCRR Part 375-6.8. Excavation will be to 25 ft below sidewalk grade (bottom of historical fill and soils impacted above UUSCOs) Site-wide. For development purposes, excavations are proposed to extend to about 25 ft below sidewalk grade in the roughly 10,200-square-foot building footprint.
- As part of waste characterization and for disposal purposes, a lateral and vertical delineation of hazardous lead centered on soil boring SB-05 (hazardous lead identified from the 18 to 20 ft bgs sample) will be completed to facilitate off-site disposal of excavated soil/fill.
- If encountered, removal of USTs and/or associated appurtenances (e.g., fill lines, vent line, and electrical conduit) and decommissioning and off-Site disposal during redevelopment in accordance with DER-10, 6 NYCRR Part 613.9, NYSDEC CP-51, and other applicable NYSDEC UST closure requirements.
- Screening for indications of contamination (by visual means, odor, and monitoring PIDs) of excavated material during intrusive site work.
- Continuing operation of the existing dewatering and treatment system designed by Ground/Water Treatment & Technology, LLC (GWTT) during excavation and remediation activities.
- Appropriate off-site disposal of material removed from the Site in accordance with federal, state, and local rules and regulations for handling, transport, and disposal.
- Backfilling of excavated areas, as necessary for development, with certified-clean material (i.e., meeting UUSCOs), recycled concrete aggregate (RCA), or virgin, native crushed stone.
- Upon completion of Track 1 excavation, an *in situ* chemical reductant (ISCR) reagent (DARAMEND®) will be mixed with approved backfill at the base of the excavation in the vicinity

of the elevated CVOCs near MW-05 at the proposed development depth of 30 ft bgs providing contact with groundwater impacted with CVOCs.

- Collection and analysis of confirmation soil samples from the excavation base and, to the extent possible, sidewalls of the excavation in accordance with DER-10, to document post-excavation conditions to confirm a Track 1 remedy was achieved.
- Installation of two monitoring wells to replace the decommissioned well MW-05 and one well installed downgradient. Collection and analysis of groundwater samples in accordance with DER-10 following remedial excavation activities to document groundwater quality below the Site.
- Completion of SVI evaluation to assess indoor air quality in accordance with DER-10 and NYSDOH Final Guidance on Soil Vapor Intrusion following remedial excavation activities and prior to occupancy. A SVI WP will be provided to the NYSDEC and NYSDOH for review and approval prior to commencing the SVI evaluation. Formal request for access letters will be transmitted via certified mail to adjacent offsite properties requesting access to perform a SVI Evaluation.

The Alternative I remediation extent is shown in Figure 8. The requirements for each of the Alternative I tasks are described below.

On-Site Worker, Public Health, and Environmental Protection

A site-specific CHASP is appended to this RAWP (Appendix D) and will be implemented during excavation and foundation construction to protect Site workers from accidents and acute and chronic exposures to the identified contaminants of concern (COCs). Public health will be protected by implementing and enforcing dust, odor, and organic vapor control and monitoring procedures included in the CAMP. The CAMP will include continuous perimeter monitoring of dust and organic vapors using DustTrak aerosol monitors and PIDs capable of recording data and calculating 15-minute averages. Field personnel will monitor site perimeters for visible dust and odors.

Support of Excavation

To accommodate removal of soil that exceeds Track 1 UUSCOs, an SOE system will require construction. Excavations are anticipated to be completed into the water table throughout the Site. Additional SOE to support hot-spot excavation areas throughout the Site may be constructed, as necessary.

Fill and Soil Removal

PAHs, metals, and VOCs were detected in historical fill material at concentrations that exceed the UUSCOs and metals were detected in deeper native soil at concentrations exceeding UUSCOs. To achieve Track 1, soil removal and disposal will extend from surface grade to about 25 ft below sidewalk grade throughout the entire Site footprint (extent of historical fill material), resulting in about 7,600 cubic yards of contaminated historical fill/native material to be disposed off-site. For development purposes, excavations will extend to about 25 ft below sidewalk grade in the roughly 10,200-square-foot building footprint and a total of about 7,600 cubic yards of material will be removed from the Site. The soil will be screened for visual, olfactory, and instrumental evidence of environmental impacts. Excavation is expected to extend below the water table during remedial excavation or construction; therefore, installation of a dewatering system occurred as part of the Corrective Action and is detailed in the Interim Construction Completion Report submitted to NYSDEC in February 2022.

Waste Characterization

Waste characterization will be performed for off-site disposal in a manner suitable to the receiving facility and in conformance with applicable permits. Sampling and analytical methods, sampling frequency, analytical results, and QA/QC results will be reported. Data available for excavated material to be disposed of at a given facility will be submitted to the disposal facility with suitable explanation prior to shipment and receipt.

In addition, during the SRI, TCLP lead was detected in SB-05 (18-20') at 25.6 mg/L, which exceeds the USEPA allowable limit of 5 mg/L for hazardous waste. TCLP lead was also detected above laboratory detection limits in SB-04 (0-2") and SB-10 (18-20') at concentrations of 1.09 mg/L and 1.63 mg/L, respectively, however, the concentrations did not exceed the USEPA allowable limit of 5 mg/L. Additional vertical and horizontal delineation of elevated TCLP lead will be performed during waste characterization sampling in the northeast region of the Site.

Hazardous soil will be managed in accordance with applicable federal, state, and local regulations. As such, the handling, transport, and disposal of hazardous fill material is subject to USEPA and the Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response (HAZWOPER) regulations. The excavated material would be segregated in the field and temporarily placed in stockpiles, or direct loaded, and transported by Part 364-permitted trucks to a facility permitted by RCRA to accept hazardous waste.

UST Removal

If encountered, USTs and/or associated appurtenances (e.g., fill lines, vent line, and electrical conduit) would be decommissioned in accordance with applicable NYSDEC tank closure requirements, including DER-10 Section 5.5 and 6 NYCRR Part 613.9, and NYSDEC CP-51. USTs and/or associated appurtenances would be registered and administratively closed with the NYSDEC Petroleum Bulk Storage (PBS) unit. Petroleum-impacted soil would be excavated and disposed of off-site at a permitted disposal facility in accordance with applicable regulations. Closure documentation, such as Contractor affidavits, bills of lading for sludge disposal, and tank disposal receipts, would be provided as appendices in the Final Engineering Report (FER).

Excavation Backfill

As required for construction purposes, imported material will consist of clean fill that meets the UUSCOs or other acceptable fill material such as virgin stone from a quarry or RCA. If RCA is imported to the Site, it will come from a NYSDEC-registered facility in compliance with 6 NYCRR Part 360 registration and permitting requirements for the period of RCA acquisition. RCA imported from compliant facilities will not require chemical testing, unless required by NYSDEC under its terms for operation of the facility. Imported RCA must be derived from recognizable and uncontaminated concrete (less than 10% by weight passing through a No. 80 sieve). RCA is not acceptable for, and will not be used as, site cover material.

Fluids Management

A dewatering and treatment system was designed by a Ground/Water Treatment & Technology, LLC (GWTT) NYS-licensed Professional Engineer. To date, GWTT has installed four dewatering sumps and brought a 7,800-gallon frac tank to the Site. Approximately 12,000 gallons of standing water was evacuated to the sewer on Eckford Street and as the current grade of the site does not extend into the groundwater interface, dewatering operations currently address only accumulated water from precipitation events.

During future excavation associated with the remedy and installation of the proposed foundation, water management will be required to facilitate construction. Groundwater is encountered between 8 to 10 ft below sidewalk surface across the Site. The on-Site dewatering system was installed to collect the groundwater infiltration during the excavation. The revised permit, issued on August 27, 2021 (Permit No. 929596) allows for the dewatering of 20,000 gallons per day for the period of 30 August 2021 through 29 August 2022.

Groundwater will be collected from within the active work area using the four sumps installed by GWTT. Pumps will be used to convey collected groundwater from the sumps to a temporary on-Site treatment and/or collection system. Liquids removed from the Site, including dewatering fluids, will be handled, transported, and disposed of in accordance with approved New York City Department of Environmental Protection (NYCDEP) permits.

Groundwater Remediation

Upon completion of over excavation in a 15 by 15 ft vicinity of MW-05 from 25 ft bgs to 30 ft bgs, DARAMEND® (Appendix I), an ISCR reagent produced by PeroxyChem (formerly Adventus Remediation Technologies, Inc.), will be mixed with approved backfill at the base of the excavation to the proposed development depth of 25 ft bgs providing contact with the groundwater impacted with CVOCs. DARAMEND® is a mixture of zerovalent iron and carbon that promotes the ISCR of CVOCs through the creation of reducing anoxic conditions.

The proposed over-excavation area will be backfilled with approximately 70 tons of approved backfill. DARAMEND® will be applied dry to the backfill material directly in the excavation as per the manufacturer's directions at 2 to 3% percent ratio by weight, or a total of 1.4 to 2 tons of reagent. The reagent will be applied to the over excavation area in one-foot lifts and mixed with the excavator buckets and/or axial head mixers. DARAMEND® will be handled properly in accordance with instructions for use and the safety data sheet included in Appendix I.

Confirmation Soil Sampling

Per NYSDEC DER-10, confirmation soil samples will be collected from the excavation base (approximately 25 to 27 ft bgs) at a frequency of one sample per 900 square feet to confirm Track 1 UUSCOs were achieved. Sidewall samples will not be collected from the site perimeter because excavation will extend across the site footprint and SOE measures (e.g., sheeting and lagging) will have vertical excavation faces. If the site is sloped for SOE, then one sidewall sample will be collected for every 30 linear feet per DER-10. If these confirmation samples do not meet UUSCOs, then the Site may

achieve Track 2, if Residential SCOs are achieved, and these samples then become documentation samples.

An estimated twelve confirmation soil samples, plus QA/QC samples, would be collected and analyzed for the Part 375 list of VOCs, SVOCs, pesticides, metals, PFAS and 1,4-dioxane.

Post-Remedy Soil Vapor Intrusion Evaluation

CVOCs, including cis,1,2-dichloroethene, TCE, and vinyl chloride were identified in soil vapor samples collected throughout the Site. The origin of the CVOC impacts to soil vapor may be attributed to the former metal spraying and finishing operations at the Site and/or migration from an off-site source.

Following remedial actions and prior to occupancy, a Soil Vapor Intrusion (SVI) Evaluation will be conducted to determine if engineering controls will be required to address the potential for soil vapor intrusion and will include a provision for implementing actions recommended to address exposures related to soil vapor intrusion, if necessary, and submitted to the NYSDEC and NYSDOH for review. SVI Evaluation will include confirmatory soil vapor intrusion sampling or indoor air sampling of the lowest occupied levels of the building.

3.2 ALTERNATIVE II – TECHNICAL DESCRIPTION

Alternative II, a Track 2 remedy, will include the following tasks:

- Development and implementation of a CHASP and CAMP for the protection of on-site workers, community/residents, and environment during remediation and construction activities.
- Design and construction of a SOE system to facilitate the Track 2 remediation.
- Implementation of soil erosion, pollution, and sediment control measures in compliance with applicable laws and regulations.
- Removal of the miscellaneous debris on the Site.
- Decommission on-site monitoring wells in accordance with NYSDEC CP-43 Policy.
- Excavation, stockpiling, off-Site transport, and disposal of 5,700 cubic yards of contaminated historical fill/native material that exceeds RRSCOs as defined by 6 NYCRR Part 375-6.8. This includes excavation to a depth of 15 ft below sidewalk grade within the proposed 10,200-square-foot building footprint to remove contaminated historical fill material and native soil exceeding RRSCOs. Excavation beyond the historical fill interval and impacted native soil, to approximately 25 ft bgs, will also occur in the hotspot area surrounding soil borings SB-10, SB-11, and SB-12, to remove metals-impacted (specifically, mercury-impacted) soil/fill material and PAH-impacted soil/fill material (in SB-10 only) that exceeds the RRSCOs. This localized excavation is expected to generate an additional 20-30 cubic yards of impacted soil/fill for off-site transport and disposal. For development purposes, excavations will extend to about 25 ft below sidewalk grade in the roughly 10,200-square-foot building footprint and a total of about 7,600 cubic yards of material will be removed from the Site.
- If encountered, removal of USTs and/or associated appurtenances (e.g., fill lines, vent line, and electrical conduit) and decommissioning/disposal off-site during site redevelopment in accordance with DER-10, 6 NYCRR Part 613.9, NYSDEC CP-51, and other applicable NYSDEC UST closure requirements.

- As part of waste characterization and for disposal purposes, a lateral and vertical delineation of hazardous lead centered on soil boring SB-05 (hazardous lead identified from the 18-20' sample) will be completed to facilitate off-site disposal of excavated soil/fill.
- Screening for indications of contamination (by visual means, odor, and monitoring with PIDs) of excavated material during intrusive site work.
- Continuing operation of the existing dewatering and treatment system designed by GWTT during excavation and remediation activities.
- Appropriate off-site disposal of material removed from the Site in accordance with federal, state, and local rules and regulations for handling, transport, and disposal.
- Backfilling of excavated areas, as necessary for development, with certified-clean material (i.e., meeting both the Protection of Groundwater [PG] and RRSCOs), RCA, or virgin, native crushed stone.
- Collection and analysis of documentation soil samples from the excavation base and, to the extent possible, sidewalls of the excavation in accordance with DER-10, to document post-excavation conditions to confirm a Track 2 RRSCOs were achieved.
- Completion of a SVI Evaluation in accordance with DER-10 and NYSDOH Final Guidance on Soil Vapor Intrusion following remedial excavation activities and prior to occupancy.
- Establishment of use restrictions including prohibitions on the use of groundwater from the Site and prohibitions on sensitive site uses, such as farming or vegetable gardening in residual site soil, to significantly reduce the potential for future exposure pathways.
- Establishment of an approved SMP to ensure long-term management of engineering and institutional controls, including the performance of periodic inspections and certification that the controls are performing as they were intended.
- Recording of an Environmental Easement (EE) to ensure future owners of the site continue to maintain engineering/ institutional controls as required.

The Alternative II remediation extent is shown on Figure 9 and is based on data presented in the SRIR and the proposed development plans. The requirements for each of the Alternative II tasks are described below.

On-Site Worker, Public Health, and Environmental Protection

A site-specific CHASP is appended to this RAWP (Appendix D) and will be enforced during excavation and foundation construction to protect on-Site workers from accidents and acute and chronic exposures to the identified contaminated media. Public health will be protected by implementing and enforcing dust, odor, and organic vapor control and monitoring procedures included in the CAMP. The CAMP will include continuous perimeter monitoring of dust and organic vapor using DustTrak aerosol monitors and PIDs capable of recording data and calculating 15-minute averages. Field personnel will monitor site perimeters for visible dust and odors.

Support of Excavation

To accommodate removal of soil that exceeds Track 2 RRSCOs, an SOE system will require construction. Excavations are anticipated to be completed below the water table throughout the site.

Fill and Soil Removal

PAHs and metals were detected in historical fill material and deeper native soil at concentrations that exceed the RRSCOs. To achieve Track 2, soil removal and disposal will extend from surface grade to about 15 ft bgs throughout the entire Site footprint, resulting in 5,700 cubic yards of contaminated historical fill/native material to be disposed of off-site. Excavation beyond the historical fill interval and impacted deeper native soil, to approximately 25 ft below sidewalk grade, will also occur in the hotspot areas surrounding soil boring SB-10, SB-11, and SB-12, to remove metals-impacted (specifically, mercury-impacted) and PAH-impacted soil/fill material (in SB-10 only) that exceeds the RRSCOs. This localized excavation is expected to generate an additional 20-25 cubic yards of impacted soil/fill for off-site transport and disposal. For development purposes, excavations will extend to 25 ft below sidewalk grade in the roughly 10,200 square-foot building footprint and a total of about 7,600 cubic yards of material will be removed from the Site. The soil will be screened for visual, olfactory, and instrumental evidence of environmental impacts. Excavation is expected to extend below the water table during remedial excavation or construction; therefore, installation of a dewatering system or localized dewatering is anticipated.

Waste Characterization

Waste characterization will be performed for off-site disposal in a manner suitable to the receiving facility and in conformance with applicable permits. Sampling and analytical methods, sampling frequency, analytical results, and QA/QC results will be reported. Data available for excavated material to be disposed of at a given facility will be submitted to the disposal facility with suitable explanation prior to shipment and receipt.

In addition, during the SRI, TCLP lead was detected in SB-05 (18-20') at 25.6 mg/L, which exceeds the USEPA allowable limit of 5 mg/L for hazardous waste. TCLP lead was also detected above laboratory detection limits in SB-04 (0-2") and SB-10 (18-20') at concentrations of 1.09 mg/L and 1.63 mg/L, respectively, however, the concentrations did not exceed the USEPA allowable limit of 5 mg/L. Additional vertical and horizontal delineation of elevated TCLP lead will be performed during waste characterization sampling in the northeast region of the Site.

Hazardous soil will be managed in accordance with applicable federal, state, and local regulations. As such, the handling, transport, and disposal of hazardous fill material is subject to USEPA and the OSHA HAZWOPER regulations. The excavated material would be segregated in the field and temporarily placed in stockpiles, or direct loaded, and transported by Part 364-permitted trucks to a facility permitted by RCRA to accept hazardous waste.

UST Removal

If encountered, USTs and/or associated appurtenances (e.g., fill lines, vent line, and electrical conduit) would be decommissioned in accordance with applicable NYSDEC tank closure requirements, including DER-10 Section 5.5 and 6 NYCRR Part 613.9, and NYSDEC CP-51. USTs and/or associated appurtenances would be registered and administratively closed with the NYSDEC Petroleum Bulk Storage (PBS) unit. Petroleum-impacted soil would be excavated and disposed of off-site at a permitted disposal facility in accordance with applicable regulations. Closure documentation, such as Contractor affidavits, bills of lading for sludge disposal, and tank disposal receipts, would be provided as appendices in the FER.

Fluids Management

A dewatering and treatment system was designed by a GWTT NYS-licensed Professional Engineer. To date, GWTT has installed four dewatering sumps and brought a 7,800-gallon FRAC tank to the Site. Approximately 12,000 gallons of standing water was evacuated to the sewer on Eckford Street and as the current grade of the site does not extend into the groundwater interface, dewatering operations currently address only accumulated water from overflow events.

During future excavation associated with the remedy and installation of the proposed foundation, water management will be required to facilitate construction. Groundwater is encountered between 8 to 10 ft below sidewalk surface across the Site. The on-Site dewatering system was installed to collect the groundwater infiltration during the excavation. The revised permit, issued on August 27, 2021 (Permit No. 929596) allows for the dewatering of 20,000 gallons per day for the period of 30 August 2021 through 29 August 2022.

Groundwater will be collected from within the active work area using the four sumps installed by GWTT. Pumps will be used to convey collected groundwater from the sumps to a temporary on-Site treatment and/or collection system. Liquids removed from the Site, including dewatering fluids, will be handled, transported, and disposed of in accordance with approved NYCDEP permits.

Excavation Backfill

As required for construction purposes, imported material will consist of clean fill that meets the lower of PGW SCOs or RRSCOs or other acceptable fill material such as virgin stone from a quarry or RCA. If RCA is imported to the site, it will come from a NYSDEC-registered facility in compliance with 6 NYCRR Part 360 registration and permitting requirements for the period of RCA acquisition. RCA imported from compliant facilities will not require chemical testing, unless required by NYSDEC under its terms for operation of the facility. Imported RCA must be derived from recognizable and uncontaminated concrete (less than 10% by weight passing through a No. 80 sieve). RCA is not acceptable for, and will not be used as, site cover or drainage material.

Documentation Soil Sampling

Per NYSDEC DER-10, documentation soil samples will be collected from the excavation base (approximately 25-27 ft bgs) at a frequency of one sample per 900 square feet. Sidewall samples will not be collected from the site perimeter because excavation will extend across the Site footprint and SOE measures (e.g., sheeting and lagging) will preclude access to soil sidewalls. If the Site is sloped for SOE, then one sidewall sample will be collected for every 30 linear feet per DER-10.

An estimated twelve documentation soil samples, plus QA/QC samples, would be collected and analyzed for the Part 375 list of VOCs, SVOCs, pesticides, metals, PFAS and 1,4-dioxane.

Post-Remedy Soil Vapor Intrusion Evaluation

CVOCs, including cis,1,2-dichloroethene, PCE, TCE, and vinyl chloride were identified in soil vapor samples collected throughout the Site. The CVOCs that have partitioned to the vapor phase from impacted soil and groundwater are likely due the historic metals finishing and spraying operations at the

Site and nearby properties and/or migration from an off-site source. A mechanical ventilation system will be installed within the proposed subgrade areas compliant with the NYC Mechanical Code requirements to mitigate any potential soil vapor intrusion. Although not considered an engineering control, the building foundations will be waterproofed as part of building construction.

Following remedial actions and prior to occupancy, a Soil Vapor Intrusion (SVI) Evaluation will be conducted to determine if engineering controls will be required to address the potential for soil vapor intrusion and will include a provision for implementing actions recommended to address exposures related to soil vapor intrusion, if necessary, and submitted to the NYSDEC and NYSDOH for review. SVI Evaluation will include confirmatory soil vapor intrusion sampling or indoor air sampling of the lowest occupied levels of the building.

Site Management Plan and Environmental Easement

An EE would be recorded referencing Institutional Controls (ICs) that are part of the selected remedy, which would be binding upon all subsequent owners and occupants of the property. The ICs would: 1) restrict the site's use to restricted residential, commercial and industrial uses, although land use is subject to local zoning laws; 2) restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDEC or NYSDOH; 3) require implementation of an NYSDEC-approved Site Management plan (SMP); 4) require the completion and submission to the NYSDEC a periodic certification of ICs and ECs in accordance with Part 375; and 5) include notice-of-use restrictions of the site's soil. The Engineering Controls (ECs) for the Site would include the composite cover system (including concrete foundation and waterproofing/vapor barrier). The SMP would identify all use restrictions and ECs and long-term monitoring and maintenance requirements to ensure the ICs and/or ECs remain in place and are effective. The SMP will include, but may not be limited to:

1. An Excavation Work Plan which details the provisions for management of future excavations in areas of remaining contamination
2. Descriptions of the provisions of the EE including any land use, and/or groundwater use restrictions
3. Provision for evaluation of the potential for soil vapor intrusion for any buildings developed on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion
4. Provisions for the management and inspection of the identified ECs
5. Maintaining site access controls and NYSDEC notification
6. The steps necessary for the periodic reviews and certification of the ICs and/or ECs
7. A Monitoring Plan to assess the performance and effectiveness of the remedy. The Monitoring plan includes, but may not be limited to:
 - a. Monitoring for vapor intrusion for any buildings developed on the site, as may be required by the Institutional and Engineering Control Plan discussed above
8. A schedule of monitoring and frequency of submittals to NYSDEC.

3.3 EVALUATION OF REMEDIAL ALTERNATIVES

The following is an evaluation of the proposed remedy based on the BCP remedy evaluation criteria listed below. The first two criteria are considered “threshold criteria” and the remaining criteria are “balancing criteria.” A remedial alternative must meet the threshold criteria to be considered and evaluated further under the balancing criteria.

- Protection of human health and the environment
- Compliance with standards, criteria, and guidance (SCG)
- Short-term effectiveness and impacts
- Long-term effectiveness and permanence
- Reduction of toxicity, mobility, or volume of contaminated material
- Implementability
- Cost-effectiveness
- Community acceptance
- Land use

3.3.1 Compliance with Standards, Criteria, and Guidance

Both alternatives will be in compliance with applicable standards, criteria, and guidance listed in Section 4.1 by removing Site sources of contamination to achieve the RAOs. While implementing either remedy, protection of public health and the environment will be maintained by enforcing a Site-specific CHASP and CAMP. OSHA requirements for on-site construction safety will be followed by Site contractors performing work.

3.3.2 Short-Term Effectiveness and Impacts

Alternative I – The most significant short-term adverse impacts and risks to the community will be the potential complications and risk involved with designing and constructing SOE and underpinning for the building and structures adjoining the site. Potential impositions on roadway and pedestrian traffic associated with construction may be a result of the remedial excavation to achieve both Track 1 cleanup. Increased truck traffic in Alternative I, relative to Alternative II, may be necessary to haul out the additional soil that exceeds UUSCOs to achieve Track 1 standards.

Under Alternative I, the excavated soil and fill would require approximately 378, 20-cubic yard truck trips for disposal. Implementing the Alternative I would require approximately 2 to 3 months of effort (assuming normal work hours). Truck traffic will be routed on the most direct course using major thoroughfares where possible, and flaggers will be used to protect pedestrians at site entrances and exits. Waiting times associated with analysis of confirmation sampling and resampling may delay construction, leaving soil exposed for a longer time resulting in a potential increase in dust, odors, and/or organic vapor from the excavation and construction-related noise. The effects of these potential adverse impacts to the community, workers, and the environment will be minimized by implementing the respective control plans.

Alternative II – Alternative II will result in similar short-term adverse impacts and risks to the community. The excavated soil and fill would require approximately 285, 20-cubic-yard truck trips.

Implementing the Alternative II concept would require approximately 1 to 2 months of effort (assuming normal work hours).

Under both remedial alternatives, dust will be controlled by the on-site application of water spray as needed. Engineering controls, such as slowing the pace of work, applying foam and/or dust suppressant, and/or covering portions of the excavation will be used to suppress odors/dust when required. Work will be modified or stopped according to the action levels defined in the CAMP. Therefore, short-term impacts are similar for both alternatives.

3.3.3 Long-Term Effectiveness and Performance

Alternative I will remove contaminated soil from the Site exceeding UUSCOs while Alternative II will remove contaminated soil from the Site exceeding RRSCOs and will be documented in post-excavation endpoint soil sampling. A post-construction SVI Evaluation would be implemented to evaluate potential for vapor intrusion into the on-Site building.

3.3.4 Reduction of Toxicity, Mobility, or Volume of Contaminated Material

Both remedial alternatives would permanently and significantly reduce the toxicity, mobility, and volume of contamination through removal of contaminated fill and buried solid waste through excavation and off-Site disposal.

3.3.5 Implementability

Alternative I – Implementing a Track 1 remedy will be technically challenging because of SOE requirements associated with protection of the neighboring buildings and streets; however, the construction of SOE systems to allow for excavations to depths the Alternative I remedy are regularly installed. This remedy will consist primarily of excavation with standard bucket excavators. The availability of local contractors, personnel, and equipment suitable to working in a structurally challenging environment is high due to the frequency of this type of remediation in the region. It is not expected to require schedule extensions or additional costs associated with the excavation and SOE. However, if deeper contamination above UUSCOs is encountered requiring unanticipated over-excavation, the cost is marginal compared to the benefit of achieving an unrestricted use remediation and elimination of long-term engineering and institutional controls. Additional coordination between trades may be required. This alternative is considered feasible.

Alternative II – The technical feasibility of implementing the Alternative II remedy is similar to Alternative I, as significant excavation as well as installation of an SOE is still required to achieve the Track 2 RRSCOs. This alternative will consist primarily of excavation with standard bucket excavators. The availability of local contractors, personnel, and equipment suitable to working in a structurally challenging environment is high due to the frequency of this type of remediation in the region. Additional coordination between trades may be required. This alternative is considered feasible.

3.3.6 Cost-Effectiveness

Alternative I – Based on the assumptions detailed for Alternative I, the estimated remediation cost of a Track 1 cleanup is approximately \$5,135,000. Because the Site will be remediated to

UUSCOs, there are no long-term operation, maintenance, or monitoring costs associated with the proposed remedy. Table 1 details the individual cost components used to arrive at this cost estimate.

Alternative II – Based on the assumptions detailed for Alternative II, the estimated remediation cost to achieve a Track 2 cleanup is approximately \$8,800,000. Alternative I is more cost-effective as Alternative II requires the implementation of the composite cover system as an engineering control as well as long-term operation, maintenance and monitoring for site management. Table 2 outlines the individual cost-components used to arrive at this cost estimate.

3.3.7 Community Acceptance

Both remedial alternatives should be acceptable to the community because the potential exposure pathways to on-Site contamination will be addressed upon completion of the respective remedies and the Site will be remediated to allow for a higher-level use. The selected remedy will be subject to a 45-day public comment period in accordance with the Citizen Participation Plan (CPP), included as Appendix E. Substantive public comments will be addressed before the remedy is approved.

3.3.8 Land Use

The current, intended, and reasonably anticipated future residential land use of the Site and its surroundings are compatible with both remedial alternatives. The proposed development will include construction of a residential condominium building with full cellar extending to approximately 25 feet from sidewalk grade. Mid-rise mixed-use commercial/residential, and multiple-story commercial and institutional buildings are located at properties surrounding the Site.

3.4 SELECTION PREFERRED REMEDY

Both alternatives will be protective of human health and the environment and meet the remedy selection criteria. Alternative I achieves the remedial action goals established for the redevelopment project and is effective in the short-term. Alternative I effectively reduces contaminant mobility and is a better alternative in the reduction of contaminant volume. Alternative I is more effective in the long-term because the Site achieves unrestricted use. The excavation depths for both remedial alternatives are comparable and will produce similar remedial costs. Alternative I is preferred over Alternative II if it can be feasibly and practically implemented at a similar cost while providing greater overall protection to human health and the environment. Therefore, Alternative I is the recommended remedial alternative for this Site. However, if this Alternative is not achievable, Alternative II is similarly protective of human health and the environment.

Figure 8 depicts the Alternative I (Track 1) cleanup plan. Figure 9 depicts the Alternative II (Track 2) cleanup plan. The development excavation plan is shown in Figure 10. The Alternative I and II remediation extent is based on data presented in the RIR and SRIR.

3.4.1 Zoning

The land is located within a MX-8 Special Mixed-Use District (MX) and is currently zoned as M1-2/R6A which allows for residential use. The reasonably anticipated future use conforms to applicable zoning laws and maps.

3.4.2 Applicable Comprehensive Community Master Plans or Land Use Plans

According to the New York City Planning Commission, “R6 districts are medium-density areas in Brooklyn, Queens and the Bronx. The height factor regulations for R6 districts encourage small multi-family buildings on small zoning lots and, on larger lots, tall buildings that are set back from the street.” The Site is not located in an En-Zone. A copy of the zoning map is included in Appendix F.

3.4.3 Surrounding Property Uses

The current, intended, and reasonably anticipated future land use of the Site and its surroundings are compatible with the selected remedy. The construction of a new residential development conforms to recent development patterns in the area and current zoning.

3.4.4 Environmental Justice Concerns

Per the “Potential Environmental Justice Areas in Northern Brooklyn, Kings County, New York” The Site is not in a potential Environmental Justice area. NYSDEC’s Office of Environmental Justice acts as an advocate on behalf of these areas, which are disproportionately affected by environmental burdens.

3.4.5 Land Use Designations

There are no federal or state land use designations.

3.4.6 Population Growth Patterns

The population growth patterns and projections support the current and anticipated future land use.

3.4.7 Accessibility to Existing Infrastructure

The Site is accessible to existing infrastructure.

3.4.8 Proximity to Cultural Resources

The Site is not in close proximity to a registered landmark. The nearest registered landmarks include McCarron Park, located between Leonard Street and Lorimer Street (approximately 0.15-mile west of the Site) and the Russian Orthodox Cathedral of the Transfiguration of Our Lord, located at 228 North 12th Street, Brooklyn, NY (approximately 0.31-mile southwest of the Site), and the 19th Police Precinct Station House and Stable, located at 43 Herbert Street, Brooklyn, NY (approximately 0.28-mile southeast of the Site).

3.4.9 Proximity to Natural Resources

The Site is not located in close proximity to important federal, state, or local natural resources including waterways, wildlife refuges, wetlands, and critical habitats of endangered or threatened species. The nearest ecological receptor is the Bushwick Inlet, which is located approximately 0.55-mile west-northwest of the Site.

3.4.10 Off-Site Groundwater Impacts

Municipal water supply wells are not present in this area of New York City; therefore, groundwater from the Site does not affect municipal water supply wells or recharge areas.

3.4.11 Proximity to Floodplains

According to the FEMA Preliminary Flood Insurance Rate Map (FIRM) dated 5 September 2007 (Map Number 3604970202F), the Site is located in Zone X, which is designated for areas of 0.2 percent annual chance of flood; areas of one percent annual chance of flood with average depths of less than one foot or with drainage areas less than one square mile; and areas protected by levees from one percent annual chance of flood.

3.4.12 Geography and Geology of the Site

The Site geology is described in Section 2.6.

3.4.13 Current Institutional Controls

There are currently no institutional controls being implemented at the Site.

3.5 SUMMARY OF THE SELECTED REMEDIAL ACTION

The selected Track 1 (Alternative I) remedy will include the following:

- Development and implementation of a CHASP and CAMP for the protection of on-site workers, community/residents, and the environment during remediation and construction activities.
- Design and construction of a SOE system to facilitate the Track 1 remediation.
- Implementation of soil erosion, pollution, and sediment control measures in compliance with applicable laws and regulations.
- Removal of remaining miscellaneous debris on the Site.
- Decommission on-site monitoring wells in accordance with NYSDEC CP-43 Policy.
- Excavation, stockpiling, off-Site transport, and disposal of approximately 7,600 cubic yards of contaminated historical fill material that exceeds UUSCOs as defined by 6 NYCRR Part 375-6.8. Excavation will be to 25 ft below sidewalk grade (bottom of historical fill and soils impacted above UUSCOs) Site-wide. For development purposes, excavations will extend to about 25 ft below sidewalk grade in the roughly 10,200-square-foot building footprint.
- As part of waste characterization and for disposal purposes, a lateral and vertical delineation of hazardous lead centered on soil boring SB-05 (hazardous lead identified from the 18-20' sample) will be completed to facilitate off-site disposal of excavated soil/fill.

- If encountered, removal of USTs and/or associated appurtenances (e.g., fill lines, vent line, and electrical conduit) and decommissioning and off-Site disposal during redevelopment in accordance with DER-10, 6 NYCRR Part 613.9, NYSDEC CP-51, and other applicable NYSDEC UST closure requirements.
- Screening for indications of contamination (by visual means, odor, and monitoring PIDs) of excavated material during intrusive site work.
- Continuing operation of the existing dewatering and treatment system designed by GWTT during excavation and remediation activities.
- Appropriate off-site disposal of material removed from the Site in accordance with federal, state, and local rules and regulations for handling, transport, and disposal.
- Backfilling of excavated areas, as necessary for development, with certified-clean material (i.e., meeting UUSCOs), recycled concrete aggregate (RCA), or virgin, native crushed stone.
- Upon completion of Track 1 excavation, an *in situ* ISCR reagent (DARAMEND®) will be mixed with approved backfill at the base of the excavation in the vicinity of the elevated CVOCs near MW-05 at the proposed development depth of 30 ft bgs providing contact with groundwater impacted with CVOCs.
- Collection and analysis of confirmation soil samples at the base of the excavation (25 ft bgs) in accordance with DER-10, to document post-excavation conditions to confirm a Track 1 remedy was achieved. Proposed confirmation sample locations are shown in Figure 11.
- Installation of two post-remedy monitoring wells to replace the decommissioned well MW-05 and one well installed downgradient. Post-remedy collection and analysis of groundwater samples for VOCs in accordance with DER-10 following remedial excavation activities to document groundwater quality below the Site.
- Collection of a SVI Evaluation in accordance with DER-10 and NYSDOH Final Guidance on Soil Vapor Intrusion following remedial investigation activities and prior to occupancy.

Remedial activities will be performed in accordance with this RAWP and the Department-issued Decision Document under the oversight of a New York State-Licensed Professional Engineer. Deviations from the RAWP and/or Decision Document will be promptly reported to the NYSDEC for approval and explained in the FER.

4. Remedial Action Program

4.1 GOVERNING DOCUMENTS

The primary documents governing the remedial action are summarized in this section.

4.1.1 Standards, Criteria and Guidance

The following standards, criteria, and guidance are typically applicable to Remedial Action projects in New York State, and will be consulted and adhered to as applicable:

- 29 Code of Federal Regulations (CFR) Part 1910.120 – Hazardous Waste Operations and Emergency Response
- 6 NYCRR Part 364 – Waste Transporter Permits
- 6 NYCRR Part 371 – Identification and Listing of Hazardous Wastes
- 6 NYCRR Part 372 – Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities
- 6 NYCRR Subpart 373-4 – Facility Standards for the Collection of Household Hazardous Waste and Hazardous Waste from Conditionally Exempt Small Quantity Generators
- 6 NYCRR Subpart 374-1 – Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
- 6 NYCRR Subpart 374-3 – Standards for Universal Waste
- 6 NYCRR Part 375 – Environmental Remediation Programs
- 6 NYCRR Part 376 – Land Disposal Restrictions
- 6 NYCRR Part 750 – State Pollutant Discharge Elimination System (SPDES) Permits
- Code of Federal Regulations (CFR) Title 29 Part 1910.120 - Hazardous Waste Operations and Emergency Response Standard
- CFR Title 29 Part 1926 - Safety and Health Regulations for Construction
- CP-43 – Commissioner Policy on Groundwater Monitoring Well Decommissioning (December 2009)
- NYSDEC Spill Response Guidance Manual
- NYSDEC Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances Under NYSDEC's Part 375 Remedial Programs (June 2021)
- CP-51 – Soil Cleanup Guidance (2010)
- DER-10 – Technical Guidance for Site Investigation and Remediation (May 3, 2010)
- DER-23 – Citizen Participation Handbook for Remedial Programs (March 2010)
- NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (October 2006)
- TOGS 1.1.1 – Ambient Water Quality Standards & Guidance Values and Groundwater Effluent Limitations
- Screening and Assessment of Contaminated Sediment (Division of Fish, Wildlife and Marine Resources, June 2014)

4.1.2 Site-Specific Construction Health & Safety Plan

A site-specific CHASP has been prepared (Appendix D). The CHASP will apply to remedial and construction-related work on Site. The CHASP provides a mechanism for establishing on-Site safe working conditions, safety organization, procedures, and PPE requirements during implementation of the remedy. The CHASP meets the requirements of 29 CFR 1910 and 29 CFR 1926 (which includes 29 CFR 1910.120 and 29 CFR 1926.65, respectively). The CHASP includes, but is not limited to, the following components:

- Organization and identification of key personnel
- Training requirements
- Medical surveillance requirements
- List of Site hazards
- Excavation safety
- Drill rig safety
- Work zone descriptions and monitoring procedures
- Personal safety equipment and PPE requirements
- Decontamination requirements
- Standard operating procedures
- Contingency plan
- CAMP
- Safety data sheets (SDS)

The Volunteer and associated parties preparing the remedial documents submitted to the State and those performing the construction work are responsible for the preparation of a CHASP and for performance of the work according to the CHASP and applicable laws. The CHASP and requirements defined in this RAWP pertain to remedial and ground-intrusive work performed at the Site until the issuance of a Certificate of Completion. The Haley & Aldrich Safety Coordinator will be Brian Ferguson, a resume for whom is included in Appendix G. If required, confined space entry will comply with OSHA requirements to address the potential risk posed by combustible and toxic gasses.

4.1.3 Quality Assurance Project Plan

A QAPP has been prepared that describes the quality control components that will ensure that the proposed remedy accomplishes the remedial goals and RAOs and is completed in accordance with the design specifications. The QAPP is provided as Appendix H and includes:

- Responsibilities of key personnel and their organizations for the proposed remedy
- Qualifications of the quality assurance officer
- Sampling requirements including methodologies, quantity, volume, locations, frequency, and acceptance and rejection criteria
- Description of the reporting requirements for quality assurance activities including weekly quality assurance review reports.

4.1.4 Construction Quality Assurance Plan

A Construction Quality Assurance Plan (CQAP) has been prepared that describes the quality control components that will ensure that the proposed remedy accomplishes the remedial goals and RAOs and is completed in accordance with the design specifications. Because the remedy will be accomplished concurrently with building construction, the Contractor and construction manager will have the primary responsibility to provide construction quality. A list of engineering personnel involved in implementation of the CQAP and procedures that will be carried out by the remedial engineering team are listed in Section 4.2.1. Project personnel resumes are provided in Appendix G.

4.1.5 Soil/Materials Management Plan

A Soil/Materials Management Plan (SMMP) has been prepared that includes detailed plans for managing soils/materials that are disturbed at the Site, including excavation, handling, storage, transport, and disposal. The SMMP also includes controls that will be applied to these efforts to facilitate effective, nuisance-free performance in compliance with applicable federal, state, and local laws and regulations (see Section 5.4).

4.1.6 Stormwater Pollution Prevention Plan

Erosion and sediment controls will be implemented as necessary in conformance with requirements presented in the New York State Guidelines for Urban Erosion and Sediment Control. Best management practices for soil erosion and sediment control will be selected to minimize erosion and sedimentation off-Site from the onset of remediation to the completion of development. Stormwater pollution prevention will be implemented as described below in Section 5.4.9. A Stormwater Pollution Prevention Plan (SWPPP) is not necessary because the project will disturb less than one acre, and stormwater discharge will be to a combined sewer in accordance with the New York City generic SPDES permit.

4.1.7 Community Air Monitoring Program

Details of the CAMP are discussed in section 5.4.11.

4.1.8 Contractors Site Operations Plan

The RE will review plans and submittals for this remedial project, and Contractor and subcontractor document submittals, and will confirm that plans and submittals are in compliance with this RAWP. The RE is responsible to ensure that later document submittals for this remedial project, including Contractor and subcontractor document submittals, are in compliance with this RAWP. Remedial documents, including Contractor and subcontractor document submittals, will be submitted to the NYSDEC and NYSDOH in a timely manner and prior to the start of work associated with the remedial document.

4.1.9 Citizen Participation Plan

Document repositories were established at the following locations and contain the applicable project documents:

1. Brooklyn Community Board 1

Attn: Dealice Fuller, Chairperson
435 Graham Avenue
Brooklyn, NY 11211
Phone: (718) 389-0009
Email: bk01@cb.nyc.gov

2. Brooklyn Public Library – Greenpoint Branch

Attn: Abigail Garnett
107 Norman Avenue at Leonard Street
Brooklyn, NY 11222
Phone: (718) 602-1348
Email: agarnett@bklynlibrary.org
Hours: Monday: 10:00 a.m. – 6:00 p.m.
Tuesday: 1:00 p.m. – 8:00 p.m.
Wednesday, Friday: 10:00 a.m. – 6:00 p.m.
Thursday: 10:00 a.m. – 8:00 p.m.
Saturday: 10:00 a.m. – 5:00 p.m.
Sunday: Closed

3. NYSDEC

Attn: Bob Corcoran, Case Manager
625 Broadway, 12th Floor
Albany, NY 12233-9656
Phone: (518) 402-9658

4.2 GENERAL REMEDIAL CONSTRUCTION INFORMATION

4.2.1 Project Organization

A project team for the Site was created based on qualifications and experience with personnel suited for successful completion of the project.

The following project personnel are anticipated for oversight of the RAWP implementation. Project personnel resumes are provided in Appendix G.

NYSDEC Case Manager
NYSDOH Case Manager
Remediation Engineer
Principal
Project Manager/Qualified Environmental Professional
Haley & Aldrich Health & Safety Director
Health & Safety Officer
Field Support and Coordination
Field Team Leader/Quality Assurance Officer

Bob Corcoran
Arunesh Ghosh
Scott Underhill, P.E.
James Bellew
Mari Cate Conlon, P.G.
Brian Fitzpatrick, CHMM
Brian Ferguson
Elizabeth Scheuerman
Zachary Simmel

Haley & Aldrich personnel, under the direct supervision of the Qualified Environmental Professional and

the RE, will be on-Site during implementation of the RAWP to monitor particulates and organic vapor in accordance with the CAMP. CAMP results that exceed specified action levels will be reported to the NYSDEC and NYSDOH.

Haley & Aldrich personnel will meet with the Construction Superintendent on a daily basis to discuss the plans for that day and schedule upcoming activities. Field personnel will document remedial activities. Field activities will be forwarded to the Field Team Leader and Project Manager on a daily basis and to the Qualified Environmental Professional and the RE on a weekly basis. Daily reports will also be submitted to the NYSDEC and NYSDOH case managers by noon the following business day.

Field personnel will screen excavations with a PID during ground-intrusive work. PID readings, including specifically elevated readings, will be recorded in the project field book (or on separate logs) and reported to the NYSDEC and NYSDOH. Field personnel under the direct supervision of the RE and Qualified Environmental Professional will collect confirmation samples from the base and sidewalls of the excavation in accordance with this RAWP.

Field observations and laboratory tests will be recorded in the project field book or on separate logs. Recorded field observations may take the form of notes, charts, sketches, and/or photographs. A photo log will be kept to document construction activities during remediation.

The Field Team Leader will maintain original field paperwork during performance of the remedy. Remedial activities will be documented in the monthly BCP progress reports. The Project Manager will maintain the field paperwork after completion and will maintain submittal document files.

4.2.2 Resident Engineer

The Resident Engineer (RE) for this project will be Scott Underhill. The RE is a registered professional engineer licensed by the State of New York. The RE will have primary direct responsibility for implementation of the remedial program at the Site. The RE will certify in the FER that the remedial activities were observed by qualified environmental professionals under their supervision and that the remediation requirements set forth in this RAWP and other relevant provisions of ECL 27-1419 have been achieved in substantial conformance with the RAWP.

Under direction of the RE, the work of other contractors and subcontractors involved in aspects of the remedial construction will be documented, including soil excavation, stockpiling, confirmation sample collection, air monitoring, emergency spill response services, import of backfill, and management of waste transport and disposal.

The RE will review the pre-remedial plans submitted by contractors and subcontractors for substantial conformance with this RAWP and will provide a certification in the FER. The RE will provide the certifications listed below in Section 8.1.

4.2.3 Remedial Action Construction Schedule

The remedial action construction schedule is discussed below in Section 9.0 and included in Appendix J. The NYSDEC will be promptly notified of proposed changes, delays, and/or deviations to the schedule.

4.2.4 Work Hours

The hours for operation of remedial construction will either conform to the requirements of the New York City Department of Buildings (NYCDOB) construction code or to a site-specific variance issued by the NYCDOB. The NYSDEC will be notified by the Volunteer of variances issued by the NYCDOB. The NYSDEC reserves the right to deny alternate remedial construction hours.

4.2.5 Site Security

Site access will be controlled by gate entrances to the property. The site perimeter will be secured with gated, signed, plywood fencing with restricted points of entry in accordance with the NYCDOB and New York City Department of Transportation (NYCDOT) permits and requirements. The purpose of the fencing is to limit site access to authorized personnel, protect pedestrians from Site activities, and maintain Site security.

4.2.6 Traffic Control

Site traffic will be controlled through designated points of access along Eckford Street. Access points will be continuously monitored and if necessary, a flagging system will be used to protect workers, pedestrians, and authorized guests. Traffic will also be required to adhere to applicable local, state, and federal laws.

4.2.7 Contingency Plan

Contingency plans, as described below, have been developed to effectively deal with potential unexpected discovery of additional contaminated media or USTs.

4.2.8 Discovery of Additional Contaminated Soil

During remediation and construction, soil will be continuously monitored by the RE's field representatives via visual, olfactory, and instrumental field screening techniques to identify additional soil that may not be suitable for disposal at the NYSDEC-approved disposal facility. If such soil is identified, the suspected impacts will be confirmed by collecting and analyzing samples in accordance with the NYSDEC-approved facility's requirements. If the previously approved facility is not permitted to receive the impacted soil, the soil will be excavated and disposed of off-Site at a permitted facility that can receive the material.

Identification of unknown or unexpected contaminated media identified by screening during ground-intrusive Site work will be promptly communicated to the NYSDEC Project Manager. These findings will be detailed in the monthly BCP progress report.

4.2.9 UST Discovery

Previous investigations did not identify presence of USTs on the Site. In the event a UST is discovered during excavation, it will be decommissioned as per the 6 NYCRR part 612.2 and 613.9 and DER-10 Section 5.5. After removal of the tank and residual contents, confirmatory post-excavation soil samples will be collected as outlined in DER-10 if deemed necessary by the NYSDEC and/or the RE. Post-

excavation soil samples is not expected where the proposed excavation would extend below the UST, unless visual, olfactory, or instrumental field screening techniques indicate the potential for contamination. If petroleum impacted soils are encountered, they will be segregated, characterized, and disposed of at an appropriate offsite facility. Closure documentation including affidavits, bills of lading, and tank disposal receipts will be included in the FER. If necessary, the NYSDEC petroleum bulk storage registration will be updated.

In the event USTs are encountered during ground-intrusive activities, the NYSDEC Project Manager will be promptly notified, and pertinent information will be included in the monthly BCP progress report.

4.2.10 Worker Training and Monitoring

Worker training and monitoring will be conducted in accordance with the site-specific CHASP.

4.2.11 Agency Approvals

Permits or government approvals required for remedial construction have been or will be obtained prior to the start of remedial construction.

4.2.12 Pre-Construction Meeting with the NYSDEC

Prior to the start of remedial construction, a meeting will be held between the NYSDEC, RE, the Volunteer, Construction Manager, and remediation contractor to discuss project roles, responsibilities, and expectations associated with this RAWP.

4.2.13 Emergency Contact Information

An emergency contact sheet that states the specific project contacts (with names and phone numbers) for use by NYSDEC and NYSDOH in the case of an emergency is included in the CHASP.

4.2.14 Remedial Action Costs

A detailed summary of the total estimated costs of the Track 1 and Track 2 remedies are included in Tables 1 and 2, respectively.

4.3 SITE PREPARATION

4.3.1 Mobilization

Prior to commencing remedial construction, the remediation contractor will mobilize to the Site and prepare for remedial activities. Mobilization and site preparation activities may include the following:

- Identifying the location of aboveground and underground utilities (e.g., power, gas, water, sewer, and telephone), equipment, and structures as necessary to implement remediation;
- Mobilizing necessary remediation personnel, equipment, and materials to the Site;

- Constructing one or more stabilized construction entrances consisting of non-hazardous material at or near the site exit, which takes into consideration the Site setting and Site perimeter;
- Constructing an equipment decontamination pad for trucks, equipment, and personnel that come into contact with impacted materials during remediation;
- Mark-out metals hot spots and other hot spot areas (if identified during the preliminary waste characterization sampling event)

4.3.2 Monitoring Well Decommissioning

Monitoring wells be decommissioned in accordance with NYSDEC CP-43 by an experience driller with oversight from Haley & Aldrich. Decommissioning documentation will be provided in the FER.

4.3.3 Erosion and Sedimentation Controls

Since the planned earthwork activities will be below the adjacent sidewalk grade, full-time erosion and sedimentation measures are not anticipated. Best management practices for soil erosion will be implemented to minimize erosion and sedimentation offsite.

4.3.4 Temporarily Stabilized Construction Entrance(s)

Temporary stabilized construction entrances will be installed at the existing curb cuts along Eckford Street. The entrances will be covered with NYSDEC approved gravel or RCA and graded so that runoff water will be directed on site. Vehicles exiting construction areas will be cleaned using clean water or dry brushing, as needed, to remove site soil from the tires and undercarriages. The Contractor will protect and maintain the existing sidewalks and roadways at both site access points.

4.3.5 Utility Marker and Easement Layouts

65-73 Eckford Realty LLC and its Contractors are solely responsible for the identification of utilities and/or easements that might be affected by work under this RAWP and implementation of the required, appropriate, or necessary health and safety measures during performance of the work under this RAWP. 65-73 Eckford Realty LLC and its Contractors are solely responsible for safe execution of the work performed under this RAWP. 65-73 Eckford Realty LLC and its Contractors must obtain the necessary local, state, and/or federal permits or approvals that may be required to perform the work detailed in this RAWP. Approval of this RAWP by the NYSDEC does not constitute satisfaction of these requirements.

4.3.6 Excavation Support

Appropriate management of the structural stability of on-site or off-site structures during site activities is the sole responsibility of 65-73 Eckford Realty LLC and its Contractors. 65-73 Eckford Realty LLC and its contractors are solely responsible for the safe execution of the work performed under this RAWP. 65-73 Eckford Realty LLC and its Contractors must obtain the necessary local, state, and/or federal permits or approvals that may be required to perform the work detailed in this RAWP. Additionally, 65-73 Eckford Realty LLC and its Contractors are solely responsible for the implementation of the required,

appropriate, or necessary health and safety measures during performance of work conducted under this RAWP.

4.3.7 Equipment and Material Staging

The Contractor will notify the RE and 65-73 Eckford Realty LLC, in writing with receipt confirmed, at least 30 calendar days in advance of pending site work mobilization. During mobilization, construction equipment will be delivered to the Site, temporary facilities constructed, and temporary utilities installed. The Contractor will place and maintain temporary toilet facilities within the work areas for usage by Site personnel.

4.3.8 Truck-Inspection Station

An outbound-truck inspection station will be set up at or near the Site exit. Before exiting the Site, trucks will be required to stop at the truck inspection station and will be examined for evidence of contaminated soil on the undercarriage, body, and wheels. If observed, soil and debris will be removed. Brooms, shovels, and potable water will be utilized for the removal of soil from vehicles and equipment, as necessary. The Contractor is responsible for collecting soil that is tracked immediately off-Site and returning the soil to the Site.

4.3.9 Site Fencing

The Site will be secured with a gated fence with appropriate signage maintained by the Contractor. The fence will limit access to authorized personnel and protect pedestrian from Site activities.

4.3.10 Demobilization

After remediation and construction is completed, the Contractor will be responsible for demobilizing equipment and materials not designated for off-site disposal. The RE's representative will document that the Contractor performs follow-up coordination and maintenance for the following activities:

- Removal of sediment and erosion control measures and disposal of materials in accordance with applicable rules and regulations
- Equipment decontamination
- Refuse disposal
- Removal of remaining contaminated material or waste.

4.4 REPORTING

Periodic reports and a FER will be required to document the remedial action. The RE, Scott Underhill, will be responsible for certifying the FER and is licensed to practice engineering in the State of New York. Should Mr. Underhill become unable to fulfill this responsibility, another suitably qualified NYS Professional Engineer will take their place. Field reports will be included as appendices to the FER. In addition to the periodic reports and the FER, copies of the relevant Contractor documents will be submitted to the NYSDEC.

4.4.1 Field Reports

Reports providing a summary of activities for each day of active remedial work will be emailed to the NYSDEC and NYSDOH project managers on a daily basis. These reports will include:

- The project number, statement of activities, an update of the progress made, locations of excavation, and other remedial work performed
- Quantities of material imported and exported from the Site
- Status of on-Site soil/fill stockpiles
- A summary of citizen complaints including relevant details (i.e., name, phone number, basis of complaint, actions taken)
- A summary of CAMP results noting exceedances
- Photographs of notable Site conditions and activities

Reports are not intended to be the primary mode of communication for notifying NYSDEC of emergencies, requests for changes to the RAWP, or time critical information. However, these conditions if to occur, will be included in the daily reports. Emergency conditions and changes to the RAWP will be directly communicated to the NYSDEC Project Manager.

4.4.2 Monthly Reports

Monthly reports will consist of a summary of remedial work performed at the Site throughout the month and will include:

- Investigative or remedial actions relative to the Site during the reporting period
- Actions relative to the Site anticipated for the next reporting period
- Approved changes of work scope or schedule, if applicable
- Results of sampling or testing
- Deliverables submitted during the reporting period
- The approximate percentage of completion of the project at the Site
- Unresolved delays encountered that may affect the schedule
- Community participation (CP) plan activities during this reporting period and activities anticipated in support of the CP plan for the next reporting period
- All daily reports submitted to NYSDEC during the reporting period will be included as an appendix

4.4.3 Photographs

Photographs of the remedial activities will be taken and included in the FER with provided descriptions of the representative photographs.

4.4.4 Complaint Management Plan

Complaints from the public regarding nuisance or other Site conditions will be addressed by notifying the NYSDEC of the complaint and investigating the cause/source of the issue. Records will be kept regarding the date and time of the complaint, the nature of the complaint, the type of communication (i.e., telephone, email, letter, etc.) and the name and contact information of the complaint provider.

Corrective measures will then be formulated and put into place to address the complaint as soon as possible. Resolution will be documented and submitted to the NYSDEC. A representative of the Volunteer will reply within two weeks of receipt to the complaint provider to ensure resolution.

4.4.5 Deviations from the RAWP

Deviations from the RAWP will be communicated to and coordinated with the NYSDEC in advance. Notification will be provided to the NYSDEC by telephone and email for conditions requiring immediate action (e.g., conditions judged to be a danger to the surrounding community). Based on the significance of the deviation, an addendum to this RAWP may be necessary and will include:

- Reasons for deviating from the approved RAWP
- Approval process to be followed for changes/editions to the RAWP
- Effect of the deviations on the overall remedy.

5. Remedial Action: Material Removal from the Site

Remediation will include the following material removal tasks:

Excavation, stockpiling, off-Site transport, and disposal of 7,600 cubic yards of historical fill material and native material exceeding UUSCOs as defined by 6 NYCRR Part 375-6.8. Excavation will be to 25 ft bgs (bottom of excavation) site-wide.

For development purposes, excavations will extend to about 25 ft bgs in the roughly 10,200-square-foot building footprint and a total of about 7,600 cubic yards of material will be removed from the Site.

5.1 SOIL CLEANUP OBJECTIVES

SCOs for the Site will be the Track 1 UUSCO concentrations listed in Table 3. Soil and materials management will be conducted in accordance with the SMMP as described below. Soil sample locations and results that exceed the UUSCOs are shown on Figure 3. UST closures (if necessary) will, at a minimum, conform to criteria defined in DER-10.

5.2 REMEDIAL PERFORMANCE EVALUATION (CONFIRMATION SAMPLING)

5.2.1 Soil Sampling Frequency

One confirmation soil sample will be collected for every 900 square feet of excavation base site-wide in accordance with NYSDEC DER-10, or at an alternative frequency approved by NYSDEC.

Confirmation samples will be collected to confirm that UUSCOs have been achieved. If applicable, sidewall samples will be collected from each excavation sidewall at a frequency of one sample per every 30 linear feet.

A total of twelve confirmation samples, plus QA/QC samples, will be collected from the base of the excavation, ranging from 25 to 26 ft bgs. If results of a confirmation soil sample do not comply with the UUSCOs, over-excavation will be completed as practical to achieve a Track 1 remedy and additional confirmation samples will be collected of the over-excavation area at the frequencies indicated above. Alternatively, a Track 2 remedy with Residential SCOs will be achieved. Proposed confirmation sample locations are shown in Figure 11.

5.2.2 Methodology

Confirmation samples soil samples will be collected from the base of the excavations in accordance with NYSDEC DER-10 to document remedial performance and will be analyzed for the Part 375 list of VOCs, SVOCs, pesticides, metals, PFAS, and 1,4-dioxane. Samples will be collected into laboratory-provided bottle ware. VOCs will be collected into Terracore or Encores. Samples will be transported under chain of custody protocol to an ELAP certified laboratory. Should additional soil samples be deemed necessary (e.g., additional tank closure, unknown environmental condition through visual evidence of a remaining

source, over-excavation of failed confirmation sample), confirmation sampling will be conducted in accordance with NYSDEC DER-10.

5.2.3 QA/QC

Quality control procedures for confirmation soil sampling are included in the QAPP (refer to Appendix H). Confirmation analytical results will be provided in the NYSDEC's electronic data deliverable (EDD) format for EQUIS™. Guidance on the sampling frequency is presented in NYSDEC DER-10 Section 5.4.

The QA/QC procedures required by the NYSDEC Analytical Services Protocol (ASP) and SW-846 methods will be followed. This will include instrument calibration, standard compound spikes, surrogate compound spikes, and analysis of quality control samples. The laboratory will provide sample bottles, which will be pre-cleaned and preserved. Where there are differences in the SW-846 and NYSDEC ASP requirements, the NYSDEC ASP will take precedence.

5.2.4 Data Validation

ASP Category B deliverables will be prepared for remedial performance samples collected during implementation of this RAWP. Data Usability Summary Reports (DUSR) will be prepared by a qualified data validator and the findings will be reported in the FER.

5.2.5 Reporting

Analytical laboratories that analyze confirmation soil samples, prepare results, and perform contingency sampling will be NYSDOH ELAP-certified.

5.3 ESTIMATED MATERIAL REMOVAL QUANTITIES

Excavation on-site for the proposed redevelopment plan is anticipated to generate approximately 7,600 cubic yards of soil. A summary of anticipated material types to be excavated and disposed off-site is provided below:

1. Excavation, stockpiling, off-Site transport, and disposal of approximately 7,600 cubic yards of historical fill material and native soil exceeding UUSCOs as defined by 6 NYCRR Part 375-6.8.

5.4 SOIL/MATERIALS MANAGEMENT PLAN

This section presents the approach to management, disposal, and reuse of soil, fill, and materials excavated from the Site. This plan is based on the current knowledge of Site conditions and will be altered as necessary. Field personnel, under the direction of the RE, will monitor and document the handling and transport of material removed from the Site for disposal as a regulated solid waste. Field personnel, under the direction of the RE, will assist the remediation contractor in identifying impacted materials during remediation, determining materials suitable for direct load out versus temporary on-site stockpiling, selection of samples for waste characterization, if necessary, and determining the

proper off-Site disposal facility. Separate stockpile areas will be constructed as needed for the various materials to be excavated or generated in order to avoid comingling impacted with nonimpacted soil.

5.4.1 Soil Screening Methods

Visual, olfactory, and instrumental soil screening and assessment will be performed during remediation and development-related ground intrusive activities into known or potentially contaminated material. Soil screening will be performed regardless of when the invasive work is done and will include excavation and invasive work performed during the remedy and development, such as excavations for foundations and utility work.

5.4.2 Stockpile Methods

Stockpiles will be used as necessary to separate and stage excavated material pending loading or characterization sampling. Separate stockpile areas will be constructed to avoid comingling materials. Stockpile areas will meet the following minimum requirements:

- Excavated soil will be placed onto a minimum thickness of 6 mil low-permeability liner of sufficient strength and thickness to prevent puncture during use; separate stockpiles will be created where material types are different. The use of multiple layers of thinner liners is permissible.
- Efforts will be made to place and remove the soil to minimize the potential to jeopardize the integrity of the liner.
- Stockpiles will be covered at the designated times (see below) with minimum 6-mil plastic sheeting or tarps which will be securely anchored to the ground. Stockpiles will be routinely inspected and broken sheeting covers will be promptly replaced.
- Stockpiles will be covered upon reaching their capacity (approximately 1,000 cubic yards) until ready for loading. Stockpiles that have not reached their capacity will be covered at the end of each workday.
- Each stockpile will be encircled with silt fences and hay bales, as needed, to contain and filter particulates from rainwater that has drained off the soils and to mitigate the potential for surface water run-off.
- Stockpiles will be inspected at a minimum of once daily and after every storm event.
- If encountered, stockpiling hazardous-impacted on Site will be avoided as necessary, and material will be live-loaded into trucks permitted to transport hazardous waste.

5.4.3 Materials Excavation and Load Out

Field personnel, under the supervision of the RE, will monitor ground-intrusive work and the excavation and load-out of excavated material.

Loaded vehicles leaving the site will be appropriately lined, securely covered, manifested, and placarded in accordance with the appropriate federal, state, and local requirements, including applicable transportation requirements (i.e., New York State Department of Transportation [NYSDOT] and NYCDOT requirements). Trucks hauling historic fill material will not be lined unless free liquids are present or the material is grossly impacted. Hazardous wastes derived from the site will be stored, transported, and disposed of in compliance with applicable local, state, and federal regulations.

A truck wash will be operated on Site. Trucks will be washed, as necessary, before leaving the Site, and Site ingress and egress points will be cleaned of dirt and other materials to prevent material generated during remediation and development from being tracked off-Site.

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

The Volunteer and associated parties will ensure that site development activities will not interfere with, or otherwise impair or compromise, remedial activities proposed in this RAWP. Development-related grading cuts and fills will not be performed without NYSDEC approval and will not interfere with, or otherwise impair or compromise, the performance of remediation required by this RAWP. Mechanical processing of historic fill and contaminated soil on-Site is prohibited unless otherwise approved by NYSDEC.

Primary contaminant sources (including, but not limited to, tanks and hotspots) identified during site characterization, the RI, and implementation of the remedy will be surveyed by a surveyor licensed to practice in the State of New York. The excavation will be surveyed, and survey information will be shown on maps to be included with the FER.

5.4.4 Materials Transport Off-Site

Transport of materials will be performed by licensed haulers in accordance with appropriate local, state, and federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded. Trucks headed to disposal facilities will travel north on Eckford Street to Driggs Avenue, west on Driggs Avenue to Leonard Street, south on Leonard Street to Engert Street, east on Engert Street to McGuinness Boulevard, southeast on McGuinness Boulevard to the Brooklyn Queens Expressway, south/southeast on the Brooklyn Queens Expressway to the Verrazzano Bridge (or other NYSDEC approved routes). Truck routes are shown on Figure 12.

Loaded trucks will exit in the vicinity of the Site using approved truck routes. These routes are the most appropriate route to and from the site and take into account the following:

- Limiting transport through residential areas and past sensitive sites
- Use of city mapped truck routes
- Prohibiting off-site queuing of trucks entering the facility
- Limiting total distance to major highways
- Promoting safety in access to highways
- Overall safety in transport
- Community input (where necessary).

Trucks will be prohibited from excessive stopping and idling in the neighborhood outside of the Site. Material transported by trucks exiting the Site will be secured with tight-fitting covers. Loose fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, or hazardous metals-impacted material, truck liners will be used.

5.4.5 Materials Disposal Off-Site

Disposal facilities have not been determined at the time of this report submittal; however, facility determination will be reported to the NYSDEC Project Manager prior to off-Site transport and disposal of excavated material. About 9,450 cubic yards of historical fill and native soil that exceeds UUSCOs is expected to be disposed off-Site. Soil/fill/solid waste excavated and removed from the Site will be treated as contaminated and regulated material and will be disposed in accordance with local, state (including 6NYCRR Part 360), and federal regulations.

If hazardous soil is identified, it will be managed in accordance with applicable federal, state, and local regulations. As such, the handling, transport, and disposal of hazardous fill material is subject to USEPA and the OSHA HAZWOPER regulations. As such, the handling, transport, and disposal of this fill material is subject to USEPA and the OSHA HAZWOPER regulations. The presence of hazardous waste requires compliance with both federal and state regulations and the following requirements:

1. Hazardous waste disposal requires obtaining a United States EPA RCRA generator ID number
2. Hazardous waste must be transported to a facility permitted by RCRA to accept hazardous waste
3. Hazardous waste must be segregated and cannot be comingled with other Site material
4. Hazardous waste must be transported and disposed by properly permitted (Part 364) transporters and facilities

If disposal of soil/fill from this site is proposed for unregulated disposal (i.e., clean soil removed for development purposes), a formal request with an associated plan will be made to NYSDEC's Project Manager. Unregulated off-Site management of materials from this Site is prohibited without formal NYSDEC approval. Material that does not meet UUSCOs, such as nonhazardous historic fill material, contaminated soil, and hazardous lead-impacted material excavated, is prohibited from being taken to a New York State recycling facility (6 NYCRR Part 360-16 Registration Facility). Non-hazardous historic fill material, contaminated soil, and hazardous lead-impacted material transported off-site will be handled, at a minimum, as a solid waste per 6 NYCRR Part 360.

The following documentation, to be included in the FER, will be obtained for each disposal location used in this project to fully demonstrate and document that the disposal of material derived from the Site conforms to applicable laws:

- A letter from the RE or 65-73 Eckford Realty LLC to the receiving facility describing the material to be disposed of and requesting formal written acceptance of the material. This letter will state that material to be disposed of is contaminated material generated at an environmental remediation site located in New York State. The letter will provide the project identity and the name and phone number of the RE. The letter will include as an attachment a summary of chemical data for the material being transported (including waste characterization and RI data); and
- A letter from each receiving facility stating that it is in receipt of the correspondence (above) and acceptance of the material is approved.

5.4.6 Materials Reuse On-Site

Materials reuse is not anticipated at the Site.

If on-site material is proposed for reuse, material will be stockpiled and sampled at a frequency consistent with the recommendations of Table 5.4(e)10 in DER-10 in order to confirm UUSCOs are achieved prior to placing backfill. It is noted that only soils meeting the requirements in this section may be reused. Soil proposed for reuse must be non-hazardous, must not be grossly contaminated, and must meet Track 1 UUSCOs. Soil proposed for reuse will not contain organic matter, including wood, roots, stumps, etc., or other solid waste derived from clearing and grubbing. Soil removed during implementation of the remedy will not be reused in a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines.

5.4.7 Fluids Management

A dewatering and treatment system was designed by a GWTT NYS-licensed Professional Engineer. To date, GWTT has installed four dewatering sumps and brought a 7,800-gallon frac tank to the Site. Approximately 12,000 gallons of standing water was evacuated to the sewer on Eckford Street and as the current grade of the site does not extend into the groundwater interface, dewatering operations currently address only accumulated water from overflow events.

During future excavation associated with the remedy and installation of the proposed foundation, water management will be required to facilitate construction. Groundwater is encountered between 8 to 10 ft below sidewalk surface across the Site. The on-Site dewatering system was installed to collect the groundwater infiltration during the excavation. The revised permit, issued on August 27, 2021 (Permit No. 929596) allows for the dewatering of 20,000 gallons per day for the period of August 30, 2021 through August 29, 2022.

Groundwater will be collected from within the active work area using the four sumps installed by GWTT. Pumps will be used to convey collected groundwater from the sumps to a temporary on-Site treatment and/or collection system. Liquids removed from the Site, including dewatering fluids, will be handled, transported, and disposed of in accordance with approved New York City Department of Environmental Protection (NYCDEP) permits.

5.4.8 Backfill from Off-Site Sources

Materials proposed for import onto the Site are not anticipated as part of the Track 1 remedy. However, if imported materials is proposed, documentation of the material will be provided to NYSDEC for approval prior to its use on Site. Imported soil for backfill must meet the requirements of 6 NYCRR Part 375-6.7(d) and NYSDEC DER-10 Section 5.4(e), Table 5.4(e)10. Material from industrial sites, spill sites, other environmental remediation sites, or other potentially contaminated sites will not be imported to the Site. Solid waste will not be imported onto the Site.

Backfill material will consist of clean fill (as described in the following paragraph) or other acceptable fill material such as virgin stone from a quarry or recycled concrete aggregate (RCA). If RCA is imported to the site, it will be from a NYSDEC-registered facility in compliance with 6 NYCRR Part 360 registration and permitting requirements for the period of acquisition of RCA. RCA imported from compliant facilities

will not require chemical testing, unless required by the NYSDEC under the terms for operation of the facility. RCA imported to the site must be derived from recognizable and uncontaminated concrete, with no more than 10% by weight passing through a No. 80 sieve. RCA is not acceptable for and will not be used as cover or drainage material.

Imported soil (i.e., clean fill) will meet the UUSCOs. Non-compliant soils will not be imported to the Site. Clean fill will be segregated at a source/facility that is free of environmental contaminants. Qualified environmental personnel will collect representative samples at a frequency consistent with NYSDEC CP-51. The samples will be analyzed for Part 375 VOCs, SVOCs, pesticides/herbicides, PCBs, cyanide, metals including trivalent and hexavalent chromium, 1,4-dioxane, and PFAS by a NYSDOH ELAP-certified laboratory. Upon meeting these criteria, the certified-clean fill will be transported to the Site and segregated from impacted material, as necessary, on plastic sheeting until used as backfill. Trucks entering the Site with imported soils will be secured with tight fitting covers.

Soils that meet “exempt” fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this Site, will not be imported onto the site without prior approval by the NYSDEC. The contents of this RAWP and NYSDEC approval of this RAWP should not be considered an approval for this purpose.

5.4.9 Stormwater Pollution Prevention

Silt fence or hay bales will be installed around the perimeter of the remedial construction area, as required. Barriers and hay bale checks will be installed and inspected once a week and after every storm event. Results of inspections will be recorded in a logbook maintained at the site and available for inspection by the NYSDEC. Necessary repairs to silt fence and/or hay bales will be made immediately. Accumulated sediments will be removed as required to keep the barriers and hay bale checks functional. Manufacturer's recommendations will be followed for replacing silt fence damaged due to weathering. Erosion and sediment control measures identified in the RAWP will be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they will be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to the sewer system.

5.4.10 Contingency Plan

As discussed above in Section 4.2.7, if USTs or other previously unidentified contaminant sources are found during on-Site remedial excavation or development-related construction, sampling will be performed on product, if encountered, and surrounding subsurface materials (e.g., soil, stone). Chemical analyses will include Part 375 VOCs, SVOCs, PCBs, pesticides, and metals. Analyses will not be otherwise limited without NYSDEC approval. Identification of unknown or unexpected contaminated media identified by screening during ground-intrusive work will be promptly communicated by phone to the NYSDEC Project Manager. These findings will also be detailed in the monthly BCP progress report.

5.4.11 Community Air Monitoring Plan

The Community Air Monitoring Plan will require real-time monitoring for particulates (i.e., dust) and VOCs at the upwind and downwind perimeters when ground intrusive activities, including soil/waste excavation, soil handling, test pit excavation and/or trenching, are in progress at the Site. The CAMP

aims to provide protection for residents in the designated work area and residents of the downwind community from potential airborne releases that directly result from the remedial construction activities conducted at the Site. Adherence to the monitoring action levels specified in the CAMP requires monitoring and, when necessary, corrective actions to abate emissions, and/or shutdown work. The CAMP also helps to confirm that work activities do not spread contamination off-Site through the air. In addition, visual and olfactory observations will be made to keep dust and odors at a minimum around the work areas. VOCs will be monitored using PIDs, and particulates will be monitored using TSI DustTrak Environmental Monitor (DustTraks) equipment. Readings will be recorded every 15-minutes at the Site by field personnel.

The following actions will be taken based on monitoring of particulate concentrations:

- If the downwind PM-10 particulate level is $100 \mu\text{g}/\text{m}^3$ greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work will continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed $150 \mu\text{g}/\text{m}^3$ above the upwind level and provided that no visible dust is migrating from the work area.
- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than $150 \mu\text{g}/\text{m}^3$ 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 $150 \mu\text{g}/\text{m}^3$ of the upwind level and in preventing visible dust migration.

The following actions will be taken based on VOC monitoring:

- 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.
- 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 identified, corrective actions taken to abate emissions, and monitoring 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.
- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities will be shut down.

5.4.12 Odor, Dust and Nuisance Control Plan

Dust, odor, and nuisance controls will be accomplished by the remediation contractor as described in this section.

Odor Control

This odor control plan is capable of controlling emissions of nuisance odors off-Site. Specific odor control methods to be used if needed will include application of foam suppressants or tarps over the odor or VOC source areas. If nuisance odors are identified, work will be halted, and the source of odors will be identified and corrected. Work will not resume until nuisance odors have been abated. The NYSDEC and NYSDOH will be notified of odor events and of other complaints about the project. Implementation of odor controls is the responsibility of the Contractor. Monitoring odor emission, including the halt of work, will be the responsibility of the RE or his/her designated representative.

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

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

Dust Control

A dust suppression plan that addresses dust management during ground-intrusive on-Site work will include, at a minimum: (a) use of a dedicated water distribution system, on-Site water truck for road wetting, or an alternate source with suitable supply and pressure for use in dust control; (b) gravel used for on-Site roads to provide a clean and dust-free road surface; and (c) on-Site roads will be limited in total area to minimize the area required for water spraying.

Other Nuisances

A plan for rodent control will be developed and used by the remediation contractor during Site preparation (including clearing and grubbing) and during remedial work. A plan for noise control will be developed and used by the remediation contractor during Site preparation and remedial work and will conform, at a minimum, to the NYCDEP noise control standards.

6. Residual Contamination to Remain On-Site

Residual contaminated soil and groundwater will not exist beneath the development footprint after the Track 1 remedy is complete; therefore, ECs and ICs will not be required post-excavation.

7. Engineering Controls

Following completion of the Track 1 UUSCO remedy, neither ECs nor ICs will be required as part of the remedial action. In the event that a Track 4 cleanup (Restricted-Residential) is required since a Track 1 or Track 2 cleanup cannot be achieved, implementation of ECs and ICs may be required.

8. Final Engineering Report

A FER will be submitted to the NYSDEC following implementation of the remedy defined in this RAWP. The FER will be prepared in conformance with NYSDEC DER-10 and will include the following:

- Documentation that the remedial work required under this RAWP has been completed and has been performed in substantial conformance with this plan.
- A summary of the locations and characteristics of material removed from the Site including the surveyed map(s) of each area, as necessary.
- As-built drawings for constructed elements, certifications, manifests, and bills of lading.
- A description of the changes to the remedy from the elements provided in the RAWP and associated design documents, if any.
- A tabular summary of performance evaluation sampling results and material characterization results and other sampling and chemical analyses performed as part of the remedy.
- Written and photographic documentation of remedial work performed under this remedy.
- A summary of the post-excavation groundwater analytical results.
- A summary of confirmation sampling results to show that remaining soil left on-site meets the Track 1 UUSCOs.
- If necessary, a summary of remaining contamination that exceeds the Track 1 UUSCOs and an explanation for why the material was not removed as part of the remedy. A table and a map that shows remaining contamination in excess of the Track 1 UUSCOs would also be included.
- Documentation of treatment and/or disposal of material removed from the Site, including excavated contaminated soil, historic fill, solid waste, hazardous waste, non-regulated material, and fluids. Documentation associated with the disposal of material must also include records and approvals for receipt of the material.
- Documentation of the origin and chemical quality of each material type imported onto the Site.

Before approval of the FER and issuance of a Certificate of Completion, the daily or weekly reports and monthly BCP progress reports must be submitted in digital format (i.e., PDF).

8.1 CERTIFICATIONS

The following certification will appear in front of the FER Executive Summary. The certification will be signed by the RE, Scott Underhill, who is a NYS-licensed Professional Engineer. The certification will be appropriately signed and stamped.

The certification will include the following statements:

I, _____, certify that I am currently a NYS registered professional engineer, I had primary direct responsibility for the implementation of the subject remedial program, and I certify that the Remedial Work Plan was implemented and that all remediation activities were completed in substantial conformance with the DER-approved Remedial Work Plan.

If the Remedial Action Work Plan identifies time frames to be achieved by the remedial program, the certification will include: *The data submitted to DER demonstrates that the remediation requirements set forth in the Remedial Work and all applicable statutes and regulations have been or will be achieved in accordance with the time frames, if any, established in the work plan.*

9. Schedule

Mobilization for implementation of the RAWP is expected to take about one to two weeks. Once mobilization is complete, remediation of the Site will proceed. The remedy, which will be implemented in accordance with this RAWP, is anticipated to take about 10 to 12 weeks to complete. After completion of the remedy, a FER will be drafted and subsequently submitted to the NYSDEC for review and approval. A proposed project schedule is included in Appendix J.

References

1. Supplemental Remedial Investigation Report, 65 Eckford Street, Brooklyn, New York. Prepared by Haley & Aldrich of New York, prepared 65-73 Eckford Realty LLC, February 2022.
2. Interim Construction Completion Report, 65 Eckford Street, Brooklyn, New York. Prepared by Haley & Aldrich of New York, prepared 65-73 Eckford Realty LLC, February 2022.
3. Corrective Action Work Plan, 65 Eckford Street, Brooklyn, New York. Prepared by Haley & Aldrich of New York, prepared 65-73 Eckford Realty LLC, August 2021.
4. New York State Department of Environmental Conservation, Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (PFAS), dated June 2021.
5. United States Environmental Protection Agency, Low Flow Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells, EQASOP-GW 001, September 19, 2017.
6. Remedial Investigation Report, 65 Eckford Street, Brooklyn, New York, June 2016, Prepared by Environmental Business Consultants, Prepared for Z65 Realty LLC.
7. Phase I Environmental Site Assessment Screening, 65 Eckford Street, Brooklyn, New York, May 2015, Environmental Business Consultants.
8. Program Policy DER-10, "Technical Guidance for Site Investigation and Remediation," New York State Department of Environmental Conservation, May 2010.
9. New York State Department of Environmental Conservation, Part 375 Title 6 of the New York Compilation of Codes, Rules, and Regulations, Effective December 14, 2006.
10. New York State Division of Water Technical and Operational Guidance Series (TOGS) (1.1.1) dated June 1998.

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TABLES

Table 1. Alternative I Remedial Cost Estimate

Former Carter Spray Finishing Corp.

65 Eckford Street, Brooklyn, NY

NYSDEC BCP Site C224218

Consulting/Engineering Costs					
Task	Description	Unit	Unit Cost	Quantity	Total Cost
1	Waste Characterization and Lead Delineation	Lump Sum	\$ 80,000	1	\$ 80,000
2	Program Management (NYSDEC/NYSDOH Correspondence, Daily/Weekly/Monthly Reporting, etc.)	Month	\$ 15,000	10	\$ 150,000
3	Remedial Oversight	Month	\$ 30,000	3	\$ 90,000
4	Confirmation Sampling	Sample	\$ 1,000	15	\$ 15,000
5	Closure Reporting and COC Coordination	Lump Sum	\$ 60,000	1	\$ 60,000
Consulting/Engineering Subtotal					\$ 395,000
Contractor Costs					
Task					
1	Mobilization/Demobilization, Site Maintenance, Security, etc.	Allowance	\$ 200,000	1	\$ 200,000
2	Truck Wash Station	Month	\$ 25,000	6	\$ 150,000
3	Management/Handling Contaminated Material	Cubic Yard	\$ 40	7,600	\$ 304,000
4	Support of Excavation (Tiebacks)	Linear Foot	\$ 2,000	520	\$ 1,040,000
5	Transport and Disposal of Fill Material	Ton	\$ 75	11,000	\$ 825,000
6	Transport and Disposal of Hazardous Material (Lead)	Ton	\$ 275	2,000	\$ 550,000
7	DARAMEND® and application	Allowance	\$ 25,000	1	\$ 25,000
8	Dewatering System	Month	\$ 75,000	12	\$ 900,000
9	Underground Storage Tank Removal	Allowance	\$ 75,000	1	\$ 75,000
Contractor Subtotal					\$ 4,069,000
Total					\$ 4,464,000
15% Contingency					\$ 669,600
Estimated Total					\$ 5,133,600

Notes:

1. Assuming a conditional Track 1 Remedy
2. Assumes density of 1.7 tons per cubic yard of fill/soil
3. Assumes residual soil will meet Track 1 Unrestricted Use Soil Cleanup Objectives
4. Assumes full site dewatering
5. SOE Costs are based on a conventional soldier pile and timber lagging system with lateral bracing provided by either steel rakers or tiebacks.
6. Costs are estimated and subject to change. Costs do not include new building construction.
7. RAWP implementation is assumed to take 2-3 months.
8. This cost estimate was prepared to compare various remedial alternatives as was based on available information at the time of preparation. The estimate may be +/- 30-50% of the actual cost. This estimate was not prepared for financial or legal consulting purposes and was not intended for use regarding compliance with financial reporting requirements or liability services.
9. This estimate does not include legal fees associated with attorneys involved in the project, insurance fees or outside consulting fees.

Table 2. Alternative II Remedial Cost Estimate

Former Carter Spray Finishing Corp.

65 Eckford Street, Brooklyn, NY

NYSDEC BCP Site C224218

Consulting/Engineering Costs					
Task	Description	Unit	Unit Cost	Quantity	Total Cost
1	Waste Characterization and Lead Delineation	Lump Sum	\$ 80,000	1	\$ 80,000
2	Program Management (NYSDEC/NYSDOH Correspondence, Daily/Weekly/Monthly Reporting, etc.)	Month	\$ 15,000	10	\$ 150,000
3	Remedial Oversight	Month	\$ 30,000	3	\$ 90,000
4	Documentation Sampling	Sample	\$ 1,000	15	\$ 15,000
5	Closure Reporting and COC Coordination (including Site Management Plan)	Lump Sum	\$ 110,000	1	\$ 110,000
6	Site Management	Month	\$ 10,000	360	\$ 3,600,000
Consulting/Engineering Subtotal					\$ 4,045,000
Contractor Costs					
Task					
1	Mobilization/Demobilization, Site Maintenance, Security, etc.	Allowance	\$ 200,000	1	\$ 200,000
2	Truck Wash Station	Month	\$ 25,000	6	\$ 150,000
3	Management/Handling Contaminated Material	Cubic Yard	\$ 40	5,700	\$ 228,000
4	Support of Excavation	Linear Foot	\$ 1,500	520	\$ 780,000
5	Transport and Disposal of Fill Material	Ton	\$ 75	7,700	\$ 577,500
6	Transport and Disposal of Hazardous Material (Lead)	Ton	\$ 275	2,000	\$ 550,000
7	Dewatering System	Month	\$ 75,000	12	\$ 900,000
8	Underground Storage Tank Removal	Allowance	\$ 75,000	1	\$ 75,000
9	Composite Cover System	Allowance	\$ 150,000	1	\$ 150,000
Contractor Subtotal					\$ 3,610,500
Total					\$ 7,655,500
15% Contingency					\$ 1,148,325
Estimated Total					\$ 8,803,825

Notes:

1. Assuming a conditional Track 2 Remedy with site management
2. Assumes density of 1.7 tons per cubic yard of fill/soil
3. Assumes residual soil will meet Track 2 Restricted Residential Use Soil Cleanup Objectives
4. Assumes full dewatering
5. SOE Costs are based on a conventional soldier pile and timber lagging system with lateral bracing provided by either steel rakers or tiebacks.
6. Costs are estimated and subject to change. Costs do not include new building construction.
7. RAWP implementation is assumed to take 2-3 months.
8. This cost estimate was prepared to compare various remedial alternatives as was based on available information at the time of preparation. The estimate may be +/- 30-50% of the actual cost. This estimate was not prepared for financial or legal consulting purposes and was not intended for use regarding compliance with financial reporting requirements or liability services.
9. This estimate does not include legal fees associated with attorneys involved in the project, insurance fees or outside consulting fees.

Table 3. Track 1 Soil Cleanup Objectives
Former Carter Spray Finishing Corp. Site
65 Eckford Street, Brooklyn, NY
NYSDEC BCP Site C224218

PCBs/Pesticides (mg/kg)	
Delta-BHC	0.04
Lindane	0.1
Alpha-BHC	0.02
Beta-BHC	0.036
Heptachlor	0.042
Aldrin	0.005
Endrin	0.014
Dieldrin	0.005
4,4'-DDE	0.0033
4,4'-DDD	0.0033
4,4'-DDT	0.0033
Endosulfan I	2.4
Endosulfan II	2.4
Endosulfan sulfate	2.4
cis-Chlordane	0.094
PCBs, Total	0.1

Volatile Organic Compounds (mg/kg)	
Methylene chloride	0.05
1,1-Dichloroethane	0.27
Chloroform	0.37
Carbon tetrachloride	0.76
Tetrachloroethene	1.3
Chlorobenzene	1.1
1,2-Dichloroethane	0.02
1,1,1-Trichloroethane	0.68
Benzene	0.06
Toluene	0.7
Ethylbenzene	1
Vinyl chloride	0.02
1,1-Dichloroethene	0.33
trans-1,2-Dichloroethene	0.19
Trichloroethene	0.47
1,2-Dichlorobenzene	1.1
1,3-Dichlorobenzene	2.4
1,4-Dichlorobenzene	1.8
Methyl tert butyl ether	0.93
Xylenes, Total	0.26
cis-1,2-Dichloroethene	0.25
Acetone	0.05
2-Butanone	0.12
n-Butylbenzene	12
sec-Butylbenzene	11
tert-Butylbenzene	5.9
Naphthalene	12
n-Propylbenzene	3.9
1,3,5-Trimethylbenzene	8.4
1,2,4-Trimethylbenzene	3.6
1,4-Dioxane	0.1

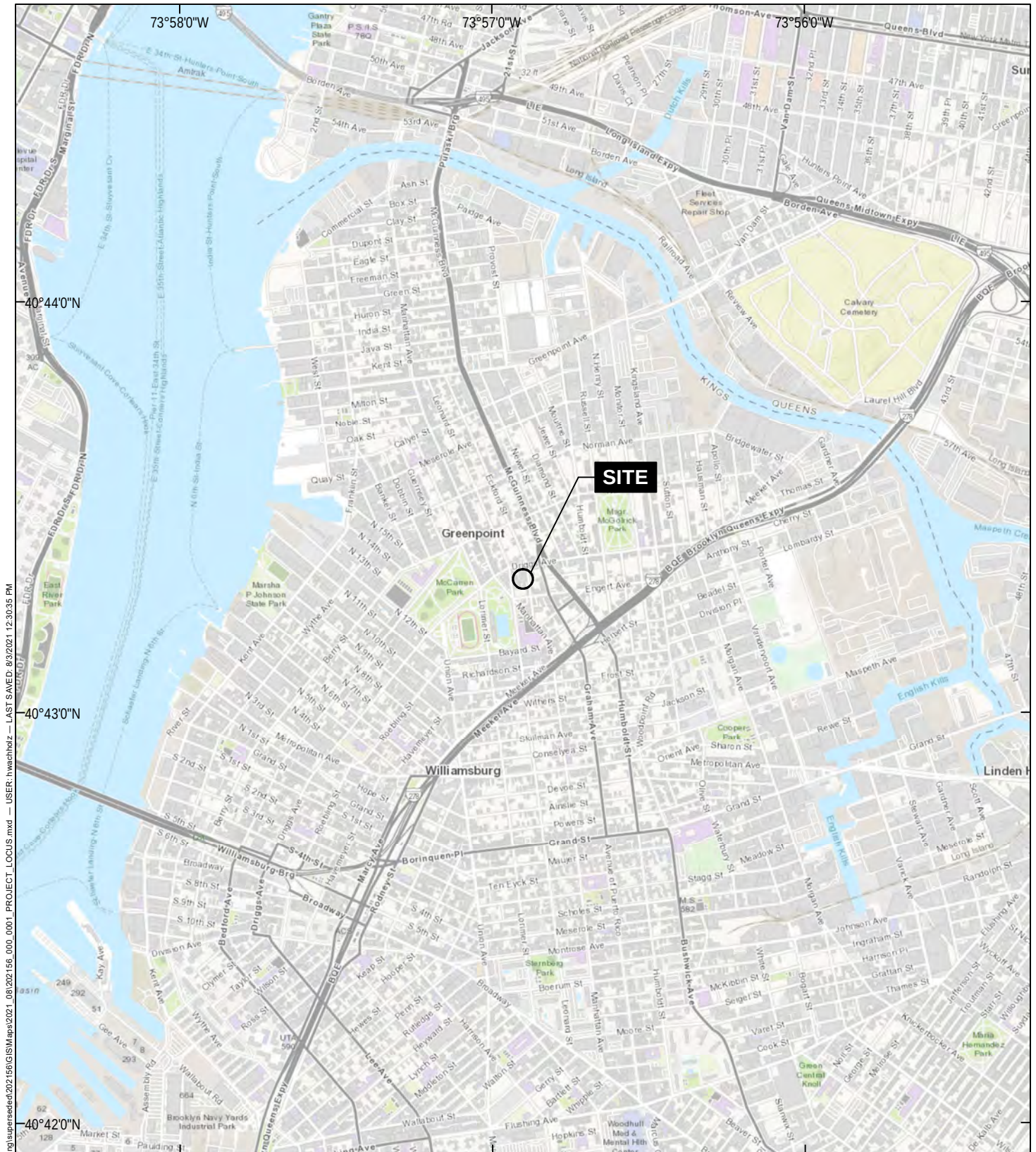
Semivolatile Organic Compounds (mg/kg)	
Acenaphthene	20
Hexachlorobenzene	0.33
1,2-Dichlorobenzene	1.1
1,3-Dichlorobenzene	2.4
1,4-Dichlorobenzene	1.8
Fluoranthene	100
Naphthalene	12
Benzo(a)anthracene	1
Benzo(a)pyrene	1
Benzo(b)fluoranthene	1
Benzo(k)fluoranthene	0.8
Chrysene	1
Acenaphthylene	100
Anthracene	100
Benzo(ghi)perylene	100
Fluorene	30
Phenanthrene	100
Dibenzo(a,h)anthracene	0.33
Indeno(1,2,3-cd)pyrene	0.5
Pyrene	100
Dibenzofuran	7
Pentachlorophenol	0.8
Phenol	0.33
2-Methylphenol	0.33
3-Methylphenol/4-Methylph	0.33
1,4-Dioxane	0.1

Metals (mg/kg)	
Arsenic, Total	13
Barium, Total	350
Beryllium, Total	7.2
Cadmium, Total	2.5
Copper, Total	50
Lead, Total	63
Manganese, Total	1600
Mercury, Total	0.18
Nickel, Total	30
Selenium, Total	3.9
Silver, Total	2
Zinc, Total	109

Notes:

1. Criteria are 6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives
2. mg/kg: milligram per kilogram

FIGURES



GIS FILE PATH: C:\Users\hwachob\Documents\working\superseded\202156\GIS\Maps\2021_08\202156_000_0001_PROJECT_LOCUS.mxd — LAST SAVED: 8/3/2021 12:30:35 PM — USER: hwachob



MAP SOURCE: ESRI
SITE COORDINATES: 40°43'19"N, 73°56'54"W

**HALEY
ALDRICH**

65 ECKFORD STREET
BROOKLYN, NEW YORK

PROJECT LOCUS

APPROXIMATE SCALE: 1 IN = 2000 FT
AUGUST 2021

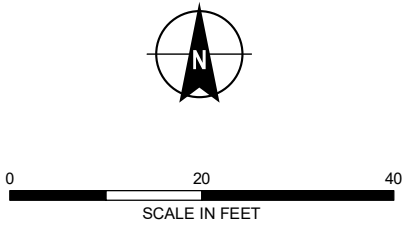
FIGURE 1

GIS FILE PATH: C:\Users\hwachholz\Documents\working\pers\eded\202156\GIS\Maps\2021_08\202156_000_0002_SITE_PLAN.mxd — USER: hwachholz — LAST SAVED: 8/5/2021 1:00:46 PM



LEGEND
 SITE BOUNDARY

NOTES
1. ALL LOCATIONS ARE APPROXIMATE.
2. AERIAL IMAGERY SOURCE: NEARMAP, 12 MARCH 2021



**HALEY
ALDRICH**

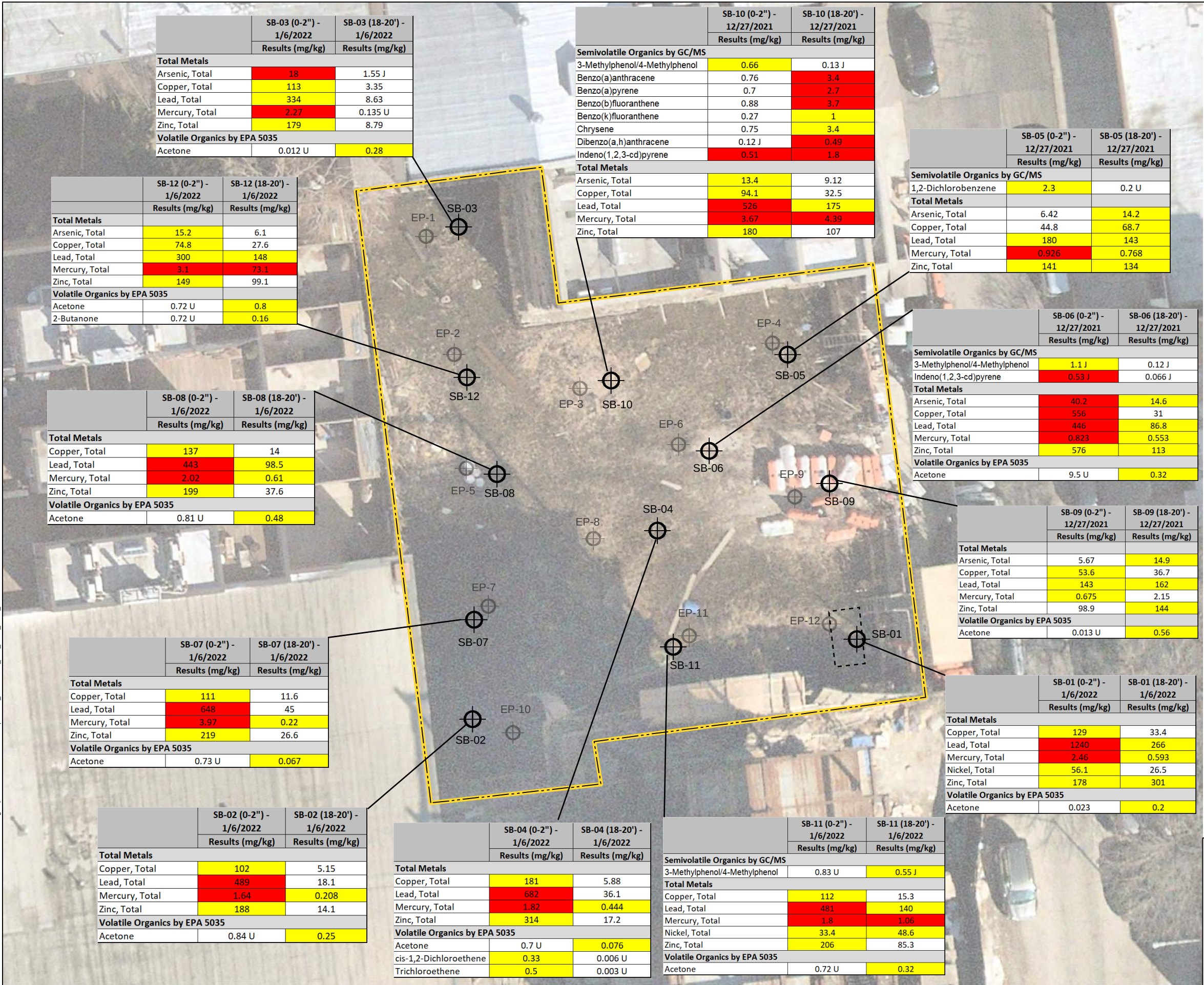
65 ECKFORD STREET
BROOKLYN, NEW YORK

SITE PLAN

AUGUST 2021

FIGURE 2

GIS FILE PATH: C:\Users\hwatholz\Documents\working\superseded\2021\56\GIS\Maps\2021_08\202156_000_0002_SITE_PLAN.mxd — LAST SAVED: 8/3/2021 1:00:46 PM



LEGEND

SITE BOUNDARY

SOIL BORING LOCATION

PROPOSED ENDPOINT SAMPLE LOCATION FROM THE CORRECTIVE ACTION WORK PLAN

APPROXIMATE LOCATION OF 550-GALLON UST REMOVED IN JUNE 2018

	NY-RESRR	NY-UNRES	Units
Semivolatile Organics by GC/MS			
3-Methylphenol/4-Methylphenol	100	0.33	mg/kg
Benzo(a)anthracene	1	1	mg/kg
Benzo(a)pyrene	1	1	mg/kg
Benzo(b)fluoranthene	1	1	mg/kg
Benzo(k)fluoranthene	3.9	0.8	mg/kg
Chrysene	3.9	1	mg/kg
Dibenzo(a,h)anthracene	0.33	0.33	mg/kg
Indeno(1,2,3-cd)pyrene	0.5	0.5	mg/kg
1,2-Dichlorobenzene	100	1.1	mg/kg
Total Metals			
Arsenic, Total	16	13	mg/kg
Copper, Total	270	50	mg/kg
Lead, Total	400	63	mg/kg
Mercury, Total	0.81	0.18	mg/kg
Nickel, Total	310	30	mg/kg
Zinc, Total	10000	109	mg/kg
Volatile Organics by EPA 5035			
Acetone	100	0.05	mg/kg
2-Butanone	100	0.12	mg/kg
cis-1,2-Dichloroethene	100	0.25	mg/kg
Trichloroethene	21	0.47	mg/kg

NY-RESRR: New York NYCRR Part 375 Restricted-Residential Criteria, New York Restricted use Criteria per 6 NYCRR Part 375 Environmental Remediation Programs, effective December 14, 2006.

NY-UNRES: New York NYCRR Part 375 Unrestricted Criteria, Criteria per 6 NYCRR Part 375 Environmental Remediation Programs, effective December 14, 2006.

NOTES

- ALL LOCATIONS ARE APPROXIMATE AND BASED ON FIELD MEASUREMENTS.
- AERIAL IMAGERY SOURCE: NEARMAP, 12 MARCH 2021



0 20 40
SCALE IN FEET

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65 ECKFORD STREET
BROOKLYN, NEW YORK

SOIL RESULTS EXCEEDANCE MAP

JANUARY 2022

FIGURE 3

GIS FILE PATH: C:\Users\hwachholz\Documents\working\pers\pers\2021\56\GIS\Maps\2021_08\202156_000_0002_SITE_PLAN.mxd — USER: hwachholz — LAST SAVED: 8/5/2021 1:00:46 PM

MW-03 - 1/14/2022	Results (µg/L)
Semivolatile Organics by GC/MS - SIM	
Benzo(a)anthracene	0.02
Benzo(a)pyrene	0.02
Benzo(b)fluoranthene	0.03
Benzo(k)fluoranthene	0.02
Chrysene	0.02
Indeno(1,2,3-cd)pyrene	0.05
Total Metals	
Iron, Total	16900
Manganese, Total	306.2
Sodium, Total	94000
Volatile Organics by GC/MS	
1,2,4,5-Tetramethylbenzene	24
Isopropylbenzene	10
n-Propylbenzene	5.8
sec-Butylbenzene	27
tert-Butylbenzene	8.4

MW-02 - 1/14/2022	Results (µg/L)
Semivolatile Organics by GC/MS - SIM	
Chrysene	0.01
Total Metals	
Iron, Total	4110
Sodium, Total	45200
Volatile Organics by GC/MS	
1,2,4,5-Tetramethylbenzene	41
1,2,4-Trimethylbenzene	31
Isopropylbenzene	40
n-Butylbenzene	14
n-Propylbenzene	50
sec-Butylbenzene	36
tert-Butylbenzene	10

MW-05 - 1/14/2022	Results (µg/L)
Semivolatile Organics by GC/MS - SIM	
Benzo(a)anthracene	0.07
Benzo(a)pyrene	0.04
Benzo(b)fluoranthene	0.06
Benzo(k)fluoranthene	0.02
Chrysene	0.05
Total Metals	
Iron, Total	21200
Manganese, Total	920.7
Sodium, Total	69100
Volatile Organics by GC/MS	
Benzene	1
cis-1,2-dichloroethene	69
p/m-Xylene	10
Trichloroethene	27
Vinyl Chloride	51

MW-04 - 1/14/2022	Results (µg/L)
Semivolatile Organics by GC/MS - SIM	
Chrysene	0.05
Semivolatile Organics by GC/MS	
Bis(2-ethylhexyl)phthalate	5.4
Total Metals	
Arsenic, Total	79.9
Iron, Total	8660
Sodium, Total	86000
Volatile Organics by GC/MS	
1,2,4,5-Tetramethylbenzene	15
sec-Butylbenzene	11
tert-Butylbenzene	7.7

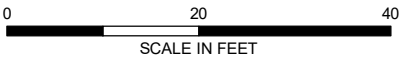
MW-01 - 1/14/2022	Results (µg/L)
Total Metals	
Iron, Total	5330
Manganese, Total	522.1
Sodium, Total	77300

LEGEND

- SITE BOUNDARY
- PERMANENT MONITORING WELL LOCATION
- PROPOSED ENDPOINT SAMPLE LOCATION FROM THE CORRECTIVE ACTION WORK PLAN
- APPROXIMATE LOCATION OF 550-GALLON UST REMOVED IN JUNE 2018

Ambient Water Quality (New York State Groundwater Effluent Limitations for Class GA Groundwater)		
Analytes	Value	Unit
Bis(2-ethylhexyl)phthalate	5	µg/L
Benzo(a)anthracene	0.002	µg/L
Benzo(a)pyrene	0.0	µg/L
Benzo(b)fluoranthene	0.002	µg/L
Benzo(k)fluoranthene	0.002	µg/L
Chrysene	0.002	µg/L
Indeno(1,2,3-cd)pyrene	0.002	µg/L
Arsenic, Total	25	µg/L
Iron, Total	300	µg/L
Manganese, Total	300	µg/L
Sodium, Total	20000	µg/L
1,2,4,5-Tetramethylbenzene	5	µg/L
1,2,4-Trimethylbenzene	5	µg/L
Benzene	1	µg/L
Isopropylbenzene	5	µg/L
n-Butylbenzene	5	µg/L
n-Propylbenzene	5	µg/L
sec-Butylbenzene	5	µg/L
tert-Butylbenzene	5	µg/L
p/m-Xylene	5	µg/L
cis-1,2-dichloroethene	5	µg/L
Trichloroethene	5	µg/L
Vinyl chloride	2	µg/L

- NOTES
1. ALL LOCATIONS ARE APPROXIMATE AND BASED OFF FIELD MEASUREMENTS.
2. AERIAL IMAGERY SOURCE: NEARMAP, 12 MARCH 2021
3. GROUNDWATER ANALYTICAL RESULTS COMPARED TO NYSDEC TECHNICAL AND OPERATIONAL GUIDANCE SERIES (TOGS) 1.1.1 AMBIENT WATER QUALITY STANDARDS AND GUIDANCE VALUES FOR CLASS A DRINKING WATER.
4. RESULTS SHOWN IN MICROGRAMS PER LITER (µg/L)
5. RESULTS IN EXCEEDANCE OF NYSDEC TOGS AWQS ARE HIGHLIGHTED



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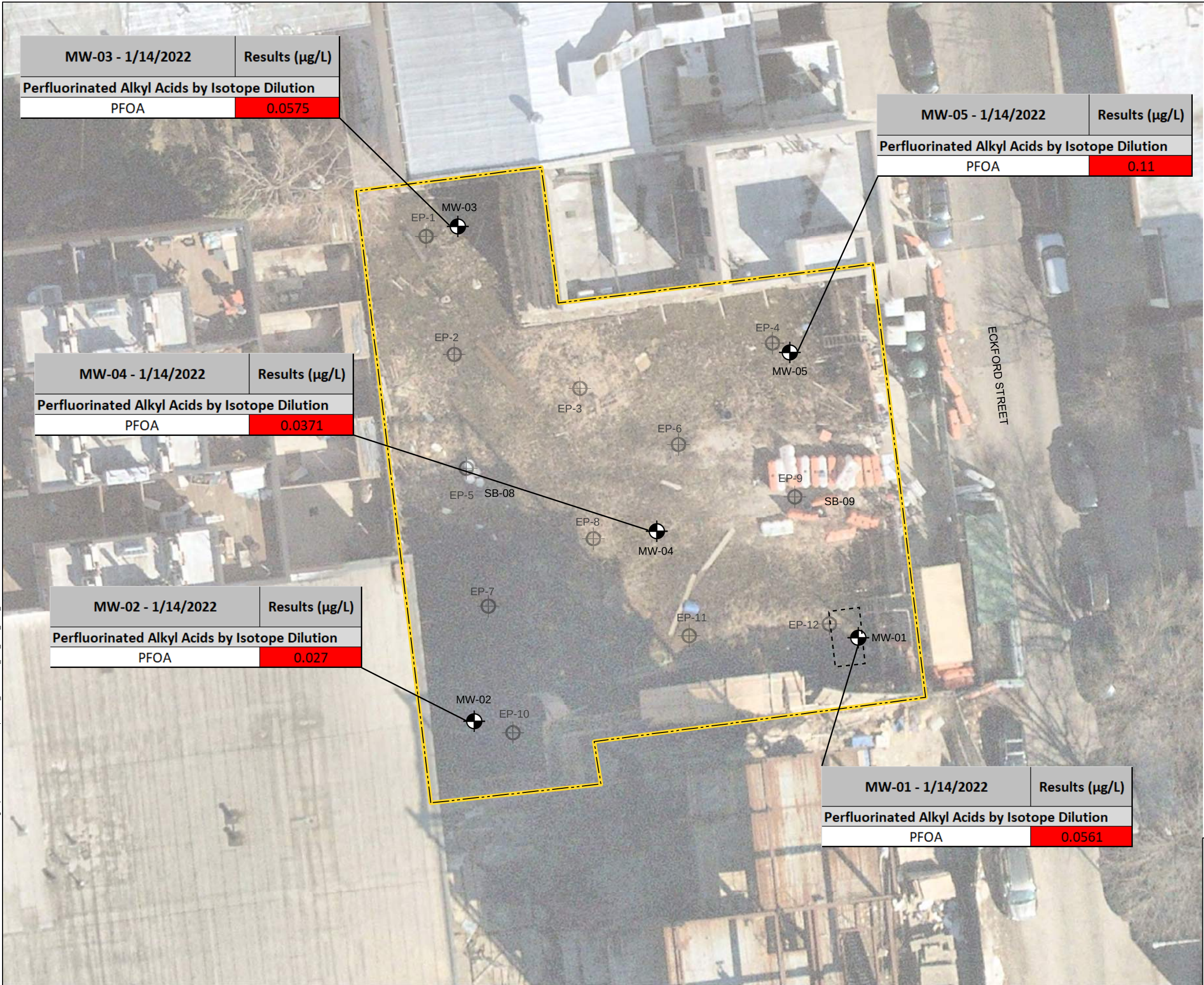
65 ECKFORD STREET
BROOKLYN, NEW YORK

GROUNDWATER RESULTS
EXCEEDANCE MAP

JANUARY 2022

FIGURE 4

GIS FILE PATH: C:\Users\hwacholz\Documents\working\pers\2021\08\202156_000_0002_SITE_PLAN.mxd — USER: hwacholz — LAST SAVED: 8/2/2021 1:00:46 PM



LEGEND

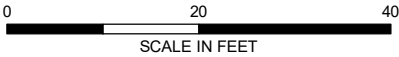
- SITE BOUNDARY
- PERMANENT MONITORING WELL LOCATION
- PROPOSED ENDPOINT SAMPLE LOCATION FROM THE CORRECTIVE ACTION WORK PLAN
- APPROXIMATE LOCATION OF 550-GALLON UST REMOVED IN JUNE 2018

Ambient Water Quality (New York State Groundwater Effluent Limitations for Class GA Groundwater)

Analytes	Value	Unit
Perfluorooctanoic Acid (PFOA)	0.01	µg/L

NOTES

- ALL LOCATIONS ARE APPROXIMATE AND BASED ON FIELD MEASUREMENTS.
- AERIAL IMAGERY SOURCE: NEARMAP, 12 MARCH 2021
- GROUNDWATER ANALYTICAL RESULTS COMPARED TO NYSDEC TECHNICAL AND OPERATIONAL GUIDANCE SERIES (TOGS) 1.1.1 AMBIENT WATER QUALITY STANDARDS AND GUIDANCE VALUES FOR CLASS A DRINKING WATER.
- RESULTS SHOWN IN MICROGRAMS PER LITER (µg/L)
- RESULTS IN EXCEEDANCE OF NYSDEC TOGS AWQS ARE HIGHLIGHTED



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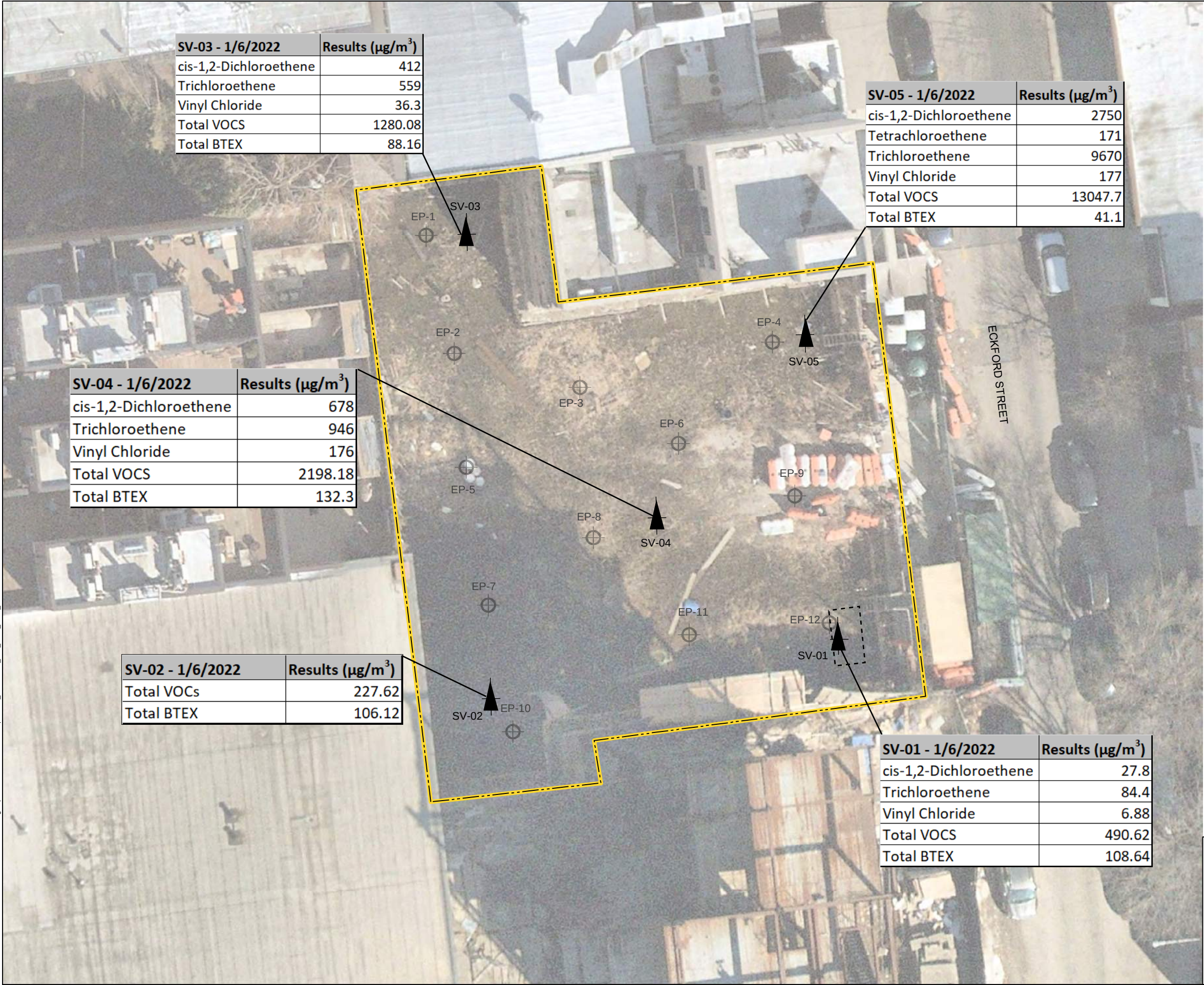
65 ECKFORD STREET
BROOKLYN, NEW YORK

EMERGING CONTAMINANTS
IN GROUNDWATER RESULTS
EXCEEDANCE MAP

JANUARY 2022

FIGURE 5

GIS FILE PATH: C:\Users\hwachholz\Documents\working\pers\ded\2021\56\GIS\Maps\2021_08\202156_000_0002_SITE_PLAN.mxd — USER: hwachholz — LAST SAVED: 8/5/2021 1:00:46 PM



SV-03 - 1/6/2022	Results (µg/m ³)
cis-1,2-Dichloroethene	412
Trichloroethene	559
Vinyl Chloride	36.3
Total VOCs	1280.08
Total BTEX	88.16

SV-05 - 1/6/2022	Results (µg/m ³)
cis-1,2-Dichloroethene	2750
Tetrachloroethene	171
Trichloroethene	9670
Vinyl Chloride	177
Total VOCs	13047.7
Total BTEX	41.1

SV-04 - 1/6/2022	Results (µg/m ³)
cis-1,2-Dichloroethene	678
Trichloroethene	946
Vinyl Chloride	176
Total VOCs	2198.18
Total BTEX	132.3

SV-02 - 1/6/2022	Results (µg/m ³)
Total VOCs	227.62
Total BTEX	106.12

SV-01 - 1/6/2022	Results (µg/m ³)
cis-1,2-Dichloroethene	27.8
Trichloroethene	84.4
Vinyl Chloride	6.88
Total VOCs	490.62
Total BTEX	108.64

LEGEND

SITE BOUNDARY

SOIL VAPOR POINT LOCATION

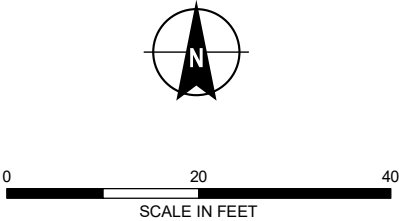
PROPOSED ENDPOINT SAMPLE LOCATION FROM THE CORRECTIVE ACTION WORK PLAN

APPROXIMATE LOCATION OF 550-GALLON UST REMOVED IN JUNE 2018

NOTES

1. ALL LOCATIONS ARE APPROXIMATE AND BASED ON FIELD MEASUREMENTS.

2. AERIAL IMAGERY SOURCE: NEARMAP, 12 MARCH 2021



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65 ECKFORD STREET
BROOKLYN, NEW YORK

SOIL VAPOR RESULTS MAP

JANUARY 2022

FIGURE 6

GIS FILE PATH: C:\Users\hwachholz\Documents\working\jpl\pers\ded\202156\GIS\Maps\2021_08\202156_000_0002_SITE_PLAN.mxd — USER: hwachholz — LAST SAVED: 8/5/2021 1:00:46 PM

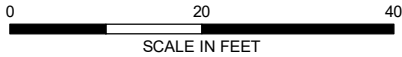


LEGEND

-  SITE BOUNDARY
-  JANUARY 2022 SRI GROUNDWATER MONITORING WELL
-  (6.80) GROUNDWATER ELEVATION (NAVD 88)

NOTES

1. ALL LOCATIONS ARE APPROXIMATE AND BASED OFF FIELD MEASUREMENTS.
2. AERIAL IMAGERY SOURCE: NEARMAP, 12 MARCH 2021
3. GROUNDWATER ELEVATIONS BASED ON MONITORING WELL SURVEY PERFORMED BY C.O.C. MAPPING CORPORATION ON 4 FEBRUARY 2022.



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65 ECKFORD STREET
BROOKLYN, NEW YORK

GROUNDWATER
ELEVATION MAP

MARCH 2022

FIGURE 7

GIS FILE PATH: \\haleyaldrich.com\share\CF\Projects\0202156\GIS\Maps\2022_03\202156_000_0008_ALTERNATIVE_1_EXCAVATION_PLAN.mxd — USER: hwacholz — LAST SAVED: 3/11/2022 4:55:56 PM

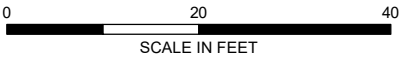


LEGEND

-  ALTERNATIVE 1/ TRACK 1 REMEDIAL EXCAVATION TO 25 FT BGS
-  SITE BOUNDARY
-  PROPOSED DEEPER EXCAVATION AND IN SITU CHEMICAL REDUCTION (ISCR) TREATMENT AREA
-  PROPOSED POST REMEDIATION MONITORING WELL LOCATION

NOTES

1. ALL LOCATIONS ARE APPROXIMATE.
2. BASEMAP REFERENCED FROM NEW RESIDENTIAL BUILDING 65 ECKFORD STREET, BROOKLYN, N.Y., PREPARED BY S. WIEDER ARCHITECT PC, DATED 2.21.2022
3. FT BGS = FEET BELOW GROUND SURFACE
4. AERIAL IMAGERY SOURCE: NEARMAP, 12 MARCH 2021



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65 ECKFORD STREET
BROOKLYN, NEW YORK

ALTERNATIVE I EXCAVATION PLAN

MARCH 2022

GIS FILE PATH: \\haleyaldrich.com\share\CF\Projects\0202156\GIS\Maps\2022_03\202156_000_009_ALTERNATIVE_2_EXCAVATION_PLAN.mxd — USER: hwacholz — LAST SAVED: 3/11/2022 5:41:33 PM



LEGEND

-  FEBRUARY 2022 SRI SOIL BORING LOCATION
-  ALTERNATIVE II/ TRACK 2 REMEDIAL EXCAVATION TO 25 FT BGS (10X10 FT AREA CENTERED ON SRI BORINGS SB-10, SB-11, AND SB-12)
-  ALTERNATIVE II/ TRACK 2 REMEDIAL EXCAVATION TO 20 FT BGS
-  SITE BOUNDARY
-  PROPOSED POST REMEDIATION MONITORING WELL LOCATION

NOTES

1. ALL LOCATIONS ARE APPROXIMATE.
2. BASEMAP REFERENCED FROM NEW RESIDENTIAL BUILDING 65 ECKFORD STREET, BROOKLYN, N.Y., PREPARED BY S. WIEDER ARCHITECT PC, DATED 2.21.2022
3. FT BGS = FEET BELOW GROUND SURFACE
4. AERIAL IMAGERY SOURCE: NEARMAP, 12 MARCH 2021



0 20 40
SCALE IN FEET

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65 ECKFORD STREET
BROOKLYN, NEW YORK

ALTERNATIVE II EXCAVATION PLAN

MARCH 2022

FIGURE 9

GIS FILE PATH: \\haleyaldrich.com\share\CFR\Projects\0202156\GIS\Maps\2022_03\202156_000_0010_DEVELOPMENT_EXCAVATION_PLAN.mxd — USER: hwachholz — LAST SAVED: 3/11/2022 6:05:26 PM



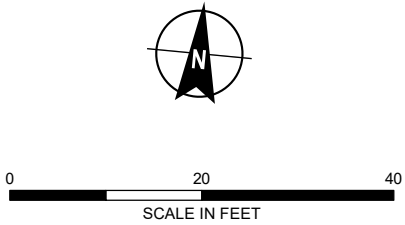
LEGEND

29 FT EXCAVATION FOR ELEVATOR PIT INSTALLATION

SITE-WIDE EXCAVATION TO 25 FEET BELOW GROUND SURFACE

SITE BOUNDARY

- NOTES**
1. ALL LOCATIONS ARE APPROXIMATE.
 2. BASEMAP REFERENCED FROM NEW RESIDENTIAL BUILDING 65 ECKFORD STREET, BROOKLYN, N.Y., PREPARED BY S. WIEDER ARCHITECT PC, DATED 2.21.2022
 3. AERIAL IMAGERY SOURCE: NEARMAP, 12 MARCH 2021



65 ECKFORD STREET
BROOKLYN, NEW YORK

DEVELOPMENT EXCAVATION PLAN

MARCH 2022

FIGURE 10

GIS FILE PATH: \\haleyaldrich.com\share\CFR\Projects\0202156\GIS\Maps\2022_03\202156_000_0011_ENDPOINT_SAMPLE_LOCATION_MAP.mxd — USER: hwachholz — LAST SAVED: 3/11/2022 4:37:20 PM

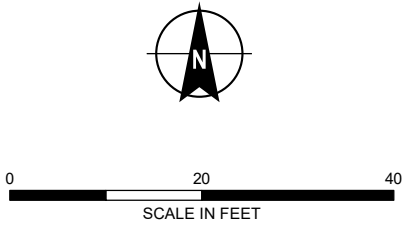


LEGEND

⊕ PROPOSED SOIL ENDPOINT SAMPLE LOCATION

▭ SITE BOUNDARY

- NOTES**
- 1. ALL LOCATIONS ARE APPROXIMATE.
 - 2. AERIAL IMAGERY SOURCE: NEARMAP, 12 MARCH 2021



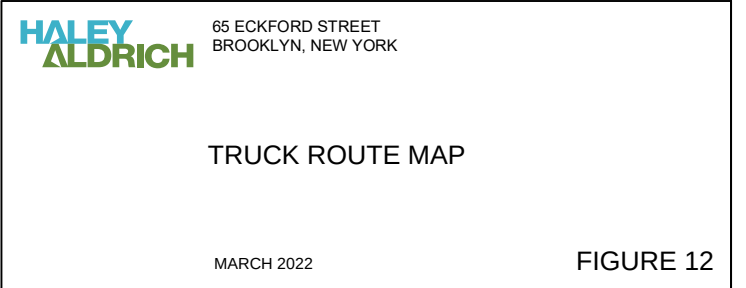
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65 ECKFORD STREET
BROOKLYN, NEW YORK

ENDPOINT SAMPLE LOCATION PLAN

MARCH 2022

FIGURE 11



APPENDIX A

Survey Map



TOP OF PIPE
ELEV. 9.46

TOP OF PIPE
ELEV. 11.44

TAX BLOCK 2698
TAX LOT 26

ELEVATION OF GRADE = 9.50

TOP OF PIPE
ELEV. 11.52

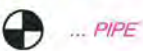
TOP OF PIPE
ELEV. 11.75

TOP OF PIPE
ELEV. 11.45

TOP OF SIDEWALK EL=15.60

ECKFORD STREET

LEGEND



SURVEY No:- COC2022063

DESCRIPTION:- LOCATION OF TOP OF PIPE EL.



C.O.C MAPPING CORP.
COORDINATES OF CONSTRUCTION

91-22 215th PLACE
QUEENS VILLAGE, N.Y. 11428
TELEPHONE (347)239-9844
EMAIL:- COCMAPPING@GMAIL.COM

DRAFTED:-C.J

CHECKED:- SK

DATE:- FEBRUARY 4, 2022



- NOTES:
- 1. THERE ARE NO VISIBLE STREAMS NOR NATURAL WATER COURSES IN THE PROPERTY EXCEPT AS SHOWN ON THIS SURVEY.
 - 2. PROPERTY CORNER MONUMENTS WERE NOT PLACED AS PART OF THIS SURVEY.
 - 3. IT IS A VIOLATION OF THE STATE EDUCATION LAW FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED LAND SURVEYOR TO ALTER AN ITEM IN ANY WAY.
 - 4. ARCHITECTS MUST ORDER A TOPOGRAPHICAL MAP SPECIFYING THEIR EXACT NEEDS.
 - 5. CONSULT WITH THE HIGHWAY DEPARTMENT BEFORE DESIGNING, INSTALLING, OR MODIFYING ANY NEW OR EXISTING CURBS, WALKS, OR ROADWAYS IN THE STREETS SHOWN HEREON.
 - 6. SUBSURFACE INFORMATION SHOWN HEREON WAS OBTAINED FROM VARIOUS CITY DEPARTMENTS AND/OR PRIVATE UTILITY COMPANIES. THE SURVEYOR ACCEPTS NO RESPONSIBILITY FOR ANY OF THIS DATA.
 - 7. EASEMENTS OF RECORD ARE ONLY GUARANTEED IF AN ABSTRACT OF TITLE IS FURNISHED TO THE SURVEYOR.
 - 8. ALL ELEVATIONS SHOWN REFER TO THE 1988 NAVD.

APPENDIX B

Proposed Development Plans

65 ECKFORD STREET

BROOKLYN NY 11222

PROPOSED 5 STORY RESIDENTIAL NEW BUILDING

24 DWELLING UNITS



SHEET LIST					
	SHEET NUMBER	DOB REV. NUMBER	SHEET NAME	REVISION DATE	ISSUE
T-100					
1	T-100	0	TITLESHEET	11/19/2021	DOB FILING
Z-100					
2	Z-100	0	ZONING ANALYSIS	11/19/2021	DOB FILING
3	Z-101	0	ZONING SITE PLAN	11/19/2021	DOB FILING
4	Z-102	0	ZONING MAPS & SURVEY	11/19/2021	DOB FILING
5	Z-103	0	ZONING GROSS AREA PLANS	11/19/2021	DOB FILING
6	Z-104	0	ZONING GROSS AREA PLANS	11/19/2021	DOB FILING
7	Z-105	0	ZONING FLOOR AREA DEDUCTIONS	11/19/2021	DOB FILING
8	Z-106	0	ZONING FLOOR AREA DEDUCTIONS	11/19/2021	DOB FILING
9	Z-107	0	SITE IMAGES	11/19/2021	DOB FILING
A-000					
10	G-100	0	GENERAL NOTES	11/19/2021	DOB FILING
11	G-101	0	GENERAL NOTES	11/19/2021	DOB FILING
12	G-102	0	GENERAL NOTES	11/19/2021	DOB FILING
13	G-103	0	GENERAL NOTES	11/19/2021	DOB FILING
14	G-104	0	GENERAL NOTES	11/19/2021	DOB FILING
15	G-105	0	BUILDING CODE ANALYSIS	11/19/2021	DOB FILING
16	G-200	0	LIFE SAFETY PLANS	11/19/2021	DOB FILING
17	G-201	0	LIFE SAFETY PLANS	11/19/2021	DOB FILING
18	G-202	0	LIFE SAFETY PLANS	11/19/2021	DOB FILING
19	G-203	0	LIFE SAFETY PLANS	11/19/2021	DOB FILING
20	G-204	0	LIFE SAFETY PLANS	11/19/2021	DOB FILING
21	G-300	0	UNIT AREA PLANS	11/19/2021	DOB FILING
22	G-301	0	UNIT AREA PLANS	11/19/2021	DOB FILING
A-100					
23	A-100	0	SUBCELLAR FLOOR PLAN	11/19/2021	DOB FILING
24	A-101	0	CELLAR PLAN	11/19/2021	DOB FILING
25	A-102	0	1ST FLOOR PLAN	11/19/2021	DOB FILING
26	A-103	0	2ND FLOOR PLAN	11/19/2021	DOB FILING
27	A-104	0	3RD-4TH TYPICAL FLOOR PLAN	11/19/2021	DOB FILING
28	A-105	0	5TH FLOOR PLAN	11/19/2021	DOB FILING
29	A-106	0	ROOF PLAN	11/19/2021	DOB FILING
30	A-107	0	BULKHEAD PLAN	11/19/2021	DOB FILING
31	A-108	0	3D FLOOR PLAN VIEWS	11/19/2021	DOB FILING

SHEET LIST					
	SHEET NUMBER	DOB REV. NUMBER	SHEET NAME	REVISION DATE	ISSUE
A-200					
32	A-200	0	EAST (ECKFORD STREET) ELEVATION	11/19/2021	DOB FILING
33	A-201	0	NORTH ELEVATION	11/19/2021	DOB FILING
34	A-202	0	WEST ELEVATION	11/19/2021	DOB FILING
35	A-203	0	SOUTH ELEVATION	11/19/2021	DOB FILING
36	A-210	0	3D VIEWS	11/19/2021	DOB FILING
A-300					
37	A-300	0	BUILDING SECTIONS	11/19/2021	DOB FILING
38	A-301	0	BUILDING SECTIONS	11/19/2021	DOB FILING
39	A-302	0	BUILDING SECTIONS	11/19/2021	DOB FILING
40	A-303	0	BUILDING SECTIONS	11/19/2021	DOB FILING
41	A-310	0	WALL SECTION 1	11/19/2021	DOB FILING
42	A-311	0	WALL SECTION 1	11/19/2021	DOB FILING
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49	A-402	0	PARTITION DETAILS	11/19/2021	DOB FILING
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51	A-404	0	DETAILS	11/19/2021	DOB FILING
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53	A-411	0	STAIR PLANS	11/19/2021	DOB FILING
54	A-412	0	STAIR PLANS	11/19/2021	DOB FILING
55	A-413	0	STAIR PLANS	11/19/2021	DOB FILING
56	A-414	0	BUILDING SECTIONS - PARKING RAMP	11/19/2021	DOB FILING
57	A-415	0	STAIR DETAILS	11/19/2021	DOB FILING
58	A-416	0	RAILING & LADDER DETAILS	11/19/2021	DOB FILING
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64	A-502	0	REFLECTED CEILING PLANS	11/19/2021	DOB FILING
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66	A-504	0	REFLECTED CEILING PLANS	11/19/2021	DOB FILING
A-600					
67	A-600	0	DOOR SCHEDULE	11/19/2021	DOB FILING
68	A-601	0	DOOR DETAILS	11/19/2021	DOB FILING
69	A-602	0	WINDOW SCHEDULE	11/19/2021	DOB FILING
A-700					
70	A-700	0	ENLARGED KITTE & LAUNDRY PLANS	11/19/2021	DOB FILING
71	A-701	0	ENLARGED BATH PLANS	11/19/2021	DOB FILING
A-800					
72	A-800	0	MAILBOX ELEVATIONS & ENLARGED BIKE ROOM	11/19/2021	DOB FILING
73	A-801	0	SIGNAGE	11/19/2021	DOB FILING
EN-100					
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75	EN-101	0	ENERGY ANALYSIS	11/19/2021	DOB FILING
76	EN-102	0	ENERGY AREA DIAGRAMS	11/19/2021	DOB FILING
77	EN-103	0	ENERGY AREA DIAGRAMS	11/19/2021	DOB FILING
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TOTAL: 82					



RELATED APPLICATIONS

#	WORK TYPE	APPLICATION #	DOCUMENT #	
1	FN FENCE	320625016	01	TO BE FILED UNDER SEPARATE APPLICATION
2	FO FOUNDATION	320625016	02	FILED UNDER SEPARATE APPLICATION
3	ST STRUCTURAL	320625016	03	FILED UNDER SEPARATE APPLICATION
4	SHED	320625016	04	TO BE FILED UNDER SEPARATE APPLICATION
5	SOE SUPPORT OF EXCAVATION	320625016	05	
6	MH MECHANICAL	320625016	06	UNDER SUBSEQUENT APPLICATION
7	PL PLUMBING	320625016	06	UNDER SUBSEQUENT APPLICATION
8	SP SPRINKLER	320625016	08	FILED UNDER SUBSEQUENT APPLICATION
9	DM DEMOLITION	321142278	01	TO BE FILED UNDER SEPARATE APPLICATION
10	CC CURB CUT		01	TO BE FILED UNDER SEPARATE APPLICATION
11	SITE CONNECTION		-	TO BE FILED UNDER SEPARATE APPLICATION
12	ELEVATOR		01	TO BE FILED UNDER SEPARATE APPLICATION
13	FA FIRE ALARM		01	FILED UNDER SEPARATE APPLICATION
14	ZONING EXHIBIT RECORD		-	
15	BPP BUILDERS PAVEMENT PLAN		01	TO BE FILED UNDER SEPARATE APPLICATION
16	STREET TREE		-	TO BE FILED UNDER SEPARATE APPLICATION
17	STANDPIPE	320625016	08	TO BE FILED UNDER SEPARATE APPLICATION



203 CLIFTON PLACE, SUITE #20
BROOKLYN NY, 11216
T: (718) 484-3201

STRUCTURAL ENGINEER:
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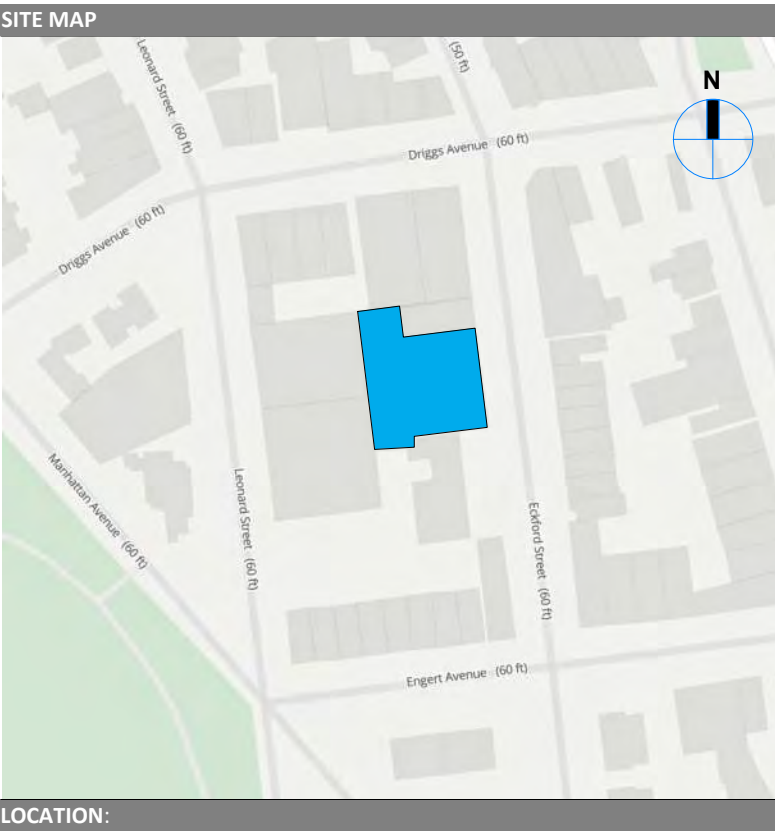
MEP ENGINEER:
...

MUNICIPAL CONSULTANT:
...

OWNER:
...

NO.	DESCRIPTION	DATE
0	DOB FILING	11/19/2021

75% CONSTRUCTION DRAWINGS



65 ECKFORD STREET
BROOKLYN, NEW YORK 11222

PROPOSED 5 STORY RESIDENTIAL NEW BUILDING

TITLESHEET

DOB # :
320625016
DOB BSCAN + STAMP :

DATE: 2/21/2022 3:17:37 PM
SCALE:
DRAWN BY: XX

T-100.00

SHEET: 1 OF 82
COPYRIGHT 2022 S. WIEDER ARCHITECT PC



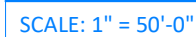
Effective & Preliminary Flood Hazards



Effective	
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Effective FIRM Panel	3604970202F
Effective Date	9/5/2007
Flood Zone	X
Static BFE*	Not Available
Flood Depth	Not Available
Vertical Datum	Not Available



Preliminary	
POI Longitude/Latitude	-73.9482, 40.7221
Preliminary FIRM Panel	3604970202G
Preliminary Issue Date	1/30/2015
Flood Zone	X
Estimated Static BFE*	Not Available
Estimated Flood Depth	Not Available
Vertical Datum	Not Available



203 CLIFTON PLACE, SUITE #20
BROOKLYN NY, 11216
T: (718) 484-3201

STRUCTURAL ENGINEER:

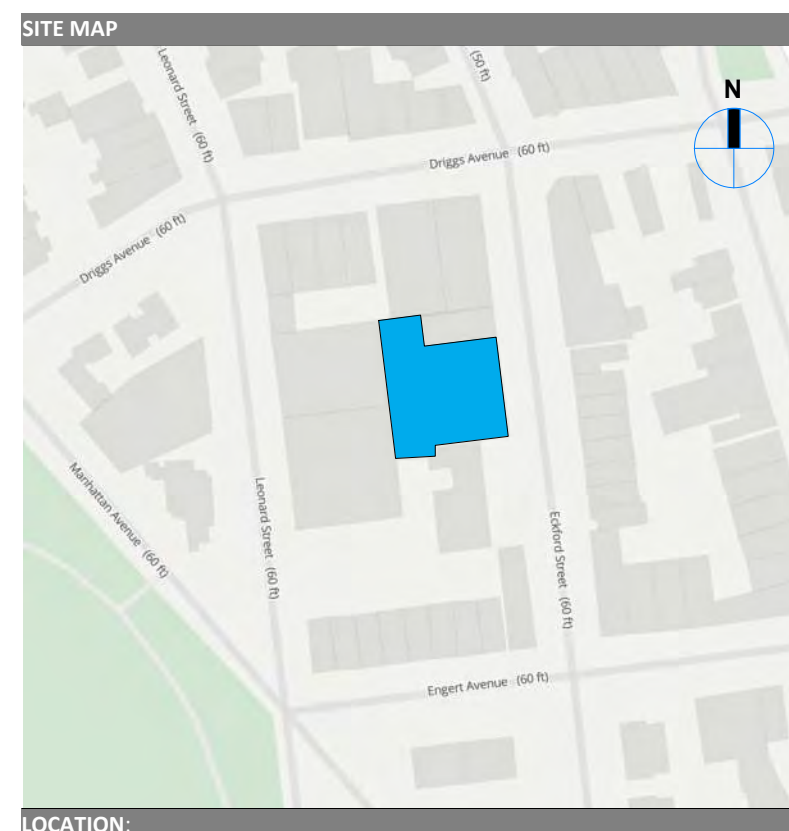
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MUNICIPAL CONSULTANT:

OWNER:

[illegible]

75% CONSTRUCTION DRAWINGS



LOCATION:
65 ECKFORD STREET
BROOKLYN, NEW YORK 11222

PROPOSED 5 STORY RESIDENTIAL NEW BUILDING

ZONING MAPS & SURVEY

DOB # :

DOB BSCAN + STAMP :

	DATE:	2/21/2022 3:18:17 PM
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	DRAWN BY:	XX



Z-102.00



203 CLIFTON PLACE, SUITE #20
BROOKLYN NY, 11216
T: (718) 484-3201

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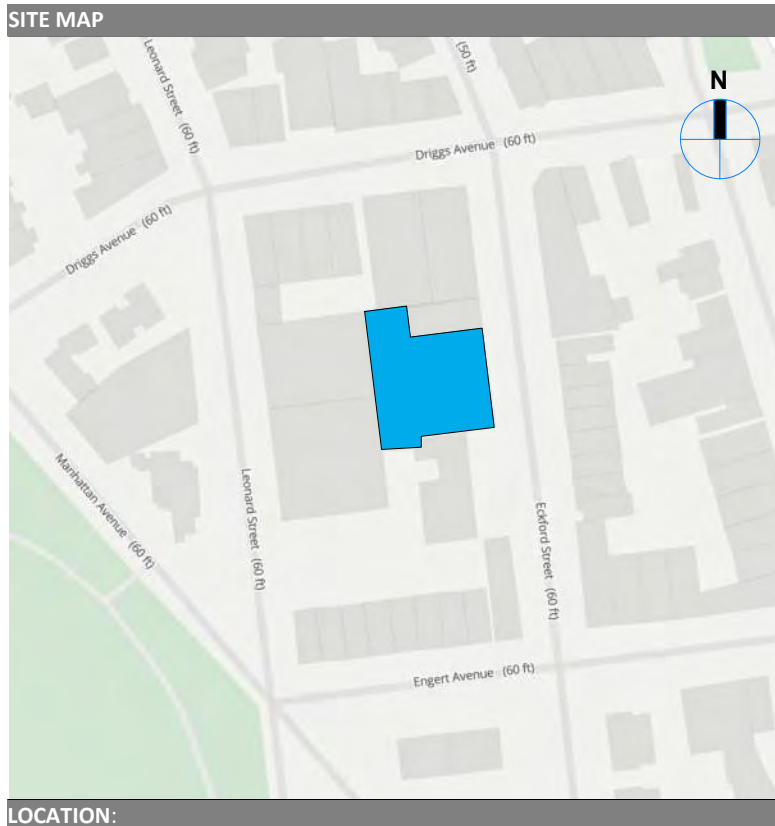
MEP ENGINEER:
...

MUNICIPAL CONSULTANT:
...

OWNER:
...

NO.	DESCRIPTION	DATE
0	DOB FILING	11/19/2021

75% CONSTRUCTION DRAWINGS



LOCATION:
**65 ECKFORD STREET
BROOKLYN, NEW YORK 11222**

**PROPOSED 5 STORY RESIDENTIAL NEW
BUILDING**

SUBCELLAR FLOOR PLAN

DOB # :
320625016
DOB BSCAN + STAMP :

FLOOR LEGEND

MATERIAL + SYMBOLS

- CONCRETE
- CMU
- STEEL / METAL
- RIGID INSULATION
- GYPSUM BOARD
- BRICK
- EXISTING BUILDING
- NON-FIRE RATED PARTITION
- FIRE RATED PARTITION
- MV 50 CFM SPR MECH. VENT
- SPRINKLER HEAD
- EXIT SIGN SYMBOL
- HANDICAPPED SYMBOL
- FLOOR DRAIN
- BICYCLE STORAGE 150 SF
- ROOM TAG
- UNIT TAG
- FLOOR ELEVATION SYMBOL
- SPOT ELEVATION SYMBOL
- WINDOW SCHEDULE TAG
SEE WINDOW SCHEDULE FOR DETAILED INFORMATION
- DOOR TYPE, SEE DOOR SCHEDULE SHEET
- PARTITION TYPE TAG
- STOREFRONT TYPE TAG
- COLUMN LINE / GRID INDICATOR
- SMOKE AND CARBON MONOXIDE DETECTOR
- ELECTRIC VEHICLE CHARGING STATION



NOTES:
1. NO GAS PROPOSED IN BUILDING.

1 SUBCELLAR FLOOR
SCALE: 3/16" = 1'-0"

DATE: 2/21/2022 3:08:03 PM
SCALE: As indicated
DRAWN BY: XX



A-100.00



203 CLIFTON PLACE, SUITE #20
BROOKLYN, NY, 11216
T: (718) 484-3201

STRUCTURAL ENGINEER:
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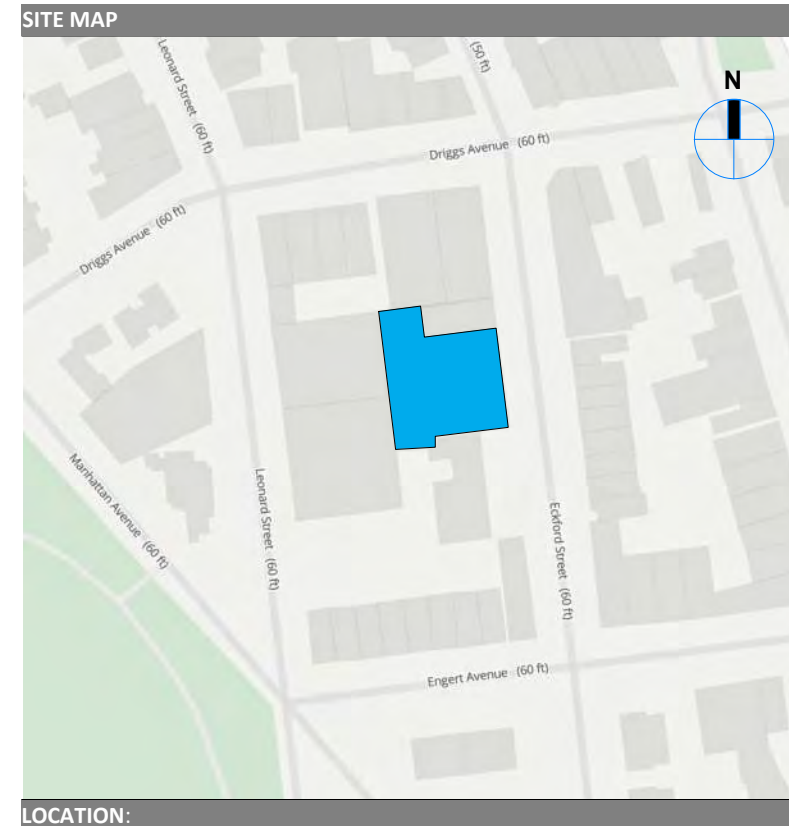
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MUNICIPAL CONSULTANT:
...

OWNER:
...

NO.	DESCRIPTION	DATE
0	DOB FILING	11/19/2021

75% CONSTRUCTION DRAWINGS



65 ECKFORD STREET
BROOKLYN, NEW YORK 11222

PROPOSED 5 STORY RESIDENTIAL NEW
BUILDING

CELLAR PLAN

DOB #:

320625016

DOB SCAN + STAMP:



DATE: 2/21/2022 3:08:09 PM

SCALE: As indicated

DRAWN BY: XX

A-101.00

SHEET: 24 OF 82

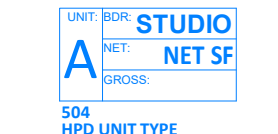
FLOOR LEGEND

MATERIAL + SYMBOLS

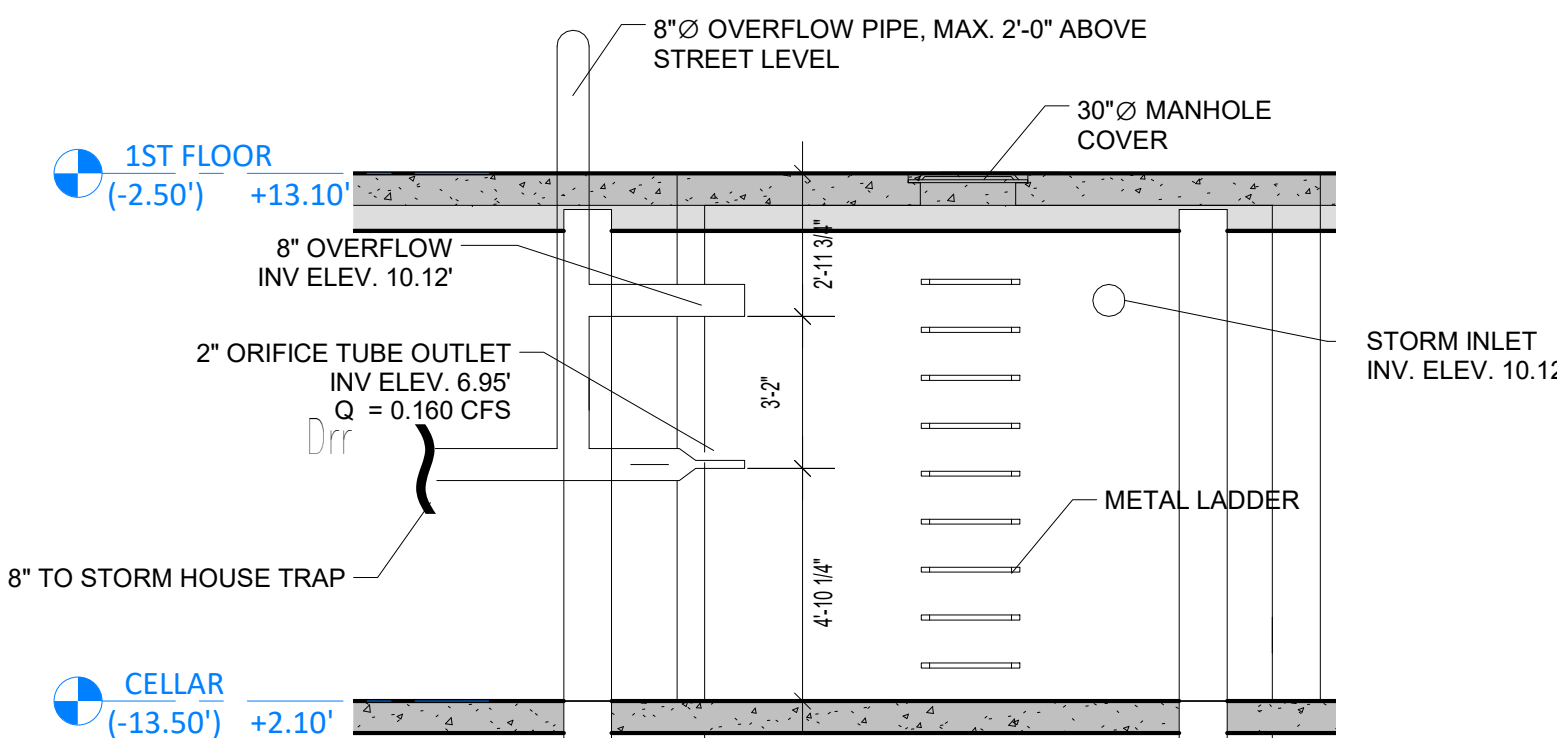
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- CMU
- STEEL / METAL
- RIGID INSULATION
- GYPSUM BOARD
- BRICK
- EXISTING BUILDING
- NON-FIRE RATED PARTITION
- FIRE RATED PARTITION
- MV 50 CFM SPR
- SPRINKLER HEAD
- EXIT SIGN SYMBOL
- HANDICAPPED SYMBOL
- FLOOR DRAIN

BICYCLE STORAGE

150 SF	ROOM TAG
R.L. XX	UNIT TAG
P.L. XX	UNIT TAG
D.A. XX	UNIT TAG
P.A. XX	UNIT TAG



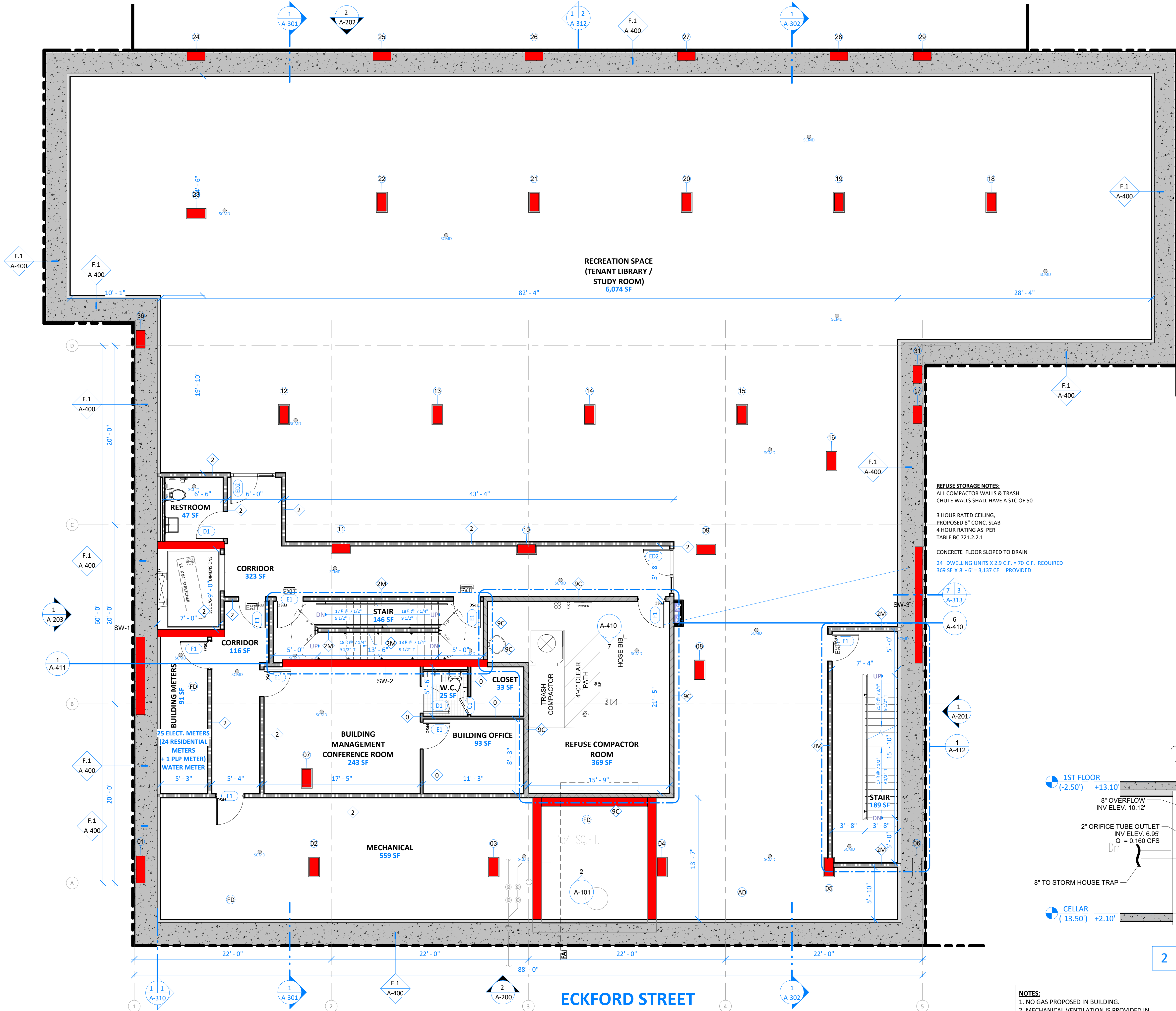
- FLOOR ELEVATION SYMBOL
- SPOT ELEVATION SYMBOL
- WINDOW SCHEDULE TAG
SEE WINDOW SCHEDULE FOR DETAILED INFORMATION
- DOOR TYPE, SEE DOOR SCHEDULE SHEET
- PARTITION TYPE TAG
- STOREFRONT TYPE TAG
- COLUMN LINE / GRID INDICATOR
- SMOKE AND CARBON MONOXIDE DETECTOR
- ELECTRIC VEHICLE CHARGING STATION



NOTES:
1. NO GAS PROPOSED IN BUILDING.
2. MECHANICAL VENTILATION IS PROVIDED IN
REFUSE COMPACTOR AND MECHANICAL ROOMS.

DETENTION TANK ELEVATION

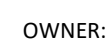
SCALE: 1/4" = 1'-0"



ECKFORD STREET
60 WIDE(NARROW STREET)

CELLAR FLOOR PLAN

SCALE: 3/16" = 1'-0"



75% CONSTRUCTION DRAWINGS



DOB BSCAN + STAMP

10

1 / 6 = 0.16 VAN ACCESSIBLE PARKING SPACE REQUIRED
1 PROVIDED AT 1ST FLOOR

APPENDIX C

Supplemental Remedial Investigation Report



**SUPPLEMENTAL REMEDIAL INVESTIGATION REPORT
FORMER CARTER SPRAY FINISHING CORP.**

**BCP SITE C224218
65 ECKFORD STREET
BROOKLYN, NEW YORK**

**PREPARED FOR
65-73 ECKFORD REALTY LLC
266 BROADWAY, SUITE 301
BROOKLYN, NY 11211**

PREPARED BY:

Zachary Simmel
Staff Engineer
Haley & Aldrich of New York

REVIEWED AND APPROVED BY:

A handwritten signature in blue ink that reads 'James M. Bellew'.

James M. Bellew
Principal
Haley & Aldrich of New York

A handwritten signature in black ink that reads 'Mari Cate Conlon'.

Mari Cate Conlon, PG
Senior Project Manager
Haley & Aldrich of New York



HALEY & ALDRICH OF NEW YORK
237 West 35th Street
16th Floor
New York, NY 10123
646.518.7735

29 March 2022
File No. 0202156

New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, New York 12233

Attention: Bob Corcoran

Subject: Supplemental Remedial Investigation Report
Former Carter Spray Finishing Corp.
65 Eckford Street
Brooklyn, New York

Dear Mr. Corcoran,

On behalf of 65-73 Eckford realty LLC, Haley & Aldrich of New York is submitting for the review and approval of the New York State Department of Environmental Conservation (NYSDEC) this dSupplemental Remedial Investigation Report (SRIR) for the Former Carter Spray Finishing Corp. Site (Brownfield Cleanup Program Site C224218), located at 65 Eckford Street in the Greenpoint neighborhood of Brooklyn, NY (Site). This SRIR was developed in accordance with the NYSDEC (6 NYCRR) Part 375 Brownfield Cleanup Regulations dated December 2006, the "Technical Guidance for Site Investigation and Remediation" (DER-10 dated May 2010) and other relevant NYSDEC technical and administrative guidance.

Please do not hesitate to contact us if there are any questions regarding this submittal or any other aspects of the project.

Sincerely yours,
HALEY & ALDRICH OF NEW YORK

A handwritten signature in blue ink that reads "James M. Bellew".

James M. Bellew
Principal

A handwritten signature in black ink that reads "Mari Cate Conlon".

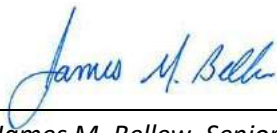
Mari Cate Conlon, P.G.
Senior Project Manager

Cc: Abraham Posner – 65-73 Eckford Realty LLC
Jon Schuyler Brooks, Esq. – Freeborn & Peters LLP
Jane O'Connell - NYSDEC
Scarlett McLaughlin – NYSDOH

Certification

This report documents remedial investigation activities conducted 65 Eckford Street, Brooklyn, New York.

I, James M. Bellew, certify that I am currently a Qualified Environmental Professional as defined in 6 NYCRR Part 375 and that this Remedial Investigation Report¹ was prepared in accordance with all statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).



James M. Bellew, Senior Associate

29 March 2022

Date

¹ Certification applies to remedial investigation activities conducted prior to the execution of a Brownfield Cleanup Agreement for the property.

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Submittal Correspondence

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3C	Emerging Contaminants Analytical Results in Groundwater
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7	Soil Vapor Results Summary Map

List of Acronyms and Abbreviations

A

AA	Alternatives Analysis
AAR	Alternatives Analysis Report
AGV	Air Guidance Value
Alpha	Alpha Analytical Laboratories, Inc.
AMSL	Above Mean Sea Level
AOCs	Areas of Concern
ASP	Analytical Services Protocol
AWQS	NYSDEC Technical and Operational Guidance Series 1.1.1 Ambient Water Quality Standards and Guidance Values for Class GA Water

B

BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
bgs	Below ground surface
BTEX	Benzene, toluene, ethylbenzene, total xylenes

C

CEQR	City Environmental Quality Review
cis-1,2-DCE	cis-1,2-dichloroethene
COCs	Contaminants of Concern
CP-51	Commissioners Policy-51 (<i>specifically "October 2010 NYSDEC Commissioners Policy 51"</i>)
CREC	Controlled Recognized Environmental Condition
CSM	Conceptual Site Model
CVOCs	Chlorinated volatile organic compounds

D

1,1-DCA	1,1-dichloroethane
1,1-DCE	1,1-dichloroethene
DCE	Dichloroethene
DER-10	Division of Environmental Remediation-10 (<i>specifically "May 2010 NYSDEC Technical Guidance for Site Investigation and Remediation"</i>)
DOT	Department of Transportation
DUSR	Data Usability Summary Report

E

EBC	Environmental Business Consultants
ELAP	Environmental Laboratory Approval Program
EPA	U.S. Environmental Protection Agency
ESI	Environmental Site Investigation

F

Ft bgs	Feet below current grade surface
FSP	Field sampling plan

H

Haley & Aldrich	Haley & Aldrich of New York
HASP	Health & Safety Plan
HAZWOPER	Health Administration Hazardous Waste Operations and Emergency Response

L

L/min	Liters per minute
Lakewood	Lakewood Environmental Services, Corp.

M

MS	Matrix Spike
MSD	Matrix Spike Duplicate
MDL	Method Detection Limit
mg/kg	Milligrams per Kilogram
Montrose	Montrose Surveying Company, LLP

N

Ng/g	Nanograms per gram
ng/L	nanograms per liter
NNO	Notice of No Objection
NTP	Notice to Proceed
NTU	Nephelometric turbidity units
6NYCRR	NYSDEC Title 6 of New York Codes, Rules and Regulations
NYCOER	New York City Office of Environmental Remediation
NYCRR	New York Codes, Rules and Regulations
NY-MCL	New York Maximum Concentrations Limit
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health

P

PAH	Polycyclic Aromatic Hydrocarbon
PCE	Perchloroethene/tetrachloroethene
PFAS	Per- and Polyfluoroalkyl Substances
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctanesulfonic acid
PPE	Personal protective equipment
PQL	Practical quantitation limit
PVC	Polyvinyl Chloride
PID	Photoionization Detector

Q

QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
QHHEA	Qualitative Human Health Exposure Assessment

R

RA	Remedial Action
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act
RCSCOs	Restricted Commercial Soil Cleanup Objectives
REC	Recognized Environmental Condition
RI	Remedial Investigation
RIR	Remedial Investigation Report
RRSCO	Restricted-Residential Soil Cleanup Objectives

S

SCG	Standards, Criteria and Guidelines
SCO	Soil Cleanup Objective
Site	the property located at 65 Eckford Street, Brooklyn, New York
SVOC	Semi-Volatile Organic Compound

T

TAL	Target Analyte List
1,1,1-TCA	1,1,1-trichloroethane
TCE	trichloroethene
TCL	Target Compound List
TCLP	Toxicity characteristic leaching procedure
TOGS 1.1.1	Technical and Operational Guidance Series 1.1.1 (<i>Specifically "June 1998 NYSDEC Division of Water Technical and Operational Guidance Series 1.1.1 Ambient Water Quality Standards and Guidance Values, Class GA for the protection of a source of drinking water modified per the April 2000 addendum"</i>)
TPH	Total Petroleum Hydrocarbons
trans-1,2-DCE	trans-1,2-Dichloroethene

U

µg/kg	micrograms per kilogram
µg/L	micrograms per liter
µg/m ³	micrograms per cubic meter
USGS	United States Geologic Survey
UST	Underground Storage Tank
UUSCOs	Unrestricted Use Soil Cleanup Objectives

V

VOCs	Volatile Organic Compounds

1. Introduction

This Supplemental Remedial Investigation Report (SRIR) was developed by Haley & Aldrich of New York (Haley & Aldrich) on behalf of 65-73 Eckford Realty LLC for (65-73 Eckford Realty) the proposed development of the property located at 65 Eckford Street, Brooklyn, New York (the Site).

The Site, identified as Section 3, Block 2698, Lot 26 on the New York City tax map, is an irregular-shaped vacant lot totaling approximately 10,200-square-feet in size (about 0.234 acres). The Site is currently in the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) identified as NYSDEC Site Number C224218 with 65-73 Eckford Realty LLC listed as a volunteer. The Site is located in a mixed-use residential, commercial and industrial area. The Site is bound to the north by a four-story residential building, to the east by Eckford followed by residential apartment buildings, to the south by a residential apartment building currently in construction (enrolled in the NYSDEC BCP Program as Site Number C224218), and to the west by a four-story residential building and a one-story industrial building. A Project Locus is provided in Figure 1, and existing Site features are displayed on the Site Map provided as Figure 2.

According to the New York City Planning Commission Zoning Map 13a, the Site is located within a MX-8 Special Mixed-Use District (MX) and currently zoned M1-2/R6A. The Site is listed with an environmental E-Designation (E-138) for hazardous materials resulting from a City Environmental Quality Review (CEQR) effective 11 May 2005 (CEQR #04DCP003K). Satisfaction of the E-Designation requirements through the NYSDEC BCP is subject to review and approval by the New York City Mayor's Office of Environmental Remediation (NYCOER) to obtain a Notice to Proceed (NTP) and/or a Notice of No Objection (NNO) prior to obtaining building permits.

The activities of this Supplemental Remedial Investigation (SRI) were completed from 27 December 2021 through 14 January 2022 in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10) and in accordance with the Supplemental Investigation Work Plan approved on 23 December 2021.

1.1 PURPOSE AND OBJECTIVES

A RI was completed by EBC in December 2015 to investigate the contaminants of concerns identified based on the Site's current and former uses and identified in the previous Phase II Investigation, also performed by EBC in February through April 2015. EBC subsequently submitted a Remedial investigation Report (RIR) to NYSDEC in June 2016. The RIR indicated the presence of urban fill extending to approximately 13 feet from sidewalk grade impacted with metals and semi-volatile organic compounds (SVOCs) (specifically polycyclic aromatic hydrocarbons [PAHs]), widely distributed throughout the Site. Arsenic and mercury were also detected at elevated concentrations in a native soil layer from 18 to 20 feet from sidewalk grade. Results found a 5 to 6 foot (ft) smear zone of petroleum impacted soil present across the Site at the groundwater interface (9 to 10 feet from sidewalk grade). The RIR indicated groundwater was impacted with SVOCs and petroleum related VOCs exceeding New York State Department of Environmental Conservation (NYSDEC) Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values (NY-AWQS) for Class GA Water (herein referred to as NYSDEC SGVs). Chlorinated volatile organic compounds (CVOCs) were also identified in

groundwater above method detection limits. Low levels of petroleum related VOCs were detected in soil vapor samples in addition to elevated concentrations of the CVOCs, trichloroethylene (TCE) and tetrachloroethene (PCE).

The 2015 Remedial Investigation (RI) partially determined the nature and extent of contamination at the Site but did not fully delineate the extent, therefore target soil, groundwater and soil vapor sampling was proposed in the SIWP approved on 23 December 2021. A Supplemental Remedial Investigation (SRI) was conducted by Haley & Aldrich at the site from 27 December 2021 through 14 January 2022 to address data gaps from the RI, characterize on-Site soil conditions post Corrective Actions, and to further delineate soil and soil vapor contamination and obtain additional samples of the groundwater plume. Furthermore, the SRI was conducted at the Site to address the deficiencies in Site progression through the BCP.

2. Site Background

2.1 SITE LOCATION AND DESCRIPTION

The Site, identified as Section 3, Block 2698, Lot 26 on the New York City tax map, is an irregular-shaped undeveloped lot totaling approximately 10,200-square-feet in size (about 0.234 acres). The Site has been vacant since 2008 and is currently excavated to approximately 5 to 6 feet below grade Site wide from former construction operations. The Site is located in a mixed-use residential, commercial and industrial area. The Site is bound to the north by a four-story residential building, to the east by Eckford Street followed by residential apartment buildings, to the south by a residential apartment building currently in construction (enrolled in NYSDEC BCP Program as Site Number C224218), and the west by a four-story residential and one-story industrial building. McCarren Park is located approximately 250 feet west of the Site. A Project Locus is provided as Figure 1, and existing Site features are displayed on the Site Map provided as Figure 2.

According to the New York City Planning Commission Zoning Map 13a, the Site is located within a MX-8 Special Mixed-Use District (MX) and currently zoned M1-2/R6A. The proposed development of this property will be consistent with the current zoning.

2.2 GEOLOGY AND HYDROGEOLOGY

The ground level elevation on the Site is approximately 9.5 ft (NAVD88), and the depth to bedrock is approximately 100 feet below sidewalk grade. The Site's stratigraphy, from the surface down, consists of urban fill generally consisting of brown to dark brown, medium to fine silty sand with varying amounts of loose gravel, asphalt, brick, cinders, and plastic was observed from current grade (excavated to approximately 5 feet below sidewalk grade) to depths extending approximately 3 to 4 ft (approximately 8 to 9 ft below sidewalk grade). The urban fill layer was underlain by a potential native layer consisting of gray to dark gray medium to fine silty sand with varying amounts of coarse sand and clay to depths extending approximately 11 to 12 ft (16 to 17 ft from sidewalk grade). Following this native layer was an organic/peat layer observed up to the terminus depth of each soil boring, ranging from 15 to 16 ft (20 to 21 ft from sidewalk grade). Groundwater was encountered at depths ranging from approximately 9 to 10 ft from sidewalk grade.

2.3 SITE HISTORY

The Site was developed between 1905 and 1916 and improved with several one-story manufacturing buildings occupied by the Meisel Danowitz & Co. woodworking operation. The Site was redeveloped by 1916 with a 1-2 story building and had been utilized by several industrial operations including a machine shop, wood box manufacturing facility, automobile parking garage, and metal finishing facility. Records indicate that former operations utilized underground gasoline storage tanks that were located in the northeast portion of the Site. The Site was occupied by the Carter Spray Finishing Corporation from 1960 to 2008 which used the building for metal finishing and spraying. The building was razed in 2015. The Site was subject to multiple subsurface investigations and construction of a five-story hotel on the Site began in 2018. Construction included excavation, transportation of soil for off-site disposal, and the

installation of a secant pile wall along the perimeter of the Site. Construction of the hotel was not completed. Currently, the Site is excavated to approximately 5 to 6 feet below grade Site wide and remains vacant.

2.4 REDEVELOPMENT PLANS

The redevelopment plan includes a residential condominium building with full cellar extending to approximately 25 feet from sidewalk grade.

3. Summary of Previous Investigations

The following reports were prepared for the Site prior to submission of the SRIR:

1. Phase I Environmental Site Assessment Screening, prepared by Environmental Business Solutions (EBC), May 2015
2. Phase II Environmental Site Assessment, prepared by EBC, February and April 2015
3. Remedial Investigation prepared by EBC, December 2015
4. Summary of Construction Activities and Remedial Measures, May to December 2015
5. Summary of Correction Action Activities, October 2021

May 2015 – Phase I Environmental Site Assessment Screening (EBC)

The Phase I Environmental Site Assessment (ESA) identified the following Recognized Environmental Conditions (RECs) for the Site:

- The 1916 and 1942 Sanborn maps show a parking garage building with an underground gasoline storage tank in the northeast portion of the building. A Site inspection performed in 2015 noted a fill port indicative of an underground gasoline storage tank within the same area of the gasoline tank drawn on the Sanborn maps indicating the tank(s) has not been removed. No information regarding the current status of this tank and/or soil quality in its vicinity was available for review. As such, there is a potential for spills or release from gasoline underground storage tank to have impacted the subsurface.
- New York City Department of Building records indicated fuel oil was used for heating the building. Based on the age and size of the building, it is assumed that an underground storage tank of at least 550 gallons was used. No information/records were obtained indicating proper removal/abandonment of a No. 2 fuel oil underground storage tank had occurred. As such, there is potential for spills or release from the No. 2 fuel oil underground storage tank to have impacted the subsurface.
- City Directory Listings, Sanborn maps and internet search results indicate the building has been historically utilized for industrial purposes, including a machine shop, parking garage, wood box manufacturing and metal finishing. From approximately 1959 to 1998, Carter Spray Finishing Corporation utilized two 275-gallon aboveground storage tanks that contained trichloroethene (TCE) and the Toxic Chemical Release Inventory System (TRIS) database indicates Carter Spray Finishing Corporation emitted greater than 8,000 pounds per year of TCE into the air. As such, there is a potential for historic site operations to have impacted soil, groundwater, and/or soil vapor quality beneath the Site.

Based on its findings, EBC recommended a Phase II Investigation be conducted to document subsurface conditions and determine the nature and extent of contamination, if any.

February and April 2015 – Limited Phase II Environmental Site Assessment (EBC)

An initial Limited Phase II Environmental Site Assessment performed by EBC in February 2015 and included the following scope of work:

1. Installed two soil borings and collected soil samples for chemical analysis from the soil borings to evaluate soil quality; and,
2. Collected one groundwater sample for chemical analysis to evaluate groundwater quality.

Additional sampling was performed by EBC in April 2015 and included the following scope of work:

1. Installed three soil borings and collected soil samples for chemical analysis from the soil borings to evaluate soil quality; and,
2. Collected three groundwater samples for chemical analysis to evaluate groundwater quality.

Shallow soil samples representing the depth interval 0 to 2 feet below grade were collected from the historic fill layer and were analyzed for polychlorinated biphenyls (PCBs) and Target Analyte List (TAL) metals. Soil samples representing the depth interval 11 to 13 feet below grade were collected from the water table interface and analyzed for volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs). The laboratory results identified petroleum related VOCs above Unrestricted Use SCOs and Protection of Groundwater SCOs within the samples collected from the water table interface, including n-Propylbenzene, sec-Butylbenzene, tert-Butylbenzene, and Toluene. Trichloroethene (TCE) (1,100 ug/kg) was detected within one of the samples at the water table interface.

Petroleum-related VOCs were detected in the groundwater samples above groundwater quality standards (GQS). Petroleum-related VOCs detected above GQS includes 2-Isopropyltoluene, Isopropylbenzene, n-Butylbenzene, n-Propylbenzene, sec-Butylbenzene, and tert-Butylbenzene.

SVOCs including Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Chrysene, and Indeno(1,2,3-cd)pyrene were reported above Restricted Residential Use SCOs within the soil sample from soil boring B2 (11-13 ft).

December 2015 – Remedial Investigation (EBC)

A Remedial Investigation (RI) performed by EBC included the following scope of work:

1. Installed ten soil borings (15SB1 – 15SB10) and collected 31 soil samples for chemical analysis to evaluate soil quality;
2. Installed eight groundwater monitoring wells (15MW1 – 15MW8) and collected eight groundwater samples for chemical analysis to evaluate groundwater quality; and,
3. Installed seven soil vapor probes and collected 7 samples for chemical analysis to evaluate the potential for vapor intrusion.

Soil samples collected at both 0 to 2 and 2 to 4 feet below grade were analyzed for VOCs, SVOCs, pesticides, PCBs, and TAL metals. Soil samples collected at 11 to 13 feet below grade (groundwater interface) were analyzed for VOCs and SVOCs. Soil samples collected at 18 to 20 feet below grade (native soil layer) were analyzed for VOCs, SVOCs, pesticides, PCBs, and TAL metals. Groundwater samples were analyzed for VOCs, SVOCs, pesticides, PCBs, and TAL metals and dissolved metals. Soil vapor samples were analyzed for VOCs by EPA Method TO-15.

A summary of the environmental findings of the Remedial Investigation includes the following:

1. A 5- to 6-foot thick zone of petroleum VOC contamination was identified at the groundwater interface across the Site.
2. TCE impacted soil with the highest concentrations was detected in the shallow soil samples collected from the western portion of the Site.
3. A historic fill material layer extending to depths as deep as 13 feet below grade contained SVOCs and metals exceeding the commercial SCOs.
4. A native soil layer approximately 18 to 20 feet below grade contained elevated concentrations of both arsenic and mercury.
5. Petroleum related VOCs were detected above GQS in six of the eight groundwater samples.
6. Low levels of petroleum related VOCs were detected in soil vapor samples in addition to elevated concentrations of the chlorinated VOCs, TCE and PCE.

May to December 2018 – Summary of Construction Activities

Construction activities and remedial measures took place on the Site from May to December 2018. Construction work was completed under the final Interim Remedial Measures Work Plan (IRMWP) submitted to NYSDEC in January 2016 by AMC Engineering. According to available records, intrusive work began on the Site in late May 2018 and commenced with the excavation and offsite disposal of soil from 0 to 5 feet below grade site wide. This interval was documented as the historic fill layer. Executed manifests and logs indicated that a total of 6,458.53 tons of soil were excavated and transported offsite to Bayshore Soil Management Facility (Bayshore) located in Keasbey, NJ. Soil excavation and offsite disposal was temporarily concluded on 13 December 2018.

Beginning on 12 June 2018, a secant pile wall was installed on the perimeter of the Site as part of the support-of-excavation (SOE) design and was overseen by Mueser Rutledge Consulting Engineers (Mueser). A review of daily field reports prepared by Mueser revealed that a total of 292 secant piles (each grouted) were installed. An unknown number of tiebacks were also installed as part of the SOE.

On 20 June 2018, a 550-gallon underground storage tank located in the southeast corner of the Site was removed according to a tank removal affidavit provided by Eastern Environmental Solutions, Inc. The affidavit indicates that the tank was purged, cut open, cleaned of all contents, and disposed of at a permitted disposal facility. The associated piping was also removed and disposed of at a permitted scrap metal facility.

Dewatering efforts were required on-site during excavation. Dewatering permits were authorized by the NYC Department of Environmental Protection on 9 December 2018, to discharge up to 20,000 gallons per day (gpd) of groundwater during construction. Although the permits were authorized, no records indicate that a dewatering system was implemented. The permits have since expired.

Construction and IRM activities have left an open excavation area approximately 5 to 6 feet below grade. The excavation is heavily vegetated and contains approximately 1- to 2-ft of standing water. Garbage, debris, and construction materials are scattered throughout the excavation depression.

October 2021- Summary of Corrective Action Activities (Haley & Aldrich)

A Corrective Action Work Plan (CAWP) was submitted and approved by NYSDEC on 12 October 2021. The activities outlined in the CAWP were designed to address the deficiencies in Site progression through the BCP and remedy non-compliant conditions at the Site. Corrective Action activities required equipment mobilization, dewatering, installation of a demarcation layer, backfilling, and documentation sampling.

A summary of the corrective action activities includes the following:

1. Installation of new suction points as part of Site-wide dewatering; reactivation of water treatment system
2. Removal and off-site disposal of vegetation and construction debris
3. Contractor grading in the southern and northeastern regions of the Site
4. Implementation of community air monitoring and submission of daily reports to NYSDEC and New York State Department of health (NYSDOH)

Implementation of the CAWP was completed in October 2021.

4. Remedial Investigation Approach

4.1 PROJECT TEAM

A project team for the Site was created based on qualifications and experience with personnel suited for successfully completion of the project.

James Bellew was the Qualified Environmental Professional and Principal in Charge for this work. In this role, Mr. Bellew was responsible for the overall completion of each task as per the requirements outlined in the field sampling plan and in accordance with the DER-10 guidance.

Mari Cate Conlon, PG was the Haley & Aldrich Project Manager for this work. In this role, Ms. Conlon managed the day-to-day tasks, including coordination and supervision of field engineers and scientists, adherence to the field sampling plan and oversight of project schedule.

Zachary Simmel was the field engineer responsible for implementing the field effort for this work. Mr. Simmel's responsibilities included implementing the field sampling plan activities and directing the subcontractors to ensure successful completion of field activities.

The drilling subcontractors utilized for this investigation was Lakewood Environmental Solutions (Lakewood). Lakewood provided a track-mounted Geoprobe® and operator to implement the majority of the SRI scope of work including, advancement of soil borings, installation of groundwater monitoring wells and installation of soil vapor probes.

Soil and groundwater samples were collected into laboratory prepared sample bottles (pre-preserved when appropriate), placed in ice-packed coolers maintained at approximately 4 degrees Celsius under standard chain of custody procedures and transported to Alpha Analytical Laboratories, Inc. of Westborough, Massachusetts (Certification No. 07010T) (Alpha). Soil vapor samples were collected in laboratory-supplied batch certified-clean 2.7-liter SUMMA canisters with 2-hour flow controllers and transported under standard chain of custody to Alpha. Alpha is a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP)-certified laboratory (ELAP No. 11148) and was responsible for analyzing the samples as per the analyses and methods identified in this SRIR. In addition, Alpha subcontracted soil samples analyzed for Per- and polyfluoroalkyl substances (PFAS) to GEL Laboratories LLC of Charleston, South Carolina.

4.2 SOIL BORING INSTALLATION AND SOIL SAMPLING

Soil samples were collected to meet NYSDEC DER-10 requirements for RIs, as well as to further investigate and delineate the nature and extent of contamination identified at the Site during the previous subsurface investigations.

Twelve soil borings were advanced to depths of between 20 and 21 ft bgs using a track-mounted direct-push drill rig (Geoprobe®) operated by a licensed operator provided by Lakewood, the drilling subcontractor. Soil samples were collected from dedicated acetate liners using a stainless-steel trowel

or sampling spoon. Samples were collected using laboratory provided clean bottle ware. VOC grab samples were collected using terra cores. Soil sampling locations are displayed in Figure 3.

Soils were logged continuously by an engineer. Sampling methods are described in the Field Sampling Plan (FSP) provided in the SRIWP included in Appendix A. A Quality Assurance Project Plan (QAPP) is also provided in Appendix A. The presence of staining, odors, and PID response was noted. Soil boring logs are provided as Appendix B.

Soil samples representative of Site conditions were collected at 12 locations widely distributed across the Site, as shown in Figure 3. Samples were collected at the surface, from the surface to 2 inches below current grade (variable throughout the Site) and from the native soil layer from 18 to 20 ft below sidewalk grade.

Haley & Aldrich collected a total of 26 soil samples (plus quality assurance/quality control [QA/QC] samples) for laboratory analysis. Soil samples were collected in laboratory-supplied containers, which were relinquished under standard chain-of-custody protocol and delivered via courier to Alpha for analysis.

Alpha is a NYSDOH ELAP-certified laboratory. As detailed in Table 1, soil samples were analyzed for the following:

- Target Compound List (TCL) VOCs by EPA Method 8260B
- TCL SVOCs using EPA Method by 8270C
- Total Analyte List (TAL) Metals by EPA Method 6010
- Per- and polyfluoroalkyl substances (PFAS) by EPA Method 537.1 SIM
- 1,4-dioxane by EPA Method 8270 SIM

As per NYDSEC DER-10 requirements, all soil samples were analyzed for emerging contaminants. Soil samples collected for PFAS and 1,4-dioxane were collected in accordance with the protocols established in NYSDEC's "Guidance for Sampling, Analysis, and Assessment of PFAS Under NYSDEC's Part 375 Remedial Programs" (June 2021). Select soil samples were also run for toxicity characteristic leaching procedure (TCLP) for lead and mercury.

Table 1 provides a summary of all soil samples collected as part of this SRI, including sample locations, sample depths and analyses performed on each sample. Tables 2A through 2E provide all soil analytical results collected as part of this SRI, including sample locations, sample depths and analyses performed.

4.3 PERMANENT MONITORING WELL INSTALLATION AND GROUNDWATER SAMPLING

The purpose of the groundwater sampling was to obtain current groundwater data and analyze for additional parameters (i.e., PFAS and 1,4-dioxane) to meet NYSDEC DER-10 requirements for RIs.

Five, two-inch diameter polyvinyl chloride (PVC) riser pipe permanent monitoring wells were installed to 13 to 15 ft bgs (17 to 20 ft from sidewalk grade). Each monitoring well was constructed with 2-inch annular space installed using certified clean sand fill and a bentonite plug. Wells were screened with 10-foot-long, 10 slot (0.01-inch) slotted screens terminating at the base of the well. Monitoring well screens bisected the water table. Monitoring wells were installed as stick-up in order to avoid damage. The

height of the casing of each monitoring well varied between 30 to 32 inches above grade. Well construction diagrams are provided as Appendix C.

Monitoring wells were developed by surging a pump in the well several times to pull fine-grained material from the well. Development was completed until the water turbidity was 50 nephelometric turbidity units (NTU) or less or ten well volumes were purged. Well development logs are included in Appendix D.

Table 1 provides a summary of all groundwater samples collected as part of this SRI, including sample locations, sample depths and analyses performed on each sample. Tables 3A through 3D provide a summary of all groundwater samples collected as part of this SRI, including sample locations, sample depths, and analyses performed on each sample.

Haley & Aldrich collected five groundwater samples (plus QA/QC samples) for laboratory analysis including the following:

- TCL VOCs by EPA Method 8260B
- TCL SVOCs by EPA Method 8270C
- Total TAL Metals by EPA Methods 6010/7471
- PFAS by EPA by 537 SIM
- 1,4-dioxane by EPA Method 8260B

Groundwater samples collected PFAS and 1,4-dioxane were collected in accordance with the protocols established in NYSDEC's "Guidance for Sampling, Analysis, and Assessment of PFAS Under NYSDEC's Part 375 Remedial Programs" (June 2021).

Groundwater monitoring wells were sampled utilizing low-flow sampling procedures for groundwater sampling. Prior to sampling, the water level was measured from each monitoring well using an electronic water level meter. Groundwater from each well was purged using low pumping rates (less than 500 milliliters per minute) to limit drawdown of the water level. Dedicated disposable field equipment used at each well included high density polyethylene and silicon tubing. Wells were purged until turbidity, pH, temperature, dissolved oxygen, and specific conductivity stabilized. In the event monitoring wells ran dry during low-flow sampling, a minimum of three well volumes were purged prior to collection of groundwater samples. Field measurements collected from the flow cell were logged and are included in Appendix E.

4.4 SOIL VAPOR PROBE INSTALLATION AND SOIL VAPOR SAMPLING

Soil vapor samples were collected in accordance with the NYSDOH Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York (NYSDOH October 2006). Five soil vapor probes were installed on 06 January 2022 by Lakewood to depths of approximately 7 feet below sidewalk grade, targeting the vadose zone above the water table. The vapor implants were installed with a direct-push drill rig (e.g., Geoprobe®) to advance a stainless-steel probe to the desired sample depth. To ensure the stainless-steel soil vapor probe was sealed completely to the surface using bentonite, a tracer gas was used in accordance with NYSDOH protocols to serve as a QA/QC to verify the integrity of the soil vapor probe seal. In addition, one to three implant volumes were purged prior to the collection of the soil vapor

samples. Sampling occurred for the duration of two hours. At the conclusion of the sampling round, tracer monitoring was performed a second time to confirm the continued integrity of the probe seals.

Haley & Aldrich collected five soil vapor samples. Samples were collected in appropriately sized Summa canisters that were certified clean by the laboratory. Samples were analyzed for VOCs using USEPA Method TO-15. Flow rate for both purging and sampling did exceed 0.2 liters per minute (L/min). The soil vapor purge log is included as Appendix F. Additional details regarding the sampling methods are described in the FSP provided in the SRIWP in Appendix A.

Table 1 provides a summary of all soil vapor samples collected as part of this SRI, including sample locations, sample depths and analyses performed on each sample.

4.5 DEVIATIONS FROM THE SRIWP

The SRIWP called for permanent monitoring wells were to be installed to 20 ft below sidewalk grade and screened from 10 to 20 ft, however based on varying groundwater depths observed in the field final depths of the permanent monitoring wells range from 17 to 20 ft from sidewalk grade and screening intervals were 7 to 17 ft or 10 to 20 ft (dependent on location).

The SRIWP called for soil vapor probes to be installed to 11 ft from sidewalk grade, however based on groundwater depth encountered at approximately 9 ft from sidewalk grade probes were set to approximately 7 ft.

4.6 QUALITY ASSURANCE/QUALITY CONTROL

The SRI was conducted in accordance with the QAPP in the approved SRIWP, provided in Appendix A. Haley & Aldrich's sampling program included several types of QA/QC samples and measures to ensure the usability of the data. QA/QC samples included equipment rinsate/field blanks, trip blanks, sample duplicates, and matrix spike/matrix spike duplicates (MS/MSDs).

When applicable, the sample result summary tables list the laboratory method detection limit (MDL) at which a compound was non-detectable. The laboratory results were 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. The accuracy and precision of the laboratory analytical methods were maintained by using calibration and calibration verification procedures, laboratory control samples, and surrogate, matrix, and analytical spikes. A review of the laboratory data packages indicates that holding times were met and no significant non-conformance issues were reported. Details of the laboratory reports are provided in Appendix G. Data validation is described in Section 6.5 and will be summarized in Data Usability Summary Reports (DUSRs).

4.7 REPORTING

Daily reports were provided to NYSDEC including a summary of Site activities, investigation progress updates, and photographs of field work. The daily reports are included in Appendix H.

4.8 FIELD EQUIPMENT DECONTAMINATION

Downhole drilling equipment was decontaminated between each boring by washing with an Alconox-based solution. Decontamination wastewater was contained in a wash pan and containerized in 55-gallon drums for disposal. Handheld sampling equipment was decontaminated by hand in an Alconox-based solution and triple rinsed with deionized water. Decontamination liquids were temporarily contained in 5-gallon buckets and then added to drums at the end of each work day.

4.9 INVESTIGATION DERIVED WASTE

Following sample collection, boreholes that were not converted to monitoring wells were backfilled with non-impacted soil cuttings and an upper bentonite plug. Boreholes were restored to the current excavation grade. Groundwater purged from the monitoring wells during development and sample collection was placed into a New York State Department of Transportation (NYSDOT) approved 55-gallon drum pending off-site disposal. A total of three drums were produced during the Supplemental Remedial Investigation: one drum containing soil cuttings; and two drums containing purged groundwater and decontamination liquids. The drums are currently labeled and staged on-site in a manner that prevents leakage, deterioration or release of waste. The drums will be transferred to an approved facility for disposal at a later date during implementation of the remedy.

5. Health and Safety

The work outlined above was completed under a Site-specific Health and Safety Plan (HASP) in accordance with Occupational Safety and Health Administration Hazardous Waste Operations and Emergency Response (HAZWOPER) regulations. Work was completed in Modified Level D personal protective equipment (PPE).

The SRI activities were conducted in accordance with a Site-specific Community Air Monitoring Plan (CAMP). CAMP data was provided to NYSDEC in the daily reports included in Appendix H.

6. Contaminants of Concern and Nature and Extent of Contamination

6.1 APPLICABLE STANDARDS

Soil analytical results were compared to NYSDEC 6NYCRR Part 375 UUSCOs and RRSCOs. Note that no standards for PFAS in soil currently exist in New York State; however, NYSDEC published soil guidance values for perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) in October 2020 (latest revision June 2021). PFOA and PFOS soil sample results are compared to the UU and RRU soil guidance values outlined in the Part 375 Remedial Programs Guidelines for Sampling and Analysis of Per- and Polyfluoroalkyl Substances (PFAS) guidance.

Groundwater analytical results were compared to 6NYCRR Part 703.5 NYSDEC SGVs and Part 375 Remedial Programs Guidelines for Sampling and Analysis of PFAS NYSDEC June 2021 guidance value. Currently, a groundwater cleanup regulatory criterion does not exist for 1,4-dioxane in New York State. Concentrations of 1,4-dioxane were compared to New York State's drinking water maximum contaminant level (MCL) of 1 µg/L.

No standard currently exists for soil vapor samples in New York State. Soil vapor was evaluated for elevated VOC detections above laboratory detection limits.

6.2 FIELD OBSERVATIONS

Based on field observations from the SRI, the Site's stratigraphy, from the surface down, consists of urban fill generally consisting of brown to dark brown, medium to fine silty sand with varying amounts of loose gravel, asphalt, brick, cinders, and plastic was observed from current grade to depths extending approximately 3 to 4 ft (approximately 8 to 9 ft below sidewalk grade). The urban fill layer was underlain by a potential native layer consisting of gray to dark gray medium to fine silty sand with varying amounts of coarse sand and clay to depths extending approximately 11 to 12 ft (16 to 17 ft from sidewalk grade). Following this native layer was an organic/peat layer observed up to the terminus depth of each soil boring, ranging from 15 to 16 ft (20 to 21 ft from sidewalk grade). During soil sampling activities, PID readings ranged from non-detect to 659.5 parts per million (ppm). Visible staining and petroleum-like odors were observed in soil intervals intersecting the groundwater interface. Groundwater was encountered at depths ranging from 9 to 10 ft from sidewalk grade, and groundwater beneath the Site generally flows from south-southeast to north-northwest.

6.3 SOIL SAMPLING RESULTS

Tables 2A through 2E summarize the analytical results from the soil sampling event. Figure 5 provides the soil boring locations as well as a summary of soil data from the sampling event. Details of the soil boring logs are provided in Appendix B.

Volatile Organic Compounds

Acetone (maximum concentration 0.8 mg/kg in SB-12 (18-20') was identified above the UUSCO (0.5 mg/kg), but below the RRSCO (100 mg/kg), in eleven soil samples analyzed. 2-Butanone was identified in

one soil sample, SB-12 (18-20'), at a concentration of 0.16 mg/kg, which is above the UUSCO (0.12 mg/kg), but below the RRSCO (100 mg/kg).

Two CVOCs, cis-1,2-dichloroethene and trichloroethene, were identified in SB-04 (0-2") at concentrations of 0.33 mg/kg and 0.5 mg/kg, respectively, which is above the UUSCOs (0.25 mg/kg and 0.47 mg/kg, respectively), but below the RRSCOs (100 mg/kg and 21 mg/kg, respectively).

No other VOC concentrations exceeded UUSCOs or RRSCOs in soil samples analyzed.

Semi-Volatile Organic Compounds

Two SVOCs including 3-methylphenol/4-methylphenol (maximum concentration 1.1 mg/kg in SB-06 (0-2")) and indeno(1,2,3-cd)pyrene (maximum concentration of 1.8 mg/kg in SB-10 (18-20')) were identified in several soil samples above UUSCOs (0.33 mg/kg and 0.5 mg/kg, respectively) and RRSCOs, (100 mg/kg and 0.5 mg/kg, respectively).

In addition, 1,2-dichlorobenzene was identified in one soil sample, SB-05 (0-2" at a concentration of 2.3 mg/kg, which is above the UUSCO (1.1 mg/kg), but below the RRSCO (100 mg/kg). Three SVOCs including benzo(a)anthracene (concentration of 3.4 mg/kg), benzo(a)pyrene (concentration of 2.7 mg/kg), and benzo(b)fluoranthene (concentration of 3.7 mg/kg) were identified in SB-10 (18-20') at concentrations above the RRSCOs (all 1 mg/kg). Two SVOCs, benzo(k)fluoranthene and chrysene, were also identified in SB-10 (18-20') at concentrations of 1 mg/kg and 3.4 mg/kg, respectively, which is above the UUSCOs (0.8 mg/kg and 1 mg/kg, respectively), but below the RRSCO (both 3.9 mg/kg). No other SVOC concentrations exceeded UUSCOs or RRSCOs in soil samples analyzed.

Metals

Metals including arsenic [maximum concentration of 40.2 mg/kg in SB-06 (0-2")]; lead [maximum concentration of 1,240 mg/kg in SB-01 (0-2")]; and mercury [maximum concentration of 73.1 mg/kg in SB-12 (18-20')] were detected above RRSCOs (16 mg/kg, 400 mg/kg and 0.81 mg/kg, respectively) in three or more soil samples analyzed (both shallow and deep). Copper was detected in SB-06 (0-2") at a concentration of 556 mg/kg exceeding the RRSCO (170 mg/kg) and identified in up to 11 soil samples at concentrations exceeding UUSCOs.

Metals including nickel [maximum concentration of 48.6 mg/kg in SB-11 (18-20')] and zinc [maximum concentration of 576 mg/kg in SB-06 (0-2")] were detected in multiple soil samples analyzed above UUSCOs (30 mg/kg and 109 mg/kg).

During the SRI, TCLP lead was detected in SB-05 (18-20') at 25.6 mg/L, which exceeds the USEPA allowable limit of 5 mg/L for hazardous waste. TCLP lead was also detected above laboratory detection limits in SB-04 (0-2") and SB-10 (18-20') at concentrations of 1.09 mg/L and 1.63 mg/L, respectively, however, the concentrations did not exceed the USEPA allowable limit of 5 mg/L. Additional vertical and horizontal delineation of elevated TCLP lead will be performed during waste characterization sampling in the northeast region of the Site.

Emerging Contaminants

1,4-dioxane was not detected above laboratory detection limits in soil samples analyzed.

Concentrations of PFOA [(maximum 0.175 nanograms per kilogram (ng/g) in SB-09 (18-20')] was detected above detection limits in six soil samples analyzed. PFOS was detected at a concentration of 0.155 ng/g in SB-04 (0-2") only.

The following PFAS compounds were detected above the laboratory detection limits in one or more the twenty-four soil samples analyzed:

- Perfluorobutanoic Acid (PFBA)
- 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)
- Perfluorodecanesulfonic Acid (PFDS)
- Perfluorohexanesulfonic Acid (PFHxS)
- Perfluorotetradecanoic Acid (PFTA)

Total PFOA/PFAS compounds detected ranged from 0.057 ng/g in SB-05 (0-2") to 0.265 ng/g in SB-04 (0-2").

6.4 GROUNDWATER SAMPLING RESULTS

Tables 3A through 3D summarize the analytical results from the groundwater sampling event. Figure 5 provides the groundwater monitoring well locations as well as a summary of the groundwater data from the sampling event. Groundwater sampling logs are provided in Appendix E. The following sections provide a summary of groundwater analytical results in exceedance of NY AWQS and guidance values for emerging contaminants.

Volatile Organic Compounds

Five petroleum VOCs including isopropylbenzene (maximum concentration of 40 µg/L in MW-01, AWQS 5 µg/L); n-Propylbenzene (maximum concentration of 50 µg/L in MW-01, AWQS 5 µg/L); sec-Butylbenzene (maximum concentration of 36 µg/L in MW-01, AWQS 5 µg/L); tert-Butylbenzene (maximum concentration of 10 µg/L in MW-01, AWQS 5 µg/L); and 1,2,4,5-Tetramethylbenzene (maximum concentration of 41 µg/L in MW-01, AWQS 5 µg/L) were detected in two or more groundwater samples above their respective NY-AWQS. Two VOCs, n-Butylbenzene and 1,2,4-Trimethylbenzene, were also detected in MW-01 at concentrations of 14 µg/L and 31 µg/L, respectively, above NY-AWQS (both 5 µg/L).

The following five VOCs were identified in MW-05 only at concentrations exceeding NY-AWQS: benzene at 1 µg/L (AWQS 1 µg/L), cis-1,2-dichloroethene at 69 µg/L (AWQS 5 µg/L), p/m-xylene at 10 µg/L (AWQS 5 µg/L), trichloroethene at 6.2 µg/L (AWQS 5 µg/L), and vinyl chloride at 51 µg/L (AWQS 2 µg/L).

Semi-Volatile Organic Compounds

The following six SVOCS, specifically PAHS, were identified in two groundwater samples, MW-03 and MW-05, at concentrations exceeding NY-AWQS: benzo(a)anthracene (maximum concentration of 0.07 µg/L in MW-05, AWQS 0.002 µg/L); benzo(a)pyrene (maximum concentration of 0.04 µg/L in MW-05, AWQS 0 µg/L); benzo(b)fluoranthene (maximum concentration of 0.06 µg/L in MW-05, AWQS 0.002 µg/L), and chrysene (maximum concentration of 0.05 µg/L in MW-05, AWQS 0.002 µg/L). Chrysene was also detected in MW-02 and MW-04 at concentrations of 0.01 µg/L and 0.05 µg/L, respectively,

exceeding NY-AWQS. The SVOC indeno(1,2,3-cd)pyrene was detected in MW-03 only at a concentration of 0.05 µg/L, exceeding NY-AWQS (0.002 µg/L). Benzo(k)fluoranthene was detected in MW-03 and MW-05 both at a concentration of 0.02 µg/L, exceeding the NY-AWQS (0.002 µg/L). Bis(2-ethylhexyl)phthalate was detected in MW-04 only at a concentration of 5.4 µg/L, exceeding NY-AWQS (5 µg/L).

Metals

Four metals were identified in groundwater samples at concentrations exceeding the NY AWQS in groundwater samples collected at the Site. Arsenic concentrations exceeded the NY AWQS (25 µg/L) in one groundwater sample collected from MW-04 and the field duplicate collected from the same location (maximum concentration of 79.9 µg/L in MW-04); iron exceeded the NY AWQS (300 µg/L) in all five groundwater samples analyzed and the duplicate sample from MW-04 (maximum concentration 21,200 µg/L in MW-04); manganese exceeded the NY AWQS (300 µg/L) in three groundwater samples analyzed (maximum concentration 920.07 µg/L in MW-05); and sodium concentrations exceeded the NY AWQS (20,000 µg/L in all five groundwater samples analyzed plus the duplicate sample of MW-04 (maximum concentration of 94,000 µg/L in MW-03).

Emerging Contaminants

A groundwater cleanup regulatory criterion does not exist for 1,4-dioxane in New York State. Concentrations of 1,4-dioxane were compared to New York State's drinking water MCL of 1 µg/L. PFAS compounds in groundwater are compared to the NYSDEC June 2021 guidance values of 0.01 µg/L for individual PFAS (not PFOA or PFOS) compounds and 0.5 µg/L for total concentrations of PFAS (including PFOA and PFOS).

1,4-dioxane was detected at concentrations exceeding New York State's drinking water MCL of 1 µg/L in groundwater samples MW-01 and MW-05, at concentrations of 2.78 µg/L and 1.2 µg/L, respectively.

Perfluorooctanoic Acid (PFOA) was detected at concentrations exceeding the NYSDEC June 2021 guidance value of 0.01 µg/L in all five groundwater samples collected (plus one duplicate sample collected from MW-04). The maximum concentration of PFOA was identified at a concentration of 0.11 µg/L in MW-05. Total PFOA/PFAS concentrations in groundwater samples ranged from 0.0303 µg/L in MW-02 to 0.113 µg/L in MW-05, below the NYSDEC June 2021 guidance value of 0.5 µg/L.

6.5 SOIL VAPOR SAMPLING RESULTS

Table 4 provides a summary of the analytical results from the soil vapor sampling event. Figure 8 provides the soil vapor sampling locations as well as a summary of soil vapor data from the sampling event. The soil vapor purge log is provided in Appendix F and includes details on each soil vapor sample collected. No standard currently exists for soil vapor samples in New York State.

Total VOC concentrations in soil vapor samples ranged from 227.62 $\mu\text{g}/\text{m}^3$ in sample SV-02 to 13,047.7 $\mu\text{g}/\text{m}^3$ in sample SV-05. Total benzene, toluene, ethylbenzene, and xylenes (BTEX) concentrations ranged from 41.1 $\mu\text{g}/\text{m}^3$ in sample SV-05 to 132.2 $\mu\text{g}/\text{m}^3$ in sample SV-04.

Elevated CVOCs were detected in soil vapor samples collected at the Site. CVOCs detected include TCE (maximum concentration of 9,670 $\mu\text{g}/\text{m}^3$), cis-1,2-dichloroethene (maximum concentration of 2,750 $\mu\text{g}/\text{m}^3$), and vinyl chloride (maximum concentration of 177 $\mu\text{g}/\text{m}^3$) were detected in all soil vapor samples, with the exception of SV-02. In addition, PCE was detected in soil vapor sample SV-05 at a concentration of 171 $\mu\text{g}/\text{m}^3$. In soil vapor samples SV-04 and SV-05, 1,1-dichloroethene was detected at a concentrations of 12.9 $\mu\text{g}/\text{m}^3$ and 37.9 $\mu\text{g}/\text{m}^3$, respectively.

It should be noted that although there are no comparison criteria, elevated concentrations of multiple VOCs were detected in one or more soil vapor samples collected at the Site. Elevated concentrations consist of the following:

- 1,1-dichloroethane detected in SV-02 (4.02 $\mu\text{g}/\text{m}^3$)
- 1,2,4-trimethylbenzene detected in all five samples (maximum concentration 27 $\mu\text{g}/\text{m}^3$ in SV-05)
- 1,3,5-trimethylbenzene detected in three samples (maximum concentration 9.83 $\mu\text{g}/\text{m}^3$ in SV-02)
- 1,3-butadiene detected in three samples (maximum concentration 4.42 $\mu\text{g}/\text{m}^3$ in SV-02)
- 2,2,4-trimethylpentane detected in SV-01 (71 $\mu\text{g}/\text{m}^3$)
- 2-butanone detected in four samples (maximum concentration of 24.6 $\mu\text{g}/\text{m}^3$ in SV-02)
- 4-ethyltoluene detected in two samples (maximum concentration 7.23 $\mu\text{g}/\text{m}^3$ in SV-04)
- acetone detected in all five samples (maximum concentration 72.7 $\mu\text{g}/\text{m}^3$ in SV-05)
- benzene detected in four samples, (maximum concentration 26 $\mu\text{g}/\text{m}^3$ in SV-04)
- carbon disulfide detected in four samples (maximum concentration of 15.8 $\mu\text{g}/\text{m}^3$ in SV-01)
- chloromethane detected in two samples (maximum concentration 1.85 $\mu\text{g}/\text{m}^3$ in SV-04)
- cyclohexane detected in SV-01 (24.2 $\mu\text{g}/\text{m}^3$)
- dichlorodifluoromethane detected in two samples (maximum concentration 2.43 $\mu\text{g}/\text{m}^3$ in SV-01)
- ethanol detected in two samples (maximum concentration of 52 $\mu\text{g}/\text{m}^3$ in SV-03)
- ethylbenzene detected in four samples (maximum concentration 14.3 $\mu\text{g}/\text{m}^3$ in SV-02)
- heptane detected in four samples (maximum concentration 20.3 $\mu\text{g}/\text{m}^3$ in SV-01)
- isopropanol detected in three samples (maximum concentration 21.3 $\mu\text{g}/\text{m}^3$ in SV-03)
- n-hexane detected in four samples (maximum concentration 50.8 $\mu\text{g}/\text{m}^3$ in SV-04)
- o-xylene detected in four samples (maximum concentration 16.4 $\mu\text{g}/\text{m}^3$ in SV-04)
- p/m-xylene detected in four samples (maximum concentration 40.3 $\mu\text{g}/\text{m}^3$ in SV-01)
- tertiary butyl alcohol detected in two samples (maximum concentration 10 $\mu\text{g}/\text{m}^3$ in SV-03)
- tetrahydrofuran detected in three samples (maximum concentration 14.7 $\mu\text{g}/\text{m}^3$ in SV-02)
- toluene detected in all five samples (maximum concentration 41.1 $\mu\text{g}/\text{m}^3$ in SV-05)
- trans,1,2-dichloroethene detected in four samples (maximum concentration 128 $\mu\text{g}/\text{m}^3$ in SV-05)

6.6 DATA VALIDATION

Data packages for all samples collected during the RI in December 2021/January 2022 have been sent to a qualified data validation specialist for evaluation of accuracy and precision of the analytical results. From this, DUSRs were prepared to confirm the compliance of methods with protocols described in NYSDEC Analytical service Protocol (ASP). DUSRs are included in Appendix I.

6.7 DATA USE

Validated analytical data, supplied in ASP Category B Data Packages in Appendix G, was submitted via email to the NYSDEC EQulS database in an Electronic Data Deliverable (EDD) package upon finalization of the DUSRs. Email correspondence confirming submittal of the EDDs is included in Appendix I.

7. Conceptual Site Model

7.1 AREAS OF CONCERN

The following areas of concern (AOCs) were identified at the Site:

AOC 1 – Site-Wide Urban Fill

The Site was developed between 1905 and 1916 and improved with several one-story manufacturing buildings before being redeveloped in 1916 with a 1-2 story building that was primarily occupied by the Carter Spray Finishing Corporation, a metal finishing and spraying company. During the SRI, a historical fill layer of unknown origin was identified from current grade (approx. 5 ft bgs) extending to depths between 10 and 13 ft below sidewalk grade across the Site. Fill material predominantly consists of brown to dark brown, medium to fine silty sand with varying amounts of loose gravel, asphalt, brick, cinders, and plastic. Based on soil sampling performed during the SRI, the urban fill interval from current grade to at least 13 ft below sidewalk grade is impacted with SVOCs (specifically PAHs), metals including arsenic, copper, lead, mercury, and zinc which are present at concentrations above NYSDEC Part 375 UUSCOs and/or RRSCOs. Metals concentrations were generally consistent Site-wide and the highest SVOC concentrations in soil were primarily identified in the central-northern portion of the Site.

Data reported in the June 2016 RI completed by EBC also identified PAH and metals contamination in historical fill material throughout the Site to depths as great as 13 ft bgs.

AOC 2 – CVOCs in Soil

Cis-1,2-dichloroethene and TCE were identified in one soil sample collected from the historical urban fill interval [SB-04 (0-2'')] at concentrations of 0.33 mg/kg and 0.5 mg/kg, respectively, exceeding the UUSCOs.

Data reported in the June 2016 RI completed by EBC identified the CVOC TCE detected above UUSCOs within shallow soil samples collected from 0-2 ft and 2-4 ft intervals Site-wide. The highest concentrations were detected within the rear of the former building (i.e. the western portion of the Site). It should be noted that the Site is currently excavated to approximately 5 ft bgs Site-wide, and therefore, a majority of the CVOC-impacted shallow soil has been removed and disposed of off-Site as part of the 2018 IRM.

AOC 3 –Metals in Deep Native Soil

Metals including arsenic [maximum concentration of 14.9 mg/kg in SB-09 (18-20')], mercury [maximum concentration of 73.1 mg/kg in SB-12 (18-20')], lead [maximum concentration of 266 mg/kg in SB-01 (18-20')], and zinc [maximum concentration of 301 mg/kg in SB-01 (18-20')] were identified in the deep intervals Site-wide at concentrations above NYSDEC Part 375 UUSCOs and/or RRSCOs.

AOC 4 – Chlorinated and Petroleum VOCs in Groundwater

Several CVOCs including cis,1,2-dichloroethene, trichloroethene, and vinyl chloride were detected MW-05 only at concentrations of 69 µg/m³, 6.2 µg/L, and 51 µg/L, respectively, exceeding NY-AWQS. Petroleum related VOCs including isopropylbenzene (maximum concentration of 40 µg/L in MW-01); n-Propylbenzene (maximum concentration of 50 µg/L in MW-01); sec-Butylbenzene (maximum

concentration of 36 µg/L in MW-01); tert-Butylbenzene (maximum concentration of 10 µg/L in MW-01); and 1,2,4,5-Tetramethylbenzene (maximum concentration of 41 µg/L in MW-01) were detected in two or more groundwater samples above NY-AWQS. The absence of petroleum contamination within soil above the groundwater interface and the evenly distributed concentration of petroleum related VOCs in groundwater Site-wide suggests an off-Site source(s), possibly associated with historic spill incidents at both 55 Eckford Street and 498 Leonard Street.

AOC 5 – Soil Vapor Impacts

Elevated CVOCs including cis-1,2-dichloroethene (maximum concentration of 2750 µg/m³ in SV-05), trichloroethene (maximum concentration of 9670 µg/m³ in SV-05), and vinyl chloride (maximum concentration of 177 µg/m³ in SV-05) were detected in four soil vapor samples. Soil vapor sample SV-05, collected from the northeast portion of the Site, also contained a PCE concentration of 171 µg/m³. Cis,1,2-dichloroethene, TCE and vinyl chloride were identified in a co-located groundwater sample collected during the SRI (MW-05). Based on the data collected during this SRI, CVOCs are present in soil vapor Site-wide likely attributed to the former metal finishing and spraying operations.

7.2 POTENTIAL ON-SITE AND OFF-SITE SOURCES

Based on the analytical results of the SRI, the primary contaminants of concern for the Site are metals, SVOCs (specifically PAHs), and VOCs (specifically chlorinated compounds) in soil; SVOCs, VOCs and metals in groundwater; and CVOCs in soil vapor.

Based on the identified contaminants, the source of contamination to soil, groundwater and soil vapor is likely the result of both the historical metals finishing and spraying processes at the Site and placement of historical urban fill from an unknown source.

It should be noted that the surrounding area was formerly used for industrial operations, which could indicate additional source areas off-Site with migrating impacts. In addition, the lack of petroleum contamination in soil above the groundwater interface and the evenly distributed concentrations of petroleum related VOCs in groundwater Site-wide suggests an off-Site source(s), possibly associated with historic spill incidents at both 55 Eckford Street and 498 Leonard Street.

8. Human Health and Environmental Risk Evaluation

8.1 HUMAN HEALTH RISK EVALUATION

A qualitative exposure assessment consists of characterizing the exposure setting (including the physical environment and potentially exposed human populations), identifying exposure pathways, and evaluating chemical fate and transport. An exposure pathway describes the means by which an individual may be exposed to contaminants originating from a site. An exposure pathway has the following five elements:

1. Receptor population;
2. Contaminant source;
3. Contaminant release and transport mechanism;
4. Point of exposure; and
5. Route of exposure.

An exposure pathway is complete when all five elements of an exposure pathway are documented; a potential exposure pathway exists when any one or more of the five elements comprising an exposure pathway is not documented but could reasonably occur. An exposure pathway may be eliminated from further evaluation when any one of the five elements comprising an exposure pathway does not exist in the present and will not exist in the future.

8.1.1 Receptor Population

The receptor population includes the people who are or may be exposed to contaminants at a point of exposure. The identification of potential human receptors is based on the characteristics of the Site, the surrounding land uses, and the probable future land uses. The Site is currently vacant, excavated to approximately 5 to 6 ft Site-wide, and secured with a 10' high construction fence. Since the Site is vacant, individual receptors would currently only include construction/maintenance workers that may be employed to perform work on the property.

The Site owner plans to redevelop the property for residential and commercial purposes, consistent with surrounding property use and zoning. Exposed receptors under the future use scenario may comprise residents of the future building, indoor employees, outdoor employees (e.g., groundskeepers or maintenance staff), and construction workers who may be employed at or perform work on the property. Site visitors may also be considered receptors; however, their exposure would be similar to that of the indoor employees but at a lesser frequency and duration. In addition, residents or employees in off-site adjoining buildings have the potential to be exposed to vapors.

8.1.2 Contaminant Sources

The source of contamination is defined as either the source of contaminant release to the environment (such as a waste disposal area or point of discharge) or the impacted environmental medium (soil, air,

water) at the point of exposure. Sections 6.0 and 7.0 discuss the COCs present in the Site media at elevated concentrations above background levels. In general, these are metals, SVOCs (specifically PAHs), and VOCs (specifically chlorinated compounds).

8.1.3 Exposure Routes and Mechanisms

The point of exposure is a location where actual or potential human contact with a contaminated medium may occur. Based on the exceedances of RRSCOs for PAHs and metals in soil, CVOC concentrations in soil vapor, and exceedances of SGVs for SVOCs, VOCs, and metals in groundwater, the point of exposure is defined as the entire Site.

The route of exposure is the manner in which a contaminant actually enters or contacts the human body (e.g., ingestion, inhalation, dermal absorption). Based on the types of receptors and points of exposure identified above, potential routes of exposure are listed below:

Current Use Scenario: The Site is currently vacant, excavated to approximately 5 to 6 ft Site-wide, and secured with a 10' high construction fence. Exposure to contaminated soil and contaminated groundwater is possible during subsurface investigations or other activities that disturb the subsurface. Release and transport mechanisms include contaminated surface soil transported as dust, contaminated groundwater flow, and volatilization of contaminants from soil and/or groundwater into vapor phase.

- Occupant/Employee/Visitor – skin contact, inhalation, and incidental ingestion
- Construction/Utility Worker – skin contact, inhalation, and incidental ingestion

Construction/Remediation Scenario: In the continued absence of engineering and institutional controls, there will be continued exposure pathways during construction/remediation specifically related to surface soil. Construction/remedial activities include excavation and off-site disposal of soil and dewatering of impacted groundwater (if required) to facilitate the construction of the foundation elements. Release and transport mechanisms include disturbed and exposed soil during excavation, contaminated soil transported as dust, contaminated groundwater flow (dewatering, if required), inhalation of dust from contaminated soil, and volatilization of contaminants from soil and/or groundwater into vapor phase.

- Construction/Utility Worker – skin contact, inhalation, and incidental ingestion

Future Use Scenario: The anticipated remedial approach includes excavation of contaminated soil, dewatering of groundwater accumulated in excavations (if required), and installation of a composite cover system as part of construction. In the absence of engineering and institutional controls, release and transport mechanisms include contaminated groundwater and volatilization of contaminants from soil and/or groundwater into the vapor phase. Routes of future exposure include cracks in the foundation or slab or emergency repairs to the foundation walls or slab.

- Construction/Utility Worker – skin contact, inhalation, and incidental ingestion
- Occupant/Employee/Visitor – inhalation
- Public Adjacent to the Site – inhalation

Contaminant release and transport mechanisms carry contaminants from the source to points where people may be exposed and are specific to the type of contaminant and Site use. For the VOCs (including CVOCs) present in soil vapor and groundwater, the potential exists for exposure through pathways associated with soil vapor migration. This would include the indoor vapor intrusion pathway also referred to as “soil vapor intrusion”). Additional pathways could include skin contact, inhalation, and incidental ingestion of VOCs present in soil and groundwater when and where construction workers are involved in subsurface activities where volatiles are present at elevated concentrations.

Concerning the indoor air pathway, the NYSDOH has issued a guidance document for assessing potential impacts to indoor air via soil vapor intrusion. The soil vapor samples collected during the SRI were assessed by the NYSDOH Soil Vapor Intrusion Guidance document. Soil vapor intrusion is a relevant transport mechanism under the current and future use scenario. Concerning skin contact, inhalation, and incidental ingestion of volatile organics present in soil and groundwater, the potential is low for exposure to VOCs for construction workers involved in subsurface activities where volatiles are present at elevated concentrations, given the results of the SRI.

8.1.4 Exposure Assessment

Based on the above assessment, the potential exposure pathways for the current and future use conditions are listed below.

Current Use Scenario

Impacted media include soil, groundwater, and soil vapor. Analytical data indicate that historical fill contains SVOCs, VOCs, and metals at concentrations greater than the UUSCOs and/or RRSCOs. Groundwater impacts include SVOCs, VOCs, and metals. PFOA and PFOS compounds were identified in groundwater above SGVs, however the concentrations are consistent with regional groundwater quality in New York City; an on-site source of PFAS was not identified. Soil vapor Site-wide is impacted with CVOCs including cis-1,2-dichloroethene, TCE, and vinyl chloride. Under current conditions, the likelihood of exposure to soil or groundwater is limited. The Site is currently vacant, excavated to approximately 5 ft bgs Site-wide, and secured with a 10' high construction fence. The Site entrances are each locked and secured with Site access only granted to personnel associated with the planned development. Potable water for Brooklyn will continue to be sourced from reservoirs in the Catskill and Delaware Watersheds. Intrusive work on the Site is done in accordance with a Site-Specific Health and Safety Plan and donning of PPE.

Construction/Remediation Scenario:

The exposure element exists for each element during the construction/remediation phase. The overall risk will be minimized by the implementation of a Site-Specific Construction Health and Safety Plan (CHASP), localized monitoring of organic vapors, community air monitoring on the site perimeter for particulates and VOCs, vapor and dust suppression techniques, installation of a stabilized entrance, cleaning truck tires and undercarriages, and donning of appropriate PPE. Additionally, the Site will be remediated under a RAWP which will include a Soil Materials Management Plan that will highlight measures for PPE, covering of stockpiles, housekeeping, suppression techniques (particulates and

vapor), and measures to prevent off-Site migration of contaminants. In addition, the Site will be secured and inaccessible to the public during remedial construction.

Future Use Scenario

Under the proposed future condition (after construction/remediation), residual contaminants may remain on-site depending on the remedy achieved. The remaining contaminants would include those listed in the current conditions. If contaminants remain on site after construction/remediation, the route of exposure will be mitigated by proper installation of engineering controls such as Site capping system foundation and implementation of institutional controls such as land use and groundwater use restrictions.

8.2 FISH AND WILDLIFE IMPACT ANALYSIS

NYSDEC DER-10 requires an on-site and off-site Fish and Wildlife Resource Impact Analysis if the stipulated criteria are met. The Site, which was developed between 1905 and 1916 and improved with several one-story manufacturing buildings occupied by the Meisel Danowitz & Co. woodworking operation and redeveloped by 1916 and had been utilized by several industrial operations including Carter Spray Finishing Corporation, is located within a developed dense urban commercial/industrial/residential area of Brooklyn, New York. The Site provides little or no wildlife habitat or food value and/or access to the detected subsurface contamination. No natural waterways are present on or adjacent to the Site. The proposed future use of the Site is for residential and commercial purposes. As such, no unacceptable ecological risks are expected under the current and future use scenario.

9. Conclusions and Recommendations

9.1 CONCLUSIONS

Based on the results of this SRI, the following conclusions have been identified:

- Urban fill material was encountered beneath surface cover to depths of between about 5 to 13 ft below sidewalk grade originated from unknown sources and was placed as backfill at an unspecified time, prior to the development of the Site.
- Contaminants of concern for the Site include metals, SVOCs, and VOCs (specifically chlorinated compounds).
- Based on the identified contaminants, the source of contamination to soil is likely the result of both the historical metal finishing and spraying operations at the Site and placement of historical urban fill from an unknown source.

9.2 RECOMMENDATIONS

Based on the results of the SRI, remedial action will be necessary to proceed with the anticipated redevelopment plan. Combined with previous subsurface investigations performed at the Site, sufficient analytical data were gathered during this SRI to establish soil cleanup levels and develop a remedy protective of human health and the environment.

To address the AOCs, Haley & Aldrich is evaluating utilization of a combination of remedial techniques. Applicable strategies and technologies may include, but are not limited to, source removal, in-situ remediation of groundwater and soil vapor, and installation engineering controls.

10. References

1. Phase I Environmental Site Assessment Screening, 65 Eckford Street, Brooklyn, New York, May 2015, Prepared by Environmental Business Consultants.
2. Remedial Investigation Report, 65 Eckford Street, Brooklyn, New York, June 2016, Prepared by Environmental Business Consultants, Prepared for Z65 Realty LLC.
3. Program Policy DER-10, "Technical Guidance for Site Investigation and Remediation," May 2010, Prepared by New York State Department of Environmental Conservation
4. New York State Department of Environmental Conservation, Part 375 of Title 6 of the New York Compilation of Codes, Rules, and Regulations, Effective December 14, 2006.
5. New York State Department of Environmental Conservation, Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (PFAS), dated June 2021.
6. New York State Department of Health, Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York, dated October 2006.
7. New York State Division of Water Technical and Operational Guidance Series (TOGS) (1.1.1) dated June 1998.
8. United States Environmental Protection Agency, Low Flow Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells, EQASOP-GW 001, September 19, 2017.

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TABLES

Table 1. Sampling and Analysis Plan
Former Carter Spray Finishing Corp.
BCP Site C224218
65 Eckford Street, Brooklyn, New York

Location	Sample Depth	Target Compound List VOCs (8260B)	Target Compound List SVOCs (8270C)	Total Analyte List Metals (6010)	PCBs (8082)	Pesticides (8081)	PFAS (537)	1,4-Dioxane (8270 SIM)	VOCs (TO-15)
SOIL									
SB-01	0-2"	X	X	X			X	X	
	18-20'	X	X	X			X	X	
SB-02	0-2"	X	X	X			X	X	
	18-20'	X	X	X			X	X	
SB-03	0-2"	X	X	X			X	X	
	18-20'	X	X	X			X	X	
SB-04	0-2"	X	X	X			X	X	
	18-20'	X	X	X			X	X	
SB-05	0-2"	X	X	X			X	X	
	18-20'	X	X	X			X	X	
SB-06	0-2"	X	X	X			X	X	
	18-20'	X	X	X			X	X	
SB-07	0-2"	X	X	X			X	X	
	18-20'	X	X	X			X	X	
SB-08	0-2"	X	X	X			X	X	
	18-20'	X	X	X			X	X	
SB-09	0-2"	X	X	X			X	X	
	18-20'	X	X	X			X	X	
SB-10	0-2"	X	X	X			X	X	
	18-20'	X	X	X			X	X	
SB-11	0-2"	X	X	X			X	X	
	18-20'	X	X	X			X	X	
SB-12	0-2"	X	X	X			X	X	
	18-20'	X	X	X			X	X	
GROUNDWATER									
MW-01	-	X	X	X			X	X	
MW-02	-	X	X	X			X	X	
MW-03	-	X	X	X			X	X	
MW-04	-	X	X	X			X	X	
MW-05	-	X	X	X			X	X	
SOIL VAPOR									
SV-01	10-11'								X
SV-02	10-11'								X
SV-03	10-11'								X
SV-04	10-11'								X
SV-05	10-11'								X

Notes:

VOCs - Volatile Organic Compounds

SVOCs - Semi-volatile Organic Compounds

PCBs - Polychlorinated biphenyls

PFAS - Per- and Polyfluoroalkyl Substances

Surface soil samples collected from 0-2 inches depth from current grade

Subsurface soil samples collected from 18-20 feet from sidewalk grade

Soil vapor sample depth from grade after backfilling of the site post Corrective Action

QAQC samples include:

MS/MSD - 1 for every 20 samples

Field Duplicate - 1 for every 20 samples

Trip Blanks - 1 per cooler of samples to be analyzed for VOCs

Field Blanks - 1 for every 20 samples

Table 2A. Volatile Organic Compound Analytical Results in Soil
65 Eckford Street, Brooklyn, NY

LOCATION				SB-01 (0-2")		SB-01 (18-20")		SB-02 (0-2")		SB-02 (18-20")		SB-03 (0-2")		SB-03 (18-20")		SB-04 (0-2")		SB-04 (18-20")		SB-05 (0-2")		SB-05 (18-20")		
SAMPLING DATE				1/6/2022		1/6/2022		1/6/2022		1/6/2022		1/6/2022		1/6/2022		1/6/2022		1/6/2022		12/27/2021		12/27/2021		
LAB SAMPLE ID				L2200873-01		L2200873-02		L2200873-03		L2200873-04		L2200873-05		L2200873-06		L2200873-07		L2200873-08		L2171041-01		L2171041-02		
		NY-RESRR	NY-UNRES	Units	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual		
Volatile Organics by EPA 5035																								
1,1,1,2-Tetrachloroethane				mg/kg	0.00057	U	0.0025	U	0.042	U	0.0021	U	0.00058	U	0.0019	U	0.035	U	0.003	U	0.0006	U	0.00049	U
1,1,1-Trichloroethane	100	0.68		mg/kg	0.00057	U	0.0025	U	0.042	U	0.0021	U	0.00058	U	0.0019	U	0.035	U	0.003	U	0.0006	U	0.00049	U
1,1,2,2-Tetrachloroethane				mg/kg	0.00057	U	0.0025	U	0.042	U	0.0021	U	0.00058	U	0.0019	U	0.035	U	0.003	U	0.0006	U	0.00049	U
1,1,2-Trichloroethane				mg/kg	0.0011	U	0.0049	U	0.084	U	0.0042	U	0.0012	U	0.0038	U	0.07	U	0.006	U	0.0012	U	0.00098	U
1,1-Dichloroethane	26	0.27		mg/kg	0.0011	U	0.0049	U	0.084	U	0.0042	U	0.0012	U	0.0038	U	0.07	U	0.006	U	0.0012	U	0.00098	U
1,1-Dichloroethene	100	0.33		mg/kg	0.0011	U	0.0049	U	0.084	U	0.0042	U	0.0012	U	0.0038	U	0.07	U	0.006	U	0.0012	U	0.00098	U
1,1-Dichloropropene				mg/kg	0.00057	U	0.0025	U	0.042	U	0.0021	U	0.00058	U	0.0019	U	0.035	U	0.003	U	0.0006	U	0.00049	U
1,2,3-Trichlorobenzene				mg/kg	0.0023	U	0.0099	U	0.17	U	0.0085	U	0.0023	U	0.0076	U	0.14	U	0.012	U	0.0024	U	0.002	U
1,2,3-Trichloropropane				mg/kg	0.0023	U	0.0099	U	0.17	U	0.0085	U	0.0023	U	0.0076	U	0.14	U	0.012	U	0.0024	U	0.002	U
1,2,4,5-Tetramethylbenzene				mg/kg	0.0075		0.0099	U	0.75		0.0085	U	0.041		0.0076	U	0.48		0.012	U	0.00034	J	0.002	U
1,2,4-Trichlorobenzene				mg/kg	0.0023	U	0.0099	U	0.17	U	0.0085	U	0.0023	U	0.0076	U	0.14	U	0.012	U	0.0024	U	0.002	U
1,2,4-Trimethylbenzene	52	3.6		mg/kg	0.00073	J	0.0099	U	0.085	J	0.0085	U	0.0023	U	0.0067	J	0.06	J	0.012	U	0.0024	U	0.002	U
1,2-Dibromo-3-chloropropane				mg/kg	0.0034	U	0.015	U	0.25	U	0.013	U	0.0035	U	0.011	U	0.21	U	0.018	U	0.0036	U	0.0029	U
1,2-Dibromoethane				mg/kg	0.0011	U	0.0049	U	0.084	U	0.0042	U	0.0012	U	0.0038	U	0.07	U	0.006	U	0.0012	U	0.00098	U
1,2-Dichlorobenzene	100	1.1		mg/kg	0.0023	U	0.0099	U	0.17	U	0.0085	U	0.0023	U	0.0076	U	0.14	U	0.012	U	0.0015	J	0.002	U
1,2-Dichloroethane	3.1	0.02		mg/kg	0.0011	U	0.0049	U	0.084	U	0.0042	U	0.0012	U	0.0038	U	0.07	U	0.006	U	0.0012	U	0.00098	U
1,2-Dichloroethene, Total				mg/kg	0.00097	J	0.0049	U	0.1		0.0042	U	0.0013		0.0038	U	0.35	J	0.006	U	0.0056		0.00037	J
1,2-Dichloropropane				mg/kg	0.0011	U	0.0049	U	0.084	U	0.0042	U	0.0012	U	0.0038	U	0.07	U	0.006	U	0.0012	U	0.00098	U
1,3,5-Trimethylbenzene	52	8.4		mg/kg	0.00032	J	0.0099	U	0.019	J	0.0085	U	0.0023	U	0.0046	J	0.14	U	0.012	U	0.0024	U	0.002	U
1,3-Dichlorobenzene	49	2.4		mg/kg	0.0023	U	0.0099	U	0.17	U	0.0085	U	0.0023	U	0.0076	U	0.14	U	0.012	U	0.0024	U	0.002	U
1,3-Dichloropropane				mg/kg	0.0023	U	0.0099	U	0.17	U	0.0085	U	0.0023	U	0.0076	U	0.14	U	0.012	U	0.0024	U	0.002	U
1,3-Dichloropropene, Total				mg/kg	0.00057	U	0.0025	U	0.042	U	0.0021	U	0.00058	U	0.0019	U	0.035	U	0.003	U	0.0006	U	0.00049	U
1,4-Dichlorobenzene	13	1.8		mg/kg	0.0023	U	0.0099	U	0.17	U	0.0085	U	0.0023	U	0.0076	U	0.14	U	0.012	U	0.00084	J	0.002	U
1,4-Dioxane	13	0.1		mg/kg	0.091	U	0.4	U	6.8	U	0.34	U	0.094	U	0.3	U	5.6	U	0.48	U	0.096	U	0.078	U
2,2-Dichloropropane				mg/kg	0.0023	U	0.0099	U	0.17	U	0.0085	U	0.0023	U	0.0076	U	0.14	U	0.012	U	0.0024	U	0.002	U
2-Butanone	100	0.12		mg/kg	0.011	U	0.04	J	0.84	U	0.047	U	0.012	U	0.056		0.7	U	0.06	U	0.012	U	0.0098	U
2-Hexanone				mg/kg	0.011	U	0.049	U	0.84	U	0.042	U	0.012	U	0.038	U	0.7	U	0.06	U	0.012	U	0.0098	U
4-Methyl-2-pentanone				mg/kg	0.011	U	0.049	U	0.84	U	0.042	U	0.012	U	0.038	U	0.7	U	0.06	U	0.012	U	0.0098	U
Acetone	100	0.05		mg/kg	0.023		0.2		0.84	U	0.25		0.012	U	0.28		0.7	U	0.076		0.013		0.0073	J
Acrylonitrile				mg/kg	0.0046	U	0.02	U	0.34	U	0.017	U	0.0047	U	0.015	U	0.28	U	0.024	U	0.0048	U	0.0039	U
Benzene	4.8	0.06		mg/kg	0.00057	U	0.0025	U	0.042	U	0.0021	U	0.00058	U	0.0019	U	0.014	J	0.003	U	0.0006	U	0.00049	U
Bromobenzene				mg/kg	0.0023	U	0.0099	U	0.17	U	0.0085	U	0.0023	U	0.0076	U	0.14	U	0.012	U	0.0024	U	0.002	U
Bromochloromethane				mg/kg	0.0023	U	0.0099	U	0.17	U	0.0085	U	0.0023	U	0.0076	U	0.14	U	0.012	U	0.0024	U	0.002	U
Bromodichloromethane				mg/kg	0.00057	U	0.0025	U	0.042	U	0.0021	U	0.00058	U	0.0019	U	0.035	U	0.003	U	0.0006	U	0.00049	U
Bromoform				mg/kg	0.0046	U	0.02	U	0.34	U	0.017	U	0.0047	U	0.015	U	0.28	U	0.024	U	0.0048	U	0.0039	U
Bromomethane				mg/kg	0.0023	U	0.0099	U	0.17	U	0.0085	U	0.0023	U	0.0076	U	0.14	U	0.012	U	0.0024	U	0.002	U
Carbon disulfide				mg/kg	0.011	U	0.049	U	0.84	U	0.021	J	0.012	U	0.038	U	0.7	U	0.06	U	0.012	U	0.0098	U
Carbon tetrachloride	2.4	0.76		mg/kg	0.0011	U	0.0049	U	0.084	U	0.042	U	0.0012	U	0.0038	U	0.07	U	0.006	U	0.0012	U	0.00098	U
Chlorobenzene	100	1.1		mg/kg	0.00057	U	0.0025	U	0.042	U	0.0021	U	0.00058	U	0.0019	U	0.035	U	0.003	U	0.00053	J	0.00049	U
Chloroethane				mg/kg	0.0023	U	0.0099	U	0.17	U	0.0085	U	0.0023	U	0.0076	U	0.14	U	0.012	U	0.0024	U	0.002	U
Chloroform	49	0.37		mg/kg	0.0017	U	0.0074	U	0.13	U	0.0064	U	0.0018	U	0.0057	U	0.1	U	0.009	U	0.0018	U	0.0015	U
Chloromethane	</																							

Table 2A. Volatile Organic Compound Analytical Results in Soil
65 Eckford Street, Brooklyn, NY

LOCATION				SB-06 (0-2")		SB-06 (18-20")		SB-06 (18-20")		SB-07 (0-2")		SB-07 (18-20")		SB-08 (0-2")		SB-08 (18-20")		SB-09 (0-2")		SB-09 (18-20")		SB-09 (18-20")	
SAMPLING DATE				12/27/2021		12/27/2021		12/27/2021		1/6/2022		1/6/2022		1/6/2022		1/6/2022		12/27/2021		12/27/2021		12/27/2021	
LAB SAMPLE ID				L2171041-03		L2171041-04		L2171041-04 R1		L2200873-09		L2200873-10		L2200873-11		L2200873-12		L2171041-05		L2171041-06		L2171041-06 R1	
				NY-RESRR	NY-UNRES	Units	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	
Volatile Organics by EPA 5035																							
1,1,1,2-Tetrachloroethane			mg/kg	0.48	U	0.00088	U	0.00088	U	0.036	U	0.0026	U	0.04	U	0.0024	U	0.00064	U	0.0014	U	0.0014	U
1,1,1-Trichloroethane	100	0.68	mg/kg	0.48	U	0.00088	U	0.00088	U	0.036	U	0.0026	U	0.04	U	0.0024	U	0.00064	U	0.0014	U	0.0014	U
1,1,2,2-Tetrachloroethane			mg/kg	0.48	U	0.00088	U	0.00088	U	0.036	U	0.0026	U	0.04	U	0.0024	U	0.00064	U	0.0014	U	0.0014	U
1,1,2-Trichloroethane			mg/kg	0.95	U	0.0018	U	0.0018	U	0.073	U	0.0053	U	0.081	U	0.0049	U	0.0013	U	0.0028	U	0.0028	U
1,1-Dichloroethane	26	0.27	mg/kg	0.95	U	0.0018	U	0.0018	U	0.073	U	0.0053	U	0.081	U	0.0049	U	0.0013	U	0.0028	U	0.0028	U
1,1-Dichloroethene	100	0.33	mg/kg	0.95	U	0.0018	U	0.0018	U	0.073	U	0.0053	U	0.081	U	0.0049	U	0.0013	U	0.0028	U	0.0028	U
1,1-Dichloropropene			mg/kg	0.48	U	0.00088	U	0.00088	U	0.036	U	0.0026	U	0.04	U	0.0024	U	0.00064	U	0.0014	U	0.0014	U
1,2,3-Trichlorobenzene			mg/kg	1.9	U	0.0035	U	0.0035	U	0.14	U	0.011	U	0.16	U	0.0098	U	0.0025	U	0.0056	U	0.0056	U
1,2,3-Trichloropropane			mg/kg	1.9	U	0.0035	U	0.0035	U	0.14	U	0.011	U	0.16	U	0.0098	U	0.0025	U	0.0056	U	0.0056	U
1,2,4,5-Tetramethylbenzene			mg/kg	34		0.00066	J	0.00066	J	3.6		0.0041	J	1.5		0.0098	U	0.0025	U	0.0056	U	0.0056	U
1,2,4-Trichlorobenzene			mg/kg	1.9	U	0.0035	U	0.0035	U	0.14	U	0.011	U	0.16	U	0.0098	U	0.0025	U	0.0056	U	0.0056	U
1,2,4-Trimethylbenzene	52	3.6	mg/kg	0.62	J	0.0035	U	0.0035	U	0.48		0.011	U	0.14	J	0.0098	U	0.0025	U	0.0056	U	0.0056	U
1,2-Dibromo-3-chloropropane			mg/kg	2.8	U	0.0053	U	0.0053	U	0.22	U	0.016	U	0.24	U	0.015	U	0.0038	U	0.0084	U	0.0084	U
1,2-Dibromoethane			mg/kg	0.95	U	0.0018	U	0.0018	U	0.073	U	0.0053	U	0.081	U	0.0049	U	0.0013	U	0.0028	U	0.0028	U
1,2-Dichlorobenzene	100	1.1	mg/kg	1.9	U	0.0035	U	0.0035	U	0.14	U	0.011	U	0.16	U	0.0098	U	0.0025	U	0.0056	U	0.0056	U
1,2-Dichloroethane	3.1	0.02	mg/kg	0.95	U	0.0018	U	0.0018	U	0.073	U	0.0053	U	0.081	U	0.0049	U	0.0013	U	0.0028	U	0.0028	U
1,2-Dichloroethene, Total			mg/kg	0.95	U	0.0018	U	0.0018	U	0.12		0.0053	U	0.11		0.0049	U	0.00064	J	0.0028	U	0.0028	U
1,2-Dichloropropane			mg/kg	0.95	U	0.0018	U	0.0018	U	0.073	U	0.0053	U	0.081	U	0.0049	U	0.0013	U	0.0028	U	0.0028	U
1,3,5-Trimethylbenzene	52	8.4	mg/kg	0.18	J	0.0035	U	0.0035	U	0.11	J	0.011	U	0.041	J	0.0098	U	0.0025	U	0.0056	U	0.0056	U
1,3-Dichlorobenzene	49	2.4	mg/kg	1.9	U	0.0035	U	0.0035	U	0.14	U	0.011	U	0.16	U	0.0098	U	0.0025	U	0.0056	U	0.0056	U
1,3-Dichloropropane			mg/kg	1.9	U	0.0035	U	0.0035	U	0.14	U	0.011	U	0.16	U	0.0098	U	0.0025	U	0.0056	U	0.0056	U
1,3-Dichloropropene, Total			mg/kg	0.48	U	0.00088	U	0.00088	U	0.036	U	0.0026	U	0.04	U	0.0024	U	0.00064	U	0.0014	U	0.0014	U
1,4-Dichlorobenzene	13	1.8	mg/kg	1.9	U	0.0035	U	0.0035	U	0.14	U	0.011	U	0.16	U	0.0098	U	0.0025	U	0.0056	U	0.0056	U
1,4-Dioxane	13	0.1	mg/kg	76	U	0.14	U	0.14	U	5.8	U	0.42	U	6.5	U	0.39	U	0.1	U	0.22	U	0.22	U
2,2-Dichloropropane			mg/kg	1.9	U	0.0035	U	0.0035	U	0.14	U	0.011	U	0.16	U	0.0098	U	0.0025	U	0.0056	U	0.0056	U
2-Butanone	100	0.12	mg/kg	9.5	U	0.066		0.066		0.73	U	0.053	U	0.81	U	0.095		0.013	U	0.11		0.11	
2-Hexanone			mg/kg	9.5	U	0.018	U	0.018	U	0.73	U	0.053	U	0.81	U	0.049	U	0.013	U	0.028	U	0.028	U
4-Methyl-2-pentanone			mg/kg	9.5	U	0.018	U	0.018	U	0.73	U	0.053	U	0.81	U	0.049	U	0.013	U	0.028	U	0.028	U
Acetone	100	0.05	mg/kg	9.5	U	0.32		0.32		0.73	U	0.067		0.81	U	0.48		0.013	U	0.56		0.56	
Acrylonitrile			mg/kg	3.8	U	0.0071	U	0.0071	U	0.29	U	0.021	U	0.32	U	0.02	U	0.0051	U	0.011	U	0.011	U
Benzene	4.8	0.06	mg/kg	0.48	U	0.00088	U	0.00088	U	0.036	U	0.0026	U	0.04	U	0.0024	U	0.00064	U	0.0014	U	0.0014	U
Bromobenzene			mg/kg	1.9	U	0.0035	U	0.0035	U	0.14	U	0.011	U	0.16	U	0.0098	U	0.0025	U	0.0056	U	0.0056	U
Bromochloromethane			mg/kg	1.9	U	0.0035	U	0.0035	U	0.14	U	0.011	U	0.16	U	0.0098	U	0.0025	U	0.0056	U	0.0056	U
Bromodichloromethane			mg/kg	0.48	U	0.00088	U	0.00088	U	0.036	U	0.0026	U	0.04	U	0.0024	U	0.00064	U	0.0014	U	0.0014	U
Bromoform			mg/kg	3.8	U	0.0071	U	0.0071	U	0.29	U	0.021	U	0.32	U	0.02	U	0.0051	U	0.011	U	0.011	U
Bromomethane			mg/kg	1.9	U	0.0035	U	0.0035	U	0.14	U	0.011	U	0.16	U	0.0098	U	0.0025	U	0.0056	U	0.0056	U
Carbon disulfide			mg/kg	9.5	U	0.018	U	0.018	U	0.73	U	0.053	U	0.81	U	0.049	U	0.013	U	0.028	U	0.028	U
Carbon tetrachloride	2.4	0.76	mg/kg	0.95	U	0.0018	U	0.0018	U	0.073	U	0.0053	U	0.081	U	0.0049	U	0.0013	U	0.0028	U	0.0028	U
Chlorobenzene	100	1.1	mg/kg	0.48	U	0.00088	U	0.00088	U	0.036	U	0.0026	U	0.04	U	0.0024	U	0.00064	U	0.0014	U	0.0014	U
Chloroethane			mg/kg	1.9	U	0.0016	J	0.0016	J	0.14	U	0.011	U	0.16	U	0.0098	U	0.0025	U	0.0056	U	0.0056	U
Chloroform	49	0.37	mg/kg	1.4	U	0.0026	U	0.0026	U	0.11	U	0.008	U	0.12	U	0.0073	U	0.0019	U	0.0042	U	0.0042	U
Chloromethane			mg/kg	3.8	U	0.0071	U	0.0071	U	0.29	U	0.021	U	0.32	U	0.02	U	0.0051	U	0.011	U	0.011	U
cis-1,2-Dichloroethene	100	0.25	mg/kg	0.95	U	0.0018	U	0.0018	U	0.12		0.0053	U	0.11		0.0049	U	0.00064	J	0.0028	U	0.0028	U
cis-1,3-Dichloropropene			mg/kg	0.48	U	0.00088	U	0.00088	U	0.036	U	0.0026	U	0.04	U	0.0024	U	0.00064	U	0.0014	U	0.0014	U
Dibromochloromethane			mg/kg	0.95	U	0.0018	U	0.0018	U	0.073													

Table 2A. Volatile Organic Compound Analytical Results in Soil
65 Eckford Street, Brooklyn, NY

LOCATION			SB-10 (0-2")			SB-10 (18-20")			SB-11 (0-2")			SB-11 (18-20")			SB-12 (0-2")			SB-12 (18-20")			DUP01_ 20220106			DUP02_ 20220106		
SAMPLING DATE			12/27/2021			12/27/2021			1/6/2022			1/6/2022			1/6/2022			1/6/2022			1/6/2022			1/6/2022		
LAB SAMPLE ID			L2171041-07			L2171041-08			L2200873-13			L2200873-14			L2200873-15			L2200873-16			L2200873-17			L2200873-18		
	NY-RESRR	NY-UNRES	Units	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual			
Volatile Organics by EPA 5035																										
1,1,1,2-Tetrachloroethane			mg/kg	0.039	U	0.00053	U	0.036	U	0.0025	U	0.036	U	0.0031	U	-	0.0032	U		0.00073	U					
1,1,1-Trichloroethane	100	0.68	mg/kg	0.039	U	0.00053	U	0.036	U	0.0025	U	0.036	U	0.0031	U	-	0.0032	U		0.00073	U					
1,1,2,2-Tetrachloroethane			mg/kg	0.039	U	0.00053	U	0.036	U	0.0025	U	0.036	U	0.0031	U	-	0.0032	U		0.00073	U					
1,1,2-Trichloroethane			mg/kg	0.078	U	0.0011	U	0.072	U	0.0051	U	0.072	U	0.0062	U	-	0.0065	U		0.0015	U					
1,1-Dichloroethane	26	0.27	mg/kg	0.078	U	0.0011	U	0.072	U	0.0051	U	0.072	U	0.0062	U	-	0.0065	U		0.0015	U					
1,1-Dichloroethene	100	0.33	mg/kg	0.078	U	0.0011	U	0.072	U	0.0051	U	0.072	U	0.0062	U	-	0.0065	U		0.0015	U					
1,1-Dichloropropene			mg/kg	0.039	U	0.00053	U	0.036	U	0.0025	U	0.036	U	0.0031	U	-	0.0032	U		0.00073	U					
1,2,3-Trichlorobenzene			mg/kg	0.16	U	0.0021	U	0.14	U	0.01	U	0.14	U	0.012	U	-	0.013	U		0.0029	U					
1,2,3-Trichloropropane			mg/kg	0.16	U	0.0021	U	0.14	U	0.01	U	0.14	U	0.012	U	-	0.013	U		0.0029	U					
1,2,4,5-Tetramethylbenzene			mg/kg	0.41		0.006		0.28		0.0022	J	2.6		0.035		-	0.0039	J		0.0043						
1,2,4-Trichlorobenzene			mg/kg	0.16	U	0.0021	U	0.14	U	0.01	U	0.14	U	0.012	U	-	0.013	U		0.0029	U					
1,2,4-Trimethylbenzene	52	3.6	mg/kg	0.046	J	0.0021	U	0.054	J	0.01	U	0.17		0.012	U	-	0.013	U		0.0029	U					
1,2-Dibromo-3-chloropropane			mg/kg	0.23	U	0.0032	U	0.21	U	0.015	U	0.22	U	0.019	U	-	0.02	U		0.0044	U					
1,2-Dibromoethane			mg/kg	0.078	U	0.0011	U	0.072	U	0.0051	U	0.072	U	0.0062	U	-	0.0065	U		0.0015	U					
1,2-Dichlorobenzene	100	1.1	mg/kg	0.16	U	0.0021	U	0.14	U	0.01	U	0.14	U	0.012	U	-	0.013	U		0.0029	U					
1,2-Dichloroethane	3.1	0.02	mg/kg	0.078	U	0.0011	U	0.072	U	0.0051	U	0.072	U	0.0062	U	-	0.0065	U		0.0015	U					
1,2-Dichloroethene, Total			mg/kg	0.018	J	0.0011	U	0.084		0.0051	U	0.072	U	0.0062	U	-	0.0065	U		0.0014	J					
1,2-Dichloropropane			mg/kg	0.078	U	0.0011	U	0.072	U	0.0051	U	0.072	U	0.0062	U	-	0.0065	U		0.0015	U					
1,3,5-Trimethylbenzene	52	8.4	mg/kg	0.16	U	0.0021	U	0.14	U	0.01	U	0.042	J	0.012	U	-	0.013	U		0.0029	U					
1,3-Dichlorobenzene	49	2.4	mg/kg	0.16	U	0.0021	U	0.14	U	0.01	U	0.14	U	0.012	U	-	0.013	U		0.0029	U					
1,3-Dichloropropane			mg/kg	0.16	U	0.0021	U	0.14	U	0.01	U	0.14	U	0.012	U	-	0.013	U		0.0029	U					
1,3-Dichloropropene, Total			mg/kg	0.039	U	0.00053	U	0.036	U	0.0025	U	0.036	U	0.0031	U	-	0.0032	U		0.00073	U					
1,4-Dichlorobenzene	13	1.8	mg/kg	0.16	U	0.0021	U	0.14	U	0.01	U	0.14	U	0.012	U	-	0.013	U		0.0029	U					
1,4-Dioxane	13	0.1	mg/kg	6.2	U	0.085	U	5.7	U	0.4	U	5.7	U	0.5	U	-	0.52	U		0.12	U					
2,2-Dichloropropane			mg/kg	0.16	U	0.0021	U	0.14	U	0.01	U	0.14	U	0.012	U	-	0.013	U		0.0029	U					
2-Butanone	100	0.12	mg/kg	0.78	U	0.0051	J	0.72	U	0.065		0.72	U	0.16		-	0.07			0.015	U					
2-Hexanone			mg/kg	0.78	U	0.011	U	0.72	U	0.051	U	0.72	U	0.062	U	-	0.065	U		0.015	U					
4-Methyl-2-pentanone			mg/kg	0.78	U	0.011	U	0.72	U	0.051	U	0.72	U	0.062	U	-	0.065	U		0.015	U					
Acetone	100	0.05	mg/kg	0.78	U	0.026		0.72	U	0.32		0.72	U	0.8		-	0.36			0.015	U					
Acrylonitrile			mg/kg	0.31	U	0.0042	U	0.29	U	0.02	U	0.29	U	0.025	U	-	0.026	U		0.0058	U					
Benzene	4.8	0.06	mg/kg	0.039	U	0.00053	U	0.036	U	0.0025	U	0.036	U	0.0031	U	-	0.0032	U		0.00073	U					
Bromobenzene			mg/kg	0.16	U	0.0021	U	0.14	U	0.01	U	0.14	U	0.012	U	-	0.013	U		0.0029	U					
Bromochloromethane			mg/kg	0.16	U	0.0021	U	0.14	U	0.01	U	0.14	U	0.012	U	-	0.013	U		0.0029	U					
Bromodichloromethane			mg/kg	0.039	U	0.00053	U	0.036	U	0.0025	U	0.036	U	0.0031	U	-	0.0032	U		0.00073	U					
Bromoform			mg/kg	0.31	U	0.0042	U	0.29	U	0.02	U	0.29	U	0.025	U	-	0.026	U		0.0058	U					
Bromomethane			mg/kg	0.16	U	0.0021	U	0.14	U	0.01	U	0.14	U	0.012	U	-	0.013	U		0.0029	U					
Carbon disulfide			mg/kg	0.78	U	0.011	U	0.72	U	0.051	U	0.72	U	0.062	U	-	0.065	U		0.015	U					
Carbon tetrachloride	2.4	0.76	mg/kg	0.078	U	0.0011	U	0.072	U	0.0051	U	0.072	U	0.0062	U	-	0.0065	U		0.0015	U					
Chlorobenzene	100	1.1	mg/kg	0.039	U	0.00053	U	0.036	U	0.0025	U	0.036	U	0.0031	U	-	0.0032	U		0.00073	U					
Chloroethane			mg/kg	0.16	U	0.0021	U	0.14	U	0.01	U	0.14	U	0.012	U	-	0.013	U		0.0029	U					
Chloroform	49	0.37	mg/kg	0.12	U	0.0016	U	0.11	U	0.0076	U	0.11	U	0.0093	U	-	0.0098	U		0.0022	U					
Chloromethane			mg/kg	0.31	U	0.0042	U	0.29	U	0.02	U	0.29	U	0.025	U	-	0.026	U		0.0058	U					
cis-1,2-Dichloroethene	100	0.25	mg/kg	0.018	J	0.0011	U	0.084		0.0051	U	0.072	U	0.0062	U	-	0.0065	U		0.0014	J					
cis-1,3-Dichloropropene			mg/kg	0.039	U	0.00053	U	0.036	U	0.0025	U	0.036	U	0.0031	U	-	0.0032	U		0.00073	U					
Dibromochloromethane			mg/kg	0.078	U	0.0011	U	0.072	U	0.0051	U	0.072	U	0.0062	U	-	0.0065	U		0.0015	U					
Dibromomethane			mg/kg	0.16	U	0.0021	U	0.14	U	0.01	U	0.14	U	0.012	U	-	0.013	U		0.0029	U					
Dichlorodifluoromethane			mg/kg	0.78	U	0.011	U	0.72	U	0.051	U	0.72	U	0.062	U	-	0.065	U		0.015	U					
Ethyl ether			mg/kg	0.16	U	0.0021	U	0.14	U	0.01	U	0.14	U	0.012	U	-	0.013	U		0.0029	U					
Ethylbenzene	41	1	mg/kg	0.078	U	0.0011	U	0.072	U	0.0051	U	0.011	J	0.0062	U	-	0.0065	U		0.00150						

Notes and Abbreviations:

Table 2B. Semi-Volatile Organic Compound Analytical Results in Soil
65 Eckford Street, Brooklyn, NY

LOCATION			SB-01 (0-2")		SB-01 (18-20')		SB-02 (0-2")		SB-02 (18-20')		SB-03 (0-2")		SB-03 (18-20')		SB-04 (0-2")		SB-04 (18-20')		SB-05 (0-2")		SB-05 (0-2")		
SAMPLING DATE			1/6/2022		1/6/2022		1/6/2022		1/6/2022		1/6/2022		1/6/2022		1/6/2022		1/6/2022		12/27/2021		12/27/2021		
LAB SAMPLE ID			L2200873-01		L2200873-02		L2200873-03		L2200873-04		L2200873-05		L2200873-06		L2200873-07		L2200873-08		L2171041-01		L2171041-01 R1		
	NY-RESRR	NY-UNRES	Units	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual
Semivolatile Organics by GC/MS																							
1,2,4,5-Tetrachlorobenzene			mg/kg	0.6	U	1.7	U	0.61	U	1.6	U	0.62	U	1	U	0.59	U	1.9	U	0.2	U	0.2	U
1,2,4-Trichlorobenzene			mg/kg	0.6	U	1.7	U	0.61	U	1.6	U	0.62	U	1	U	0.59	U	1.9	U	0.071	J	0.071	J
1,2-Dichlorobenzene	100	1.1	mg/kg	0.6	U	1.7	U	0.61	U	1.6	U	0.62	U	1	U	0.59	U	1.9	U	2.3		2.3	
1,3-Dichlorobenzene	49	2.4	mg/kg	0.6	U	1.7	U	0.61	U	1.6	U	0.62	U	1	U	0.59	U	1.9	U	0.21		0.21	
1,4-Dichlorobenzene	13	1.8	mg/kg	0.6	U	1.7	U	0.61	U	1.6	U	0.62	U	1	U	0.59	U	1.9	U	0.83		0.83	
2,4,5-Trichlorophenol			mg/kg	0.6	U	1.7	U	0.61	U	1.6	U	0.62	U	1	U	0.59	U	1.9	U	0.2	U	0.2	U
2,4,6-Trichlorophenol			mg/kg	0.36	U	1	U	0.37	U	0.93	U	0.37	U	0.61	U	0.35	U	1.2	U	0.12	U	0.12	U
2,4-Dichlorophenol			mg/kg	0.54	U	1.5	U	0.55	U	1.4	U	0.55	U	0.92	U	0.53	U	1.7	U	0.18	U	0.18	U
2,4-Dimethylphenol			mg/kg	0.6	U	1.7	U	0.61	U	1.6	U	0.62	U	1	U	0.59	U	1.9	U	0.2	U	0.2	U
2,4-Dinitrophenol			mg/kg	2.9	U	8	U	2.9	U	7.4	U	3	U	4.9	U	2.8	U	9.3	U	0.98	U	0.98	U
2,4-Dinitrotoluene			mg/kg	0.6	U	1.7	U	0.61	U	1.6	U	0.62	U	1	U	0.59	U	1.9	U	0.2	U	0.2	U
2,6-Dinitrotoluene			mg/kg	0.6	U	1.7	U	0.61	U	1.6	U	0.62	U	1	U	0.59	U	1.9	U	0.2	U	0.2	U
2-Chloronaphthalene			mg/kg	0.6	U	1.7	U	0.61	U	1.6	U	0.62	U	1	U	0.59	U	1.9	U	0.2	U	0.2	U
2-Chlorophenol			mg/kg	0.6	U	1.7	U	0.61	U	1.6	U	0.62	U	1	U	0.59	U	1.9	U	0.2	U	0.2	U
2-Methylnaphthalene			mg/kg	0.72	U	2	U	0.73	U	1.9	U	0.74	U	1.2	U	0.7	U	2.3	U	0.032	J	0.032	J
2-Methylphenol	100	0.33	mg/kg	0.6	U	1.7	U	0.61	U	1.6	U	0.62	U	1	U	0.59	U	1.9	U	0.2	U	0.2	U
2-Nitroaniline			mg/kg	0.6	U	1.7	U	0.61	U	1.6	U	0.62	U	1	U	0.59	U	1.9	U	0.2	U	0.2	U
2-Nitrophenol			mg/kg	1.3	U	3.6	U	1.3	U	3.4	U	1.3	U	2.2	U	1.3	U	4.2	U	0.44	U	0.44	U
3,3'-Dichlorobenzidine			mg/kg	0.6	U	1.7	U	0.61	U	1.6	U	0.62	U	1	U	0.59	U	1.9	U	0.2	U	0.2	U
3-Methylphenol/4-Methylphenol	100	0.33	mg/kg	0.86	U	2.4	U	0.88	U	2.2	U	0.89	U	1.5	U	0.85	U	2.8	U	0.29	U	0.29	U
3-Nitroaniline			mg/kg	0.6	U	1.7	U	0.61	U	1.6	U	0.62	U	1	U	0.59	U	1.9	U	0.2	U	0.2	U
4,6-Dinitro-o-cresol			mg/kg	1.6	U	4.4	U	1.6	U	4	U	1.6	U	2.6	U	1.5	U	5	U	0.53	U	0.53	U
4-Bromophenyl phenyl ether			mg/kg	0.6	U	1.7	U	0.61	U	1.6	U	0.62	U	1	U	0.59	U	1.9	U	0.2	U	0.2	U
4-Chloroaniline			mg/kg	0.6	U	1.7	U	0.61	U	1.6	U	0.62	U	1	U	0.59	U	1.9	U	0.2	U	0.2	U
4-Chlorophenyl phenyl ether			mg/kg	0.6	U	1.7	U	0.61	U	1.6	U	0.62	U	1	U	0.59	U	1.9	U	0.2	U	0.2	U
4-Nitroaniline			mg/kg	0.6	U	1.7	U	0.61	U	1.6	U	0.62	U	1	U	0.59	U	1.9	U	0.2	U	0.2	U
4-Nitrophenol			mg/kg	0.84	U	2.3	U	0.86	U	2.2	U	0.86	U	1.4	U	0.82	U	2.7	U	0.28	U	0.28	U
Acenaphthene	100	20	mg/kg	0.48	U	1.3	U	0.49	U	1.2	U	0.49	U	0.82	U	0.47	U	1.5	U	0.03	J	0.03	J
Acenaphthylene	100	100	mg/kg	0.48	U	1.3	U	0.49	U	1.2	U	0.49	U	0.82	U	0.47	U	1.5	U	0.16	U	0.16	U
Acetophenone			mg/kg	0.6	U	1.7	U	0.61	U	1.6	U	0.62	U	1	U	0.59	U	1.9	U	0.2	U	0.2	U
Anthracene	100	100	mg/kg	0.36	U	1	U	0.37	U	0.93	U	0.27	J	0.61	U	0.35	U	1.2	U	0.059	J	0.059	J
Benzo(a)anthracene	1	1	mg/kg	0.4		1		0.2	J	0.93	U	0.73		0.14	J	0.28	J	1.2	U	0.18		0.18	
Benzo(a)pyrene	1	1	mg/kg	0.41	J	1.3	U	0.23	J	1.2	U	0.71		0.82	U	0.34	J	1.5	U	0.16		0.16	
Benzo(b)fluoranthene	1	1	mg/kg	0.52		1	U	0.3	J	0.93	U	0.84		0.19	J	0.43		1.2	U	0.21		0.21	
Benzo(ghi)perylene	100	100	mg/kg	0.3	J	1.3	U	0.18	J	1.2	U	0.44	J	0.82	U	0.26	J	1.5	U	0.13	J	0.13	J
Benzo(k)fluoranthene	3.9	0.8	mg/kg	0.16	J	1	U	0.37	U	0.93	U	0.29	J	0.61	U	0.11	J	1.2	U	0.065	J	0.065	J
Benzoic Acid			mg/kg	1.9	U	5.4	U	2	U	5	U	2	U	3.3	U	1.9	U	6.3	U	0.66	U	0.66	U
Benzyl Alcohol			mg/kg	0.6	U	1.7	U	0.61	U	1.6	U	0.62	U	1	U	0.59	U	1.9	U	0.2	U	0.2	U
Biphenyl			mg/kg	1.4	U	3.8	U	1.4	U	3.5	U	1.4	U	2.3	U	1.3	U	4.4	U	0.46	U	0.46	U
Bis(2-chloroethoxy)methane			mg/kg	0.65	U	1.8	U	0.66	U	1.7	U	0.66	U	1.1	U	0.63	U	2.1	U	0.22	U	0.22	U
Bis(2-chloroethyl)ether			mg/kg	0.54	U	1.5	U	0.55	U	1.4	U	0.55	U	0.92	U	0.53	U	1.7	U	0.18	U	0.18	U
Bis(2-chloroisopropyl)ether			mg/kg	0.72	U	2	U	0.73	U	1.9	U	0.74	U	1.2	U	0.7	U	2.3	U	0.24	U	0.24	U
Bis(2-ethylhexyl)phthalate			mg/kg	0.6	U	1.7	U	0.61	U	1.6	U	0.62	U	1	U	0.59	U	1.9	U	0.077	J	0.077	J
Butyl benzyl phthalate			mg/kg	0.6	U	1.7	U	0.61	U	1.6	U	0.62	U	1	U	0.59	U	1.9	U	0.2	U	0.2	U
Carbazole			mg/kg	0.6	U	1.7	U	0.61	U	1.6	U	0.62	U	1	U	0.59	U	1.9	U	0.022	J	0.022	J
Chrysene	3.9	1	mg/kg	0.38		1	U	0.2	J	0.93	U	0.66		0.14	J	0.27	J	1.2	U	0.17		0.17	
Di-n-butylphthalate			mg/kg	0.6	U	1.7	U	0.61	U	1.6	U	0.62	U	1	U	0.59	U	1.9	U	0.2	U	0.2	U
Di-n-octylphthalate			mg/kg	0.6	U	1.7	U	0.61	U	1.6	U	0.62	U	1	U	0.59	U	1.9	U	0.2>			

Table 2B. Semi-Volatile Organic Compound Analytical Results in Soil
65 Eckford Street, Brooklyn, NY

LOCATION			SB-05 (18-20')		SB-06 (0-2")		SB-06 (18-20')		SB-07 (0-2")		SB-07 (18-20')		SB-08 (0-2")		SB-08 (18-20')		SB-09 (0-2")		SB-09 (18-20')		SB-10 (0-2")		
SAMPLING DATE			12/27/2021		12/27/2021		12/27/2021		1/6/2022		1/6/2022		1/6/2022		1/6/2022		12/27/2021		12/27/2021		12/27/2021		
LAB SAMPLE ID			L2171041-02		L2171041-03		L2171041-04		L2200873-09		L2200873-10		L2200873-11		L2200873-12		L2171041-05		L2171041-06		L2171041-07		
NY-RESRR NY-UNRES			Units	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual
Semivolatile Organics by GC/MS																							
1,2,4,5-Tetrachlorobenzene			mg/kg	0.2	U	1.1	U	0.2	U	0.61	U	1.8	U	0.65	U	1.6	U	0.2	U	0.81	U	0.21	U
1,2,4-Trichlorobenzene			mg/kg	0.2	U	1.1	U	0.2	U	0.61	U	1.8	U	0.65	U	1.6	U	0.2	U	0.81	U	0.21	U
1,2-Dichlorobenzene	100	1.1	mg/kg	0.2	U	1.1	U	0.2	U	0.61	U	1.8	U	0.65	U	1.6	U	0.2	U	0.81	U	0.21	U
1,3-Dichlorobenzene	49	2.4	mg/kg	0.2	U	1.1	U	0.2	U	0.61	U	1.8	U	0.65	U	1.6	U	0.2	U	0.81	U	0.21	U
1,4-Dichlorobenzene	13	1.8	mg/kg	0.2	U	1.1	U	0.2	U	0.61	U	1.8	U	0.65	U	1.6	U	0.2	U	0.81	U	0.21	U
2,4,5-Trichlorophenol			mg/kg	0.2	U	1.1	U	0.2	U	0.61	U	1.8	U	0.65	U	1.6	U	0.2	U	0.81	U	0.21	U
2,4,6-Trichlorophenol			mg/kg	0.12	U	0.65	U	0.12	U	0.36	U	1	U	0.39	U	0.93	U	0.12	U	0.49	U	0.13	U
2,4-Dichlorophenol			mg/kg	0.18	U	0.97	U	0.18	U	0.55	U	1.6	U	0.58	U	1.4	U	0.18	U	0.73	U	0.19	U
2,4-Dimethylphenol			mg/kg	0.2	U	1.1	U	0.2	U	0.61	U	1.8	U	0.65	U	1.6	U	0.2	U	0.81	U	0.21	U
2,4-Dinitrophenol			mg/kg	0.96	U	5.2	U	0.95	U	2.9	U	8.4	U	3.1	U	7.4	U	0.95	U	3.9	U	1	U
2,4-Dinitrotoluene			mg/kg	0.2	U	1.1	U	0.2	U	0.61	U	1.8	U	0.65	U	1.6	U	0.2	U	0.81	U	0.21	U
2,6-Dinitrotoluene			mg/kg	0.2	U	1.1	U	0.2	U	0.61	U	1.8	U	0.65	U	1.6	U	0.2	U	0.81	U	0.21	U
2-Chloronaphthalene			mg/kg	0.2	U	1.1	U	0.2	U	0.61	U	1.8	U	0.65	U	1.6	U	0.2	U	0.81	U	0.21	U
2-Chlorophenol			mg/kg	0.2	U	1.1	U	0.2	U	0.61	U	1.8	U	0.65	U	1.6	U	0.2	U	0.81	U	0.21	U
2-Methylnaphthalene			mg/kg	0.24	U	0.55	J	0.025	J	0.73	U	2.1	U	0.12	J	1.9	U	0.025	J	0.98	U	0.089	J
2-Methylphenol	100	0.33	mg/kg	0.2	U	1.1	U	0.2	U	0.61	U	1.8	U	0.65	U	1.6	U	0.2	U	0.81	U	0.21	U
2-Nitroaniline			mg/kg	0.2	U	1.1	U	0.2	U	0.61	U	1.8	U	0.65	U	1.6	U	0.2	U	0.81	U	0.21	U
2-Nitrophenol			mg/kg	0.43	U	2.3	U	0.43	U	1.3	U	3.8	U	1.4	U	3.4	U	0.43	U	1.8	U	0.46	U
3,3'-Dichlorobenzidine			mg/kg	0.2	U	1.1	U	0.2	U	0.61	U	1.8	U	0.65	U	1.6	U	0.2	U	0.81	U	0.21	U
3-Methylphenol/4-Methylphenol	100	0.33	mg/kg	0.29		1.1	J	0.12	J	0.88	U	2.5	U	0.93	U	2.2	U	0.28	U	1.2	U	0.66	
3-Nitroaniline			mg/kg	0.2	U	1.1	U	0.2	U	0.61	U	1.8	U	0.65	U	1.6	U	0.2	U	0.81	U	0.21	U
4,6-Dinitro-o-cresol			mg/kg	0.52	U	2.8	U	0.51	U	1.6	U	4.6	U	1.7	U	4	U	0.51	U	2.1	U	0.55	U
4-Bromophenyl phenyl ether			mg/kg	0.2	U	1.1	U	0.2	U	0.61	U	1.8	U	0.65	U	1.6	U	0.2	U	0.81	U	0.21	U
4-Chloroaniline			mg/kg	0.2	U	1.1	U	0.2	U	0.61	U	1.8	U	0.65	U	1.6	U	0.2	U	0.81	U	0.21	U
4-Chlorophenyl phenyl ether			mg/kg	0.2	U	1.1	U	0.2	U	0.61	U	1.8	U	0.65	U	1.6	U	0.2	U	0.81	U	0.21	U
4-Nitroaniline			mg/kg	0.2	U	1.1	U	0.2	U	0.61	U	1.8	U	0.65	U	1.6	U	0.2	U	0.81	U	0.21	U
4-Nitrophenol			mg/kg	0.28	U	1.5	U	0.28	U	0.85	U	2.5	U	0.91	U	2.2	U	0.28	U	1.1	U	0.3	U
Acenaphthene	100	20	mg/kg	0.04	J	0.38	J	0.12	J	0.49	U	1.4	U	0.52	U	1.2	U	0.16	U	0.65	U	0.15	J
Acenaphthylene	100	100	mg/kg	0.16	U	0.86	U	0.16	U	0.49	U	1.4	U	0.52	U	1.2	U	0.16	U	0.65	U	0.037	J
Acetophenone			mg/kg	0.2	U	1.1	U	0.2	U	0.61	U	1.8	U	0.65	U	1.6	U	0.2	U	0.81	U	0.21	U
Anthracene	100	100	mg/kg	0.055	J	0.29	J	0.042	J	0.36	U	1	U	0.39	U	0.93	U	0.06	J	0.49	U	0.25	
Benzo(a)anthracene	1	1	mg/kg	0.2		0.72		0.11	J	0.2	J	1	U	0.25	J	0.93	U	0.22		0.49	U	0.76	
Benzo(a)pyrene	1	1	mg/kg	0.16		0.75	J	0.078	J	0.24	J	1.4	U	0.22	J	1.2	U	0.22		0.65	U	0.7	
Benzo(b)fluoranthene	1	1	mg/kg	0.19		0.92		0.11	J	0.27	J	1	U	0.28	J	0.93	U	0.28		0.49	U	0.88	
Benzo(ghi)perylene	100	100	mg/kg	0.095	J	0.54	J	0.061	J	0.19	J	1.4	U	0.21	J	1.2	U	0.17		0.65	U	0.48	
Benzo(k)fluoranthene	3.9	0.8	mg/kg	0.064	J	0.32	J	0.04	J	0.1	J	1	U	0.39	U	0.93	U	0.082	J	0.49	U	0.27	
Benzoic Acid			mg/kg	0.65	U	3.5	U	0.64	U	2	U	5.7	U	2.1	U	5	U	0.64	U	2.6	U	0.69	U
Benzyl Alcohol			mg/kg	0.2	U	1.1	U	0.2	U	0.61	U	1.8	U	0.65	U	1.6	U	0.2	U	0.81	U	0.21	U
Biphenyl			mg/kg	0.46	U	2.4	U	0.45	U	1.4	U	4	U	1.5	U	3.5	U	0.45	U	1.8	U	0.48	U
Bis(2-chloroethoxy)methane			mg/kg	0.22	U	1.2	U	0.21	U	0.66	U	1.9	U	0.7	U	1.7	U	0.21	U	0.88	U	0.23	U
Bis(2-chloroethyl)ether			mg/kg	0.18	U	0.97	U	0.18	U	0.55	U	1.6	U	0.58	U	1.4	U	0.18	U	0.73	U	0.19	U
Bis(2-chloroisopropyl)ether			mg/kg	0.24	U	1.3	U	0.24	U	0.73	U	2.1	U	0.78	U	1.9	U	0.24	U	0.98	U	0.25	U
Bis(2-ethylhexyl)phthalate			mg/kg	0.2	U	1.2	U	0.2	U	0.61	U	1.8	U	0.65	U	1.6	U	0.088	J	0.81	U	0.11	J
Butyl benzyl phthalate			mg/kg	0.2	U	1.1	U	0.2	U	0.61	U	1.8	U	0.65	U	1.6	U	0.2	U	0.81	U	0.21	U
Carbazole			mg/kg	0.022	J	1.1	U	0.2	U	0.61	U	1.8	U	0.65	U	1.6	U	0.022	J	0.81	U	0.091	J
Chrysene	3.9	1	mg/kg	0.17		0.74		0.1	J	0.2	J	1	U	0.25	J	0.93	U	0.22		0.49	U	0.75	
Di-n-butylphthalate			mg/kg	0.2	U	1.1	U	0.2	U	0.61	U	1.8	U	0.65	U	1.6	U	0.2	U	0.81	U		

Table 2B. Semi-Volatile Organic Compound Analytical Results in Soil
65 Eckford Street, Brooklyn, NY

LOCATION			SB-10 (18-20')			SB-11 (0-2")			SB-11 (18-20')			SB-12 (0-2")			SB-12 (18-20')			DUP01_20220106			DUP02_20220106		
SAMPLING DATE			12/27/2021			1/6/2022			1/6/2022			1/6/2022			1/6/2022			1/6/2022			1/6/2022		
LAB SAMPLE ID			L2171041-08			L2200873-13			L2200873-14			L2200873-15			L2200873-16			L2200873-17			L2200873-18		
	NY-RESRR	NY-UNRES	Units	Results	Qual	Results	Qual		Results	Qual		Results	Qual		Results	Qual		Results	Qual		Results	Qual	
Semivolatile Organics by GC/MS																							
1,2,4,5-Tetrachlorobenzene			mg/kg	0.22	U	0.58	U		1.9	U		0.64	U		2	U		2.2	U		0.63	U	
1,2,4-Trichlorobenzene			mg/kg	0.22	U	0.58	U		1.9	U		0.64	U		2	U		2.2	U		0.63	U	
1,2-Dichlorobenzene	100	1.1	mg/kg	0.22	U	0.58	U		1.9	U		0.64	U		2	U		2.2	U		0.63	U	
1,3-Dichlorobenzene	49	2.4	mg/kg	0.22	U	0.58	U		1.9	U		0.64	U		2	U		2.2	U		0.63	U	
1,4-Dichlorobenzene	13	1.8	mg/kg	0.22	U	0.58	U		1.9	U		0.64	U		2	U		2.2	U		0.63	U	
2,4,5-Trichlorophenol			mg/kg	0.22	U	0.58	U		1.9	U		0.64	U		2	U		2.2	U		0.63	U	
2,4,6-Trichlorophenol			mg/kg	0.13	U	0.35	U		1.2	U		0.38	U		1.2	U		1.3	U		0.38	U	
2,4-Dichlorophenol			mg/kg	0.19	U	0.52	U		1.8	U		0.58	U		1.8	U		2	U		0.56	U	
2,4-Dimethylphenol			mg/kg	0.22	U	0.58	U		1.9	U		0.64	U		2	U		2.2	U		0.63	U	
2,4-Dinitrophenol			mg/kg	1	U	2.8	U		9.3	U		3.1	U		9.8	U		11	U		3	U	
2,4-Dinitrotoluene			mg/kg	0.22	U	0.58	U		1.9	U		0.64	U		2	U		2.2	U		0.63	U	
2,6-Dinitrotoluene			mg/kg	0.22	U	0.58	U		1.9	U		0.64	U		2	U		2.2	U		0.63	U	
2-Chloronaphthalene			mg/kg	0.22	U	0.58	U		1.9	U		0.64	U		2	U		2.2	U		0.63	U	
2-Chlorophenol			mg/kg	0.22	U	0.58	U		1.9	U		0.64	U		2	U		2.2	U		0.63	U	
2-Methylnaphthalene			mg/kg	0.28	U	0.69	U		2.3	U		0.77	U		2.4	U		2.7	U		0.75	U	
2-Methylphenol	100	0.33	mg/kg	0.22	U	0.58	U		1.9	U		0.64	U		2	U		2.2	U		0.63	U	
2-Nitroaniline			mg/kg	0.22	U	0.58	U		1.9	U		0.64	U		2	U		2.2	U		0.63	U	
2-Nitrophenol			mg/kg	0.46	U	1.2	U		4.2	U		1.4	U		4.4	U		4.8	U		1.4	U	
3,3'-Dichlorobenzidine			mg/kg	0.22	U	0.58	U		1.9	U		0.64	U		2	U		2.2	U		0.63	U	
3-Methylphenol/4-Methylphenol	100	0.33	mg/kg	0.13	J	0.83	U		0.55	J		0.92	U		2.9	U		3.2	U		0.9	U	
3-Nitroaniline			mg/kg	0.22	U	0.58	U		1.9	U		0.64	U		2	U		2.2	U		0.63	U	
4,6-Dinitro-o-cresol			mg/kg	0.56	U	1.5	U		5	U		1.7	U		5.3	U		5.8	U		1.6	U	
4-Bromophenyl phenyl ether			mg/kg	0.22	U	0.58	U		1.9	U		0.64	U		2	U		2.2	U		0.63	U	
4-Chloroaniline			mg/kg	0.22	U	0.58	U		1.9	U		0.64	U		2	U		2.2	U		0.63	U	
4-Chlorophenyl phenyl ether			mg/kg	0.22	U	0.58	U		1.9	U		0.64	U		2	U		2.2	U		0.63	U	
4-Nitroaniline			mg/kg	0.22	U	0.58	U		1.9	U		0.64	U		2	U		2.2	U		0.63	U	
4-Nitrophenol			mg/kg	0.3	U	0.81	U		2.7	U		0.9	U		2.8	U		3.1	U		0.88	U	
Acenaphthene	100	20	mg/kg	1.1		0.46	U		1.6	U		0.2	J		1.6	U		1.8	U		0.5	U	
Acenaphthylene	100	100	mg/kg	0.17		0.46	U		1.6	U		0.51	U		1.6	U		1.8	U		0.5	U	
Acetophenone			mg/kg	0.22	U	0.58	U		1.9	U		0.64	U		2	U		2.2	U		0.63	U	
Anthracene	100	100	mg/kg	1.4		0.35	U		1.2	U		0.3	J		1.2	U		1.3	U		0.38	U	
Benzo(a)anthracene	1	1	mg/kg	3.4		0.21	J		1.2	U		0.74			1.2	U		1.3	U		0.11	J	
Benzo(a)pyrene	1	1	mg/kg	2.7		0.25	J		1.6	U		0.7			1.6	U		1.8	U		0.5	U	
Benzo(b)fluoranthene	1	1	mg/kg	3.7		0.29	J		1.2	U		0.93			1.2	U		1.3	U		0.17	J	
Benzo(ghi)perylene	100	100	mg/kg	1.6		0.17	J		1.6	U		0.41	J		1.6	U		1.8	U		0.098	J	
Benzo(k)fluoranthene	3.9	0.8	mg/kg	1		0.11	J		1.2	U		0.23	J		1.2	U		1.3	U		0.38	U	
Benzoic Acid			mg/kg	0.7	U	1.9	U		6.3	U		2.1	U		6.6	U		7.2	U		2	U	
Benzyl Alcohol			mg/kg	0.22	U	0.58	U		1.9	U		0.64	U		2	U		2.2	U		0.63	U	
Biphenyl			mg/kg	0.078	J	1.3	U		4.4	U		1.5	U		4.6	U		5.1	U		1.4	U	
Bis(2-chloroethoxy)methane			mg/kg	0.23	U	0.62	U		2.1	U		0.69	U		2.2	U		2.4	U		0.68	U	
Bis(2-chloroethyl)ether			mg/kg	0.19	U	0.52	U		1.8	U		0.58	U		1.8	U		2	U		0.56	U	
Bis(2-chloroisopropyl)ether			mg/kg	0.26	U	0.69	U		2.3	U		0.77	U		2.4	U		2.7	U		0.75	U	
Bis(2-ethylhexyl)phthalate			mg/kg	0.22	U	0.58	U		1.9	U		0.64	U		2	U		2.2	U		18		
Butyl benzyl phthalate			mg/kg	0.22	U	0.58	U		1.9	U		0.64	U		2	U		2.2	U		0.63	U	
Carbazole			mg/kg	0.76		0.58	U		1.9	U		0.072	J		2	U		2.2	U		0.63	U	
Chrysene	3.9	1	mg/kg	3.4		0.2	J		1.2	U		0.7			1.2	U		1.3	U		0.11	J	
Di-n-butylphthalate			mg/kg	0.22	U	0.58	U		1.9	U		0.64	U		2	U		2.2	U		0.63	U	
Di-n-octylphthalate			mg/kg	0.22	U	0.58	U		1.9	U		0.64	U		2	U		2.2	U		0.63	U	
Dibenzo(a,h)anthracene	0.33	0.33	mg/kg	0.49		0.35	U		1.2	U		0.11	J		1.2	U		1.3	U		0.38	U	
Dibenzofuran	59	7	mg/kg	0.6		0.58	U		1.9	U		0.12	J		2	U		2.2	U		0.63	U	
Diethyl phthalate			mg/kg	0.22	U	0.58	U		1.9	U		0.64	U		2	U		2.2	U		0.63	U	
Dimethyl phthalate			mg/kg	0.22	U	0.58	U		1.9	U		0.64	U		2	U		2.2	U		0.63	U	
Fluoranthene	100	100	mg/kg	5.8		0.4			1.2	U		1.6			1.2	U		1.3	U		0.14	J	
Fluorene	100	30	mg/kg	0.93		0.58	U		1.9	U		0.24	J		2	U		2.2	U		0.63	U	
Hexachlorobenzene	1.2	0.33	mg/kg	0.13	U	0.35	U		1.2	U		0.38	U		1.2	U		1.3	U		0.38	U	
Hexachlorobutadiene			mg/kg	0.22	U	0.58	U		1.9	U		0.64	U		2	U		2.2	U		0.63	U	
Hexachlorocyclopentadiene			mg/kg	0.62	U	1.6	U		5.6	U		1.8	U		5.8	U		6.4	U		1.8	U	
Hexachloroethane			mg/kg	0.17	U	0.46	U		1.6	U		0.51	U		1.6	U		1.8	U		0.5	U	
Indeno(1,2,3-cd)pyrene	0.5	0.5	mg/kg	1.8		0.17	J		1.6	U		0.45	J		1.6	U		1.8	U		0.098	J	
Isophorone			mg/kg	0.19	U	0.52	U		1.8	U		0.58	U		1.8	U		2	U		0.56	U	
n-Nitrosodi-n-propylamine			mg/kg	0.22	U	0.58	U		1.9	U		0.64	U		2	U		2.2	U		0.63	U	
Naphthalene	100	12	mg/kg	0.52		0.58	U		1.9	U		0.12	J		2	U		2.2	U		0.63	U	
NDPA/DPA			mg/kg	0.17	U	0.46	U		1.6	U		0.51	U		1.6	U		1.8	U		0.5	U	
Nitrobenzene			mg/kg	0.19	U	0.52	U		1.8	U		0.58	U		1.8	U		2	U		0.56	U	
p-Chloro-m-cresol			mg/kg	0.22	U	0.58	U		1.9	U		0.64	U		2	U		2.2	U		0.63	U	
Pentachlorophenol	6.7	0.8	mg/kg	0.17	U	0.46	U		1.6	U		0.51	U		1.6	U		1.8	U		0.5	U	
Phenanthrene	100	100	mg/kg	6.2		0.25	J		1.2	U		1.2			1.2	U		1.3	U		0.085	J	
Phenol	100	0.33	mg/kg	0.22	U	0.58	U		1.9	U		0.64	U		2	U		2.2	U		0.63	U	
Pyrene	100	100	mg/kg	5.4		0.39			0.21	J		1.4			1.2	U		1.3	U		0.16	J	

Notes and Abbreviations:

1. Concentration exceeds NYSDEC Part 375 UU & RRU SCOs

2. Concentration exceeds NYSDEC Part 375 UU SCOs

3. J = Estimated result

4. mg/kg = milligrams per kilogram

5. RRU SCOs: NYSDEC Part

Table 2C. Emerging Contamiants Analytical Results in Soil
65 Eckford Street, Brooklyn, NY

LOCATION				SB-01 (0-2")		SB-01 (18-20')		SB-02 (0-2")		SB-02 (18-20')		SB-03 (0-2")		SB-03 (18-20')		SB-04 (0-2")		SB-04 (18-20')		SB-05 (0-2")		SB-05 (18-20')		SB-06 (0-2")		
SAMPLING DATE				1/6/2022		1/6/2022		1/6/2022		1/6/2022		1/6/2022		1/6/2022		1/6/2022		1/6/2022		12/27/2021		12/27/2021		12/27/2021		
LAB SAMPLE ID				L2200873-01		L2200873-02		L2200873-03		L2200873-04		L2200873-05		L2200873-06		L2200873-07		L2200873-08		L2171041-01		L2171041-02		L2171041-03		
SAMPLE TYPE				SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		
		NY-RESRR	NY-UNRES	Units	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual
General Chemistry																										
Solids, Total				%	76.2		28.4		76.2		29.3		74.7		47.7		80.4		24.5		81.2		82.8		76.5	
Perfluorinated Alkyl Acids by Isotope Dilution																										
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)				ug/g	0.584	U	1.64	U	0.599	U	1.59	U	0.647	U	0.991	U	0.574	U	1.78	U	0.557	U	0.53	U	0.566	U
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)				ug/g	0.23	J	1.64	U	0.599	U	1.59	U	0.647	U	0.991	U	0.284	J	1.78	U	0.557	U	0.53	U	0.566	U
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)				ug/g	0.584	U	1.64	U	0.599	U	1.59	U	0.647	U	0.991	U	0.574	U	1.78	U	0.557	U	0.53	U	0.566	U
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)				ug/g	0.584	U	1.64	U	0.599	U	1.59	U	0.647	U	0.991	U	0.574	U	1.78	U	0.557	U	0.53	U	0.566	U
Perfluorobutanesulfonic Acid (PFBS)				ug/g	0.292	U	0.823	U	0.3	U	0.796	U	0.323	U	0.496	U	0.287	U	0.891	U	0.279	U	0.265	U	0.283	U
Perfluorobutanoic Acid (PFBA)				ug/g	0.584	U	1.64	U	0.599	U	1.59	U	0.647	U	0.991	U	0.574	U	0.33	J	0.282	J	0.53	U	0.566	U
Perfluorodecanesulfonic Acid (PFDS)				ug/g	0.584	U	1.64	U	0.599	U	1.59	U	0.647	U	0.991	U	0.574	U	1.78	U	0.557	U	0.53	U	0.566	U
Perfluorodecanoic Acid (PFDA)				ug/g	0.292	U	0.823	U	0.3	U	0.796	U	0.323	U	0.496	U	0.287	U	0.891	U	0.279	U	0.265	U	0.283	U
Perfluorododecanoic Acid (PFDoA)				ug/g	0.584	U	1.64	U	0.599	U	1.59	U	0.647	U	0.991	U	0.574	U	1.78	U	0.557	U	0.53	U	0.566	U
Perfluoroheptanesulfonic Acid (PFHpS)				ug/g	0.584	U	1.64	U	0.599	U	1.59	U	0.647	U	0.991	U	0.574	U	1.78	U	0.557	U	0.53	U	0.566	U
Perfluoroheptanoic Acid (PFHpA)				ug/g	0.292	U	0.823	U	0.3	U	0.796	U	0.323	U	0.496	U	0.287	U	0.891	U	0.279	U	0.265	U	0.283	U
Perfluorohexanesulfonic Acid (PFHxS)				ug/g	0.292	U	0.823	U	0.3	U	0.796	U	0.323	U	0.496	U	0.287	U	0.891	U	0.279	U	0.265	U	0.283	U
Perfluorohexanoic Acid (PFHxA)				ug/g	0.584	U	1.64	U	0.599	U	1.59	U	0.647	U	0.991	U	0.574	U	1.78	U	1.22		0.078	JF	0.566	U
Perfluorononanoic Acid (PFNA)				ug/g	0.292	U	0.823	U	0.3	U	0.796	U	0.323	U	0.496	U	0.287	U	0.891	U	0.279	U	0.265	U	0.283	U
Perfluorooctanesulfonamide (FOSA)				ug/g	0.584	U	1.64	U	0.599	U	1.59	U	0.647	U	0.991	U	0.574	U	1.78	U	0.557	U	0.53	U	0.566	U
Perfluorooctanesulfonic Acid (PFOS)	44	0.88		ug/g	0.292	U	0.823	U	0.3	U	0.796	U	0.323	U	0.496	U	0.155	J	0.891	U	0.279	U	0.265	U	0.283	U
Perfluorooctanoic Acid (PFOA)	33	0.66		ug/g	0.292	U	0.823	U	0.3	U	0.796	U	0.323	U	0.496	U	0.11	J	0.891	U	0.057	JF	0.051	J	0.283	U
Perfluoropentanoic Acid (PFPeA)				ug/g	0.584	U	1.64	U	0.599	U	1.59	U	0.647	U	0.991	U	0.574	U	1.78	U	0.557	U	0.53	U	0.566	U
Perfluorotetradecanoic Acid (PFTA)				ug/g	0.584	U	1.64	U	0.599	U	1.59	U	0.647	U	0.991	U	0.574	U	1.78	U	0.076	J	0.081	J	0.087	J
Perfluorotridecanoic Acid (PFTTrDA)				ug/g	0.584	U	1.64	U	0.599	U	1.59	U	0.647	U	0.991	U	0.574	U	1.78	U	0.557	U	0.53	U	0.566	U
Perfluoroundecanoic Acid (PFUnA)				ug/g	0.584	U	1.64	U	0.599	U	1.59	U	0.647	U	0.991	U	0.574	U	1.78	U	0.557	U	0.53	U	0.566	U
PFOA/PFOS, Total				ug/g	0.292	U	0.823	U	0.3	U	0.796	U	0.323	U	0.496	U	0.265	J	0.891	U	0.057	J	0.051	J	0.283	U
Semivolatile Organics by GC/MS																										
1,4-Dioxane	13	0.1	mg/kg	0.09	U	0.25	U	0.092	U	0.23	U	0.092	U	0.15	U	0.088	U	0.29	U	0.031	U	0.03	U	0.16	U	U

Notes and Abbreviations:

1. Concentration exceeds NYSDEC Part 375 UU & RRU SCOs
2. Concentration exceeds NYSDEC Part 375 UU SCOs
3. J = Estimated result
4. mg/kg = milligrams per kilogram
5. RRU SCOs: NYSDEC Part 375 Restricted-Residential Criteria
6. UU SCOs: NYSDEC Part 375 New York Unrestricted Use Criteria
7. U = Not detected at the reported detection limit.
8. NA = Sample Not Analyzed for parameter shown.
9. ug/kg = micrograms per kilogram or parts per billions (ppb)

Table 2C. Emerging Contamiants Analytical Results in Soil
65 Eckford Street, Brooklyn, NY

LOCATION				SB-06 (18-20')		SB-07 (0-2")		SB-07 (18-20')		SB-08 (0-2")		SB-08 (18-20')		SB-09 (0-2")		SB-09 (18-20')		SB-10 (0-2")		SB-10 (18-20')		SB-11 (0-2")		SB-11 (18-20')				
SAMPLING DATE				12/27/2021		1/6/2022		1/6/2022		1/6/2022		1/6/2022		12/27/2021		12/27/2021		12/27/2021		12/27/2021		1/6/2022		1/6/2022				
LAB SAMPLE ID				L2171041-04		L2200873-09		L2200873-10		L2200873-11		L2200873-12		L2171041-05		L2171041-06		L2171041-07		L2171041-08		L2200873-13		L2200873-14				
SAMPLE TYPE				SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL				
	NY-RESRR	NY-UNRES	Units	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual			
General Chemistry																												
Solids, Total						%	84		77.1		27.5		76.4		31.4		82.7		61.1		77.7		77.3		80.7		24.6	
Perfluorinated Alkyl Acids by Isotope Dilution																												
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)						ug/g	0.57	U	0.615	U	1.77	U	0.629	U	1.48	U	0.551	U	0.806	U	0.58	U	0.606	U	0.594	U	1.84	U
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)						ug/g	0.57	U	0.615	U	1.77	U	0.629	U	1.48	U	0.551	U	0.806	U	0.58	U	0.606	U	0.594	U	1.84	U
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)						ug/g	0.57	U	0.615	U	1.77	U	0.629	U	1.48	U	0.551	U	0.806	U	0.58	U	0.606	U	0.594	U	1.84	U
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)						ug/g	0.57	U	0.615	U	1.77	U	0.629	U	1.48	U	0.551	U	0.806	U	0.58	U	0.606	U	0.594	U	1.84	U
Perfluorobutanesulfonic Acid (PFBS)						ug/g	0.285	U	0.307	U	0.887	U	0.315	U	0.739	U	0.275	U	0.403	U	0.29	U	0.303	U	0.297	U	0.918	U
Perfluorobutanoic Acid (PFBA)						ug/g	0.57	U	0.615	U	1.77	U	0.629	U	1.48	U	0.03	J	0.806	U	0.136	J	0.606	U	0.594	U	0.694	J
Perfluorodecanesulfonic Acid (PFDS)						ug/g	0.57	U	0.615	U	1.77	U	0.659	F	1.48	U	0.551	U	0.806	U	0.58	U	0.606	U	0.594	U	1.84	U
Perfluorodecanoic Acid (PFDA)						ug/g	0.285	U	0.307	U	0.887	U	0.315	U	0.739	U	0.275	U	0.403	U	0.29	U	0.303	U	0.297	U	0.918	U
Perfluorododecanoic Acid (PFDoA)						ug/g	0.57	U	0.615	U	1.77	U	0.629	U	1.48	U	0.551	U	0.806	U	0.58	U	0.606	U	0.594	U	1.84	U
Perfluoroheptanesulfonic Acid (PFHpS)						ug/g	0.57	U	0.615	U	1.77	U	0.629	U	1.48	U	0.551	U	0.806	U	0.58	U	0.606	U	0.594	U	1.84	U
Perfluoroheptanoic Acid (PFHpA)						ug/g	0.285	U	0.307	U	0.887	U	0.315	U	0.739	U	0.275	U	0.403	U	0.29	U	0.303	U	0.297	U	0.918	U
Perfluorohexanesulfonic Acid (PFHxS)						ug/g	0.285	U	0.307	U	0.887	U	0.098	JF	0.739	U	0.275	U	0.403	U	0.29	U	0.303	U	0.297	U	0.918	U
Perfluorohexanoic Acid (PFHxA)						ug/g	0.57	U	0.615	U	1.77	U	0.629	U	1.48	U	0.551	U	0.098	JF	0.134	J	0.606	U	0.594	U	1.84	U
Perfluorononanoic Acid (PFNA)						ug/g	0.285	U	0.307	U	0.887	U	0.315	U	0.739	U	0.275	U	0.403	U	0.29	U	0.303	U	0.297	U	0.918	U
Perfluorooctanesulfonamide (FOSA)						ug/g	0.57	U	0.615	U	1.77	U	0.629	U	1.48	U	0.551	U	0.806	U	0.58	U	0.606	U	0.594	U	1.84	U
Perfluorooctanesulfonic Acid (PFOS)				44	0.88	ug/g	0.285	U	0.307	U	0.887	U	0.315	U	0.739	U	0.275	U	0.403	U	0.29	U	0.303	U	0.297	U	0.918	U
Perfluorooctanoic Acid (PFOA)				33	0.66	ug/g	0.054	J	0.307	U	0.887	U	0.315	U	0.739	U	0.275	U	0.175	J	0.061	J	0.303	U	0.297	U	0.918	U
Perfluoropentanoic Acid (PFPeA)						ug/g	0.57	U	0.615	U	1.77	U	0.629	U	1.48	U	0.551	U	0.806	U	0.58	U	0.606	U	0.594	U	1.84	U
Perfluorotetradecanoic Acid (PFTA)						ug/g	0.117	J	0.615	U	1.77	U	0.629	U	1.48	U	0.091	J	0.144	J	0.078	JF	0.093	J	0.594	U	1.84	U
Perfluorotridecanoic Acid (PFTTrDA)						ug/g	0.57	U	0.615	U	1.77	U	0.629	U	1.48	U	0.551	U	0.806	U	0.58	U	0.606	U	0.594	U	1.84	U
Perfluoroundecanoic Acid (PFUnA)						ug/g	0.57	U	0.615	U	1.77	U	0.629	U	1.48	U	0.551	U	0.806	U	0.58	U	0.606	U	0.594	U	1.84	U
PFOA/PFOS, Total						ug/g	0.054	J	0.307	U	0.887	U	0.315	U	0.739	U	0.275	U	0.175	J	0.061	J	0.303	U	0.297	U	0.918	U
Semivolatile Organics by GC/MS																												
1,4-Dioxane				13	0.1	mg/kg	0.03	U	0.091	U	0.26	U	0.097	U	0.23	U	0.03	U	0.12	U	0.032	U	0.032	U	0.087	U	0.29	U

Notes and Abbreviations:

1. Concentration exceeds NYSDEC Part 375 UU & RRU SCOs
2. Concentration exceeds NYSDEC Part 375 UU SCOs
3. J = Estimated result
4. mg/kg = milligrams per kilogram
5. RRU SCOs: NYSDEC Part 375 Restricted-Residential Criteria
6. UU SCOs: NYSDEC Part 375 New York Unrestricted Use Criteria
7. U = Not detected at the reported detection limit.
8. NA = Sample Not Analyzed for parameter shown.
9. ug/kg = micrograms per kilogram or parts per billions (ppb)

Table 2C. Emerging Contaminants Analytical Results in Soil
65 Eckford Street, Brooklyn, NY

LOCATION	SB-12 (0-2")			SB-12 (18-20")			DUP01_20220106			DUP02_20220106		
SAMPLING DATE	1/6/2022			1/6/2022			1/6/2022			1/6/2022		
LAB SAMPLE ID	L2200873-15			L2200873-16			L2200873-17			L2200873-18		
SAMPLE TYPE	SOIL			SOIL			SOIL			SOIL		
	NY-RESRR	NY-UNRES	Units	Results	Qual	Results	Qual	Results	Qual	Results	Qual	
General Chemistry												
Solids, Total			%	72.1		22.8		-	22.4		76	
Perfluorinated Alkyl Acids by Isotope Dilution												
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)			ug/g	0.65	U	2.07	U	-	2.05	U	0.64	U
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)			ug/g	0.65	U	2.07	U	-	2.05	U	0.64	U
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)			ug/g	0.65	U	2.07	U	-	2.05	U	0.64	U
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)			ug/g	0.65	U	2.07	U	-	2.05	U	0.64	U
Perfluorobutanesulfonic Acid (PFBS)			ug/g	0.325	U	1.04	U	-	1.03	U	0.32	U
Perfluorobutanoic Acid (PFBA)			ug/g	0.65	U	2.07	U	-	0.168	J	0.64	U
Perfluorodecanesulfonic Acid (PFDS)			ug/g	0.65	U	2.07	U	-	2.05	U	0.64	U
Perfluorodecanoic Acid (PFDA)			ug/g	0.325	U	1.04	U	-	1.03	U	0.32	U
Perfluorododecanoic Acid (PFDoA)			ug/g	0.65	U	2.07	U	-	2.05	U	0.64	U
Perfluoroheptanesulfonic Acid (PFHpS)			ug/g	0.65	U	2.07	U	-	2.05	U	0.64	U
Perfluoroheptanoic Acid (PFHpA)			ug/g	0.325	U	1.04	U	-	1.03	U	0.32	U
Perfluorohexanesulfonic Acid (PFHxS)			ug/g	0.325	U	1.04	U	-	1.03	U	0.32	U
Perfluorohexanoic Acid (PFHxA)			ug/g	0.65	U	2.07	U	-	2.05	U	0.64	U
Perfluorononanoic Acid (PFNA)			ug/g	0.325	U	1.04	U	-	1.03	U	0.32	U
Perfluorooctanesulfonamide (FOSA)			ug/g	0.65	U	2.07	U	-	2.05	U	0.64	U
Perfluorooctanesulfonic Acid (PFOS)	44	0.88	ug/g	0.325	U	1.04	U	-	1.03	U	0.32	U
Perfluorooctanoic Acid (PFOA)	33	0.66	ug/g	0.325	U	1.04	U	-	1.03	U	0.32	U
Perfluoropentanoic Acid (PFPeA)			ug/g	0.65	U	2.07	U	-	2.05	U	0.64	U
Perfluorotetradecanoic Acid (PFTA)			ug/g	0.65	U	2.07	U	-	2.05	U	0.64	U
Perfluorotridecanoic Acid (PFTTrDA)			ug/g	0.65	U	2.07	U	-	2.05	U	0.64	U
Perfluoroundecanoic Acid (PFUnA)			ug/g	0.65	U	2.07	U	-	2.05	U	0.64	U
PFOA/PFOS, Total			ug/g	0.325	U	1.04	U	-	1.03	U	0.32	U
Semivolatile Organics by GC/MS												
1,4-Dioxane	13	0.1	mg/kg	0.096	U	0.31	U	-	0.33	U	0.094	U

Notes and Abbreviations:

1. Concentration exceeds NYSDEC Part 375 UU & RRU SCOs
2. Concentration exceeds NYSDEC Part 375 UU SCOs
3. J = Estimated result
4. mg/kg = milligrams per kilogram
5. RRU SCOs: NYSDEC Part 375 Restricted-Residential Criteria
6. UU SCOs: NYSDEC Part 375 New York Unrestricted Use Criteria
7. U = Not detected at the reported detection limit.
8. NA = Sample Not Analyzed for parameter shown.
9. ug/kg = micrograms per kilogram or parts per billions (ppb)

Table 2D. Total Metals Analytical Results in Soil
65 Eckford Street, Brooklyn, NY

LOCATION				SB-01 (0-2")		SB-01 (18-20")		SB-02 (0-2")		SB-02 (18-20")		SB-03 (0-2")		SB-03 (18-20")		SB-04 (0-2")		SB-04 (18-20")		SB-05 (0-2")		SB-05 (18-20")		SB-06 (0-2")		SB-06 (18-20")		SB-07 (0-2")		
SAMPLING DATE				1/6/2022		1/6/2022		1/6/2022		1/6/2022		1/6/2022		1/6/2022		1/6/2022		1/6/2022		12/27/2021		12/27/2021		12/27/2021		12/27/2021		1/6/2022		
LAB SAMPLE ID				L2200873-01		L2200873-02		L2200873-03		L2200873-04		L2200873-05		L2200873-06		L2200873-07		L2200873-08		L2171041-01		L2171041-02		L2171041-03		L2171041-04		L2200873-09		
SAMPLE TYPE				SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		
				NY-RESRR	NY-UNRES	Units	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual
Total Metals																														
Aluminum, Total			mg/kg	4650		17300			5190		3950		5530		2380		3270		2620		7760		3940		2710		2720		5190	
Antimony, Total			mg/kg	1.62	J	13.6	U		2.79	J	1.25	J	2.74	J	8.14	U	2.98	J	16.2	U	4.81	U	4.64	U	3.99	J	0.496	J	1.66	J
Arsenic, Total	16	13	mg/kg	8.74		10			12		1.94	J	18		1.55	J	11		3.83		6.42		14.2		40.2		14.6		11.6	
Barium, Total	400	350	mg/kg	123		102			148		19.7		129		19.7		146		19.6		250		61.6		123		39.1		140	
Beryllium, Total	72	7.2	mg/kg	0.273	J	1.06	J		0.314	J	0.239	J	0.231	J	0.228	J	0.224	J	0.13	J	0.346	J	0.213	J	0.223	J	0.165	J	0.306	J
Cadmium, Total	4.3	2.5	mg/kg	0.607	J	0.706	J		0.807	J	0.292	J	1.28		0.179	J	0.819	J	3.25	U	0.375	J	0.288	J	0.924	J	0.285	J	0.835	J
Calcium, Total			mg/kg	20400		7770			28600		6640		46300		7730		9120		7580		39600		3790		17700		4740		19900	
Chromium, Total			mg/kg	30		27.9			21.6		8.39		34.9		6.48		15.9		6.92		57		13.3		9.95		7.12		23	
Cobalt, Total			mg/kg	5.48		8.45			6		3.42	J	10.7		0.749	J	5.08		1.2	J	5.53		5.46		5.18		3.92		6.61	
Copper, Total	270	50	mg/kg	129		33.4			102		5.15		113		3.35		181		5.88		44.8		68.7		556		31		111	
Iron, Total			mg/kg	13100		20000			22700		9670		39900		5520		12900		3530		17600		19200		18900		10200		21100	
Lead, Total	400	63	mg/kg	1240		266			489		18.1		334		8.63		682		36.1		180		143		446		86.8		648	
Magnesium, Total			mg/kg	1590		3770			1820		5150		2330		4580		1010		5570		2260		1370		1170		1170		1660	
Manganese, Total	2000	1600	mg/kg	212		236			429		70.9		243		82.4		172		52.3		246		256		189		101		284	
Mercury, Total	0.81	0.18	mg/kg	2.46		0.593			1.64		0.208	J	2.27		0.135	U	1.82		0.444		0.926		0.768		0.823		0.553		3.97	
Nickel, Total	310	30	mg/kg	56.1		26.5			24.6		11		24.3		4.88		20.7		10.1		16.4		15.5		13.9		9.15		24.6	
Potassium, Total			mg/kg	693		1870			964		1030		590		315	J	554		663	J	772		673		743		393		877	
Selenium, Total	180	3.9	mg/kg	0.536	J	5.43	U		0.545	J	5.31	U	0.778	J	0.96	J	1.1	J	1.78	J	1.3	J	0.872	J	2.42		1.11	J	0.509	J
Silver, Total	180	2	mg/kg	1.01	U	2.72	U		1.05	U	2.65	U	1.05	U	1.63	U	0.351	J	3.25	U	0.962	U	0.918	J	0.69	J	0.919	U	1.02	U
Sodium, Total			mg/kg	190	J	903			253		1500		141	J	321	J	242		2650		141	J	144	J	270		260		245	
Thallium, Total			mg/kg	2.02	U	5.43	U		2.1	U	5.31	U	2.1	U	3.26	U	1.95	U	6.49	U	1.92	U	1.86	U	2.03	U	1.84	U	2.04	U
Vanadium, Total			mg/kg	28.4		39.3			25.7		14.3		37.5		7.84		21.2		12.7		36.9		21.5		15.3		9.5		26.9	
Zinc, Total	10000	109	mg/kg	178		301			188		14.1		179		8.79		314		17.2		141		134		576		113		219	

Notes and Abbreviations:

1. Concentration exceeds NYSDEC Part 375 UU & RRU SCOs

2. Concentration exceeds NYSDEC Part 375 UU SCOs

3. J = Estimated result

4. mg/kg = milligrams per kilogram

5. RRU SCOs: NYSDEC Part 375 Restricted-Residential Criteria

6. UU SCOs: NYSDEC Part 375 New York Unrestricted Use Criteria

7. U = Not detected at the reported detection limit.

8. NA = Sample Not Analyzed for parameter shown.

Table 2E. TCLP Metals Analytical Results in Soil
65 Eckford Street, Brooklyn, NY

LOCATION			SB-01 (0-2")		SB-01 (18-20')		SB-02 (0-2")		SB-03 (0-2")		SB-04 (0-2")		SB-05 (0-2")		SB-05 (18-20')		SB-06 (0-2")		SB-07 (0-2")		SB-08 (0-2")		SB-09 (18-20')		SB-10 (18-20')		SB-11 (18-20')		SB-12 (18-20')	
SAMPLING DATE			1/6/2022		1/6/2022		1/6/2022		1/6/2022		1/6/2022		12/27/2021		12/27/2021		12/27/2021		1/6/2022		1/6/2022		12/27/2021		12/27/2021		1/6/2022		1/6/2022	
LAB SAMPLE ID			L2205282-01		L2205282-02		L2205282-03		L2205282-04		L2205282-05		L2205282-12		L2205282-13		L2205282-14		L2205282-06		L2205282-07		L2205282-15		L2205282-16		L2205282-08		L2205282-09	
	EPA-TCLP	Units	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual
TCLP Metals by EPA 1311																														
Lead, TCLP		5 mg/l	0.518		0.5	U	0.217	J	0.5	U	1.09		0.034	J	25.6		0.263	J	0.541		0.626		0.028	J	1.63		0.5	U	0.027	J
Mercury, TCLP		0.2 mg/l	0.001	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.001	U	-	-	-	-

Notes and Abbreviations:

- 1. EPA-TCLP: EPA Toxicity Characteristic (TCLP) Regulatory Levels Criteria per 40CFR Part 261 as of September 10, 2015.
- 2. Indicates exceedance of TCLP Regulatory Levels
- 3. U = Not detected at the reported detection limit.
- 4. J = Estimated result
- 5. mg/kg = milligrams/kilogram

Table 3A. Volatile Organic Compound Analytical Results in Groundwater
65 Eckford Street, Brooklyn, NY

LOCATION		MW-01		MW-02		MW-03		MW-04		MW-05		DUP-20220114		FB-20220114		TB-20220114			
SAMPLING DATE		1/14/2022		1/14/2022		1/14/2022		1/14/2022		1/14/2022		1/14/2022		1/14/2022		1/14/2022			
LAB SAMPLE ID		L2202387-01		L2202387-05		L2202387-06		L2202387-02		L2202387-04		L2202387-03		L2202387-07		L2202387-08			
SAMPLE TYPE		WATER		WATER		WATER		WATER		WATER		WATER		WATER		WATER			
	NY-AWQS	Units	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	
Volatile Organics by GC/MS																			
1,1,1,2-Tetrachloroethane	5 ug/l	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,1,1-Trichloroethane	5 ug/l	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,1,2,2-Tetrachloroethane	5 ug/l	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,2-Trichloroethane	1 ug/l	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
1,1-Dichloroethane	5 ug/l	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,1-Dichloroethene	5 ug/l	0.5	U	0.5	U	0.5	U	0.5	U	0.46	J	0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloropropene	5 ug/l	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,2,3-Trichlorobenzene	5 ug/l	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,2,3-Trichloropropane	0.04 ug/l	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,2,4,5-Tetramethylbenzene	5 ug/l	1.2	J	41		24		15		1.4	J	16		2	U	2	U	2	U
1,2,4-Trichlorobenzene	5 ug/l	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,2,4-Trimethylbenzene	5 ug/l	2.5	U	31		2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,2-Dibromo-3-chloropropane	0.04 ug/l	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,2-Dibromomethane	0.0006 ug/l	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
1,2-Dichlorobenzene	3 ug/l	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,2-Dichloroethane	0.6 ug/l	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dichloroethene, Total	ug/l	2.5	U	2.5	U	2.5	U	2.5	U	69		2.5	U	2.5	U	2.5	U	2.5	U
1,2-Dichloropropane	1 ug/l	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,3,5-Trimethylbenzene	5 ug/l	2.5	U	1.6	J	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,3-Dichlorobenzene	3 ug/l	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,3-Dichloropropane	5 ug/l	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,3-Dichloropropene, Total	ug/l	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,4-Dichlorobenzene	3 ug/l	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,4-Dioxane	ug/l	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U	250	U
2,2-Dichloropropane	5 ug/l	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
2-Butanone	50 ug/l	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
2-Hexanone	50 ug/l	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
4-Methyl-2-pentanone	ug/l	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
Acetone	50 ug/l	5	U	2.4	J	5	U	2.6	J	5	U	2.3	J	5	U	5	U	5	U
Acrylonitrile	5 ug/l	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
Benzene	1 ug/l	0.5	U	0.5	U	0.5	U	0.28	J	1		0.27	J	0.5	U	0.5	U	0.5	U
Bromobenzene	5 ug/l	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Bromochloromethane	5 ug/l	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Bromodichloromethane	50 ug/l	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromoform	50 ug/l	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
Bromomethane	5 ug/l	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Carbon disulfide	60 ug/l	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
Carbon tetrachloride	5 ug/l	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chlorobenzene	5 ug/l	2.5	U	2.5	U	2.5	U	2.5	U	3		2.5	U	2.5	U	2.5	U	2.5	U
Chloroethane	5 ug/l	2.5	U	2.5	U	1.2	J	2.3	J	2.5	U	2.1	J	2.5	U	2.5	U	2.5	U
Chloroform	7 ug/l	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Chloromethane	ug/l	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
cis-1,2-Dichloroethene	5 ug/l	2.5	U	2.5	U	2.5	U	2.5	U	69		2.5	U	2.5	U	2.5	U	2.5	U
cis-1,3-Dichloropropene	0.4 ug/l	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dibromochloromethane	50 ug/l	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dibromomethane	5 ug/l	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
Dichlorodifluoromethane	5 ug/l	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
Ethyl ether	ug/l	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Ethylbenzene	5 ug/l	2.5	U	2.5	U	2.5	U	2.5	U	0.7	J	2.5	U	2.5	U	2.5	U	2.5	U
Hexachlorobutadiene	0.5 ug/l	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Isopropylbenzene	5 ug/l	2.5	U	40		10		4.7		1.8	J	4.7		2.5	U	2.5	U	2.5	U
Methyl tert butyl ether	10 ug/l	0.76	J	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Methylene chloride	5 ug/l	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
n-Butylbenzene	5 ug/l	2.5	U	14		4.2		0.76	J	2.5	U	0.78	J	2.5	U	2.5	U	2.5	U
n-Propylbenzene	5 ug/l	2.5	U	50		5.8		2.5		2.5	U	2.5		2.5	U	2.5	U	2.5	U
Naphthalene	10 ug/l	2.5	U	2.5	U	2.8		2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
o-Chlorotoluene	5 ug/l	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
o-Xylene	5 ug/l	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
p-Chlorotoluene	5 ug/l	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
p-Diethylbenzene	ug/l	2	U	12		5.7		0.79	J	2	U	0.79	J	2	U	2	U	2	U
p-Ethyltoluene	ug/l	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
p-Isopropyltoluene	5 ug/l	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
p/m-Xylene	5 ug/l	2.5	U	2.5	U	2.5	U	2.5	U	10		2.5	U	2.5	U	2.5	U	2.5	U
sec-Butylbenzene	5 ug/l	4.8		36		27		11		2.7		11		2.5	U	2.5	U	2.5	U
Styrene	5 ug/l	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
tert-Butylbenzene	5 ug/l	2.8		10		8.4		7.7		1.8	J	7.8		2.5	U	2.5	U	2.5	U
Tetrachloroethene	5 ug/l	0.5	U	0.5	U	0.5	U	0.5	U	0.25	J	0.5	U	0.5	U	0.5	U	0.5	U
Toluene	5 ug/l	2.5	U	2.5	U	2.5	U	2.5	U	0.78	J	2.5	U	2.5	U	2.5	U	2.5	U
trans-1,2-Dichloroethene	5 ug/l	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
trans-1,3-Dichloropropene	0.4 ug/l	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
trans-1,4-Dichloro-2-butene	5 ug/l	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U

Notes:

- Concentration Exceeds NY-AWQS
- J = Estimated Result
- NY-AWQS: NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values (SGVs) for Class GA Water
- ug/l = micrograms per liter
- U = Not detected at the reported detection limit for the sample

Table 3B. Semi-Volatile Organic Compound Analytical Results in Groundwater
65 Eckford Street, Brooklyn, NY

LOCATION		MW-01		MW-02		MW-03		MW-04		MW-05		DUP-20220114		FB-20220114		TB-20220114		
SAMPLING DATE		1/14/2022		1/14/2022		1/14/2022		1/14/2022		1/14/2022		1/14/2022		1/14/2022		1/14/2022		
LAB SAMPLE ID		L2202387-01		L2202387-05		L2202387-06		L2202387-02		L2202387-04		L2202387-03		L2202387-07		L2202387-08		
SAMPLE TYPE		WATER		WATER		WATER		WATER		WATER		WATER		WATER		WATER		
	NY-AWQS	Units	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual
Semivolatiles by GC/MS																		
1,2,4,5-Tetrachlorobenzene	5	ug/l	10	U	10	U	10	U	10	U	10	U	10	U	10	U	-	-
1,2,4-Trichlorobenzene	5	ug/l	5	U	5	U	5	U	5	U	5	U	5	U	5	U	-	-
1,2-Dichlorobenzene	3	ug/l	2	U	2	U	2	U	2	U	2	U	2	U	2	U	-	-
1,3-Dichlorobenzene	3	ug/l	2	U	2	U	2	U	2	U	2	U	2	U	2	U	-	-
1,4-Dichlorobenzene	3	ug/l	2	U	2	U	2	U	2	U	2	U	2	U	2	U	-	-
2,4,5-Trichlorophenol		ug/l	5	U	5	U	5	U	5	U	5	U	5	U	5	U	-	-
2,4,6-Trichlorophenol		ug/l	5	U	5	U	5	U	5	U	5	U	5	U	5	U	-	-
2,4-Dichlorophenol	1	ug/l	5	U	5	U	5	U	5	U	5	U	5	U	5	U	-	-
2,4-Dimethylphenol	50	ug/l	5	U	5	U	5	U	5	U	5	U	5	U	5	U	-	-
2,4-Dinitrophenol	10	ug/l	20	U	20	U	20	U	20	U	20	U	20	U	20	U	-	-
2,4-Dinitrotoluene	5	ug/l	5	U	5	U	5	U	5	U	5	U	5	U	5	U	-	-
2,6-Dinitrotoluene	5	ug/l	5	U	5	U	5	U	5	U	5	U	5	U	5	U	-	-
2-Chlorophenol		ug/l	2	U	2	U	2	U	2	U	2	U	2	U	2	U	-	-
2-Methylphenol		ug/l	5	U	5	U	5	U	5	U	5	U	5	U	5	U	-	-
2-Nitroaniline	5	ug/l	5	U	5	U	5	U	5	U	5	U	5	U	5	U	-	-
2-Nitrophenol		ug/l	10	U	10	U	10	U	10	U	10	U	10	U	10	U	-	-
3,3'-Dichlorobenzidine	5	ug/l	5	U	5	U	5	U	5	U	5	U	5	U	5	U	-	-
3-Methylphenol/4-Methylphenol		ug/l	5	U	5	U	5	U	0.8	J	1.2	J	5	U	5	U	-	-
3-Nitroaniline	5	ug/l	5	U	5	U	5	U	5	U	5	U	5	U	5	U	-	-
4,6-Dinitro-o-cresol		ug/l	10	U	10	U	10	U	10	U	10	U	10	U	10	U	-	-
4-Bromophenyl phenyl ether		ug/l	2	U	2	U	2	U	2	U	2	U	2	U	2	U	-	-
4-Chloroaniline	5	ug/l	5	U	5	U	5	U	5	U	5	U	5	U	5	U	-	-
4-Chlorophenyl phenyl ether		ug/l	2	U	2	U	2	U	2	U	2	U	2	U	2	U	-	-
4-Nitroaniline	5	ug/l	5	U	5	U	5	U	5	U	5	U	5	U	5	U	-	-
4-Nitrophenol		ug/l	10	U	10	U	10	U	10	U	10	U	10	U	10	U	-	-
Acetophenone		ug/l	5	U	5	U	5	U	5	U	5	U	5	U	5	U	-	-
Benzoic Acid		ug/l	50	U	50	U	50	U	50	U	50	U	50	U	7.4	J	-	-
Benzyl Alcohol		ug/l	2	U	2	U	2	U	2	U	2	U	2	U	2	U	-	-
Biphenyl		ug/l	2	U	2	U	2	U	2	U	2	U	2	U	2	U	-	-
Bis(2-chloroethoxy)methane	5	ug/l	5	U	5	U	5	U	5	U	5	U	5	U	5	U	-	-
Bis(2-chloroethyl)ether	1	ug/l	2	U	2	U	2	U	2	U	2	U	2	U	2	U	-	-
Bis(2-chloroisopropyl)ether	5	ug/l	2	U	2	U	2	U	2	U	2	U	2	U	2	U	-	-
Bis(2-ethylhexyl)phthalate	5	ug/l	3	U	3.2		3	U	5.4		2.3	J	3.7		3	U	-	-
Butyl benzyl phthalate	50	ug/l	5	U	5	U	5	U	5	U	5	U	5	U	5	U	-	-
Carbazole		ug/l	2	U	2	U	2	U	2	U	2	U	2	U	2	U	-	-
Di-n-butylphthalate	50	ug/l	5	U	5	U	5	U	5	U	5	U	5	U	5	U	-	-
Di-n-octylphthalate	50	ug/l	5	U	5	U	5	U	5	U	5	U	5	U	5	U	-	-
Dibenzofuran		ug/l	2	U	2	U	2	U	2	U	2	U	2	U	2	U	-	-
Diethyl phthalate	50	ug/l	5	U	5	U	5	U	5	U	5	U	5	U	5	U	-	-
Dimethyl phthalate	50	ug/l	5	U	5	U	5	U	5	U	5	U	5	U	5	U	-	-
Hexachlorocyclopentadiene	5	ug/l	20	U	20	U	20	U	20	U	20	U	20	U	20	U	-	-
Isophorone	50	ug/l	5	U	5	U	5	U	5	U	5	U	5	U	5	U	-	-
n-Nitrosodi-n-propylamine		ug/l	5	U	5	U	5	U	5	U	5	U	5	U	5	U	-	-
NDPA/DPA	50	ug/l	2	U	2	U	2	U	2	U	2	U	2	U	2	U	-	-
Nitrobenzene	0.4	ug/l	2	U	2	U	2	U	2	U	2	U	2	U	2	U	-	-
p-Chloro-m-cresol		ug/l	2	U	2	U	2	U	2	U	2	U	2	U	2	U	-	-
Phenol	1	ug/l	5	U	5	U	5	U	5	U	5	U	5	U	5	U	-	-
Semivolatiles by GC/MS-SIM																		
2-Chloronaphthalene	10	ug/l	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	-	-
2-Methylnaphthalene		ug/l	0.1	U	0.03	J	0.07	J	0.03	J	0.06	J	0.1	U	0.1	U	-	-
Acenaphthene	20	ug/l	0.03	J	0.3		0.66		0.48		1.2		0.4		0.1	U	-	-
Acenaphthylene		ug/l	0.1	U	0.1	U	0.1	U	0.1	U	0.04	J	0.1	U	0.1	U	-	-
Anthracene	50	ug/l	0.1	U	0.02	J	0.07	J	0.02	J	0.14		0.03	J	0.1	U	-	-
Benzo(a)anthracene	0.002	ug/l	0.1	U	0.1	U	0.02	J	0.1	U	0.07	J	0.02	J	0.1	U	-	-
Benzo(a)pyrene	0	ug/l	0.1	U	0.1	U	0.02	J	0.1	U	0.04	J	0.1	U	0.1	U	-	-
Benzo(b)fluoranthene	0.002	ug/l	0.1	U	0.1	U	0.03	J	0.1	U	0.06	J	0.1	U	0.1	U	-	-
Benzo(ghi)perylene		ug/l	0.1	U	0.1	U	0.05	J	0.1	U	0.04	J	0.1	U	0.1	U	-	-
Benzo(k)fluoranthene	0.002	ug/l	0.1	U	0.1	U	0.02	J	0.1	U	0.02	J	0.1	U	0.1	U	-	-
Chrysene	0.002	ug/l	0.1	U	0.01	J	0.02	J	0.05	J	0.05	J	0.1	U	0.1	U	-	-
Dibenzo(a,h)anthracene		ug/l	0.1	U	0.1	U	0.05	J	0.1	U	0.1	U	0.1	U	0.1	U	-	-
Fluoranthene	50	ug/l	0.1	U	0.02	J	0.1		0.03	J	0.33		0.03	J	0.1	U	-	-
Fluorene	50	ug/l	0.1	U	0.04	J	0.22		0.15		0.39		0.12		0.1	U	-	-
Hexachlorobenzene	0.04	ug/l	0.8	U	0.8	U	0.02	J	0.8	U	0.8	U	0.8	U	0.8	U	-	-
Hexachlorobutadiene	0.5	ug/l	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	-	-
Hexachloroethane	5	ug/l	0.8	U	0.8	U	0.8	U	0.8	U	0.8	U	0.8	U	0.8	U	-	-
Indeno(1,2,3-cd)pyrene	0.002	ug/l	0.1	U	0.1	U	0.05	J	0.1	U	0.1	U	0.1	U	0.1	U	-	-
Naphthalene	10	ug/l	0.1	U	0.63		1.9		0.4		0.25		0.34		0.1	U	-	-
Pentachlorophenol	1	ug/l	0.8	U	0.8	U	0.17	J	0.8	U	0.15	J	0.8	U	0.8	U	-	-
Phenanthrene	50	ug/l	0.1	U	0.05	J	0.27		0.07	J	0.34		0.07	J	0.1	U	-	-
Pyrene	50	ug/l	0.1	U	0.1	U	0.08	J	0.03	J	0.29		0.03	J	0.1	U	-	-

Notes:

1. Concentration Exceeds NY-AWQS

2. J = Estimated Result

3. NY-AWQS: NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values (SGVs) for Class GA Water

4. ug/l = micrograms per liter

5. U = Not detected at the reported detection limit for the sample

Table 3C. Emerging Contaminants Analytical Results in Groundwater
65 Eckford Street, Brooklyn, NY

LOCATION	MW-01	MW-02	MW-03	MW-04	MW-05	DUP-20220114	FB-20220114	TB-20220114
SAMPLING DATE	1/14/2022	1/14/2022	1/14/2022	1/14/2022	1/14/2022	1/14/2022	1/14/2022	1/14/2022
LAB SAMPLE ID	L2202387-01	L2202387-05	L2202387-06	L2202387-02	L2202387-04	L2202387-03	L2202387-07	L2202387-08
SAMPLE TYPE	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
	NY-AWQS	Units	Results	Qual	Results	Qual	Results	Qual
1,4 Dioxane by 8270D-SIM								
1,4-Dioxane	ug/l	2.78			0.828			
					0.572			
					0.642			
					1.2			
					0.51			
					0.139	U	-	-
Perfluorinated Alkyl Acids by Isotope Dilution								
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ug/l	0.00181	U		0.00185	U	0.00182	U
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ug/l	0.0154			0.00988		0.00497	
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ug/l	0.00181	U		0.00185	U	0.00182	U
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ug/l	0.00181	U		0.00185	U	0.00182	U
Perfluorobutanesulfonic Acid (PFBS)	ug/l	0.00123	J		0.0014	J	0.00111	JF
Perfluorobutanoic Acid (PFBA)	ug/l	0.0103			0.0146		0.0124	
Perfluorodecanesulfonic Acid (PFDS)	ug/l	0.00181	U		0.00185	U	0.00182	U
Perfluorodecanoic Acid (PFDA)	ug/l	0.00181	U		0.00185	U	0.00182	U
Perfluorododecanoic Acid (PFDoA)	ug/l	0.00181	U		0.00185	U	0.00182	U
Perfluoroheptanesulfonic Acid (PFHpS)	ug/l	0.00181	U		0.00185	U	0.00182	U
Perfluoroheptanoic Acid (PFHpA)	ug/l	0.00636			0.00495		0.00675	
Perfluorohexanesulfonic Acid (PFHxS)	ug/l	0.00148	J		0.000984	J	0.00102	JF
Perfluorohexanoic Acid (PFHxA)	ug/l	0.0116			0.0116		0.00903	
Perfluorononanoic Acid (PFNA)	ug/l	0.00181	U		0.00091	J	0.00182	U
Perfluorooctanesulfonamide (FOSA)	ug/l	0.00181	U		0.00185	U	0.00182	U
Perfluorooctanesulfonic Acid (PFOS)	0.01 ug/l	0.00204	F		0.00334		0.00102	JF
Perfluorooctanoic Acid (PFOA)	0.01 ug/l	0.0561			0.027		0.0575	
Perfluoropentanoic Acid (PFPeA)	ug/l	0.00962			0.0108		0.0111	
Perfluorotetradecanoic Acid (PFTA)	ug/l	0.00181	U		0.00185	U	0.00182	U
Perfluorotridecanoic Acid (PFTrDA)	ug/l	0.00181	U		0.00185	U	0.00182	U
Perfluoroundecanoic Acid (PFUnA)	ug/l	0.00181	U		0.00185	U	0.00182	U
PFOA/PFOS, Total	ug/l	0.0581			0.0303		0.0585	J

Notes:

1. Concentration Exceeds NY-AWQS
2. J = Estimated Result
3. NY-AWQS: NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values (SGVs) for Class GA Water
4. ug/l = micrograms per liter
5. U = Not detected at the reported detection limit for the sample
6. JF =

Table 3D. Total Metals Analytical Results in Groundwater
65 Eckford Street, Brooklyn, NY

LOCATION			MW-01		MW-02		MW-03		MW-04		MW-05		DUP-20220114		FB-20220114		TB-20220114	
SAMPLING DATE			1/14/2022		1/14/2022		1/14/2022		1/14/2022		1/14/2022		1/14/2022		1/14/2022		1/14/2022	
LAB SAMPLE ID			L2202387-01		L2202387-05		L2202387-06		L2202387-02		L2202387-04		L2202387-03		L2202387-07		L2202387-08	
SAMPLE TYPE			WATER		WATER		WATER		WATER		WATER		WATER		WATER		WATER	
	NY-AWQS	Units	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual
Total Metals																		
Aluminum, Total		ug/l	76		42.7		81.9		42		148		34.6		10	U	-	-
Antimony, Total	3	ug/l	1.35	J	0.89	J	4	U	4	U	1.73	J	4	U	4	U	-	-
Arsenic, Total	25	ug/l	4.68		12.64		9.86		79.9		5.94		79.76		0.5	U	-	-
Barium, Total	1000	ug/l	209.3		80.64		284.2		165.5		261.2		168.2		0.39	J	-	-
Beryllium, Total	3	ug/l	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	-	-
Cadmium, Total	5	ug/l	0.2	U	0.2	U	0.2	U	0.2	U	0.06	J	0.2	U	0.2	U	-	-
Calcium, Total		ug/l	204000		31200		103000		70200		109000		72400		74.4	J	-	-
Chromium, Total	50	ug/l	0.51	J	0.47	J	0.91	J	0.68	J	1.05		0.6	J	0.2	J	-	-
Cobalt, Total		ug/l	2.23		1.07		2.8		1.37		1.51		1.38		0.5	U	-	-
Copper, Total	200	ug/l	1.68		5.22		1.97		1.7		2.2		1.06		1	U	-	-
Iron, Total	300	ug/l	5330		4110		16900		8660		21200		8570		50	U	-	-
Lead, Total	25	ug/l	10.16		8.59		18.72		5.45		14.6		4.18		1	U	-	-
Magnesium, Total	35000	ug/l	24500		6220		25100		20000		19200		20500		70	U	-	-
Manganese, Total	300	ug/l	522.1		75.5		306.2		284.8		920.7		283.6		1	U	-	-
Mercury, Total	0.7	ug/l	0.2	U	0.1	J	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	-	-
Nickel, Total	100	ug/l	12.58		0.98	J	0.79	J	2.25		3.61		2.02		2	U	-	-
Potassium, Total		ug/l	29500		34100		32500		50600		33600		52300		100	U	-	-
Selenium, Total	10	ug/l	5	U	5	U	5	U	5	U	5	U	5	U	5	U	-	-
Silver, Total	50	ug/l	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	-	-
Sodium, Total	20000	ug/l	77300		45200		94000		86000		69100		87100		360		-	-
Thallium, Total	0.5	ug/l	0.29	J	1	U	1	U	1	U	0.29	J	1	U	1	U	-	-
Vanadium, Total		ug/l	5	U	5	U	5	U	5	U	5	U	5	U	5	U	-	-
Zinc, Total	2000	ug/l	9.9	J	10	U	12.44		4.09	J	30		10	U	10	U	-	-

Notes:

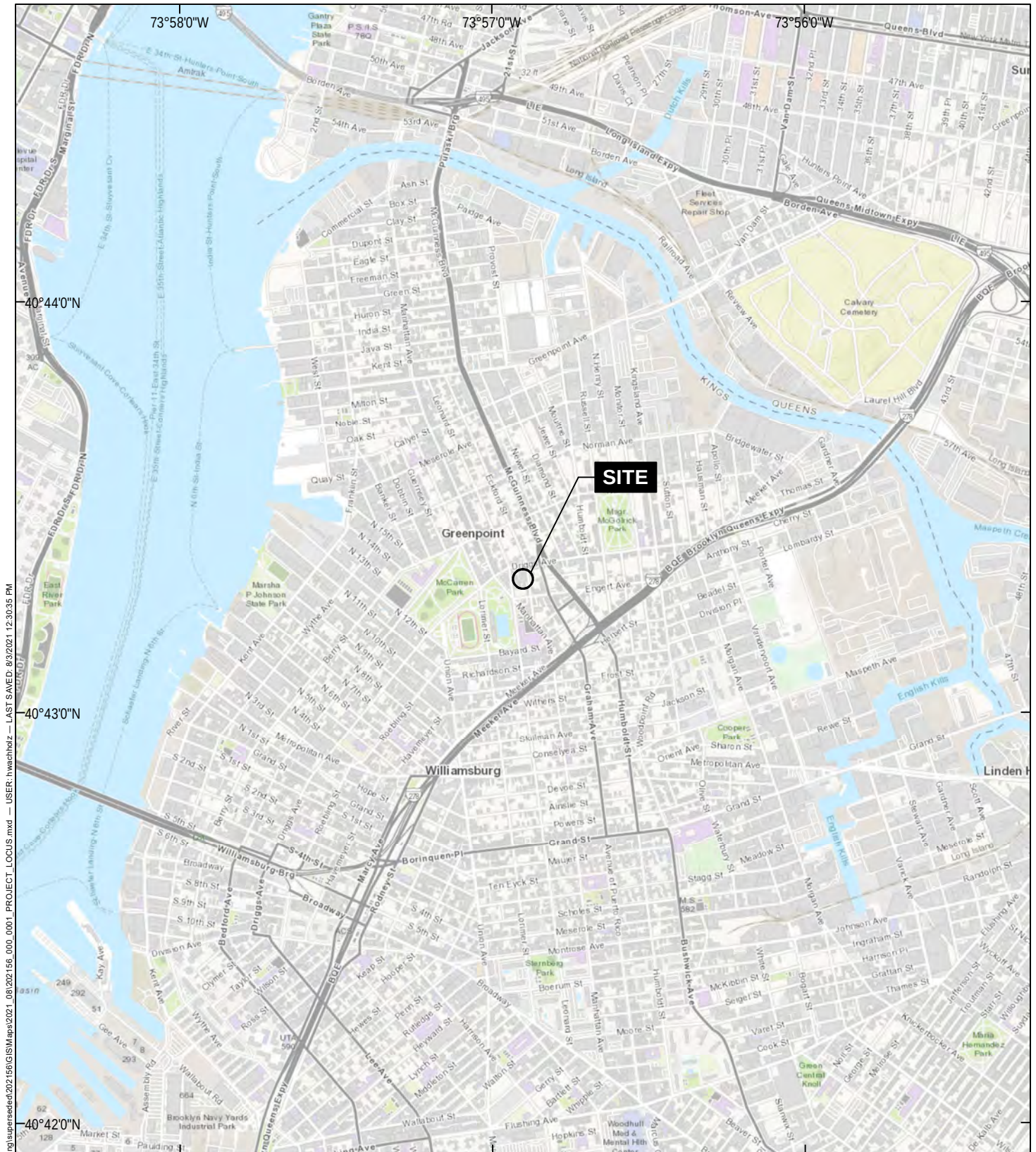
1. Concentration Exceeds NY-AWQS
2. J = Estimated Result
3. NY-AWQS: NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values (SGVs) for Class GA Water
4. ug/l = micrograms per liter
5. U = Not detected at the reported detection limit for the sample

Table 4. Soil Vapor Analytical Results 65 Eckford Street, Brooklyn, NY												
LOCATION		SV-01		SV-02		SV-03		SV-04		SV-05		
SAMPLING DATE		1/6/2022		1/6/2022		1/6/2022		1/6/2022		1/6/2022		
LAB SAMPLE ID		L2200831-01		L2200831-02		L2200831-03		L2200831-04		L2200831-05		
SAMPLE TYPE		SOIL VAPOR		SOIL VAPOR		SOIL VAPOR		SOIL VAPOR		SOIL VAPOR		
	Units	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	
Volatile Organics in Air												
1,1,1-Trichloroethane	ug/m3	1.52	U	10.9	U	2.18	U	2.73	U	30	U	-
1,1,2,2-Tetrachloroethane	ug/m3	1.91	U	13.7	U	2.75	U	3.43	U	37.8	U	-
1,1,2-Trichloroethane	ug/m3	1.52	U	10.9	U	2.18	U	2.73	U	30	U	-
1,1-Dichloroethane	ug/m3	1.13	U	8.09	U	1.62	U	4.02		22.3	U	-
1,1-Dichloroethene	ug/m3	1.1	U	7.93	U	1.59	U	12.9		37.9		-
1,2,4-Trichlorobenzene	ug/m3	2.06	U	14.8	U	2.97	U	3.71	U	40.8	U	-
1,2,4-Trimethylbenzene	ug/m3	16.4		17.1		20.1		25.3		27	U	-
1,2-Dibromoethane	ug/m3	2.14	U	15.4	U	3.07	U	3.84	U	42.3	U	-
1,2-Dichlorobenzene	ug/m3	1.67	U	12	U	2.4	U	3.01	U	33.1	U	-
1,2-Dichloroethane	ug/m3	1.13	U	8.09	U	1.62	U	2.02	U	22.3	U	-
1,2-Dichloropropane	ug/m3	1.28	U	9.24	U	1.85	U	2.31	U	25.4	U	-
1,3,5-Trimethylbenzene	ug/m3	4.1		9.83	U	5.31		7.37		27	U	-
1,3-Butadiene	ug/m3	0.894		4.42	U	2.39		14.4		12.2	U	-
1,3-Dichlorobenzene	ug/m3	1.67	U	12	U	2.4	U	3.01	U	33.1	U	-
1,4-Dichlorobenzene	ug/m3	1.67	U	12	U	2.4	U	3.01	U	33.1	U	-
1,4-Dioxane	ug/m3	1	U	7.21	U	1.44	U	1.8	U	19.8	U	-
2,2,4-Trimethylpentane	ug/m3	71		9.34	U	1.87	U	2.34	U	25.7	U	-
2-Butanone	ug/m3	11.3		24.6		16.2		24.1		40.7	U	-
2-Hexanone	ug/m3	1.14	U	8.2	U	1.64	U	2.05	U	22.5	U	-
3-Chloropropene	ug/m3	0.87	U	6.26	U	1.25	U	1.57	U	17.2	U	-
4-Ethyltoluene	ug/m3	1.37	U	9.83	U	6.49		7.23		27	U	-
4-Methyl-2-pentanone	ug/m3	2.84	U	20.5	U	4.1	U	5.12	U	56.6	U	-
Acetone	ug/m3	39.7		38.2		39.9		57		72.7		-
Benzene	ug/m3	7.44		6.42		3.26		26		17.6	U	-
Benzyl chloride	ug/m3	1.44	U	10.4	U	2.07	U	2.59	U	28.5	U	-
Bromodichloromethane	ug/m3	1.86	U	13.4	U	2.68	U	3.35	U	36.8	U	-
Bromoform	ug/m3	2.87	U	20.7	U	4.14	U	5.17	U	56.9	U	-
Bromomethane	ug/m3	1.08	U	7.77	U	1.55	U	1.94	U	21.4	U	-
Carbon disulfide	ug/m3	15.8		8.41		15.4		8.5		17.1	U	-
Carbon tetrachloride	ug/m3	1.75	U	12.6	U	2.52	U	3.15	U	34.6	U	-
Chlorobenzene	ug/m3	1.28	U	9.21	U	1.84	U	2.3	U	25.3	U	-
Chloroethane	ug/m3	0.734	U	5.28	U	1.06	U	1.32	U	14.5	U	-
Chloroform	ug/m3	1.36	U	9.77	U	1.95	U	2.44	U	26.9	U	-
Chloromethane	ug/m3	1.01		4.13	U	0.826	U	1.85		11.4	U	-
cis-1,2-Dichloroethene	ug/m3	27.8		7.93	U	412		678		2750		-
cis-1,3-Dichloropropene	ug/m3	1.26	U	9.08	U	1.82	U	2.27	U	25	U	-
Cyclohexane	ug/m3	24.2		6.88	U	1.38	U	1.72	U	18.9	U	-
Dibromochloromethane	ug/m3	2.37	U	17	U	3.41	U	4.26	U	46.9	U	-
Dichlorodifluoromethane	ug/m3	2.43		9.89	U	2.36		2.47	U	27.2	U	-
Ethanol	ug/m3	19		94.2	U	52		23.6	U	260	U	-
Ethyl Acetate	ug/m3	2.5	U	18	U	3.6	U	4.5	U	49.7	U	-
Ethylbenzene	ug/m3	11.1		14.3		9.6		11.5		23.9	U	-
Freon-113	ug/m3	2.13	U	15.3	U	3.07	U	3.83	U	42.2	U	-
Freon-114	ug/m3	1.94	U	14	U	2.8	U	3.49	U	38.4	U	-
Heptane	ug/m3	20.3		8.69		4.63		14.4		22.5	U	-
Hexachlorobutadiene	ug/m3	2.97	U	21.3	U	4.27	U	5.33	U	58.7	U	-
Isopropanol	ug/m3	4.99		12.3	U	21.3		5.92		33.9	U	-
Methyl tert butyl ether	ug/m3	1	U	7.21	U	1.44	U	1.8	U	19.8	U	-
Methylene chloride	ug/m3	2.41	U	17.4	U	3.47	U	4.34	U	47.9	U	-
n-Hexane	ug/m3	21.7		24.5		9.06		50.8		19.4	U	-
o-Xylene	ug/m3	14		14.8		13.1		16.4		23.9	U	-
p/m-Xylene	ug/m3	40.3		39.4		37.8		40		47.8	U	-
Styrene	ug/m3	1.18	U	8.52	U	1.7	U	2.13	U	23.4	U	-
Tertiary butyl Alcohol	ug/m3	5.03		15.2	U	10		3.79	U	41.8	U	-
Tetrachloroethene	ug/m3	6.78		13.6	U	2.71	U	7.53		171		-
Tetrahydrofuran	ug/m3	4.04		14.7	U	2.98		6.96		40.7	U	-
Toluene	ug/m3	35.8		31.2		24.4		38.4		41.1		-
trans-1,2-Dichloroethene	ug/m3	1.11		7.93	U	12.8		17.6		128		-
trans-1,3-Dichloropropene	ug/m3	1.26	U	9.08	U	1.82	U	2.27	U	25	U	-
Trichloroethene	ug/m3	84.4		10.7	U	559		946		9670		-
Trichlorofluoromethane	ug/m3	1.56	U	11.2	U	2.25	U	2.81	U	30.9	U	-
Vinyl bromide	ug/m3	1.22	U	8.74	U	1.75	U	2.19	U	24	U	-
Vinyl chloride	ug/m3	6.88		5.11	U	36.3		176		177		-

Notes:

1. ug/m3 = microgram per cubic meter
2. U = Not detected at the reported detection limit.
3. J = Estimated result

FIGURES



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MAP SOURCE: ESRI
SITE COORDINATES: 40°43'19"N, 73°56'54"W

**HALEY
ALDRICH**

65 ECKFORD STREET
BROOKLYN, NEW YORK

PROJECT LOCUS

APPROXIMATE SCALE: 1 IN = 2000 FT
AUGUST 2021

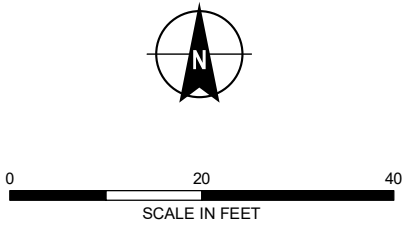
FIGURE 1

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LEGEND
 SITE BOUNDARY

NOTES
1. ALL LOCATIONS ARE APPROXIMATE.
2. AERIAL IMAGERY SOURCE: NEARMAP, 12 MARCH 2021



**HALEY
ALDRICH**

65 ECKFORD STREET
BROOKLYN, NEW YORK

SITE PLAN

AUGUST 2021

FIGURE 2

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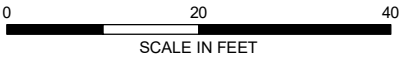


LEGEND

- SITE BOUNDARY
- PROPOSED SOIL BORING/PERMANENT MONITORING WELL LOCATION
- PROPOSED SOIL BORING LOCATION
- PROPOSED SOIL VAPOR POINT LOCATION
- PROPOSED ENDPOINT SAMPLE LOCATION FROM THE CORRECTIVE ACTION WORK PLAN
- APPROXIMATE LOCATION OF 550-GALLON UST REMOVED IN JUNE 2018

NOTES

- 1. ALL LOCATIONS ARE APPROXIMATE.
- 2. AERIAL IMAGERY SOURCE: NEARMAP, 12 MARCH 2021



HALEY
ALDRICH

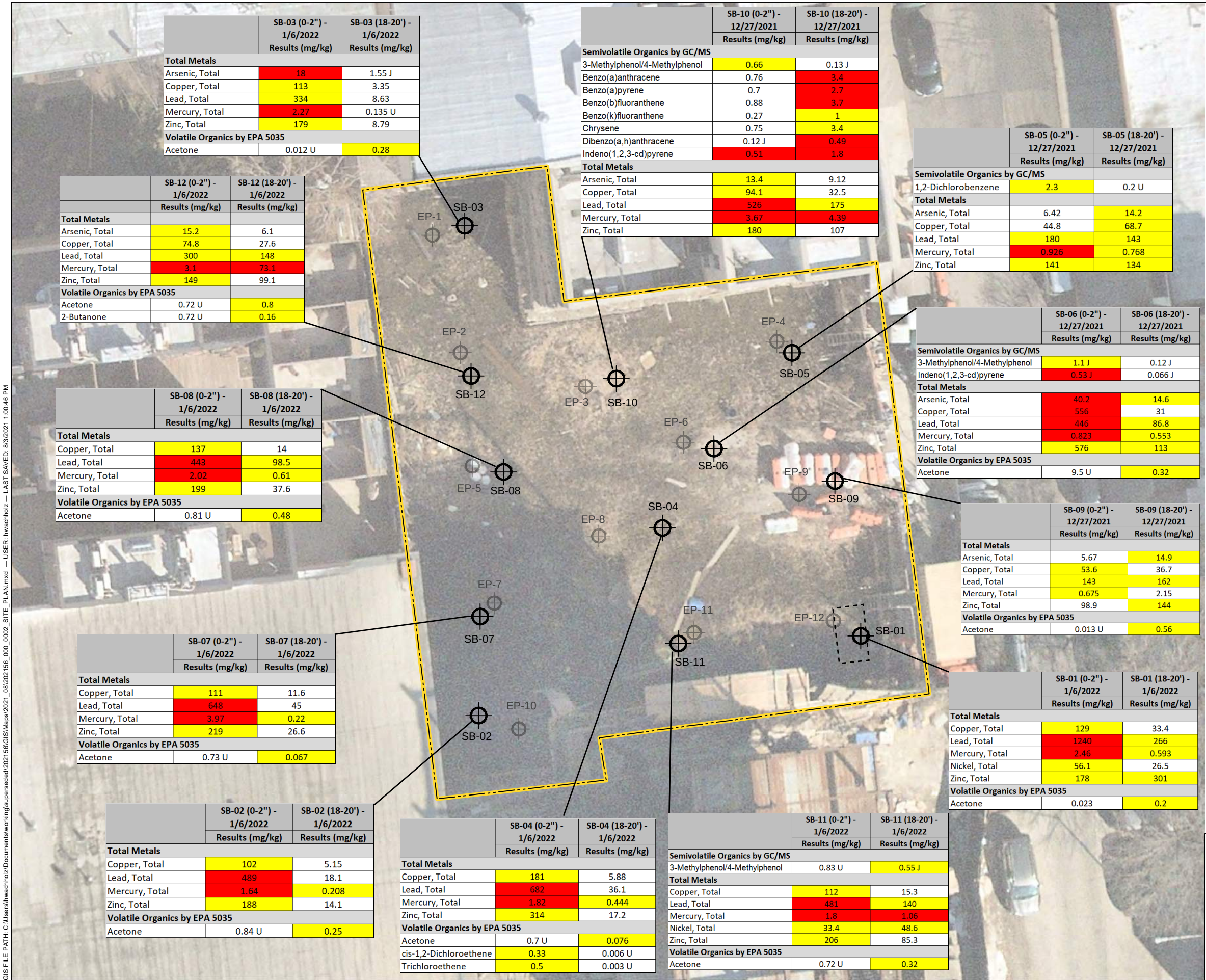
65 ECKFORD STREET
BROOKLYN, NEW YORK

SAMPLE LOCATION MAP

SEPTEMBER 2021

FIGURE 3

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SOIL BORING LOCATION

- PROPOSED ENDPOINT SAMPLE LOCATION FROM THE CORRECTIVE ACTION WORK PLAN
- APPROXIMATE LOCATION OF 550-GALLON UST REMOVED IN JUNE 2018

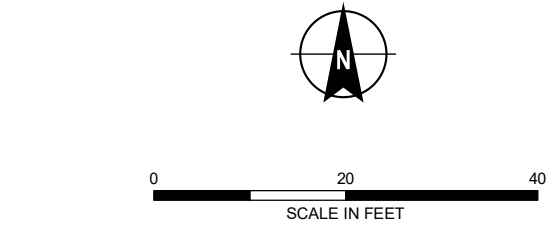
	NY-RESRR	NY-UNRES	Units
Semivolatile Organics by GC/MS			
3-Methylphenol/4-Methylphenol	100	0.33	mg/kg
Benzo(a)anthracene	1	1	mg/kg
Benzo(a)pyrene	1	1	mg/kg
Benzo(b)fluoranthene	1	1	mg/kg
Benzo(k)fluoranthene	3.9	0.8	mg/kg
Chrysene	3.9	1	mg/kg
Dibenzo(a,h)anthracene	0.33	0.33	mg/kg
Indeno(1,2,3-cd)pyrene	0.5	0.5	mg/kg
1,2-Dichlorobenzne	100	1.1	mg/kg
Total Metals			
Arsenic, Total	16	13	mg/kg
Copper, Total	270	50	mg/kg
Lead, Total	400	63	mg/kg
Mercury, Total	0.81	0.18	mg/kg
Nickel, Total	310	30	mg/kg
Zinc, Total	10000	109	mg/kg
Volatile Organics by EPA 5035			
Acetone	100	0.05	mg/kg
2-Butanone	100	0.12	mg/kg
cis-1,2-Dichloroethene	100	0.25	mg/kg
Trichloroethene	21	0.47	mg/kg

NY-RESRR: New York NYCRR Part 375 Restricted-Residential Criteria, New York Restricted use Criteria per 6 NYCRR Part 375 Environmental Remediation Programs, effective December 14, 2006.

NY-UNRES: New York NYCRR Part 375 Unrestricted Criteria, Criteria per 6 NYCRR Part 375 Environmental Remediation Programs, effective December 14, 2006.

- NOTES
1. ALL LOCATIONS ARE APPROXIMATE AND BASED ON FIELD MEASUREMENTS.

2. AERIAL IMAGERY SOURCE: NEARMAP, 12 MARCH 2021



HALEY ALDRICH 65 ECKFORD STREET
BROOKLYN, NEW YORK

SOIL RESULTS EXCEEDANCE MAP

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MW-03 - 1/14/2022	Results (µg/L)
Semivolatile Organics by GC/MS - SIM	
Benzo(a)anthracene	0.02
Benzo(a)pyrene	0.02
Benzo(b)fluoranthene	0.03
Benzo(k)fluoranthene	0.02
Chrysene	0.02
Indeno(1,2,3-cd)pyrene	0.05
Total Metals	
Iron, Total	16900
Manganese, Total	306.2
Sodium, Total	94000
Volatile Organics by GC/MS	
1,2,4,5-Tetramethylbenzene	24
Isopropylbenzene	10
n-Propylbenzene	5.8
sec-Butylbenzene	27
tert-Butylbenzene	8.4

MW-05 - 1/14/2022	Results (µg/L)
Semivolatile Organics by GC/MS - SIM	
Benzo(a)anthracene	0.07
Benzo(a)pyrene	0.04
Benzo(b)fluoranthene	0.06
Benzo(k)fluoranthene	0.02
Chrysene	0.05
Total Metals	
Iron, Total	21200
Manganese, Total	920.7
Sodium, Total	69100
Volatile Organics by GC/MS	
Benzene	1
cis-1,2-dichloroethene	69
p/m-Xylene	10
Trichloroethene	27
Vinyl Chloride	8.4

MW-04 - 1/14/2022	Results (µg/L)
Semivolatile Organics by GC/MS - SIM	
Chrysene	0.05
Semivolatile Organics by GC/MS	
Bis(2-ethylhexyl)phthalate	5.4
Total Metals	
Arsenic, Total	79.9
Iron, Total	8660
Sodium, Total	86000
Volatile Organics by GC/MS	
1,2,4,5-Tetramethylbenzene	15
sec-Butylbenzene	11
tert-Butylbenzene	7.7

MW-02 - 1/14/2022	Results (µg/L)
Semivolatile Organics by GC/MS - SIM	
Chrysene	0.01
Total Metals	
Iron, Total	4110
Sodium, Total	45200
Volatile Organics by GC/MS	
1,2,4,5-Tetramethylbenzene	41
1,2,4-Trimethylbenzene	31
Isopropylbenzene	40
n-Butylbenzene	14
n-Propylbenzene	50
sec-Butylbenzene	36
tert-Butylbenzene	10

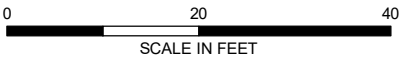
MW-01 - 1/14/2022	Results (µg/L)
Total Metals	
Iron, Total	5330
Manganese, Total	522.1
Sodium, Total	77300

LEGEND

- SITE BOUNDARY
- PERMANENT MONITORING WELL LOCATION
- PROPOSED ENDPOINT SAMPLE LOCATION FROM THE CORRECTIVE ACTION WORK PLAN
- APPROXIMATE LOCATION OF 550-GALLON UST REMOVED IN JUNE 2018

Ambient Water Quality (New York State Groundwater Effluent Limitations for Class GA Groundwater)		
Analytes	Value	Unit
Bis(2-ethylhexyl)phthalate	5	µg/L
Benzo(a)anthracene	0.002	µg/L
Benzo(a)pyrene	0.0	µg/L
Benzo(b)fluoranthene	0.002	µg/L
Benzo(k)fluoranthene	0.002	µg/L
Chrysene	0.002	µg/L
Indeno(1,2,3-cd)pyrene	0.002	µg/L
Arsenic, Total	25	µg/L
Iron, Total	300	µg/L
Manganese, Total	300	µg/L
Sodium, Total	20000	µg/L
1,2,4,5-Tetramethylbenzene	5	µg/L
1,2,4-Trimethylbenzene	5	µg/L
Benzene	1	µg/L
Isopropylbenzene	5	µg/L
n-Butylbenzene	5	µg/L
n-Propylbenzene	5	µg/L
sec-Butylbenzene	5	µg/L
tert-Butylbenzene	5	µg/L
p/m-Xylene	5	µg/L
cis-1,2-dichloroethene	5	µg/L
Trichloroethene	5	µg/L
Vinyl chloride	2	µg/L

- NOTES
1. ALL LOCATIONS ARE APPROXIMATE AND BASED OFF FIELD MEASUREMENTS.
 2. AERIAL IMAGERY SOURCE: NEARMAP, 12 MARCH 2021
 3. GROUNDWATER ANALYTICAL RESULTS COMPARED TO NYSDEC TECHNICAL AND OPERATIONAL GUIDANCE SERIES (TOGS) 1.1.1 AMBIENT WATER QUALITY STANDARDS AND GUIDANCE VALUES FOR CLASS A DRINKING WATER.
 4. RESULTS SHOWN IN MICROGRAMS PER LITER (µg/L)
 5. RESULTS IN EXCEEDANCE OF NYSDEC TOGS AWQS ARE HIGHLIGHTED



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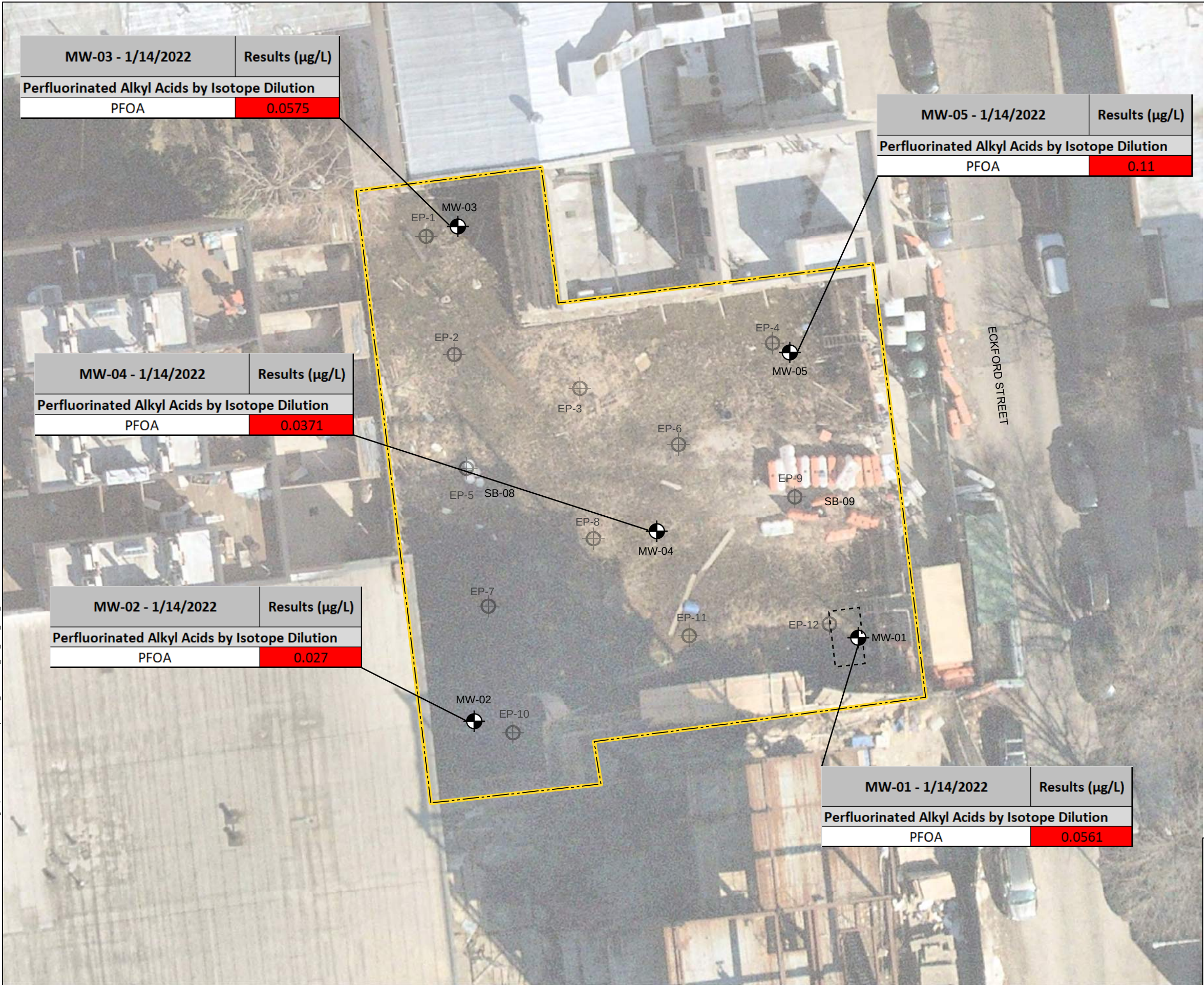
65 ECKFORD STREET
BROOKLYN, NEW YORK

GROUNDWATER RESULTS
EXCEEDNACE MAP

JANUARY 2022

FIGURE 5

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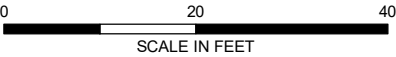
- SITE BOUNDARY
- PERMANENT MONITORING WELL LOCATION
- PROPOSED ENDPOINT SAMPLE LOCATION FROM THE CORRECTIVE ACTION WORK PLAN
- APPROXIMATE LOCATION OF 550-GALLON UST REMOVED IN JUNE 2018

Ambient Water Quality (New York State Groundwater Effluent Limitations for Class GA Groundwater)

Analytes	Value	Unit
Perfluorooctanoic Acid (PFOA)	0.01	µg/L

NOTES

- ALL LOCATIONS ARE APPROXIMATE AND BASED ON FIELD MEASUREMENTS.
- AERIAL IMAGERY SOURCE: NEARMAP, 12 MARCH 2021
- GROUNDWATER ANALYTICAL RESULTS COMPARED TO NYSDEC TECHNICAL AND OPERATIONAL GUIDANCE SERIES (TOGS) 1.1.1 AMBIENT WATER QUALITY STANDARDS AND GUIDANCE VALUES FOR CLASS A DRINKING WATER.
- RESULTS SHOWN IN MICROGRAMS PER LITER (µg/L)
- RESULTS IN EXCEEDANCE OF NYSDEC TOGS AWQS ARE HIGHLIGHTED



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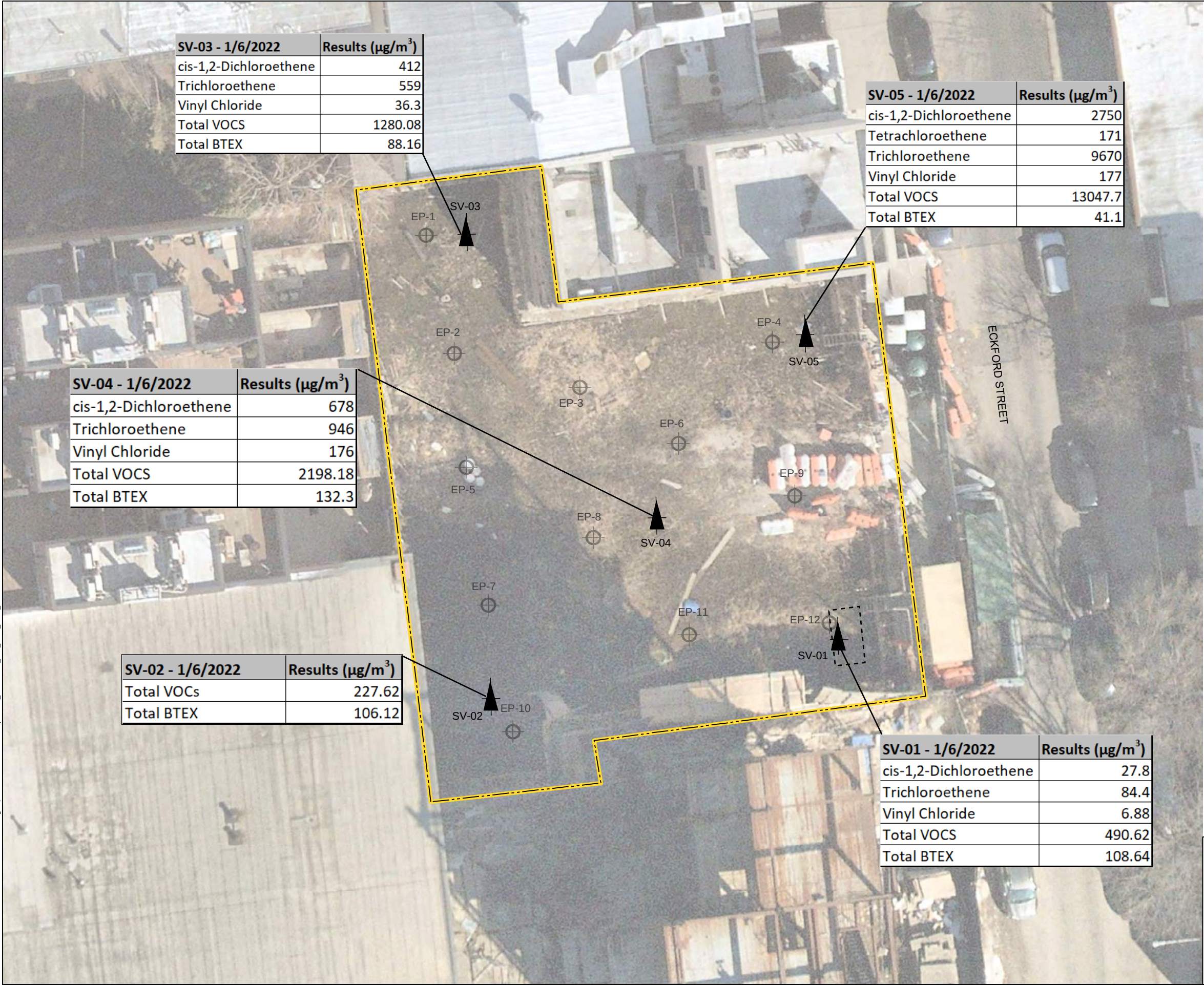
65 ECKFORD STREET
BROOKLYN, NEW YORK

EMERGING CONTAMINANTS
IN GROUNDWATER RESULTS
EXCEEDNACE MAP

JANUARY 2022

FIGURE 6

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SV-03 - 1/6/2022	Results (µg/m³)
cis-1,2-Dichloroethene	412
Trichloroethene	559
Vinyl Chloride	36.3
Total VOCs	1280.08
Total BTEX	88.16

SV-05 - 1/6/2022	Results (µg/m³)
cis-1,2-Dichloroethene	2750
Tetrachloroethene	171
Trichloroethene	9670
Vinyl Chloride	177
Total VOCs	13047.7
Total BTEX	41.1

SV-04 - 1/6/2022	Results (µg/m³)
cis-1,2-Dichloroethene	678
Trichloroethene	946
Vinyl Chloride	176
Total VOCs	2198.18
Total BTEX	132.3

SV-02 - 1/6/2022	Results (µg/m³)
Total VOCs	227.62
Total BTEX	106.12

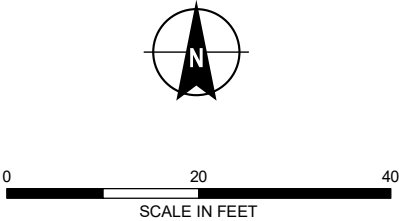
SV-01 - 1/6/2022	Results (µg/m³)
cis-1,2-Dichloroethene	27.8
Trichloroethene	84.4
Vinyl Chloride	6.88
Total VOCs	490.62
Total BTEX	108.64

LEGEND

SITE BOUNDARY

- PROPOSED SOIL VAPOR POINT LOCATION
- PROPOSED ENDPOINT SAMPLE LOCATION FROM THE CORRECTIVE ACTION WORK PLAN
- APPROXIMATE LOCATION OF 550-GALLON UST REMOVED IN JUNE 2018

- NOTES
1. ALL LOCATIONS ARE APPROXIMATE AND BASED ON FIELD MEASUREMENTS.
2. AERIAL IMAGERY SOURCE: NEARMAP, 12 MARCH 2021



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65 ECKFORD STREET
BROOKLYN, NEW YORK

SOIL VAPOR RESULTS MAP

JANUARY 2022

FIGURE 7

APPENDIX A

Supplemental Remedial Investigation Work Plan

SUPPLEMENTAL INVESTIGATION WORK PLAN
FORMER CARTER SPRAY FINISHING CORP.
BCP SITE C224218
65 ECKFORD STREET
BLOCK 2698 LOT 26
BROOKLYN, NEW YORK

by Haley & Aldrich of New York
New York, New York

for 65-73 Eckford Realty LLC
266 Broadway, Suite 301
Brooklyn, New York

File No. 0202156-002
December 2021





HALEY & ALDRICH OF NEW YORK
237 West 35th Street
16th Floor
New York, NY 10123
646-277-5688

15 December 2021
File No. 0202156-002

New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway, 12th Floor
Albany, New York 12233

Attention: Mr. Bob Corcoran

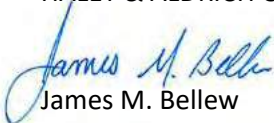
Subject: Supplemental Investigation Work Plan
NYSDEC BCP Site C224218- Former Carter Spray Finishing Corp.
65 Eckford Street
Brooklyn, New York

Dear Mr. Corcoran,

On behalf of 65-73 Eckford Realty LLC, Haley & Aldrich of New York is submitting for the review and approval of the New York State Department of Environmental Conservation (NYSDEC) this draft Supplemental Investigation Work Plan (SIWP) for the Former Carter Spray Finishing Corp. Site (Brownfield Cleanup Program Site C224218), located at 65 Eckford Street in the Greenpoint neighborhood of Brooklyn, NY (Site). This SIWP has been developed based on the NYSDEC's "Technical Guidance for Site Investigation and Remediation" (DER-10 dated May 2010).

Please do not hesitate to contact us if there are any questions regarding this submittal or any other aspects of the project.

Sincerely yours,
HALEY & ALDRICH OF NEW YORK



James M. Bellew
Senior Associate



Mari C. Conlon, P.G.
Project Manager

Cc:

Abraham Posner (65-73 Eckford Realty LLC)
Jon Schuyler Brooks (Freeborn & Peters LLP)
Jane O'Connell (NYSDEC)
Scarlett McLaughlin (NYSDOH)

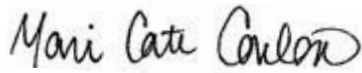
Email: abe6991 @gmail.com
Email: jbrooks@freeborn.com
Email: jane.oconnell@dec.ny.gov
Email: scarlett.mclaughlin@halth.ny.gov

\\haleyaldrich.com\share\CF\Projects\0202156\Deliverables\3. Supplemental Investigation Work Plan\Text\2021-1102-HANY-65 Eckford St-SIWP-F2.docx

Certification

This report details proposed supplemental investigation activities to be conducted at the Former Carter Spray Finishing Corp. BCP Site C224218.

I, Mari C. Conlon, certify that I am currently a Qualified Environmental Professional as defined in 6 NYCRR Part 375 and that this Supplemental Investigation Work Plan was prepared in accordance with all statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10) and that all activities were performed in full accordance with the DER-approved work plan(s) and any DER-approved modifications.



15 December 2021

Mari C. Conlon, P.G.

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6	Historical Soil Analytical Results- Pesticides PCBs
7	Historical Soil Analytical Results- Metals
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1. Introduction

On behalf of 65-73 Eckford Realty LLC, Haley & Aldrich of New York (Haley & Aldrich) has prepared this Supplemental Investigation Work Plan (SIWP) for the Former Carter Spray Finishing Corp Site located at 65 Eckford Street (see Figure 1) in the Greenpoint neighborhood of Brooklyn NY (Site). This SIWP was prepared in accordance with the regulations and guidance applicable to the Brownfield Cleanup Program (BCP), including DER-10 which is entitled “Technical Guidance for Site Investigation and Remediation” and dated May 2010.

The Site, identified as Section 3, Block 2698, Lot 26 on the New York City tax map, is approximately 10,200-square feet and is bounded by a four-story residential building to the north, Eckford Street to the east, a residential apartment building currently in construction (enrolled in the New York State Department of Environmental Conservation (NYSDEC) BCP Program as Site Number C224218) to the south, and a four-story residential and one-story industrial building to the west. The Site location is shown on Figure 1 and existing site features on Figure 2.

The lot is within a MX-8 Special Mixed-Use District (MX) and currently zoned M1-2/R6A. The MX was established in 1997 to encourage investment in, and enhance the vitality of, existing neighborhoods with mixed residential and industrial uses in close proximity and create expanded opportunities for new mixed-use communities. New residential and nonresidential uses (commercial, community facility and light industrial) can be developed as-of right and be located side by-side or within the same building. Pairing an M1 district with an R3 through R10 district (e.g., M1-2/R6) ensures a balanced variety of uses.

1.1 PURPOSE

A Remedial Investigation (RI) was performed at the Site in December 2015 by Environmental Business Consultants (EBC) to investigate the contaminants of concern identified based on the Site’s current and former uses and identified in the previous Phase II Investigation, also performed by EBC. The RI partially determined the nature and extent of volatile organic compound (VOC), semi-volatile organic compound (SVOC), polychlorinated biphenyl (PCB), pesticide, and metal contamination at the Site. Results of previous Site characterization activities are summarized in Tables 1 through 13.

The Site characterization did not comprehensively delineate the extent of contamination on the Site; therefore, additional targeted soil, groundwater, and soil vapor sampling is proposed. Additionally, since construction was halted leaving an open excavation, standing water accumulated in the excavation area and dense vegetation grew across the entire Site. It is necessary to analyze soil conditions below the previous excavation to evaluate whether soil conditions have changed. Additionally, sampling locations will help further delineate the groundwater plume and extent of soil vapor contamination. Sampling for emerging contaminants will also be conducted.

The SI will be performed upon completion of the activities included in the approved Corrective Action Work Plan (CAWP) and upon approval of this SIWP. Results of the additional sample analyses will be used to confirm the results of the previous Site characterization activities, potentially identify an on-Site source, and determine a course for remedial action.

2. Background

2.1 CURRENT LAND USE

The Site is currently an undeveloped lot and is enrolled in the NYSDEC Brownfield Cleanup Program as NYSBCP Site Number C224218. Historically, the Site was utilized by several industrial operations including the former Carter Spray Finishing Corporation, which occupied the Site from approximately 1960 to 2008.

2.2 SITE HISTORY

The Site was developed between 1905 and 1916 and improved with several one-story manufacturing buildings occupied by the Meisel Danowitz & Co. woodworking operation. The Site was redeveloped by 1916 with a 1-2 story building and had been utilized by several industrial operations including a machine shop, wood box manufacturing facility, automobile parking garage, and metal finishing facility. Records indicate that former operations utilized underground gasoline storage tanks that were located in the northeast portion of the Site. The Site was occupied by the Carter Spray Finishing Corporation from 1960 to 2008 which used the building for metal finishing and spraying. The building was razed in 2015. The Site was subject to multiple subsurface investigations and construction of a five-story hotel on the Site began in 2018. Construction included excavation, transportation of soil for off-site disposal, and the installation of a secant pile wall along the perimeter of the Site. Construction of the hotel was not completed. Currently, the Site is excavated to approximately 5 to 6 feet below grade Site wide and remains vacant.

2.3 SURROUNDING LAND USE

The Site is located in a mixed-use residential, commercial, and industrial area. The Site is bounded by a four-story residential building to the north, Eckford Street followed by residential apartment buildings to the east, a residential apartment building currently in construction (enrolled in the NYSDEC BCP Program as Site Number C224218) to the south, and a four-story residential and one-story industrial building to the west. The properties adjacent to the Site to the north, west, and south are zoned M1-2/R6B and the properties to the east of the Site across Eckford Street are zoned R6B. The closest public park, McCarren Park, is approximately 300 feet west of the Site. No other sensitive receptors were identified down gradient of the Site.

2.4 SURROUNDING LAND USE HISTORY

The area surrounding the Site was historically used for dwellings and manufacturing/industrial purposes from the late 1800s through 1980s. The area to the west of the Site was historically characterized by heavy industry and manufacturing. The area was subject to a steady decline of industrial operations and manufacturing from the late 1960s through the 1980s and is now predominantly commercial and residential.

2.5 PREVIOUS INVESTIGATIONS AND REMEDIAL MEASURES

To date the following investigations and remedial measures have been performed at the subject Site:

- Phase I Environmental Site Assessment (Environmental Business Solutions [EBC], May 2015)
- Phase II Site Assessment (EBC, February and April 2015)
- Remedial Investigation (EBC, December 2015)
- Summary of Construction Activities and Remedial Measures (May to December 2018)

May 2015 – Phase I Environmental Site Assessment (EBC)

The Phase I Environmental Site Assessment (ESA) identified the following Recognized Environmental Conditions (RECs) for the Site:

- The 1916 and 1942 Sanborn maps show a parking garage building with an underground gasoline storage tank in the northeast portion of the building. A Site inspection performed in 2015 noted a fill port indicative of an underground gasoline storage tank within the same area of the gasoline tank drawn on the Sanborn maps indicating the tank(s) has not been removed. No information regarding the current status of this tank and/or soil quality in its vicinity was available for review. As such, there is a potential for spills or release from gasoline underground storage tank to have impacted the subsurface.
- New York City Department of Building records indicated fuel oil was used for heating the building. Based on the age and size of the building, it is assumed that an underground storage tank of at least 550 gallons was used. No information/records were obtained indicating proper removal/abandonment of a No. 2 fuel oil underground storage tank had occurred. As such, there is potential for spills or release from the No. 2 fuel oil underground storage tank to have impacted the subsurface.
- City Directory Listings, Sanborn maps and internet search results indicate the building has been historically utilized for industrial purposes, including a machine shop, parking garage, wood box manufacturing and metal finishing. From approximately 1959 to 1998, Carter Spray Finishing Corporation utilized two 275-gallon aboveground storage tanks that contained trichloroethene (TCE) and the Toxic Chemical Release Inventory System (TRIS) database indicates Carter Spray Finishing Corporation emitted greater than 8,000 pounds per year of TCE into the air. As such, there is a potential for historic site operations to have impacted soil, groundwater, and/or soil vapor quality beneath the Site.

Based on its findings, EBC recommended a Phase II Investigation be conducted to document subsurface conditions and determine the nature and extent of contamination, if any.

February and April 2015 – Limited Phase II Environmental Site Assessment (EBC)

An initial Limited Phase II Environmental Site Assessment performed by EBC in February 2015 and included the following scope of work:

1. Installed two soil borings and collected soil samples for chemical analysis from the soil borings to evaluate soil quality; and,
2. Collected one groundwater sample for chemical analysis to evaluate groundwater quality.

Additional sampling was performed by EBC in April 2015 and included the following scope of work:

1. Installed three soil borings and collected soil samples for chemical analysis from the soil borings to evaluate soil quality; and,
2. Collected three groundwater samples for chemical analysis to evaluate groundwater quality.

Shallow soil samples representing the depth interval 0 to 2 feet below grade were collected from the historic fill layer and were analyzed for polychlorinated biphenyls (PCBs) and Target Analyte List (TAL) metals. Soil samples representing the depth interval 11 to 13 feet below grade were collected from the water table interface and analyzed for volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs). The laboratory results identified petroleum related VOCs above Unrestricted Use SCOs and Protection of Groundwater SCOs within the samples collected from the water table interface, including n-Propylbenzene, sec-Butylbenzene, tert-Butylbenzene, and Toluene. Trichloroethene (TCE) (1,100 ug/kg) was detected within one of the samples at the water table interface.

Petroleum-related VOCs were detected in the groundwater samples above groundwater quality standards (GQS). Petroleum-related VOCs detected above GQS includes 2-Isopropyltoluene, Isopropylbenzene, n-Butylbenzene, n-Propylbenzene, sec-Butylbenzene, and tert-Butylbenzene.

SVOCs including Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Chrysene, and Indeno(1,2,3-cd)pyrene were reported above Restricted Residential Use SCOs within the soil sample from soil boring B2 (11-13 ft).

December 2015 – Remedial Investigation (EBC)

A Remedial Investigation (RI) performed by EBC included the following scope of work:

1. Installed ten soil borings (15SB1 – 15SB10) and collected 31 soil samples for chemical analysis to evaluate soil quality;
2. Installed eight groundwater monitoring wells (15MW1 – 15MW8) and collected eight groundwater samples for chemical analysis to evaluate groundwater quality; and,
3. Installed seven soil vapor probes and collected 7 samples for chemical analysis to evaluate the potential for vapor intrusion.

Soil samples collected at both 0 to 2 and 2 to 4 feet below grade were analyzed for VOCs, SVOCs, pesticides, PCBs, and TAL metals. Soil samples collected at 11 to 13 feet below grade (groundwater interface) were analyzed for VOCs and SVOCs. Soil samples collected at 18 to 20 feet below grade (native soil layer) were analyzed for VOCs, SVOCs, pesticides, PCBs, and TAL metals. Groundwater

samples were analyzed for VOCs, SVOCs, pesticides, PCBs, and TAL metals and dissolved metals. Soil vapor samples were analyzed for VOCs by EPA Method TO-15.

A summary of the environmental findings of the Remedial Investigation includes the following:

1. A 5- to 6-foot thick zone of petroleum VOC contamination was identified at the groundwater interface across the Site.
2. TCE impacted soil with the highest concentrations was detected in the shallow soil samples collected from the western portion of the Site.
3. A historic fill material layer extending to depths as deep as 13 feet below grade contained SVOCs and metals exceeding the commercial SCOs.
4. A native soil layer approximately 18 to 20 feet below grade contained elevated concentrations of both arsenic and mercury.
5. Petroleum related VOCs were detected above GQS in six of the eight groundwater samples.
6. Low levels of petroleum related VOCs were detected in soil vapor samples in addition to elevated concentrations of the chlorinated VOCs, TCE and PCE.

May to December 2018 – Summary of Construction Activities

Construction activities and remedial measures took place on the Site from May to December 2018. Construction work was completed under the final Interim Remedial Measures Work Plan (IRMWP) submitted to NYSDEC in January 2016 by AMC Engineering. According to available records, intrusive work began on the Site in late May 2018 and commenced with the excavation and offsite disposal of soil from 0 to 5 feet below grade site wide. This interval was documented as the historic fill layer. Executed manifests and logs indicated that a total of 6,458.53 tons of soil were excavated and transported offsite to Bayshore Soil Management Facility (Bayshore) located in Keasbey, NJ. Soil excavation and offsite disposal was temporarily concluded on 13 December 2018.

Beginning on 12 June 2018, a secant pile wall was installed on the perimeter of the Site as part of the support-of-excavation (SOE) design and was overseen by Mueser Rutledge Consulting Engineers (Mueser). A review of daily field reports prepared by Mueser revealed that a total of 292 secant piles (each grouted) were installed. An unknown number of tiebacks were also installed as part of the SOE.

On 20 June 2018, a 550-gallon underground storage tank located in the southeast corner of the Site was removed according to a tank removal affidavit provided by Eastern Environmental Solutions, Inc. The affidavit indicates that the tank was purged, cut open, cleaned of all contents, and disposed of at a permitted disposal facility. The associated piping was also removed and disposed of at a permitted scrap metal facility.

Dewatering efforts were required on-site during excavation. Dewatering permits were authorized by the NYC Department of Environmental Protection on 9 December 2018, to discharge up to 20,000 gallons per day (gpd) of groundwater during construction. Although the permits were authorized, no records indicate that a dewatering system was implemented. The permits have since expired.

Construction and IRM activities have left an open excavation area approximately 5 to 6 feet below grade. The excavation is heavily vegetated and contains approximately 1- to 2-ft of standing water. Garbage, debris, and construction materials are scattered throughout the excavation depression.

October 2021- Corrective Action Work Plan (Haley & Aldrich)

A Corrective Action Work Plan (CAWP) was submitted and approved by NYSDEC on 12 October 2021. The CAWP is ongoing and designed to address the deficiencies in Site progression through the BCP and remedy non-compliant conditions at the Site. Corrective Action activities required equipment mobilization, dewatering, installation of a demarcation layer, backfilling, and documentation sampling. Based on initial observations, the soil appears to be saturated to the point where collection of endpoint samples may not be feasible until the material is stabilized or backfill is installed.

3. Supplemental Investigation

This section describes the field activities to be conducted during the SI and provides the sampling scope, objectives, methods, anticipated number of samples, and sample locations. A summary of the sampling and analysis plan is provided in Table 14 and Figure 3. The following activities will be conducted to fill data gaps and determine the nature and extent of contamination at the site.

3.1 UTILITY MARKOUT AND SURVEY

Field personnel will mobilize to the site to stake (with flagging or paint) the proposed soil sample locations. Once the sample locations are marked, Dig Safely New York will be contacted to mark underground utilities. If necessary, the adjacent property owners and private vendors will be contacted for assistance with a mark out of utilities. Once the utilities are marked, field equipment and personnel will be mobilized to the site. A current elevation survey will also be conducted at the Site.

3.2 SOIL SAMPLING

To further characterize subsurface soil conditions and analyze for additional parameters (i.e., per- and polyfluoroalkyl substances [PFAS] and 1,4-dioxane) on-Site soil samples will be collected to meet NYSDEC DER-10 requirements for remedial investigations.

The sampling and analysis plan is summarized in Table 14. Twelve soil borings will be installed to 20 feet below sidewalk grade (ft bgs) by a track-mounted direct-push drill rig (Geoprobe®) operated by a licensed operator. Soil samples will be collected from acetate liners using a stainless-steel trowel or sampling spoon. Samples will be collected using laboratory provided clean bottle ware. VOC grab samples will be collected using terra cores.

Soils will be logged continuously by a geologist or engineer using the Unified Soil Classification System. The presence of staining, odors, and photoionization detector (PID) response will be noted. Samples will be collected using laboratory-provided clean bottle ware. VOC grab samples will be collected using terra cores. Sampling methods are described in the Field Sampling Plan (FSP) provided as Appendix B. A Quality Assurance Project Plan (QAPP) is provided as Appendix C. Laboratory data will be reported in ASP Category B deliverable format.

Soil samples representative of Site conditions will be collected at twelve locations widely distributed across the site, as shown in Figure 3. Samples will be collected from 0 to 2 inches below current grade (variable throughout the Site) and from 18 to 20 feet below sidewalk grade. Additional samples will be collected from any interval exhibiting elevated PID readings or visual and olfactory impacts. Soil samples will be analyzed for:

- Target Compound List (TCL) VOCs using EPA method 8260B
- TCL SVOCs using EPA method 8270C
- Total Analyte List (TAL) Metals using EPA method 6010
- Per- and polyfluoroalkyl substances (PFAS) by Modified EPA Method 537.1
- 1,4-dioxane by EPA Method 8270 SIM

Samples to be analyzed for PFAS and 1,4-dioxane will be collected and analyzed in accordance with the NYSDEC issued June 2021 “Guidelines for sampling and Analysis of PFAS” and the June 2019 Sampling for “1,4-dioxane and Per- and Polyfluoroalkyl Substances (PFAS) Under DEC’s Part 375 Remedial Programs,” respectively.

Endpoint sample locations to be collected during the Corrective Action are detailed in Figure 3. If Site conditions do not allow for all of the endpoint samples to be collected during the Corrective Action, they will be collected during this Supplemental Investigation by the updated Sample nomenclature reflected in Figure 3.

3.3 GROUNDWATER SAMPLING

The purpose of the groundwater sampling is to obtain current groundwater data and analyze for additional parameters (i.e., per- and polyfluoroalkyl substances [PFAS] and 1,4-dioxane) to meet NYSDEC DER-10 requirements for remedial investigations.

Five two-inch permanent monitoring wells will be installed to 20 ft bgs. Monitoring wells will have a 2-inch annular space and will be installed using either #0 or #00 certified clean sand fill. Wells will be screened from 10 to 20 ft bgs. Groundwater was encountered at approximately 12 to 13 ft bgs during the RI completed in 2015. Monitoring wells will be developed at least one week after installation by surging a pump in the well several times to pull fine-grained material from the well. Development will be completed until the water turbidity is 50 nephelometric turbidity units (NTU) or less or ten well volumes are removed, if possible. The well casings will be surveyed by a New York State licensed surveyor to facilitate the preparation of a groundwater contour map and to determine the direction of groundwater flow.

The sampling and analysis plan is summarized in Table 14. Well locations are provided in Figure 3.

Monitoring wells MW-01 through MW-05 will be sampled and analyzed for:

- TCL VOCs using EPA method 8260B;
- TCL SVOCs using EPA method 8270C;
- Total Metals using EPA methods 6010/7471;
- PFAS using Modified EPA method 537; and
- 1,4-Dioxane using EPA method 8260B.

Samples to be analyzed for PFAS and 1,4-dioxane will be collected and analyzed in accordance with the NYSDEC issued January 2020 “Guidelines for sampling and Analysis of PFAS” and the June 2019 Sampling for “1,4-dioxane and Per- and Polyfluoroalkyl Substances (PFAS) Under DEC’s Part 375 Remedial Programs,” respectively.

Groundwater wells will be sampled using low-flow sampling methods described in the Field Sampling Plan (FSP). Following the low-flow purge, samples will be collected from monitoring wells for analysis of the analytes mentioned above.

The FSP presented in Appendix B details field procedures and protocols that will be followed during field activities. The Quality Assurance Project Plan (QAPP) presented in Appendix C details the analytical methods and procedures that will be used to analyze samples collected during field activities. Wells to be sampled for PFAS will be done following the purge and sampling method detailed in the NYSDEC guidance documents (see Appendix D).

3.4 INVESTIGATION DERIVED WASTE

Following sample collection, boreholes that are not converted to monitoring wells will be backfilled with soil cutting and an upper bentonite plug. Boreholes will be restored to grade with the surrounding area. If soil is identified as grossly contaminated, it will be separated and placed into a sealed and labeled Department of Transportation (DOT) approved 55-gallon drum pending characterization and offsite disposal. Groundwater purged from the monitoring wells during development and sample collected will be placed into a DOT approved 55-gallon drum pending offsite disposal.

3.5 SOIL VAPOR SAMPLING

Samples will be collected in accordance with the Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York (NYSDOH October 2006). Five soil vapor probes will be installed to approximately 10 to 11 ft bgs, approximately one and two feet above the groundwater interface (previously encountered at approximately 12 to 13 ft bgs). The vapor implants will be installed with a direct-push drilling rig (e.g., Geoprobe®) to advance a stainless-steel probe to the desired sample depth. Sampling will occur for the duration of two (2) hours.

Samples will be collected in appropriately sized Summa canisters that have been certified clean by the laboratory, and samples will be analyzed by using USEPA Method TO-15. Flow rate for both purging and sampling will not exceed 0.2 L/min. Sampling methods are described in the Field Sampling Plan (FSP) provided as Appendix B.

3.6 PROPOSED SAMPLING RATIONALE

Haley & Aldrich has proposed the sample plan described herein and as shown in Figure 3, in consideration of the data generated during the Remedial Investigation performed in 2015. Proposed sampling locations will address data gaps from the RI to further delineate soil and soil vapor contamination as well as obtain additional samples of the groundwater plume. Sampling locations will also help characterize soil conditions post-corrective action. Since the Site was idle since late 2018, with standing water accumulating in the excavation and dense vegetation growing across the Site, soil will be sampled directly below the previous excavation at 0 to 2 inches below current grade to test if soil conditions have changed. A deeper soil sample will be collected at each soil boring from 18 to 20 ft below current grade to examine the extent of contamination in deeper soils above Restricted-residential criteria previously identified in the RI.

SB-01/MW-01/SV-01 will be installed proximal to the location where a 550-gallon fuel oil underground storage tank (UST) was removed during construction activities in June 2018 to analyze whether subsurface impacts have occurred from the tank.

Lastly, soil and groundwater samples will be analyzed for emerging contaminants, not previously analyzed in the RI.

4. Quality Assurance and Quality Control

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

QA/QC procedures are defined in the Quality Assurance Project Plan included in Appendix C.

5. Data Use

5.1 DATA SUBMITTAL

Analytical data will be supplied in ASP Category B Data Packages if more stringent than those suggested by the United States Environmental Protection Agency, the laboratory's in-house QA/QC limits will be utilized. Validated data will be submitted to the NYSDEC EQulS database in an EDD package.

5.2 DATA VALIDATION

Data packages will be sent to a qualified data validation specialist to evaluate the accuracy and precision of the analytical results. A Data Usability Summary Report (DUSR) will be created to confirm the compliance of methods with the protocols described in the NYSDEC Analytical service Protocol (ASP). DUSRs will summarize and confirm the usability of the data for project-related decisions. Data validation will be completed in accordance with the DUSR guidelines from the NYSDEC Division of Environmental Remediation. DUSRs will be included with the submittal of a Supplemental Investigation Report (SIR), further discussed in Section 8.

6. Project Organization

A project team for the site has been created based on qualifications and experience with personnel suited for successfully completing the project.

The NYSDEC Case Manager will be Caroline Jalanti. The Case Manager will be responsible for overseeing the successful completion of the project work and adherence to the work plan on behalf of NYSDEC.

The NYSDOH Case Manager will be Scarlett McLaughlin. The Case Manager will be responsible for overseeing the successful completion of the project work and adherence to the work plan on behalf of NYSDEC.

James Bellew will be the Qualified Environmental Professional (QEP) and Principal in Charge for this work. Mr. Bellew has 15 years of experience in investigation and remediation in New York and throughout the eastern United States. In this role, Mr. Bellew will be responsible for the overall completion of each task as per requirements outlined in this work plan and in accordance with the DER-10 guidance.

Mari Conlon P.G. will be the Project Manager for this work. In this role, Ms. Conlon will manage the day-to-day tasks including coordination and supervision of field engineers and scientists, adherence to the work plan and oversight of project schedule. As the Project Manager, Ms. Conlon will also be responsible for communications with the NYSDEC Case Manager regarding project status, schedule, issues, and updates for project work.

Die Fu will be the Assistant Project Manager for this work as well as the Quality Assurance Officer (QAO). The QAO will assure the application and effectiveness of the QAPP by the analytical laboratory and the project staff, provide input to field team as to corrective actions that may be required as a result of the above-mentioned evaluations and prepare and/or review data validation and audit reports.

Sarah Commisso will be the field geologist responsible for implementing the field effort for this work. Ms. Commisso's responsibilities will include implementing the work plan activities and directing the subcontractors to ensure successful completion of all field activities.

The drilling subcontractor will be Eastern Environmental Solutions and/or Coastal Environmental. Eastern Environmental Solutions and/or Coastal Environmental will provide a geoprobe operator to implement the scope of work in this SIWP.

The analytical laboratory will be Alpha Analytical of Westborough, MA, a New York Environmental Laboratory Approval Program (ELAP) certified laboratory. Alpha Analytical will be responsible for analyzing samples as per the analyses and methods identified in Section 2.

7. Health and Safety

7.1 HEALTH AND SAFETY PLAN

A Site-specific Health and Safety Plan (HASP) has been prepared in accordance with NYSDEC and NYSDOH guidelines and is provided as Appendix E of this work plan. The HASP includes a description of health and safety protocols to be followed by Haley & Aldrich field staff during implementation of the remedy, including monitoring within the work area, along with response actions should impacts be observed. The HASP has been developed in accordance with Occupational Health and Safety Administration (OSHA) 40 CFR Part 1910.120 regulatory requirements for use by Haley & Aldrich field staff that will work at the site during planned activities. Contractors or other personnel who perform work at the site are required to develop their own health and safety plan and procedures of comparable or higher content for their respective personnel in accordance with relevant OSHA regulatory requirements for work at hazardous waste sites as well as the general industry as applicable based on the nature of work being performed.

7.2 COMMUNITY AIR MONITORING PLAN

The proposed investigation/remediation work will be completed outdoors at the Site. Where intrusive operations are planned, community air monitoring will be implemented to protect the downwind receptors. A Haley & Aldrich representative will continually monitor the breathing air in the vicinity of the immediate work area using a PID to measure total VOCs in air at concentrations as low as 1 part per million (ppm). The air in the work zone also will be monitored for visible dust generation.

If visible dust generation is observed, the intrusive work will be temporarily halted, and a more rigorous monitoring of dust particulates using recordable meters will be implemented in accordance with the NYSDOH Generic Community Air Monitoring Plan (CAMP).

The following actions will be taken based on VOC monitoring:

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 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.
- 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 identified, corrective actions taken to abate emissions, and monitoring 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.
- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities will be shut down.

CAMP data will be provided to NYSDEC in the daily reports, further detailed in Section 8.

8. Reporting

Daily reports will be submitted to NYSDEC and NYSDOH summarizing the Site activities completed during the remedial investigation. Daily reports will include a Site figure, a description of Site activities, a photo log, and CAMP data. Daily reports will be submitted the following morning after Site work is completed.

Following the completion of the work, a summary of the SI will be provided to NYSDEC in a Supplemental Investigation Report (SIR) to support the implementation of proposed remedial action. The report will include:

- Summary of the SRI activities;
- Figure showing sampling locations;
- Tables summarizing laboratory analytical results;
- Laboratory analytical data reports;
- Field sampling data sheets;
- Findings regarding the nature and extent of contamination at the site; and
- Conclusions and recommendations.

The SIR may be combined with the Remedial Action Work Plan (RAWP) as an SIR/RAWP. The SIR/RAWP will include all data collected during the RI and adhere to the technical requirements of DER-10.

9. Schedule

The Site owner plans to implement this SIWP promptly upon approval

Anticipated SI Schedule	
NYSDEC Approval of SIWP	November-December 2021
Supplemental Investigation Implementation	December 2021
Supplemental Investigation Report Submittal	January 2022
NYSDEC Review of Supplemental Investigation Report	January-February 2022

References

1. Phase I Screening. 65 Eckford Street, Brooklyn, New York. Prepared by Environmental Business Consultants, May 2015.
2. Phase II Investigation Data Summary. 65 Eckford Street, Brooklyn, New York. Prepared by Environmental Business Consultants, May 2015.
3. Remedial Investigation Report. 65 Eckford Street, Brooklyn, New York. Prepared by Environmental Business Consultants, Prepared for Z65 Realty LLC and New York State Department of Environmental Conservation, June 2016.
4. Corrective Action Work Plan. 65 Eckford Street, Brooklyn, New York. Prepared by Haley & Aldrich of New York, Prepared for 65-73 Eckford Realty LLC, August 2021.
5. Program Policy DER-10, "Technical Guidance for Site Investigation and Remediation," New York State Department of Environmental Conservation, May 2010.

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TABLES

TABLE 1
Soil Analytical Results
Volatile Organic Compounds

COMPOUND	NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives*	NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	15SB1						15SB2						15SB3						15SB4						15SB5					
			(2-4)		(11-13)		(18-20)		(0-2)		(11-13)		(18-20)		(2-4)		(11-13)		(18-20)		(0-2)		(11-13)		(18-20)		(2-4)		(11-13)		(22-24)	
			12/16/2015		12/16/2015		12/16/2015		12/17/2015		12/17/2015		12/17/2015		12/16/2015		12/16/2015		12/16/2015		12/17/2015		12/17/2015		12/17/2015		12/16/2015		12/16/2015		12/16/2015	
			Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
1,1,1,2-Tetrachloroethane			< 14	14	<8900	8900	<5.5	5.5	<16	16	<14000	14,000	<90	90	<19	19	<6.2	6.2	<8.8	8.8	<8.7	8.7	<4700	4700	<21	21	<20	20	<6900	6900	<16	16
1,1,1-Trichloroethane	680	100,000	<3.5	3.5	<8900	8900	<5.5	5.5	<3.9	3.9	<680	680	<23	23	<4.8	4.8	<6.2	6.2	<8.8	8.8	<2.2	2.2	<680	680	<5.2	5.2	<5.1	5.1	<6900	680	<4.0	4.0
1,1,2,2-Tetrachloroethane			<5.5	5.5	<8900	8900	<5.5	5.5	<3.9	3.9	<3400	3400	<23	23	<370	370	<6.2	6.2	<570	570	<2.2	2.2	<4700	4700	<5.2	5.2	<220	220	<6900	6900	<4.0	4.0
1,1,2-Trichloroethane			<3.5	3.5	<8900	8900	<5.5	5.5	<3.9	3.9	<3400	3400	<23	23	<4.8	4.8	<6.2	6.2	<8.8	8.8	<2.2	2.2	<4700	4700	<5.2	5.2	<5.1	5.1	<6900	6900	<4.0	4.0
1-Dichloroethane	270	26,000	<3.5	3.5	<8900	8900	<5.5	5.5	<3.9	3.9	<3400	3400	<23	23	<4.8	4.8	<6.2	6.2	<8.8	8.8	<2.2	2.2	<4700	4700	<5.2	5.2	<5.1	5.1	<6900	6900	<4.0	4.0
1-Dichloroethane	330	100,000	<3.5	3.5	<8900	8900	<5.5	5.5	<3.9	3.9	<3400	3400	<23	23	<4.8	4.8	<6.2	6.2	<8.8	8.8	<2.2	2.2	<4700	4700	<5.2	5.2	<5.1	5.1	<6900	6900	<4.0	4.0
1-Dichloropropane			<3.5	3.5	<8900	8900	<5.5	5.5	<3.9	3.9	<3400	3400	<23	23	<4.8	4.8	<6.2	6.2	<8.8	8.8	<2.2	2.2	<4700	4700	<5.2	5.2	<5.1	5.1	<6900	6900	<4.0	4.0
1,2,3-Trichlorobenzene			<3.5	3.5	<8900	8900	<5.5	5.5	<3.9	3.9	<3400	3400	<23	23	<370	370	<6.2	6.2	<570	570	<2.2	2.2	<4700	4700	<5.2	5.2	<220	220	<6900	6900	<4.0	4.0
1,2,3-Trichloropropane			<3.5	3.5	<8900	8900	<5.5	5.5	<3.9	3.9	<3400	3400	<23	23	<370	370	<6.2	6.2	<570	570	<2.2	2.2	<4700	4700	<5.2	5.2	<220	220	<6900	6900	<4.0	4.0
1,2,4-Trichlorobenzene			<3.5	3.5	<8900	8900	<5.5	5.5	<3.9	3.9	<3400	3400	<23	23	<370	370	<6.2	6.2	<570	570	<2.2	2.2	<4700	4700	<5.2	5.2	<220	220	<6900	6900	<4.0	4.0
1,2,4-Trimethylbenzene	3,600	52,000	<3.5	3.5	<3500	3500	<5.5	5.5	<3.9	3.9	<3400	3400	<23	23	<370	370	<6.2	6.2	<570	570	<2.2	2.2	530	3,600	<5.2	5.2	<220	220	1,500	3,500	<4.0	4.0
1,2-Dibromo-3-chloropropane			<3.5	3.5	<8900	8900	<5.5	5.5	<3.9	3.9	<3400	3400	<23	23	<370	370	<6.2	6.2	<570	570	<2.2	2.2	<4700	4700	<5.2	5.2	<220	220	<6900	6900	<4.0	4.0
1,2-Dibromomethane			<3.5	3.5	<8900	8900	<5.5	5.5	<3.9	3.9	<3400	3400	<23	23	<4.8	4.8	<6.2	6.2	<8.8	8.8	<2.2	2.2	<4700	4700	<5.2	5.2	<5.1	5.1	<6900	6900	<4.0	4.0
1,2-Dichlorobenzene	1,100	100,000	<3.5	3.5	<1000	1000	<5.5	5.5	<3.9	3.9	<1100	1100	<23	23	<370	370	<6.2	6.2	<570	570	<2.2	2.2	<1100	1100	<5.2	5.2	<220	220	<1000	1000	<4.0	4.0
1,2-Dichloroethane	20	3,100	<3.5	3.5	<8900	8900	<5.5	5.5	<3.9	3.9	<3400	3400	<20	20	<4.8	4.8	<6.2	6.2	<8.8	8.8	<2.2	2.2	<4700	4700	<5.2	5.2	<5.1	5.1	<6900	6900	<4.0	4.0
1,2-Dichloropropane			<3.5	3.5	<8900	8900	<5.5	5.5	<3.9	3.9	<3400	3400	<23	23	<4.8	4.8	<6.2	6.2	<8.8	8.8	<2.2	2.2	<4700	4700	<5.2	5.2	<5.1	5.1	<6900	6900	<4.0	4.0
1,3,5-Trimethylbenzene	8,400	52,000	<3.5	3.5	<8900	8900	<5.5	5.5	<3.9	3.9	<3400	3400	<23	23	<370	370	<6.2	6.2	<570	570	<2.2	2.2	<4700	4700	<5.2	5.2	<220	220	<6900	6900	<4.0	4.0
1,3-Dichlorobenzene	2,400	4,900	<3.5	3.5	<2000	2,000	<5.5	5.5	<3.9	3.9	<2400	2,400	<23	23	<370	370	<6.2	6.2	<570	570	<2.2	2.2	<2400	2,400	<5.2	5.2	<220	220	<1000	1,000	<4.0	4.0
1,3-Dichloropropane			<3.5	3.5	<8900	8900	<5.5	5.5	<3.9	3.9	<3400	3400	<23	23	<4.8	4.8	<6.2	6.2	<8.8	8.8	<2.2	2.2	<4700	4700	<5.2	5.2	<5.1	5.1	<6900	6900	<4.0	4.0
1,4-Dichlorobenzene	1,800	13,000	<3.5	3.5	<1800	1,800	<5.5	5.5	<3.9	3.9	<1800	1,800	<23	23	<370	370	<6.2	6.2	<570	570	<2.2	2.2	<1800	1,800	<5.2	5.2	<220	220	<1000	1,000	<4.0	4.0
1,4-dioxane	100	13,000	<70	70	<180000	180,000	<68	68	<70	70	<69000	69,000	<450	450	<96	96	<100	100	<100	100	<43	43	<93000	93,000	<100	100	<100	100	<130000	130,000	<96	96
2,2-Dichloropropane			<3.5	3.5	<8900	8900	<5.5	5.5	<3.9	3.9	<3400	3400	<23	23	<4.8	4.8	<6.2	6.2	<8.8	8.8	<2.2	2.2	<4700	4700	<5.2	5.2	<5.1	5.1	<6900	6900	<4.0	4.0
2-Chlorotoluene			<3.5	3.5	<8900	8900	<5.5	5.5	<3.9	3.9	<3400	3400	<23	23	<370	370	<6.2	6.2	<570	570	<2.2	2.2	<4700	4700	<5.2	5.2	<220	220	<6900	6900	<4.0	4.0
2-Hexanone (Methyl Butyl Ketone)			<18	18	<45000	45,000	<27	27	<20	20	<17000	17,000	<110	110	<24	24	<31	31	<44	44	<11	11	<23000	23,000	<26	26	<25	25	<35000	35,000	<20	20
2-Isopropyltoluene			<3.5	3.5	6,300	6,300	<5.5	5.5	<3.9	3.9	7,800	7,800	<23	23	<370	370	<6.2	6.2	<570	570	<2.2	2.2	7,100	7,100	<5.2	5.2	<220	220	11,000	11,000	0.92	0.92
4-Chlorotoluene			<3.5	3.5	<8900	8900	<5.5	5.5	<3.9	3.9	<3400	3400	<23	23	<370	370	<6.2	6.2	<570	570	<2.2	2.2	<4700	4700	<5.2	5.2	<220	220	<6900	6900	<4.0	4.0
4-Methyl-2-Pentanone			<18	18	<45000	45,000	<27	27	<20	20	<17000	17,000	<110	110	<24	24	<31	31	<44	44	<11	11	<23000	23,000	<26	26	<25	25	<35000	35,000	<20	20
Acetone	50	100,000	9.3	35	10,000	89,000	210	55	<39	39	<34000	34,000	630	230	14	48	29	50	170	88	3.9	22	<47000	47,000	32	50	<50	50	<69000	69,000	47	40
Acrolein			<14	14	<35000	35,000	<22	22	<16	16	<14000	14,000	<90	90	<19	19	<25	25	<35	35	<8.7	8.7	<19000	19,000	<21	21	<20	20	<28000	28,000	<16	16
Acrylonitrile			<70	70	<35000	35,000	<11	11	<16	16	<14000	14,000	<90	90	<19	19	<12	12	<35	35	<8.7	8.7	<19300	19,300	<21	21	<20	20	<14000	14,000	<16	16
Benzene	60	4,800	0.45	3.5	<8900	8900	<5.5	5.5	<3.9	3.9	<3400	3400	<23	23	<4.8	4.8	<6.2	6.2	<8.8	8.8	<2.2	2.2	<4700	4700	<5.2	5.2	<5.1	5.1	<6900	6900	<4.0	4.0
Bromobenzene			<3.5	3.5	<8900	8900	<5.5	5.5	<3.9	3.9	<3400	3400	<23	23	<370	370	<6.2	6.2	<570	570	<2.2	2.2	<4700	4700	<5.2	5.2	<220	220	<6900	6900	<4.0	4.0
Bromochloromethane			<3.5	3.5	<8900	8900	<5.5	5.5	<3.9	3.9	<3400	3400	<23	23	<4.8	4.8	<6.2	6.2	&													

TABLE 1
Soil Analytical Results
Volatile Organic Compounds

COMPOUND	NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives*	NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	15SB6						15SB7						15SB8						15SB9						15SB10						Duplicate	
			(9-2)		(11-13)		(18-20)		(9-2)		(11-13)		(18-20)		(9-2)		(11-13)		(18-20)		(9-2)		(11-13)		(18-20)		(9-2)		(11-13)		(18-20)			
			12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015			
			µg/Kg	RL	µg/Kg	RL	µg/Kg	RL	µg/Kg	RL	µg/Kg	RL	µg/Kg	RL	µg/Kg	RL	µg/Kg	RL	µg/Kg	RL	µg/Kg	RL	µg/Kg	RL	µg/Kg	RL	µg/Kg	RL	µg/Kg	RL	µg/Kg	RL		
1,1,1,2-Tetrachloroethane			Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL		
1,1,1-Trichloroethane	680	100,000	< 8.1	8.1	< 9700	9,700	< 6.5	6.5	< 4.0	4.0	< 7900	7,900	< 250	250	3.4	180	< 680	680	< 5.9	5.9	56	280	< 2.6	2.6	< 7.6	7.6	< 3.3	3.3	< 420	420	< 14	14	< 2.5	2.5
1,1,2-Trichloroethane			< 8.1	8.1	< 2400	2,400	< 6.5	6.5	< 4.0	4.0	< 7900	7,900	< 250	250	< 3.2	3.2	< 4900	4,900	< 5.9	5.9	< 280	280	< 2.6	2.6	< 7.6	7.6	< 3.3	3.3	< 320	320	< 420	420	< 1000	1,000
1,1,2-Trichloroethane			< 8.1	8.1	< 2400	2,400	< 6.5	6.5	< 4.0	4.0	< 7900	7,900	< 250	250	< 3.2	3.2	< 4900	4,900	< 5.9	5.9	< 280	280	< 2.6	2.6	< 7.6	7.6	< 3.3	3.3	< 420	420	< 14	14	< 2.5	2.5
1,1-Dichloroethane	270	26,000	< 8.1	8.1	< 2400	2,400	< 6.5	6.5	< 4.0	4.0	< 7900	7,900	< 250	250	< 3.2	3.2	< 4900	4,900	< 5.9	5.9	< 270	270	< 2.6	2.6	< 7.6	7.6	< 3.3	3.3	< 270	270	< 14	14	< 2.5	2.5
1,1-Dichloroethane	330	100,000	< 8.1	8.1	< 330	330	< 6.5	6.5	< 4.0	4.0	< 7900	7,900	< 250	250	< 3.2	3.2	< 4900	4,900	< 5.9	5.9	< 280	280	< 2.6	2.6	< 7.6	7.6	< 3.3	3.3	< 330	330	< 14	14	< 2.5	2.5
1,1-Dichloropropene			< 8.1	8.1	< 2400	2,400	< 6.5	6.5	< 4.0	4.0	< 7900	7,900	< 250	250	< 3.2	3.2	< 4900	4,900	< 5.9	5.9	< 280	280	< 2.6	2.6	< 7.6	7.6	< 3.3	3.3	< 420	420	< 14	14	< 2.5	2.5
1,2,3-Trichlorobenzene			< 8.1	8.1	< 2400	2,400	< 6.5	6.5	< 4.0	4.0	< 7900	7,900	< 250	250	< 3.2	3.2	< 4900	4,900	< 5.9	5.9	< 280	280	< 2.6	2.6	< 7.6	7.6	< 3.3	3.3	< 420	420	< 1000	1,000	< 2.5	2.5
1,2,3-Trichloropropene			< 8.1	8.1	< 2400	2,400	< 6.5	6.5	< 4.0	4.0	< 7900	7,900	< 250	250	< 3.2	3.2	< 4900	4,900	< 5.9	5.9	< 280	280	< 2.6	2.6	< 7.6	7.6	< 3.3	3.3	< 420	420	< 1000	1,000	< 2.5	2.5
1,2,4-Trichlorobenzene			< 8.1	8.1	< 2400	2,400	< 6.5	6.5	< 4.0	4.0	< 7900	7,900	< 250	250	< 3.2	3.2	< 4900	4,900	< 5.9	5.9	< 280	280	< 2.6	2.6	< 7.6	7.6	< 3.3	3.3	< 420	420	< 1000	1,000	< 2.5	2.5
1,2,4-Trimethylbenzene	3,600	52,000	< 8.1	8.1	< 2400	2,400	0.81	6.5	< 4.0	4.0	< 3600	3,600	< 250	250	0.48	3.2	6,500	5,900	46	280	64	510	530	< 220	220	< 320	320	410	420	< 1000	1,000	< 2.5	2.5	
1,2-Dibromo-3-chloropropane			< 8.1	8.1	< 2400	2,400	< 6.5	6.5	< 4.0	4.0	< 7900	7,900	< 250	250	< 3.2	3.2	< 4900	4,900	< 5.9	5.9	< 280	280	< 2.6	2.6	< 7.6	7.6	< 3.3	3.3	< 420	420	< 1000	1,000	< 2.5	2.5
1,2-Dibromomethane			< 8.1	8.1	< 2400	2,400	< 6.5	6.5	< 4.0	4.0	< 7900	7,900	< 250	250	< 3.2	3.2	< 4900	4,900	< 5.9	5.9	< 280	280	< 2.6	2.6	< 7.6	7.6	< 3.3	3.3	< 420	420	< 14	14	< 2.5	2.5
1,2-Dichlorobenzene	1,100	100,000	< 8.1	8.1	< 1100	1,100	< 6.5	6.5	< 4.0	4.0	< 1100	1,100	< 250	250	< 3.2	3.2	< 1100	1,100	< 5.9	5.9	< 280	280	< 2.6	2.6	< 7.6	7.6	< 3.3	3.3	< 420	420	< 1000	1,000	< 2.5	2.5
1,2-Dichloroethane	20	3,100	< 8.1	8.1	< 2400	2,400	< 6.5	6.5	< 4.0	4.0	< 7900	7,900	< 250	250	< 3.2	3.2	< 4900	4,900	< 5.9	5.9	< 280	280	< 2.6	2.6	< 7.6	7.6	< 3.3	3.3	< 420	420	< 14	14	< 2.5	2.5
1,2-Dichloropropane			< 8.1	8.1	< 2400	2,400	< 6.5	6.5	< 4.0	4.0	< 7900	7,900	< 250	250	< 3.2	3.2	< 4900	4,900	< 5.9	5.9	< 280	280	< 2.6	2.6	< 7.6	7.6	< 3.3	3.3	< 420	420	< 14	14	< 2.5	2.5
1,3-Trichlorobenzene	8,400	52,000	< 8.1	8.1	< 2400	2,400	0.99	6.5	< 4.0	4.0	< 2400	2,400	< 250	250	< 3.2	3.2	< 2400	2,400	0.76	5.9	< 280	200	330	< 220	220	< 320	320	< 420	420	< 1000	1,000	< 2.5	2.5	
1,3-Dichlorobenzene	2,400	4,900	< 8.1	8.1	< 2400	2,400	< 6.5	6.5	< 4.0	4.0	< 2400	2,400	< 250	250	< 3.2	3.2	< 2400	2,400	< 5.9	5.9	< 280	280	< 2.6	2.6	< 7.6	7.6	< 3.3	3.3	< 420	420	< 14	14	< 2.5	2.5
1,3-Dichloropropane			< 8.1	8.1	< 2400	2,400	< 6.5	6.5	< 4.0	4.0	< 7900	7,900	< 250	250	< 3.2	3.2	< 4900	4,900	< 5.9	5.9	< 280	280	< 2.6	2.6	< 7.6	7.6	< 3.3	3.3	< 420	420	< 14	14	< 2.5	2.5
1,4-Dichlorobenzene	1,800	13,000	< 8.1	8.1	< 1800	1,800	< 6.5	6.5	< 4.0	4.0	< 1800	1,800	< 250	250	< 3.2	3.2	< 1800	1,800	< 5.9	5.9	< 280	280	< 2.6	2.6	< 7.6	7.6	< 3.3	3.3	< 420	420	< 1000	1,000	< 2.5	2.5
1,4-dioxane	100	13,000	< 100	100	< 48000	48,000	< 100	100	< 80	80	< 160000	160,000	< 5000	5,000	< 63	63	< 97000	97,000	< 100	100	< 9600	5,600	< 51	51	< 100	100	< 67	67	< 8300	8,300	< 100	100	< 49	49
2,2-Dichloropropane			< 8.1	8.1	< 2400	2,400	< 6.5	6.5	< 4.0	4.0	< 7900	7,900	< 250	250	< 3.2	3.2	< 4900	4,900	< 5.9	5.9	< 280	280	< 2.6	2.6	< 7.6	7.6	< 3.3	3.3	< 420	420	< 14	14	< 2.5	2.5
2-Chlorotoluene			< 8.1	8.1	< 2400	2,400	< 6.5	6.5	< 4.0	4.0	< 7900	7,900	< 250	250	< 3.2	3.2	< 4900	4,900	< 5.9	5.9	< 280	280	< 2.6	2.6	< 7.6	7.6	< 3.3	3.3	< 420	420	< 14	14	< 2.5	2.5
2-Hexanone (Methyl Butyl Ketone)			< 40	40	< 12000	12,000	< 32	32	< 20	20	< 40000	40,000	< 1200	1,200	< 16	16	< 24000	24,000	< 30	30	< 1400	1,400	< 13	13	< 38	38	< 17	17	< 2100	2,100	< 69	69	< 12	12
2-Chloropropylene			< 8.1	8.1	< 2400	2,400	< 6.5	6.5	< 4.0	4.0	< 7900	7,900	< 250	250	< 3.2	3.2	< 4900	4,900	< 5.9	5.9	< 280	280	< 2.6	2.6	< 7.6	7.6	< 3.3	3.3	< 420	420	< 1000	1,000	< 2.5	2.5
4-Chlorotoluene			< 8.1	8.1	< 2400	2,400	< 6.5	6.5	< 4.0	4.0	< 7900	7,900	< 250	250	< 3.2	3.2	< 4900	4,900	< 5.9	5.9	< 280	280	< 2.6	2.6	< 7.6	7.6	< 3.3	3.3	< 420	420	< 14	14	< 2.5	2.5
4-Methyl-2-Pentanone			< 40	40	< 12000	12,000	< 32	32	< 20	20	< 40000	40,000	< 1200	1,200	< 16	16	< 24000	24,000	< 30	30	< 1400	1,400	< 13	13	< 38	38	< 17	17	< 2100	2,100	< 69	69	< 12	12
Acetone	50	100,000	< 50	50	< 24000	24,000	70	30	< 40	40	< 79000	79,000	< 2500	2,500	8.2	32	< 49000	49,000	< 50	50	< 2800	2,800	3.1	26	16	50	< 33	33	< 4200	4,200	230	50	< 25	25
Acrolein			< 32	32	< 9700	9,700	< 26	26	< 16	16	< 32000	32,000	< 1000	1,000	< 13	13	< 19000	19,000	< 24	24	< 1100	1,100	< 10	10	< 31	31	< 13	13	< 1700	1,700	< 55	55	< 9.9	9.9
Acrylonitrile			< 32	32	< 9700	9,700	< 26	26	< 16	16	< 16000	16,000	< 1000	1,000	< 13	13	< 19000	19,000	< 24</															

TABLE 2
Soil Analytical Results
Volatile Organic TICs

COMPOUND	NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives*	NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	15SB5	
			(22-24') 12/17/2015 µg/Kg	
			Result	RL
Cyclohexane, 1-ethyl-4-methyl-, trans- (RT 4.930)			4.1	5
Cyclohexane, butyl- (RT 6.049)			10	5
unknown (RT 5.071)			5	5
unknown (RT 5.123)			7.8	5

Notes:

* - 6 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives

RL- Reporting Limit

Bold/highlighted- Indicated exceedance of the NYSDEC UUSCO Guidance Value

Bold/highlighted- Indicated exceedance of the NYSDEC RRSCO Guidance Value

TABLE 3
Soil Analytical Results
Semi-Volatile Organic Compounds

COMPOUND	NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives*	NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	155B1						155B2						155B3						155B4						155B5					
			(2-4) 12/16/2015		(11-13) 12/16/2015		(18-20) 12/16/2015		(0-2) 12/17/2015		(11-13) 12/17/2015		(18-20) 12/17/2015		(2-4) 12/16/2015		(11-13) 12/16/2015		(18-20) 12/16/2015		(0-2) 12/17/2015		(11-13) 12/17/2015		(18-20) 12/17/2015		(2-4) 12/16/2015		(11-13) 12/16/2015		(22-24) 12/16/2015	
			µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg	
			Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
1,2,4,5-Tetrachlorobenzene			< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
1,2,4-Trichlorobenzene			< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
1,2-Dichlorobenzene			< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
1,2-Diphenylhydrazine			< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
1,3-Dichlorobenzene			< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
1,4-Dichlorobenzene			< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
2,4,5-Trichlorophenol			< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
2,4,6-Trichlorophenol			< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
2,4-Dichlorophenol			< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
2,4-Dimethylphenol			< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
2,4-Dinitrophenol			< 660	660	< 820	820	< 980	980	< 780	780	< 930	930	< 2400	2,400	< 660	660	< 860	860	< 980	980	< 740	740	< 850	850	< 920	920	< 650	650	< 860	860	< 650	650
2,4-Dinitrotoluene			< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
2,6-Dinitrotoluene			< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
2-Chloronaphthalene			< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
2-Chlorophenol			< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
2-Methylnaphthalene			< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	300	230	< 300	300	< 230	230
2-Methylphenol (o-cresol)	330	100,000	< 230	230	< 290	290	< 330	330	< 270	270	< 320	320	< 330	330	< 230	230	< 300	300	< 330	330	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
2-Nitroaniline			< 660	660	< 820	820	< 980	980	< 780	780	< 930	930	< 2400	2,400	< 660	660	< 860	860	< 980	980	< 740	740	< 850	850	< 920	920	< 650	650	< 860	860	< 650	650
2-Nitrophenol			< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
3&4-Methylphenol (m&p-cresol)	330	100,000	< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
3,3'-Dichlorobenzidine			< 660	660	< 820	820	< 980	980	< 780	780	< 930	930	< 2400	2,400	< 660	660	< 860	860	< 980	980	< 740	740	< 850	850	< 920	920	< 650	650	< 860	860	< 650	650
3-Nitroaniline			< 660	660	< 820	820	< 980	980	< 780	780	< 930	930	< 2400	2,400	< 660	660	< 860	860	< 980	980	< 740	740	< 850	850	< 920	920	< 650	650	< 860	860	< 650	650
4,6-Dinitro-2-methylphenol			< 1600	1,600	< 2,100	2,100	< 2,500	2,500	< 2000	2,000	< 2,500	2,300	< 6000	6,000	< 1600	1,600	< 2,200	2,200	< 2,500	2,500	< 1600	1,600	< 2,100	2,100	< 2,300	2,300	< 1,600	1,600	< 2,200	2,200	< 1,600	1,600
4-Bromophenyl phenyl ether			< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
4-Chloro-3-methylphenol			< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
4-Chloroaniline			< 260	260	< 330	330	< 390	390	< 310	310	< 370	370	< 980	980	< 260	260	< 340	340	< 390	390	< 290	290	< 340	340	< 370	370	< 260	260	< 350	350	< 260	260
4-Chlorophenyl phenyl ether			< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
4-Nitroaniline			< 660	660	< 820	820	< 980	980	< 780	780	< 930	930	< 2400	2,400	< 660	660	< 860	860	< 980	980	< 740	740	< 850	850	< 920	920	< 650	650	< 860	860	< 650	650
4-Nitrophenol			< 330	330	< 410	410	< 490	490	< 390	390	< 460	460	< 1200	1,200	< 330	330	< 430	430	< 490	490	< 370	370	< 420	420	< 440	440	< 330	330	< 430	430	< 330	330
Acenaphthene	20,000	100,000	< 230	230	380	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	210	300	< 320	320	620	230	1,400	300	< 230	230
Acenaphthylene	100,000	100,000	96	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	230	230	180	300	< 23	

TABLE 3
Soil Analytical Results
Semi-Volatile Organic Compounds

COMPOUND	NYSDC Part 375.6 Unrestricted Use Soil Cleanup Objectives*	NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	15SB6						15SB7						15SB8						15SB9						15SB10						Duplicate	
			(0-2)		(11-13)		(18-20)		(0-2)		(11-13)		(18-20)		(0-2)		(11-13)		(18-20)		(0-2)		(11-13)		(18-20)		(0-2)		(11-13)		(18-20)			
			12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015			
			Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
1,2,4,5-Tetrachlorobenzene			< 270	270	< 350	350	< 360	360	< 260	260	< 290	290	< 310	310	< 260	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 340	340	< 440	440	< 280	280
1,2,4-Trichlorobenzene			< 270	270	< 350	350	< 360	360	< 260	260	< 290	290	< 310	310	< 260	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 340	340	< 440	440	< 280	280
1,2-Dichlorobenzene			< 270	270	< 350	350	< 360	360	< 260	260	< 290	290	< 310	310	< 260	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 340	340	< 440	440	< 280	280
1,2-Diphenylhydrazine			< 270	270	< 350	350	< 360	360	< 260	260	< 290	290	< 310	310	< 260	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 340	340	< 440	440	< 280	280
1,3-Dichlorobenzene			< 270	270	< 350	350	< 360	360	< 260	260	< 290	290	< 310	310	< 260	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 340	340	< 440	440	< 280	280
1,4-Dichlorobenzene			< 270	270	< 350	350	< 360	360	< 260	260	< 290	290	< 310	310	< 260	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 340	340	< 440	440	< 280	280
2,4,5-Trichlorophenol			< 270	270	< 350	350	< 360	360	< 260	260	< 290	290	< 310	310	< 260	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 340	340	< 440	440	< 280	280
2,4,6-Trichlorophenol			< 270	270	< 350	350	< 360	360	< 260	260	< 290	290	< 310	310	< 260	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 340	340	< 440	440	< 280	280
2,4-Dichlorophenol			< 270	270	< 350	350	< 360	360	< 260	260	< 290	290	< 310	310	< 260	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 340	340	< 440	440	< 280	280
2,4-Dimethylphenol			< 270	270	< 350	350	< 360	360	< 260	260	< 290	290	< 310	310	< 260	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 340	340	< 440	440	< 280	280
2,4-Dinitrophenol			< 760	760	< 990	990	< 1000	1,000	< 750	750	< 820	820	< 880	880	< 750	750	< 860	860	< 940	940	< 770	770	< 810	810	< 750	750	< 720	720	< 980	980	< 1300	1,300	< 810	810
2,4-Dinitrotoluene			< 270	270	< 350	350	< 360	360	< 260	260	< 290	290	< 310	310	< 260	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 340	340	< 440	440	< 280	280
2,6-Dinitrotoluene			< 270	270	< 350	350	< 360	360	< 260	260	< 290	290	< 310	310	< 260	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 340	340	< 440	440	< 280	280
2-Chloronaphthalene			< 270	270	< 350	350	< 360	360	< 260	260	< 290	290	< 310	310	< 260	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 340	340	< 440	440	< 280	280
2-Chlorophenol			< 270	270	< 350	350	< 360	360	< 260	260	< 290	290	< 310	310	< 260	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 340	340	< 440	440	< 280	280
2-Methylnaphthalene			< 270	270	< 350	350	< 360	360	770	260	< 290	290	< 310	310	160	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 340	340	< 440	440	< 280	280
2-Methylphenol (o-cresol)	330	100,000	< 270	270	< 330	330	< 330	330	< 260	260	< 290	290	< 310	310	< 260	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 330	330	< 330	330	< 280	280
2-Nitroaniline			< 760	760	< 990	990	< 1000	1,000	< 750	750	< 820	820	< 880	880	< 750	750	< 860	860	< 940	940	< 770	770	< 810	810	< 750	750	< 720	720	< 980	980	< 1300	1,300	< 810	810
2-Nitrophenol			< 270	270	< 350	350	< 360	360	< 260	260	< 290	290	< 310	310	< 260	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 340	340	< 440	440	< 280	280
3,4-Methylphenol (m&p-cresol)	330	100,000	< 270	270	< 350	350	< 360	360	< 260	260	< 290	290	< 310	310	< 260	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 340	340	< 440	440	< 280	280
3,3'-Dichlorobenzidine			< 760	760	< 990	990	< 1000	1,000	< 750	750	< 820	820	< 880	880	< 750	750	< 860	860	< 940	940	< 770	770	< 810	810	< 750	750	< 720	720	< 980	980	< 1300	1,300	< 810	810
3-Nitroaniline			< 760	760	< 990	990	< 1000	1,000	< 750	750	< 820	820	< 880	880	< 750	750	< 860	860	< 940	940	< 770	770	< 810	810	< 750	750	< 720	720	< 980	980	< 1300	1,300	< 810	810
4,6-Dinitro-2-methylphenol			< 1900	1,900	< 2500	2,500	< 2600	2,600	< 1900	1,900	< 2100	2,100	< 2200	2,200	< 1900	1,900	< 2200	2,200	< 2300	2,300	< 1900	1,900	< 2000	2,000	< 1900	1,900	< 1900	1,900	< 2400	2,400	< 3200	3,200	< 2000	2,000
4-Bromophenyl phenyl ether			< 270	270	< 350	350	< 360	360	< 260	260	< 290	290	< 310	310	< 260	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 340	340	< 440	440	< 280	280
4-Chloro-3-methylphenol			< 270	270	< 350	350	< 360	360	< 260	260	< 290	290	< 310	310	< 260	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 340	340	< 440	440	< 280	280
4-Chloroaniline			< 300	300	< 400	400	< 410	410	< 300	300	< 330	330	< 350	350	< 300	300	< 350	350	< 380	380	< 310	310	< 320	320	< 300	300	< 250	250	< 380	380	< 510	510	< 320	320
4-Chlorophenyl phenyl ether			< 270	270	< 350	350	< 360	360	< 260	260	< 290	290	< 310	310	< 260	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 340	340	< 440	440	< 280	280
4-Nitroaniline			< 760	760	< 990	990	< 1000	1,000	< 750	750	< 820	820	< 880	880	< 750	750	< 860	860	< 940	940	< 770	770	< 810	810	< 750	750	< 720	720	< 980	980	< 1300	1,300	< 810	810
4-Nitrophenol			< 380	380	< 490	490	< 520	520	< 370	370	< 410	410	< 440	440	< 370	370	< 430	430	< 470	470	< 380	380	< 400	400	< 380	380	< 350	350	< 480	480	< 630	630	< 410	410
Acenaphthene	20,000	100,000	< 270	270	< 350	350	< 360	360																										

TABLE 4
Soil Analytical Results
Semi-Volatile Organic
TICs (15SB1-15SB5)

COMPOUND	NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives*	NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	15SB1				15SB2				15SB3				15SB4				15SB5			
			(2-4")		(18-20")		(0-2")		(18-20")		(2-4")		(18-20")		(0-2")		(11-13")		(18-20")		(2-4")	
			12/16/2015		12/16/2015		12/17/2015		12/17/2015		12/16/2015		12/16/2015		12/17/2015		12/17/2015		12/17/2015		12/16/2015	
			µg/Kg	RL	µg/Kg	RL	µg/Kg	RL	µg/Kg	RL	µg/Kg	RL	µg/Kg	RL	µg/Kg	RL	µg/Kg	RL	µg/Kg	RL	µg/Kg	RL
11H-Benzo[b]fluorene (RT 8.281)																						
11H-Benzo[b]fluorene (RT 8.398)																					810	4
11H-Benzo[b]fluorene (RT 8.404)																					1,800	4
11H-Benzo[b]fluorene Isomer (RT 8.281)																						
11H-Benzo[b]fluorene Isomer (RT 8.469)																					970	4
1H-Indene, 1-ethylidene- (RT 4.659)																						
1H-Indene, 2,3-dihydro-1,1-dimethyl (RT 3.546)																	6,600	4				
1H-Indene, 2-phenyl- (RT 7.239)																						
2-Pentanone, 4-hydroxy-4-methyl- (RT 1.981)					4,100	4							3,600	4							5,300	4
2-Pentanone, 4-hydroxy-4-methyl- (RT 1.981)																						
2-Pentanone, 4-hydroxy-4-methyl- (RT 1.987)											15,000	4										
2-Pentanone, 4-hydroxy-4-methyl- (RT 2.010)			120,000	4																		
2-Pentanone, 4-hydroxy-4-methyl- (RT 2.063)																					7,900	4
2-Pentanone, 4-hydroxy-4-methyl- (RT 2.063)							2,600	4			16,000	4			1,300	4						
2-Pentanone, 4-hydroxy-4-methyl- (RT 2.069)																		8,700	4			
2-Pentanone, 4-hydroxy-4-methyl- (RT 2.075)																						
2-Pentanone, 4-hydroxy-4-methyl- (RT 2.081)																						
2-Pentanone, 4-hydroxy-4-methyl- (RT 2.087)																						
2-Pentanone, 4-hydroxy-4-methyl- (RT 2.704)									19,000	4												
2-Pentene, 2,3-dimethyl- (RT 1.751)			2,800	4																		
2-Pentene, 3-ethyl-4,4-dimethyl- (RT 2.904)																						
2-Phenylnaphthalene (RT 7.475)																						
3,4-Dihydrocyclopenta[cd]pyrene (a (RT 9.716)																					840	4
3-Hexene, 3-methyl-2,5-dimethyl- (RT 2.834)																						
Anthracene, 1-methyl- (RT 7.239)																						
Anthracene, 2-(1,1-dimethylethyl)- (RT 8.369)																		580	4			
Anthracene, 2-methyl- (RT 7.216)																						
Anthracene, 2-methyl- (RT 7.240)																					670	4
Benzo[a]acetylenanthylene (RT 11.792)																					1,200	4
Benzene, (2-methyl-1-butanyl)- (RT 3.540)																						
Benzene, (2-methyl-1-butanyl)- (RT 3.546)																						
Benzene, 1,2,3,4-tetramethyl- (RT 3.793)																						
Benzene, 1,2,3,4-tetramethyl- (RT 3.810)																	11,000	4				
Benzene, 1,2,3,5-tetramethyl- (RT 3.581)																						
Benzene, 1,2,3-trimethyl- (RT 2.893)																						
Benzene, 1,2,4-trimethyl- (RT 2.893)																						
Benzene, 1,2-diethyl- (RT 3.193)																						
Benzene, 1,2-diethyl- (RT 3.204)									16,000	4												
Benzene, 1-methyl-3-(1-methylethyl) (RT 3.599)																	21,000	4				
Benzene, 1-methyl-4-(1-methylethyl) (RT 3.657)																						
Benzene, 1-methyl-4-(1-methylethyl) (RT 3.698)																						
Benzene, 1-methyl-4-(1-methylethyl) (RT 3.810)																						
Benzene, 2-ethyl-1,4-dimethyl- (RT 3.575)																						
Benzene, methyl(1-methylethyl)- (RT 3.575)																						
Benzo[el]pyrene (RT 11.786)																						
Benzo[el]pyrene (RT 11.886)																						
Benzo[el]pyrene (RT 11.898)											300	4										
Benzo[el]pyrene (RT 12.150)																						
Benzo[el]pyrene (RT 12.192)																						
Benzo[el]pyrene (RT 12.196)																					2,700	4
Benzo[el]pyrene Isomer (RT 11.780)																						
Benzo[el]pyrene Isomer (RT 12.510)																						
Benzo[el]pyrene Isomer (RT 12.522)																					1,100	4
Cyclohexane, (bromomethyl)- (RT 3.381)																						
Cyclohexane, 1,1-dimethyl- (RT 2.904)									15,000	4												
Cyclohexane, 1,3,5-trimethyl- (RT 2.704)																						
Cyclohexane, 1-ethyl-1-methyl- (RT 2.828)																						
Cyclohexane, elcosyl- (RT 3.675)																		8,900	4			
Cyclohexane, octyl- (RT 2.845)																						
Cyclohexane, pentyl- (RT 3.669)																						
Cyclohexane, pentyl- (RT 3.675)																						
Cyclohexane, propyl- (RT 2.540)																						
Elcosane (RT 13.498)																						
Hexadecanoic acid (RT 7.228)							330	4							340	4						
Hexadecanoic acid (RT 7.257)																						
Naphthalene, 1,5-dimethyl- (RT 5.187)																						
Naphthalene, decahydro-, trans- (RT 3.281)																						
Naphthalene, decahydro-, trans- (RT 3.287)																						
Naphthalene, decahydro-, trans- (RT 3.299)									32,000	4												
Octadecane, 1-(ethenyl)- (RT 9.369)											1,500	4						2,300	4			
Pentatriacontane (RT 11.645)																					330	4
Pentatriacontane (RT 11.651)																						
Phenanthrene, 2,5-dimethyl- (RT 7.710)																						
Phenanthrene, 2-methyl- (RT 7.216)																						
Phenanthrene, 3,4,5,6-tetramethyl- (RT 8.239)																						
Sulfur dioxide (RT 5.575)																						
Tetracontane, 3,5,24-trimethyl- (RT 3.069)																						
Tricyclo[4.3.1.13,8]undecane, 1-bromo (RT 3.640)																			2,500	4		
Triphenylene, 2-methyl- (RT 10.210)																					940	4

Notes:
* - 6 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives
RL - Reporting Limit
Bold/highlighted - Indicated exceedance of the NYSDEC (USDO Guidance Value
Bold/highlighted - Indicated exceedance of the NYSDEC RRSO Guidance Value

TABLE 4
Soil Analytical Results
Semi-Volatile Organic
TICs (15SB1-15SB5)

COMPOUND	NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives*	NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	15SB1				15SB2				15SB3				15SB4						15SB5			
			(2-4) 12/16/2015		(18-20) 12/16/2015		(8-2) 12/17/2015		(18-20) 12/17/2015		(2-4) 12/16/2015		(18-20) 12/16/2015		(8-2) 12/17/2015		(11-13) 12/17/2015		(18-20) 12/17/2015		(2-4) 12/16/2015		(22-24) 12/16/2015	
			Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
Unknown (RT 1.869)											8,200	4												
Unknown (RT 10.045)																								
unknown (RT 10.351)					3,200	4																		
unknown (RT 10.822)					840	4																		
unknown (RT 11.216)																								
Unknown (RT 11.457)											4,000	4												
unknown (RT 11.863)					1,100	4																		
Unknown (RT 12.128)																								
Unknown (RT 12.174)																								
Unknown (RT 12.198)																								
Unknown (RT 12.615)																								
Unknown (RT 12.645)																		860	4					
Unknown (RT 12.980)																								
Unknown (RT 14.804)																								
Unknown (RT 14.992)																								
Unknown (RT 15.768)													1,100	4										
Unknown (RT 15.768)																								
unknown (RT 15.886)													840	4										
Unknown (RT 15.886)																								
unknown (RT 15.892)					1,500	4																		
Unknown (RT 15.960)											8,000	4												
Unknown (RT 16.051)											2,700	4												
Unknown (RT 16.074)																								
Unknown (RT 16.098)											4,600	4												
Unknown (RT 16.145)													640	4										
Unknown (RT 16.145)																								
Unknown (RT 16.186)											10,000	4												
Unknown (RT 16.286)					760	4																		
Unknown (RT 16.345)											4,600	4												
Unknown (RT 16.480)											1,700	4										560	4	
Unknown (RT 17.033)																								
Unknown (RT 2.075)																								
Unknown (RT 2.445)																								
Unknown (RT 2.546)																								
Unknown (RT 2.552)																								
Unknown (RT 2.610)																								
Unknown (RT 2.699)																								
Unknown (RT 2.704)																								
Unknown (RT 2.734)																								
Unknown (RT 2.751)																								
Unknown (RT 2.810)																								
Unknown (RT 2.816)																								
Unknown (RT 2.828)											7,700	4												
Unknown (RT 2.840)																								
Unknown (RT 2.851)											18,000	4												
Unknown (RT 2.893)																								
Unknown (RT 2.904)																								
Unknown (RT 2.957)											7,000	4												
Unknown (RT 2.975)																								
Unknown (RT 3.010)																								
Unknown (RT 3.063)																								
Unknown (RT 3.075)											25,000	4												
Unknown (RT 3.081)																								
Unknown (RT 3.093)																								
Unknown (RT 3.104)											25,000	4												
Unknown (RT 3.110)																								
Unknown (RT 3.116)																		2,900	4					
Unknown (RT 3.128)																								
Unknown (RT 3.157)																								
Unknown (RT 3.169)																								
Unknown (RT 3.181)											7,100	4												
Unknown (RT 3.193)																								
Unknown (RT 3.198)																								
Unknown (RT 3.234)																								
Unknown (RT 3.275)																								
Unknown (RT 3.287)																								
Unknown (RT 3.310)											8,700	4												
Unknown (RT 3.375)																								
Unknown (RT 3.387)											21,000	4												
Unknown (RT 3.410)																								
Unknown (RT 3.487)																								
Unknown (RT 3.522)																								
Unknown (RT 3.540)											6,600	4												
Unknown (RT 3.569)																		6,000	4					
Unknown (RT 3.581)																								
Unknown (RT 3.587)																								

Notes:
* - 8 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives
RL- Reporting Limit
Boldhighlighted- Indicated exceedance of the NYSDC UUSCO Guidance Value
Boldhighlighted- Indicated exceedance of the NYSDC RRSO Guidance Value

TABLE 4
Soil Analytical Results
Semi-Volatile Organic
TICs (15SB1-15SB5)

COMPOUND	NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives*	NYSDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	15SB1				15SB2				15SB3				15SB4				15SB5					
			(2-4) 12/16/2015		(18-20) 12/16/2015		(8-2) 12/17/2015		(18-20) 12/17/2015		(2-4) 12/16/2015		(18-20) 12/16/2015		(8-2) 12/17/2015		(11-13) 12/17/2015		(18-20) 12/17/2015		(2-4) 12/16/2015		(22-24) 12/16/2015	
			Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
Unknown (RT 3.593)									24,000	4														
Unknown (RT 3.599)																								
Unknown (RT 3.687)									21,000	4														
Unknown (RT 3.693)																								
Unknown (RT 3.722)																			11,000	4				
Unknown (RT 3.728)																			9,200	4				
Unknown (RT 3.792)																								
Unknown (RT 3.793)																								
Unknown (RT 3.798)																								
Unknown (RT 3.834)																			3,200	4				
Unknown (RT 3.869)																			2,000	4				
Unknown (RT 3.893)																								
Unknown (RT 3.899)																			3,900	4				
Unknown (RT 3.924)																			2,900	4				
Unknown (RT 4.669)																								
Unknown (RT 4.675)																								
Unknown (RT 5.210)																								
Unknown (RT 5.622)																								
Unknown (RT 5.686)																			950	4				
Unknown (RT 5.687)											8,100	4												
Unknown (RT 5.834)																								
Unknown (RT 6.496)																								
Unknown (RT 7.210)																								
Unknown (RT 7.322)																						1,700	4	
Unknown (RT 7.410)																								
Unknown (RT 7.475)																			450	4				
Unknown (RT 7.564)																								
Unknown (RT 7.696)																								
Unknown (RT 7.786)																								
Unknown (RT 7.892)																								
Unknown (RT 7.898)																								
Unknown (RT 7.945)																								
Unknown (RT 8.016)																								
Unknown (RT 8.022)									800	4														
Unknown (RT 8.133)											1,300	4												
Unknown (RT 8.134)																			400	4				
Unknown (RT 8.139)																								
Unknown (RT 8.140)																							660	4
Unknown (RT 8.151)																								
Unknown (RT 8.369)																								
Unknown (RT 8.396)																								
Unknown (RT 8.833)																								
Unknown (RT 8.981)																								
Unknown (RT 9.016)																								
Unknown (RT 9.022)																								
Unknown (RT 9.026)																								
Unknown (RT 9.210)																						710	4	
Unknown (RT 9.234)																						710	4	
Unknown (RT 9.298)																								
Unknown (RT 9.304)																							680	4
Unknown (RT 9.304)																								
Unknown (RT 9.398)																								
Unknown (RT 9.504)																								
Unknown (RT 9.510)																								
Unknown (RT 9.516)																								
Unknown (RT 9.551)																			540	4				
Unknown (RT 9.557)																			880	4				
Unknown (RT 9.851)																								
Unknown hydrocarbon (RT 10.351)																			1,100	4				
Unknown hydrocarbon (RT 10.822)																			420	4				
Unknown hydrocarbon (RT 11.210)																			430	4				
Unknown hydrocarbon (RT 11.857)																			550	4				
Unknown hydrocarbon (RT 12.251)																								
Unknown hydrocarbon (RT 14.163)																								
Unknown hydrocarbon (RT 14.174)																			2,300	4				
Unknown hydrocarbon (RT 15.774)																								
Unknown hydrocarbon (RT 8.416)																								
Unknown hydrocarbon (RT 8.833)																								
Unknown hydrocarbon (RT 8.846)																			6,900	4				
Unknown hydrocarbon (RT 9.210)																								
Unknown hydrocarbon (RT 9.210)																			3,900	4				
Unknown hydrocarbon (RT 9.857)																								
Unknown hydrocarbon (RT 9.857)																			2,400	4				
Vinylcyclooctane (RT 3.622)																								
																			3,000	4				

Notes:
* - 6 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives
RL- Reporting Limit
Boldhighlighted- Indicated exceedance of the NYSDEC UIUSCO Guidance Value
Boldhighlighted- Indicated exceedance of the NYSDEC RRSCO Guidance Value

TABLE 5
Soil Analytical Results
Semi-Volatile Organic
TICS (15SB6-15SB10, Duplicate)

[illegible]

Notes:
* - 6 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives

Bold/highlighted: Indicated exceedance of the NYSDOC UUSCO Guidance Value

TABLE 6
Soil Analytical Results
Pesticides PCBs

	COMPOUND	NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives*	NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	15SB1				15SB2				15SB3				15SB4				15SB5			
				(2-4') 12/16/2015 µg/Kg		(18-20') 12/16/2015 µg/Kg		(0-2') 12/17/2015 µg/Kg		(18-20') 12/17/2015 µg/Kg		(2-4') 12/16/2015 µg/Kg		(18-20') 12/16/2015 µg/Kg		(0-2') 12/17/2015 µg/Kg		(18-20') 12/17/2015 µg/Kg		(2-4') 12/16/2015 µg/Kg		(22-24') 12/16/2015 µg/Kg	
				Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
Pesticides	4,4' -DDD	3.3	13,000	< 2.0	2.0	< 2.9	2.9	< 2.3	2.3	< 4.1	4.1	< 1.9	1.9	< 2.9	2.9	< 2.2	2.2	< 2.8	2.8	< 2.0	2.0	< 2.0	2.0
	4,4' -DDE	3.3	8,900	< 2.0	2.0	< 2.9	2.9	< 2.3	2.3	< 4.1	4.1	< 1.9	1.9	< 2.9	2.9	< 2.2	2.2	< 2.8	2.8	< 2.0	2.0	< 2.0	2.0
	4,4' -DDT	3.3	7,900	< 2.0	2.0	< 2.9	2.9	< 2.3	2.3	< 4.1	4.1	< 1.9	1.9	< 2.9	2.9	< 2.2	2.2	< 2.8	2.8	< 2.0	2.0	< 2.0	2.0
	a-BHC	20	480	< 6.6	6.6	< 9.8	9.8	< 7.8	7.8	< 16	16	< 6.5	6.5	< 9.8	9.8	< 7.3	7.3	< 9.3	9.3	< 6.6	6.6	< 6.5	6.5
	a-Chlordane	94	4,200	< 3.3	3.3	< 4.9	4.9	< 3.9	3.9	< 8.1	8.1	< 3.2	3.2	< 4.9	4.9	< 3.6	3.6	< 4.7	4.7	< 3.3	3.3	< 3.3	3.3
	Aldrin	5	97	< 3.3	3.3	< 4.9	4.9	< 3.9	3.9	< 4.1	4.1	< 3.2	3.2	< 4.9	4.9	< 3.6	3.6	< 4.7	4.7	< 3.3	3.3	< 3.3	3.3
	b-BHC	36	360	< 6.6	6.6	< 9.8	9.8	< 7.8	7.8	< 16	16	< 6.5	6.5	< 9.8	9.8	< 7.3	7.3	< 9.3	9.3	< 6.6	6.6	< 6.5	6.5
	Chlordane	94	4,200	< 33	33	< 49	49	< 39	39	< 81	81	< 32	32	< 49	49	< 36	36	< 47	47	< 33	33	< 33	33
	d-BHC	40	100,000	< 6.6	6.6	< 9.8	9.8	< 7.8	7.8	< 16	16	< 6.5	6.5	< 9.8	9.8	< 7.3	7.3	< 9.3	9.3	< 6.6	6.6	< 6.5	6.5
	Dieldrin	5	200	< 3.3	3.3	< 4.9	4.9	< 3.9	3.9	< 2.4	2.4	< 3.2	3.2	< 4.9	4.9	< 3.6	3.6	< 4.7	4.7	< 3.3	3.3	< 3.3	3.3
	Endosulfan I	2,400	24,000	< 6.6	6.6	< 9.8	9.8	< 7.8	7.8	< 16	16	< 6.5	6.5	< 9.8	9.8	< 7.3	7.3	< 9.3	9.3	< 6.6	6.6	< 6.5	6.5
	Endosulfan II	2,400	24,000	< 6.6	6.6	< 9.8	9.8	< 7.8	7.8	< 16	16	< 6.5	6.5	< 9.8	9.8	< 7.3	7.3	< 9.3	9.3	< 6.6	6.6	< 6.5	6.5
	Endosulfan sulfate	2,400	24,000	< 6.6	6.6	< 9.8	9.8	< 7.8	7.8	< 16	16	< 6.5	6.5	< 9.8	9.8	< 7.3	7.3	< 9.3	9.3	< 6.6	6.6	< 6.5	6.5
	Endrin	14	11,000	< 6.6	6.6	< 9.8	9.8	< 7.8	7.8	< 8.1	8.1	< 6.5	6.5	< 9.8	9.8	< 7.3	7.3	< 9.3	9.3	< 6.6	6.6	< 6.5	6.5
	Endrin aldehyde			< 6.6	6.6	< 9.8	9.8	< 7.8	7.8	< 16	16	< 6.5	6.5	< 9.8	9.8	< 7.3	7.3	< 9.3	9.3	< 6.6	6.6	< 6.5	6.5
	Endrin ketone			< 6.6	6.6	< 9.8	9.8	< 7.8	7.8	< 16	16	< 6.5	6.5	< 9.8	9.8	< 7.3	7.3	< 9.3	9.3	< 6.6	6.6	< 6.5	6.5
	g-BHC			< 1.3	1.3	< 2.0	2.0	< 1.6	1.6	< 3.2	3.2	< 1.3	1.3	< 2.0	2.0	< 1.5	1.5	< 1.9	1.9	< 1.3	1.3	< 1.3	1.3
	g-Chlordane			< 3.3	3.3	< 4.9	4.9	< 3.9	3.9	< 8.1	8.1	< 3.2	3.2	< 4.9	4.9	< 3.6	3.6	< 4.7	4.7	< 3.3	3.3	< 3.3	3.3
	Heptachlor	42	2,100	< 6.6	6.6	< 9.8	9.8	< 7.8	7.8	< 16	16	< 6.5	6.5	< 9.8	9.8	< 7.3	7.3	< 9.3	9.3	< 6.6	6.6	< 6.5	6.5
	Heptachlor epoxide			< 6.6	6.6	< 9.8	9.8	< 7.8	7.8	< 16	16	< 6.5	6.5	< 9.8	9.8	< 7.3	7.3	< 9.3	9.3	< 6.6	6.6	< 6.5	6.5
	Methoxychlor			< 33	33	< 49	49	< 39	39	< 81	81	< 32	32	< 49	49	< 36	36	< 47	47	< 33	33	< 33	33
	Toxaphene			< 130	130	< 200	200	< 160	160	< 320	320	< 130	130	< 200	200	< 150	150	< 190	190	< 130	130	< 130	130
Chlorinated Herbicides	2,4,5-T			< 41	41	< 120	120	-	-	-	-	< 41	41	< 120	120	-	-	-	-	< 42	42	< 82	82
	2,4,5-TP (Silvex)			< 41	41	< 120	120	-	-	-	-	< 41	41	< 120	120	-	-	-	-	< 42	42	< 82	82
	2,4-D			< 41	41	< 120	120	-	-	-	-	< 41	41	< 120	120	-	-	-	-	< 42	42	< 82	82
	2,4-DB			< 410	410	< 1200	1,200	-	-	-	-	< 410	410	< 1200	1,200	-	-	-	-	< 420	420	< 820	820
	Dalapon			< 41	41	< 120	120	-	-	-	-	< 41	41	< 120	120	-	-	-	-	< 42	42	< 82	82
	Dicamba			< 82	82	< 230	230	-	-	-	-	< 82	82	< 250	250	-	-	-	-	< 83	83	< 160	160
	Dichloroprop			< 41	41	< 120	120	-	-	-	-	< 41	41	< 120	120	-	-	-	-	< 42	42	< 82	82
	Dinoseb			< 82	82	< 230	230	-	-	-	-	< 82	82	< 250	250	-	-	-	-	< 83	83	< 160	160
Organophosphate Pesticides	Alachlor			< 33	33	< 49	49	-	-	-	-	< 33	33	< 50	50	-	-	-	-		33	< 32	32
	Atrazine			< 33	33	< 49	49	-	-	-	-	< 33	33	< 50	50	-	-	-	-	< 33	33	< 32	32
	Azinphos methyl			< 40	40	< 49	49	-	-	-	-	< 33	33	< 50	50	-	-	-	-	< 33	33	< 32	32
	Diazinon			< 33	33	< 49	49	-	-	-	-	< 33	33	< 50	50	-	-	-	-	< 33	33	< 32	32
	Disulfoton			< 33	33	< 49	49	-	-	-	-	< 33	33	< 50	50	-	-	-	-	< 33	33	< 32	32
	Malathion			< 33	33	< 49	49	-	-	-	-	< 33	33	< 50	50	-	-	-	-	< 33	33	< 32	32
	Simazine			< 33	33	< 49	49	-	-	-	-	< 33	33	< 50	50	-	-	-	-	< 33	33	< 32	32
PCBs	PCB-1016	100	1,000	< 33	33	< 49	49	< 39	39	< 81	81	< 32	32	< 49	49	< 36	36	< 47	47	< 33	33	< 33	33
	PCB-1221	100	1,000	< 33	33	< 49	49	< 39	39	< 81	81	< 32	32	< 49	49	< 36	36	< 47	47	< 33	33	< 33	33
	PCB-1232	100	1,000	< 33	33	< 49	49	< 39	39	< 81	81	< 32	32	< 49	49	< 36	36	< 47	47	< 33	33	< 33	33
	PCB-1242	100	1,000	< 33	33	< 49	49	< 39	39	< 81	81	< 32	32	< 49	49	< 36	36	< 47	47	< 33	33	< 33	33
	PCB-1248	100	1,000	< 33	33	< 49	49	< 39	39	< 81	81	< 32	32	< 49	49	< 36	36	< 47	47	< 33	33	< 33	33
	PCB-1254	100	1,000	< 33	33	< 49	49	< 39	39	< 81	81	< 32	32	< 49	49	< 36	36	< 47	47	< 33	33	< 33	33
	PCB-1260	100	1,000	< 33	33	< 49	49	< 39	39	< 81	81	< 32	32	< 49	49	< 36	36	< 47	47	< 33	33	< 33	33
	PCB-1262	100	1,000	< 33	33	< 49	49	< 39	39	< 81	81	< 32	32	< 49	49	< 36	36	< 47	47	< 33	33	< 33	33
	PCB-1268	100	1,000	< 33	33	< 49	49	< 39	39	< 81	81	< 32	32	< 49	49	< 36	36	< 47	47	< 33	33	< 33	33

Notes:

* - 6 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives

RL- Reporting Limit

Bold/highlighted- Indicated exceedance of the NYSDEC UUSCO Guidance Value

Bold/highlighted- Indicated exceedance of the NYSDEC RRSCO Guidance Value

65 Eckford Street
Brooklyn, New York

TABLE 6
Soil Analytical Results
Pesticides PCBs

	COMPOUND	NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives*	NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	15SB6				15SB7				15SB8				15SB9				15SB10				Duplicate	
				(0-2') 12/17/2015 µg/Kg		(18-20') 12/17/2015 µg/Kg		(0-2') 12/17/2015 µg/Kg		(18-20') 12/17/2015 µg/Kg		(0-2') 12/17/2015 µg/Kg		(18-20') 12/17/2015 µg/Kg		(0-2') 12/17/2015 µg/Kg		(18-20') 12/17/2015 µg/Kg		(0-2') 12/17/2015 µg/Kg		(18-20') 12/17/2015 µg/Kg		12/17/2015 µg/Kg	
				Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
Pesticides	4,4'-DDD	3.3	13,000	< 2.3	2.3	< 3.1	3.1	< 2.2	2.2	< 2.7	2.7	< 3.3	3.3	< 2.9	2.9	< 2.3	2.3	< 2.2	2.2	< 2.2	2.2	< 3.2	3.2	< 2.4	2.4
	4,4'-DDE	3.3	8,900	< 2.3	2.3	< 3.1	3.1	< 2.2	2.2	< 2.7	2.7	< 2.2	2.2	< 2.9	2.9	< 2.3	2.3	< 2.2	2.2	< 2.2	2.2	< 3.2	3.2	< 2.4	2.4
	4,4'-DDT	3.3	7,900	< 2.3	2.3	< 3.1	3.1	< 2.2	2.2	< 2.7	2.7	< 2.2	2.2	< 2.9	2.9	< 3.0	3.0	< 2.2	2.2	< 2.2	2.2	< 3.2	3.2	7.1	2.4
	a-BHC	20	480	< 7.8	7.8	< 10	10	< 7.4	7.4	< 8.9	8.9	< 7.4	7.4	< 9.5	9.5	< 7.6	7.6	< 7.5	7.5	< 7.4	7.4	< 13	13	< 8.1	8.1
	a-Chlordane	94	4,200	< 3.9	3.9	< 5.1	5.1	< 3.7	3.7	< 4.5	4.5	< 3.7	3.7	< 4.8	4.8	< 3.8	3.8	< 3.7	3.7	< 3.7	3.7	< 6.4	6.4	10	4.1
	Aldrin	5	97	< 3.9	3.9	< 5.1	5.1	< 3.7	3.7	< 4.5	4.5	< 3.7	3.7	< 4.8	4.8	< 3.8	3.8	< 3.7	3.7	< 3.7	3.7	< 3.2	3.2	< 4.1	4.1
	b-BHC	36	360	< 7.8	7.8	< 10	10	< 7.4	7.4	< 8.9	8.9	< 7.4	7.4	< 9.5	9.5	< 7.6	7.6	< 7.5	7.5	< 7.4	7.4	< 13	13	< 8.1	8.1
	Chlordane	94	4,200	< 39	39	< 51	51	< 37	37	< 45	45	< 37	37	< 48	48	< 38	38	< 37	37	< 37	37	< 64	64	55	41
	d-BHC	40	100,000	< 7.8	7.8	< 10	10	< 7.4	7.4	< 8.9	8.9	< 7.4	7.4	< 9.5	9.5	< 7.6	7.6	< 7.5	7.5	< 7.4	7.4	< 13	13	< 8.1	8.1
	Dieldrin	5	200	< 3.9	3.9	< 5.1	5.1	< 3.7	3.7	< 4.5	4.5	< 3.7	3.7	< 4.8	4.8	< 3.8	3.8	< 3.7	3.7	< 3.7	3.7	< 1.9	1.9	< 4.1	4.1
	Endosulfan I	2,400	24,000	< 7.8	7.8	< 10	10	< 7.4	7.4	< 8.9	8.9	< 7.4	7.4	< 9.5	9.5	< 7.6	7.6	< 7.5	7.5	< 7.4	7.4	< 13	13	< 8.1	8.1
	Endosulfan II	2,400	24,000	< 7.8	7.8	< 10	10	< 7.4	7.4	< 8.9	8.9	< 7.4	7.4	< 9.5	9.5	< 7.6	7.6	< 7.5	7.5	< 7.4	7.4	< 13	13	< 8.1	8.1
	Endosulfan sulfate	2,400	24,000	< 7.8	7.8	< 10	10	< 7.4	7.4	< 8.9	8.9	< 7.4	7.4	< 9.5	9.5	< 7.6	7.6	< 7.5	7.5	< 7.4	7.4	< 13	13	< 8.1	8.1
	Endrin	14	11,000	< 7.8	7.8	< 10	10	< 7.4	7.4	< 8.9	8.9	< 7.4	7.4	< 9.5	9.5	< 7.6	7.6	< 7.5	7.5	< 7.4	7.4	< 13	13	< 8.1	8.1
	Endrin aldehyde			< 7.8	7.8	< 10	10	< 7.4	7.4	< 8.9	8.9	< 7.4	7.4	< 9.5	9.5	< 7.6	7.6	< 7.5	7.5	< 7.4	7.4	< 13	13	< 8.1	8.1
	Endrin ketone			< 7.8	7.8	< 10	10	< 7.4	7.4	< 8.9	8.9	< 7.4	7.4	< 9.5	9.5	< 7.6	7.6	< 7.5	7.5	< 7.4	7.4	< 13	13	< 8.1	8.1
	g-BHC			< 1.6	1.6	< 2.1	2.1	< 1.5	1.5	< 1.8	1.8	< 1.5	1.5	< 1.9	1.9	< 1.5	1.5	< 1.5	1.5	< 1.5	1.5	< 2.5	2.5	< 1.6	1.6
	g-Chlordane			< 3.9	3.9	< 5.1	5.1	< 3.7	3.7	< 4.5	4.5	< 3.7	3.7	< 4.8	4.8	< 3.8	3.8	< 3.7	3.7	< 3.7	3.7	< 6.4	6.4	6.8	4.1
	Heptachlor	42	2,100	< 7.8	7.8	< 10	10	< 7.4	7.4	< 8.9	8.9	< 7.4	7.4	< 9.5	9.5	< 7.6	7.6	< 7.5	7.5	< 7.4	7.4	< 13	13	< 8.1	8.1
	Heptachlor epoxide			< 7.8	7.8	< 10	10	< 7.4	7.4	< 8.9	8.9	< 7.4	7.4	< 9.5	9.5	< 7.6	7.6	< 7.5	7.5	< 7.4	7.4	< 13	13	< 8.1	8.1
	Methoxychlor			< 39	39	< 51	51	< 37	37	< 45	45	< 37	37	< 48	48	< 38	38	< 37	37	< 37	37	< 64	64	< 41	41
	Toxaphene			< 160	160	< 210	210	< 150	150	< 180	180	< 150	150	< 190	190	< 150	150	< 150	150	< 150	150	< 250	250	< 160	160
PCBs	PCB-1016	100	1,000	< 39	39	< 51	51	< 37	37	< 45	45	< 37	37	< 48	48	< 38	38	< 37	37	< 37	37	< 64	64	< 41	41
	PCB-1221	100	1,000	< 39	39	< 51	51	< 37	37	< 45	45	< 37	37	< 48	48	< 38	38	< 37	37	< 37	37	< 64	64	< 41	41
	PCB-1232	100	1,000	< 39	39	< 51	51	< 37	37	< 45	45	< 37	37	< 48	48	< 38	38	< 37	37	< 37	37	< 64	64	< 41	41
	PCB-1242	100	1,000	< 39	39	< 51	51	< 37	37	< 45	45	< 37	37	< 48	48	< 38	38	< 37	37	< 37	37	< 64	64	< 41	41
	PCB-1248	100	1,000	< 39	39	< 51	51	< 37	37	< 45	45	< 37	37	< 48	48	< 38	38	< 37	37	< 37	37	< 64	64	< 41	41
	PCB-1254	100	1,000	< 39	39	< 51	51	< 37	37	< 45	45	< 37	37	< 48	48	< 38	38	< 37	37	< 37	37	< 64	64	< 41	41
	PCB-1260	100	1,000	< 39	39	< 51	51	< 37	37	< 45	45	< 37	37	< 48	48	< 38	38	< 37	37	< 37	37	< 64	64	< 41	41
	PCB-1262	100	1,000	< 39	39	< 51	51	< 37	37	< 45	45	< 37	37	< 48	48	< 38	38	< 37	37	< 37	37	< 64	64	< 41	41
	PCB-1268	100	1,000	< 39	39	< 51	51	< 37	37	< 45	45	< 37	37	< 48	48	< 38	38	< 37	37	< 37	37	< 64	64	< 41	41

Notes:

* - 6 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives

RL- Reporting Limit

Bold/highlighted- Indicated exceedance of the NYSDEC UUSCO Guidance Value

Bold/highlighted- Indicated exceedance of the NYSDEC RRSO Guidance Value

TABLE 7
Soil Analytical Results
Metals

COMPOUND	NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives*	NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	15SB1				15SB2				15SB3				15SB4				15SB5			
			(2-4') 12/16/2015 µg/Kg		(18-20') 12/16/2015 µg/Kg		(0-2') 12/17/2015 µg/Kg		(18-20') 12/17/2015 µg/Kg		(2-4') 12/16/2015 µg/Kg		(18-20') 12/16/2015 µg/Kg		(0-2') 12/17/2015 µg/Kg		(18-20') 12/17/2015 µg/Kg		(2-4') 12/16/2015 µg/Kg		(22-24') 12/16/2015 µg/Kg	
			Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
Aluminum			5,830	31	857	3.2	8,420	41	18,300	72	6,170	34	1,650	3.5	7,470	35	7,150	48	7,140	31	6,360	30
Antimony			< 1.5	1.5	< 1.6	1.6	2	2.0	< 3.6	3.6	2.5	1.7	< 1.7	1.7	10.1	1.8	< 2.4	2.4	< 1.5	1.5	< 1.5	1.5
Arsenic	13	16	4.5	0.6	1.4	0.6	8.7	8.2	17.7	1.4	13.4	0.7	1.5	0.7	8.8	0.7	18.1	1.0	6.9	0.6	5.3	0.6
Barium	350	350	93	0.6	12.7	0.6	303	0.8	96.2	1.4	743	0.7	16.1	0.7	111	0.7	183	1.0	136	0.6	50.3	0.6
Beryllium	7.2	14	0.25	0.25	0.24	0.26	0.43	0.33	0.67	0.57	0.53	0.27	0.22	0.28	0.19	0.28	0.44	0.39	0.55	0.25	0.45	0.24
Cadmium	2.5	2.5	0.85	0.31	0.21	0.32	1.56	0.41	< 0.72	0.72	1.28	0.34	0.22	0.35	1.19	0.35	0.63	0.48	0.71	0.31	0.42	0.30
Calcium			11,200	31	3,210	3.2	49,300	41	5,690	7.2	14,100	34	3,730	3.5	8,300	3.5	7,480	4.8	2,270	3.1	1,190	3.0
Chromium	30	180	87.7	0.31	2.76	0.32	23.7	4.1	26.3	0.72	19	0.34	2.83	0.35	20.8	0.35	18.5	0.48	16.9	0.31	16.2	0.30
Cobalt			6.31	0.31	0.94	0.32	7.3	4.1	10.7	0.72	7.15	0.34	1.83	0.35	9.03	0.35	9.21	0.48	7.73	0.31	7.95	0.30
Copper	50	270	52.4	0.31	5.75	0.32	97.9	4.1	28.7	0.72	938	3.4	3.78	0.35	63.9	0.35	89.6	0.48	50.4	0.31	13.5	0.30
Iron			14,200	31	2,380	3.2	16,900	41	28,300	72	26,800	34	3,880	3.5	43,000	35	19,300	48	29,400	31	21,900	30
Lead	63	400	228	6.2	11.8	0.6	776	8.2	103	1.4	2,790	63	16.4	0.7	162	7.0	512	9.7	190	6.2	8.8	0.6
Magnesium			1,650	3.1	1,540	3.2	3,120	41	3,570	7.2	686	3.4	1,300	3.5	1,760	3.5	1,480	4.8	1,730	3.1	2,960	3.0
Manganese	1,600	2,000	285	3.1	30.2	0.32	285	4.1	223	0.72	249	3.4	59.8	0.35	323	3.5	284	4.8	337	3.1	72.7	0.30
Mercury	0.18	0.81	0.72	0.03	0.03	0.03	1	0.03	0.4	0.06	2.75	0.24	0.55	0.03	0.16	0.03	3.35	0.36	0.92	0.02	< 0.02	0.02
Nickel	30	140	138	3.1	1.56	0.32	16.6	4.1	18.8	0.72	15.5	0.34	2.8	0.35	14.3	0.35	17.8	0.48	14.1	0.31	14.1	0.30
Potassium			1,070	6	138	6	1,870	8	1,930	140	903	7	327	7	1,780	70	1,190	10	1,160	6	1,610	6
Selenium	3.9	36	< 1.2	1.2	< 1.3	1.3	< 1.6	1.6	< 2.9	2.9	< 1.4	1.4	< 1.4	1.4	< 1.4	1.4	< 1.9	1.9	< 1.2	1.2	< 1.2	1.2
Silver	2	36	< 0.31	0.31	< 0.32	0.32	< 0.41	0.41	< 0.72	0.72	< 0.34	0.34	< 0.35	0.35	< 0.35	0.35	< 0.48	0.48	< 0.31	0.31	< 0.30	0.30
Sodium			296	6	297	6	931	8	1,180	14	362	68	474	7	788	7	416	10	200	6	142	6
Thallium			< 1.2	1.2	< 1.3	1.3	< 1.6	1.6	< 2.9	2.9	< 1.4	1.4	< 1.4	1.4	< 1.4	1.4	< 1.9	1.9	< 1.2	1.2	< 1.2	1.2
Vanadium			21.3	0.3	2.5	0.3	23.5	4.1	35.9	0.7	27.4	0.3	4.8	0.3	23.9	0.4	30.6	0.5	23.6	0.3	24.6	0.3
Zinc	109	2,200	577	6.2	8	0.6	300	8.2	114	1.4	995	6.8	8.9	0.7	184	7.0	359	9.7	177	6.2	42.5	0.6

Notes:

* - 6 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives

RL- Reporting Limit

Bold/highlighted- Indicated exceedance of the NYSDEC UUSCO Guidance Value

Bold/highlighted- Indicated exceedance of the NYSDEC RRSO Guidance Value

TABLE 7
Soil Analytical Results
Metals

COMPOUND	NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives*	NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	15SB6				15SB7				15SB8				15SB9				15SB10				Duplicate	
			(0-2") 12/17/2015 mg/Kg		(18-20") 12/17/2015 mg/Kg		(0-2") 12/17/2015 mg/Kg		(18-20") 12/17/2015 mg/Kg		(0-2") 12/17/2015 mg/Kg		(18-20") 12/17/2015 mg/Kg		(0-2") 12/17/2015 mg/Kg		(18-20") 12/17/2015 mg/Kg		(0-2") 12/17/2015 mg/Kg		(18-20") 12/17/2015 mg/Kg		12/17/2015 mg/Kg	
			Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
Aluminum			4,460	40	3,110	51	2,830	35	4,440	40	3,600	35	5,620	50	4,170	36	2,340	36	2,210	38	7,730	63	4,800	39
Antimony			15.6	2.0	< 2.5	2.5	8.3	1.8	2.8	2.0	7.1	1.8	< 2.5	2.5	3.4	1.8	< 1.8	1.8	6.9	1.9	< 3.2	3.2	4.7	1.9
Arsenic	13	16	14.1	0.8	31.5	1.0	10	0.7	17.9	0.8	11.1	0.7	4.1	1.0	15.2	0.7	27	0.7	10	0.8	35.8	1.3	51.7	0.8
Barium	350	350	256	0.8	818	1.0	134	0.7	259	0.8	206	0.7	88.9	1.0	179	0.7	62.3	0.7	74.1	0.8	151	1.3	333	0.8
Beryllium	7.2	14	0.25	0.32	0.42	0.41	0.15	0.28	0.39	0.32	0.16	0.28	0.49	0.40	0.26	0.29	0.25	0.29	< 0.30	0.30	0.43	0.51	0.38	0.31
Cadmium	2.5	2.5	1.55	0.40	0.57	0.51	1.68	0.35	0.57	0.40	1.8	0.35	0.5	0.50	1.46	0.36	1.39	0.36	2.95	0.38	1.22	0.63	1.07	0.39
Calcium			11,400	40	3,660	5.1	8,180	3.5	8,600	4.0	3,100	3.5	2,980	5.0	11,800	36	7,440	3.6	3,290	3.8	21,800	63	12,100	39
Chromium	30	180	15.2	0.40	27.4	0.51	10.7	0.35	20.1	0.40	19.3	0.35	29.1	0.50	20.7	0.36	12.3	0.36	10	0.38	24.7	0.63	75.4	0.39
Cobalt			9.9	0.40	11.2	0.51	9.64	0.35	7.14	0.40	12.4	0.35	11.5	0.50	8.92	0.36	6.89	0.36	14.9	0.38	7.98	0.63	8.09	0.39
Copper	50	270	95.2	0.40	44.7	0.51	62.4	0.35	119	0.40	59.2	0.35	31.4	0.50	66.8	0.36	18.4	0.36	60	0.38	77	0.63	327	3.9
Iron			35,100	40	6,780	51	37,500	35	10,700	40	42,800	35	15,900	50	31,700	36	31,300	36	74,400	38	18,400	63	14,600	39
Lead	63	400	733	7.9	122	10	172	7.0	529	7.9	317	7.0	134	1.0	612	7.3	106	0.7	213	7.6	268	13	2,470	77
Magnesium			2,240	4.0	1,190	5.1	1,370	3.5	1,310	4.0	1,150	3.5	3,130	5.0	1,550	3.6	856	3.6	645	3.8	2,120	6.3	1,070	3.9
Manganese	1,600	2,000	364	4.0	92.3	5.1	193	3.5	149	4.0	468	3.5	261	5.0	189	3.6	282	3.6	290	3.8	184	0.63	175	3.9
Mercury	0.18	0.81	0.45	0.03	14	0.41	3.04	0.27	11.3	0.35	0.21	0.03	0.92	0.04	4.47	0.30	0.14	0.03	0.12	0.03	12.1	0.48	5.3	0.31
Nickel	30	140	17.6	0.40	65	0.51	14.8	0.35	13.6	0.40	20.5	0.35	17.5	0.50	17.8	0.36	9.12	0.36	22.1	0.38	17.1	0.63	18.8	0.39
Potassium			1,510	8	1,300	10	1,550	7	1,300	8	1,230	7	3,050	10	1,210	7	638	7	1,490	8	1,310	13	1,200	8
Selenium	3.9	36	< 1.6	1.6	< 2.0	2.0	< 1.4	1.4	< 1.6	1.6	< 1.4	1.4	< 2.0	2.0	< 1.5	1.5	< 1.4	1.4	< 1.5	1.5	< 2.5	2.5	< 1.5	1.5
Silver	2	36	< 0.40	0.40	< 0.51	0.51	< 0.35	0.35	< 0.40	0.40	< 0.35	0.35	< 0.50	0.50	< 0.36	0.36	< 0.36	0.36	< 0.38	0.38	< 0.63	0.63	< 0.39	0.39
Sodium			826	8	474	10	833	7	406	8	500	7	192	10	907	7	242	7	759	8	809	13	643	8
Thallium			< 1.6	1.6	< 2.0	2.0	< 1.4	1.4	< 1.6	1.6	< 1.4	1.4	< 2.0	2.0	< 1.5	1.5	< 1.4	1.4	< 1.5	1.5	< 2.5	2.5	< 1.5	1.5
Vanadium			19.4	0.4	28.6	0.5	17	0.4	25.1	0.4	24.4	0.4	40	0.5	15.8	0.4	63.9	0.4	16.6	0.4	30.2	0.6	30.3	0.4
Zinc	109	2,200	768	7.9	197	1.0	150	7.0	217	7.9	222	7.0	136	1.0	170	7.3	21.3	0.7	112	0.8	277	13	424	7.7

Notes:

* - 6 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives

RL- Reporting Limit

Bold/highlighted- Indicated exceedance of the NYSDEC UUSCO Guidance Value

Bold/highlighted- Indicated exceedance of the NYSDEC RRSO Guidance Value

Table 8
Ground Water Analytical Results
Volatile Organic Compounds

Compound	NYSDEC Groundwater Quality Standards	15MW1		15MW2		15MW3		15MW4		15MW5		15MW6		15MW7		15MW8		Duplicate	
		12/22/2015		12/22/2015		12/22/2015		12/22/2015		12/22/2015		12/23/2015		12/23/2015		12/23/2015		12/22/2015	
		µg/L	Results	RI	µg/L	Results	RI	µg/L	Results	RI	µg/L	Results	RI	µg/L	Results	RI	µg/L	Results	RI
1,1,1,2-Tetrachloroethane	5	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
1,1,1-Trichloroethane	5	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
1,1,2,2-Tetrachloroethane	5	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
1,1,2-Trichloroethane	1	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<5.0	5.0	<1.0	1.0	<1.0	1.0
1,1-Dichloroethane	5	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
1,1-Dichloroethene	5	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
1,1-Dichloropropene		<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
1,2,3-Trichlorobenzene		<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<20	20	<2.0	2.0	<1.0	1.0
1,2,3-Trichloropropane	0.04	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
1,2,4-Trichlorobenzene		<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<20	20	<2.0	2.0	<1.0	1.0
1,2,4-Trimethylbenzene	5	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	39	20	<2.0	2.0	<1.0	1.0
1,2-Dibromo-3-chloropropane	0.04	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<2.5	2.5	<2.0	2.0	<10	10	<2.0	2.0	<1.0	1.0
1,2-Dibromoethane		<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
1,2-Dichlorobenzene	5	0.99	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<2.5	2.5	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
1,2-Dichloroethane	0.6	<0.60	0.60	<0.5	0.5	<0.60	0.60	<0.5	0.5	<1.0	1.0	<0.5	0.5	<5.0	5.0	<0.5	0.5	<0.60	0.60
1,2-Dichloropropene	0.94	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<5.0	5.0	<1.0	1.0	<1.0	1.0
1,3,5-Trimethylbenzene	5	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
1,3-Dichlorobenzene		<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<2.5	2.5	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
1,3-Dichloropropene	5	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
1,4-Dichlorobenzene	5	0.91	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
2,2-Dichloropropane	5	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
2-Chlorotoluene	5	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
2-Hexanone (Methyl Butyl Ketone)		<2.5	2.5	<5.0	5.0	<2.5	2.5	<5.0	5.0	<13	13	<5.0	5.0	<50	50	<5.0	5.0	<2.5	2.5
2-Isopropyltoluene	5	7	1.0	7.3	2.0	<1.0	1.0	28	2.0	17	5.0	0.6	2.0	88	20	11	2.0	<1.0	1.0
4-Chlorotoluene	5	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
4-Methyl-2-Pentanone		<2.5	2.5	<5.0	5.0	<2.5	2.5	<5.0	5.0	<13	13	<5.0	5.0	<50	50	<5.0	5.0	<2.5	2.5
Acetone		<5.0	5.0	59	10	4.5	5.0	7.8	10	<25	25	<10	10	<50	50	7.3	10	3	5.0
Acrolein		<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<13	13	<5.0	5.0	<50	50	<5.0	5.0	<5.0	5.0
Acrylonitrile	5	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
Benzene	1	0.28	0.70	<0.5	0.5	<0.70	0.70	<0.5	0.5	<1.0	1.0	<0.5	0.5	<5.0	5.0	<0.5	0.5	<0.70	0.70
Bromobenzene	5	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
Bromochloromethane	5	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
Bromodichloromethane		<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<20	20	<2.0	2.0	<1.0	1.0
Bromoform		<5.0	5.0	<10	10	<5.0	5.0	<10	10	<25	25	<10	10	<5.0	5.0	<10	10	<5.0	5.0
Bromomethane	5	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
Carbon Disulfide	60	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<20	20	<2.0	2.0	<1.0	1.0
Carbon tetrachloride	5	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
Chlorobenzene	5	8.1	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
Chloroethane	5	<5.0	5.0	56	10	<5.0	5.0	130	25	23	25	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
Chloroform	7	<5.0	5.0	<7.0	7.0	<5.0	5.0	<7.0	7.0	<5.0	5.0	<7.0	7.0	<5.0	5.0	<7.0	7.0	<5.0	5.0
Chloromethane	60	<5.0	5.0	0.67	5.0	0.46	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	0.31	5.0
cis-1,2-Dichloroethene	5	13	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
cis-1,3-Dichloropropene		<0.40	0.40	<0.4	0.4	<0.40	0.40	<0.4	0.4	<1.0	1.0	<0.4	0.4	<5.0	5.0	<0.4	0.4	<0.40	0.40
Dibromochloromethane		<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<20	20	<2.0	2.0	<1.0	1.0
Dibromomethane	5	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
Dichlorodifluoromethane	5	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
Ethylbenzene	5	1.8	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
Hexachlorobutadiene	0.5	<0.50	0.50	<0.5	0.5	<0.50	0.50	<0.5	0.5	<1.0	1.0	<0.5	0.5	<4.0	4.0	<0.5	0.5	<0.50	0.50
Isopropylbenzene	5	8.5	1.0	1.7	2.0	<1.0	1.0	6.8	2.0	25	5.0	<2.0	2.0	100	20	37	2.0	<1.0	1.0
m&p-Xylenes	5	0.9	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<20	20	<2.0	2.0	<1.0	1.0
Methyl Ethyl Ketone (2-Butanone)		<2.5	2.5	<5.0	5.0	4.5	2.5	<5.0	5.0	<13	13	<5.0	5.0	<50	50	5.8	5.0	2.7	2.5
Methyl t-butyl ether (MTBE)	10	1.2	1.0	1.6	2.0	2.2	1.0	0.92	2.0	3.7	5.0	<2.0	2.0	<20	20	5.7	2.0	2.1	1.0
Methylene chloride	5	<3.0	3.0	<5.0	5.0	<3.0	3.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<20	20	<5.0	5.0	<3.0	3.0
Naphthalene	10	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<20	20	<2.0	2.0	<1.0	1.0
n-Butylbenzene	5	5	1.0	1.5	2.0	<1.0	1.0	5.4	2.0	3.8	5.0	<2.0	2.0	97	20	11	2.0	<1.0	1.0
n-Propylbenzene	5	6.2	1.0	0.66	2.0	<1.0	1.0	2.8	2.0	23	5.0	<2.0	2.0	170	20	59	2.0	<1.0	1.0
o-Xylene	5	0.39	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
p-Isopropyltoluene		<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
sec-Butylbenzene	5	15	1.0	12	2.0	0.88	1.0	36	2.0	35	5.0	1	2.0	210	20	24	2.0	0.69	1.0
Styrene	5	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
tert-Butylbenzene	5	6	1.0	6.5	2.0	1.8	1.0	15	2.0	12	5.0	<2.0	2.0	39	20	5.7	2.0	1.6	1.0
Tetrachloroethene	5	0.32	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
Tetrahydrofuran (THF)		<5.0	5.0	<10	10	<5.0	5.0	<10	10	<25	25	<10	10	<50	50	<10	10	<5.0	5.0
Toluene	5	1.9	1.0	1.2	2.0	1.9	1.0	2	2.0	1.6	5.0	0.99	2.0	<5.0	5.0	1.7	2.0	1.4	1.0

TABLE 9
Groundwater Analytical Results
Semi-Volatile Organic Compounds

Compound	NYSDEC Groundwater Quality Standards	15MW1		15MW2		15MW3		15MW4		15MW5		15MW6		15MW7		15MW8		Duplicate	
		12/22/2015		12/22/2015		12/22/2015		12/22/2015		12/22/2015		12/23/2015		12/23/2015		12/23/2015		12/22/2015	
		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
1,2,4-Trichlorobenzene		< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.3	5.3	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0
1,2-Dichlorobenzene		< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.1	1.1	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0
1,2-Diphenylhydrazine		< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.3	5.3	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0
1,3-Dichlorobenzene	3	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.1	1.1	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0
1,4-Dichlorobenzene		< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.1	1.1	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0
2,4,5-Trichlorophenol	1	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0
2,4,6-Trichlorophenol	1	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0
2,4-Dichlorophenol		< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0
2,4-Dimethylphenol		< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0
2,4-Dinitrophenol	5	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0
2,4-Dinitrotoluene	5	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0
2,6-Dinitrotoluene	5	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0
2-Chloronaphthalene	10	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.3	5.3	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0
2-Chlorophenol	1	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0
2-Methylnaphthalene		< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.3	5.3	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0
2-Methylphenol (o-cresol)	1	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0
2-Nitroaniline	5	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0
2-Nitrophenol	1	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0
3&4-Methylphenol (m&p-cresol)		< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.1	1.1	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0
3,3'-Dichlorobenzidine	5	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0
3-Nitroaniline	5	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0
4,6-Dinitro-2-methylphenol	1	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0
4-Bromophenyl phenyl ether		< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.3	5.3	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0
4-Chloro-3-methylphenol	1	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0
4-Chloroaniline	5	< 3.5	3.5	< 3.5	3.5	< 3.5	3.5	< 3.7	3.7	< 3.5	3.5	< 3.5	3.5	< 3.5	3.5	< 3.5	3.5	< 3.5	3.5
4-Chlorophenyl phenyl ether		< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.3	5.3	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0
4-Nitroaniline	5	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0
4-Nitrophenol		< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0
Acetophenone		< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.3	5.3	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0
Aniline	5	< 3.5	3.5	< 3.5	3.5	< 3.5	3.5	< 3.7	3.7	< 3.5	3.5	< 3.5	3.5	< 3.5	3.5	< 3.5	3.5	< 3.5	3.5
Anthracene	50	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.3	5.3	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0
Benzidine	5	< 4.5	4.5	< 4.5	4.5	< 4.5	4.5	< 4.7	4.7	< 4.5	4.5	< 4.5	4.5	< 4.5	4.5	< 4.5	4.5	< 4.5	4.5
Benzoic acid		< 25	25	< 25	25	< 25	25	< 26	26	< 25	25	< 25	25	< 25	25	< 25	25	< 25	25
Benzyl butyl phthalate	50	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.3	5.3	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0
Bis(2-chloroethoxy)methane	5	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0
Bis(2-chloroethyl)ether	1	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0	< 1.0	1.0
Bis(2-chloroisopropyl)ether		< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.3	5.3	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0
Carbazole		< 25	25	< 25	25	< 25	25	< 26	26	< 25	25	< 25	25	< 25	25	< 25	25	< 25	25
Dibenzofuran		< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0
Diethyl phthalate	50	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.3	5.3	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0
Dimethylphthalate	50	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.3	5.3	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0
Di-n-butylphthalate	50	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.3	5.3	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0
Di-n-octylphthalate	50	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.3	5.3	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0
Fluoranthene	50	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	1.8	5.3	< 5.0	5.0	4.4	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0
Fluorene	50	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.3	5.3	< 5.0	5.0	1.7	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0
Hexachlorobutadiene	0.5	< 0.40	0.40	< 0.40	0.40	< 0.40	0.40	< 0.42	0.42	< 0.40	0.40	< 0.40	0.40	< 0.40	0.40	< 0.40	0.40	< 0.40	0.40
Hexachlorocyclopentadiene	5	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0
Isophorone	50	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.3	5.3	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0
Naphthalene	10	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0	5.0	< 5.0									

TABLE 10
Groundwater Analytical Results
Pesticides/PCBs

	Compound	NYSDEC Groundwater Quality Standards µg/L	15MW1 12/22/2015 µg/L		15MW2 12/22/2015 µg/L		15MW3 12/22/2015 µg/L		15MW4 12/22/2015 µg/L		15MW5 12/22/2015 µg/L		15MW6 12/23/2015 µg/L		15MW7 12/23/2015 µg/L		15MW8 12/23/2015 µg/L		Duplicate 12/22/2015 µg/L	
			Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
PCBs	PCB-1016	0.09	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050
	PCB-1221	0.09	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050
	PCB-1232	0.09	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050
	PCB-1242	0.09	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050
	PCB-1248	0.09	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050
	PCB-1254	0.09	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050
	PCB-1260	0.09	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050
	PCB-1262	0.09	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050
	PCB-1268	0.09	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050
Pesticides	4,4-DDD	0.3	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	0.014	0.010	< 0.010	0.010	< 0.010	0.010	< 0.050	0.050	< 0.010	0.010	< 0.010	0.010
	4,4-DDE	0.2	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.012	0.012	< 0.010	0.010	< 0.010	0.010
	4,4-DDT	0.11	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.012	0.012	< 0.010	0.010	< 0.010	0.010
	a-BHC	0.94	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.012	0.012	< 0.005	0.005	< 0.005	0.005
	a-Chlordane		< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.050	0.050	< 0.010	0.010	< 0.010	0.010
	Alachlor		< 0.075	0.075	< 0.075	0.075	< 0.075	0.075	< 0.075	0.075	< 0.075	0.075	< 0.075	0.075	< 0.38	0.38	< 0.075	0.075	< 0.075	0.075
	Aldrin		< 0.002	0.002	< 0.002	0.002	< 0.002	0.002	< 0.003	0.003	< 0.003	0.003	< 0.002	0.002	< 0.008	0.008	< 0.003	0.003	< 0.002	0.002
	b-BHC	0.04	< 0.005	0.005	< 0.005	0.005	< 0.020	0.020	< 0.015	0.015	< 0.010	0.010	< 0.005	0.005	< 0.012	0.012	< 0.005	0.005	< 0.005	0.005
	Chlordane	0.05	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.25	0.25	< 0.050	0.050	< 0.050	0.050
	d-BHC	0.04	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.025	0.025	< 0.005	0.005	< 0.005	0.005
	Dieldrin	0.004	< 0.002	0.002	< 0.002	0.002	< 0.002	0.002	< 0.004	0.004	< 0.002	0.002	< 0.003	0.003	< 0.008	0.008	< 0.002	0.002	< 0.002	0.002
	Endosulfan I		< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.050	0.050	< 0.010	0.010	< 0.010	0.010
	Endosulfan II		< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.050	0.050	< 0.010	0.010	< 0.010	0.010
	Endosulfan Sulfate		< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.050	0.050	< 0.010	0.010	< 0.010	0.010
	Endrin		< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.025	0.025	< 0.010	0.010	< 0.010	0.010
	Endrin aldehyde	5	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.050	0.050	< 0.010	0.010	< 0.010	0.010
	Endrin ketone		< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.060	0.060	< 0.010	0.010	< 0.010	0.010
	gamma-BHC	0.05	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.010	0.010	< 0.050	0.050	< 0.005	0.005	< 0.005	0.005
	g-Chlordane		< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.050	0.050	< 0.010	0.010	< 0.010	0.010
	Heptachlor	0.04	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.025	0.025	< 0.010	0.010	< 0.010	0.010
	Heptachlor epoxide	0.03	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.025	0.025	< 0.010	0.010	< 0.010	0.010
	Methoxychlor	35	< 0.10	0.10	< 0.10	0.10	< 0.10	0.10	< 0.10	0.10	< 0.10	0.10	< 0.10	0.10	< 0.50	0.50	< 0.10	0.10	< 0.10	0.10
	Toxaphene		< 0.20	0.20	< 0.20	0.20	< 0.20	0.20	< 0.25	0.25	< 0.20	0.20	< 0.25	0.25	< 1.3	1.3	< 0.25	0.25	< 0.20	0.20

Notes:

RL- Reporting limit

Bold/highlighted- Indicated exceedance of the NYSDEC Groundwater Standard

Table 11
Groundwater Analytical Results
TAL Filtered Metals

Compound	NYSDEC Groundwater Quality Standards mg/L	15MW1 12/22/2015 mg/L		15MW2 12/22/2015 mg/L		15MW3 12/22/2015 mg/L		15MW4 12/22/2015 mg/L		15MW5 12/22/2015 mg/L		15MW6 12/23/2015 mg/L		15MW7 12/23/2015 mg/L		15MW8 12/23/2015 mg/L		Duplicate 12/22/2015 mg/L	
		Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Total Metals																			
Aluminum	NS	0.22	0.010	1.02	0.010	0.282	0.010	1.28	0.010	0.131	0.010	8.62	0.010	1.64	0.010	0.093	0.010	0.235	0.010
Antimony	0.003	< 0.002	0.002	< 0.002	0.002	< 0.002	0.002	< 0.002	0.002	< 0.002	0.002	0.002	0.002	< 0.002	0.002	< 0.002	0.002	< 0.002	0.002
Arsenic	0.025	0.009	0.004	0.045	0.004	0.004	0.004	0.07	0.004	0.162	0.004	0.03	0.004	0.027	0.004	0.028	0.004	0.005	0.004
Barium	1	0.35	0.010	0.46	0.010	0.395	0.010	0.426	0.010	0.357	0.010	0.772	0.010	0.547	0.010	0.304	0.010	0.398	0.010
Beryllium	0.003	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001
Cadmium	0.005	< 0.004	0.004	0.001	0.004	< 0.004	0.004	< 0.004	0.004	< 0.004	0.004	0.001	0.004	0.001	0.004	< 0.004	0.004	< 0.004	0.004
Calcium	NS	158	0.10	170	0.10	257	0.10	162	0.10	136	0.010	204	0.10	156	0.10	122	0.010	268	0.10
Chromium	0.05	0.001	0.001	0.003	0.001	< 0.001	0.001	0.005	0.001	< 0.001	0.001	0.021	0.001	0.005	0.001	< 0.001	0.001	< 0.001	0.001
Cobalt	NS	< 0.005	0.005	0.001	0.005	< 0.005	0.005	0.002	0.005	0.003	0.005	0.009	0.005	0.005	0.005	0.001	0.005	< 0.005	0.005
Copper	0.2	0.002	0.005	0.04	0.005	0.003	0.005	0.03	0.005	< 0.005	0.005	0.225	0.005	0.018	0.005	< 0.005	0.005	0.002	0.005
Iron	0.5	21.2	0.01	34.2	0.01	5.87	0.01	28.5	0.01	25.2	0.01	50.6	0.01	35.9	0.01	25.3	0.01	5.98	0.01
Lead	0.025	0.03	0.002	0.031	0.002	0.022	0.002	0.062	0.002	0.008	0.002	0.724	0.002	0.168	0.002	0.01	0.002	0.019	0.002
Magnesium	35	12.7	0.01	24.4	0.01	19.6	0.01	26.8	0.01	23.3	0.01	32.2	0.01	25	0.01	23.4	0.01	19.8	0.01
Manganese	0.3	0.882	0.005	0.852	0.005	1.21	0.005	1.44	0.005	0.57	0.005	0.558	0.005	0.53	0.005	0.278	0.005	1.22	0.005
Mercury	0.0007	< 0.0002	0.0002	< 0.0002	0.0002	< 0.0002	0.0002	< 0.0002	0.0002	< 0.0002	0.0002	< 0.0002	0.0002	< 0.0002	0.0002	< 0.0002	0.0002	< 0.0002	0.0002
Nickel	0.1	0.003	0.004	0.004	0.004	0.003	0.004	0.008	0.004	0.005	0.004	0.016	0.004	0.004	0.004	0.002	0.004	0.002	0.004
Potassium	NS	15.4	0.1	30.7	0.1	28.1	0.1	33.3	0.1	28.9	0.1	41.3	0.1	33.8	0.1	25.2	0.1	28.4	0.1
Selenium	0.01	< 0.002	0.002	< 0.002	0.002	< 0.002	0.002	< 0.002	0.002	< 0.002	0.002	< 0.002	0.002	< 0.002	0.002	< 0.002	0.002	0.001	0.002
Silver	0.05	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	0.001	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005
Sodium	2	112	1.0	175	1.0	212	1.0	145	1.0	142	1.0	159	1.0	109	1.0	77	1.0	230	1.0
Thallium	0.0005	< 0.0005	0.0005	< 0.0005	0.0005	< 0.0005	0.0005	< 0.0005	0.0005	< 0.0005	0.0005	< 0.0005	0.0005	< 0.0005	0.0005	< 0.0005	0.0005	< 0.0005	0.0005
Vanadium	NS	< 0.010	0.010	0.003	0.010	0.002	0.010	0.003	0.010	0.001	0.010	0.025	0.010	0.005	0.010	< 0.010	0.010	< 0.010	0.010
Zinc	2	0.023	0.010	0.031	0.010	0.059	0.010	0.073	0.010	0.007	0.010	0.374	0.010	0.14	0.010	0.008	0.010	0.055	0.010

Notes:

RL- Reporting limit

NS - No Standard

Bold/highlighted- Indicated exceedance of the NYSDEC Groundwater Standard

Table 12
Groundwater Analytical Results
Dissolved Metals

Compound	NYSDEC Groundwater Quality Standards mg/L	15MW1		15MW2		15MW3		15MW4		15MW5		15MW6		15MW7		15MW8		Duplicate	
		12/22/2015		12/22/2015		12/22/2015		12/22/2015		12/22/2015		12/23/2015		12/23/2015		12/23/2015		12/22/2015	
		Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Dissolved Metals																			
Aluminum	NS	< 0.011	0.011	0.37	0.11	0.73	0.11	0.45	0.11	0.9	0.11	0.32	0.11	0.021	0.011	0.49	0.11	< 0.011	0.011
Antimony	0.003	< 0.003	0.003	< 0.003	0.003	< 0.003	0.003	0.003	0.003	< 0.003	0.003	< 0.003	0.003	< 0.003	0.003	< 0.003	0.003	< 0.003	0.003
Arsenic	0.025	0.003	0.003	0.003	0.003	0.001	0.003	0.005	0.003	0.024	0.003	0.004	0.003	0.005	0.003	0.008	0.003	0.001	0.003
Barium	1	0.243	0.011	0.263	0.011	0.324	0.011	0.287	0.011	0.197	0.011	0.297	0.011	0.24	0.011	0.187	0.011	0.327	0.011
Beryllium	0.003	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001
Cadmium	0.005	< 0.004	0.004	< 0.004	0.004	< 0.004	0.004	< 0.004	0.004	< 0.004	0.004	< 0.004	0.004	< 0.004	0.004	< 0.004	0.004	< 0.004	0.004
Calcium	NS	157	0.01	155	0.01	232	0.11	150	0.01	128	0.01	186	0.11	155	0.01	114	0.01	250	0.11
Chromium	0.05	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001
Cobalt	NS	< 0.005	0.005	0.002	0.005	< 0.005	0.005	0.002	0.005	0.002	0.005	0.002	0.005	0.003	0.005	0.002	0.005	< 0.005	0.005
Copper	0.2	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005
Iron	0.5	1.63	0.01	2.38	0.01	0.03	0.01	1.26	0.01	2.24	0.01	8.33	0.01	4.81	0.01	5.27	0.01	0.03	0.01
Lead	0.025	< 0.002	0.002	< 0.002	0.002	0.001	0.002	< 0.002	0.002	< 0.002	0.002	0.001	0.002	< 0.002	0.002	< 0.002	0.002	< 0.002	0.002
Magnesium	35	12.4	0.01	24.6	0.01	19.6	0.01	25.6	0.01	22.6	0.01	30.9	0.01	24.7	0.01	22.6	0.01	19.3	0.01
Manganese	0.3	0.848	0.005	0.82	0.005	1.21	0.005	1.27	0.005	0.529	0.005	0.39	0.005	0.471	0.005	0.261	0.005	1.18	0.005
Mercury	0.0007	< 0.0002	0.0002	< 0.0002	0.0002	< 0.0002	0.0002	< 0.0002	0.0002	< 0.0002	0.0002	< 0.0002	0.0002	< 0.0002	0.0002	< 0.0002	0.0002	< 0.0002	0.0002
Nickel	0.1	0.001	0.004	0.002	0.004	< 0.004	0.004	0.003	0.004	0.002	0.004	0.002	0.004	0.002	0.004	0.002	0.004	< 0.004	0.004
Potassium	NS	15.4	0.1	31	0.1	27.4	0.1	32.9	0.1	28.6	0.1	40.8	0.1	34.6	0.1	24	0.1	28.7	0.1
Selenium	0.01	< 0.004	0.004	< 0.004	0.004	0.003	0.004	< 0.004	0.004	< 0.004	0.004	< 0.004	0.004	< 0.004	0.004	< 0.004	0.004	0.003	0.004
Silver	0.05	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005
Sodium	2	114	1.1	164	1.1	203	1.1	148	1.1	131	1.1	144	1.1	113	1.1	74.7	1.1	211	1.1
Thallium	0.0005	< 0.0005	0.0005	< 0.0005	0.0005	< 0.0005	0.0005	< 0.0005	0.0005	< 0.0005	0.0005	< 0.0005	0.0005	< 0.0005	0.0005	< 0.0005	0.0005	< 0.0005	0.0005
Vanadium	NS	< 0.011	0.011	< 0.011	0.011	< 0.011	0.011	< 0.011	0.011	< 0.011	0.011	< 0.011	0.011	< 0.011	0.011	< 0.011	0.011	< 0.011	0.011
Zinc	2	0.002	0.011	0.003	0.011	0.009	0.011	0.013	0.011	0.002	0.011	0.004	0.011	0.003	0.011	0.002	0.011	0.009	0.011

Notes:

RL- Reporting limit

NS - No Standard

Bold/highlighted- Indicated exceedance of the NYSDEC Groundwater Standard

COMPOUNDS	NYSDOH Maximum Sub-Slab Value (µg/m ³) ^(a)	NYSDOH Soil Outdoor Background Levels (µg/m ³) ^(b)	SG1 12/8/2015 (µg/m3)		SG2 12/8/2015 (µg/m3)		SG3 12/9/2015 (µg/m3)		SG4 12/8/2015 (µg/m3)		SG5 12/8/2015 (µg/m3)		SG6 12/8/2015 (µg/m3)		SG7 12/8/2015 (µg/m3)	
			Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
1,1,1,2-Tetrachloroethane			< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.00	5.00
1,1,1-Trichloroethane	100	<2.0 - 2.8	3.38	1.00	< 1.00	1.00	47.6	1.00	1.37	1.00	< 3.00	3.00	1.62	1.00	< 5.00	5.00
1,1,2,2-Tetrachloroethane		<1.5	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.00	5.00
1,1,2-Trichloroethane		<1.0	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.00	5.00
1,1-Dichloroethane		<1.0	6.63	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	1.72	1.00	< 5.02	5.02
1,1-Dichloroethene		<1.0	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 4.99	4.99
1,2,4-Trichlorobenzene		NA	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.00	5.00
1,2,4-Trimethylbenzene		<1.0	1.64	1.00	1.24	1.00	1.26	1.00	1.62	1.00	< 3.00	3.00	< 1.00	1.00	< 5.01	5.01
1,2-Dibromoethane		<1.5	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.00	5.00
1,2-Dichlorobenzene		<2.0	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.00	5.00
1,2-Dichloroethane		<1.0	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.02	5.02
1,2-Dichloropropane			< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 4.99	4.99
1,2-Dichlorotetrafluoroethane			< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.00	5.00
1,3,5-Trimethylbenzene		<1.0	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	1	1.00	< 3.00	3.00	< 1.00	1.00	< 5.01	5.01
1,3-Butadiene		NA	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.01	3.01	< 1.00	1.00	< 5.00	5.00
1,3-Dichlorobenzene		<2.0	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.00	5.00
1,4-Dichlorobenzene		NA	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.00	5.00
1,4-Dioxane			< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.01	5.01
2-Hexanone			4.3	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 4.99	4.99
4-Ethyltoluene		NA	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.01	5.01
4-Isopropyltoluene			< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.00	5.00
4-Methyl-2-pentanone			< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	3.03	1.00	5.77	4.99
Acetone		NA	475	9.99	451	9.99	117	5.01	577	9.99	< 2.99	2.99	275	9.99	203	5.01
Acrylonitrile			< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 2.99	2.99	< 1.00	1.00	< 5.01	5.01
Benzene		<1.6 - 4.7	< 1.00	1.00	2.29	1.00	< 1.00	1.00	49.2	1.00	19.8	3.00	4.15	1.00	< 5.01	5.01
Benzyl Chloride		NA	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.00	5.00
Bromodichloromethane		<5.0	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.00	5.00
Bromoform		<1.0	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.00	5.00
Bromomethane		<1.0	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.01	5.01
Carbon Disulfide		NA	< 1.00	1.00	2.3	1.00	1.85	1.00	12	1.00	79.7	3.00	62.5	1.00	29.4	5.01
Carbon Tetrachloride	5	<3.1	< 0.25	0.25	< 0.25	0.25	0.35	0.25	< 0.25	0.25	< 0.75	0.75	< 0.25	0.25	< 1.24	1.24
Chlorobenzene		<2.0	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.01	5.01
Chloroethane		NA	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.01	3.01	59.1	1.00	7.17	5.01
Chloroform		<2.4	33	1.00	< 1.00	1.00	< 1.00	1.00	1.58	1.00	< 3.00	3.00	16.5	1.00	< 4.98	4.98
Chloromethane		<1.0 - 1.4	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 2.99	2.99	< 1.00	1.00	< 4.99	4.99
cis-1,2-Dichloroethene		<1.0	85.2	1.00	< 1.00	1.00	< 1.00	1.00	1.03	1.00	< 3.00	3.00	< 1.00	1.00	< 4.99	4.99
cis-1,3-Dichloropropene		NA	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 4.99	4.99
Cyclohexane		NA	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	464	30.0	< 1.00	1.00	10.9	4.99
Dibromochloromethane		<5.0	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.00	5.00
Dichlorodifluoromethane		NA	2.14	1.00	128	1.00	2.06	1.00	< 1.00	1.00	< 3.00	3.00	1.68	1.00	< 4.99	4.99
Ethanol			8.94	1.00	14.8	1.00	4.59	1.00	10.1	1.00	7.49	2.99	6.12	1.00	6.23	5.01
Ethyl Acetate		NA	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.01	5.01
Ethylbenzene		<4.3	1.1	1.00	1.3	1.00	< 1.00	1.00	13.9	1.00	< 3.00	3.00	< 1.00	1.00	< 4.99	4.99
Heptane		NA	1.45	1.00	16.2	1.00	< 1.00	1.00	64.7	1.00	300	3.00	7.66	1.00	6.47	5.00
Hexachlorobutadiene		NA	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.01	3.01	< 1.00	1.00	< 5.00	5.00
Hexane		<1.5	< 1.00	1.00	46.5	1.00	< 1.00	1.00	193	10.0	842	30.0	11.1	1.00	18.1	5.00
Isopropylalcohol		NA	4.03	1.00	7.17	1.00	1.94	1.00	4.45	1.00	3.39	3.00	3.05	1.00	8.55	5.01
Isopropylbenzene			< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	4.43	1.00	< 3.00	3.00	< 1.00	1.00	< 5.01	5.01
Xylene (m&p)		<4.3	4.34	1.00	4.13	1.00	1.86	1.00	13.9	1.00	< 3.00	3.00	4.05	1.00	< 4.99	4.99
Methyl Ethyl Ketone			13.9	1.00	14.2	1.00	2.88	1.00	11.1	1.00	< 3.01	3.01	9.4	1.00	5.36	5.01
MTBE		NA	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.01	5.01
Methylene Chloride		<3.4	2.75	1.00	1.07	1.00	3.1	1.00	2.3	1.00	< 3.00	3.00	2.43	1.00	< 5.00	5.00
n-Butylbenzene			< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.00	5.00
Xylene (o)		<4.3	1.17	1.00	1.15	1.00	< 1.00	1.00	2.39	1.00	10.6	3.00	1.5	1.00	< 4.99	4.99
Propylene		NA	3.61	1.00	160	9.99	5.87	1.00	473	9.99	1,320	29.9	66.4	1.00	182	5.01
sec-Butylbenzene			< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.00	5.00
Styrene		<1.0	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 4.98	4.98
Tetrachloroethene	100		69.8	0.25	0.72	0.25	7.39	0.25	7.93	0.25	2.77	0.75	13.8	0.25	14.3	1.25
Tetrahydrofuran		NA	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.01	3.01	< 1.00	1.00	< 5.01	5.01
Toluene		1.0 - 6.1	9.91	1.00	7.65	1.00	2.07	1.00	20.4	1.00	18.4	3.00	15.1	1.00	6.21	5.01
trans-1,2-Dichloroethene		NA	15.5	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 4.99	4.99
trans-1,3-Dichloropropene		NA	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 4.99	4.99
Trichloroethene	5	<1.7	1,650	2.50	4.04	0.25	14.1	0.25	6.18	0.25	69.3	0.75	245	2.50	38	1.25
Trichlorofluoromethane		NA	< 1.00	1.00	< 1.00	1.00	1.99	1.00	< 1.00	1.00	< 3.00	3.00	1.56	1.00	30.9	5.00
Trichlorotrifluoroethane			< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.00	5.00
Vinyl Chloride		<1.0	1.26	0.25	7.43	0.25	< 0.25	0.25	< 0.25	0.25	107	0.75	< 0.25	0.25	< 1.25	1.25
BTEX			16.52		16.52		3.93	</								

Table 14. Sampling and Analysis Plan
Former Carter Spray Finishing Corp.
BCP Site C224218
65 Eckford Street, Brooklyn, New York

Location	Sample Depth	Target Compound List VOCs (8260B)	Target Compound List SVOCs (8270C)	Total Analyte List Metals (6010)	PCBs (8082)	Pesticides (8081)	PFAS (537)	1,4-Dioxane (8270 SIM)	VOCs (TO-15)
SOIL									
SB-01	0-2"	X	X	X			X	X	
	18-20'	X	X	X			X	X	
SB-02	0-2"	X	X	X			X	X	
	18-20'	X	X	X			X	X	
SB-03	0-2"	X	X	X			X	X	
	18-20'	X	X	X			X	X	
SB-04	0-2"	X	X	X			X	X	
	18-20'	X	X	X			X	X	
SB-05	0-2"	X	X	X			X	X	
	18-20'	X	X	X			X	X	
SB-06	0-2"	X	X	X			X	X	
	18-20'	X	X	X			X	X	
SB-07	0-2"	X	X	X			X	X	
	18-20'	X	X	X			X	X	
SB-08	0-2"	X	X	X			X	X	
	18-20'	X	X	X			X	X	
SB-09	0-2"	X	X	X			X	X	
	18-20'	X	X	X			X	X	
SB-10	0-2"	X	X	X			X	X	
	18-20'	X	X	X			X	X	
SB-11	0-2"	X	X	X			X	X	
	18-20'	X	X	X			X	X	
SB-12	0-2"	X	X	X			X	X	
	18-20'	X	X	X			X	X	
SB-13	0-2"	X	X	X			X	X	
	18-20'	X	X	X			X	X	
SB-14	0-2"	X	X	X			X	X	
	18-20'	X	X	X			X	X	
SB-15	0-2"	X	X	X			X	X	
	18-20'	X	X	X			X	X	
GROUNDWATER									
MW-01	-	X	X	X			X	X	
MW-02	-	X	X	X			X	X	
MW-03	-	X	X	X			X	X	
MW-04	-	X	X	X			X	X	
MW-05	-	X	X	X			X	X	
MW-06	-	X	X	X			X	X	
MW-07	-	X	X	X			X	X	
MW-08	-	X	X	X			X	X	
SOIL VAPOR									
SV-01	10-11'								X
SV-02	10-11'								X
SV-03	10-11'								X
SV-04	10-11'								X
SV-05	10-11'								X

Notes:

VOCs - Volatile Organic Compounds

SVOCs - Semi-volatile Organic Compounds

PCBs - Polychlorinated biphenyls

PFAS - Per- and Polyfluoroalkyl Substances

Surface soil samples collected from 0-2 inches depth from current grade

Subsurface soil samples collected from 18-20 feet from sidewalk grade

Soil vapor sample depth from grade after backfilling of the site post Corrective Action

QAQC samples include:

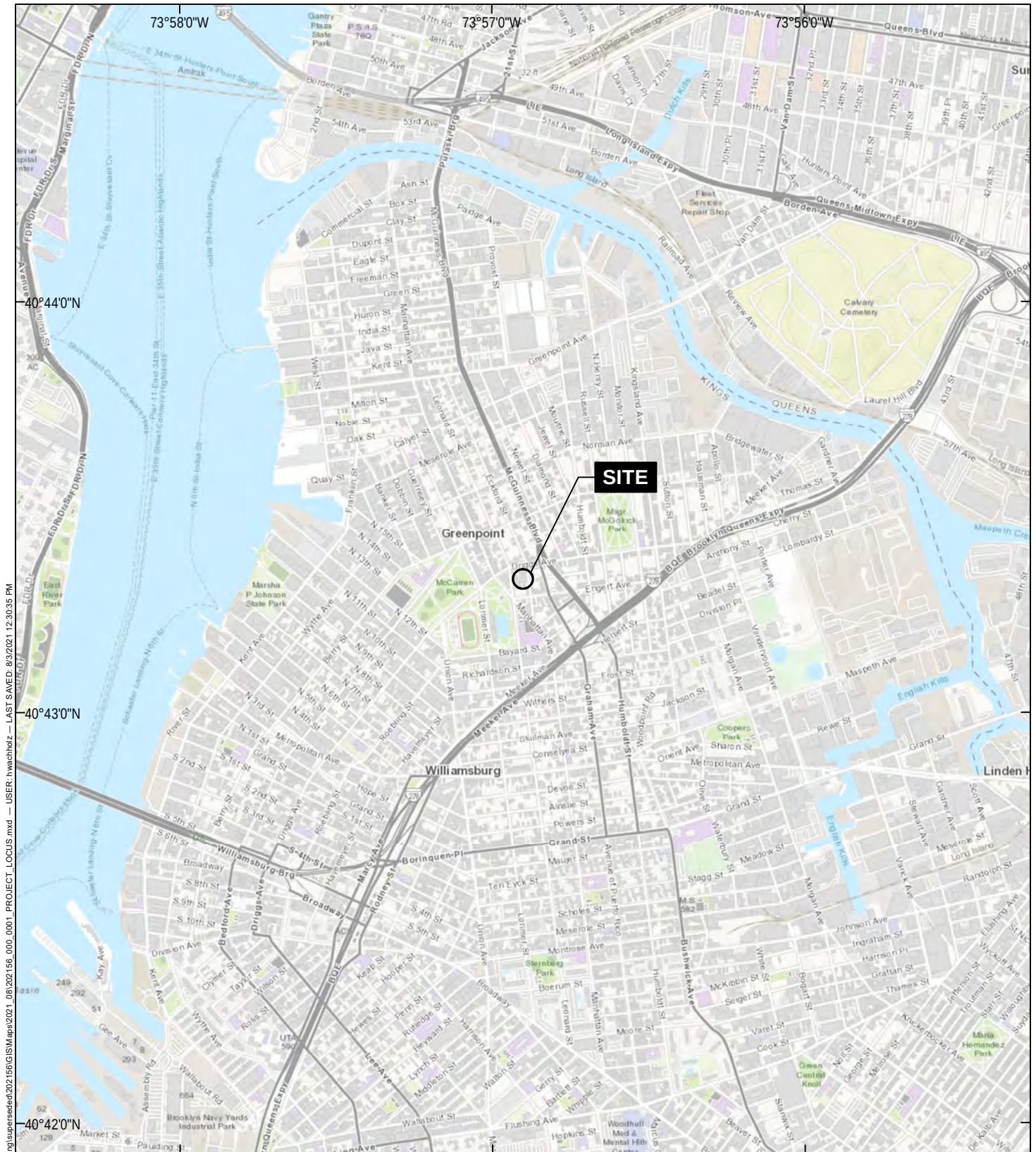
MS/MSD - 1 for every 20 samples

Field Duplicate - 1 for every 20 samples

Trip Blanks - 1 per cooler of samples to be analyzed for VOCs

Field Blanks - 1 for every 20 samples

FIGURES



GIS FILE PATH: C:\Users\hwachob\Documents\working\superseded\202156\GIS\Maps\2021_08\202156_000_0001_PROJECT_LOCUS.mxd — LAST SAVED: 8/3/2021 12:30:35 PM — USER: hwachob



MAP SOURCE: ESRI
SITE COORDINATES: 40°43'19"N, 73°56'54"W

**HALEY
ALDRICH**

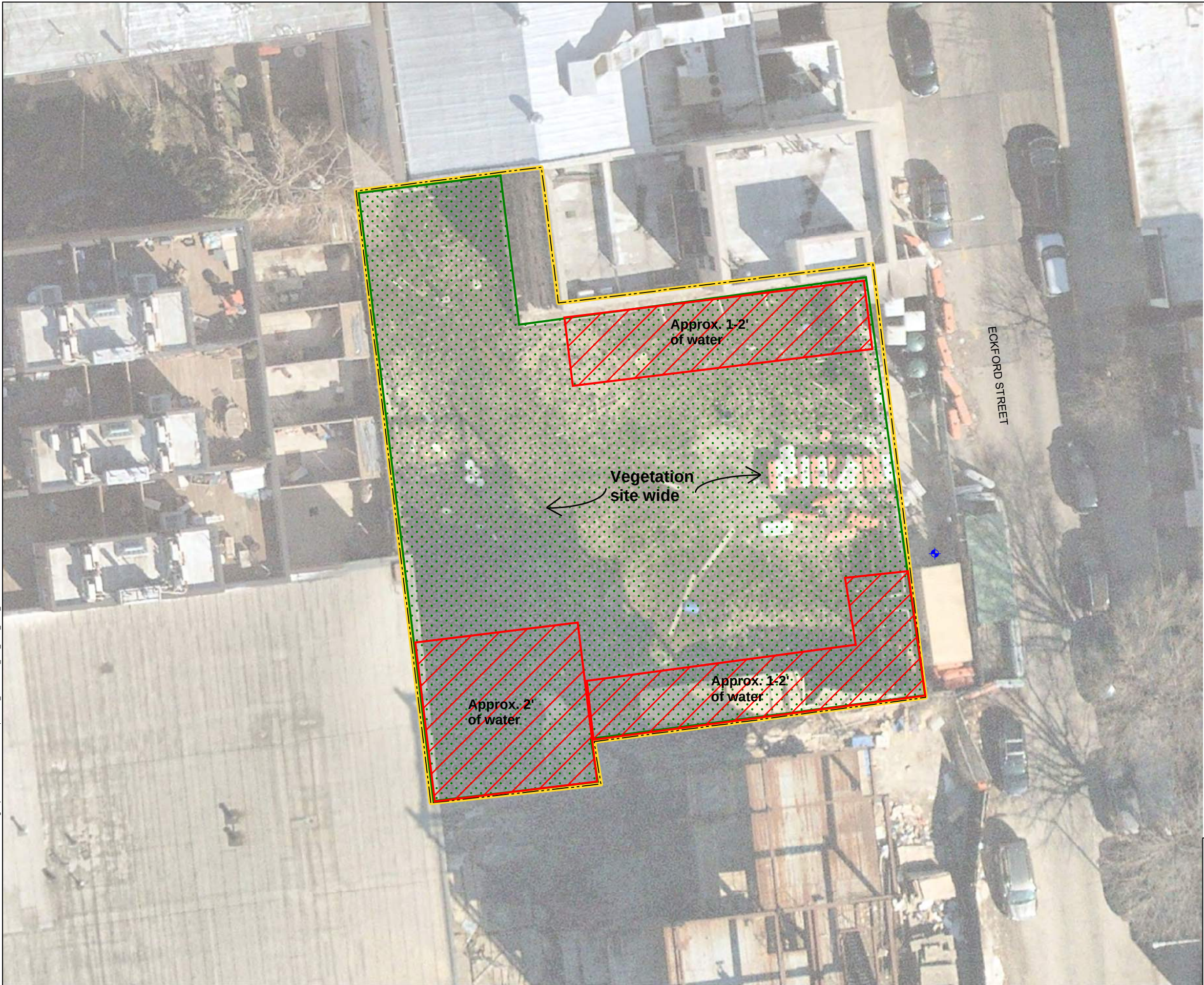
65 ECKFORD STREET
BROOKLYN, NEW YORK

PROJECT LOCUS

APPROXIMATE SCALE: 1 IN = 2000 FT
AUGUST 2021

FIGURE 1

GIS FILE PATH: C:\Users\hwacholz\Documents\working\pers\eded\202156\GIS\Maps\2021_08\202156_000_0002_SITE_PLAN.mxd — USER: hwacholz — LAST SAVED: 8/5/2021 1:00:46 PM



LEGEND

 SITE BOUNDARY

Field Notes:

1. 95% of site is covered in thick vegetation (i.e. reeds and weeds).
1. Excavation depth site wide is approx. 6' bgs (potential to be deeper as site gently slopes to the west).
3. Existing construction ramp located in the central portion of the site and contains gravel.
4. Debris and garbage located within the excavation and entrance area.
5. One permanent groundwater monitoring well observed in the southwestern corner of the site (i.e. in sidewalk within construction fence).

NOTES

1. ALL LOCATIONS ARE APPROXIMATE.
2. AERIAL IMAGERY SOURCE: NEARMAP, 12 MARCH 2021



0 20 40
SCALE IN FEET

HALEY
ALDRICH

65 ECKFORD STREET
BROOKLYN, NEW YORK

MAP OF EXISTING SITE CONDITIONS

SEPTEMBER 2021

FIGURE 2

GIS FILE PATH: C:\Users\hwachholz\Documents\working\pers\sedel\202156\GIS\Maps\2021_08\202156_000_0002_SITE_PLAN.mxd — USER: hwachholz — LAST SAVED: 8/5/2021 1:00:46 PM



LEGEND

- SITE BOUNDARY
- PROPOSED SOIL BORING/PERMANENT MONITORING WELL LOCATION
- PROPOSED SOIL BORING LOCATION
- PROPOSED SOIL VAPOR POINT LOCATION
- PROPOSED ENDPOINT SAMPLE LOCATION FROM THE CORRECTIVE ACTION WORK PLAN
- APPROXIMATE LOCATION OF 550-GALLON UST REMOVED IN JUNE 2018

NOTES

1. ALL LOCATIONS ARE APPROXIMATE.
2. AERIAL IMAGERY SOURCE: NEARMAP, 12 MARCH 2021



0 20 40
SCALE IN FEET

HALEY
ALDRICH

65 ECKFORD STREET
BROOKLYN, NEW YORK

PROPOSED SAMPLE LOCATION MAP

SEPTEMBER 2021

FIGURE 3

APPENDIX A

Previous Reports

**FORMER CARTER SPRAY FINISHING CORP.
SITE**

DEC Site ID No. C224218

**65 ECKFORD STREET
BROOKLYN, NEW YORK 11222
Block 2698, Lot 26**

**REMEDIAL INVESTIGATION
REPORT**

JUNE 2016

Prepared for:

Z65 Realty LLC
266 Broadway Suite 301
Brooklyn, NY 11211



ENVIRONMENTAL BUSINESS CONSULTANTS

1808 Middle Country Road
Ridge, NY 11961

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Former Carter Spray Finishing Corp. Site

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LIST OF ACRONYMS

Acronym	Definition
AOC	Area of Concern
AST	Aboveground Storage Tank
BCP	Brownfields Cleanup Program
BCA	Brownfield Site Cleanup Agreement
CVOC	Chlorinated VOC
ESA	Environmental Site Assessment
EBC	Environmental Business Consultants
IRM	Interim Remedial Measure Work Plan
NYCDEP	New York City Department of Environmental Protection
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PID	Photo-Ionization Detector
PCB	Polychlorinated Biphenyls
REC	Recognized Environmental Condition
RI	Remedial Investigation
RIWR	Remedial Investigation Work Plan
SVOC	Semi-Volatile Organic Compound
UST	Underground Storage Tank
VOC	Volatile Organic Compound

REPORT CERTIFICAION

I, Charles Sosik, certify that I am currently a Qualified Environmental Professional as defined in 6 NYCRR Part 375 and that this Remedial Investigation Report was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10) and that all activities were performed in full accordance with the DER-approved work plan and any DER-approved modifications.



Charles Sosik, PG
Principal

Date: 10-31-2016

1.0 INTRODUCTION

1.1 Project Background

This Remedial Investigation Report (RIR) was prepared on behalf of Z65 Realty LLC for the property known as the Former Carter Spray Finishing Corp. Site, located at 65 Eckford Street, Brooklyn, New York (hereafter referred to as the Site). In May 2015, Z65 Realty LLC filed an application with the New York State Department of Environmental Conservation (NYSDEC), to admit the Project Site into the New York State Brownfield Cleanup Program (BCP). The application was deemed complete by the NYSDEC on May 18, 2015. On June 29, 2015, the NYSDEC informed Z65 Realty LLC that the project had been accepted into the BCP with Z65 Realty LLC classified as a “Volunteer”. The Brownfield Cleanup Agreement was executed by NYSDEC on July 16, 2015 (Site No. C224218).

The purpose of this Remedial Investigation Report is to collect data of sufficient quality and quantity to characterize the nature and extent of contamination and to complete a qualitative exposure assessment for future occupants of the proposed building and the surrounding community.

The overall objectives of the project are to prepare the Site for unrestricted use as defined in the Brownfield Cleanup Agreement and to remediate known and unknown environmental conditions at the Site to the satisfaction of the NYSDEC and the New York State Department of Health (NYSDOH).

The field work portion of the RI was conducted by EBC in December 2015.

1.2 Site Location and Description

The street address for the Site is 65 Eckford Street, Brooklyn, NY 11222 (**Figure 1**). The Site is located in the City of New York and Borough of Brooklyn and is identified as Block 2698, Lot 26 on the New York City Tax Map. The Site is an irregular shaped lot consisting of approximately 85 feet of frontage along Eckford Street (**Figure 2**) and a depth of approximately 100 feet for a total of approximately 10,206 ft² (0.23 acres).

The 1 and 2-story industrial/manufacturing building (constructed between 1905 and 1916) that previously occupied the entire footprint of Lot 26 was demolished in November/December of 2015. The Site was previously utilized by several industrial operations, including a woodworking shop, machine shop, wood box manufacturing facility, automobile parking garage with underground gasoline storage tank(s), and a metal finishing facility that utilized two 275-gallon aboveground storage tanks that contained Trichloroethene (TCE). A topographic survey showing underground utilities is provided in **Figure 3**.

The elevation of the Site ranges from 19 to 20 feet above the National Geodetic Vertical Datum (NGVD). The area topography gradually slopes downward to the north and west. The depth to groundwater beneath the Site is approximately 12 to 13 feet below grade. Based on regional groundwater elevation maps, groundwater flows to the north-northwest.

The area surrounding the property (**Figure 4**) is highly urbanized and predominantly consists of multi-family residential buildings with mixed-use buildings (residential w/ first floor retail) along main corridors such as Driggs Avenue located at the end of the block to the north and McGuinness Boulevard, located two blocks to the east. The area is marked by late 19th and early 20th century row houses with commercial and industrial properties interspersed throughout the residential sections. The area to the west of the Site was historically characterized by heavy industry and manufacturing. Following a steady decline of manufacturing in the area from the late 1960's through the 1980's, many of the industrial properties were vacated leaving the buildings to be vandalized and become derelict. Four sensitive receptors were identified within a ¼ mile radius of the Site. Each is identified below:

- 1) John Ericsson Middle School 126 (500 feet south of Site)
424 Leonard Street, Brooklyn, New York 11222
- 2) Northside Charter High School (500 feet south of Site)
424 Leonard Street, Brooklyn, NY 11222
- 3) Automotive High School (1,200 feet west of Site)
50 Bedford Avenue, Brooklyn, New York 11222
- 4) St. Stanislaus Kostka School (600 feet east-northeast of Site)
189 Driggs Avenue, Brooklyn, New York 11222
- 5) ABC Infant & Toddler Center, Inc. (800 feet north of Site)
109 Nassau Avenue, Brooklyn, NY 11222

The entire area is serviced by the New York City municipal water system which provides water from a series of reservoir systems (Croton, Delaware, Catskill) located north of the City. There are no known public or private drinking water supply wells within a half mile down gradient of the Site.

1.3 Redevelopment Plans

The redevelopment project consists of the construction of a new 5-story hotel building with a full cellar level and a rear cellar level courtyard. The cellar level and rear cellar level courtyard will require excavation of the entire Site to a depth of approximately 12 ft below grade with additional excavation to depths of approximately 15 feet in some areas for the building's footings and foundation. With groundwater present at 12 feet below grade, extensive dewatering will be required during construction of the building's foundation.

The cellar level will consist of a recreational room, gym, lobby/lounge, kitchen and break room for the hotel, six mechanical rooms located in the front of the cellar, and eight hotel rooms that face a cellar level, concrete capped rear yard.

1.4 Site History

A history for the Site dating back to 1887 was established. A review of Sanborn maps shows that the Site and adjacent properties were undeveloped prior to 1887. By 1905, several one-story manufacturing buildings were constructed on the Site and used as a part of the Meisel Danowitz & Co. woodworking operation. The Site was redeveloped by 1916 with the existing one and two-story building currently constructed at the Site. The 1916 Sanborn map indicates the center portion of the building was used as a parking garage for 30 cars, the rear of the building was used as a machine shop, and the front portion of the building was vacant. By 1942, the Eckford Garage utilized the entire building for parking of up to 40 cars. The 1916 and 1942 Sanborn maps indicate an underground gasoline storage tank was located in the northeast portion of the parking garage building, just beyond the front portion of the building that has a 2nd floor. The approximate location of the underground storage tank is shown on **Figure 3**. By 1950, the building was occupied with a wood box manufacturing company, and a company that performed laquer spraying on the 2nd floor. The 1965 through 1989 Sanborn maps indicate the building was used for metal finishing and spraying. City Directory Listings from 1960 to 2008 indicate the building was occupied by Carter Spray Finishing Corp.

1.5 Summary of Previous Investigations

Environmental investigations performed at the Site include the following:

- Phase I Environmental Site Assessment Screening - EBC (May 2015)
- Phase II Subsurface Investigation Data Summary - EBC (May 2015)

A digital copy of the reports is provided in **Attachment A**.

1.5.1 May 2015 – Phase I Environmental Site Assessment Screening (EBC)

Based upon reconnaissance of the Site and surrounding properties, and review of historical records and regulatory agency databases, the Phase I ESA identified the following Recognized Environmental Conditions (RECs) for the Site:

- The 1916 and 1942 Sanborn maps show a parking garage building with an underground gasoline storage tank in the northeast portion of the building. A Site inspection performed in 2015 noted a fill port indicative of an underground gasoline storage tank within the same area of the gasoline tank drawn on the Sanborn maps. Therefore, the tank(s) has not been removed. No information regarding the current status of this tank and/or soil quality in its vicinity was available for review. As such, there is a potential for spills or release from the gasoline underground storage tank to have impacted the subsurface.
- NYC Department of Building records indicate fuel oil was used for heating the building. Based on the age and size of the building, it is assumed that an underground storage tank of at least 550 gallons was used. No information/records were obtained indicating proper removal/abandonment of a No. 2 fuel oil underground storage tank has occurred. As such, there is a potential for spills or release from the No. 2 fuel oil underground storage tank to have impacted the subsurface.

- City Directory Listings, Sanborn maps and internet search results indicate the building has been historically utilized for industrial purposes, including a machine shop, parking garage, wood box manufacturing (with lacquer spray booths), and metal finishing. From approximately 1959 to 1998, Carter Spray Finishing Corp. utilized two 275-gallon aboveground storage tanks containing trichloroethene (TCE) and the Toxic Chemical Release Inventory System (TRIS) database indicates Carter Spray Finishing Corp. emitted greater than 8,000 pounds per year of TCE into the air. As such, there is a potential for historic Site operations to have impacted soil, groundwater and/or soil vapor quality beneath the Site. Further, the Site was identified as a New York City Department of City Planning (NYCDP) Environmental "E" declaration site due to its historic use and the presence of the UST.

Based upon its findings, EBC recommended the following:

- A geophysical survey (e.g., magnetometer and/or ground penetrating radar surveys) should be conducted across the Site to confirm the location of the underground gasoline storage tank, locate a possible No. 2 fuel oil underground storage tank, and identify any other tanks, pits, drums, etc.
- If present, any historic USTs should be removed in accordance with New York State Department of Environmental Conservation (NYSDEC) and New York City Fire Department (FDNY) regulations. Any identified geophysical anomalies should be further investigated through the excavation of test pits, with soil samples collected for laboratory analysis as warranted.
- To evaluate potential impacts related to historic usage of the Site and to satisfy the NYCDP and New York City Office of Environmental Remediation (NYCOER) requirements related to the site's listing as an "E"-designated property, a subsurface investigation should be performed. At a minimum, the investigation should include the installation of soil borings with the collection of representative soil, groundwater and/or soil vapor samples for laboratory analysis to document subsurface conditions and determine the nature and extent of contamination (if present).

The EDR Radius Map Report identified Brumar Sheet Metal, Inc. (498 Leonard Street) with open NYSDEC Spill No. 1205075. Brumar Sheet Metal, Inc. is the adjacent property to the rear/west. NYSDEC Spill file notes provided within the EDR Radius Map Report indicate ten 1,000-gallon underground storage tanks were removed in February of 2015 near the property line that separates the Site from the adjacent property to the west. Test pits excavated on the adjacent property and monitoring wells installed on the property noted free product on the groundwater surface.

A digital copy of the Phase I Environmental Site Assessment Screening is included in **Attachment A**.

1.5.2 May 2015 - Phase II Investigation Data Summary (EBC)

An initial subsurface investigation was performed on February 26, 2015, and additional sampling was performed on April 21, 2015. The initial investigation included the installation of two soil borings (B1 and B2) and the collection of one groundwater sample (B1 GW), and the second sampling event consist of the installation of three soil borings (B2, B3, B4) and the collection of a

groundwater sample from each of the three soil boring locations (GW2, GW3, G4). The installation location of all of the soil borings is shown on **Figure 5**.

A shallow soil sample representing the depth interval 0-2 feet below grade was collected from soil borings B1 and B2 in February 2015, and from 2 to 4 feet below grade from soil borings B2 and B3 in April 2015. Each of the shallow soil samples were collected from the historic fill layer below the building slab. The two historic fill soil samples collected in February were submitted for laboratory analysis of PCBs and TAL metals, and the two historic fill soil samples collected in April were submitted for laboratory analysis of SVOCs via EPA method 8270, TAL metals and TCLP Lead.

A soil sample was collected from both soil borings B1 and B2 in February from the water table interface and submitted for laboratory analysis of VOCs via EPA Method 8260 and SVOCs (CP51 list) via EPA Method 8270. Soil samples were also retained from the water table interface (11 to 13 feet below grade) from soil borings B2, B3 and B4 in April. These three soil samples were submitted for laboratory analysis of VOCs via EPA method 8260 and SVOCs via EPA method 8270.

The laboratory results identified petroleum related VOCs above Unrestricted Use SCOs and Protection of Groundwater SCOs within each of the four soil samples collected from the water table interface, including n-Propylbenzene, sec-Butylbenzene, tert-Butylbenzene, and Toluene. The concentration of total VOCs (when including naphthalene) were reported as high as 102,700 µg/kg in soil sample B3(11-13). The chlorinated VOC Trichloroethene was also detected within one of the soil samples collected in February at the water table interface at a concentration of 1,100 µg/kg.

Petroleum VOCs were detected above groundwater quality standards (GQS) within the groundwater sample collected in February 2015 and each of the three groundwater samples collected in April 2015. Petroleum VOCs detected above GQS includes 2-Isopropyltoluene, Isopropylbenzene, n-Butylbenzene, n-Propyl-benzene, sec-Butylbenzene, and tert-Butylbenzene. Total petroleum VOCs were reported in the three groundwater samples at a concentration ranging from 135 to 457 µg/L.

SVOCs including Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Chrysene, and Indeno(1,2,3-cd)pyrene were all reported above Restricted Residential Use SCOs within the soil sample collected from the water table interface from soil boring B2. No historic fill material was present at the water table interface, so the total SVOC concentration in soil sample B2(11-13) (165,300 µg/kg) is believed to be associated with a fuel oil or other petroleum release.

2.0 REMEDIAL INVESTIGATION

2.1 Field Investigation

The field work portion of the RI was conducted by EBC in December 2015. The field investigation consisted of environmental sampling, field observations and measurements to determine:

- Local geologic/hydro geological conditions;
- Definition of source areas;
- Potential migration of contaminants from the Site to surrounding areas; and,
- Overall characterization of site-related contamination in all media.

The field effort included the collection and analysis of soil, groundwater and soil vapor samples. Laboratory services for soil, groundwater and soil vapor analysis were provided by Phoenix Environmental Laboratories, Inc. located at 587 East Middle Turnpike, Manchester, CT (NY Cert No. 11301). A sample matrix showing the number, type and analysis of samples collected during the Remedial Investigation is provided as **Table 1**.

2.2 Soil Sampling

2.2.1 Soil Borings

On December 16, 2015, and December 17, 2015, a total of ten soil borings (15SB1 – 15SB10) were advanced. The soil borings were performed during the RI to identify source areas and to obtain general soil quality information present at the Site (**Figure 4**). From each soil boring location, soil samples were collected continuously in 5-foot intervals to a depth of 20 feet below the former building slab using a track-mounted Geoprobe™ model 66DT sampling system. The Geoprobe™ uses a direct push hydraulic percussion system to drive and retrieve core samplers. Soil samples were retrieved using a 2-inch diameter, 5-foot long macro-core sampler with disposable acetate liners. Each soil sample recovered from the soil borings was characterized by an experienced geologist and field screened for the presence of VOCs using a photo-ionization detector (PID). The geologist's field observations and PID readings were recorded for each boring in a soil boring log (see **Attachment B**).

Soil samples were retained from each of the soil borings for laboratory analysis. Samples collected for laboratory analysis include the following:

- Soil samples representing the interval 0 to 2 feet below the former building slab grade were retained from soil borings 15SB1, 15SB2, and 15SB5 through 15SB10. Soil samples representing the interval 2 to 4 feet below the former building slab grade were retained from soil borings 15SB3 and 15SB4. Each of the samples was submitted for laboratory analysis of VOCs by EPA Method 8260C plus TICs, SVOCs by EPA Method 8270 plus TICs, pesticides by EPA Method 8081B, PCBs by EPA Method 8082, and target analyte list metals (EPA Method 6010). The 15SB3(2-4) and 15SB4(2-4) soil samples were also submitted for laboratory analysis of chlorinated herbicides by EPA Method 8151A and organophosphate pesticides by EPA Method 8141B.

- A soil sample was retained from each of the soil borings from the water table interface, which was determined to be the interval 11 to 13 feet below grade. Each of the samples was submitted for laboratory analysis of VOCs by EPA Method 8260C, and SVOCs by EPA Method 8270.
- A soil sample was retained from each of the soil borings from the clean native soil layer that exhibited no olfactory or PID evidence of petroleum contamination. Each of the samples correlated to the 18 to 20 foot interval, with the exception of the soil sample retained from soil boring 15SB5, which was retained from 22 to 24 ft. Each of the samples was submitted for laboratory analysis of VOCs by EPA Method 8260C, SVOCs by EPA Method 8270, pesticides by EPA Method 8081, PCBs by EPA Method 8082, and target analyte list metals (EPA Method 6010).

A total of thirty one soil samples (plus one duplicate) were retained for analysis from the ten soil boring locations. Soil sample analytical results are summarized and compared to NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives, Protection of Groundwater SCOS, Residential Restricted Use SCOs and/or Commercial SCOs on **Tables 3** through **6**.

2.3 Monitoring Well Installation

Eight groundwater monitoring wells (15MW1 through 15MW8), were installed at the Site on December 17, 2015. The locations of each of the monitoring wells are shown on **Figure 5**. All of the monitoring wells were installed with a track mounted probe drilling machine to a depth of approximately 20 ft below grade with 10 ft of 0.010 PVC well screen and 10 ft of PVC riser.

A No. 00 morie filter-pack sand filled the annulus surrounding the screen within two feet above the top of the screen. A one-foot hydrated bentonite seal was then placed on top of the filter sand and the remainder of the borehole was backfilled to grade. Following installation, each of the wells was surveyed to determine relative casing elevation to the nearest 0.01 ft and horizontal position to the nearest 0.1 ft. Groundwater elevations and monitoring well specifications for each well are provided in **Table 2**. Well completion reports detailing monitoring well construction are provided in **Attachment C**.

Prior to sampling, a synoptic round of depth-to-groundwater (DTW) measurements were obtained from the monitoring wells to determine the water table elevation and to calculate the volume of standing water in the well. The depth to groundwater was approximately 12 to 13 ft below grade. Depth to water and survey readings are provided in **Table 2**.

2.3.1 Groundwater Sampling

Each of the eight monitoring wells (15MW1 through 15MW8) was sampled on December 22, 2015. Groundwater samples were collected from the monitoring wells using low-flow sampling techniques and were monitored continuously until parameters stabilized. A peristaltic pump and polyethylene sampling tube were used to purge and collect samples from each well location. Sample tubing and the silicone pump tubing were replaced between each sample location. Samples were collected directly into pre-cleaned laboratory supplied glassware, stored in a cooler with ice and submitted to Phoenix Environmental Laboratories, Inc. Groundwater sampling logs are provided in **Attachment D**.

All groundwater samples from the monitoring wells were analyzed for VOCs by EPA Method 8260, SVOCs by EPA method 8270, Pesticides/PCBs by method 8081/8082, target analyte list (TAL) total metals and dissolved metals by EPA method 6010.

2.4 Soil Vapor Sampling

Seven soil vapor samples (SG1 through SG7) were collected during the RI from a depth of approximately 8 feet below the existing building slab on December 22, 2015. Each of the soil vapor sampling locations is shown on **Figure 6**. All soil vapor samples were collected over a 2-hr sampling period. Soil vapor samples were collected in accordance with the procedures as described in the *Guidance for Evaluating Soil Vapor Intrusion in the State of New York (NYSDOH 10/06)*.

2.4.1 Installation of Soil Vapor Implants

The eight soil vapor implants were installed at the Site on December 17, 2015. The vapor implants (Geoprobe™ Model AT86 series), were constructed of a 6-inch length of double woven stainless steel wire and installed to a depth of 8 ft below grade using Geoprobe™ equipment.

During installation, the barbed end of each implant was attached to ¼ inch polyethylene tubing which extended approximately 24 inches beyond that needed to reach the surface. The tubing was capped with a ¼ inch plastic end to prevent the infiltration of foreign particles into the tube. Coarse sand was placed around the vapor implant to a height of approximately 1 foot above the bottom of the implant. The remainder of the borehole was sealed with a bentonite slurry to the surface. The tubing and borehole were then sealed at the surface with hydrated granular bentonite and a 12" x 12" (approx.) plastic sheet.

2.4.2 Surface Seal Test Procedure

In accordance with NYSDOH guidance, a tracer gas (helium) was used as a quality assurance/quality control device to verify the integrity of the sampling point seal prior to collecting the samples. This was accomplished by enriching the air space above the seal with a tracer gas (helium) while continuously monitoring air drawn from the implant with a helium detector (Ionscience Gas Check G). The tracer gas test procedure was employed at all eight soil vapor sampling locations. All seals tested tight with no infiltration of helium through the surface.

2.4.3 Soil Vapor Sample Collection

Following verification that the surface seal was tight, one to three volumes (i.e., the volume of the sample probe and tube) were purged with a handheld vacuum pump prior to collecting the samples to ensure samples collected were representative. After purging, a 6-liter summa canister, fitted with a 2-hour flow regulator was attached to the surface tube of each of the sampling points and the valve opened to initiate sampling. Sample identification, date, start time, start vacuum, end time and end vacuum were recorded on tags attached to each canister and on a sample log sheet (**Attachment E**). When the remaining vacuum in the canisters was between 5 and 8 inches Hg, (after approximately 2 hrs of run-time) the valve was closed and the canisters were detached from the sampling tube.

Sample canisters were picked up the following day by the laboratory courier and delivered to the Phoenix Environmental Laboratories, Inc. for analysis of VOCs by USEPA Method TO-15.

2.6 Laboratory Analysis

Data tables summarizing the laboratory results are provided in **Tables 3** through **12** and copies of the laboratory reports (with each chain-of-custody) are included in digital format in **Attachment F**. Soil sample results were compared to Unrestricted Use Soil Cleanup Objectives (SCOs), Protection of Groundwater SCOs, and Restricted Residential Use SCOs, as promulgated in 6 NYCRR Subpart 375-6. Groundwater results were compared to NYSDEC Division of Water, Technical & Operational Guidance Series 1.1.1, Ambient Water Quality Standards and Guidance Values (AWQS), June 1998. Soil vapor analytical results were compared to Summary of Background Levels for Selected Compounds (NYSDOH Database, Outdoor values, 2003) and New York State Department of Health (NYSDOH) Final Guidance on Soil Vapor Intrusion (October 2006) Matrix 1 and Matrix 2 values. **Table 13** contains a list of parameters detected in each of the soil samples above SCOs and the range in detections. **Table 14** contains a list of parameters detected above Ambient Groundwater Quality Standards and the range in detections.

2.6.1 Analytical Results – Soil Boring Soil Samples

A total of thirty soil samples (and one duplicate) were collected from ten soil borings for laboratory analysis of VOCs by EPA Method 8260C plus TICs, SVOCs by EPA Method 8270 plus TICs, PCBs by EPA Method 8082, and target analyte list metals (EPA Method 6010). Soil samples 15SB1(2-4), 15SB1(18-20), 15SB3(2-4), 15SB3(18-20), 15SB5(2-4), and 15SB5(22-24) were also analyzed for chlorinated herbicides by EPA Method 8151A, and organophosphorus pesticides by EPA Method 8141B. Analytical results of the soil samples collected from the soil borings are summarized and compared to Unrestricted Use SCOs, Protection of Groundwater SCOs, Restricted Residential Use SCOs, and/or Commercial SCOs in **Tables 3** through **6**.

All soil samples results above Unrestricted Use SCOs are presented in **Table 13** and posted on **Figure 7**.

VOCs in Soil Above SCOs:

Petroleum Volatile Organic Compounds

Petroleum related VOCs were detected above Unrestricted Use SCOs and Protection of Groundwater SCOs within six of the ten soil samples retained from the groundwater interface (11 to 13 feet below grade). No VOCs were detected above Restricted Residential Use SCOs. Petroleum related VOCs were not detected above Unrestricted Use SCOs or Protection of Groundwater SCOs within any of the clean native soil samples retained from the 18 to 20 ft interval, or the soil samples collected from the historic fill layer, representing the 0 to 2 ft or 2 to 4 ft intervals.

Chlorinated Volatile Organic Compounds

The chlorinated VOC Tetrachloroethylene was detected within several of the shallow soil samples collected from the historic fill layer, but not at a concentration above Unrestricted Use SCOs or Protection of Groundwater SCOs. PCE was not detected above the laboratory reporting limit (RL) within any of the soil samples retained at the groundwater interface (11 to 13 ft) or from the native soil layer (18 to 20 ft). It should be noted that the RL for each of the soil samples from the 11 to 13 ft interval was significantly higher due to elevated concentrations of petroleum related VOCs.

The chlorinated VOC Trichloroethylene was detected within six of the ten soil samples collected from the historic fill layer at a concentration above Unrestricted Use SCOs and Protection of Groundwater SCOs. The highest Trichloroethylene concentrations were reported in soil samples 15SB1(2-4) (6,600 µg/kg), 15SB2(0-2) (4,000 µg/kg), and 15SB10 (0-2) (2,100 µg/kg). The 15SB1, 15SB2 and 15SB10 soil borings are all located in the rear of the Site. TCE was not detected above the laboratory reporting limit (RL) within any of the soil samples retained at the groundwater interface (11 to 13 ft) or from the native soil layer (18 to 20 ft), with the exception of soil sample 15SB2(18-20) (3.8 µg/kg). It should be noted that the RL for each of the soil samples from the 11 to 13 ft interval was significantly higher due to elevated concentrations of petroleum related VOCs.

Unrestricted Use SCO exceedances for each soil sample are provided below:

15SB1(2-4') – cis-1,2-Dichloroethene (430 µg/kg), Trichloroethene (6,600 µg/kg)

15SB1(11-13') – Acetone (10,000 µg/kg), Chlorobenzene (8,000 µg/kg), cis-1,2-dichloroethene (1,900 µg/kg), ethylbenzene (2,900 µg/kg), m&p-Xylenes (5,700 µg/kg), n-Propylbenzene (4,800 µg/kg), sec-Butylbenzene (18,000 µg/kg)

15SB1(18-20') – Acetone (210 µg/kg)

15SB2(0-2') – cis-1,2-Dichloroethene (450 µg/kg), Trichloroethene (4,000 µg/kg)

15SB2(11-13') – sec-Butylbenzene (15,000 µg/kg)

15SB2(18-20') – Acetone (630 µg/kg), Methyl Ethyl Ketone (200 µg/kg)

15SB3(18-20') – Acetone (170 µg/kg)

15SB4(11-13') – n-Propylbenzene (12,000 µg/kg), sec-Butylbenzene (19,000 µg/kg)

15SB5(2-4') – Trichloroethene (780 µg/kg)

15SB5(11-13') – sec-Butylbenzene (26,000 µg/kg), tert-Butylbenzene (6,100 µg/kg)

15SB6(0-2') – Trichloroethene (630 µg/kg)

15SB6(18-20') – Acetone (70 µg/kg)

15SB7(0-2') – Trichloroethene (510 µg/kg)

15SB7(11-13') – n-Propylbenzene (4,700 µg/kg), sec-Butylbenzene (27,000 µg/kg)

15SB8(11-13') – 1,2,4-Trimethylbenzene (6,500 µg/kg), n-butylbenzene (16,000 µg/kg), n-Propylbenzene (31,000 µg/kg), sec-Butylbenzene (31,000 µg/kg)

15SB10(0-2') – Trichloroethene (2,100 µg/kg)

15SB10(11-13') – Vinyl Chloride (350 µg/kg)

15SB10(18-20') – Acetone (200 µg/kg)

SVOCs in Soil Above SCO:

SVOCs were detected above Unrestricted Use SCOs, Restricted Residential Use SCOs and/or Commercial SCOs (COM) within five of the ten shallow soil samples collected from the historic fill layer, and within two of the soil samples collected at the groundwater interface (11 to 13 ft interval). No SVOCs were detected above Unrestricted Use SCOs or Protection of Groundwater SCOs within any of the soil samples retained from the native soil layer (18 to 20 ft interval). Unrestricted Use SCO and Restricted Residential Use SCO exceedances for each soil sample are provided below.

15SB1 (2-4') – RR – Indeno(1,2,3-cd)pyrene (630 µg/kg)

15SB1 (11-13') – RR – Indeno(1,2,3-cd)pyrene (510 µg/kg)

15SB5 (2-4') – UU – Benzo(k)fluoranthene (3,300 µg/kg)
– RR – Benz(a)anthracene (4,300 µg/kg), Benzo(b)fluoranthene (3,900 µg/kg), Chrysene (4,400 µg/kg), Dibenz(a,h)anthracene (450 µg/kg), Indeno(1,2,3-cd)pyrene (2,400 µg/kg)
– COM – Benzo(a)pyrene (4,500 µg/kg)

15SB5 (11-13') – UU – Benzo(k)fluoranthene (840 µg/kg), Chrysene (1,200 µg/kg)
– RR – Benz(a)anthracene (1,100 µg/kg), Indeno(1,2,3-cd)pyrene (550 µg/kg)
– COM – Benzo(a)pyrene (1,200 µg/kg)

15SB7 (0-2') – UU – Benzo(k)fluoranthene (3,800 µg/kg)
– RR – Benzo(b)fluoranthene (4,100 µg/kg), Chrysene (6,600 µg/kg), Indeno(1,2,3-cd)pyrene (3,200 µg/kg)
– COM – Benz(a)anthracene (6,400 µg/kg), Benzo(a)pyrene (5,000 µg/kg), Dibenz(a,h)anthracene (660 µg/kg)

15SB8 (0-2') – UU – Benzo(k)fluoranthene (1,600 µg/kg), Chrysene (2,300 µg/kg)
– RR – Benz(a)anthracene (2,000 µg/kg), Benzo(b)fluoranthene (1,600 µg/kg), Indeno(1,2,3-cd)pyrene (990 µg/kg)
– COM – Benzo(a)pyrene (1,900 µg/kg)

15SB9 (0-2') – UU – Benzo(k)fluoranthene (1,700 µg/kg), Chrysene (2,100 µg/kg)
– RR – Benz(a)anthracene (1,800 µg/kg), Benzo(b)fluoranthene (1,700 µg/kg), Indeno(1,2,3-cd)pyrene (1,100 µg/kg)
– COM – Benzo(a)pyrene (1,800 µg/kg)

Pesticides, Organophosphate Pesticides, and Chlorinated Herbicides in Soil Above

Unrestricted Use SCOs:

The pesticide 4,4'-DDT (7.1 µg/kg) was detected above Unrestricted Use SCOs within the duplicate soil sample. No other pesticides or chlorinated herbicides were detected above Unrestricted Use SCOs or Protection of Groundwater SCOs in any of the soil samples analyzed.

PCBs in Soil Above Unrestricted Use SCOs:

No PCBs were detected in any of the samples analyzed, with the exception of PCB-1260 (58 µg/kg) which was detected in soil sample 15SB1(2-4') at a concentration below Unrestricted Use SCOs.

Metals in Soil Above SCOs:

Metals were detected above Unrestricted Use SCOs (UU), Restricted Residential Use SCOs (RRU) and/or Commercial SCOs (COM) within all ten shallow soil samples collected from the historic fill layer (0 to 2ft and 2 to 4ft intervals), and within all but two of the soil samples retained from the native soil layer (18 to 20 ft interval). Unrestricted Use, Restricted Residential Use and Commercial Use SCO exceedances for each soil sample are provided below.

15SB1 (2-4')	– UU –	Chromium (87.7 mg/kg), Copper (52.4 mg/kg), Lead (228 mg/kg), Mercury (0.72 mg/kg), Nickel (138 mg/kg), Zinc (577 mg/kg)
15SB2 (0-2')	– UU –	Copper (97.9 mg/kg), Mercury (1 mg/kg), Zinc (300 mg/kg)
	– RRU –	Lead (776 mg/kg)
15SB2 (18-20')	– UU –	Lead (103 mg/kg), Mercury (0.4 mg/kg), Zinc (114 mg/kg)
	– COM –	Arsenic (17.7 mg/kg)
15SB3 (2-4')	– UU –	Arsenic (13.4 mg/kg), Zinc (995 mg/kg)
	– RRU –	Mercury (2.75 mg/kg)
	– COM –	Barium (743 mg/kg), Copper (938 mg/kg), Lead (2,790 mg/kg)
15SB3 (18-20')	– UU –	Mercury (0.55 mg/kg)
15SB4 (0-2')	– UU –	Copper (63.9 mg/kg), Lead (162 mg/kg), Zinc (184 mg/kg)
15SB4 (18-20')	– UU –	Copper (89.6 mg/kg), Zinc (359 mg/kg)
	– RRU –	Lead (512 mg/kg)
	– COM –	Arsenic (18.1 mg/kg), Mercury (3.35 mg/kg)
15SB5 (2-4')	– UU –	Copper (50.4 mg/kg), Lead (190 mg/kg), Zinc (177 mg/kg)
	– RRU –	Mercury (0.92 mg/kg)
15SB6 (0-2')	– UU –	Arsenic (14.4 mg/kg), Copper (95.2 mg/kg), Mercury (0.45 mg/kg), Zinc (768 mg/kg)
15SB6 (18-20')	– UU –	Lead (122 mg/kg), Nickel (65 mg/kg), Zinc (197 mg/kg)
	– COM –	Arsenic (31.5 mg/kg), Barium (818 mg/kg), Mercury (14 mg/kg)

15SB7 (0-2')	– UU – Copper (62.4 mg/kg), Lead (172 mg/kg), Zinc (150 mg/kg) – COM – Mercury (3.04 mg/kg)
15SB7 (18-20')	– UU – Copper (119 mg/kg), Zinc (217 mg/kg) – RRU – Lead (529 mg/kg) – COM – Arsenic (17.9 mg/kg), Mercury (11.3 mg/kg)
15SB8 (0-2')	– UU – Copper (59.2 mg/kg), Lead (317 mg/kg), Mercury (0.21 mg/kg), Zinc (222 mg/kg)
15SB8 (18-20')	– UU – Lead (134 mg/kg), Zinc (136 mg/kg) – RRU – Mercury (0.92 mg/kg)
15SB9 (0-2')	– UU – Arsenic (15.2 mg/kg), Copper (66.8 mg/kg), Zinc (170 mg/kg) – RRU – Lead (612 mg/kg) – COM – Mercury (4.47 mg/kg)
15SB9 (18-20')	– UU – Lead (106 mg/kg) – COM – Arsenic (27 mg/kg)
15SB10 (0-2')	– UU – Copper (60 mg/kg), Lead (213 mg/kg), Zinc (112 mg/kg) – RRU – Cadmium (2.95 mg/kg)
15SB10 (18-20')	– UU – Copper (77 mg/kg), Lead (268 mg/kg), Zinc (277 mg/kg) – COM – Arsenic (35.8 mg/kg), Mercury (12.1 mg/kg)

2.6.2 Analytical Results – Groundwater Samples

A total of eight groundwater samples were collected from the eight groundwater monitoring wells for laboratory analysis of VOCs (EPA Method 8260), SVOCs (EPA Method 8270), pesticides/PCBs (EPA Method 8081/8082), and total and dissolved TAL metals (EPA Method 6010). The results of groundwater samples collected during the RI are summarized in **Tables 7** through **11** and posted on **Figure 9**. Several VOC detections were in excess of the NYSDEC Division of Water, Technical & Operational Guidance Series 1.1.1, Ambient Water Quality Standards (GQS) for Class GA (drinking water), June 1998.

VOCs in Groundwater Above GQS:

No VOCs were detected above GQS within groundwater samples 15MW3 and 15MW6. VOCs consisting primarily of petroleum related VOCs were detected above GQS within groundwater samples 15MW1, 15MW2, 15MW4, 15MW5, 15MW7 and 15MW8. GQS exceedences are listed below:

15MW1	– 2-Isopropyltoluene (7 µg/L), Chlorobenzene (8.1 µg/L), cis-1,2,-Dichloroethene (13 µg/L), Isopropylbenzene (8.5 µg/L), n-Propylbenzene (6.2 µg/L), sec-Butylbenzene (15 µg/L), tert-Butylbenzene (6 µg/L), vinyl chloride (13 µg/L)

- 15MW2 – 2-Isopropyltoluene (7.3 µg/L), Acetone (59 µg/L), Chloroethane (56 µg/L), sec-Butylbenzene (12 µg/L), tert-Butylbenzene (6.5 µg/L)
- 15MW4 – 2-Isopropyltoluene (28 µg/L), Chloroethane (130 µg/L), Isopropylbenzene (6.8 µg/L), n-Butylbenzene (5.4 µg/L), sec-Butylbenzene (36 µg/L), tert-Butylbenzene (15 µg/L)
- 15MW5 – 2-Isopropyltoluene (17 µg/L), Chloroethane (23 µg/L), Isopropylbenzene (25 µg/L), n-Propylbenzene (23 µg/L), sec-Butylbenzene (35 µg/L), tert-Butylbenzene (12 µg/L)
- 15MW7 – 1,2,4-Trimethylbenzene (39 µg/L), 2-Isopropyltoluene (88 µg/L), Isopropylbenzene (100 µg/L), n-Butylbenzene (97 µg/L), n-Propylbenzene (170 µg/L), sec-Butylbenzene (210 µg/L), tert-Butylbenzene (39 µg/L)
- 15MW8 – 2-Isopropyltoluene (11 µg/L), Isopropylbenzene (37 µg/L), n-Butylbenzene (11 µg/L), n-Propylbenzene (59 µg/L), sec-Butylbenzene (24 µg/L), tert-Butylbenzene (5.7 µg/L)

The chlorinated VOC Trichloroethene was detected at a concentrations below GQS within 15MW1 (3.5 µg/L), 15MW2 (0.54 µg/L), and 15MW4 (1.2 µg/L). The chlorinated VOCs Tetrachloroethene (0.32 µg/L), Chlorobenzene (8.1 µg/L), cis-1,2-Dichloroethene (13 µg/L), 1,4-Dichlorobenzene (0.91 µg/L), and 1,2-Dichlorobenzene (0.99 µg/L) were also detected in groundwater sample 15MW1.

SVOCs in Groundwater Above GQS:

SVOCs were detected in all eight groundwater samples at concentrations above GQS. SVOC detections above GQS were limited to those polynuclear aromatic hydrocarbons (PAHs) with a 2 per trillion standard.

Pesticides and PCBs in Groundwater Above GQS:

No pesticides or PCBs were detected in any of the groundwater samples collected at the Site.

Dissolved Metals in Groundwater Above GQS:

The dissolved concentrations of the metals Iron, Manganese and/or Sodium were detected above GQS within each of the eight groundwater samples. Dissolved metal GQS exceedances for each groundwater sample are provided below:

15MW1 – Iron (1.63 mg/L), Manganese (0.848 mg/L), Sodium (151 mg/L)

15MW2 – Iron (2.38 mg/L), Manganese (0.82 mg/L), Sodium (164 mg/L)

15MW3 –Manganese (1.21 mg/L), Sodium (203 mg/L)

15MW4 – Iron (1.26 mg/L), Manganese (1.27 mg/L), Sodium (148 mg/L)

15MW5 – Iron (2.24 mg/L), Manganese (0.529 mg/L), Sodium (131 mg/L)

15MW6 – Iron (8.33 mg/L), Manganese (0.39 mg/L), Sodium (144 mg/L)

15MW7 – Iron (4.81 mg/L), Manganese (0.471 mg/L), Sodium (113 mg/L)

15MW8 – Iron (5.27 mg/L), Sodium (74.7 mg/L)

Total Metals in Groundwater Above NYSDEC GQS:

Multiple metals were reported above standards in the unfiltered samples from all of the monitoring wells including Arsenic, Copper, Iron, Lead, Manganese, and Sodium. As demonstrated by the filtered samples, these detections are a function of suspended solids in the sample and are not representative of metals concentrations dissolved in the groundwater.

2.6.4 Analytical Results – Soil Vapor Samples

In order to determine the vapor quality in the soil beneath the Site, soil vapor samples were collected from seven soil vapor implants (SG1 through SG7) installed approximately 8 feet below grade. Analytical results were compared to the Summary of Background Levels for Selected Compounds (NYSDOH Database, Outdoor values, 2003) and NYSDOH Final Guidance on Soil Vapor Intrusion (October 2006) Matrix 1 and Matrix 2 values.

BTEX concentrations were generally low in soil vapor samples. BTEX concentrations ranged from 6.21 $\mu\text{g}/\text{m}^3$ (SG7) to 99.8 $\mu\text{g}/\text{m}^3$ (SV-4).

Chlorinated VOCs (CVOC) were detected at elevated concentrations within several of the soil vapor samples collected at the Site. Trichloroethene (TCE) was detected in all 7 soil gas samples at a maximum concentration of 1,650 $\mu\text{g}/\text{m}^3$ (SG1) and tetrachloroethane was detected within all 7 soil gas samples at a maximum concentration of 47.6 $\mu\text{g}/\text{m}^3$ (SG3).

The CVOC Carbon Tetrachloride was detected within one of the seven soil gas samples at a concentration of 0.35 $\mu\text{g}/\text{m}^3$ and 1,1,1-Trichloroethane was detected within four of the seven soil gas samples at a maximum concentration of 47.6 $\mu\text{g}/\text{m}^3$. Soil vapor results are summarized on **Table 17** and posted on **Figure 10**.

2.6.5 Data Usability Summary Report

Data validation services were provided by H&S Environmental (H&S) of Westborough, Massachusetts. H&S reported that, in general, the data are valid as reported and may be used for decision making purposes. Selected data points were qualified due to nonconformance of certain Quality Control criteria. The Data Usability Summary Reports prepared by H&S are provided in **Attachment G**.

3.0 HYDROGEOLOGIC ASSESSMENT AND PHYSICAL SETTING

3.1 Site Topography

According to the USGS topographic map for the area (Brooklyn Quadrangle), the elevation of the property ranges from 19 to 20 feet above the National Geodetic Vertical Datum (NGVD). The area topography gradually slopes downward to the north and west.

3.2 Surrounding Land Use

The area surrounding the property is highly urbanized and predominantly consists of multi-family residential buildings with mixed-use buildings (residential w/ first floor retail) along main corridors such as Driggs Avenue located at the end of the block to the north and McGuinness Boulevard, located two blocks to the east. The area is marked by late 19th and early 20th century row-houses with commercial and industrial properties interspersed throughout the residential sections. A large portion of the neighborhood to the west consists of McCarren Park, which has a track, playing fields and a public swimming pool. The Site is situated on a block (Block 2698) which has historically been utilized for heavy industry and manufacturing. Following a steady decline of manufacturing in the area from the late 1960's through the 1980's, many of the industrial properties were vacated leaving the buildings to be vandalized and become derelict. Conditions continued to decline throughout the 1980's and 1990's.

The land use in the immediate vicinity of the Site includes of a one-story manufacturing building currently occupied with an automotive repair facility (75 Eckford Street) and a 3-story commercial building currently occupied with a Polish Hall/Club (261 Driggs Avenue) to the north, a lot undergoing construction of a new 4-story apartment building (498 Leonard Street) and a one-story warehouse/manufacturing building (488 Leonard Street) to the west, multi-family row houses (62, 64 66 and 68 Eckford Street) to the east and a 10-story apartment building (55 Eckford Street) to the south. There are no daycare centers in the immediate area of the Site, however there are two daycare facilities located within a 1,200 ft radius of the Site. Two schools (Northside Charter High School and John Ericsson Middle School 126) are located at 424 Leonard Street, which is approximately 500 feet to the south.

3.3 Regional Geology / Hydrogeology

Long Island's present configuration is primarily the result of glaciation which during the Pleistocene Era, predominately that of the last ice age, the Wisconsin, which ended about ten thousand years ago. Two advances of the Wisconsin ice sheet during the Upper Pleistocene of the Quaternary Period caused the island to be blanketed with till, ice contact stratified drift, outwash deposits and deposits composed of clay, silt, sand, gravel and boulders. The terminal moraines and the north shore are composed primarily of stratified drift with some till. The area between the moraines and south of them are mostly the outwash deposits. Central and South Long Island are of the glaciofluvial origin. The Pleistocene deposits lie atop the gently-dipping Cretaceous rocks.

The bedrock was eroded to a peneplain before the overlying Cretaceous sediments were deposited; its surface shows signs of later erosion by Pleistocene glaciation in the north. Bedrock crops out in

northwestern Queens County near the East River and slopes southward at about eighty (80) feet per mile. Consequently, the overlying formations form a southward-dipping wedge that attains a maximum thickness of one-thousand fifty (1,050) feet in the southeast corner of Queens County. The maximum thickness of unconsolidated deposits in Kings County is about eight-hundred (800) feet in southeast Kings.

Overlying bedrock is the Raritan Formation of Late Cretaceous age, consisting of the Lloyd Sand Member and an upper, unnamed clay member. Overlying the Raritan Formation is the Magothy Formation and Matawan Group, undifferentiated, also of Late Cretaceous age, the Jameco Gravel of Pleistocene age, the Gardiners Clay of Pleistocene age, upper Pleistocene deposits of Wisconsin age, and a generally thin soil mantle of Holocene age. Holocene beach deposits make up most of the Rockaway Peninsula and Coney Island in the south, and Holocene salt-marsh deposits underlie and fringe the south-shore bay areas. Artificial filling has been done in low and swampy shoreline areas. Because Holocene deposits occur in relative small areas of Kings and Queens and are not significant water bearers, they are not included in the geologic descriptions that follow. The four distinct formations on Long Island: The Upper Glacial, the Jameco, the Magothy and the Lloyd aquifers. They all occur in the unconsolidated materials overlying the bedrock.

3.4 Site Geology / Hydrogeology

The geologic setting of Long Island is well documented and consists of crystalline bedrock overlain by layers of unconsolidated deposits. According to geologic maps of the area created by the United States Geologic Survey (USGS), the bedrock in this area of Brooklyn is an igneous intrusive classified as the Ravenswood grano-diorite of middle Ordovician to middle Cambrian age. Unconsolidated sediments overlie the bedrock and consist of Pleistocene aged sand, gravel and silty clays, deposited by glacial-fluvial activity. Non-native fill materials consisting of dredge spoils, rubble and / or other materials have historically been used to reinforce and extend shoreline areas and to raise and improve the drainage of low lying areas.

Soil at the Site consists of historic fill material that extends to depths as great as 13 feet below grade in some areas followed by grey silty clay. According to the USGS topographic map for the area (Brooklyn Quadrangle), the elevation of the property is approximately 14 feet above mean sea level. The area topography gradually slopes downward to the north and west.

Groundwater occurs beneath the Site at a depth of 11 to 12 feet below sidewalk grade (**Table 2**) under water table conditions. Regional groundwater flow is to the northwest and the groundwater flow at the Site was calculated to be towards the north-northwest (**Figure 11**).

4.0 NATURE AND EXTENT OF CONTAMINATION

4.1 Identification of Source Areas

4.1.1 Chlorinated VOCs in Soil

The chlorinated VOC Trichloroethene was detected above Unrestricted Use SCOs within shallow soil samples collected from the 0 to 2 ft and 2 to 4 ft intervals across the majority of the Site. The highest concentrations were detected within the rear of the building within soil samples 15SB1 (2-4) (6,600 µg/kg), 15SB2 (0-2) (4,000 µg/kg), and 15SB10 (0-2) (2,100 µg/kg). Trichloroethylene was not detected above the laboratory reporting limit (RL) within any of the RI soil samples retained at the groundwater interface (11 to 13 ft) or from the native soil layer (18 to 20 ft), with the exception of soil sample 15SB2(18-20) (3.8 µg/kg). It should be noted that the RL for each of the soil samples from the 11 to 13 ft interval was significantly higher due to elevated concentrations of petroleum related VOCs. Trichloroethene was detected within a soil sample retained from the water table interface during the subsurface investigation performed in February 2015. Trichloroethene was detected at a concentration of 1,100 µg/kg within soil sample B2(10-12ft).

4.1.2 Petroleum VOCs in Soil

A 5 to 6 ft smear zone of petroleum contaminated soil is present across the Site at the groundwater interface. Petroleum related VOCs were detected above Unrestricted Use SCOs and Protection of Groundwater SCOs within six of the ten soil samples retained from the groundwater interface (11 to 13 feet below grade) during the RI. No petroleum related VOCs were detected above Restricted Residential Use SCOs. Petroleum related VOCs were not detected above Unrestricted Use SCOs or Protection of Groundwater SCOs within any of the clean native soil samples retained from the 18 to 20 ft interval, or the soil samples collected from the historic fill layer, representing the 0 to 2 ft or 2 to 4 ft intervals.

Evidence of a gasoline underground storage tank was observed in the western half of the Site (front). The tank is located approximately 30ft from the western property line (Eckford Street) and 30ft from the southern property line. The tank, tank piping and/or former dispenser may be the source of the petroleum contamination. However, no PID or olfactory evidence of petroleum contamination was noted within the soil boring performed immediately adjacent to the tank until the groundwater interface was encountered. Since no shallow petroleum contaminated soil was encountered within any of the soil borings performed at the Site, the petroleum contaminated soil present at the groundwater interface is likely associated with the spill (NYSDEC Spill No. 1205075) on the adjacent property to the rear/west. NYSDEC notes provided within the EDR Radius Map Report (see Phase I Report) indicated ten 1,000-gallon underground storage tanks were removed from the rear of the property in February of 2015 and test pits excavated at the property and monitoring wells installed on the property noted free product on the groundwater surface.

SVOCs including Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Chrysene, and Indeno(1,2,3-cd)pyrene were all reported above Restricted Residential Use SCOs within the soil sample collected from the water table interface from soil boring B2 during the February 2015 Subsurface Investigation. Historic fill material was not observed within the soil boring at the water table interface, so the total SVOC concentration in soil sample B2(11-13) (165,300 µg/kg) is believed to be associated with a fuel oil or other petroleum release.

4.1.3 Historic Fill Material

Historic fill material has been identified across the Site to depths as great as 13 feet below grade. The historic fill material contains SVOCs above Restricted Residential Use and Commercial Use SCO, the metals arsenic, barium, copper, lead and mercury above Commercial Use SCO, cadmium, chromium, nickel and zinc above Unrestricted Use and/or Restricted Residential Use SCO.

4.1.4 Elevated Metals in Deep Native Soil

The metals arsenic (maximum of 35.8 ppm) and mercury (maximum of 12.1 ppm) were detected above Commercial Use SCO within several of the soil samples retained from the deep native soil layer (18-20ft). The metal lead (maximum of 529 mg/kg) was detected above Restricted Residential Use SCO, and the metal zinc (359 mg/kg) was detected above Unrestricted Use SCO with the deep soil samples retained from the native soil layer. Soil at the 18-20ft interval was found to consist primarily of a grey silty clay with pieces of shells and/or organic matter such as reeds or peat moss. Prior to being backfilled in the late 1800's, the Site and most of the adjacent properties to the west had a much lower elevation because the area was part of the Bushwick Inlet (formerly known as Bushwick Creek). The elevated metals detected within the soil samples retained from the 18-20ft interval are likely associated with sediment associated with the former creek.

4.2 Groundwater Impacts

4.1.1 Chlorinated VOCs in Groundwater

The chlorinated VOC Trichloroethene was detected at a concentrations below GQS within groundwater samples 15MW1 (3.5 µg/L), 15MW2 (0.54 µg/L), and 15MW4 (1.2 µg/L), which were all collected from the rear (western) and southern end of the Site. The chlorinated VOCs Tetrachloroethene (0.32 µg/L), Chlorobenzene (8.1 µg/L), cis-1,2-Dichloroethene (13 µg/L), 1,4-Dichlorobenzene (0.91 µg/L), and 1,2-Dichlorobenzene (0.99 µg/L) were also detected in groundwater sample 15MW1 which was collected from the southwestern corner (rear) of the Site. These chlorinated VOCs were detected in shallow soil samples (0 to 2 and 2 to 4 feet below grade) collected from the rear of the Site during the RI, and within a deeper soil sample (10 to 12 feet below grade) collected during the February 2015 Subsurface Investigation, which suggests the CVOCs detected in groundwater may be associated with the CVOCs detected in soil within the rear of the Site.

4.1.2 Petroleum VOCs in Groundwater

Petroleum related VOCs were detected above GQS in six of the eight groundwater samples collected at the Site. The concentrations were fairly low, and evenly distributed across the Site. The absence of petroleum contamination within soil above the groundwater interface and the low, evenly distributed concentrations of petroleum related VOCs in groundwater suggests an off-Site source.

SVOC detections above GQS were limited to those polynuclear aromatic hydrocarbons (PAHs) with a 2 parts per trillion standard. Exceedances of the part per trillion standards for PAHs were reported in all eight groundwater samples. SVOCs reported in the parts per trillion range are a function of the laboratory's ability to achieve extremely low detection limits and general background conditions.

No pesticides or PCBs were detected above GQS within any of the groundwater samples collected at

the Site. The dissolved metals detected above GQS (Iron, Manganese, and Sodium) within the groundwater samples collected at the Site are consistent with general groundwater quality throughout the area.

4.3 Soil-Vapor Impacts

BTEX concentrations were generally low within the soil vapor samples. BTEX concentrations ranged from 6.21 $\mu\text{g}/\text{m}^3$ (SG7) to 99.8 $\mu\text{g}/\text{m}^3$ (SV-4).

Chlorinated VOCs (CVOC) were detected at elevated concentrations within several of the soil vapor samples collected at the Site. Trichloroethene (TCE) was detected in all 7 soil gas samples at a maximum concentration of 1,650 $\mu\text{g}/\text{m}^3$ (SG1) and tetrachloroethane was detected within all 7 soil gas samples at a maximum concentration of 47.6 $\mu\text{g}/\text{m}^3$ (SG3). The highest TCE concentrations were detected in SG1 (1,650 $\mu\text{g}/\text{m}^3$) and SG6 (245 $\mu\text{g}/\text{m}^3$). The elevated TCE concentrations in soil vapor samples collected from the rear of the building correlates with the elevated TCE concentrations detected in shallow soil samples collected from the rear of the building.

The CVOC Carbon Tetrachloride was detected within one of the seven soil gas samples at a concentration of 0.35 $\mu\text{g}/\text{m}^3$ and 1,1,1-Trichloroethane was detected within four of the seven soil gas samples at a maximum concentration of 47.6 $\mu\text{g}/\text{m}^3$.

4.4 Site Conceptual Model

Contamination at the Site consists of historic fill material that contains metals and SVOCs above Unrestricted Use, Restricted Residential Use, and/or Commercial Use SCOs to depths as great a 13 feet below grade, CVOC contaminated soil in the rear of the Lot from grade to depths of at least 12 feet below grade, and a 5 to 6 foot thick smear zone of petroleum impacted soil at the groundwater interface (approximately 10 to 15 feet below grade).

The historic fill material was likely imported to the Site to raise the grade and backfill a former building's cellar prior to construction of the recently demolished one-story industrial building.

The CVOC contaminated soil at the Site is likely associated with the historic use of Trichloroethene at the Site. From approximately 1959 to 1998, Carter Spray Finishing Corp. utilized two 275-gallon aboveground storage tanks containing Trichloroethene for metal finishing purposes. The most likely release scenario would include a surface spill(s) during use. The nature and extent of the soil contamination is indicative of a limited surface spill which migrated through cracks or other voids in the concrete floor. The timing and scenario of the release are unknown. In any case, the Trichloroethene contamination appears to be limited to the rear half of the Site, and did not migrate much as indicated by the low CVOC concentrations in groundwater. Off-gassing is occurring from the residually contaminated soil which resulted in elevated concentrations of Trichloroethene in soil vapor samples collected from the rear of the Site.

A 5 to 6 ft smear zone of petroleum contaminated soil is present across the Site at the groundwater interface. Petroleum related VOCs were detected above Unrestricted Use SCOs and Protection of Groundwater SCOs within six of the ten soil samples retained from the groundwater interface (11 to

13 feet below grade) during the RI. Evidence of a gasoline underground storage tank was observed in the central rear half of the Site. The tank, tank piping and/or former dispenser may be the source of the petroleum contamination. However, no PID or olfactory evidence of petroleum contamination was noted within the soil boring performed immediately adjacent to the tank until the groundwater interface was encountered. Since no shallow petroleum contaminated soil was encountered within any of the soil borings performed at the Site, the petroleum contaminated soil present at the groundwater interface is likely associated with the spill (NYSDEC Spill No. 1205075) on the adjacent property to the rear/west. NYSDEC notes provided within the EDR Radius Map Report (see Phase I Screening Report included in **Attachment A**) indicated ten 1,000-gallon underground storage tanks were removed from the rear of the property in February of 2015 and test pits excavated on the adjacent property and monitoring wells installed on the property noted free product on the groundwater surface.

Elevated concentrations of the metals arsenic, lead, mercury and zinc were detected within soil samples retained from the 18-20ft interval. Soil at this depth was found to consist primarily of a grey silty clay with pieces of shells and/or organic matter such as reeds or peat moss. Prior to being backfilled in the late 1800's, the Site and most of the adjacent properties to the west had a much lower elevation because the area was part of the Bushwick Inlet (formerly known as Bushwick Creek). The elevated metals detected within the soil samples retained from the 18-20ft interval are likely associated with sediment associated with the former creek.

5.0 QUALITATIVE EXPOSURE ASSESSMENT

The objective of the qualitative exposure assessment under the Brownfields Cleanup Program (BCP) is to identify potential receptors to the contaminants of concern (COC) that are present at, or migrating from, the Site. The identification of exposure pathways describes the route that the COC takes to travel from the source to the receptor. An identified pathway indicates that the potential for exposure exists; it does not imply that exposures actually occur. An exposure pathway has five elements; a contaminant source, release and transport mechanisms, point of exposure, route of exposure and a receptor population.

The potential exposure pathways identified below, represent both current and future exposure scenarios.

5.1 Contaminant Source

5.1.1 Petroleum VOCs in Soil/Groundwater

A 5 to 6 foot smear zone of petroleum contaminated soil was encountered at the groundwater interface across the Site. The petroleum contamination at the groundwater interface is likely associated with the adjacent property to the west (rear). Ten 1,000-gallon underground storage tanks were recently removed near the property line that separates the Site from the adjacent property to the west. Test pits excavated on the adjacent property and monitoring wells installed on the property noted free product on the groundwater surface.

5.1.2 Chlorinated VOCs in Soil/Groundwater/Soil Gas

CVOC contaminated soil was detected within shallow soil samples (0 to 2 feet and 2 to 4 feet below grade) collected from the rear half of the Site during the RI, and one of the deeper soil samples (10 to 12 feet below grade) collected from the rear during the February 2015 Subsurface Investigation. The CVOCs detected within the soil samples are likely associated with the historic use of Trichloroethene at the Site. From approximately 1959 to 1998, Carter Spray Finishing Corp. utilized two 275-gallon aboveground storage tanks containing Trichloroethene. Trichloroethene contamination appears to be limited to the rear half of the Site, and did not migrate much as indicated by the low CVOC concentrations in groundwater. Off-gassing is occurring from the residually contaminated soil which resulted in elevated concentrations of Trichloroethene in soil vapor samples collected from the rear of the Site.

5.1.3 Historic Fill Material

PAHs and other metals such as Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Mercury, Nickel and Zinc were also present at concentrations above Unrestricted Use, Restricted Residential Use and/or Commercial SCOs in fill material throughout the Site to depths as great as 13 feet below grade.

5.1.4 Elevated Metals in Deep Native Soil

The elevated concentrations of the metals arsenic, lead, mercury and zinc within native soil samples retained from the 18-20ft interval are not believed to be associated with a spill/release. The elevated concentrations are likely present in the sediment of the former Bushwick Inlet (formerly known as Bushwick Creek) which was historically present in the area of the Site.

5.2 Contaminant Release and Transport Mechanism

Historic fill material with elevated concentrations of SVOCs and metals is present across the Site to depths as great as 13 feet below grade. The contaminants detected within the historic fill material are not believed to be associated with a spill/release, but are likely associated with the source of material originally brought in to backfill/raise the property.

The petroleum contamination may be associated with a gasoline underground storage tank located in central rear portion of the Site, the former piping or dispenser associated with the tank, or another unidentified tank. However, no PID or olfactory evidence of petroleum contamination was noted within the soil boring performed immediately adjacent to the tank until the groundwater interface was encountered. Since no shallow petroleum contaminated soil was encountered within any of the soil borings performed at the Site, the petroleum contaminated soil present at the groundwater interface is likely associated with the spill (NYSDEC Spill No. 1205075) on the adjacent property to the rear/west. NYSDEC notes provided within the EDR Radius Map Report (see Phase I Report) indicated ten 1,000-gallon underground storage tanks were removed from the rear of the property in February of 2015 and test pits excavated on the adjacent property and monitoring wells installed on the property noted free product on the groundwater surface. There does not appear to be any significant transfer of petroleum VOCs to the vapor phase.

CVOCs were detected within shallow soil samples (0 to 2 feet and 2 to 4 feet below grade) collected from the rear of the Site and may be the source of CVOC contamination detected in groundwater samples collected at the Site. CVOCs present in on-Site soils are volatilizing to soil vapor contributing to the elevated levels of CVOCs detected within the soil vapor samples collected from the rear of the Site (SG1 and SG6).

5.3 Point of Exposure, Route of Exposure and Potentially Exposed Populations

Potential On-Site Exposures: Remediation workers and construction workers engaged in the excavation of impacted and non-impacted soil at the Site may be exposed to petroleum VOCs / SVOCs, CVOCs, and heavy metals through several routes. Workers excavating impacted soil may be exposed to VOCs, SVOCs, and heavy metals through inhalation, ingestion and dermal contact. A site specific Health and Safety Plan has been developed to identify and minimize the potential hazards to on-site workers. Site trespassers could also be exposed to impacted soil during excavation, however, security measures including an 8 ft high construction fence and 24 hr security will minimize potential exposure through this route. Potential vapor intrusion is a concern for future building occupants of proposed building, but remediation of the source area and installation of the cellar below/at the groundwater interface is expected to greatly reduce if not eliminate this potential.

Potential Off-Site Exposures: Off-Site residents could also be exposed to dust or vapors during the excavation of impacted soil. A site-specific Community Air Monitoring Plan has been developed to identify and minimize the potential for off-site exposure to residents through continuous air monitoring during excavation activity.

The entire area is serviced by the New York City Water System which distributes water from the Croton Reservoir system. Since there are no public or private potable supply wells in the area,

exposure from contact with tap water is not a concern. Off-site exposure is therefore limited to vapor intrusion from CVOCs. Since the highest concentrations in soil vapor were reported in close proximity to the impacted soil area, there appears to be a potential for off-Site exposure through soil vapor intrusion. This potential will be further reduced following the removal of the source area under the planned redevelopment of the Site.

Potential Off-Site Environmental Impacts: Since petroleum VOCs and chlorinated VOCs in groundwater may be migrating beneath the Site at low concentrations in a north-northwesterly direction, the groundwater to surface water discharge pathway was evaluated. The nearest surface water to the Site is Bushwick Inlet located approximately 2,800 feet to the northwest. Based upon the concentrations of contaminants currently in groundwater beneath the Site, there are no expected impacts to surface water environments from contaminants migrating from the Site.

6.0 CONCLUSIONS AND RECOMENDATIONS

Subsurface soil at the Site consists of a non-native fill material to a depth of approximately 13 feet below grade. PAHs and metals such as Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Mercury, Nickel and Zinc were detected above Unrestricted Use, Restricted Residential Use, and/or Commercial SCOs within the soil samples collected from the historic fill material. A native grey (wet) silty clay is present below the fill material to a depth of at least 20 feet below grade. Some borings also noted the presence of organic plant matter and/or shells at depths of approximately 15 to 20 feet below grade. Groundwater at the Site is present at a depth of approximately 12 to 13 feet below sidewalk grade and regional groundwater flow is to the northwest. Groundwater flow at the Site was determined to be towards the north-northwest.

A 5 to 6 foot thick smear zone of petroleum impacted soil was detected at the groundwater interface. Petroleum related VOCs were also detected above GQS in six of the eight groundwater samples collected at the Site. The concentrations of petroleum related VOCs in groundwater were fairly low, and evenly distributed across the Site. An absence of petroleum contaminated soil above the groundwater interface indicates the petroleum contamination in soil/ground water is associated with NYSDEC Spill No. 1205075, assigned to the adjacent property to the rear/west. Ten 1,000-gallon underground storage tanks were recently removed near the property line that separates the Site from the adjacent property to the west. Test pits excavated on the adjacent property and monitoring wells installed on the property noted free product on the groundwater surface.

The CVOC Trichloroethene was detected above Unrestricted Use SCOs within shallow soil samples (0 to 2 feet and 2 to 4 feet below grade) collected from the rear of the Site during RI, and within one of the soil samples retained from the groundwater interface during the February 2015 Subsurface Investigation. Therefore, the Trichloroethene detected with soil samples collected from the rear of the Site is likely the source of the low level CVOC (Trichloroethene, Chloroethane, cis-1,2-Dichloroethene) contamination detected in groundwater samples collected at the Site. Trichloroethene present in on-Site soil in the rear of the Site is volatilizing to soil vapor contributing to the elevated levels of Trichloroethene detected within soil vapor samples SG1 (1,650 $\mu\text{g}/\text{m}^3$) and SG6 (245 $\mu\text{g}/\text{m}^3$) which were also collected from the rear of the Site. These Trichloroethylene (TCE) concentrations are above NYSDOH mitigation values.

Arsenic and mercury were detected above Commercial Use SCOs, and lead and zinc were detected above Unrestricted Use SCOs within soil samples retained from the native soil layer at a depth of approximately 18 to 20 feet below grade. The elevated metals concentrations are not believed to be associated with a spill/release. The elevated concentrations are likely present in the sediment of the former Bushwick Inlet (formerly known as Bushwick Creek) which was historically present in the area of the Site.

The qualitative exposure assessment identified potential completed routes of exposure to construction workers and remediation workers through inhalation, ingestion and dermal contact of petroleum compounds and heavy metals during excavation activities. The Health and Safety Plan prepared for the site identifies such exposures and provides instructions for on-site workers to minimize potential exposure. Occupants in the proposed on-Site commercial buildings may be exposed to CVOCs through the vapor intrusion pathway, if remedial action is not taken to remove the source.

The exposure assessment indicated a limited potential exposure to residents and commercial workers in adjacent buildings which would be reduced further following the removal of the identified source areas.

Potential environmental impacts through the groundwater to surface water discharge were considered unlikely based on the concentrations of VOCs in groundwater.

Recommendations include removal of the UST(s), excavation and disposal of all petroleum and chlorinated VOC contaminated soil, and proper handling and disposal of all soils excavated for structural elements of the new building. This work would be performed under an approved Remedial Action Work Plan which includes a Soil Management Plan, a Construction Health and Safety Plan and a Community Air Monitoring Plan.

Potential soil vapor impact should be re-evaluated following the completion of remedial activities to determine if conditions improve to the point where active mitigation is unnecessary. Further evaluation of vapor intrusion can also be performed following implementation of the RAWP to determine if the design elements of a subslab depressurization system should then be incorporated into the Remedial Action Work Plan for the Site as a contingency, should the potential for vapor intrusion remain following the removal of the impacted soils.

7.0 REFERENCES

6 NYCRR Part 375 Environmental Remediation Programs Subparts 375-1, 375-3 and 375-6

Environmental Business Consultants, *Phase I Environmental Site Assessment Screening* – May 2015.

Environmental Business Consultants, *Phase II Subsurface Investigation Data Summary* – May 2015.

NYSDEC, Division of Environmental Remediation, May 2004, *Draft Brownfield Program Cleanup Guide*.

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NYSDEC, Division of Water, June 1998, Addendum April 2000, *Technical and Administrative Guidance Series 1:1:1, Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations*.

NYSDOH, Center for Environmental Health, October 2006, *Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York*.

TABLES

**TABLE 1
SUMMARY OF
SAMPLING PROGRAM RATIONALE AND ANALYSIS**

Matrix	Location	Number of Samples	Rationale for Sampling	Laboratory Analysis
Subsurface soil (0 to 20 feet)	7 soil borings throughout the Site. Samples collected at 0-2 ft, 11-13ft, and 18-20 ft intervals (15SB2, 15SB4, 15SB6-15SB10).	21	To evaluate the extent of soil impact and obtain information on soil quality at the Site.	VOCs EPA Method 8260B, SVOCs EPA Method 8270, pesticide / PCBs EPA Method 8081/8082, TAL metals, & SVOC TICs.
Subsurface soil (0 to 20 feet)	2 soil borings throughout the Site. Samples collected at 2-4ft, 11-13ft, and 18-20ft intervals (15SB1 and 15SB3)	6	To evaluate the extent of soil impact and obtain information on soil quality at the Site.	VOCs EPA Method 8260B, SVOCs EPA Method 8270, pesticide / PCBs EPA Method 8081/8082, TAL metals, Organophosphates, Chlorinated Herbicides, VOC TICs, & SVOC TICs, .
Subsurface soil (0 to 25 feet)	1 soil boring conducted on Site. Samples collected at 2-4ft, 11-13ft, and 22-24ft intervals (15SB5)	3	To evaluate the extent of soil impact and obtain information on soil quality at the Site.	VOCs EPA Method 8260B, SVOCs EPA Method 8270, pesticide / PCBs EPA Method 8081/8082, TAL metals, Organophosphates, Chlorinated Herbicides, VOC TICs, & SVOC TICs, .
Total (Soils)		30		
Groundwater (water table)	From 8 monitoring wells across the Site.	8	To assess groundwater quality at the Site.	VOCs EPA Method 8260B, SVOCs EPA Method 8270, pesticide / PCBs EPA Method 8081/8082, Total metals & Dissolved metals.
Total (Groundwater)		8		
Soil Gas (SG1-SG7 9 ft below existing grade)	7 soil gas implants installed across the Site.	7	Evaluate soil gas across the Site.	VOCs EPA Method TO15
Total (Soil Gas)		7		
MS/MSD	Matrix spike and Matrix spike duplicates at the rate 5%.	2	To meet requirements of QA / QC program	VOCs EPA Method 8260B, SVOCs EPA Method 8270, pesticide / PCBs EPA Method 8081/8082, Total metals & Dissolved metals.
Trip Blanks	One laboratory prepared trip blank to accompany samples each time they are delivered to the laboratory.	2	To meet requirements of QA / QC program	VOCs EPA Method 8260B
Total (QA / QC Samples)		4		

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Table 2
Well Survey Data

Well No.	Well Diameter (in)	Total Well Depth (ft)	Screened Interval (ft)	Survey Reading	Casing Elevation	DTW 12/22/2015	DTP	PT	GW ELV 12/22/2015
MW1	1	20	10 to 20	5.070	94.93	11.24	-	-	83.69
MW2	1	20	10 to 20	5.000	95	11.31	-	-	83.69
MW3	1	20	10 to 20	5.220	94.78	11.12	-	-	83.66
MW4	1	20	10 to 20	4.100	95.9	12.21	-	-	83.69
MW5	1	20	10 to 20	4.040	95.96	12.30	-	-	83.66
MW6	1	20	10 to 20	3.610	96.39	12.75	-	-	83.64
MW7	1	20	10 to 20	2.870	97.13	13.42	-	-	83.71
MW8	1	20	10 to 20	2.410	97.59	13.92	-	-	83.67

TABLE 3A
Soil Analytical Results
Volatile Organic Compounds

COMPOUND	NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives*	NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	15SB1						15SB2						15SB3						15SB4						15SB5					
			(2-4)		(11-13)		(18-20)		(0-2)		(11-13)		(18-20)		(2-4)		(11-13)		(18-20)		(0-2)		(11-13)		(18-20)		(2-4)		(11-13)		(22-24)	
			12/16/2015		12/16/2015		12/16/2015		12/17/2015		12/17/2015		12/17/2015		12/16/2015		12/16/2015		12/16/2015		12/17/2015		12/17/2015		12/17/2015		12/16/2015		12/16/2015		12/16/2015	
			Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
1,1,1,2-Tetrachloroethane			< 14	14	<8900	8,900	<5.5	5.5	<16	16	<14000	14,000	<90	90	<19	19	<6.2	6.2	<8.8	8.8	<8.7	8.7	<4700	4,700	<2.1	2.1	<20	20	<6900	6,900	<16	16
1,1,1-Trichloroethane	680	100,000	<3.5	3.5	<8900	8,900	<5.5	5.5	<3.9	3.9	<680	680	<23	23	<4.8	4.8	<6.2	6.2	<8.8	8.8	<2.2	2.2	<680	680	<5.2	5.2	<5.1	5.1	<6900	6,900	<4.0	4.0
1,1,2,2-Tetrachloroethane			<5.5	5.5	<8900	8,900	<5.5	5.5	<3.9	3.9	<3400	3,400	<23	23	<370	370	<6.2	6.2	<570	570	<2.2	2.2	<4700	4,700	<5.2	5.2	<220	220	<6900	6,900	<4.0	4.0
1,1,2-Trichloroethane			<3.5	3.5	<8900	8,900	<5.5	5.5	<3.9	3.9	<3400	3,400	<23	23	<4.8	4.8	<6.2	6.2	<8.8	8.8	<2.2	2.2	<4700	4,700	<5.2	5.2	<5.1	5.1	<6900	6,900	<4.0	4.0
1-Dichloroethane	270	26,000	<3.5	3.5	<8900	8,900	<5.5	5.5	<3.9	3.9	<3400	3,400	<23	23	<4.8	4.8	<6.2	6.2	<8.8	8.8	<2.2	2.2	<4700	4,700	<5.2	5.2	<5.1	5.1	<6900	6,900	<4.0	4.0
1-Dichloroethane	330	100,000	<3.5	3.5	<8900	8,900	<5.5	5.5	<3.9	3.9	<3400	3,400	<23	23	<4.8	4.8	<6.2	6.2	<8.8	8.8	<2.2	2.2	<4700	4,700	<5.2	5.2	<5.1	5.1	<6900	6,900	<4.0	4.0
1-Dichloropropane			<3.5	3.5	<8900	8,900	<5.5	5.5	<3.9	3.9	<3400	3,400	<23	23	<4.8	4.8	<6.2	6.2	<8.8	8.8	<2.2	2.2	<4700	4,700	<5.2	5.2	<5.1	5.1	<6900	6,900	<4.0	4.0
1,2,3-Trichlorobenzene			<3.5	3.5	<8900	8,900	<5.5	5.5	<3.9	3.9	<3400	3,400	<23	23	<370	370	<6.2	6.2	<570	570	<2.2	2.2	<4700	4,700	<5.2	5.2	<220	220	<6900	6,900	<4.0	4.0
1,2,3-Trichloropropane			<3.5	3.5	<8900	8,900	<5.5	5.5	<3.9	3.9	<3400	3,400	<23	23	<370	370	<6.2	6.2	<570	570	<2.2	2.2	<4700	4,700	<5.2	5.2	<220	220	<6900	6,900	<4.0	4.0
1,2,4-Trichlorobenzene			<3.5	3.5	<8900	8,900	<5.5	5.5	<3.9	3.9	<3400	3,400	<23	23	<370	370	<6.2	6.2	<570	570	<2.2	2.2	<4700	4,700	<5.2	5.2	<220	220	<6900	6,900	<4.0	4.0
1,2,4-Trimethylbenzene	3,600	52,000	<3.5	3.5	<3500	3,500	<5.5	5.5	<3.9	3.9	<3400	3,400	<23	23	<370	370	<6.2	6.2	<570	570	<2.2	2.2	530	3,600	<5.2	5.2	<220	220	1,500	3,500	<4.0	4.0
1,2-Dibromo-3-chloropropane			<3.5	3.5	<8900	8,900	<5.5	5.5	<3.9	3.9	<3400	3,400	<23	23	<370	370	<6.2	6.2	<570	570	<2.2	2.2	<4700	4,700	<5.2	5.2	<220	220	<6900	6,900	<4.0	4.0
1,2-Dibromomethane			<3.5	3.5	<8900	8,900	<5.5	5.5	<3.9	3.9	<3400	3,400	<23	23	<4.8	4.8	<6.2	6.2	<8.8	8.8	<2.2	2.2	<4700	4,700	<5.2	5.2	<5.1	5.1	<6900	6,900	<4.0	4.0
1,2-Dichlorobenzene	1,100	100,000	<3.5	3.5	<1000	1,000	<5.5	5.5	<3.9	3.9	<1100	1,100	<23	23	<370	370	<6.2	6.2	<570	570	<2.2	2.2	<4700	4,700	<5.2	5.2	<220	220	<1000	1,000	<4.0	4.0
1,2-Dichloroethane	20	3,100	<3.5	3.5	<8900	8,900	<5.5	5.5	<3.9	3.9	<3400	3,400	<20	20	<4.8	4.8	<6.2	6.2	<8.8	8.8	<2.2	2.2	<4700	4,700	<5.2	5.2	<5.1	5.1	<6900	6,900	<4.0	4.0
1,2-Dichloropropane			<3.5	3.5	<8900	8,900	<5.5	5.5	<3.9	3.9	<3400	3,400	<23	23	<4.8	4.8	<6.2	6.2	<8.8	8.8	<2.2	2.2	<4700	4,700	<5.2	5.2	<5.1	5.1	<6900	6,900	<4.0	4.0
1,3,5-Trimethylbenzene	8,400	52,000	<3.5	3.5	<8900	8,900	<5.5	5.5	<3.9	3.9	<3400	3,400	<23	23	<370	370	<6.2	6.2	<570	570	<2.2	2.2	<4700	4,700	<5.2	5.2	<220	220	<6900	6,900	<4.0	4.0
1,3-Dichlorobenzene	2,400	4,900	<3.5	3.5	<2000	2,000	<5.5	5.5	<3.9	3.9	<2400	2,400	<23	23	<370	370	<6.2	6.2	<570	570	<2.2	2.2	<2400	2,400	<5.2	5.2	<220	220	<1000	1,000	<4.0	4.0
1,3-Dichloropropane			<3.5	3.5	<8900	8,900	<5.5	5.5	<3.9	3.9	<3400	3,400	<23	23	<4.8	4.8	<6.2	6.2	<8.8	8.8	<2.2	2.2	<4700	4,700	<5.2	5.2	<5.1	5.1	<6900	6,900	<4.0	4.0
1,4-Dichlorobenzene	1,800	13,000	<3.5	3.5	<1800	1,800	<5.5	5.5	<3.9	3.9	<1800	1,800	<23	23	<370	370	<6.2	6.2	<570	570	<2.2	2.2	<1800	1,800	<5.2	5.2	<220	220	<1000	1,000	<4.0	4.0
1,4-dioxane	100	13,000	<70	70	<180000	180,000	<68	68	<70	70	<69000	69,000	<450	450	<96	96	<100	100	<100	100	<43	43	<93000	93,000	<100	100	<100	100	<130000	130,000	<96	96
2,2-Dichloropropane			<3.5	3.5	<8900	8,900	<5.5	5.5	<3.9	3.9	<3400	3,400	<23	23	<4.8	4.8	<6.2	6.2	<8.8	8.8	<2.2	2.2	<4700	4,700	<5.2	5.2	<5.1	5.1	<6900	6,900	<4.0	4.0
2-Chlorotoluene			<3.5	3.5	<8900	8,900	<5.5	5.5	<3.9	3.9	<3400	3,400	<23	23	<370	370	<6.2	6.2	<570	570	<2.2	2.2	<4700	4,700	<5.2	5.2	<220	220	<6900	6,900	<4.0	4.0
2-Hexanone (Methyl Butyl Ketone)			<18	18	<45000	45,000	<27	27	<20	20	<17000	17,000	<110	110	<24	24	<31	31	<44	44	<11	11	<23000	23,000	<26	26	<25	25	<35000	35,000	<20	20
2-Isopropyltoluene			<3.5	3.5	6,300	8,900	<5.5	5.5	<3.9	3.9	7,800	6,900	<23	23	<370	370	<6.2	6.2	<570	570	<2.2	2.2	7,100	4,700	<5.2	5.2	<220	220	11,000	6,900	0.92	4.0
4-Chlorotoluene			<3.5	3.5	<8900	8,900	<5.5	5.5	<3.9	3.9	<3400	3,400	<23	23	<370	370	<6.2	6.2	<570	570	<2.2	2.2	<4700	4,700	<5.2	5.2	<220	220	<6900	6,900	<4.0	4.0
4-Methyl-2-Pentanone			<18	18	<45000	45,000	<27	27	<20	20	<17000	17,000	<110	110	<24	24	<31	31	<44	44	<11	11	<23000	23,000	<26	26	<25	25	<35000	35,000	<20	20
Acetone	50	100,000	9.3	35	10,000	89,000	210	55	<39	39	<34000	34,000	630	230	14	48	29	50	170	88	3.9	22	<47000	47,000	32	50	<50	50	<69000	69,000	47	40
Acrolein			<14	14	<35000	35,000	<22	22	<16	16	<14000	14,000	<90	90	<19	19	<25	25	<35	35	<8.7	8.7	<19000	19,000	<21	21	<20	20	<28000	28,000	<16	16
Acrylonitrile			<70	70	<35000	35,000	<11	11	<16	16	<14000	14,000	<90	90	<19	19	<12	12	<35	35	<8.7	8.7	<19300	9,300	<21	21	<20	20	<14000	14,000	<16	16
Benzene	60	4,900	0.45	3.5	<8900	8,900	<5.5	5.5	<3.9	3.9	<3400	3,400	<23	23	<4.8	4.8	<6.2	6.2	<8.8	8.8	<2.2	2.2	<4700	4,700	<5.2	5.2	<5.1	5.1	<6900	6,900	<4.0	4.0
Bromobenzene			<3.5	3.5	<8900	8,900	<5.5	5.5	<3.9	3.9	<3400	3,400	<23	23	<370	370	<6.2	6.2	<570	570	<2.2	2.2	<4700	4,700	<5.2	5.2	<220	220	<6900	6,900	<4.0	4.0
Bromochloromethane			<3.5	3.5	<8900	8,900	<5.5	5.5	<3.9	3.9	<3400	3,400	<23	23	<4.8	4.8	<															

TABLE 3B
Soil Analytical Results
Volatile Organic Compounds

COMPOUND	NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives*	NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	15SB6						15SB7						15SB8						15SB9						15SB10						Duplicate	
			(0-2")		(11-13")		(18-20")		(0-2")		(11-13")		(18-20")		(0-2")		(11-13")		(18-20")		(0-2")		(11-13")		(18-20")		(0-2")		(11-13")		(18-20")			
			12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015	
			Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
1,1,1,2-Tetrachloroethane			< 8.1	32	< 970.0	9,700	< 6.5	26	< 4.0	4.0	< 750.0	7,500	< 25.0	1,000			< 1900.0	10,500	< 2.4	24	< 1100	1,100	< 10	10	< 7.6	7.6	< 3.3	3.3	< 420	420	< 14	14	< 2.5	2.5
1,1,1-Trichloroethane	680	100,000	< 8.1	8.1	< 240.0	240	< 6.5	6.5	< 4.0	4.0	< 750.0	750	< 25.0	250	34	180	< 680	680	< 5.0	5.0	56	280	< 2.6	2.6	< 220	220	< 320	320	< 420	420	< 1000	1,000	< 2.5	2.5
1,1,2,2-Tetrachloroethane			< 8.1	8.1	< 240.0	240.0	< 6.5	6.5	< 4.0	4.0	< 750.0	750.0	< 25.0	250	< 3.2	3.2	< 490.0	490.0	< 5.0	5.0	< 280	280	< 2.6	2.6	< 220	220	< 320	320	< 420	420	< 1000	1,000	< 2.5	2.5
1,1,2-Trichloroethane			< 8.1	8.1	< 240.0	240.0	< 6.5	6.5	< 4.0	4.0	< 750.0	750.0	< 25.0	250	< 3.2	3.2	< 490.0	490.0	< 5.0	5.0	< 280	280	< 2.6	2.6	< 7.6	7.6	< 3.3	3.3	< 420	420	< 14	14	< 2.5	2.5
1,1-Dichloroethane	270	26,000	< 8.1	8.1	< 240.0	240.0	< 6.5	6.5	< 4.0	4.0	< 750.0	750.0	< 25.0	250	< 3.3	3.2	< 490.0	490.0	< 5.0	5.0	< 270	270	< 2.6	2.6	< 7.6	7.6	< 3.3	3.3	< 270	270	< 14	14	< 2.5	2.5
1,1-Dichloroethane	330	100,000	< 8.1	8.1	< 330	330	< 6.5	6.5	< 4.0	4.0	< 750.0	750.0	< 25.0	250	< 3.2	3.2	< 490.0	490.0	< 5.0	5.0	< 280	280	< 2.6	2.6	< 7.6	7.6	< 3.3	3.3	< 330	330	< 14	14	< 2.5	2.5
1,1-Dichloropropene			< 8.1	8.1	< 240.0	240.0	< 6.5	6.5	< 4.0	4.0	< 750.0	750.0	< 25.0	250	< 3.2	3.2	< 490.0	490.0	< 5.0	5.0	< 280	280	< 2.6	2.6	< 7.6	7.6	< 3.3	3.3	< 420	420	< 14	14	< 2.5	2.5
1,2,3-Trichlorobenzene			< 8.1	8.1	< 240.0	240.0	< 6.5	6.5	< 4.0	4.0	< 750.0	750.0	< 25.0	250	< 3.2	3.2	< 490.0	490.0	< 5.0	5.0	< 280	280	< 2.6	2.6	< 220	220	< 320	320	< 420	420	< 1000	1,000	< 2.5	2.5
1,2,3-Trichloropropene			< 8.1	8.1	< 240.0	240.0	< 6.5	6.5	< 4.0	4.0	< 750.0	750.0	< 25.0	250	< 3.2	3.2	< 490.0	490.0	< 5.0	5.0	< 280	280	< 2.6	2.6	< 220	220	< 320	320	< 420	420	< 1000	1,000	< 2.5	2.5
1,2,4-Trichlorobenzene			< 8.1	8.1	< 240.0	240.0	< 6.5	6.5	< 4.0	4.0	< 750.0	750.0	< 25.0	250	< 3.2	3.2	< 490.0	490.0	< 5.0	5.0	< 280	280	< 2.6	2.6	< 220	220	< 320	320	< 420	420	< 1000	1,000	< 2.5	2.5
1,2,4-Trimethylbenzene	3,600	52,000	< 8.1	8.1	< 240.0	240.0	0.81	6.5	< 4.0	4.0	< 360.0	3,600	< 25.0	250	0.48	3.2	6,500	5,900	46	290	64	510	330	< 220	220	< 320	320	410	420	< 1000	1,000	< 2.5	2.5	
1,2-Dibromo-3-chloropropane			< 8.1	8.1	< 240.0	240.0	< 6.5	6.5	< 4.0	4.0	< 750.0	750.0	< 25.0	250	< 3.2	3.2	< 490.0	490.0	< 5.0	5.0	< 280	280	< 2.6	2.6	< 220	220	< 320	320	< 420	420	< 1000	1,000	< 2.5	2.5
1,2-Dibromomethane			< 8.1	8.1	< 240.0	240.0	< 6.5	6.5	< 4.0	4.0	< 750.0	750.0	< 25.0	250	< 3.2	3.2	< 490.0	490.0	< 5.0	5.0	< 280	280	< 2.6	2.6	< 7.6	7.6	< 3.3	3.3	< 420	420	< 14	14	< 2.5	2.5
1,2-Dichlorobenzene	1,100	100,000	< 8.1	8.1	< 1100	1,100	< 6.5	6.5	< 4.0	4.0	< 1100	1,100	< 25.0	250	< 3.2	3.2	< 1100	1,100	< 5.0	5.0	< 280	280	< 2.6	2.6	< 220	220	< 320	320	< 420	420	< 1000	1,000	< 2.5	2.5
1,2-Dichloroethane	20	3,100	< 8.1	8.1	< 240.0	240.0	< 6.5	6.5	< 4.0	4.0	< 750.0	750.0	< 25.0	250	< 3.2	3.2	< 490.0	490.0	< 5.0	5.0	< 280	280	< 2.6	2.6	< 7.6	7.6	< 3.3	3.3	< 420	420	< 14	14	< 2.5	2.5
1,2-Dichloropropane			< 8.1	8.1	< 240.0	240.0	< 6.5	6.5	< 4.0	4.0	< 750.0	750.0	< 25.0	250	< 3.2	3.2	< 490.0	490.0	< 5.0	5.0	< 280	280	< 2.6	2.6	< 7.6	7.6	< 3.3	3.3	< 420	420	< 14	14	< 2.5	2.5
1,3-Trichlorobenzene	8,400	52,000	< 8.1	8.1	< 240.0	240.0	0.99	6.5	< 4.0	4.0	< 240.0	2,400	< 25.0	250	< 3.2	3.2	< 490.0	490.0	< 5.0	5.0	< 280	280	< 2.6	2.6	< 7.6	7.6	< 3.3	3.3	< 420	420	< 14	14	< 2.5	2.5
1,3-Dichlorobenzene	2,400	4,900	< 8.1	8.1	< 240.0	240.0	< 6.5	6.5	< 4.0	4.0	< 240.0	2,400	< 25.0	250	< 3.2	3.2	< 240.0	2,400	< 5.0	5.0	< 280	280	< 2.6	2.6	< 7.6	7.6	< 3.3	3.3	< 420	420	< 1000	1,000	< 2.5	2.5
1,3-Dichloropropane			< 8.1	8.1	< 240.0	240.0	< 6.5	6.5	< 4.0	4.0	< 750.0	750.0	< 25.0	250	< 3.2	3.2	< 490.0	490.0	< 5.0	5.0	< 280	280	< 2.6	2.6	< 7.6	7.6	< 3.3	3.3	< 420	420	< 14	14	< 2.5	2.5
1,4-Dichlorobenzene	1,800	13,000	< 8.1	8.1	< 1800	1,800	< 6.5	6.5	< 4.0	4.0	< 1800	1,800	< 25.0	250	< 3.2	3.2	< 1800	1,800	< 5.0	5.0	< 280	280	< 2.6	2.6	< 220	220	< 320	320	< 420	420	< 1000	1,000	< 2.5	2.5
1,4-dioxane	100	13,000	< 100	100	< 4800.0	48,000	< 100	100	< 80	80	< 16000.0	160,000	< 5000	5,000	< 63	63	< 9700.0	97,000	< 100	100	< 9600	5,600	< 51	51	< 100	100	< 67	67	< 8300	8,300	< 100	100	< 49	49
2,2-Dichloropropane			< 8.1	8.1	< 240.0	240.0	< 6.5	6.5	< 4.0	4.0	< 750.0	750.0	< 25.0	250	< 3.2	3.2	< 490.0	490.0	< 5.0	5.0	< 280	280	< 2.6	2.6	< 7.6	7.6	< 3.3	3.3	< 420	420	< 14	14	< 2.5	2.5
2-Chlorotoluene			< 8.1	8.1	< 240.0	240.0	< 6.5	6.5	< 4.0	4.0	< 750.0	750.0	< 25.0	250	< 3.2	3.2	< 490.0	490.0	< 5.0	5.0	< 280	280	< 2.6	2.6	< 7.6	7.6	< 3.3	3.3	< 420	420	< 14	14	< 2.5	2.5
2-Hexanone (Methyl Butyl Ketone)			< 40	40	< 1200.0	12,000	< 32	32	< 20	20	< 4000.0	40,000	< 1200	1,200	< 16	16	< 2400.0	24,000	< 30	30	< 1400	1,400	< 13	13	< 38	38	< 17	17	< 2100	2,100	< 69	69	< 12	12
2-Isopropyltoluene			< 8.1	8.1	< 240.0	240.0	1.7	6.5	< 4.0	4.0	< 750.0	750.0	< 25.0	250	< 3.2	3.2	< 490.0	490.0	< 5.0	5.0	< 280	280	< 2.6	2.6	< 7.6	7.6	< 3.3	3.3	< 420	420	< 1000	1,000	< 2.5	2.5
4-Chlorotoluene			< 8.1	8.1	< 240.0	240.0	< 6.5	6.5	< 4.0	4.0	< 750.0	750.0	< 25.0	250	< 3.2	3.2	< 490.0	490.0	< 5.0	5.0	< 280	280	< 2.6	2.6	< 7.6	7.6	< 3.3	3.3	< 420	420	< 1000	1,000	< 2.5	2.5
4-Methyl-2-Pentanone			< 40	40	< 1200.0	12,000	< 32	32	< 20	20	< 4000.0	40,000	< 1200	1,200	< 16	16	< 2400.0	24,000	< 30	30	< 1400	1,400	< 13	13	< 38	38	< 17	17	< 2100	2,100	< 69	69	< 12	12
Acetone	50	100,000	< 50	50	< 2400.0	24,000	70	50	< 4.0	4.0	< 750.0	750.0	< 25.0	250	8.2	3.2	< 4800.0	48,000	< 50	50	< 2800	2,800	3.1	26	16	50	< 33	33	< 4200	4,200	230	50	< 25	25
Acrolein			< 32	32	< 970.0	9,700	< 26	26	< 16	16	< 3200.0	32,000	< 1000	1,000	< 13	13	< 1800.0	18,000	< 24	24	< 1100	1,100	< 10	10	< 31	31	< 13	13	<					

TABLE 4
Soil Analytical Results
Volatile Organic TICs

COMPOUND	NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives*	NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	15SB5	
			(22-24') 12/17/2015 µg/Kg	
			Result	RL
Cyclohexane, 1-ethyl-4-methyl-, trans- (RT 4.930)			4.1	5
Cyclohexane, butyl- (RT 6.049)			10	5
unknown (RT 5.071)			5	5
unknown (RT 5.123)			7.8	5

Notes:

* - 6 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives

RL- Reporting Limit

Bold/highlighted- Indicated exceedance of the NYSDEC UUSCO Guidance Value

Bold/highlighted- Indicated exceedance of the NYSDEC RRSCO Guidance Value

TABLE 5A
Soil Analytical Results
Semi-Volatile Organic Compounds

COMPOUND	NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives*	NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	155B1						155B2						155B3						155B4						155B5					
			(2-4) 12/16/2015		(11-13) 12/16/2015		(18-20) 12/16/2015		(0-2) 12/17/2015		(11-13) 12/17/2015		(18-20) 12/17/2015		(2-4) 12/16/2015		(11-13) 12/16/2015		(18-20) 12/16/2015		(0-2) 12/17/2015		(11-13) 12/17/2015		(18-20) 12/17/2015		(2-4) 12/16/2015		(11-13) 12/16/2015		(22-24) 12/16/2015	
			µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg	
			Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
1,2,4,5-Tetrachlorobenzene			< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
1,2,4-Trichlorobenzene			< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
1,2-Dichlorobenzene			< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
1,2-Diphenylhydrazine			< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
1,3-Dichlorobenzene			< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
1,4-Dichlorobenzene			< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
2,4,5-Trichlorophenol			< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
2,4,6-Trichlorophenol			< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
2,4-Dichlorophenol			< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
2,4-Dimethylphenol			< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
2,4-Dinitrophenol			< 660	660	< 820	820	< 980	980	< 780	780	< 930	930	< 2400	2,400	< 660	660	< 860	860	< 980	980	< 740	740	< 850	850	< 920	920	< 650	650	< 860	860	< 650	650
2,4-Dinitrotoluene			< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
2,6-Dinitrotoluene			< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
2-Chloronaphthalene			< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
2-Chlorophenol			< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
2-Methylnaphthalene			< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	300	230	< 300	300	< 230	230
2-Methylphenol (o-cresol)	330	100,000	< 230	230	< 290	290	< 330	330	< 270	270	< 320	320	< 330	330	< 230	230	< 300	300	< 330	330	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
2-Nitroaniline			< 660	660	< 820	820	< 980	980	< 780	780	< 930	930	< 2400	2,400	< 660	660	< 860	860	< 980	980	< 740	740	< 850	850	< 920	920	< 650	650	< 860	860	< 650	650
2-Nitrophenol			< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
3&4-Methylphenol (m&p-cresol)	330	100,000	< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
3&4-Methylphenol (m&p-cresol)	330	100,000	< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
3,3'-Dichlorobenzidine			< 660	660	< 820	820	< 980	980	< 780	780	< 930	930	< 2400	2,400	< 660	660	< 860	860	< 980	980	< 740	740	< 850	850	< 920	920	< 650	650	< 860	860	< 650	650
3-Nitroaniline			< 660	660	< 820	820	< 980	980	< 780	780	< 930	930	< 2400	2,400	< 660	660	< 860	860	< 980	980	< 740	740	< 850	850	< 920	920	< 650	650	< 860	860	< 650	650
4,6-Dinitro-2-methylphenol			< 1600	1,600	< 2100	2,100	< 2500	2,500	< 2000	2,000	< 2300	2,300	< 6000	6,000	< 1600	1,600	< 2200	2,200	< 2500	2,500	< 1600	1,600	< 2100	2,100	< 2300	2,300	< 1600	1,600	< 2200	2,200	< 1600	1,600
4-Bromophenyl phenyl ether			< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
4-Chloro-3-methylphenol			< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
4-Chloroaniline			< 260	260	< 330	330	< 390	390	< 310	310	< 370	370	< 980	980	< 260	260	< 340	340	< 390	390	< 290	290	< 340	340	< 370	370	< 260	260	< 350	350	< 260	260
4-Chlorophenyl phenyl ether			< 230	230	< 290	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	< 300	300	< 320	320	< 230	230	< 300	300	< 230	230
4-Nitroaniline			< 660	660	< 820	820	< 980	980	< 780	780	< 930	930	< 2400	2,400	< 660	660	< 860	860	< 980	980	< 740	740	< 850	850	< 920	920	< 650	650	< 860	860	< 650	650
4-Nitrophenol			< 330	330	< 410	410	< 490	490	< 390	390	< 460	460	< 1200	1,200	< 330	330	< 430	430	< 490	490	< 370	370	< 420	420	< 460	460	< 330	330	< 430	430	< 330	330
Acenaphthene	20,000	100,000	< 230	230	380	290	< 340	340	< 270	270	< 320	320	< 840	840	< 230	230	< 300	300	< 340	340	< 260	260	210	300	< 320	320	620	230	1,400	300	< 230	

TABLE 5B
Soil Analytical Results
Semi-Volatile Organic Compounds

COMPOUND	NYSDC Part 375.6 Unrestricted Use Soil Cleanup Objectives*	NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	15SB6						15SB7						15SB8						15SB9						15SB10						Duplicate	
			(0-2)		(11-13)		(18-20)		(0-2)		(11-13)		(18-20)		(0-2)		(11-13)		(18-20)		(0-2)		(11-13)		(18-20)		(0-2)		(11-13)		(18-20)		12/17/2015	
			12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015		12/17/2015	
			Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
1,2,4,5-Tetrachlorobenzene			< 270	270	< 350	350	< 360	360	< 260	260	< 290	290	< 310	310	< 260	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 340	340	< 440	440	< 280	280
1,2,4-Trichlorobenzene			< 270	270	< 350	350	< 360	360	< 260	260	< 290	290	< 310	310	< 260	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 340	340	< 440	440	< 280	280
1,2-Dichlorobenzene			< 270	270	< 350	350	< 360	360	< 260	260	< 290	290	< 310	310	< 260	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 340	340	< 440	440	< 280	280
1,2-Diphenylhydrazine			< 270	270	< 350	350	< 360	360	< 260	260	< 290	290	< 310	310	< 260	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 340	340	< 440	440	< 280	280
1,3-Dichlorobenzene			< 270	270	< 350	350	< 360	360	< 260	260	< 290	290	< 310	310	< 260	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 340	340	< 440	440	< 280	280
1,4-Dichlorobenzene			< 270	270	< 350	350	< 360	360	< 260	260	< 290	290	< 310	310	< 260	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 340	340	< 440	440	< 280	280
2,4,5-Trichlorophenol			< 270	270	< 350	350	< 360	360	< 260	260	< 290	290	< 310	310	< 260	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 340	340	< 440	440	< 280	280
2,4,6-Trichlorophenol			< 270	270	< 350	350	< 360	360	< 260	260	< 290	290	< 310	310	< 260	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 340	340	< 440	440	< 280	280
2,4-Dichlorophenol			< 270	270	< 350	350	< 360	360	< 260	260	< 290	290	< 310	310	< 260	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 340	340	< 440	440	< 280	280
2,4-Dimethylphenol			< 270	270	< 350	350	< 360	360	< 260	260	< 290	290	< 310	310	< 260	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 340	340	< 440	440	< 280	280
2,4-Dinitrophenol			< 760	760	< 990	990	< 1000	1,000	< 750	750	< 820	820	< 880	880	< 750	750	< 860	860	< 940	940	< 770	770	< 810	810	< 750	750	< 720	720	< 980	980	< 1300	1,300	< 810	810
2,4-Dinitrotoluene			< 270	270	< 350	350	< 360	360	< 260	260	< 290	290	< 310	310	< 260	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 340	340	< 440	440	< 280	280
2,6-Dinitrotoluene			< 270	270	< 350	350	< 360	360	< 260	260	< 290	290	< 310	310	< 260	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 340	340	< 440	440	< 280	280
2-Chloronaphthalene			< 270	270	< 350	350	< 360	360	< 260	260	< 290	290	< 310	310	< 260	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 340	340	< 440	440	< 280	280
2-Chlorophenol			< 270	270	< 350	350	< 360	360	< 260	260	< 290	290	< 310	310	< 260	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 340	340	< 440	440	< 280	280
2-Methylnaphthalene			< 270	270	< 350	350	< 360	360	770	260	< 290	290	< 310	310	160	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 340	340	< 440	440	< 280	280
2-Methylphenol (o-cresol)	330	100,000	< 270	270	< 330	330	< 330	330	< 260	260	< 290	290	< 310	310	< 260	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 330	330	< 330	330	< 280	280
2-Nitroaniline			< 760	760	< 990	990	< 1000	1,000	< 750	750	< 820	820	< 880	880	< 750	750	< 860	860	< 940	940	< 770	770	< 810	810	< 750	750	< 720	720	< 980	980	< 1300	1,300	< 810	810
2-Nitrophenol			< 270	270	< 350	350	< 360	360	< 260	260	< 290	290	< 310	310	< 260	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 340	340	< 440	440	< 280	280
3,4-Methylphenol (m&p-cresol)	330	100,000	< 270	270	< 350	350	< 360	360	< 260	260	< 290	290	< 310	310	< 260	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 340	340	< 440	440	< 280	280
3,3'-Dichlorobenzidine			< 760	760	< 990	990	< 1000	1,000	< 750	750	< 820	820	< 880	880	< 750	750	< 860	860	< 940	940	< 770	770	< 810	810	< 750	750	< 720	720	< 980	980	< 1300	1,300	< 810	810
3-Nitroaniline			< 760	760	< 990	990	< 1000	1,000	< 750	750	< 820	820	< 880	880	< 750	750	< 860	860	< 940	940	< 770	770	< 810	810	< 750	750	< 720	720	< 980	980	< 1300	1,300	< 810	810
4,6-Dinitro-2-methylphenol			< 1900	1,900	< 2500	2,500	< 2600	2,600	< 1900	1,900	< 2100	2,100	< 2200	2,200	< 1900	1,900	< 2200	2,200	< 2300	2,300	< 1900	1,900	< 2000	2,000	< 1900	1,900	< 1900	1,900	< 2400	2,400	< 3200	3,200	< 2000	2,000
4-Bromophenyl phenyl ether			< 270	270	< 350	350	< 360	360	< 260	260	< 290	290	< 310	310	< 260	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 340	340	< 440	440	< 280	280
4-Chloro-3-methylphenol			< 270	270	< 350	350	< 360	360	< 260	260	< 290	290	< 310	310	< 260	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 340	340	< 440	440	< 280	280
4-Chloroaniline			< 300	300	< 400	400	< 410	410	< 300	300	< 330	330	< 350	350	< 300	300	< 350	350	< 380	380	< 310	310	< 320	320	< 300	300	< 250	250	< 380	380	< 510	510	< 320	320
4-Chlorophenyl phenyl ether			< 270	270	< 350	350	< 360	360	< 260	260	< 290	290	< 310	310	< 260	260	< 300	300	< 330	330	< 270	270	< 280	280	< 260	260	< 250	250	< 340	340	< 440	440	< 280	280
4-Nitroaniline			< 760	760	< 990	990	< 1000	1,000	< 750	750	< 820	820	< 880	880	< 750	750	< 860	860	< 940	940	< 770	770	< 810	810	< 750	750	< 720	720	< 980	980	< 1300	1,300	< 810	810
4-Nitrophenol			< 380	380	< 490	490	< 520	520	< 370	370	< 410	410	< 440	440	< 370	370	< 430	430	< 470	470	< 380	380	< 400	400	< 380	380	< 350	350	< 480	480	< 630	630	< 410	410
Acenaphthene	20,000	100,000	< 270	270	< 350	350</																												

TABLE 6A
Soil Analytical Results
Semi-Volatile Organic
TICs (15SB1-15SB5)

COMPOUND	NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives*	NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	15SB1				15SB2				15SB3				15SB4				15SB5			
			(2-4")		(18-20")		(0-2")		(18-20")		(2-4")		(18-20")		(0-2")		(11-13")		(18-20")		(2-4")	
			12/16/2015		12/16/2015		12/17/2015		12/17/2015		12/16/2015		12/16/2015		12/17/2015		12/17/2015		12/17/2015		12/16/2015	
			µg/Kg	RL	µg/Kg	RL	µg/Kg	RL	µg/Kg	RL	µg/Kg	RL	µg/Kg	RL	µg/Kg	RL	µg/Kg	RL	µg/Kg	RL	µg/Kg	RL
11H-Benzo[b]fluorene (RT 8.281)																						
11H-Benzo[b]fluorene (RT 8.398)																					810	4
11H-Benzo[b]fluorene (RT 8.404)																					1,800	4
11H-Benzo[b]fluorene Isomer (RT 8.281)																						
11H-Benzo[b]fluorene Isomer (RT 8.469)																					970	4
1H-Indene, 1-ethylidene- (RT 4.659)																						
1H-Indene, 2,3-dihydro-1,1-dimethyl (RT 3.546)																	6,600	4				
1H-Indene, 2-phenyl- (RT 7.239)																						
2-Pentanone, 4-hydroxy-4-methyl- (RT 1.981)					4,100	4							3,600	4							5,300	4
2-Pentanone, 4-hydroxy-4-methyl- (RT 1.981)											15,000	4										
2-Pentanone, 4-hydroxy-4-methyl- (RT 1.987)																						
2-Pentanone, 4-hydroxy-4-methyl- (RT 2.010)			120,000	4																		
2-Pentanone, 4-hydroxy-4-methyl- (RT 2.063)																					7,900	4
2-Pentanone, 4-hydroxy-4-methyl- (RT 2.063)							2,600	4			16,000	4			1,300	4						
2-Pentanone, 4-hydroxy-4-methyl- (RT 2.069)																		8,700	4			
2-Pentanone, 4-hydroxy-4-methyl- (RT 2.075)																						
2-Pentanone, 4-hydroxy-4-methyl- (RT 2.081)																						
2-Pentanone, 4-hydroxy-4-methyl- (RT 2.087)																						
2-Pentanone, 4-hydroxy-4-methyl- (RT 2.704)									19,000	4												
2-Pentene, 2,3-dimethyl- (RT 1.751)			2,800	4																		
2-Pentene, 3-ethyl-4,4-dimethyl- (RT 2.904)																						
2-Phenylnaphthalene (RT 7.475)																						
3,4-Dihydrocyclopenta[cd]pyrene (a (RT 9.716)																					840	4
3-Hexene, 3-methyl-2,5-dimethyl- (RT 2.834)																						
Anthracene, 1-methyl- (RT 7.239)																						
Anthracene, 2-(1,1-dimethylethyl)- (RT 8.369)																		580	4			
Anthracene, 2-methyl- (RT 7.216)																						
Anthracene, 2-methyl- (RT 7.240)																					670	4
Benzo[a]acetylenanthylene (RT 11.792)																					1,200	4
Benzene, (2-methyl-1-butanyl)- (RT 3.540)																						
Benzene, (2-methyl-1-butanyl)- (RT 3.546)																						
Benzene, 1,2,3,4-tetramethyl- (RT 3.793)																						
Benzene, 1,2,3,4-tetramethyl- (RT 3.810)																	11,000	4				
Benzene, 1,2,3,5-tetramethyl- (RT 3.581)																						
Benzene, 1,2,3-trimethyl- (RT 2.893)																						
Benzene, 1,2,4-trimethyl- (RT 2.893)																						
Benzene, 1,2-diethyl- (RT 3.193)																						
Benzene, 1,2-diethyl- (RT 3.204)									16,000	4												
Benzene, 1-methyl-3-(1-methylethyl) (RT 3.599)																	21,000	4				
Benzene, 1-methyl-4-(1-methylethyl) (RT 3.657)																						
Benzene, 1-methyl-4-(1-methylethyl) (RT 3.698)																						
Benzene, 1-methyl-4-(1-methylethyl) (RT 3.810)																						
Benzene, 2-ethyl-1,4-dimethyl- (RT 3.575)																						
Benzene, methyl(1-methylethyl)- (RT 3.575)																						
Benzo[e]pyrene (RT 11.786)																						
Benzo[e]pyrene (RT 11.886)																						
Benzo[e]pyrene (RT 11.898)											300	4										
Benzo[e]pyrene (RT 12.150)																						
Benzo[e]pyrene (RT 12.192)																						
Benzo[e]pyrene (RT 12.196)																					2,700	4
Benzo[e]pyrene Isomer (RT 11.780)																						
Benzo[e]pyrene Isomer (RT 12.510)																						
Benzo[e]pyrene Isomer (RT 12.522)																					1,100	4
Cyclohexane, (bromomethyl)- (RT 3.381)																						
Cyclohexane, 1,1-dimethyl- (RT 2.904)									15,000	4												
Cyclohexane, 1,3,5-trimethyl- (RT 2.704)																						
Cyclohexane, 1-ethyl-1-methyl- (RT 2.828)																						
Cyclohexane, elcosyl- (RT 3.675)																		8,900	4			
Cyclohexane, octyl- (RT 2.845)																						
Cyclohexane, pentyl- (RT 3.669)																						
Cyclohexane, pentyl- (RT 3.675)																						
Cyclohexane, propyl- (RT 2.540)																						
Elcosane (RT 13.498)																						
Hexadecanoic acid (RT 7.228)							330	4							340	4						
Hexadecanoic acid (RT 7.257)																						
Naphthalene, 1,5-dimethyl- (RT 5.187)																						
Naphthalene, decahydro-, trans- (RT 3.281)																						
Naphthalene, decahydro-, trans- (RT 3.287)																						
Naphthalene, decahydro-, trans- (RT 3.299)									32,000	4												
Octadecane, 1-(ethenyl)- (RT 9.369)											1,500	4						2,300	4			
Pentatriacontane (RT 11.645)																					330	4
Pentatriacontane (RT 11.651)																						
Phenanthrene, 2,5-dimethyl- (RT 7.710)																						
Phenanthrene, 2-methyl- (RT 7.216)																						
Phenanthrene, 3,4,5,6-tetramethyl- (RT 8.239)																						
Sulfur dioxide (RT 5.575)																						
Tetracontane, 3,5,24-trimethyl- (RT 3.069)																						
Tricyclo[4.3.1.13,8]undecane, 1-bromo (RT 3.640)																			2,500	4		
Triphenylene, 2-methyl- (RT 10.210)																					940	4

Notes:
* - 6 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives
RL - Reporting Limit
Bold/highlighted - Indicated exceedance of the NYSDC (USCO) Guidance Value
Bold/highlighted - Indicated exceedance of the NYSDC RRSO Guidance Value

TABLE 6A
Soil Analytical Results
Semi-Volatile Organic
TICs (15SB1-15SB5)

COMPOUND	NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives*	NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	15SB1				15SB2				15SB3				15SB4						15SB5			
			(2-4) 12/16/2015		(18-20) 12/16/2015		(8-2) 12/17/2015		(18-20) 12/17/2015		(2-4) 12/16/2015		(18-20) 12/16/2015		(8-2) 12/17/2015		(11-13) 12/17/2015		(18-20) 12/17/2015		(2-4) 12/16/2015		(22-24) 12/16/2015	
			Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
Unknown (RT 1.869)											8,200	4												
Unknown (RT 10.045)																								
unknown (RT 10.351)					3,200	4																		
unknown (RT 10.822)					840	4																		
unknown (RT 11.216)																								
Unknown (RT 11.457)											4,000	4												
unknown (RT 11.863)					1,100	4																		
Unknown (RT 12.128)																								
Unknown (RT 12.174)																								
Unknown (RT 12.198)																								
Unknown (RT 12.615)																								
Unknown (RT 12.645)																		860	4					
Unknown (RT 12.980)																								
Unknown (RT 14.804)																								
Unknown (RT 14.992)																								
Unknown (RT 15.768)													1,100	4										
Unknown (RT 15.768)																								
unknown (RT 15.886)													840	4										
Unknown (RT 15.886)																								
unknown (RT 15.892)					1,500	4																		
Unknown (RT 15.960)											8,000	4												
Unknown (RT 16.051)											2,700	4												
Unknown (RT 16.074)																								
Unknown (RT 16.098)											4,600	4												
Unknown (RT 16.145)													640	4										
Unknown (RT 16.145)																								
Unknown (RT 16.186)											10,000	4												
Unknown (RT 16.286)					760	4																		
Unknown (RT 16.345)											4,600	4												
Unknown (RT 16.480)											1,700	4										560	4	
Unknown (RT 17.033)																								
Unknown (RT 2.075)																								
Unknown (RT 2.445)																								
Unknown (RT 2.546)																								
Unknown (RT 2.552)																								
Unknown (RT 2.610)																								
Unknown (RT 2.699)																								
Unknown (RT 2.704)																								
Unknown (RT 2.734)																								
Unknown (RT 2.751)																								
Unknown (RT 2.810)																								
Unknown (RT 2.816)																								
Unknown (RT 2.828)											7,700	4												
Unknown (RT 2.840)																								
Unknown (RT 2.851)											18,000	4												
Unknown (RT 2.893)																								
Unknown (RT 2.904)																								
Unknown (RT 2.957)											7,000	4												
Unknown (RT 2.975)																								
Unknown (RT 3.010)																								
Unknown (RT 3.063)																								
Unknown (RT 3.075)											25,000	4												
Unknown (RT 3.081)																								
Unknown (RT 3.093)																								
Unknown (RT 3.104)											25,000	4												
Unknown (RT 3.110)																								
Unknown (RT 3.116)																		2,900	4					
Unknown (RT 3.128)																								
Unknown (RT 3.157)																								
Unknown (RT 3.169)																								
Unknown (RT 3.181)											7,100	4												
Unknown (RT 3.193)																								
Unknown (RT 3.198)																								
Unknown (RT 3.234)																								
Unknown (RT 3.275)																								
Unknown (RT 3.287)																								
Unknown (RT 3.310)											8,700	4												
Unknown (RT 3.375)																								
Unknown (RT 3.387)											21,000	4												
Unknown (RT 3.410)																								
Unknown (RT 3.487)																								
Unknown (RT 3.522)																								
Unknown (RT 3.540)											6,600	4												
Unknown (RT 3.569)																		6,000	4					
Unknown (RT 3.581)																								
Unknown (RT 3.587)																								

Notes:
* - 8 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives
RL- Reporting Limit
Boldhighlighted- Indicated exceedance of the NYSDC UUSCO Guidance Value
Boldhighlighted- Indicated exceedance of the NYSDC RRSO Guidance Value

Notes:
 * - 6 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives
 RL- Reporting Limit
Bold/highlighted- Indicated exceedance of the NYSDEC UUSCO Guidance Value
Bold/highlighted- Indicated exceedance of the NYSDEC RRSCO Guidance Value

Notes:

* - 6 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives

RL- Reporting Limit

Bold/highlighted- Indicated exceedance of the NYSDEC UUSCO Guidance Value

Bold/highlighted- Indicated exceedance of the NYSDEC RRSCO Guidance Value

TABLE B
Soil Analytical Results
Semi-Volatile Organic
TIC2 (15586-155810, Duplicate)

COMPOUND	NYDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives*	NYDEC Part 375.6 Restricted Remedial Soil Cleanup Objectives*	15586						15587						15588						15589						155810						Duplicate					
			(9-2)		(11-13)		(18-20)		(9-2)		(11-13)		(18-20)		(9-2)		(11-13)		(18-20)		(9-2)		(11-13)		(18-20)		(9-2)		(11-13)		(18-20)							
			12/17/2016		12/17/2016		12/17/2016		12/17/2016		12/17/2016		12/17/2016		12/17/2016		12/17/2016		12/17/2016		12/17/2016		12/17/2016		12/17/2016		12/17/2016		12/17/2016						12/17/2016			
			µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g			µg/g	µg/g	µg/g	
11H-Benzo[gh]fluorene (RT 3.985)																																						
11H-Benzo[gh]fluorene isomer (RT 3.981)																																						
1H-Indene, 3-ethylidene- (RT 4.666)															330	-																						
1H-Indene, 2,3-dihydro-1-methyl- (RT 3.546)																																						
1H-Indene, 2-phenyl- (RT 7.239)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 1.961)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.693)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.688)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.676)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.681)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.682)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.684)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.685)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.686)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.687)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.688)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.689)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.690)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.691)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.692)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.693)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.694)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.695)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.696)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.697)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.698)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.699)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.700)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.701)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.702)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.703)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.704)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.705)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.706)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.707)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.708)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.709)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.710)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.711)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.712)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.713)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.714)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.715)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.716)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.717)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.718)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.719)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.720)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.721)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.722)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.723)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.724)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.725)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.726)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.727)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.728)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.729)																																						
2-Fluorotoluene, 4-hydroxy-4-methyl- (RT 2.730)																																						
2-Fluorotoluene, 4-h																																						

TABLE 7A
Soil Analytical Results
Pesticides PCBs

	COMPOUND	NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives*	NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	15SB1				15SB2				15SB3				15SB4				15SB5			
				(2-4') 12/16/2015 µg/Kg		(18-20') 12/16/2015 µg/Kg		(0-2') 12/17/2015 µg/Kg		(18-20') 12/17/2015 µg/Kg		(2-4') 12/16/2015 µg/Kg		(18-20') 12/16/2015 µg/Kg		(0-2') 12/17/2015 µg/Kg		(18-20') 12/17/2015 µg/Kg		(2-4') 12/16/2015 µg/Kg		(22-24') 12/16/2015 µg/Kg	
				Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
Pesticides	4,4' -DDD	3.3	13,000	< 2.0	2.0	< 2.9	2.9	< 2.3	2.3	< 4.1	4.1	< 1.9	1.9	< 2.9	2.9	< 2.2	2.2	< 2.8	2.8	< 2.0	2.0	< 2.0	2.0
	4,4' -DDE	3.3	8,900	< 2.0	2.0	< 2.9	2.9	< 2.3	2.3	< 4.1	4.1	< 1.9	1.9	< 2.9	2.9	< 2.2	2.2	< 2.8	2.8	< 2.0	2.0	< 2.0	2.0
	4,4' -DDT	3.3	7,900	< 2.0	2.0	< 2.9	2.9	< 2.3	2.3	< 4.1	4.1	< 1.9	1.9	< 2.9	2.9	< 2.2	2.2	< 2.8	2.8	< 2.0	2.0	< 2.0	2.0
	a-BHC	20	480	< 6.6	6.6	< 9.8	9.8	< 7.8	7.8	< 16	16	< 6.5	6.5	< 9.8	9.8	< 7.3	7.3	< 9.3	9.3	< 6.6	6.6	< 6.5	6.5
	a-Chlordane	94	4,200	< 3.3	3.3	< 4.9	4.9	< 3.9	3.9	< 8.1	8.1	< 3.2	3.2	< 4.9	4.9	< 3.6	3.6	< 4.7	4.7	< 3.3	3.3	< 3.3	3.3
	Aldrin	5	97	< 3.3	3.3	< 4.9	4.9	< 3.9	3.9	< 4.1	4.1	< 3.2	3.2	< 4.9	4.9	< 3.6	3.6	< 4.7	4.7	< 3.3	3.3	< 3.3	3.3
	b-BHC	36	360	< 6.6	6.6	< 9.8	9.8	< 7.8	7.8	< 16	16	< 6.5	6.5	< 9.8	9.8	< 7.3	7.3	< 9.3	9.3	< 6.6	6.6	< 6.5	6.5
	Chlordane	94	4,200	< 33	33	< 49	49	< 39	39	< 81	81	< 32	32	< 49	49	< 36	36	< 47	47	< 33	33	< 33	33
	d-BHC	40	100,000	< 6.6	6.6	< 9.8	9.8	< 7.8	7.8	< 16	16	< 6.5	6.5	< 9.8	9.8	< 7.3	7.3	< 9.3	9.3	< 6.6	6.6	< 6.5	6.5
	Dieldrin	5	200	< 3.3	3.3	< 4.9	4.9	< 3.9	3.9	< 2.4	2.4	< 3.2	3.2	< 4.9	4.9	< 3.6	3.6	< 4.7	4.7	< 3.3	3.3	< 3.3	3.3
	Endosulfan I	2,400	24,000	< 6.6	6.6	< 9.8	9.8	< 7.8	7.8	< 16	16	< 6.5	6.5	< 9.8	9.8	< 7.3	7.3	< 9.3	9.3	< 6.6	6.6	< 6.5	6.5
	Endosulfan II	2,400	24,000	< 6.6	6.6	< 9.8	9.8	< 7.8	7.8	< 16	16	< 6.5	6.5	< 9.8	9.8	< 7.3	7.3	< 9.3	9.3	< 6.6	6.6	< 6.5	6.5
	Endosulfan sulfate	2,400	24,000	< 6.6	6.6	< 9.8	9.8	< 7.8	7.8	< 16	16	< 6.5	6.5	< 9.8	9.8	< 7.3	7.3	< 9.3	9.3	< 6.6	6.6	< 6.5	6.5
	Endrin	14	11,000	< 6.6	6.6	< 9.8	9.8	< 7.8	7.8	< 8.1	8.1	< 6.5	6.5	< 9.8	9.8	< 7.3	7.3	< 9.3	9.3	< 6.6	6.6	< 6.5	6.5
	Endrin aldehyde			< 6.6	6.6	< 9.8	9.8	< 7.8	7.8	< 16	16	< 6.5	6.5	< 9.8	9.8	< 7.3	7.3	< 9.3	9.3	< 6.6	6.6	< 6.5	6.5
	Endrin ketone			< 6.6	6.6	< 9.8	9.8	< 7.8	7.8	< 16	16	< 6.5	6.5	< 9.8	9.8	< 7.3	7.3	< 9.3	9.3	< 6.6	6.6	< 6.5	6.5
	g-BHC			< 1.3	1.3	< 2.0	2.0	< 1.6	1.6	< 3.2	3.2	< 1.3	1.3	< 2.0	2.0	< 1.5	1.5	< 1.9	1.9	< 1.3	1.3	< 1.3	1.3
	g-Chlordane			< 3.3	3.3	< 4.9	4.9	< 3.9	3.9	< 8.1	8.1	< 3.2	3.2	< 4.9	4.9	< 3.6	3.6	< 4.7	4.7	< 3.3	3.3	< 3.3	3.3
	Heptachlor	42	2,100	< 6.6	6.6	< 9.8	9.8	< 7.8	7.8	< 16	16	< 6.5	6.5	< 9.8	9.8	< 7.3	7.3	< 9.3	9.3	< 6.6	6.6	< 6.5	6.5
	Heptachlor epoxide			< 6.6	6.6	< 9.8	9.8	< 7.8	7.8	< 16	16	< 6.5	6.5	< 9.8	9.8	< 7.3	7.3	< 9.3	9.3	< 6.6	6.6	< 6.5	6.5
	Methoxychlor			< 33	33	< 49	49	< 39	39	< 81	81	< 32	32	< 49	49	< 36	36	< 47	47	< 33	33	< 33	33
	Toxaphene			< 130	130	< 200	200	< 160	160	< 320	320	< 130	130	< 200	200	< 150	150	< 190	190	< 130	130	< 130	130
Chlorinated Herbicides	2,4,5-T			< 41	41	< 120	120	-	-	-	-	< 41	41	< 120	120	-	-	-	-	< 42	42	< 82	82
	2,4,5-TP (Silvex)			< 41	41	< 120	120	-	-	-	-	< 41	41	< 120	120	-	-	-	-	< 42	42	< 82	82
	2,4-D			< 41	41	< 120	120	-	-	-	-	< 41	41	< 120	120	-	-	-	-	< 42	42	< 82	82
	2,4-DB			< 410	410	< 1200	1,200	-	-	-	-	< 410	410	< 1200	1,200	-	-	-	-	< 420	420	< 820	820
	Dalapon			< 41	41	< 120	120	-	-	-	-	< 41	41	< 120	120	-	-	-	-	< 42	42	< 82	82
	Dicamba			< 82	82	< 230	230	-	-	-	-	< 82	82	< 250	250	-	-	-	-	< 83	83	< 160	160
	Dichloroprop			< 41	41	< 120	120	-	-	-	-	< 41	41	< 120	120	-	-	-	-	< 42	42	< 82	82
	Dinoseb			< 82	82	< 230	230	-	-	-	-	< 82	82	< 250	250	-	-	-	-	< 83	83	< 160	160
Organophosphate Pesticides	Alachlor			< 33	33	< 49	49	-	-	-	-	< 33	33	< 50	50	-	-	-	-		33	< 32	32
	Atrazine			< 33	33	< 49	49	-	-	-	-	< 33	33	< 50	50	-	-	-	-	< 33	33	< 32	32
	Azinphos methyl			< 40	40	< 49	49	-	-	-	-	< 33	33	< 50	50	-	-	-	-	< 33	33	< 32	32
	Diazinon			< 33	33	< 49	49	-	-	-	-	< 33	33	< 50	50	-	-	-	-	< 33	33	< 32	32
	Disulfoton			< 33	33	< 49	49	-	-	-	-	< 33	33	< 50	50	-	-	-	-	< 33	33	< 32	32
	Malathion			< 33	33	< 49	49	-	-	-	-	< 33	33	< 50	50	-	-	-	-	< 33	33	< 32	32
	Simazine			< 33	33	< 49	49	-	-	-	-	< 33	33	< 50	50	-	-	-	-	< 33	33	< 32	32
PCBs	PCB-1016	100	1,000	< 33	33	< 49	49	< 39	39	< 81	81	< 32	32	< 49	49	< 36	36	< 47	47	< 33	33	< 33	33
	PCB-1221	100	1,000	< 33	33	< 49	49	< 39	39	< 81	81	< 32	32	< 49	49	< 36	36	< 47	47	< 33	33	< 33	33
	PCB-1232	100	1,000	< 33	33	< 49	49	< 39	39	< 81	81	< 32	32	< 49	49	< 36	36	< 47	47	< 33	33	< 33	33
	PCB-1242	100	1,000	< 33	33	< 49	49	< 39	39	< 81	81	< 32	32	< 49	49	< 36	36	< 47	47	< 33	33	< 33	33
	PCB-1248	100	1,000	< 33	33	< 49	49	< 39	39	< 81	81	< 32	32	< 49	49	< 36	36	< 47	47	< 33	33	< 33	33
	PCB-1254	100	1,000	< 33	33	< 49	49	< 39	39	< 81	81	< 32	32	< 49	49	< 36	36	< 47	47	< 33	33	< 33	33
	PCB-1260	100	1,000	< 33	33	< 49	49	< 39	39	< 81	81	< 32	32	< 49	49	< 36	36	< 47	47	< 33	33	< 33	33
	PCB-1262	100	1,000	< 33	33	< 49	49	< 39	39	< 81	81	< 32	32	< 49	49	< 36	36	< 47	47	< 33	33	< 33	33
	PCB-1268	100	1,000	< 33	33	< 49	49	< 39	39	< 81	81	< 32	32	< 49	49	< 36	36	< 47	47	< 33	33	< 33	33

Notes:

* - 6 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives

RL- Reporting Limit

Bold/highlighted- Indicated exceedance of the NYSDEC UUSCO Guidance Value

Bold/highlighted- Indicated exceedance of the NYSDEC RRSO Guidance Value

65 Eckford Street
Brooklyn, New York

TABLE 7B
Soil Analytical Results
Pesticides PCBs

	COMPOUND	NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives*	NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	15SB6				15SB7				15SB8				15SB9				15SB10				Duplicate	
				(0-2') 12/17/2015 µg/Kg		(18-20') 12/17/2015 µg/Kg		(0-2') 12/17/2015 µg/Kg		(18-20') 12/17/2015 µg/Kg		(0-2') 12/17/2015 µg/Kg		(18-20') 12/17/2015 µg/Kg		(0-2') 12/17/2015 µg/Kg		(18-20') 12/17/2015 µg/Kg		(0-2') 12/17/2015 µg/Kg		(18-20') 12/17/2015 µg/Kg		12/17/2015 µg/Kg	
				Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
Pesticides	4,4'-DDD	3.3	13,000	< 2.3	2.3	< 3.1	3.1	< 2.2	2.2	< 2.7	2.7	< 3.3	3.3	< 2.9	2.9	< 2.3	2.3	< 2.2	2.2	< 2.2	2.2	< 3.2	3.2	< 2.4	2.4
	4,4'-DDE	3.3	8,900	< 2.3	2.3	< 3.1	3.1	< 2.2	2.2	< 2.7	2.7	< 2.2	2.2	< 2.9	2.9	< 2.3	2.3	< 2.2	2.2	< 2.2	2.2	< 3.2	3.2	< 2.4	2.4
	4,4'-DDT	3.3	7,900	< 2.3	2.3	< 3.1	3.1	< 2.2	2.2	< 2.7	2.7	< 2.2	2.2	< 2.9	2.9	< 3.0	3.0	< 2.2	2.2	< 2.2	2.2	< 3.2	3.2	7.1	2.4
	a-BHC	20	480	< 7.8	7.8	< 10	10	< 7.4	7.4	< 8.9	8.9	< 7.4	7.4	< 9.5	9.5	< 7.6	7.6	< 7.5	7.5	< 7.4	7.4	< 13	13	< 8.1	8.1
	a-Chlordane	94	4,200	< 3.9	3.9	< 5.1	5.1	< 3.7	3.7	< 4.5	4.5	< 3.7	3.7	< 4.8	4.8	< 3.8	3.8	< 3.7	3.7	< 3.7	3.7	< 6.4	6.4	10	4.1
	Aldrin	5	97	< 3.9	3.9	< 5.1	5.1	< 3.7	3.7	< 4.5	4.5	< 3.7	3.7	< 4.8	4.8	< 3.8	3.8	< 3.7	3.7	< 3.7	3.7	< 3.2	3.2	< 4.1	4.1
	b-BHC	36	360	< 7.8	7.8	< 10	10	< 7.4	7.4	< 8.9	8.9	< 7.4	7.4	< 9.5	9.5	< 7.6	7.6	< 7.5	7.5	< 7.4	7.4	< 13	13	< 8.1	8.1
	Chlordane	94	4,200	< 39	39	< 51	51	< 37	37	< 45	45	< 37	37	< 48	48	< 38	38	< 37	37	< 37	37	< 64	64	55	41
	d-BHC	40	100,000	< 7.8	7.8	< 10	10	< 7.4	7.4	< 8.9	8.9	< 7.4	7.4	< 9.5	9.5	< 7.6	7.6	< 7.5	7.5	< 7.4	7.4	< 13	13	< 8.1	8.1
	Dieldrin	5	200	< 3.9	3.9	< 5.1	5.1	< 3.7	3.7	< 4.5	4.5	< 3.7	3.7	< 4.8	4.8	< 3.8	3.8	< 3.7	3.7	< 3.7	3.7	< 1.9	1.9	< 4.1	4.1
	Endosulfan I	2,400	24,000	< 7.8	7.8	< 10	10	< 7.4	7.4	< 8.9	8.9	< 7.4	7.4	< 9.5	9.5	< 7.6	7.6	< 7.5	7.5	< 7.4	7.4	< 13	13	< 8.1	8.1
	Endosulfan II	2,400	24,000	< 7.8	7.8	< 10	10	< 7.4	7.4	< 8.9	8.9	< 7.4	7.4	< 9.5	9.5	< 7.6	7.6	< 7.5	7.5	< 7.4	7.4	< 13	13	< 8.1	8.1
	Endosulfan sulfate	2,400	24,000	< 7.8	7.8	< 10	10	< 7.4	7.4	< 8.9	8.9	< 7.4	7.4	< 9.5	9.5	< 7.6	7.6	< 7.5	7.5	< 7.4	7.4	< 13	13	< 8.1	8.1
	Endrin	14	11,000	< 7.8	7.8	< 10	10	< 7.4	7.4	< 8.9	8.9	< 7.4	7.4	< 9.5	9.5	< 7.6	7.6	< 7.5	7.5	< 7.4	7.4	< 13	13	< 8.1	8.1
	Endrin aldehyde			< 7.8	7.8	< 10	10	< 7.4	7.4	< 8.9	8.9	< 7.4	7.4	< 9.5	9.5	< 7.6	7.6	< 7.5	7.5	< 7.4	7.4	< 13	13	< 8.1	8.1
	Endrin ketone			< 7.8	7.8	< 10	10	< 7.4	7.4	< 8.9	8.9	< 7.4	7.4	< 9.5	9.5	< 7.6	7.6	< 7.5	7.5	< 7.4	7.4	< 13	13	< 8.1	8.1
	g-BHC			< 1.6	1.6	< 2.1	2.1	< 1.5	1.5	< 1.8	1.8	< 1.5	1.5	< 1.9	1.9	< 1.5	1.5	< 1.5	1.5	< 1.5	1.5	< 2.5	2.5	< 1.6	1.6
	g-Chlordane			< 3.9	3.9	< 5.1	5.1	< 3.7	3.7	< 4.5	4.5	< 3.7	3.7	< 4.8	4.8	< 3.8	3.8	< 3.7	3.7	< 3.7	3.7	< 6.4	6.4	6.8	4.1
	Heptachlor	42	2,100	< 7.8	7.8	< 10	10	< 7.4	7.4	< 8.9	8.9	< 7.4	7.4	< 9.5	9.5	< 7.6	7.6	< 7.5	7.5	< 7.4	7.4	< 13	13	< 8.1	8.1
	Heptachlor epoxide			< 7.8	7.8	< 10	10	< 7.4	7.4	< 8.9	8.9	< 7.4	7.4	< 9.5	9.5	< 7.6	7.6	< 7.5	7.5	< 7.4	7.4	< 13	13	< 8.1	8.1
	Methoxychlor			< 39	39	< 51	51	< 37	37	< 45	45	< 37	37	< 48	48	< 38	38	< 37	37	< 37	37	< 64	64	< 41	41
	Toxaphene			< 160	160	< 210	210	< 150	150	< 180	180	< 150	150	< 190	190	< 150	150	< 150	150	< 150	150	< 250	250	< 160	160
PCBs	PCB-1016	100	1,000	< 39	39	< 51	51	< 37	37	< 45	45	< 37	37	< 48	48	< 38	38	< 37	37	< 37	37	< 64	64	< 41	41
	PCB-1221	100	1,000	< 39	39	< 51	51	< 37	37	< 45	45	< 37	37	< 48	48	< 38	38	< 37	37	< 37	37	< 64	64	< 41	41
	PCB-1232	100	1,000	< 39	39	< 51	51	< 37	37	< 45	45	< 37	37	< 48	48	< 38	38	< 37	37	< 37	37	< 64	64	< 41	41
	PCB-1242	100	1,000	< 39	39	< 51	51	< 37	37	< 45	45	< 37	37	< 48	48	< 38	38	< 37	37	< 37	37	< 64	64	< 41	41
	PCB-1248	100	1,000	< 39	39	< 51	51	< 37	37	< 45	45	< 37	37	< 48	48	< 38	38	< 37	37	< 37	37	< 64	64	< 41	41
	PCB-1254	100	1,000	< 39	39	< 51	51	< 37	37	< 45	45	< 37	37	< 48	48	< 38	38	< 37	37	< 37	37	< 64	64	< 41	41
	PCB-1260	100	1,000	< 39	39	< 51	51	< 37	37	< 45	45	< 37	37	< 48	48	< 38	38	< 37	37	< 37	37	< 64	64	< 41	41
	PCB-1262	100	1,000	< 39	39	< 51	51	< 37	37	< 45	45	< 37	37	< 48	48	< 38	38	< 37	37	< 37	37	< 64	64	< 41	41
	PCB-1268	100	1,000	< 39	39	< 51	51	< 37	37	< 45	45	< 37	37	< 48	48	< 38	38	< 37	37	< 37	37	< 64	64	< 41	41

Notes:

* - 6 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives

RL- Reporting Limit

Bold/highlighted- Indicated exceedance of the NYSDEC UUSCO Guidance Value

Bold/highlighted- Indicated exceedance of the NYSDEC RRSO Guidance Value

TABLE 8A
Soil Analytical Results
Metals

COMPOUND	NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives*	NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	15SB1				15SB2				15SB3				15SB4				15SB5			
			(2-4') 12/16/2015 µg/Kg		(18-20') 12/16/2015 µg/Kg		(0-2') 12/17/2015 µg/Kg		(18-20') 12/17/2015 µg/Kg		(2-4') 12/16/2015 µg/Kg		(18-20') 12/16/2015 µg/Kg		(0-2') 12/17/2015 µg/Kg		(18-20') 12/17/2015 µg/Kg		(2-4') 12/16/2015 µg/Kg		(22-24') 12/16/2015 µg/Kg	
			Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
Aluminum			5,830	31	857	3.2	8,420	41	18,300	72	6,170	34	1,650	3.5	7,470	35	7,150	48	7,140	31	6,360	30
Antimony			< 1.5	1.5	< 1.6	1.6	2	2.0	< 3.6	3.6	2.5	1.7	< 1.7	1.7	10.1	1.8	< 2.4	2.4	< 1.5	1.5	< 1.5	1.5
Arsenic	13	16	4.5	0.6	1.4	0.6	8.7	8.2	17.7	1.4	13.4	0.7	1.5	0.7	8.8	0.7	18.1	1.0	6.9	0.6	5.3	0.6
Barium	350	350	93	0.6	12.7	0.6	303	0.8	96.2	1.4	743	0.7	16.1	0.7	111	0.7	183	1.0	136	0.6	50.3	0.6
Beryllium	7.2	14	0.25	0.25	0.24	0.26	0.43	0.33	0.67	0.57	0.53	0.27	0.22	0.28	0.19	0.28	0.44	0.39	0.55	0.25	0.45	0.24
Cadmium	2.5	2.5	0.85	0.31	0.21	0.32	1.56	0.41	< 0.72	0.72	1.28	0.34	0.22	0.35	1.19	0.35	0.63	0.48	0.71	0.31	0.42	0.30
Calcium			11,200	31	3,210	3.2	49,300	41	5,690	7.2	14,100	34	3,730	3.5	8,300	3.5	7,480	4.8	2,270	3.1	1,190	3.0
Chromium	30	180	87.7	0.31	2.76	0.32	23.7	4.1	26.3	0.72	19	0.34	2.83	0.35	20.8	0.35	18.5	0.48	16.9	0.31	16.2	0.30
Cobalt			6.31	0.31	0.94	0.32	7.3	4.1	10.7	0.72	7.15	0.34	1.83	0.35	9.03	0.35	9.21	0.48	7.73	0.31	7.95	0.30
Copper	50	270	52.4	0.31	5.75	0.32	97.9	4.1	28.7	0.72	938	3.4	3.78	0.35	63.9	0.35	89.6	0.48	50.4	0.31	13.5	0.30
Iron			14,200	31	2,380	3.2	16,900	41	28,300	72	26,800	34	3,880	3.5	43,000	35	19,300	48	29,400	31	21,900	30
Lead	63	400	228	6.2	11.8	0.6	776	8.2	103	1.4	2,790	63	16.4	0.7	162	7.0	512	9.7	190	6.2	8.8	0.6
Magnesium			1,650	3.1	1,540	3.2	3,120	41	3,570	7.2	686	3.4	1,300	3.5	1,760	3.5	1,480	4.8	1,730	3.1	2,960	3.0
Manganese	1,600	2,000	285	3.1	30.2	0.32	285	4.1	223	0.72	249	3.4	59.8	0.35	323	3.5	284	4.8	337	3.1	72.7	0.30
Mercury	0.18	0.81	0.72	0.03	0.03	0.03	1	0.03	0.4	0.06	2.75	0.24	0.55	0.03	0.16	0.03	3.35	0.36	0.92	0.02	< 0.02	0.02
Nickel	30	140	138	3.1	1.56	0.32	16.6	4.1	18.8	0.72	15.5	0.34	2.8	0.35	14.3	0.35	17.8	0.48	14.1	0.31	14.1	0.30
Potassium			1,070	6	138	6	1,870	8	1,930	140	903	7	327	7	1,780	70	1,190	10	1,160	6	1,610	6
Selenium	3.9	36	< 1.2	1.2	< 1.3	1.3	< 1.6	1.6	< 2.9	2.9	< 1.4	1.4	< 1.4	1.4	< 1.4	1.4	< 1.9	1.9	< 1.2	1.2	< 1.2	1.2
Silver	2	36	< 0.31	0.31	< 0.32	0.32	< 0.41	0.41	< 0.72	0.72	< 0.34	0.34	< 0.35	0.35	< 0.35	0.35	< 0.48	0.48	< 0.31	0.31	< 0.30	0.30
Sodium			296	6	297	6	931	8	1,180	14	362	68	474	7	788	7	416	10	200	6	142	6
Thallium			< 1.2	1.2	< 1.3	1.3	< 1.6	1.6	< 2.9	2.9	< 1.4	1.4	< 1.4	1.4	< 1.4	1.4	< 1.9	1.9	< 1.2	1.2	< 1.2	1.2
Vanadium			21.3	0.3	2.5	0.3	23.5	4.1	35.9	0.7	27.4	0.3	4.8	0.3	23.9	0.4	30.6	0.5	23.6	0.3	24.6	0.3
Zinc	109	2,200	577	6.2	8	0.6	300	8.2	114	1.4	995	6.8	8.9	0.7	184	7.0	359	9.7	177	6.2	42.5	0.6

Notes:
* - 6 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives
RL- Reporting Limit

Bold/highlighted- Indicated exceedance of the NYSDEC UUSCO Guidance Value
Bold/highlighted- Indicated exceedance of the NYSDEC RRSO Guidance Value

TABLE 8B
Soil Analytical Results
Metals

COMPOUND	NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives*	NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	15SB6				15SB7				15SB8				15SB9				15SB10				Duplicate	
			(0-2") 12/17/2015 mg/Kg		(18-20") 12/17/2015 mg/Kg		(0-2") 12/17/2015 mg/Kg		(18-20") 12/17/2015 mg/Kg		(0-2") 12/17/2015 mg/Kg		(18-20") 12/17/2015 mg/Kg		(0-2") 12/17/2015 mg/Kg		(18-20") 12/17/2015 mg/Kg		(0-2") 12/17/2015 mg/Kg		(18-20") 12/17/2015 mg/Kg		12/17/2015 mg/Kg	
			Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
Aluminum			4,460	40	3,110	51	2,830	35	4,440	40	3,600	35	5,620	50	4,170	36	2,340	36	2,210	38	7,730	63	4,800	39
Antimony			15.6	2.0	< 2.5	2.5	8.3	1.8	2.8	2.0	7.1	1.8	< 2.5	2.5	3.4	1.8	< 1.8	1.8	6.9	1.9	< 3.2	3.2	4.7	1.9
Arsenic	13	16	14.1	0.8	31.5	1.0	10	0.7	17.9	0.8	11.1	0.7	4.1	1.0	15.2	0.7	27	0.7	10	0.8	35.8	1.3	51.7	0.8
Barium	350	350	256	0.8	818	1.0	134	0.7	259	0.8	206	0.7	88.9	1.0	179	0.7	62.3	0.7	74.1	0.8	151	1.3	333	0.8
Beryllium	7.2	14	0.25	0.32	0.42	0.41	0.15	0.28	0.39	0.32	0.16	0.28	0.49	0.40	0.26	0.29	0.25	0.29	< 0.30	0.30	0.43	0.51	0.38	0.31
Cadmium	2.5	2.5	1.55	0.40	0.57	0.51	1.68	0.35	0.57	0.40	1.8	0.35	0.5	0.50	1.46	0.36	1.39	0.36	2.95	0.38	1.22	0.63	1.07	0.39
Calcium			11,400	40	3,660	5.1	8,180	3.5	8,600	4.0	3,100	3.5	2,980	5.0	11,800	36	7,440	3.6	3,290	3.8	21,800	63	12,100	39
Chromium	30	180	15.2	0.40	27.4	0.51	10.7	0.35	20.1	0.40	19.3	0.35	29.1	0.50	20.7	0.36	12.3	0.36	10	0.38	24.7	0.63	75.4	0.39
Cobalt			9.9	0.40	11.2	0.51	9.64	0.35	7.14	0.40	12.4	0.35	11.5	0.50	8.92	0.36	6.89	0.36	14.9	0.38	7.98	0.63	8.09	0.39
Copper	50	270	95.2	0.40	44.7	0.51	62.4	0.35	119	0.40	59.2	0.35	31.4	0.50	66.8	0.36	18.4	0.36	60	0.38	77	0.63	327	3.9
Iron			35,100	40	6,780	51	37,500	35	10,700	40	42,800	35	15,900	50	31,700	36	31,300	36	74,400	38	18,400	63	14,600	39
Lead	63	400	733	7.9	122	10	172	7.0	529	7.9	317	7.0	134	1.0	612	7.3	106	0.7	213	7.6	268	13	2,470	77
Magnesium			2,240	4.0	1,190	5.1	1,370	3.5	1,310	4.0	1,150	3.5	3,130	5.0	1,550	3.6	856	3.6	645	3.8	2,120	6.3	1,070	3.9
Manganese	1,600	2,000	364	4.0	92.3	5.1	193	3.5	149	4.0	468	3.5	261	5.0	189	3.6	282	3.6	290	3.8	184	0.63	175	3.9
Mercury	0.18	0.81	0.45	0.03	14	0.41	3.04	0.27	11.3	0.35	0.21	0.03	0.92	0.04	4.47	0.30	0.14	0.03	0.12	0.03	12.1	0.48	5.3	0.31
Nickel	30	140	17.6	0.40	65	0.51	14.8	0.35	13.6	0.40	20.5	0.35	17.5	0.50	17.8	0.36	9.12	0.36	22.1	0.38	17.1	0.63	18.8	0.39
Potassium			1,510	8	1,300	10	1,550	7	1,300	8	1,230	7	3,050	10	1,210	7	638	7	1,490	8	1,310	13	1,200	8
Selenium	3.9	36	< 1.6	1.6	< 2.0	2.0	< 1.4	1.4	< 1.6	1.6	< 1.4	1.4	< 2.0	2.0	< 1.5	1.5	< 1.4	1.4	< 1.5	1.5	< 2.5	2.5	< 1.5	1.5
Silver	2	36	< 0.40	0.40	< 0.51	0.51	< 0.35	0.35	< 0.40	0.40	< 0.35	0.35	< 0.50	0.50	< 0.36	0.36	< 0.36	0.36	< 0.38	0.38	< 0.63	0.63	< 0.39	0.39
Sodium			826	8	474	10	833	7	406	8	500	7	192	10	907	7	242	7	759	8	809	13	643	8
Thallium			< 1.6	1.6	< 2.0	2.0	< 1.4	1.4	< 1.6	1.6	< 1.4	1.4	< 2.0	2.0	< 1.5	1.5	< 1.4	1.4	< 1.5	1.5	< 2.5	2.5	< 1.5	1.5
Vanadium			19.4	0.4	28.6	0.5	17	0.4	25.1	0.4	24.4	0.4	40	0.5	15.8	0.4	63.9	0.4	16.6	0.4	30.2	0.6	30.3	0.4
Zinc	109	2,200	768	7.9	197	1.0	150	7.0	217	7.9	222	7.0	136	1.0	170	7.3	21.3	0.7	112	0.8	277	13	424	7.7

Notes:

* - 6 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives

RL- Reporting Limit

Bold/highlighted- Indicated exceedance of the NYSDEC UUSCO Guidance Value

Bold/highlighted- Indicated exceedance of the NYSDEC RRSO Guidance Value

Table 9
Ground Water Analytical Results
Volatile Organic Compounds

Compound	NYSDEC Groundwater Quality Standards	15MW1		15MW2		15MW3		15MW4		15MW5		15MW6		15MW7		15MW8		Duplicate	
		12/22/2015		12/22/2015		12/22/2015		12/22/2015		12/22/2015		12/23/2015		12/23/2015		12/23/2015		12/22/2015	
		µg/L	Results	RI	µg/L	Results	RI	µg/L	Results	RI	µg/L	Results	RI	µg/L	Results	RI	µg/L	Results	RI
1,1,1,2-Tetrachloroethane	5	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
1,1,1-Trichloroethane	5	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
1,1,2,2-Tetrachloroethane	5	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
1,1,2-Trichloroethane	1	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<5.0	5.0	<1.0	1.0	<1.0	1.0
1,1-Dichloroethane	5	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
1,1-Dichloroethene	5	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
1,1-Dichloropropene		<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
1,2,3-Trichlorobenzene		<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<20	20	<2.0	2.0	<1.0	1.0
1,2,3-Trichloropropane	0.04	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
1,2,4-Trichlorobenzene		<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<20	20	<2.0	2.0	<1.0	1.0
1,2,4-Trimethylbenzene	5	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	39	20	<2.0	2.0	<1.0	1.0
1,2-Dibromo-3-chloropropane	0.04	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<2.5	2.5	<2.0	2.0	<10	10	<2.0	2.0	<1.0	1.0
1,2-Dibromoethane		<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
1,2-Dichlorobenzene	5	0.99	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<2.5	2.5	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
1,2-Dichloroethane	0.6	<0.60	0.60	<0.5	0.5	<0.60	0.60	<0.5	0.5	<1.0	1.0	<0.5	0.5	<5.0	5.0	<0.5	0.5	<0.60	0.60
1,2-Dichloropropene	0.94	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<5.0	5.0	<1.0	1.0	<1.0	1.0
1,3,5-Trimethylbenzene	5	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
1,3-Dichlorobenzene		<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<2.5	2.5	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
1,3-Dichloropropene	5	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
1,4-Dichlorobenzene	5	0.91	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
2,2-Dichloropropane	5	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
2-Chlorotoluene	5	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
2-Hexanone (Methyl Butyl Ketone)		<2.5	2.5	<5.0	5.0	<2.5	2.5	<5.0	5.0	<13	13	<5.0	5.0	<50	50	<5.0	5.0	<2.5	2.5
2-Isopropyltoluene	5	7	1.0	7.3	2.0	<1.0	1.0	28	2.0	17	5.0	0.6	2.0	88	20	11	2.0	<1.0	1.0
4-Chlorotoluene	5	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
4-Methyl-2-Pentanone		<2.5	2.5	<5.0	5.0	<2.5	2.5	<5.0	5.0	<13	13	<5.0	5.0	<50	50	<5.0	5.0	<2.5	2.5
Acetone		<5.0	5.0	59	10	4.5	5.0	7.8	10	<25	25	<10	10	<50	50	7.3	10	3	5.0
Acrolein		<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<13	13	<5.0	5.0	<50	50	<5.0	5.0	<5.0	5.0
Acrylonitrile	5	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	50	<5.0	5.0	<5.0	5.0
Benzene	1	0.28	0.70	<0.5	0.5	<0.70	0.70	<0.5	0.5	<1.0	1.0	<0.5	0.5	<5.0	5.0	<0.5	0.5	<0.70	0.70
Bromobenzene	5	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
Bromochloromethane	5	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
Bromodichloromethane		<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<20	20	<2.0	2.0	<1.0	1.0
Bromoform		<5.0	5.0	<10	10	<5.0	5.0	<10	10	<25	25	<10	10	<5.0	5.0	<10	10	<5.0	5.0
Bromomethane	5	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
Carbon Disulfide	60	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<20	20	<2.0	2.0	<1.0	1.0
Carbon tetrachloride	5	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
Chlorobenzene	5	8.1	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
Chloroethane	5	<5.0	5.0	56	10	<5.0	5.0	130	25	23	25	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
Chloroform	7	<5.0	5.0	<7.0	7.0	<5.0	5.0	<7.0	7.0	<5.0	5.0	<7.0	7.0	<5.0	5.0	<7.0	7.0	<5.0	5.0
Chloromethane	60	<5.0	5.0	0.67	5.0	0.46	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	0.31	5.0
cis-1,2-Dichloroethene	5	13	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
cis-1,3-Dichloropropene		<0.40	0.40	<0.4	0.4	<0.40	0.40	<0.4	0.4	<1.0	1.0	<0.4	0.4	<5.0	5.0	<0.4	0.4	<0.40	0.40
Dibromochloromethane		<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<20	20	<2.0	2.0	<1.0	1.0
Dibromomethane	5	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
Dichlorodifluoromethane	5	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
Ethylbenzene	5	1.8	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
Hexachlorobutadiene	0.5	<0.50	0.50	<0.5	0.5	<0.50	0.50	<0.5	0.5	<1.0	1.0	<0.5	0.5	<4.0	4.0	<0.5	0.5	<0.50	0.50
Isopropylbenzene	5	8.5	1.0	1.7	2.0	<1.0	1.0	6.8	2.0	25	5.0	<2.0	2.0	100	20	37	2.0	<1.0	1.0
m&p-Xylenes	5	0.9	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<20	20	<2.0	2.0	<1.0	1.0
Methyl Ethyl Ketone (2-Butanone)		<2.5	2.5	<5.0	5.0	4.5	2.5	<5.0	5.0	<13	13	<5.0	5.0	<50	50	5.8	5.0	2.7	2.5
Methyl t-butyl ether (MTBE)	10	1.2	1.0	1.6	2.0	2.2	1.0	0.92	2.0	3.7	5.0	<2.0	2.0	<20	20	5.7	2.0	2.1	1.0
Methylene chloride	5	<3.0	3.0	<5.0	5.0	<3.0	3.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<20	20	<5.0	5.0	<3.0	3.0
Naphthalene	10	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<20	20	<2.0	2.0	<1.0	1.0
n-Butylbenzene	5	5	1.0	1.5	2.0	<1.0	1.0	5.4	2.0	3.8	5.0	<2.0	2.0	97	20	11	2.0	<1.0	1.0
n-Propylbenzene	5	6.2	1.0	0.66	2.0	<1.0	1.0	2.8	2.0	23	5.0	<2.0	2.0	170	20	59	2.0	<1.0	1.0
o-Xylene	5	0.39	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
p-Isopropyltoluene		<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
sec-Butylbenzene	5	15	1.0	12	2.0	0.88	1.0	36	2.0	35	5.0	1	2.0	210	20	24	2.0	0.69	1.0
Styrene	5	<1.0	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
tert-Butylbenzene	5	6	1.0	6.5	2.0	1.8	1.0	15	2.0	12	5.0	<2.0	2.0	39	20	5.7	2.0	1.6	1.0
Tetrachloroethene	5	0.32	1.0	<2.0	2.0	<1.0	1.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<5.0	5.0	<2.0	2.0	<1.0	1.0
Tetrahydrofuran (THF)		<5.0	5.0	<10	10	<5.0	5.0	<10	10	<25	25	<10	10	<50	50	<10	10	<5.0	5.0
Toluene	5	1.9	1.0	1.2	2.0	1.9	1.0	2	2.0	1.6	5.0	0.99	2.0	<5.0	5.0	1.7	2.0	1.4	1.0

TABLE 10
Groundwater Analytical Results
Semi-Volatile Organic Compounds

Compound	NYSDEC Groundwater Quality Standards	15MW1		15MW2		15MW3		15MW4		15MW5		15MW6		15MW7		15MW8		Duplicate	
		12/22/2015		12/22/2015		12/22/2015		12/22/2015		12/22/2015		12/23/2015		12/23/2015		12/23/2015		12/22/2015	
		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
1,2,4-Trichlorobenzene		<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.3	5.3	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
1,2-Dichlorobenzene		<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.1	1.1	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0
1,2-Diphenylhydrazine		<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.3	5.3	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
1,3-Dichlorobenzene	3	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.1	1.1	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0
1,4-Dichlorobenzene		<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.1	1.1	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0
2,4,5-Trichlorophenol	1	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0
2,4,6-Trichlorophenol	1	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0
2,4-Dichlorophenol		<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0
2,4-Dimethylphenol		<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0
2,4-Dinitrophenol	5	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0
2,4-Dinitrotoluene	5	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
2,6-Dinitrotoluene	5	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
2-Chloronaphthalene	10	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.3	5.3	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
2-Chlorophenol	1	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0
2-Methylnaphthalene		<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.3	5.3	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
2-Methylphenol (o-cresol)	1	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0
2-Nitroaniline	5	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
2-Nitrophenol	1	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0
3&4-Methylphenol (m&p-cresol)		<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.1	1.1	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0
3,3'-Dichlorobenzidine	5	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
3-Nitroaniline	5	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
4,6-Dinitro-2-methylphenol	1	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0
4-Bromophenyl phenyl ether		<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.3	5.3	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
4-Chloro-3-methylphenol	1	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0
4-Chloroaniline	5	<3.5	3.5	<3.5	3.5	<3.5	3.5	<3.7	3.7	<3.5	3.5	<3.5	3.5	<3.5	3.5	<3.5	3.5	<3.5	3.5
4-Chlorophenyl phenyl ether		<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.3	5.3	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
4-Nitroaniline	5	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
4-Nitrophenol		<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0
Acetophenone		<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.3	5.3	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
Aniline	5	<3.5	3.5	<3.5	3.5	<3.5	3.5	<3.7	3.7	<3.5	3.5	<3.5	3.5	<3.5	3.5	<3.5	3.5	<3.5	3.5
Anthracene	50	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.3	5.3	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
Benzidine	5	<4.5	4.5	<4.5	4.5	<4.5	4.5	<4.7	4.7	<4.5	4.5	<4.5	4.5	<4.5	4.5	<4.5	4.5	<4.5	4.5
Benzoic acid		<25	25	<25	25	<25	25	<26	26	<25	25	<25	25	<25	25	<25	25	<25	25
Benzyl butyl phthalate	50	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.3	5.3	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
Bis(2-chloroethoxy)methane	5	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
Bis(2-chloroethyl)ether	1	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0
Bis(2-chloroisopropyl)ether		<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.3	5.3	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
Carbazole		<25	25	<25	25	<25	25	<26	26	<25	25	<25	25	<25	25	<25	25	<25	25
Dibenzofuran		<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
Diethyl phthalate	50	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.3	5.3	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
Dimethylphthalate	50	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.3	5.3	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
Di-n-butylphthalate	50	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.3	5.3	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
Di-n-octylphthalate	50	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.3	5.3	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
Fluoranthene	50	<5.0	5.0	<5.0	5.0	<5.0	5.0	1.8	5.3	<5.0	5.0	4.4	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
Fluorene	50	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.3	5.3	<5.0	5.0	1.7	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
Hexachlorobutadiene	0.5	<0.40	0.40	<0.40	0.40	<0.40	0.40	<0.42	0.42	<0.40	0.40	<0.40	0.40	<0.40	0.40	<0.40	0.40	<0.40	0.40
Hexachlorocyclopentadiene	5	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
Isophorone	50	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.3	5.3	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
Naphthalene	10	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
Nitrobenzene	0.4	<0.10	0.10	<0.10	0.10	<0.10	0.10	<0.11	0.11	<0.10	0.10	<0.10	0.10	<0.10	0.10	<0.10	0.10	<0.10	0.10
N-Nitrosodimethylamine		<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.1	1.1	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0
N-Nitrosodi-n-propylamine																			

TABLE 11
Groundwater Analytical Results
Pesticides/PCBs

	Compound	NYSDEC Groundwater Quality Standards µg/L	15MW1 12/22/2015 µg/L		15MW2 12/22/2015 µg/L		15MW3 12/22/2015 µg/L		15MW4 12/22/2015 µg/L		15MW5 12/22/2015 µg/L		15MW6 12/23/2015 µg/L		15MW7 12/23/2015 µg/L		15MW8 12/23/2015 µg/L		Duplicate 12/22/2015 µg/L	
			Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
PCBs	PCB-1016	0.09	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050
	PCB-1221	0.09	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050
	PCB-1232	0.09	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050
	PCB-1242	0.09	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050
	PCB-1248	0.09	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050
	PCB-1254	0.09	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050
	PCB-1260	0.09	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050
	PCB-1262	0.09	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050
	PCB-1268	0.09	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050
Pesticides	4,4-DDD	0.3	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	0.014	0.010	< 0.010	0.010	< 0.010	0.010	< 0.050	0.050	< 0.010	0.010	< 0.010	0.010
	4,4-DDE	0.2	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.012	0.012	< 0.010	0.010	< 0.010	0.010
	4,4-DDT	0.11	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.012	0.012	< 0.010	0.010	< 0.010	0.010
	a-BHC	0.94	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.012	0.012	< 0.005	0.005	< 0.005	0.005
	a-Chlordane		< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.050	0.050	< 0.010	0.010	< 0.010	0.010
	Alachlor		< 0.075	0.075	< 0.075	0.075	< 0.075	0.075	< 0.075	0.075	< 0.075	0.075	< 0.075	0.075	< 0.38	0.38	< 0.075	0.075	< 0.075	0.075
	Aldrin		< 0.002	0.002	< 0.002	0.002	< 0.002	0.002	< 0.003	0.003	< 0.003	0.003	< 0.002	0.002	< 0.008	0.008	< 0.003	0.003	< 0.002	0.002
	b-BHC	0.04	< 0.005	0.005	< 0.005	0.005	< 0.020	0.020	< 0.015	0.015	< 0.010	0.010	< 0.005	0.005	< 0.012	0.012	< 0.005	0.005	< 0.005	0.005
	Chlordane	0.05	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.050	0.050	< 0.25	0.25	< 0.050	0.050	< 0.050	0.050
	d-BHC	0.04	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.025	0.025	< 0.005	0.005	< 0.005	0.005
	Dieldrin	0.004	< 0.002	0.002	< 0.002	0.002	< 0.002	0.002	< 0.004	0.004	< 0.002	0.002	< 0.003	0.003	< 0.008	0.008	< 0.002	0.002	< 0.002	0.002
	Endosulfan I		< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.050	0.050	< 0.010	0.010	< 0.010	0.010
	Endosulfan II		< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.050	0.050	< 0.010	0.010	< 0.010	0.010
	Endosulfan Sulfate		< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.050	0.050	< 0.010	0.010	< 0.010	0.010
	Endrin		< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.025	0.025	< 0.010	0.010	< 0.010	0.010
	Endrin aldehyde	5	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.050	0.050	< 0.010	0.010	< 0.010	0.010
	Endrin ketone		< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.060	0.060	< 0.010	0.010	< 0.010	0.010
	gamma-BHC	0.05	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.010	0.010	< 0.050	0.050	< 0.005	0.005	< 0.005	0.005
	g-Chlordane		< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.050	0.050	< 0.010	0.010	< 0.010	0.010
	Heptachlor	0.04	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.025	0.025	< 0.010	0.010	< 0.010	0.010
	Heptachlor epoxide	0.03	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.010	0.010	< 0.025	0.025	< 0.010	0.010	< 0.010	0.010
	Methoxychlor	35	< 0.10	0.10	< 0.10	0.10	< 0.10	0.10	< 0.10	0.10	< 0.10	0.10	< 0.10	0.10	< 0.50	0.50	< 0.10	0.10	< 0.10	0.10
	Toxaphene		< 0.20	0.20	< 0.20	0.20	< 0.20	0.20	< 0.25	0.25	< 0.20	0.20	< 0.25	0.25	< 1.3	1.3	< 0.25	0.25	< 0.20	0.20

Notes:

RL- Reporting limit

Bold/highlighted- Indicated exceedance of the NYSDEC Groundwater Standard

Table 12A
Groundwater Analytical Results
TAL Filtered Metals

Compound	NYSDEC Groundwater Quality Standards mg/L	15MW1 12/22/2015 mg/L		15MW2 12/22/2015 mg/L		15MW3 12/22/2015 mg/L		15MW4 12/22/2015 mg/L		15MW5 12/22/2015 mg/L		15MW6 12/23/2015 mg/L		15MW7 12/23/2015 mg/L		15MW8 12/23/2015 mg/L		Duplicate 12/22/2015 mg/L	
		Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Total Metals																			
Aluminum	NS	0.22	0.010	1.02	0.010	0.282	0.010	1.28	0.010	0.131	0.010	8.62	0.010	1.64	0.010	0.093	0.010	0.235	0.010
Antimony	0.003	< 0.002	0.002	< 0.002	0.002	< 0.002	0.002	< 0.002	0.002	< 0.002	0.002	0.002	0.002	< 0.002	0.002	< 0.002	0.002	< 0.002	0.002
Arsenic	0.025	0.009	0.004	0.045	0.004	0.004	0.004	0.07	0.004	0.162	0.004	0.03	0.004	0.027	0.004	0.028	0.004	0.005	0.004
Barium	1	0.35	0.010	0.46	0.010	0.395	0.010	0.426	0.010	0.357	0.010	0.772	0.010	0.547	0.010	0.304	0.010	0.398	0.010
Beryllium	0.003	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001
Cadmium	0.005	< 0.004	0.004	0.001	0.004	< 0.004	0.004	< 0.004	0.004	< 0.004	0.004	0.001	0.004	0.001	0.004	< 0.004	0.004	< 0.004	0.004
Calcium	NS	158	0.10	170	0.10	257	0.10	162	0.10	136	0.010	204	0.10	156	0.10	122	0.010	268	0.10
Chromium	0.05	0.001	0.001	0.003	0.001	< 0.001	0.001	0.005	0.001	< 0.001	0.001	0.021	0.001	0.005	0.001	< 0.001	0.001	< 0.001	0.001
Cobalt	NS	< 0.005	0.005	0.001	0.005	< 0.005	0.005	0.002	0.005	0.003	0.005	0.009	0.005	0.005	0.005	0.001	0.005	< 0.005	0.005
Copper	0.2	0.002	0.005	0.04	0.005	0.003	0.005	0.03	0.005	< 0.005	0.005	0.225	0.005	0.018	0.005	< 0.005	0.005	0.002	0.005
Iron	0.5	21.2	0.01	34.2	0.01	5.87	0.01	28.5	0.01	25.2	0.01	50.6	0.01	35.9	0.01	25.3	0.01	5.98	0.01
Lead	0.025	0.03	0.002	0.031	0.002	0.022	0.002	0.062	0.002	0.008	0.002	0.724	0.002	0.168	0.002	0.01	0.002	0.019	0.002
Magnesium	35	12.7	0.01	24.4	0.01	19.6	0.01	26.8	0.01	23.3	0.01	32.2	0.01	25	0.01	23.4	0.01	19.8	0.01
Manganese	0.3	0.882	0.005	0.852	0.005	1.21	0.005	1.44	0.005	0.57	0.005	0.558	0.005	0.53	0.005	0.278	0.005	1.22	0.005
Mercury	0.0007	< 0.0002	0.0002	< 0.0002	0.0002	< 0.0002	0.0002	< 0.0002	0.0002	< 0.0002	0.0002	< 0.0002	0.0002	< 0.0002	0.0002	< 0.0002	0.0002	< 0.0002	0.0002
Nickel	0.1	0.003	0.004	0.004	0.004	0.003	0.004	0.008	0.004	0.005	0.004	0.016	0.004	0.004	0.004	0.002	0.004	0.002	0.004
Potassium	NS	15.4	0.1	30.7	0.1	28.1	0.1	33.3	0.1	28.9	0.1	41.3	0.1	33.8	0.1	25.2	0.1	28.4	0.1
Selenium	0.01	< 0.002	0.002	< 0.002	0.002	< 0.002	0.002	< 0.002	0.002	< 0.002	0.002	< 0.002	0.002	< 0.002	0.002	< 0.002	0.002	0.001	0.002
Silver	0.05	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	0.001	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005
Sodium	2	112	1.0	175	1.0	212	1.0	145	1.0	142	1.0	159	1.0	109	1.0	77	1.0	230	1.0
Thallium	0.0005	< 0.0005	0.0005	< 0.0005	0.0005	< 0.0005	0.0005	< 0.0005	0.0005	< 0.0005	0.0005	< 0.0005	0.0005	< 0.0005	0.0005	< 0.0005	0.0005	< 0.0005	0.0005
Vanadium	NS	< 0.010	0.010	0.003	0.010	0.002	0.010	0.003	0.010	0.001	0.010	0.025	0.010	0.005	0.010	< 0.010	0.010	< 0.010	0.010
Zinc	2	0.023	0.010	0.031	0.010	0.059	0.010	0.073	0.010	0.007	0.010	0.374	0.010	0.14	0.010	0.008	0.010	0.055	0.010

Notes:

RL- Reporting limit

NS - No Standard

Bold/highlighted- Indicated exceedance of the NYSDEC Groundwater Standard

Table 12B
Groundwater Analytical Results
Dissolved Metals

Compound	NYSDEC Groundwater Quality Standards mg/L	15MW1		15MW2		15MW3		15MW4		15MW5		15MW6		15MW7		15MW8		Duplicate	
		12/22/2015		12/22/2015		12/22/2015		12/22/2015		12/22/2015		12/23/2015		12/23/2015		12/23/2015		12/22/2015	
		Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Dissolved Metals																			
Aluminum	NS	< 0.011	0.011	0.37	0.11	0.73	0.11	0.45	0.11	0.9	0.11	0.32	0.11	0.021	0.011	0.49	0.11	< 0.011	0.011
Antimony	0.003	< 0.003	0.003	< 0.003	0.003	< 0.003	0.003	0.003	0.003	< 0.003	0.003	< 0.003	0.003	< 0.003	0.003	< 0.003	0.003	< 0.003	0.003
Arsenic	0.025	0.003	0.003	0.003	0.003	0.001	0.003	0.005	0.003	0.024	0.003	0.004	0.003	0.005	0.003	0.008	0.003	0.001	0.003
Barium	1	0.243	0.011	0.263	0.011	0.324	0.011	0.287	0.011	0.197	0.011	0.297	0.011	0.24	0.011	0.187	0.011	0.327	0.011
Beryllium	0.003	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001
Cadmium	0.005	< 0.004	0.004	< 0.004	0.004	< 0.004	0.004	< 0.004	0.004	< 0.004	0.004	< 0.004	0.004	< 0.004	0.004	< 0.004	0.004	< 0.004	0.004
Calcium	NS	157	0.01	155	0.01	232	0.11	150	0.01	128	0.01	186	0.11	155	0.01	114	0.01	250	0.11
Chromium	0.05	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001
Cobalt	NS	< 0.005	0.005	0.002	0.005	< 0.005	0.005	0.002	0.005	0.002	0.005	0.002	0.005	0.003	0.005	0.002	0.005	< 0.005	0.005
Copper	0.2	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005
Iron	0.5	1.63	0.01	2.38	0.01	0.03	0.01	1.26	0.01	2.24	0.01	8.33	0.01	4.81	0.01	5.27	0.01	0.03	0.01
Lead	0.025	< 0.002	0.002	< 0.002	0.002	0.001	0.002	< 0.002	0.002	< 0.002	0.002	0.001	0.002	< 0.002	0.002	< 0.002	0.002	< 0.002	0.002
Magnesium	35	12.4	0.01	24.6	0.01	19.6	0.01	25.6	0.01	22.6	0.01	30.9	0.01	24.7	0.01	22.6	0.01	19.3	0.01
Manganese	0.3	0.848	0.005	0.82	0.005	1.21	0.005	1.27	0.005	0.529	0.005	0.39	0.005	0.471	0.005	0.261	0.005	1.18	0.005
Mercury	0.0007	< 0.0002	0.0002	< 0.0002	0.0002	< 0.0002	0.0002	< 0.0002	0.0002	< 0.0002	0.0002	< 0.0002	0.0002	< 0.0002	0.0002	< 0.0002	0.0002	< 0.0002	0.0002
Nickel	0.1	0.001	0.004	0.002	0.004	< 0.004	0.004	0.003	0.004	0.002	0.004	0.002	0.004	0.002	0.004	0.002	0.004	< 0.004	0.004
Potassium	NS	15.4	0.1	31	0.1	27.4	0.1	32.9	0.1	28.6	0.1	40.8	0.1	34.6	0.1	24	0.1	28.7	0.1
Selenium	0.01	< 0.004	0.004	< 0.004	0.004	0.003	0.004	< 0.004	0.004	< 0.004	0.004	< 0.004	0.004	< 0.004	0.004	< 0.004	0.004	0.003	0.004
Silver	0.05	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005
Sodium	2	114	1.1	164	1.1	203	1.1	148	1.1	131	1.1	144	1.1	113	1.1	74.7	1.1	211	1.1
Thallium	0.0005	< 0.0005	0.0005	< 0.0005	0.0005	< 0.0005	0.0005	< 0.0005	0.0005	< 0.0005	0.0005	< 0.0005	0.0005	< 0.0005	0.0005	< 0.0005	0.0005	< 0.0005	0.0005
Vanadium	NS	< 0.011	0.011	< 0.011	0.011	< 0.011	0.011	< 0.011	0.011	< 0.011	0.011	< 0.011	0.011	< 0.011	0.011	< 0.011	0.011	< 0.011	0.011
Zinc	2	0.002	0.011	0.003	0.011	0.009	0.011	0.013	0.011	0.002	0.011	0.004	0.011	0.003	0.011	0.002	0.011	0.009	0.011

Notes:

RL- Reporting limit

NS - No Standard

Bold/highlighted- Indicated exceedance of the NYSDEC Groundwater Standard

COMPOUNDS	NYSDOH Maximum Sub-Slab Value (µg/m ³) ^(a)	NYSDOH Soil Outdoor Background Levels (µg/m ³) ^(b)	SG1 12/8/2015 (µg/m3)		SG2 12/8/2015 (µg/m3)		SG3 12/9/2015 (µg/m3)		SG4 12/8/2015 (µg/m3)		SG5 12/8/2015 (µg/m3)		SG6 12/8/2015 (µg/m3)		SG7 12/8/2015 (µg/m3)	
			Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
1,1,1,2-Tetrachloroethane			< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.00	5.00
1,1,1-Trichloroethane	100	<2.0 - 2.8	3.38	1.00	< 1.00	1.00	47.6	1.00	1.37	1.00	< 3.00	3.00	1.62	1.00	< 5.00	5.00
1,1,2,2-Tetrachloroethane		<1.5	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.00	5.00
1,1,2-Trichloroethane		<1.0	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.00	5.00
1,1-Dichloroethane		<1.0	6.63	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	1.72	1.00	< 5.02	5.02
1,1-Dichloroethene		<1.0	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 4.99	4.99
1,2,4-Trichlorobenzene		NA	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.00	5.00
1,2,4-Trimethylbenzene		<1.0	1.64	1.00	1.24	1.00	1.26	1.00	1.62	1.00	< 3.00	3.00	< 1.00	1.00	< 5.01	5.01
1,2-Dibromoethane		<1.5	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.00	5.00
1,2-Dichlorobenzene		<2.0	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.00	5.00
1,2-Dichloroethane		<1.0	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.02	5.02
1,2-Dichloropropane			< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 4.99	4.99
1,2-Dichlorotetrafluoroethane			< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.00	5.00
1,3,5-Trimethylbenzene		<1.0	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	1	1.00	< 3.00	3.00	< 1.00	1.00	< 5.01	5.01
1,3-Butadiene		NA	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.01	3.01	< 1.00	1.00	< 5.00	5.00
1,3-Dichlorobenzene		<2.0	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.00	5.00
1,4-Dichlorobenzene		NA	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.00	5.00
1,4-Dioxane			< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.01	5.01
2-Hexanone			4.3	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 4.99	4.99
4-Ethyltoluene		NA	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.01	5.01
4-Isopropyltoluene			< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.00	5.00
4-Methyl-2-pentanone			< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	3.03	1.00	5.77	4.99
Acetone		NA	475	9.99	451	9.99	117	5.01	577	9.99	< 2.99	2.99	275	9.99	203	5.01
Acrylonitrile			< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 2.99	2.99	< 1.00	1.00	< 5.01	5.01
Benzene		<1.6 - 4.7	< 1.00	1.00	2.29	1.00	< 1.00	1.00	49.2	1.00	19.8	3.00	4.15	1.00	< 5.01	5.01
Benzyl Chloride		NA	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.00	5.00
Bromodichloromethane		<5.0	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.00	5.00
Bromoform		<1.0	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.00	5.00
Bromomethane		<1.0	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.01	5.01
Carbon Disulfide		NA	< 1.00	1.00	2.3	1.00	1.85	1.00	12	1.00	79.7	3.00	62.5	1.00	29.4	5.01
Carbon Tetrachloride	5	<3.1	< 0.25	0.25	< 0.25	0.25	0.35	0.25	< 0.25	0.25	< 0.75	0.75	< 0.25	0.25	< 1.24	1.24
Chlorobenzene		<2.0	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.01	5.01
Chloroethane		NA	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.01	3.01	59.1	1.00	7.17	5.01
Chloroform		<2.4	33	1.00	< 1.00	1.00	< 1.00	1.00	1.58	1.00	< 3.00	3.00	16.5	1.00	< 4.98	4.98
Chloromethane		<1.0 - 1.4	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 2.99	2.99	< 1.00	1.00	< 4.99	4.99
cis-1,2-Dichloroethene		<1.0	85.2	1.00	< 1.00	1.00	< 1.00	1.00	1.03	1.00	< 3.00	3.00	< 1.00	1.00	< 4.99	4.99
cis-1,3-Dichloropropene		NA	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 4.99	4.99
Cyclohexane		NA	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	464	30.0	< 1.00	1.00	10.9	4.99
Dibromochloromethane		<5.0	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.00	5.00
Dichlorodifluoromethane		NA	2.14	1.00	128	1.00	2.06	1.00	< 1.00	1.00	< 3.00	3.00	1.68	1.00	< 4.99	4.99
Ethanol			8.94	1.00	14.8	1.00	4.59	1.00	10.1	1.00	7.49	2.99	6.12	1.00	6.23	5.01
Ethyl Acetate		NA	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.01	5.01
Ethylbenzene		<4.3	1.1	1.00	1.3	1.00	< 1.00	1.00	13.9	1.00	< 3.00	3.00	< 1.00	1.00	< 4.99	4.99
Heptane		NA	1.45	1.00	16.2	1.00	< 1.00	1.00	64.7	1.00	300	3.00	7.66	1.00	6.47	5.00
Hexachlorobutadiene		NA	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.01	3.01	< 1.00	1.00	< 5.00	5.00
Hexane		<1.5	< 1.00	1.00	46.5	1.00	< 1.00	1.00	193	10.0	842	30.0	11.1	1.00	18.1	5.00
Isopropylalcohol		NA	4.03	1.00	7.17	1.00	1.94	1.00	4.45	1.00	3.39	3.00	3.05	1.00	8.55	5.01
Isopropylbenzene			< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	4.43	1.00	< 3.00	3.00	< 1.00	1.00	< 5.01	5.01
Xylene (m&p)		<4.3	4.34	1.00	4.13	1.00	1.86	1.00	13.9	1.00	< 3.00	3.00	4.05	1.00	< 4.99	4.99
Methyl Ethyl Ketone			13.9	1.00	14.2	1.00	2.88	1.00	11.1	1.00	< 3.01	3.01	9.4	1.00	5.36	5.01
MTBE		NA	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.01	5.01
Methylene Chloride		<3.4	2.75	1.00	1.07	1.00	3.1	1.00	2.3	1.00	< 3.00	3.00	2.43	1.00	< 5.00	5.00
n-Butylbenzene			< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.00	5.00
Xylene (o)		<4.3	1.17	1.00	1.15	1.00	< 1.00	1.00	2.39	1.00	10.6	3.00	1.5	1.00	< 4.99	4.99
Propylene		NA	3.61	1.00	160	9.99	5.87	1.00	473	9.99	1,320	29.9	66.4	1.00	182	5.01
sec-Butylbenzene			< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.00	5.00
Styrene		<1.0	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 4.98	4.98
Tetrachloroethene	100		69.8	0.25	0.72	0.25	7.39	0.25	7.93	0.25	2.77	0.75	13.8	0.25	14.3	1.25
Tetrahydrofuran		NA	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.01	3.01	< 1.00	1.00	< 5.01	5.01
Toluene		1.0 - 6.1	9.91	1.00	7.65	1.00	2.07	1.00	20.4	1.00	18.4	3.00	15.1	1.00	6.21	5.01
trans-1,2-Dichloroethene		NA	15.5	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 4.99	4.99
trans-1,3-Dichloropropene		NA	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 4.99	4.99
Trichloroethene	5	<1.7	1,650	2.50	4.04	0.25	14.1	0.25	6.18	0.25	69.3	0.75	245	2.50	38	1.25
Trichlorofluoromethane		NA	< 1.00	1.00	< 1.00	1.00	1.99	1.00	< 1.00	1.00	< 3.00	3.00	1.56	1.00	30.9	5.00
Trichlorotrifluoroethane			< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 1.00	1.00	< 3.00	3.00	< 1.00	1.00	< 5.00	5.00
Vinyl Chloride		<1.0	1.26	0.25	7.43	0.25	< 0.25	0.25	< 0.25	0.25	107	0.75	< 0.25	0.25	< 1.25	1.25
BTEX			16.52		16.52		3.93		99.79		48.8		24.8		6	
<																

TABLE 14
Parameters Detected Above Track () Soil Cleanup Objectives
Soil Borings 15SB1-15SB10

COMPOUND	Range in Exceedances	Frequency of Detection	15SB1			15SB2			15SB3			15SB4			15SB5		
			(2-4')	(11-13')	(18-20')	(0-2')	(11-13')	(18-20')	(2-4')	(11-13')	(18-20')	(0-2')	(11-13')	(18-20')	(2-4')	(11-13')	(22-24')
			12/16/2015	12/16/2015	12/16/2015	12/17/2015	12/17/2015	12/17/2015	12/16/2015	12/16/2015	12/16/2015	12/17/2015	12/17/2015	12/17/2015	12/16/2015	12/16/2015	12/16/2015
Sample Results in ug/kg																	
Acetone	70-10,000	6	-	10,000	210	-	-	630	-	-	170	-	-	-	-	-	-
Chlorobenzene	8,000	1	-	8,000	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	430-1,900	3	430	1,900	-	450	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	2,900	1	-	2,900	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Ethyl Ketone (2-Butanone)	200	1	-	-	-	-	-	200	-	-	-	-	-	-	-	-	-
n-Propylbenzene	4,700-31,000	4	-	4,800	-	-	-	-	-	-	-	-	12,000	-	-	-	-
sec-Butylbenzene	15,000-31,000	6	-	18,000	-	-	15,000	-	-	-	-	-	19,000	-	-	26,000	-
tert-Butylbenzene	6,100	1	-	-	-	-	-	-	-	-	-	-	-	-	-	6,100	-
Trichloroethene	510-6,600	6	6,600	-	-	4,000	-	-	-	-	-	-	-	-	780	-	-
Sample Results in ug/kg																	
Benzo(a)anthracene	1,100-6,400	5	-	-	-	-	-	-	-	-	-	-	-	-	4,300	1,100	-
Benzo(a)pyrene	1,200-5,000	5	-	-	-	-	-	-	-	-	-	-	-	-	4,500	1,200	-
Benzo(b)fluoranthene	1,600-4,100	4	-	-	-	-	-	-	-	-	-	-	-	-	3,900	-	-
Benzo(k)fluoranthene	840-3,800	5	-	-	-	-	-	-	-	-	-	-	-	-	3,300	840	-
Chrysene	1,200-6,600	5	-	-	-	-	-	-	-	-	-	-	-	-	4,400	1,200	-
Dibenz(a,h)anthracene	450-660	2	-	-	-	-	-	-	-	-	-	-	-	-	450	-	-
Indeno(1,2,3-cd)pyrene	510-3,200	7	630	510	-	-	-	-	-	-	-	-	-	-	2,400	550	-
Sample Results in mg/kg																	
Arsenic	13.4-51.7	10	-	-	-	-	-	17.70	13.4	-	-	-	-	-	18	-	-
Barium	734-818	2	-	-	-	-	-	-	734.0	-	-	-	-	-	-	-	-
Chromium	75.4-87.7	2	87.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper	50.4-938	14	52.4	-	-	97.9	-	-	938	-	-	63.9	-	89.6	50.4	-	-
Lead	103-2,790	18	228	-	-	776	-	103	2,790	-	-	162	-	512	190	-	-
Mercury	0.21-14	16	0.7	-	-	1	-	0.4	2.75	-	0.55	-	-	3.35	0.92	-	-
Nickel	65-138	2	138	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	112-995	17	577	-	-	300	-	114	995	-	-	184	-	359	177	-	-

TABLE 14
Parameters Detected Above Track () Soil Cleanup Objectives
Soil Borings 15SB1-15SB10

Compound	Range in Exceedances	Frequency of Detection	15SB6			15SB7			15SB8			15SB9			15SB10			Duplicate
			(0-2')	(11-13')	(18-20')	(0-2')	(11-13')	(18-20')	(0-2')	(11-13')	(18-20')	(0-2')	(11-13')	(18-20')	(0-2')	(11-13')	(18-20')	
			12/17/2015	12/17/2015	12/17/2015	12/17/2015	12/17/2015	12/17/2015	12/17/2015	12/17/2015	12/17/2015	12/17/2015	12/17/2015	12/17/2015	12/17/2015	12/17/2015	12/17/2015	
Sample Results in ug/kg																		
1,2,4-Trimethylbenzene	6,500	1	-	-	-	-	-	-	-	6,500	-	-	-	-	-	-	-	-
Acetone	70-10,000	6	-	-	70	-	-	-	-	-	-	-	-	-	-	-	230	-
n-Butylbenzene	16,000	1	-	-	-	-	-	-	-	16,000	-	-	-	-	-	-	-	-
n-Propylbenzene	4,700-31,000	4	-	-	-	-	4,700	-	-	31,000	-	-	-	-	-	-	-	-
sec-Butylbenzene	15,000-31,000	6	-	-	-	-	27,000	-	-	31,000	-	-	-	-	-	-	-	-
Trichloroethene	510-6,600	6	630	-	-	510	-	-	-	-	-	-	-	-	2,100	-	-	-
Vinyl Chloride	350	1	-	-	-	-	-	-	-	-	-	-	-	-	-	350	-	-
Sample Results in ug/kg																		
Benzo(a)anthracene	1,100-6,400	5	-	-	-	6,400	-	-	2,000	-	-	1,800	-	-	-	-	-	-
Benzo(a)pyrene	1,200-5,000	5	-	-	-	5,000	-	-	1,900	-	-	1,800	-	-	-	-	-	-
Benzo(b)fluoranthene	1,600-4,100	4	-	-	-	4,100	-	-	1,600	-	-	1,700	-	-	-	-	-	-
Benzo(k)fluoranthene	840-3,800	5	-	-	-	3,800	-	-	1,600	-	-	1,700	-	-	-	-	-	-
Chrysene	1,200-6,600	5	-	-	-	6,600	-	-	2,300	-	-	2,100	-	-	-	-	-	-
Dibenz(a,h)anthracene	450-660	2	-	-	-	660	-	-		-	-		-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	510-3,200	7	-	-	-	3,200	-	-	990	-	-	1,100	-	-	-	-	-	-
Sample Results in ug/kg																		
4,4-DDT	7.1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.1
Sample Results in mg/kg																		
Arsenic	13.4-51.7	10	14	-	32	-	-	17.90		-	-	15.2	-	27	-	-	35.8	51.7
Barium	734-818	2	-	-	818	-	-	-		-	-		-	-	-	-	-	-
Cadmium	2.95	1	-	-	-	-	-	-		-	-		-	-	2.95	-	-	-
Chromium	75.4-87.7	2	-	-	-	-	-	-		-	-		-	-	-	-	-	75.4
Copper	50.4-938	14	95.2	-	-	62.4	-	119	59.2	-	-	66.8	-	-	60	-	77	327
Lead	103-2,790	18	733	-	122	172	-	529	317	-	134	612	-	106	213	-	268	2,470
Mercury	0.21-14	16	0.45	-	14	3.04	-	11.3	0.21	-	0.92	4.47	-	-	-	-	12.1	5.3
Nickel	65-138	2	-	-	65	-	-	-		-	-		-	-	-	-	-	-
Zinc	112-995	17	768	-	197	150	-	217	222	-	136	170	-	-	112	-	277	424

TABLE 15
Parameters Detected Above Ambient Water Quality Standards

VOCs

COMPOUND	Range in Detections	Number of Occurrences	15MW1 12/22/2015	15MW2 12/22/2015	15MW4 12/22/2015	15MW5 12/22/2015	15MW7 12/23/2015	15MW8 12/23/2015
<i>Sample Results in (µg/L)</i>								
1,2,4-Trimethylbenzene	39	1	-	-	-	-	39	-
2-Isopropyltoluene	7.0-88	6	7	7.3	28	17	88	11
Acetone	59	1	-	59	-	-	-	-
Chlorobenzene	81	1	81	-	-	-	-	-
Chloroethane	23-130	3	-	56	130	23	-	-
cis-1,2-Dichloroethene	13	1	13	-	-	-	-	-
Isopropylbenzene	6.8-100	5	8.5	-	6.8	25	100	37
n-Butylbenzene	5.4-97	3	-	-	5.4	-	97	11
n-Propylbenzene	6.2-170		6.2	-	-	23	170	59
sec-Butylbenzene	12-210	6	15	12	36	35	210	24
tert-Butylbenzene	5.7-39	6	6	6.5	15	12	39	5.7
Vinyl Chloride	13	1	13	-	-	-	-	-

SVOCs

COMPOUND	Range in Detections	Number of Occurrences	15MW1 12/22/2015	15MW2 12/22/2015	15MW3 12/22/2015	15MW4 12/22/2015	15MW5 12/22/2015	15MW6 12/23/2015	15MW7 12/23/2015	15MW8 12/23/2015	Duplicate 12/22/2015
<i>Sample Results in (µg/L)</i>											
Benz(a)anthracene	0.03-1.9	9	0.11	0.04	0.11	0.58	0.03	1.9	0.24	0.03	0.08
Benzo(a)pyrene	0.03-1.7	7	0.07	0.03	0.08	0.57	-	1.7	0.27	-	0.05
Benzo(b)fluoranthene	0.03-1.4	7	0.06	0.03	0.07	0.44	-	1.4	0.25	-	0.04
Benzo(k)fluoranthene	0.02-1.4	7	0.06	0.02	0.06	0.4	-	1.4	0.2	-	0.04
Chrysene	0.04-1.7	7	0.11	0.04	0.1	0.54	-	1.7	0.23	-	0.06
Indeno(1,2,3-cd)pyrene	0.02-0.73	7	0.03	-	0.04	0.21	-	0.73	0.14	-	0.02

TABLE 15
Parameters Detected Above Ambient Water Quality Standards

Pesticides

COMPOUND	Range in Detections	Number of Occurrences	15MW4 12/22/2015
<i>Sample Results in (µg/L)</i>			
4,4-DDD	0.014	1	0.014

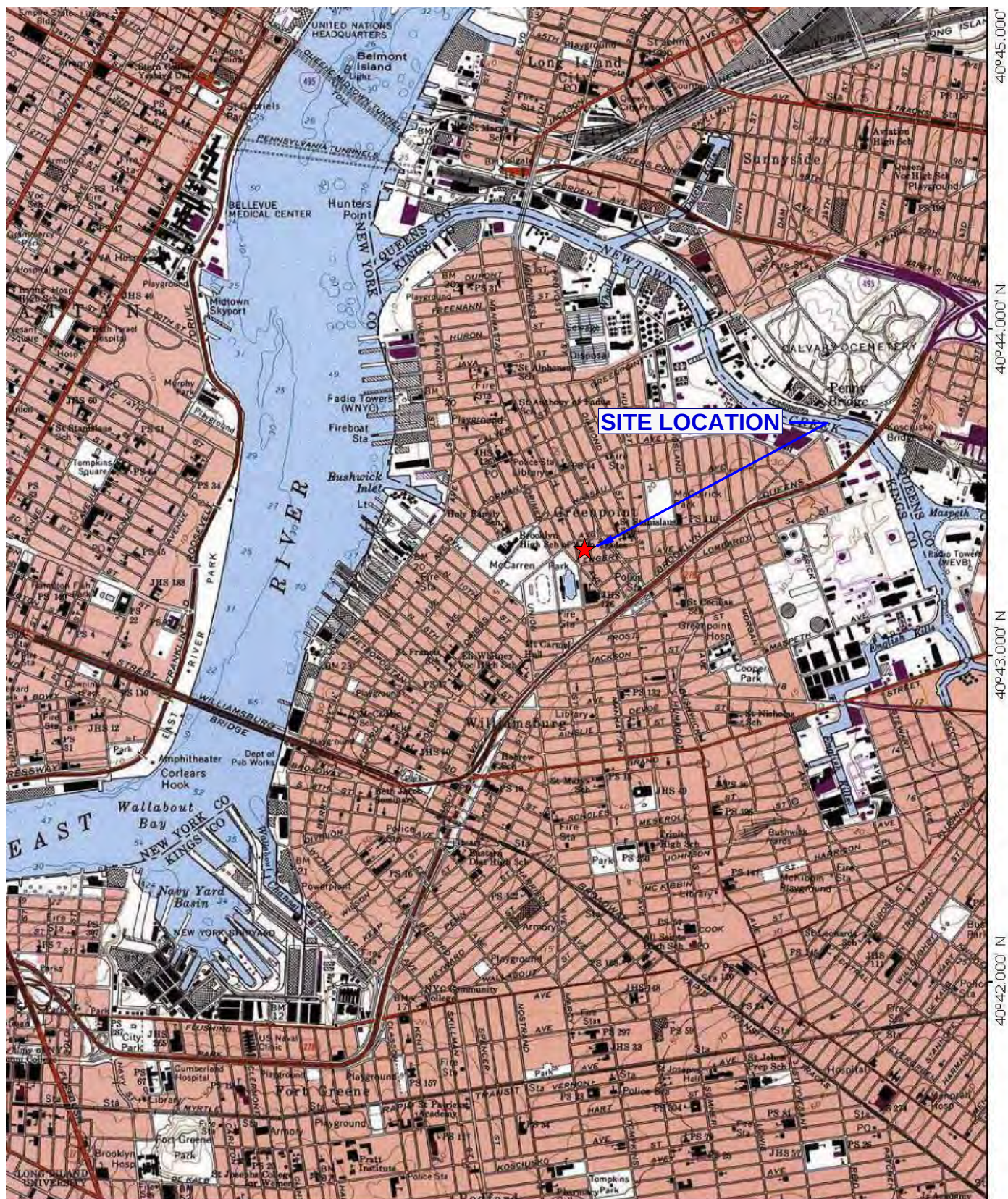
Metals (Total)

COMPOUND	Range in Detections	Number of Occurrences	15MW1 12/22/2015	15MW2 12/22/2015	15MW3 12/22/2015	15MW4 12/22/2015	15MW5 12/22/2015	15MW6 12/23/2015	15MW7 12/23/2015	15MW8 12/23/2015	Duplicate 12/22/2015
<i>Sample Results in (mg/L)</i>											
Arsenic	0.027-0.162	6	-	0.045	-	0.07	0.162	0.03	0.027	0.028	-
Copper	0	1	-	-	-	-	-	0.225	-	-	-
Iron	5.87-50.6	9	21.2	34.2	5.87	28.5	25.2	50.6	35.9	25.3	5.98
Lead	0.03-0.724	5	0.03	0.031	-	0.062	-	0.724	0.168	-	-
Manganese	0.53-1.44	8	0.882	0.852	1.21	1.44	0.57	0.558	0.53	-	1.22
Sodium	77-230	9	112	175	212	145	142	159	109	77	230

Metals (Dissolved)

COMPOUND	Range in Detections	Number of Occurrences	15MW1 12/22/2015	15MW2 12/22/2015	15MW3 12/22/2015	15MW4 12/22/2015	15MW5 12/22/2015	15MW6 12/23/2015	15MW7 12/23/2015	15MW8 12/23/2015	Duplicate 12/22/2015
<i>Sample Results in (mg/L)</i>											
Iron	1.26-8.33	7	1.63	2.38	-	1.26	2.24	8.33	4.81	5.27	-
Manganese	0.39-1.27	8	0.848	0.82	1.21	1.27	0.529	0.39	0.471	-	1.18
Sodium	74.7-211	9	114	164	203	148	131	144	113	74.7	211

FIGURES

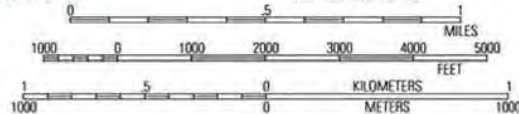


73°59.000' W

73°58.000' W

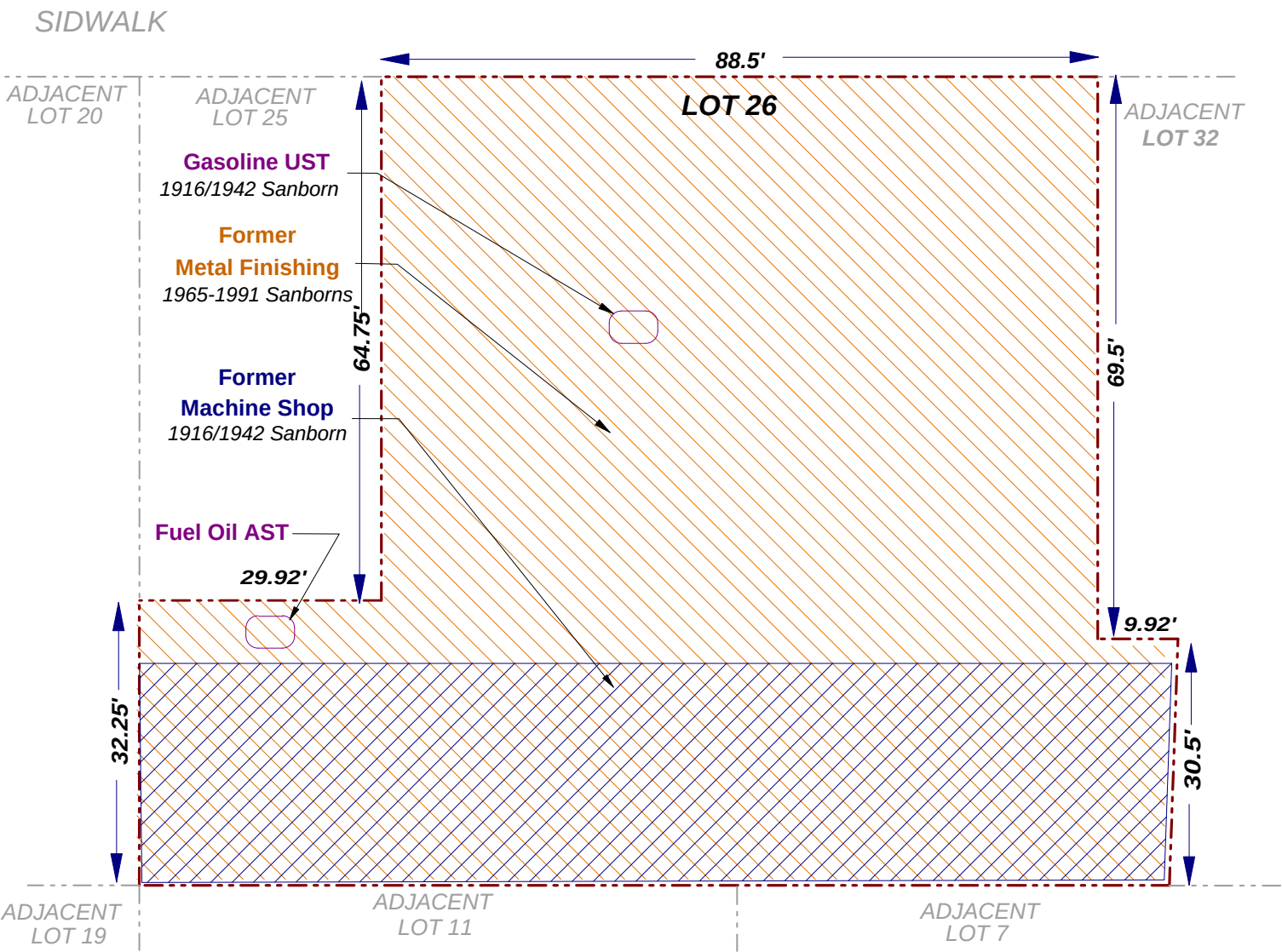
73°57.000' W

WGS84 73°56.000' W



MN ↑ TN
13°
06/04/11

ECKFORD STREET



KEY:
BCP Property Boundary

SCALE:
0 10 20 30
Scale: 1 inch = 20 feet



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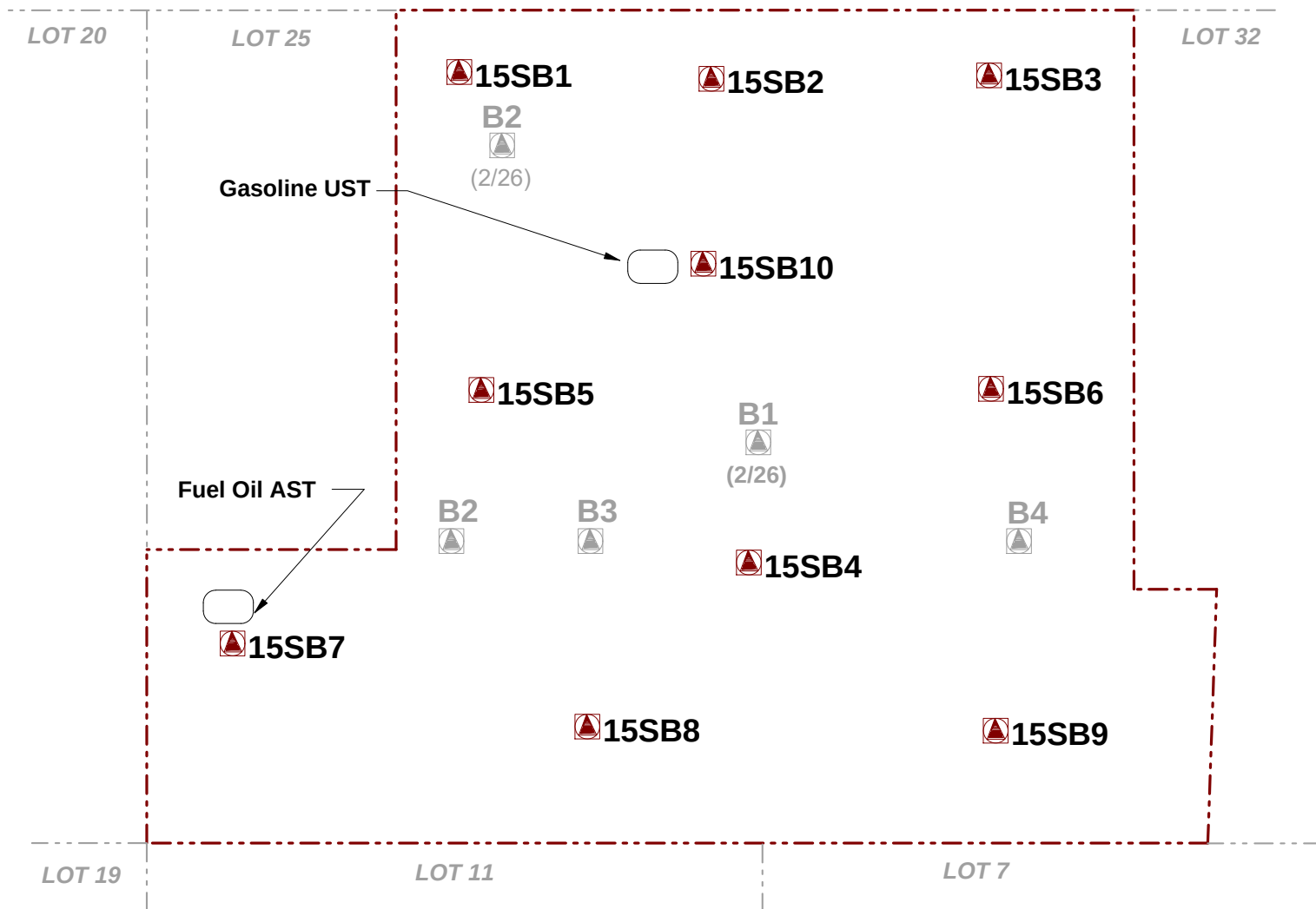
Figure No.
2

Site Name: FORMER CARTER SPRAY FINISHING CORP.
Site Address: 65 ECKFORD STREET, BROOKLYN, NY 11222
Drawing Title: SITE PLAN



ECKFORD STREET

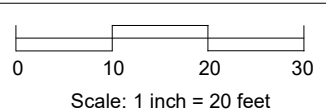
SIDWALK



KEY:

- BCP Boundary
- Soil Boring Location - December 2015
- Previous Soil Boring Location

SCALE:



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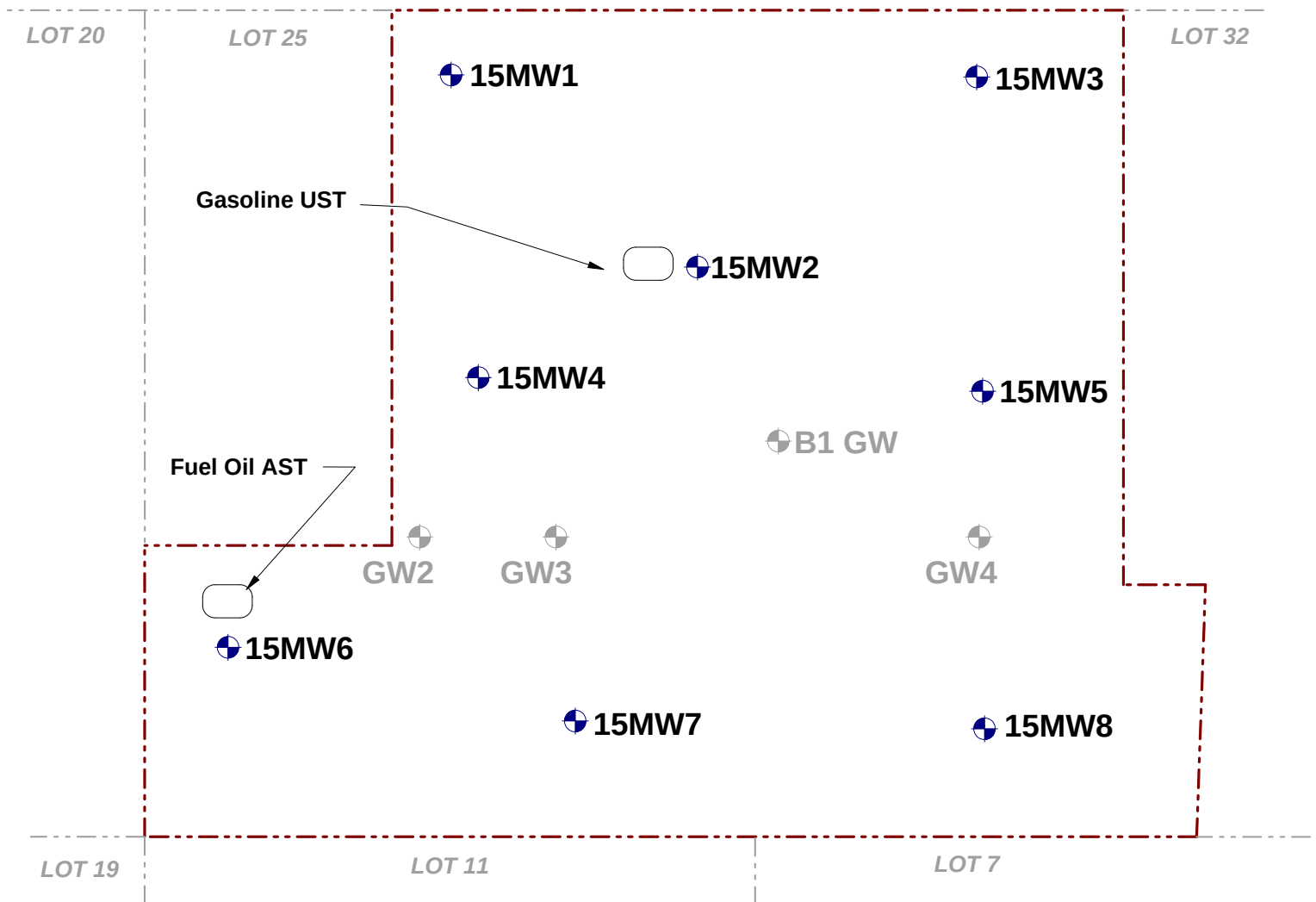
Figure No.
3

Site Name: **FORMER CARTER SPRAY FINISHING CORP.**
Site Address: **65 ECKFORD STREET, BROOKLYN, NY 11222**
Drawing Title: **SOIL BORING LOCATIONS**



ECKFORD STREET

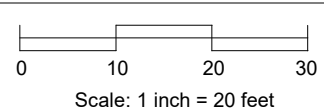
SIDWALK



KEY:

- BCP Boundary
- Monitoring Well Locations - December 2015
- Previous GW Sampling Location

SCALE:



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Figure No.
4

Site Name: **FORMER CARTER SPRAY FINISHING CORP.**

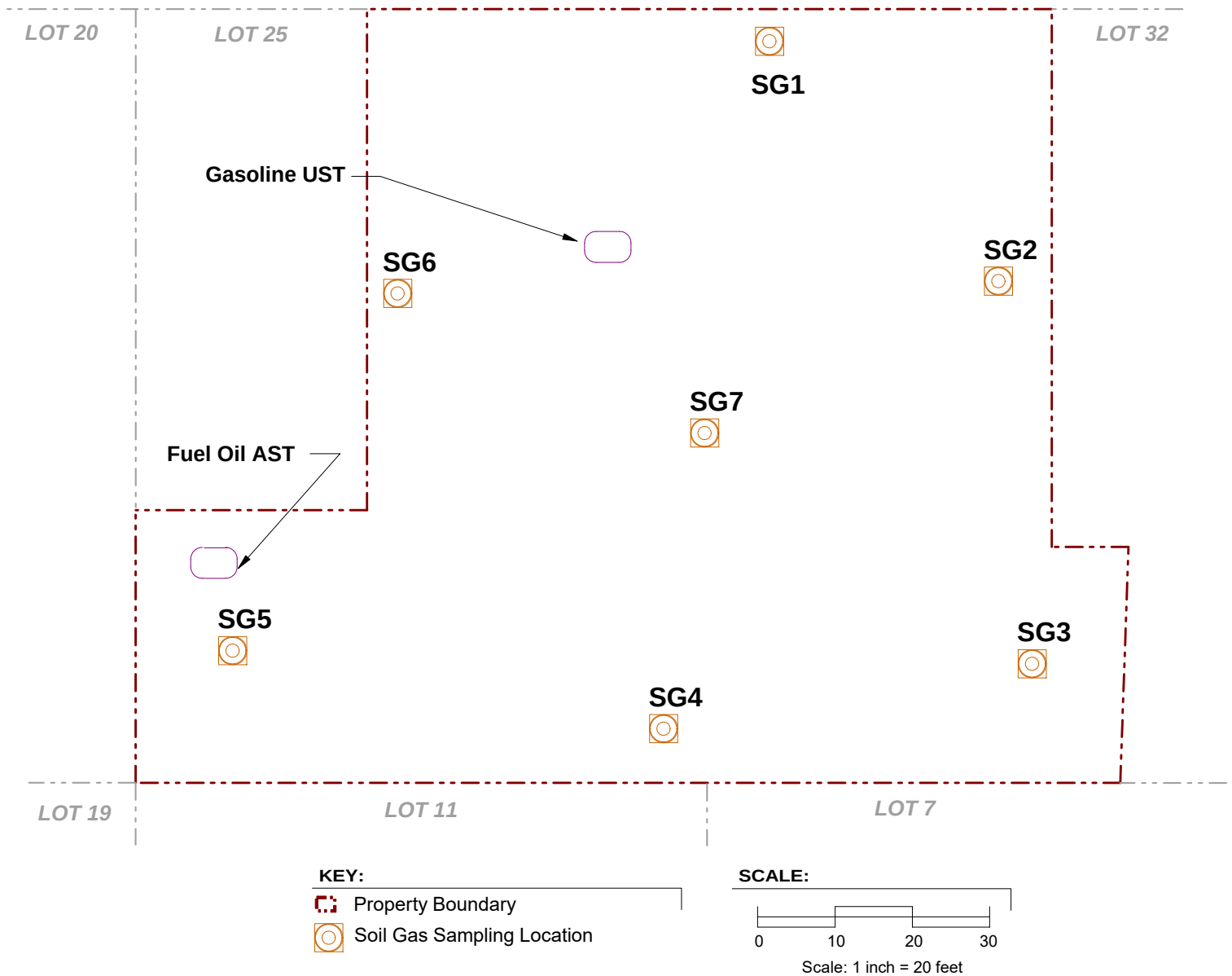
Site Address: **65 ECKFORD STREET, BROOKLYN, NY 11222**

Drawing Title: **MONITORING WELL LOCATIONS**



ECKFORD STREET

SIDWALK



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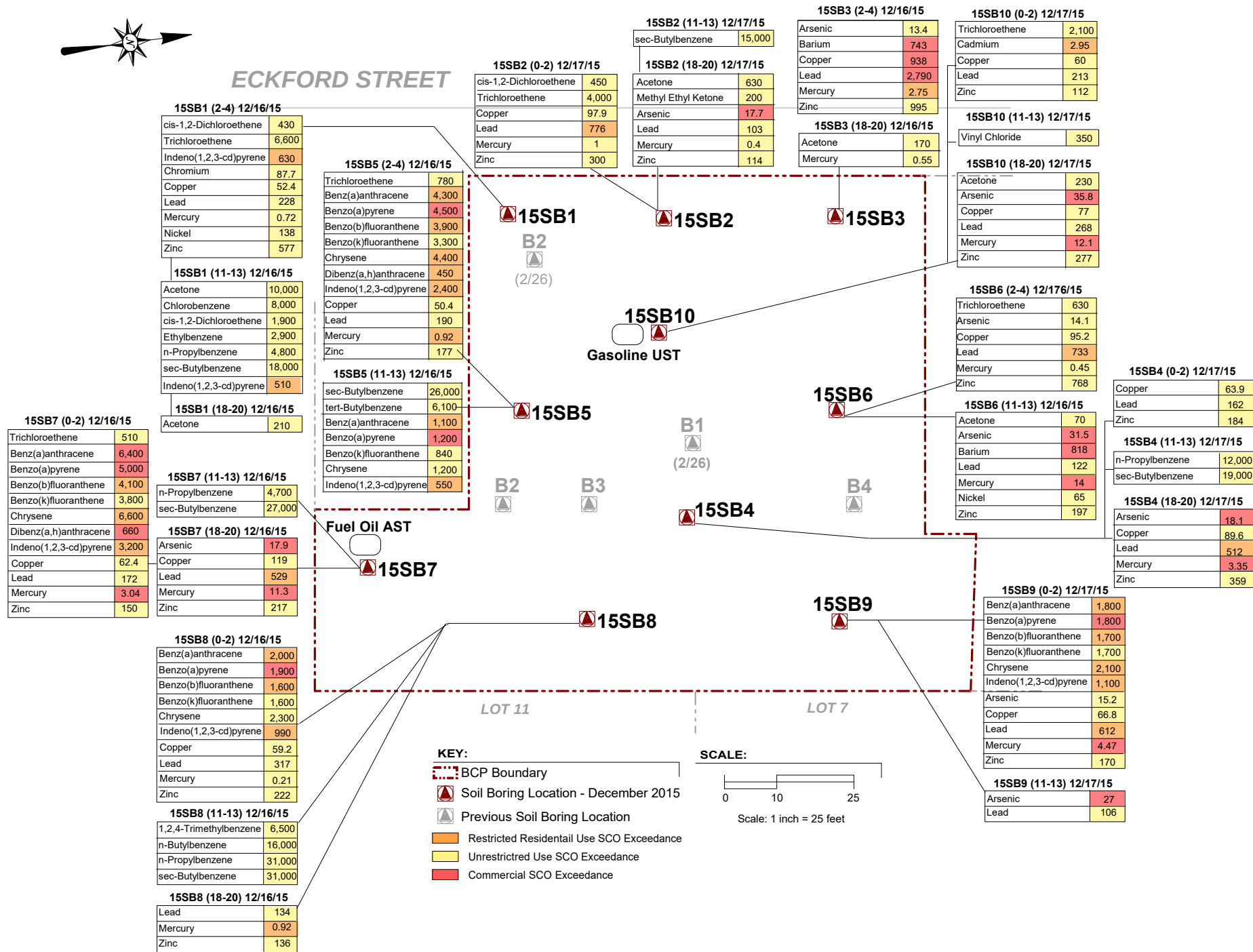
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Fax 631.924.2870

Figure No.
6

Site Name: **FORMER CARTER SPRAY FINISHING CORP.**
Site Address: **65 ECKFORD STREET, BROOKLYN, NY 11222**
Drawing Title: **SOIL GAS SAMPLING LOCATIONS**



ECKFORD STREET



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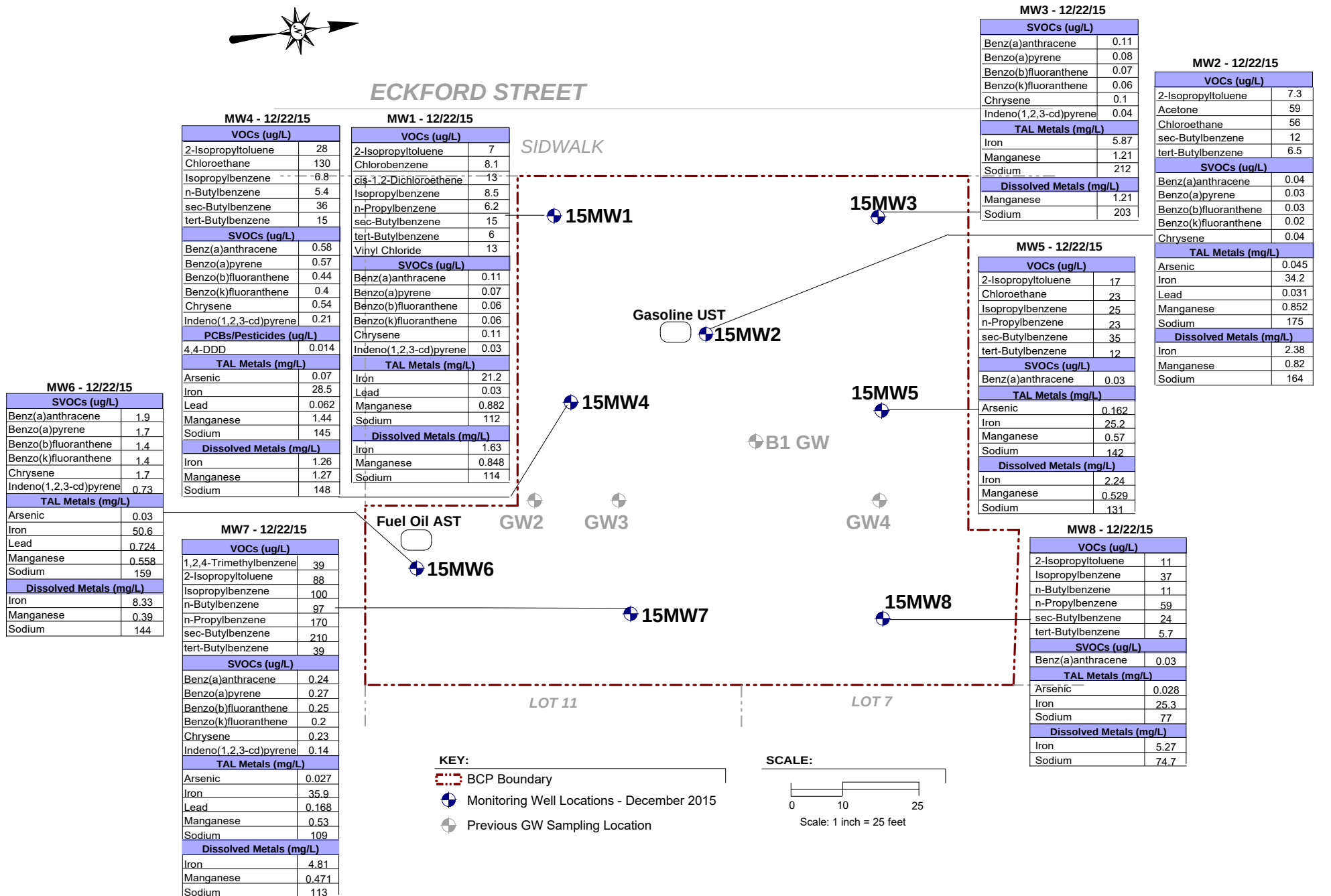
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Figure No.
7

Site Name: **FORMER CARTER SPRAY FINISHING CORP.**
Site Address: **65 ECKFORD STREET, BROOKLYN, NY 11222**
Drawing Title: **POSTED SOIL EXCEEDENCES MAP**



ECKFORD STREET



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Figure No.
8

Site Name: **FORMER CARTER SPRAY FINISHING CORP.**
Site Address: **65 ECKFORD STREET, BROOKLYN, NY 11222**
Drawing Title: **GROUNDWATER EXCEEDENCES**



ECKFORD STREET

SG5 - 12/22/15	
Benzene	19.8
Carbon Disulfide	79.7
Cyclohexane	464
Ethanol	7.49
Heptane	300
Hexane	842
Isopropylalcohol	3.39
Xylene (o)	10.6
Propylene	1,320
Tetrachloroethene	2.77
Toluene	18.4
Trichloroethene	69.3
Vinyl Chloride	107

SG4 - 12/22/15	
1,1,1-Trichloroethane	1.37
1,2,4-Trimethylbenzene	1.62
1,3,5-Trimethylbenzene	1
Acetone	577
Benzene	49.2
Carbon Disulfide	12
Chloroform	1.58
cis-1,2-Dichloroethene	1.03
Ethanol	10.1
Ethylbenzene	13.9
Heptane	64.7
Hexane	193
Isopropylalcohol	4.45
Isopropylbenzene	4.43
Xylene (m&p)	13.9
Methyl Ethyl Ketone	11.1
Methylene Chloride	2.3
Xylene (o)	2.39
Propylene	473
Tetrachloroethene	7.93
Toluene	20.4
Trichloroethene	6.18

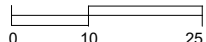
SG6 - 12/22/15	
1,1,1-Trichloroethane	1.62
1,1-Dichloroethane	1.72
4-Methyl-2-pentanone	3.03
Acetone	275
Benzene	4.15
Carbon Disulfide	62.5
Chloroethane	59.1
Chloroform	16.5
Dichlorodifluoromethane	1.68
Ethanol	6.12
Heptane	7.66
Hexane	11.1
Isopropylalcohol	3.05
Xylene (m&p)	4.05
Methyl Ethyl Ketone	9.4
Methylene Chloride	2.43
Xylene (o)	1.5
Propylene	66.4
Tetrachloroethene	13.8
Toluene	15.1
Trichloroethene	245
Trichlorofluoromethane	1.56

SIDWALK

Gasoline UST

Fuel Oil AST

KEY:
 Property Boundary
 Soil Gas Sampling Location

SCALE:

Scale: 1 inch = 25 feet

SG1 - 12/22/15	
1,1,1-Trichloroethane	3.38
1,1-Dichloroethane	6.63
1,2,4-Trimethylbenzene	1.64
2-Hexanone	4.3
Acetone	475
Chloroform	33
cis-1,2-Dichloroethene	85.2
Dichlorodifluoromethane	2.14
Ethanol	8.94
Ethylbenzene	1.1
Heptane	1.45
Isopropylalcohol	4.03
Xylene (m&p)	4.34
Methyl Ethyl Ketone	13.9
Methylene Chloride	2.75
Xylene (o)	1.17
Propylene	3.61
Tetrachloroethene	69.8
Toluene	9.91
trans-1,2-Dichloroethene	15.5
Trichloroethene	1,650
Vinyl Chloride	1.26

SG2 - 12/22/15	
1,2,4-Trimethylbenzene	1.24
Acetone	451
Benzene	2.29
Carbon Disulfide	2.3
Dichlorodifluoromethane	128
Ethanol	14.8
Ethylbenzene	1.3
Heptane	16.2
Hexane	46.5
Isopropylalcohol	7.17
Xylene (m&p)	4.13
Methyl Ethyl Ketone	14.2
Methylene Chloride	1.07
Xylene (o)	1.15
Propylene	160
Tetrachloroethene	0.72
Toluene	7.65
Trichloroethene	4.04
Vinyl Chloride	7.43

SG7 - 12/22/15	
4-Methyl-2-pentanone	5.77
Acetone	203
Carbon Disulfide	29.4
Chloroethane	7.17
Cyclohexane	10.9
Ethanol	6.23
Heptane	6.47
Hexane	18.1
Isopropylalcohol	8.55
Methyl Ethyl Ketone	5.36
Propylene	182
Tetrachloroethene	14.3
Toluene	6.21
Trichloroethene	38
Trichlorofluoromethane	30.9

SG3 - 12/22/15	
1,1,1-Trichloroethane	47.6
1,2,4-Trimethylbenzene	1.26
Acetone	117
Carbon Disulfide	1.85
Dichlorodifluoromethane	2.06
Ethanol	4.59
Isopropylalcohol	1.94
Xylene (m&p)	1.86
Methyl Ethyl Ketone	2.88
Methylene Chloride	3.1
Propylene	5.87
Tetrachloroethene	7.39
Toluene	2.07
Trichloroethene	14.1
Trichlorofluoromethane	1.99

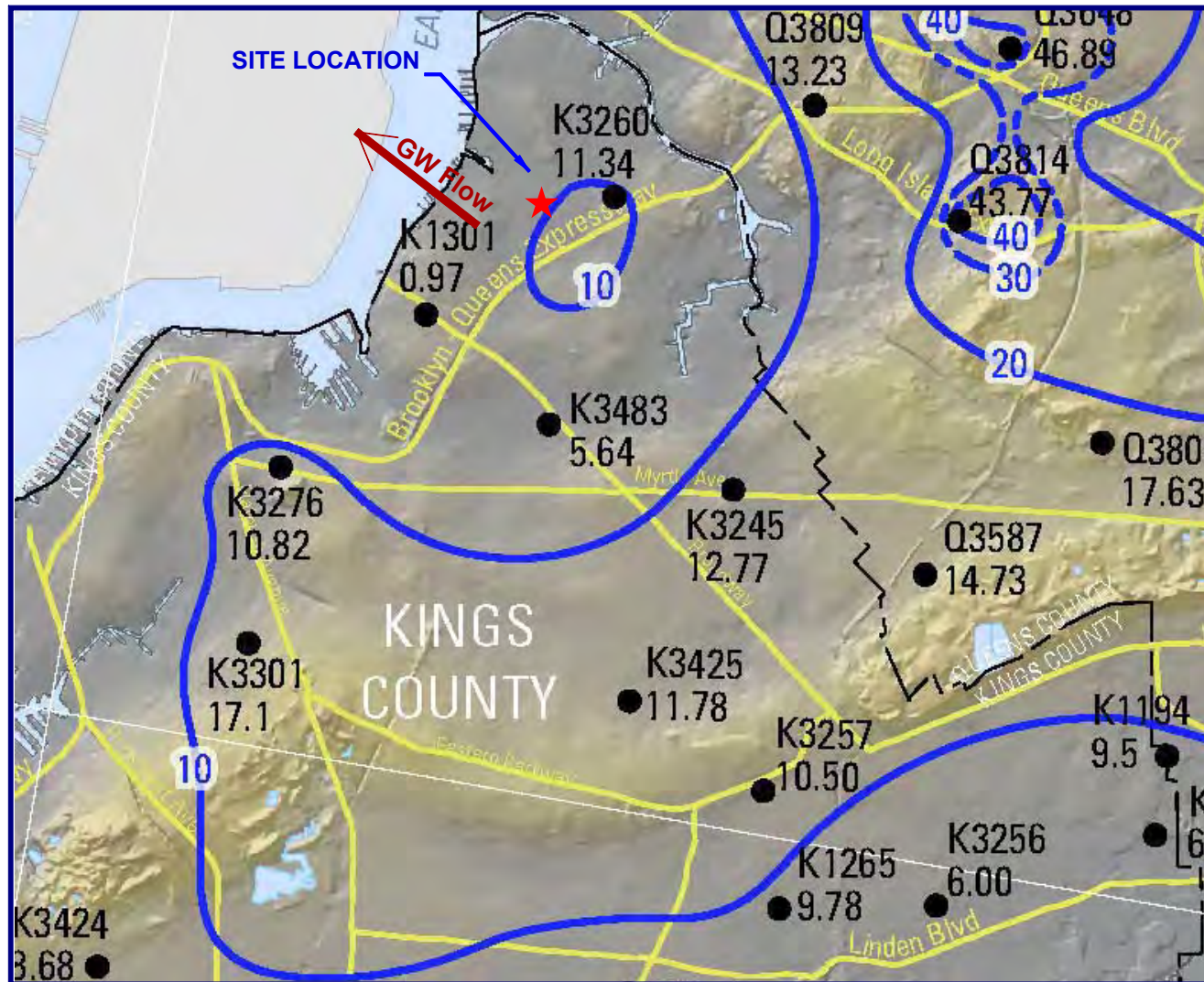


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Figure No.
9

Site Name: **FORMER CARTER SPRAY FINISHING CORP.**
Site Address: **65 ECKFORD STREET, BROOKLYN, NY 11222**
Drawing Title: **SOIL GAS DETECTIONS**



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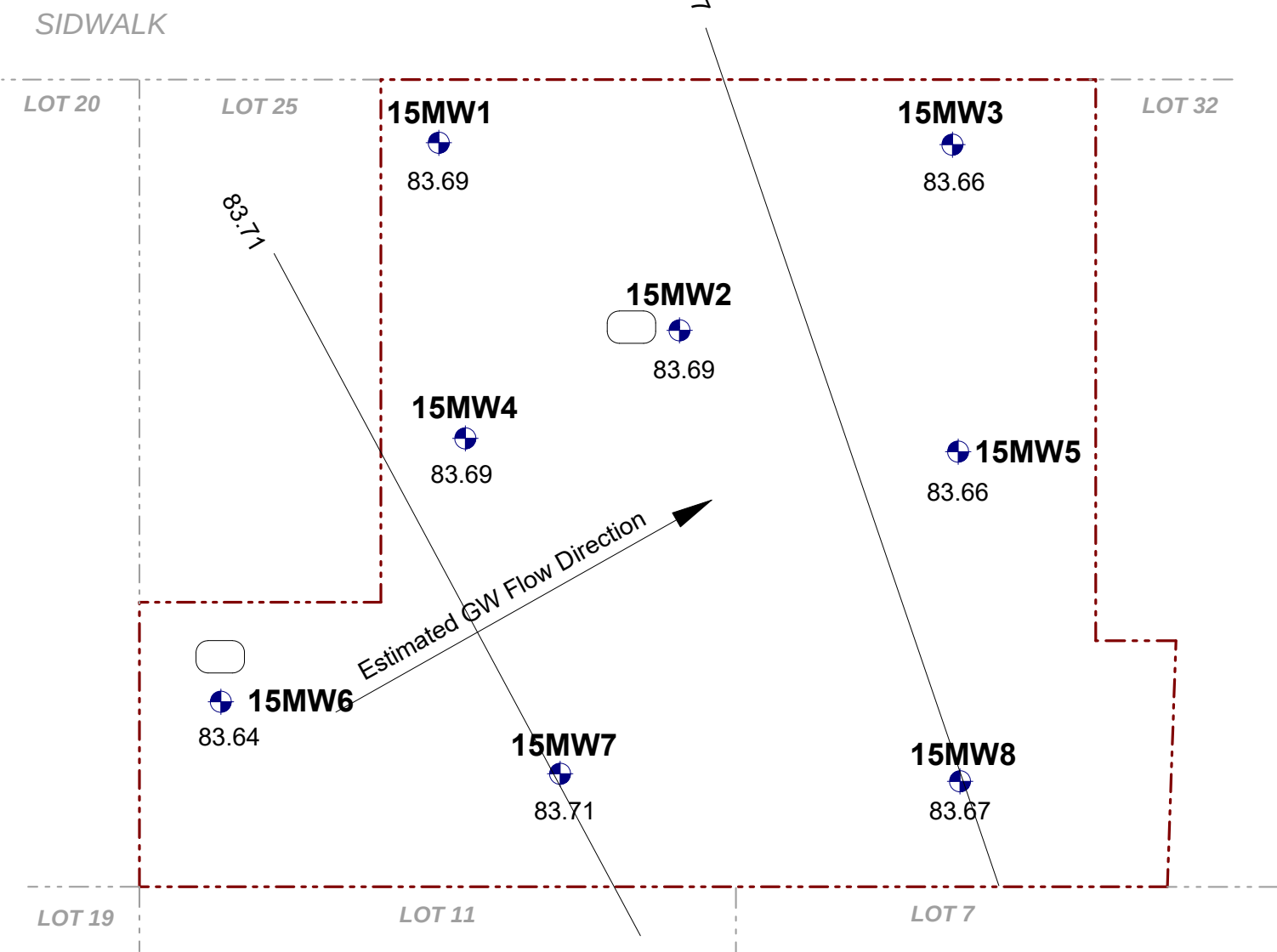
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FORMER CARTER SPRAY FINISHING CORP.
65 ECKFORD STREET, BROOKLYN, NY

FIGURE 10 REGIONAL GROUNDWATER MAP



ECKFORD STREET



KEY:

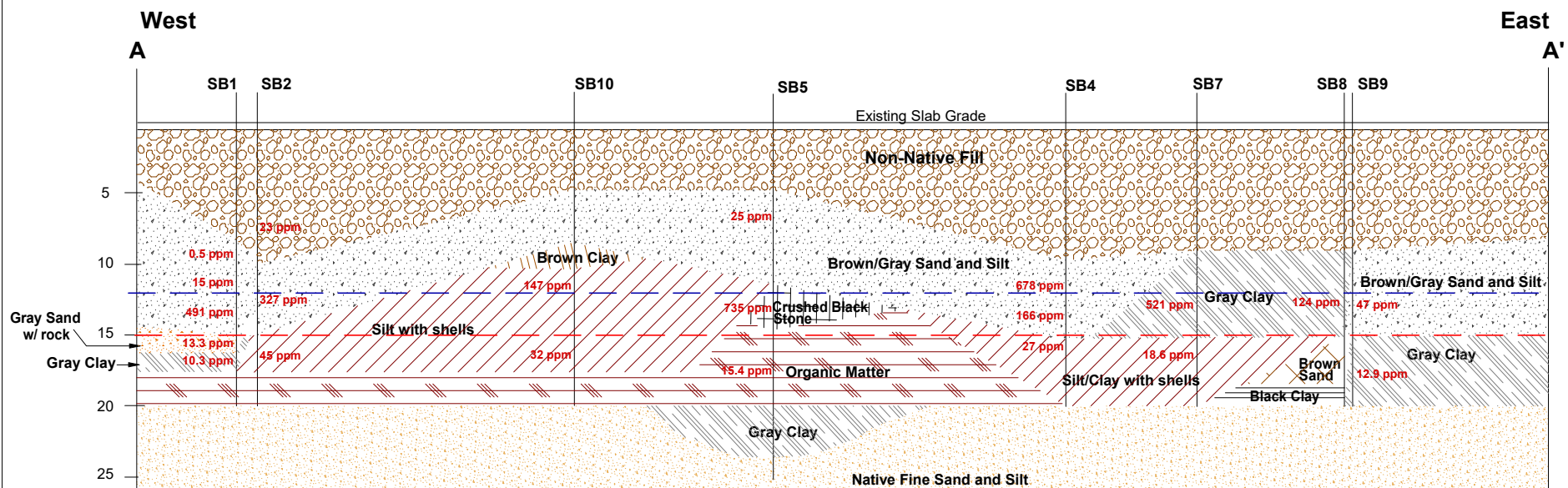
BCP Boundary

Monitoring Well Locations - December 2015

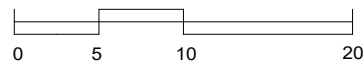
SCALE:

0 10 20 30

Scale: 1 inch = 20 feet



SCALE:



1 Inch = 10 Feet

KEY:

- Foundation and Footing Excavation Depth
- Excavation Depth/Depth to Groundwater

EB

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Figure No.
12

Site Name: **FORMER CARTER SPRAY FINISHING CORP.**

Site Address: **65 ECKFORD STREET, BROOKLYN, NY**

Drawing Title: **GEOLOGIC CROSS SECTION**

APPENDIX B

Field Sampling Plan

FIELD SAMPLING PLAN
65 ECKFORD STREET
BROOKLYN, NEW YORK

by
Haley & Aldrich of New York
New York, New York

for
New York State Department of Environmental Conservation
Albany, NY

File No. 0202156-002
November 2021



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APPENDIX A – Field Forms

1. Introduction

This Field Sampling Plan (FSP) has been prepared as a component of the Supplemental Investigation Work Plan (SIWP) for the subject Site located at 65 Eckford Street in Brooklyn, New York. This document was prepared to establish field procedures for field data collection to be performed in support of the SIWP for the Site.

The SIWP includes this Field Sampling Plan, a Quality Assurance Project Plan (QAPP), Health and Safety Plan (HASP), and Community Air Monitoring Plan (CAMP), which are included as part of this plan by reference.

The standard operating procedures (SOP) included as components of this plan will provide the procedures necessary to meet the project objectives. The SOPs will be used as reference for the methods to be employed for field sample collection and handling and the management of field data collected in the execution of the approved RIWP. The SOPs include numerous methods to execute the tasks of the RIWP. The Project Manager will select the appropriate method as required by field conditions and/or the objective of the respective project task at the time of sample collection. Field procedures will be conducted in general accordance with the New York State Department of Conservation (NYSDEC) Technical Guidance for Site Investigation and Remediation (DER-10) and the Sampling, Analysis and Assessment of Per- and Polyfluoroalkyl Substances (PFAS) under NYSDEC Part 375 Remedial Program when applicable.

2. Field Program

This FSP provides the general purpose of sampling as well as procedural information. The SIWP contains the details on sampling and analysis (locations, depths, frequency, analyte lists, etc.).

The field program has been designed to acquire the necessary data to comply with the SIWP, and includes the following tasks:

- Soil sampling;
- Groundwater sampling;
- Soil vapor sampling;
- Sampling of investigation of derived wastes (IDW) as needed for disposal.

A Remedial Investigation was performed at the Site by Environmental Business Consultants in 2015, for the anticipated contaminants based on the Site's uses and has partially determined the nature and extent of volatile organic compound (VOC), semi-volatile organic compound (SVOC), polychlorinated biphenyl (PCB), pesticide, and metal contaminants. The Site characterization did not identify a source of contamination on the Site and did not sample for emerging contaminants, therefore additional targeted soil sampling, and sampling of groundwater and soil vapor is proposed.

These SOPs presented herein may be changed as required, dependent on-site conditions, or equipment limitations, at the time of sample collection. If the procedures employed differ from the SOP, the deviations will be documented in the associated sampling report.

3. Utility Clearance

Invasive remedial activities such as excavation or remedial construction activities require location of underground utilities prior to initiating work. Such clearance is sound practice in that it minimizes the potential for damage to underground facilities and more importantly, is protective of the health and safety of personnel. Under no circumstances will invasive activities be allowed to proceed without obtaining proper utility clearance by the appropriate public agencies and/or private entities. This clearance requirement applies to all work on both public and private property, whether located in a dense urban area or a seemingly out-of-the-way rural location.

The drilling contractor performing the work will be responsible for obtaining utility clearance.

Utility clearance is required by law, and obtaining clearance includes contacting a public or private central clearance agency via a “one-call” telephone service and providing the proposed exploration location information. It is important to note that public utility agencies may not, and usually do not have information regarding utility locations on private property.

Before beginning subsurface work at any proposed exploration locations, it is critical that all readily-available information on underground utilities and structures be obtained. This includes publicly available information as well as information in the possession of private landowners. Any drawings obtained must be reviewed in detail for information pertaining to underground utilities.

Using the information obtained, the site should be viewed in detail for physical evidence of buried lines or structures, including pavement cuts and patches, variation in or lack of vegetation, variations in grading, etc. Care must also be taken to avoid overhead utilities as well. Presence of surface elements of buried utilities should be documented, such as manholes, gas or water service valves, catch basins, monuments or other evidence.

Overhead utility lines must be considered when choosing exploration and excavation locations. Most states require a minimum of 10 ft of clearance between equipment and energized wires. Such separation requirements may also be voltage-based and may vary depending on state or municipality regulations. In evaluating clearance from overhead lines, the same restrictions may apply to “drops”, or wires on a utility pole connecting overhead and underground lines.

Using the information obtained and observations made, proposed exploration or construction locations should be marked in the field. Marking locations can be accomplished using spray paint on the ground, stakes, or other means. All markings of proposed locations should be made in white, in accordance with the generally-accepted universal color code for facilities identification (AWMA 4/99):

- White: Proposed Excavation or Drilling location
- Pink: Temporary Survey Markings
- Red: Electrical Power Lines, Cables, Conduit and Lighting Cables
- Yellow: Gas, Oil, Steam, Petroleum or Gaseous Materials
- Orange: Communication, Alarm or Signal Lines, Cables or Conduits
- Blue: Potable Water
- Purple: Reclaimed Water, Irrigation and Slurry Lines

- Green: Sewers and Drain Lines

In order to effectively evaluate the proposed locations with these entities, detailed, accurate measurements between the proposed locations and existing surface features should be obtained. Such features can be buildings, street intersections, utility poles, guardrails, etc.

Obtaining the utility clearance generally involves the designated “One-Call” underground facilities protection organization for the area and the landowner and one or both following entities:

- A third-party utility locator company will be utilized to locate underground utilities outside of the public right-of-way; and/or
- “Soft dig” excavation techniques to confirm or deny the presence of underground utilities in the area.

The proposed locations should be evaluated in light of information available for existing underground facilities. The detailed measurement information described above will be required by the “one call” agency. The owners of the applicable, participating underground utilities are obligated to mark their respective facilities at the site in the colors described above. Utility stake-out activities will typically not commence for approximately 72 hours after the initial request is made.

The public and private utility entities generally only mark the locations of their respective underground facilities within public rights-of-way. Determination of the locations of these facilities on private property will be the responsibility of the property owner or Contractor. If available information does not contain sufficient detail to locate underground facilities with a reasonable amount of confidence, alternate measures may be appropriate, as described below. In some cases, the memory of a long-time employee of a facility on private property may be the best or only source of information. It is incumbent on the Consultant or Contractor to exercise caution and use good judgement when faced with uncertainty.

Note: It is important to note that not all utilities are participants in the “one-call” agency or process. As such, inquiries must be made with the “one-call” agency to determine which entities do not participate, so they can be contacted independently.

Most utility stakeouts have a limited time period for which they remain valid, typically two to three weeks. It is critical that this time period be considered to prevent expiration of clearance prior to completion of the invasive activities, and the need to repeat the stake-out process.

Care must be exercised to document receipt of notice from the involved agencies of the presence or absence of utilities in the vicinity of the proposed locations.

Most agencies will generally provide a telephone or fax communication indicating the lack of facilities in the project area. If contact is not made by all of the agencies identified by the “one-call” process, do not assume that such utilities are not present. Re-contact the “one-call” agency to determine the status.

For complicated sites with multiple proposed locations and multiple utilities, it is advisable to arrange an on-site meeting with utility representatives. This will minimize the potential for miscommunication amongst the involved parties.

Completion of the utility stake out process is not a guarantee that underground facilities will not be encountered in excavations or boreholes; in fact, most “one-call” agencies and individual utilities do not offer guarantees, nor do they accept liability for damage that might occur. In areas outside the public right-of-way, a utility locating service may be utilized to locate underground utilities. It is advisable that any invasive activities proceed with extreme caution in the upper four to five feet in the event the clearance has failed to identify an existing facility. This may necessitate hand-excavation or probing to confirm potential presence of shallow utilities. If uncertainty exists for any given utility, extra activities can be initiated to solve utility clearance concerns. These options include:

- Screening the proposed work areas with utility locating devices, and/or hiring a utility locating service to perform this task.
- Hand digging, augering or probing to expose or reveal shallow utilities and confirm presence and location. In northern climates, this may require advancing to below frost line, typically at least four feet.
- Using “soft dig” techniques that utilize specialized tools and compressed air to excavate soils and locate utilities. This technique is effective in locating utilities to a depth of four to five feet.

Equipment/Materials:

- White Spray paint
- Wooden stakes, painted white or containing white flagging
- Color-code key
- Available drawings

4. Field Data Recording

This procedure describes protocol for documenting the investigation activities in the field. Field data serves as the cornerstone for an environmental project, not only for site characterization but for additional phases of investigation or remedial design. Producing defensible data includes proper and appropriate recording of field data as it is obtained in a manner to preserve the information for future use. This procedure provides guidelines for accurate, thorough collection and preservation of written and electronic field data.

Field data to be recorded during the project generally includes, but is not limited to, the following:

- general field observations;
- numeric field measurements and instrument readings;
- quantity estimates;
- sample locations and corresponding sample numbers;
- relevant comments and details pertaining to the samples collected;
- documentation of activities, procedures and progress achieved;
- contractor pay item quantities;
- weather conditions;
- a listing of personnel involved in site-related activities;
- a log of conversations, site meetings and other communications; and,
- field decisions and pertinent information associated with the decisions.

4.1 Written Field Data

Written field data will be collected using a standardized, pre-printed field log form. In general, use of a field log form is preferable as it prompts field personnel to make appropriate observations and record data in a standardized format. This promotes completeness and consistency from one person to the next. Otherwise, electronic data collection using a handheld device produces equal completeness and consistency using a preformatted log form.

In the absence of an appropriate pre-printed form, the data should be recorded in an organized and structured manner in a dedicated project field log book. Log books must be hard cover, bound so that pages cannot be added or removed, and should be made from high-grade 50% rag paper with a water-resistant surface.

The following are guidelines for use of field log forms and log books:

1. Information must be factual and complete.
2. All entries will be made in black indelible ink with a ballpoint pen and will be written legibly. Do not use “rollerball” or felt tip-style pens, since the water-soluble ink can run or smear in the presence of moisture.
3. Field log forms should be consecutively numbered.
4. Each day’s work must start a new form/page.
5. At the end of each day, the current log book page or forms must be signed and dated by the field personnel making the entries.

6. Make data entries immediately upon obtaining the data. Do not make temporary notes in other locations for later transfer; this only increases the potential for error or loss of data.
7. Entry errors are to be crossed out with a single line and initialed by the person making the correction.
8. Do not leave blanks on log forms, if no entry is applicable for a given data field, indicate so with "NA" or a dash ("--").
9. At the earliest practical time, photocopies or typed versions of log forms and log book pages should be made and placed in the project file as a backup in the event the book or forms are lost or damaged.
10. Log books should be dedicated to one project only, i.e., do not record data from multiple projects in one log book.

4.2 Electronic Data

Electronic data recording involves electronic measurement of field information through the use of monitoring instruments, sensors, gauges, and equipment controls. The following is a list of guidelines for proper recording and management of electronic field data:

1. Field data management should follow requirements of a project-specific data management plan (DMP), if applicable.
2. Use only instruments that have been calibrated in accordance with manufacturer's recommendations.
3. Usage of instruments, controls and computers for the purpose of obtaining field data should only be performed by personnel properly trained and experienced in the use of the equipment and software.
4. Use only fully-licensed software on personal computers and laptops.
5. Loss of electronic files may mean loss of irreplaceable data. Every effort should be made to back up electronic files obtained in the field as soon as practical. A backup file placed on the file server will minimize the potential for loss.
6. Electronic files, once transferred from field instruments or laptops to office computers, should be protected if possible, to prevent unwanted or inadvertent manipulation or modification of data. Several levels of protection are usually available for spreadsheets, including making a file "read-only" or assigning a password to access the file.
7. Protect CD disks from exposure to moisture, excessive heat or cold, magnetic fields, or other potentially damaging conditions.
8. Remote monitoring is often used to obtain stored electronic data from site environmental systems. A thorough discussion of this type of electronic field data recording is beyond the scope of this Section. Such on-site systems are generally capable of storing a limited amount of data as a comma-delimited or spreadsheet file. Users must remotely access the monitoring equipment files via modem or other access and download the data. In order to minimize the potential for loss of data, access and downloading of data should be performed frequently enough to ensure the data storage capacity of the remote equipment is not exceeded.

Equipment/Materials:

- Appropriate field log forms, or iPad® or equivalent with preformatted log forms.
- Indelible ball point pen (do not use "rollerball" or felt-tip style pens);
- Straight edge;

- Pocket calculator; and
- Laptop computer (if required).

5. Aquifer Characterization

This procedure describes measurement of water levels in groundwater monitoring.

A synoptic gauging round will be completed to obtain water levels in monitoring wells. Water levels will be acquired in a manner that provides accurate data that can be used to calculate vertical and horizontal hydraulic gradients and other hydrogeologic parameters. Accuracy in obtaining the measurements is critical to ensure the usability of the data.

5.1 Procedure

In order to provide reliable data, water level monitoring events should be collected over as short a period of time as practical. Barometric pressure can affect groundwater levels and, therefore, observation of significant weather changes during the period of water level measurements must be noted. Rainfall events and groundwater pumping can also affect groundwater level measurements. Personnel collecting water level data must note if any of these controls are in effect during the groundwater level collection period. Due to possible changes during the groundwater level collection period, it is imperative that the time of data collection at each station be accurately recorded. Water levels will also be collected prior to any sample collection that day.

The depth to groundwater will be measured with an electronic depth-indicating probe. Prior to obtaining a measurement, a fixed reference point on the well casing will be established for each well to be measured. Unless otherwise established, the reference point is typically established and marked on the north side of the well casing. Do not use protective casings or flush-mounted road boxes as a reference, due to the potential for damage or settlement. The elevation of the reference point shall be obtained by accepted surveying methods, to the nearest 0.01 ft.

The water level probe will be lowered into the well until the meter indicates (via indicator light or tone) the water is reached. The probe will be raised above water level and slowly lowered again until water is indicated. The cable will be held against the side of the inner protective casing at the point designated for water level measurements and a depth reading taken. This procedure will be followed three times or until a consistent value is obtained. The value will be recorded to the nearest 0.01 feet on the Groundwater Level Monitoring Report form.

Upon completion, the probe will be raised to the surface and together with the amount of cable that entered the well casing, will be decontaminated in accordance with methods described in Equipment Decontamination Procedure.

Equipment/Materials:

- Battery-operated, non-stretch electronic water level probe with permanent markings at 0.01 ft. increments, such as the Solinst Model 101 or equivalent.
- The calibrated cable on the depth indicator will be checked against a surveyor's steel tape once per quarter year. A new cable will be installed if the cable has changed by more than 0.01% (0.01 feet for a 100-foot cable). See also the Field Instruments – Use and Calibration Procedure.
- Groundwater Level Monitoring Report form.

6. Sample Collection for Laboratory Analysis

6.1 SOIL SAMPLE COLLECTION FOR LABORATORY ANALYSIS

The following procedure is an introduction to soil sampling techniques and an outline of field staff responsibilities. All samples will be collected with dedicated sampling equipment.

6.1.1 Preparatory Requirements

Prior to the beginning of any remedial investigation or remedial measures activities, staff must attend a project briefing for the purpose of reviewing the project work plan, site and utility plans, drawings, applicable regulations, sampling location, depth, and criteria, site contacts, and other related documents. Health and safety concerns will be documented in a site-specific Health & Safety Plan.

A file folder for the field activities should be created and maintained such that all relevant documents and log forms likely to be useful for the completion of field activities by others are readily available in the event of personnel changes.

6.1.2 Soil Classification

The stratigraphic log is a factual description of the soil at the borehole location and is relied upon to interpret the soil characteristics, and their influence and significance in the subsurface environment. The accuracy of the stratigraphic log is to be verified by the person responsible for interpreting subsurface conditions. An accurate description of the soil stratigraphy is essential for a reasonable understanding of the subsurface conditions. Confirmation of the field description by examination of representative soil samples by the project geologist, hydrogeologist, or geotechnical engineer (whenever practicable) is recommended.

The ability to describe and classify soil correctly is a skill that is learned from a person with experience and by systematic training and comparison of laboratory results to field descriptions.

6.1.2.1 Data Recording

Several methods for classifying and describing soils or unconsolidated sediments are in relatively widespread use. The Unified Soil Classification System (USCS) is the most common. With the USCS, a soil is first classified according to whether it is predominantly coarse-grained or fine-grained.

The description of fill soil is similar to that of natural undisturbed soil except that it is identified as fill and not classified by USCS group, relative density, or consistency. Those logging soils must attempt to distinguish between soils that have been placed (i.e., fill) and not naturally present; or soils that have been naturally present but disturbed (i.e., disturbed native).

It is necessary to identify and group soil samples consistently to determine the subsurface pattern or changes and non-conformities in soil stratigraphy in the field at the time of drilling. The stratigraphy in each borehole during drilling is to be compared to the stratigraphy found at the previously completed

boreholes to ensure that pattern or changes in soil stratigraphy are noted and that consistent terminology is used.

Visual examination, physical observations and manual tests (adapted from ASTM D2488, visual-manual procedures) are used to classify and group soil samples in the field and are summarized in this subsection. ASTM D2488 should be reviewed for detailed explanations of the procedures.

Visual-manual procedures used for soil identification and classification include:

- visual determination of grain size, soil gradation, and percentage fines;
- dry strength, dilatancy, toughness, and plasticity (thread or ribbon test) tests for identification of inorganic fine-grained soil (e.g., CL, CH, ML, or MH); and
- soil compressive strength and consistency estimates based on thumb indent and pocket penetrometer (preferred) methods.

Soil characteristics like plasticity, strength and dilatancy should be determined using the Haley & Aldrich Soil Identification Field Form.

6.1.2.2 Field Sample Screening

Upon the collection of soil samples, the soil is screened with a photoionization detector (PID) for the presence of organic vapor. This is accomplished by running the PID across the soil sample. The highest reading and sustained readings are recorded.

Note: The PID measurement must be done upwind of the excavating equipment or any running engines so that exhaust fumes will not affect the measurements.

Another method of field screening is head space measurements. This consists of placing a portion of the soil sample in a sealable glass jar, placing aluminum foil over the jar top, and tightening the lid. Alternatively, plastic sealable bags may be utilized for field screen in lieu of glass containers. The jar should only be partially filled. Shake the jar and set aside for at least 30 minutes. After the sample has equilibrated, the lid of the jar can be opened; the foil is punctured with the PID probe and the air (headspace) above the soil sample is monitored. This headspace reading on the field form or in the field book is recorded. All head space measurements must be completed under similar conditions to allow comparability of results. Soil classification and PID readings will be recorded in the daily field report.

Equipment/Materials:

- Pocket knife or small spatula
- Small handheld lens
- Stratigraphic Log (Overburden) (Form 2001)
- Tape Measure
- When sampling for PFAS, acceptable materials for sampling include stainless steel, high density polyethylene (HDPE), PVC, silicone, acetate, and polypropylene.

6.1.3 Soil Sampling

Soil samples will be collected from acetate liners installed by a track-mounted direct push drill rig (Geoprobe®) operated by a licensed operator. Soil samples will be collected using a stainless-steel

trowel or sampling spoon into laboratory provided sample containers. If it is necessary to relocate any proposed sampling location due to terrain, utilities, access, etc., the Project Manager must be notified, and an alternate location will be selected.

Prior to use and between each sampling location at an environmental site, the sampling equipment must be decontaminated. All decontamination must be conducted in accordance with the project specific plans or the methods presented in SOP 7.0.

6.1.4 Sampling Techniques

The following procedure describes typical soil sample collection methods for submission of samples to a laboratory for chemical analysis. The primary goal of soil sampling is to collect representative samples for examination and chemical analysis (if required).

Environmental soil samples obtained for chemical analyses are collected with special attention given to the rationale behind determining the precise zone to sample, the specifics of the method of soil extraction and the requisite decontamination procedures. Preservation, handling and glassware for environmental soil samples varies considerably depending upon several factors including the analytical method to be conducted, and the analytical laboratory being used.

6.1.4.1 Grab Versus Composite Samples

A grab sample is collected to identify and quantify conditions at a specific location or interval. The sample is comprised of the minimum amount of soil necessary to make up the volume of sample dictated by the required sample analyses. Composite samples may be obtained from several locations or along a linear trend (in a test pit or excavation). Sampling may occur within or across stratification.

6.2 GROUNDWATER SAMPLE COLLECTION FOR LABORATORY ANALYSIS

The following section describes two techniques for groundwater sampling: "Low Stress/Low Flow Methods" and "Typical Sampling Methods."

"Low Stress/Low Flow" methods will be employed when collecting groundwater samples for the evaluation of volatile constituents (i.e. dissolved oxygen (DO)) or in fine-grained formations where sediment/colloid transport is possible. Analyses typically sensitive to colloidal transport issues include polychlorinated biphenyls (PCBs), polyaromatic hydrocarbons (PAHs) and metals.

The "Typical Sampling Methods" will be employed where the collection of parameters less sensitive to turbidity/sediment issues are being collected (general chemistry, pesticides and other semi-volatile organic compounds (SVOCs)).

NOTE: If non-aqueous phase liquids (NAPL) (light or dense) are detected in a monitoring well, groundwater sample collection will not be conducted, and the Project Manager must be contacted to determine a course of action.

6.2.1 Preparatory Requirements

- Verify well identification and location using borehole log details and location layout figures. Note the condition of the well and record any necessary repair work required.
- Prior to opening the well cap, measure the breathing space above the well casing with a handheld organic vapor analyzer to establish baseline breathing space VOC levels. Repeat this measurement once the well cap is opened. If either of these measurements exceeds the air quality criteria in the HASP, field personnel should adjust their PPE accordingly.
- Prior to commencing the groundwater purging/sampling, a water level must be obtained to determine the well volume for hydraulic purposes. In some settings, it may be necessary to allow the water level time to equilibrate. This condition exists if a water tight seal exists at the well cap and the water level has fluctuated above the top of screen; creating a vacuum or pressurized area in this air space. Three water level checks will verify static water level conditions have been achieved.
- Calculate the volume of water in the well. Typically overburden well volumes consider only the quantity of water standing in the well screen and riser; bedrock well volumes are calculated on the quantity of water within the open core hole and within the overburden casing.

6.2.2 Well Development

Well development is completed to remove fine grained materials from the well but in such a manner as to not introduce fines from the formation into the sand pack. Well development continues until the well responds to water level changes in the formation (i.e., a good hydraulic connection is established between the well and formation) and the well produces clear, sediment-free water to the extent practical.

- Attach appropriate pump and lower tubing into well.
- Gauge well and calculate one well volume. Turn on pump. If well runs dry, shut off pump and allow to recover.
- Surging will be performed by raising and lowering the pump several times to pull fine-grained material from the well. Periodically measure turbidity level using a La Motte turbidity reader.
- The second and third steps will be repeated until turbidity is less than 50 nephelometric turbidity units (NTU) or when 10 well volumes have been removed.
- All water generated during cleaning and development procedures will be collected and contained on site in 55-gallon drums for future analysis and appropriate disposal.

Equipment:

- Appropriate health and safety equipment
- Knife
- Power source (generator)
- Field book
- Well Development Form (Form 3006)
- Well keys

- Graduated pails
- Pump and tubing
- Cleaning supplies (including non-phosphate soap, buckets, brushes, laboratory-supplied distilled/deionized water, tap water, cleaning solvent, aluminum foil, plastic sheeting, etc.)
- Water level meter

6.2.3 Well Purging and Stabilization Monitoring (Low Stress/Low Flow Method)

The preferred method for groundwater sampling will be the low stress/low flow method described below.

- Slowly lower the pump, safety cable, tubing and electrical lines into the well to the depth specified by the project requirements. The pump intake must be at the midpoint of the well screen to prevent disturbance and resuspension of any sediment in the screen base.
- Before starting the pump, measure the water level again with the pump in the well leaving the water level measuring device in the well when completed.
- Purge the well at 100 to a maximum of 500 milliliters per minute (mL/min). During purging, the water level should be monitored approximately every 5 minutes, or as appropriate. A steady flow rate should be maintained that results in drawdown of 0.3 feet or less. The rate of pumping should not exceed the natural flow rate conditions of the well. Care should be taken to maintain pump suction and to avoid entrainment of air in the tubing. Record adjustments made to the pumping rates and water levels immediately after each adjustment.
- During the purging of the well, monitor and record the field indicator parameters (pH, temperature, conductivity, oxidation-reduction (redox) reaction potential (ORP), dissolved oxygen (DO), and turbidity) approximately every five minutes. Stabilization is considered to be achieved when the final groundwater flow rate is achieved, and three consecutive readings for each parameter are within the following limits:
 - pH: 0.1 pH units of the average value of the three readings;
 - Temperature: 3 percent of the average value of the three readings;
 - Conductivity: 0.005 milliSiemen per centimeter (mS/cm) of the average value of the three readings for conductivity <1 mS/cm and 0.01 mS/cm of the average value of the three readings for conductivity >1 mS/cm;
 - ORP: 10 millivolts (mV) of the average value of the three readings;
 - DO: 10 percent of the average value of the three readings; and
 - Turbidity: 10 percent of the average value of the three readings, or a final value of less than 50 nephelometric turbidity units (NTU).
- The pump must not be removed from the well between purging and sampling.

6.2.4 Sampling Techniques

- If an alternate pump is utilized, the first pump discharge volumes should be discarded to allow the equipment a period of acclimation to the groundwater.

- Samples are collected directly from the pump with the groundwater being discharged directly into the appropriate sample container. Avoid handling the interior of the bottle or bottle cap and don new gloves for each well sampled to avoid contamination of the sample.
- Order of sample collection:
 - Polyfluoroalkyl substances (PFAS)
 - Volatile organic compounds (VOC)
 - 1,4-Dioxane
 - Semi-volatile organic compounds (SVOC)
 - Total Analyte List (TAL) metals
- No sampling equipment components or sample containers should come in contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials including plumbers tape and sample bottle cap liners with a PTFE layer.
- For low stress/low flow sampling, samples should be collected at a flow rate between 100 and 500 mL/min and such that drawdown of the water level within the well does not exceed the maximum allowable drawdown of 0.3 feet.
- The pumping rate used to collect a sample for VOC should not exceed 100 mL/min. Samples should be transferred directly to the final container 40 mL glass vials completely full and topped with a Teflon cap. Once capped the vial must be inverted and tapped to check for headspace/air presence (bubbles). If air is present, the sample will be discarded, and recollected until free of air.
- All samples must be labeled with:
 - A unique sample number
 - Date and time
 - Parameters to be analyzed
 - Project Reference ID
 - Samplers initials
- Labels should be written in indelible ink and secured to the bottle with clear tape.

Equipment/Materials:

- pH meter, conductivity meter, DO meter, ORP meter, nephelometer, temperature gauge
- Field filtration units (if required)
- Purging/sampling equipment
 - Peristaltic Pump
- Water level probe
- Sampling materials (containers, log book/forms, coolers, chain of custody)
- Work Plan
- Health and Safety Plan
- When sampling for PFAS, acceptable materials for sampling include stainless steel, HDPE, PVC, silicone, acetate, and polypropylene.

Note: 1,4-Dioxane and PFAS purge and sample techniques will be conducted following the NYSDEC guidance documents (see Appendix C of the RIWP). Acceptable groundwater pumps include stainless steel inertia pump with HDPE tubing, peristaltic pump equipped with HDPE tubing and silicone tubing, stainless steel bailer with stainless steel ball or bladder pump (identified as PFAS-free) with HDPE tubing.

Field Notes:

- Field notes must document all the events, equipment used, and measurements collected during the sampling activities. Section 2.0 describes the data/recording procedure for field activities.
- The log book should document the following for each well sampled:
 - Identification of well
 - Well depth
 - Static water level depth and measurement technique
 - Sounded well depth
 - Presence of immiscible layers and detection/collection method
 - Well yield – high or low
 - Purge volume and pumping rate
 - Time well purged
 - Measured field parameters
 - Purge/sampling device used
 - Well sampling sequence
 - Sampling appearance
 - Sample odors
 - Sample volume
 - Types of sample containers and sample identification
 - Preservative(s) used
 - Parameters requested for analysis
 - Field analysis data and method(s)
 - Sample distribution and transporter
 - Laboratory shipped to
 - Chain of custody number for shipment to laboratory
 - Field observations on sampling event
 - Name collector(s)
 - Climatic conditions including air temperature
 - Problems encountered and any deviations made from the established sampling protocol.

A standard log form for documentation and reporting groundwater purging and sampling events are presented on the Groundwater Sampling Record, Low Flow Groundwater Sampling Form, and Low Flow Monitored Natural Attenuation (MNA) Field Sampling Form. Refer to Appendix A for example field forms.

Groundwater/Decon Fluid Disposal:

- Groundwater disposal methods will vary on a case-by-case basis but may range from:

- Off-site treatment at private treatment/disposal facilities or public owned treatment facilities
- On-site treatment at Facility operated facilities
- Direct discharge to the surrounding ground surface, allowing groundwater infiltration to the underlying subsurface regime
- Decontamination fluids should be segregated and collected separately from wash waters/groundwater containers.

6.3 SOIL VAPOR SAMPLING

The following procedure is an introduction to soil vapor sampling techniques and an outline of field staff responsibilities.

6.3.1 Preparatory Requirements

Prior to collecting the field sample, ensure the stainless steel oil vapor probe has been installed to the desired depth and sealed completely to the surface using a material such as bentonite. As part of the vapor intrusion evaluation, a tracer gas should be used in accordance with NYSDOH protocols to serve as a quality assurance/quality control (QA/QC) device to verify the integrity of the soil vapor probe seal. A container (box, plastic pail, etc.) will serve to keep the tracer gas in contact with the probe during testing. A portable monitoring device will be used to analyze a sample of soil vapor for the tracer gas prior to sampling. If the tracer sample results show a significant presence of the tracer, the probe seals will be adjusted to prevent infiltration. At the conclusion of the sampling round, tracer monitoring should be performed a second time to confirm the integrity of the probe seals.

6.3.2 Sampling Techniques

Samples will be collected in appropriately sized Summa canisters that have been certified clean by the laboratory and samples will be analyzed by using USEPA Method TO-15. Flow rate for both purging and sampling will not exceed 0.2 L/min. One to three implant volumes shall be purged prior to the collection of any soil-gas samples. A sample log sheet will be maintained summarizing sample identification, date and time of sample collection, sampling depth, identity of samplers, sampling methods and devices, soil vapor purge volumes, volume of the soil vapor extracted, vacuum of canisters before and after the samples are collected, apparent moisture content of the sampling zone, and chain of custody protocols.

6.4 SAMPLE HANDLING AND SHIPPING

Sample management is the continuous care given to each sample from the point of collection to receipt at the analytical laboratory. Good sample management ensures that samples are properly recorded, properly labeled, and not lost, broken, or exposed to conditions which may affect the sample's integrity.

All sample submissions must be accompanied with a chain of custody (COC) document to record sample collection and submission. Personnel performing sampling tasks must check the sample preparation and preservation requirements to ensure compliance with the Quality Assurance Project Plan.

The following sections provide the minimum standards for sample management.

6.4.1 Sample Handling

Prior to entering the field area where sampling is to be conducted, especially at sites with defined exclusion zones, the sampler should ensure that all materials necessary to complete the sampling are on hand. If samples must be maintained at a specified temperature after collection, dedicated coolers and ice must be available for use. Conversely, when sampling in cold weather, proper protection of water samples, trip blanks, and field blanks must be considered. Sample preservation will involve pH adjustment, cooling to 4°C, and sample filtration and preservation.

6.4.2 Sample Labeling

Samples must be properly labeled immediately upon collection.

Note that the data shown on the sample label is the minimum data required. The sample label data requirements are listed below for clarity.

- Project name
- Sample name/number/unique identifier
- Sampler's initials
- Date of sample collection
- Time of sample collection
- Analysis required
- Preservatives

To ensure that samples are not confused, a clear notation should be made on the container with a permanent marker. If the containers are too soiled for marking, the container can be put into a "zip lock" bag which can then be labeled.

All sample names will be as follows:

- Sample unique identifier: Enter the sample name or number. There should be NO slashes, spaces or periods in the date.
- Date: Enter the six-digit date when the sample was collected. Note that for one-digit days, months, and/or years, add zeros so that the format is MMDDYY (050210). There should be NO slashes, dashes, or periods in the date.

The QA/QC samples will be numbered consecutively as collected with a sample name, date and number of sample collected throughout the day (i.e. when multiple QA/QC samples are collected in one day).

Examples of this naming convention are as follows:

Sample Name:	Comments
TB-050202-0001	TRIP BLANK
TB-050202-0002	TRIP BLANK
FD-050202-0001	FIELD DUPLICATE
FD-050202-0002	FIELD DUPLICATE

NOTE: The QA/QC Sample # resets to 0001 EACH DAY, this will avoid having to look back to the previous day for the correct sequential number.

6.4.3 Field Code

The field code will be written in the 'Comments' field on the chain of custody for EVERY sample but will not be a part of the actual sample name. Enter the one/two-character code for type of sample (must be in CAPITALS):

N	Normal Field Sample
FD	Field Duplicate (note sample number (i.e. 0001) substituted for time)
TB	Trip Blank (note sample number (i.e. 0001) substituted for time)
EB	Equipment Blank (note sample number (i.e. 0001) substituted for time)
FB	Field Blank (note sample number (i.e. 0001) substituted for time)
KD	Known Duplicate
FS	Field Spike Sample
MS	Matrix Spike Sample (note on 'Comments' field of COC – laboratory to spike matrix.
MD	Matrix Spike Duplicate Sample (note on 'Comments' field of COC – laboratory to spike matrix.
RM	Reference Material

The sample labeling – both chain and sample bottles must be EXACTLY as detailed above. In addition, the Field Sample Key for each sample collected must be filled out.

6.4.4 Packaging

Sample container preparation and packing for shipment should be completed in a well-organized and clean area, free of any potential cross contamination. The following is a list of standard guidelines which must be followed when packing samples for shipment.

- Double bag ice in "Zip Lock" bags.
- Double check to ensure trip and temperature blanks have been included for all shipments containing VOCs, or where otherwise specified in the QAPP.
- Enclose the Chain of Custody form in a "Zip Lock" bag.
- Ensure custody seals (two, minimum) are placed on each cooler. Coolers with hinged lids should have both seals placed on the opening edge of the lid. Coolers with "free" lids should have seals placed on opposite diagonal corners of the lid. Place clear tape over custody seals.
- Containers should be wiped clean of all debris/water using paper towels (paper towels must be disposed of with other contaminated materials).
- Clear, wide packing tape should be placed over the sample label for protection.
- Do not bulk pack. Each sample must be individually padded.
- Large glass containers (1 liter and up) require much more space between containers.
- Ice is not a packing material due to the reduction in volume when it melts.

Note: Never store sterile sample containers in enclosures containing equipment which use any form of fuel or volatile petroleum-based product. When conducting sampling in freezing conditions at sites without a heated storage area (free of potential cross contaminants), unused trip blanks should be isolated from coolers immediately after receipt. Trip blanks should be double bagged and kept from freezing.

6.4.5 Chain-of-Custody Records

Chain of custody (COC) forms will be completed for all samples collected. The form documents the transfer of sample containers. The COC record, completed at the time of sampling, will contain, but not be limited to, the sample number, date and time of sampling, and the name of the sampler. The COC document will be signed and dated by the sampler when transferring the samples.

Each sample cooler being shipped to the laboratory will contain a COC form. The cooler will be sealed properly for shipment. The laboratory will maintain a copy for their records. One copy will be returned with the data deliverables package.

The following list provides guidance for the completion and handling of all COCs:

- COCs used should be a Haley & Aldrich standard form or supplied by the analytical laboratory.
- COCs must be completed in black ball point ink only.
- COCs must be completed neatly using printed text.
- If a simple mistake is made, cross out the error with a single line and initial and date the correction.
- Each separate sample entry must be sequentially numbered.
- If numerous repetitive entries must be made in the same column, place a continuous vertical arrow between the first entry and the next different entry.
- When more than one COC form is used for a single shipment, each form must be consecutively numbered using the "Page ____ of ____" format.
- If necessary, place additional instructions directly onto the COC in the Comment Section. Do not enclose separate instructions.
- Include a contact name and phone number on the COC in case there is a problem with the shipment.
- Before using an acronym on a COC, define clearly the full interpretation of your designation [i.e., polychlorinated biphenyls (PCBs)].

6.4.6 Shipment

Prior to the start of the field sampling, the carrier should be contacted to determine if pickup will be at the field site location. If pick-up is not available at the Site, the nearest pick-up or drop off location should be determined. Sample shipments must not be left at unsecured drop locations.

Copies of all shipment manifests must be maintained in the field file.

7. Field Instruments – Use and Calibration

A significant number of field activities involve usage of electronic instruments to monitor for environmental conditions and health and safety purposes. It is imperative the instruments are used and maintained properly to optimize their performance and minimize the potential for inaccuracies in the data obtained. This section provides guidance on the usage, maintenance and calibration of electronic field equipment.

- All monitoring equipment will be in proper working order and operated in accordance with manufacturer's recommendations.
- Field personnel will be responsible for ensuring that the equipment is maintained and calibrated in the field in accordance with manufacturer's recommendations.
- Instruments will be operated only by personnel trained in the proper usage and calibration.
- Personnel must be aware of the range of conditions such as temperature and humidity for instrument operation. Usage of instruments in conditions outside these ranges will only proceed with approval of the Project Manager and/or Health and Safety Officer as appropriate.
- Instruments that contain radioactive source material, such as x-ray fluorescence (XRF) analyzers or moisture-density gauges require specific transportation, handling and usage procedures that are generally associated with a license from the Nuclear Regulatory Commission (NRC) or an NRC-Agreement State. Under no circumstance will operation of such instruments be allowed on site unless by properly authorized and trained personnel, using the proper personal dosimetry badges or monitoring instruments.

7.1 GENERAL PROCEDURE DISCUSSION

Care must be taken to minimize the potential for transfer of contaminated materials to the ground or onto other materials. Regardless of the size or nature of the equipment being decontaminated, the process will utilize a series of steps that involve removal of gross material (dirt, grease, oil etc.), washing with a detergent, and multiple rinsing steps. In lieu of a series of washes and rinse steps, steam cleaning with low-volume, high-pressure equipment (i.e., steam cleaner) is acceptable.

Exploration equipment, and all monitoring equipment in contact with the sampling media must be decontaminated prior to initiating site activities, in between exploration locations to minimize cross-contamination, and prior to mobilizing off site after completion of site work.

The following specific decontamination procedure is recommended for sampling equipment and tools:

- Brush loose soil off equipment;
- Wash equipment with laboratory grade detergent (i.e., Alconox or equivalent);
- Rinse with tap water;
- Rinse equipment with distilled water;
- Allow water to evaporate before reusing equipment; and

- Wrap equipment in aluminum foil when not being used.

7.2 DECONTAMINATION OF MONITORING EQUIPMENT

Because monitoring equipment is difficult to decontaminate, care should be exercised to prevent contamination. Sensitive monitoring instruments should be protected when they are at risk of exposure to contaminants. This may include enclosing them in plastic bags allowing an opening for the sample intake. Ventilation ports should not be covered.

If contamination does occur, decontamination of the equipment will be required; however, immersion in decontamination fluids is not possible. As such, care must be taken to wipe the instruments down with detergent-wetted wipes or sponges, and then with de-ionized water-wetted wipes or sponges.

7.3 DISPOSAL OF WASH SOLUTIONS AND CONTAMINATED EQUIPMENT

All contaminated wash water, rinses, solids and materials used in the decontamination process that cannot be effectively decontaminated (such as polyethylene sheeting) will be containerized and disposed of in accordance with applicable regulations. All containers will be labeled with an indelible marker as to contents and date of placement in the container, and any appropriate stickers required (such as PCBs). Storage of decontamination wastes on site will not exceed 90 days under any circumstances.

Equipment/Materials:

Decontamination equipment and solutions are generally selected based on ease of decontamination and disposability.

- Polyethylene sheeting;
- Metal racks to hold equipment;
- Soft-bristle scrub brushes or long-handle brushes for removing gross contamination and scrubbing with wash solutions;
- Large galvanized wash tubs, stock tanks, or wading pools for wash and rinse solutions;
- Plastic buckets or garden sprayers for rinse solutions;
- Large plastic garbage cans or other similar containers lined with plastic bags can be used to store contaminated clothing;
- Contaminated liquids and solids should be segregated and containerized in DOT-approved plastic or metal drums, appropriate for offsite shipping/disposal if necessary.

8. Investigation Derived Waste Disposal

8.1 RATIONALE/ASSUMPTIONS

This procedure applies to the disposition of investigation derived waste (IDW) including soils and/or groundwater. IDW is dealt with the following "Best Management Practices" and is not considered a listed waste due to the lack of generator knowledge concerning chemical source, chemical origin, and timing of chemical introduction to the subsurface.

Consequently, waste sampling and characterization is performed to determine if the wastes exhibit a characteristic of hazardous waste. The disposal of soil cuttings, test pit soils and/or purged groundwater will be reviewed on a case by case basis prior to initiation of field activities. Two scenarios typically exist:

- When no information is available in the area of activity or investigation, and impacted media/soils are identified. Activities such as new construction and /or maintenance below grade may encounter environmental conditions that were unknown.
- Disposal Required/Containerization Required – When sufficient Site information regarding the investigative Site conditions warrant that all materials handled will be contained and disposed.

If a known listed hazardous and/or characteristically hazardous waste/contaminated environmental media is being handled, then handling must be performed in accordance with RCRA Subtitle C (reference 2, Part V, Section 1(a),(b),(c)).

The following outlines the waste characterization procedures to be employed when IDW disposal is required.

The following procedure describes the techniques for characterization of IDW for disposal purposes. IDW may consist of soil cuttings (augering, boring, well installation soils, test pit soils), rock core or rock flour (from coring, reaming operations), groundwater (from well development, purging and sampling activities), decontamination fluids, personal protective equipment (PPE), and disposal equipment (DE).

8.2 PROCEDURE

The procedures for handling and characterization of field activity generated wastes are:

- A.) Soil Cuttings - Soils removed from boring activities will be contained within an approved container, suitable for transportation and disposal.
- Once placed into the approved container, any free - liquids (i.e., groundwater) will be removed for disposal as waste fluids or solidified within the approved container using a solidification agent such as Speedy Dri (or equivalent).
 - Contained soils will be screened for the presence of Volatile Organic Compounds (VOCs), using a Photo ionization detector (PID); this data will be logged for future reference.
 - Once screened, full and closed; the container will be labeled and placed into the container storage area. At a minimum, the following information will be shown on each container

label: date of filling/generation, Site name, source of soils (i.e., borehole or well), and contact.

- Prior to container closure, representative samples from the containers will be collected for waste characterization purposes and submitted to the project laboratory.
- Typically, at a location where an undetermined site-specific parameter group exists, sampling and analysis may consist of the full RCRA Waste Characterization (ignitability, corrosivity, reactivity, toxicity), or a subset of the above based upon data collected, historical information, and generator knowledge.

B.) Groundwater - purging, and sampling groundwater, which requires disposal, will be contained.

- Containment may be performed in 55-gallon drums, tanks suitable for temporary storage (i.e., Nalgene tanks 500 to 1,000 gallons) or if large volumes of groundwater are anticipated, tanker trailer (5,000 to 10,000 gallons $\pm$), or drilling "Frac" tanks may be utilized (20,000 gallons $\pm$). In all cases the container/tank used for groundwater storage must be clean before use such that cross contamination does not occur.

C.) Decon Waters/Decon Fluids - Decon waters and/or fluids will be segregated, contained, and disposed accordingly.

- Decon waters may be disposed of with the containerized groundwater once analytical results have been acquired.

D.) PPE/DE – A number of disposal options exists for spent PPE/DE generated from investigation tasks. The options typically employed are:

- Immediately disposed of within on-Site dumpster/municipal trash; or
- If known to be contaminated with RCRA hazardous waste, dispose off-Site at a RCRA Subtitle C facility.
- Spent Solvent/Acid Rinses - The need for sampling must be determined in consultation with the waste management organization handling the materials. If known that only the solvent and/or acids are present, then direct disposal/treatment using media specific options may be possible without sampling (i.e., incineration).
- PPE/DE – Typically not sampled and included with the disposal of the solid wastes.

Equipment/Materials:

- Sample spoons, trier, auger,
- Sample mixing bowl,
- Sampling bailer, or pump,
- Sample glassware.

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APPENDIX A
Field Forms

EQUIPMENT CALIBRATION LOG

Project:**Location:****Model Name:****Model Number:****Serial Number:****Cal. Standards:**

Instruments will be calibrated in accordance with manufacturer's recommendations at least once per day.

[illegible]**Other Comments:**

Location:

Well ID: _____

Date: _____

Start Time: _____

Finished Time: _____

Initial Depth to Water: _____ Purging Device: _____

Well Depth: _____ Tubing present in well? _____

Depth to top of screen: _____ Tubing type: _____

Depth to bottom of screen: _____

Depth of Pump Intake: _____

[illegible]

Comments:

SAMPLE IDENTIFICATION KEY

Page of

PROJECT _____
 LOCATION _____
 CLIENT _____
 CONTRACTOR _____

H&A FILE NO. _____

PROJECT MGR. _____

[illegible]

Notes:

Common Sample Type Codes:

N Normal Environmental Sample	WG Groundwater	WS Surface Water	SO Soil	GS Soil Gas	SE Sediment
WQ Water for Quality Control	FD Field Duplicate	EB Equipment Blank	TB Trip Blank	MS Matrix Spike	MSD Matrix Spike Duplicate

see Memorandum dated 08/08/05 from Melanie Satanek "Sample Labeling for Submission to Analytical Laboratory" for less common codes

DAILY FIELD REPORT

Page of

Project

Report No.

Location

Date

Client

Page

Contractor

File No.

Weather

Temperature

Field Representative(s)

Time on site

Report/Travel/OtherTotal hours

Distribution:

Haley & Aldrich, Inc.

APPENDIX C

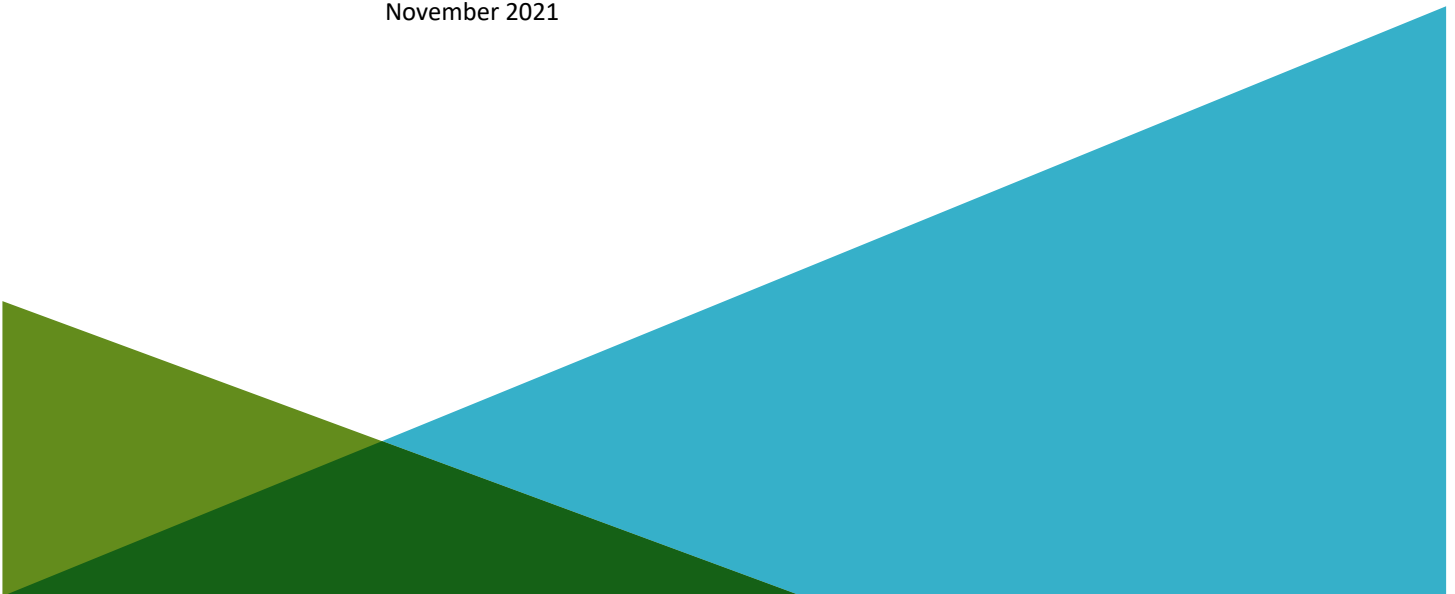
Quality Assurance Project Plan

QUALITY ASSURANCE PROJECT PLAN
65 ECKFORD STREET
BROOKLYN, NEW YORK

by
Haley & Aldrich of New York
New York, New York

for
New York State Department of Environmental Conservation
Albany, New York

File No. 0202156-002
November 2021



Executive Summary

This Quality Assurance Project Plan (QAPP) outlines the scope of the quality assurance and quality control (QA/QC) activities associated with the site monitoring activities associated with the Supplemental Investigation Work Plan (SIWP) for 65 Eckford Street (Site) in Brooklyn, New York.

Protocols for sample collection, sample handling and storage, chain-of-custody procedures, and laboratory and field analyses are described herein or specifically referenced to related project documents.

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1. Project Description

This Quality Assurance Project Plan (QAPP) has been prepared as a component of the SIWP for the 65 Eckford Street Site in Brooklyn, New York.

1.1 PROJECT OBJECTIVES

The primary objective for data collection activities is to collect sufficient data necessary to monitor the nature of any remaining groundwater and soil impacts.

1.2 SITE DESCRIPTION AND HISTORY

The general Site description and Site history is provided in the Site Description and History Summary that accompanies the SIWP.

1.3 LABORATORY PARAMETERS

The laboratory parameters for soil include:

- Target Compound List volatile organic compounds (VOCs) using EPA method 8260B
- Target Compound List semi-volatile organic compounds (SVOCs) using EPA method 8270C
- Total Analyte List (TAL) Metals using EPA method 6010
- Polychlorinated biphenyls (PCBs) using EPA method 8082
- Pesticides using EPA 8081
- Per- and polyfluoroalkyl substances (PFAS) using Modified EPA method 537
- 1,4-Dioxane using EPA method 8260B

The laboratory parameters for groundwater include:

- Target Compound List VOCs using EPA method 8260C
- Target Compound List SVOCs using EPA method 8270C
- Total Analyte List Metals using EPA method 6010
- Per- and polyfluoroalkyl substances (PFAS) using Modified EPA method 537
- 1,4-Dioxane using EPA method 8260B

Note: 1,4-Dioxane and PFAS sampling techniques will be conducted following the NYSDEC, Sampling, Analysis and Assessment of Per- and Polyfluoroalkyl Substances (PFAS) under NYSDEC Part 375 Remedial Program released in June 2021 and Sampling for 1,4-Dioxane and Per- and Polyfluoroalkyl Substances (PFAS) Under DEC's Part 375 Remedial Programs release June 2021.

During the collection of groundwater samples, pH, specific conductivity, temperature, dissolved oxygen (DO), and oxidation/reduction potential (ORP) will be measured.

Laboratory parameters for disposal samples will be determined by the disposal facility after an approved facility has been determined.

1.4 SAMPLING LOCATIONS

The SIWP provides the locations of soil samples and groundwater monitoring wells that will be sampled.

2. Project Organization and Responsibilities

This section defines the roles and responsibilities of the individuals who will perform the SIWP monitoring activities. A NYSDOH certified analytical laboratory will perform the analyses of environmental samples collected at the Site.

2.1 MANAGEMENT RESPONSIBILITIES

The Project Manager is responsible for managing the implementation of the SIWP and monitoring and coordinating the collection of data. The Project Manager is responsible for technical quality control and project oversight. The Project Manager responsibilities include the following:

- Acquire and apply technical and corporate resources as needed to ensure performance within budget and schedule restraints;
- Review work performed to ensure quality, responsiveness, and timeliness;
- Communicate with the client point of contact concerning the progress of the monitoring activities;
- Assure corrective actions are taken for deficiencies cited during audits of SIWP monitoring activities; and
- Overall Site health and safety plan compliance.

2.2 QUALITY ASSURANCE RESPONSIBILITIES

The Quality Assurance team will consist of a Quality Assurance Officer and the Data Validation staff. Quality Assurance responsibilities are described as follows:

2.2.1 Quality Assurance (QA) Officer

The QA Officer reports directly to the Project Manager and will be responsible for overseeing the review of field and laboratory data. Additional responsibilities include the following:

- Assure the application and effectiveness of the QAPP by the analytical laboratory and the project staff;
- Provide input to the Project Manager as to corrective actions that may be required as a result of the above-mentioned evaluations;
- Prepare and/or review data validation and audit reports.

The QA Officer will be assisted by the data validation staff in the evaluation and validation of field and laboratory generated data.

2.2.2 Data Validation Staff

The data validation staff will be independent of the laboratory and familiar with the analytical procedures performed. The validation will include a review of each validation criterion as prescribed by the guidelines presented in Section 9.2 of this document and be presented in a Data Usability Summary Report (DUSR) for submittal to the QA Officer.

2.3 LABORATORY RESPONSIBILITIES

Laboratory services in support of the SIWP monitoring include the following personnel:

2.3.1 Laboratory Project Manager

The Laboratory Project Manager will report directly to the QA Officer and Project Manager and will be responsible for ensuring all resources of the laboratory are available on an as-required basis. The Laboratory Project Manager will also be responsible for the approval of the final analytical reports.

2.3.2 Laboratory Operations Manager

The Laboratory Operations Manager will report to the Laboratory Project Manager and will be responsible for coordinating laboratory analysis, supervising in-house chain-of-custody reports, scheduling sample analyses, overseeing data review and overseeing preparation of analytical reports.

2.3.3 Laboratory QA Officer

The Laboratory QA Officer will have sole responsibility for review and validation of the analytical laboratory data. The Laboratory QA Officer will provide Case Narrative descriptions of any data quality issues encountered during the analyses conducted by the laboratory. The QA Officer will also define appropriate QA procedures, overseeing QA/QC documentation.

2.3.4 Laboratory Sample Custodian

The Laboratory Sample Custodian will report to the Laboratory Operations Manager and will be responsible for the following:

- Receive and inspect the incoming sample containers;
- Record the condition of the incoming sample containers;
- Sign appropriate documents;
- Verify chain-of-custody and its correctness;
- Notify the Project Manager and Operations Manager of sample receipt and inspection;
- Assign a unique identification number and enter each into the sample receiving log;
- Initiate transfer of samples to laboratory analytical sections; and
- Control and monitor access/storage of samples and extracts.

2.3.5 Laboratory Technical Personnel

The laboratory technical staff will have the primary responsibility in the performance of sample analysis and the execution of the QA procedures developed to determine the data quality. These activities will include the proper preparation and analysis of the project samples in accordance with the laboratory's Quality Assurance Manual (QAM) and associated Standard Operating Procedures (SOP).

2.4 FIELD RESPONSIBILITIES

2.4.1 Field Coordinator

The Field Coordinator is responsible for the overall operation of the field team and reports directly to the Project Manager. The Field Coordinator works with the project Health & Safety Officer (HSO) to conduct operations in compliance with the project Health & Safety Plan (HASP). The Field Coordinator will facilitate communication and coordinate efforts between the Project Manager and the field team members.

Other responsibilities include the following:

- Develop and implement field-related work plans, ensuring schedule compliance, and adhering to management-developed project requirements;
- Coordinate and manage field staff;
- Perform field system audits;
- Oversee quality control for technical data provided by the field staff;
- Prepare and approve text and graphics required for field team efforts;
- Coordinate and oversee technical efforts of subcontractors assisting the field team;
- Identify problems in the field; resolve difficulties in consultation with the Project QAO, and Project Manager; implement and document corrective action procedures; and,
- Participate in preparation of the final reports.

2.4.2 Field Team Personnel

Field Team Personnel will be responsible for the following:

- Perform field activities as detailed in the SIWP and in compliance with the Field Sampling Plan (FSP) and QAPP.
- Immediately report any accidents and/or unsafe conditions to the Site Health & Safety Officer and take reasonable precautions to prevent injury.

3. Sampling Procedures

The FSP provides the SOPs for sampling of soil and groundwater required by the SIWP.

3.1 SAMPLE CONTAINERS

Sample containers for each sampling task will be provided by the laboratory performing the analysis. The containers will be cleaned by the manufacturer to meet or exceed the analyte specifications established in the U.S. EPA, "Specifications and Guidance for Obtaining Contaminant-Free Sample Containers", April 1992, OSWER Directive #9240.0-0.5A. Certificates of analysis for each lot of sample containers used will be maintained by the laboratory.

The appropriate sample containers, preservation method, maximum holding times, and handling requirements for each sampling task are provided in Table I.

3.2 SAMPLE LABELING

Each sample will be labeled with a unique sample identifier that will facilitate tracking and cross-referencing of sample information:

- Sample Identifier-Month Day Year

Equipment rinse blank and field duplicate samples also will be numbered with a unique sample identifier to prevent analytical bias of field QC samples.

Refer to the FSP for the sample labeling procedures.

3.3 FIELD QC SAMPLE COLLECTION

3.3.1 Field Duplicate Sample Collection

3.3.1.1 *Water Samples*

Field duplicate samples will be collected by filling the first sample container to the proper level and sealing and then repeated for the second set of sample container.

1. The samples are properly labeled as specified in Section 3.2.
2. Steps 1 through 4 are repeated for the bottles for each analysis. The samples are collected in order of decreasing analyte volatility as detailed in Section 3.3.1.
3. Chain-of-custody documents are executed.
4. The samples will be handled as specified in Table I.

3.3.1.2 *Soil Samples*

Soil field duplicates will be collected as specified in the following procedure:

1. Soils will be sampling directly from acetate liners.
2. Soil for VOC analysis will be removed from the sampling device as specified in the FSP.
3. Soil for non-VOC analysis will be removed from the sampling device and collected into clean laboratory provided containers.

4. Custody Procedures

Sample custody is addressed in three parts: field sample collection, laboratory analysis, and final project files. Custody of a sample begins when it is collected by or transferred to an individual and ends when that individual relinquishes or disposes of the sample.

A sample is under custody if:

1. The item is in actual possession of a person;
2. The item is in the view of the person after being in actual possession of the person;
3. The item was in actual possession and subsequently stored to prevent tampering; or
4. The item is in a designated and identified secure area.

4.1 FIELD CUSTODY PROCEDURES

Field personnel will keep written records of field activities on applicable preprinted field forms or in a bound field notebook to record data collecting activities. These records will be written legibly in ink and will contain pertinent field data and observations. Entry errors or changes will be crossed out with a single line, dated, and initialed by the person making the correction. Field forms and notebooks will be periodically reviewed by the Field Coordinator.

The beginning of each entry in the logbook or preprinted field form will contain the following information:

- Date
- Start time
- Weather
- Names of field personnel (including subcontractors)
- Level of personal protection used at the Site
- Names of all visitors and the purpose of their visit.

For each measurement and sample collected, the following information will be recorded:

- Detailed description of sample location,
- Equipment used to collect sample or make measurement and the date equipment was calibrated,
- Time sample was collected,
- Description of the sample conditions,
- Depth sample was collected (if applicable),
- Volume and number of containers filled with the sample; and,
- Sampler's identification.

4.1.1 Field Procedures

The following procedure describes the process to maintain the integrity of the samples:

- Upon collection samples are placed in the proper containers. In general, samples collected for organic analysis will be placed in pre-cleaned glass containers and samples collected for inorganic analysis will be placed in pre-cleaned plastic (polyethylene) bottles. Refer to the FSP for sample packaging procedures.
- Samples will be assigned a unique sample number and will be affixed to a sample label. Refer to the FSP for sample labeling procedures.
- Samples will be properly and appropriately preserved by field personnel in order to minimize loss of the constituent(s) of interest due to physical, chemical, or biological mechanisms.
- Appropriate volumes will be collected to ensure that the appropriate reporting limits can be successfully achieved and that the required QC sample analyses can be performed.

4.1.2 Transfer of Custody and Shipment Procedures

- A chain-of-custody (COC) record will be completed at the time of sample collection and will accompany each shipment of project samples to the laboratory. The field personnel collecting the samples will be responsible for the custody of the samples until the samples are relinquished to the laboratory. Sample transfer will require the individuals relinquishing and receiving the samples to sign, date and note the time of sample transfer on the COC record.
- Samples will be shipped or delivered in a timely fashion to the laboratory so that holding times and/or analysis times as prescribed by the methodology can be met.
- Samples will be transported in containers (coolers) which will maintain the refrigeration temperature for those parameters for which refrigeration is required in the prescribed preservation protocols.
- Samples will be placed in an upright position and limited to one layer of samples per cooler. Additional bubble wrap or packaging material will be added to fill the cooler. Shipping containers will be secured with strapping tape and custody tape for shipment to the laboratory.
- When samples are split with the NYSDEC representatives, a separate chain-of-custody will be prepared and marked to indicate with whom the samples are shared. The person relinquishing the samples will require the representative's signature acknowledging sample receipt.
- If samples are sent by a commercial carrier, a bill of lading will be used. A copy of the bill of lading will be retained as part of the permanent record. Commercial carriers will not sign the custody record as long as the custody record is sealed inside the sample cooler and the custody tape remains intact.
- Samples will be picked up by a laboratory courier or transported to the laboratory the same day they are collected unless collected on a weekend or holiday. In these cases, the samples will be

stored in a secure location until delivery to the laboratory. Additional ice will be added to the cooler as needed to maintain proper preservation temperatures.

4.2 LABORATORY CHAIN-OF-CUSTODY PROCEDURES

A sample custodian will be designated by the laboratory and will have the responsibility to receive all incoming samples. Once received, the custodian will document if the sample is received in good condition (i.e., unbroken, cooled, etc.) and that the associated paperwork, such as chain-of-custody forms have been completed. The custodian will sign the chain-of-custody forms.

The custodian will also document if sufficient sample volume has been received to complete the analytical program. The sample custodian will then place the samples into secure, limited access storage (refrigerated storage, if required). The sample custodian will assign a unique number to each incoming sample for use in the laboratory. The unique number will then be entered into the sample-receiving log with the verified time and date of receipt also noted.

Consistent with the analyses requested on the chain-of-custody form, analyses by the laboratory's analysts will begin in accordance with the appropriate methodologies. Samples will be removed from secure storage with internal chain-of-custody sign-out procedures followed.

4.3 STORAGE OF SAMPLES

Empty sample bottles will be returned to secure and limited access storage after the available volume has been consumed by the analysis. Upon completion of the entire analytical work effort, samples will be disposed of by the sample custodian. The length of time that samples are held will be at least thirty (30) days after reports have been submitted. Disposal of remaining samples will be completed in compliance with all Federal, State and local requirements.

4.4 FINAL PROJECT FILES CUSTODY PROCEDURES

The final project files will be the central repository for all documents with information relevant to sampling and analysis activities as described in this QAPP. The Haley & Aldrich Project Manager will be the custodian of the project file. The project files including all relevant records, reports, logs, field notebooks, pictures, subcontractor reports and data reviews will be maintained in a secured, limited access area and under custody of the Project Director or his designee.

The final project file will include the following:

- Project plans and drawings
- Field data records
- Sample identification documents and soil boring/monitoring well logs
- All chain-of-custody documentation
- Correspondence
- References, literature
- Laboratory data deliverables
- Data validation and assessment reports
- Progress reports, QA reports
- Final report

The laboratory will be responsible for maintaining analytical logbooks, laboratory data and sample chain of custody documents. Raw laboratory data files and copies of hard copy reports will be inventoried and maintained by the laboratory for a period of six (6) years at which time the laboratory will contact the Haley & Aldrich Project Manager regarding the disposition of the project related files.

5. Calibration Procedures and Frequency

5.1 FIELD INSTRUMENT CALIBRATION PROCEDURES

Several field instruments will be used for both on-site screening of samples and for health and safety monitoring, as described in the Health and Safety Plan (HASP). On-site air monitoring for health and safety purposes may be accomplished using a vapor detection device, such as a Photo-ionization Detector (PID).

Field instruments will be calibrated at the beginning of each day and checked during field activities to verify performance. Instrument specific calibration procedures will be performed in accordance with the instrument manufacturer's requirements.

5.2 LABORATORY INSTRUMENT CALIBRATION PROCEDURES

Reference materials of known purity and quality will be utilized for the analysis of environmental samples. The laboratory will carefully monitor the preparation and use of reference materials including solutions, standards, and reagents through well-documented procedures.

All solid chemicals and acids/bases used by the laboratory will be rated as "reagent grade" or better. All gases will be "high" purity or better. All Standard Reference Materials (SRMs) or Performance Evaluation (PE) materials will be obtained from approved vendors of the National Institute of Standards and Technology (formerly National Bureau of Standards), the U.S. EPA Environmental Monitoring Support Laboratories (EMSL), or reliable Cooperative Research and Development Agreement (CRADA) certified commercial sources.

6. Analytical Procedures

Analytical procedures to be utilized for analysis of environmental samples will be based on referenced USEPA analytical protocols and/or project specific SOP.

6.1 FIELD ANALYTICAL PROCEDURES

Field analytical procedures include the measurement of pH, temperature, ORP, DO and specific conductivity during sampling of groundwater, and the qualitative measurement of Volatile Organic Compounds (VOC) during the collection of soil samples.

6.2 LABORATORY ANALYTICAL PROCEDURES

Laboratory analyses will be based on the U.S. EPA methodology requirements promulgated in:

- "Test Methods for Evaluating Solid Waste," SW-846 EPA, Office of Solid Waste, and promulgated updates, 1986.

6.2.1 List of Project Target Compounds and Laboratory Detection Limits

The laboratory reporting limits (RLs) and associated method detection limits (MDLs) for the target analytes and compounds for the environmental media to be analyzed are presented in Table I. MDLs have been experimentally determined by the project laboratory using the method provided in 40 CFR, Part 136 Appendix B.

Laboratory parameters for soil samples are listed in the SIWP. Laboratory parameters for disposal samples will be determined by the disposal facility after an approved facility has been determined.

6.2.2 List of Method Specific Quality Control (QC) Criteria

The laboratory SOPs include a section that presents the minimum QC requirements for the project analyses. Section 7.0 references the frequency of the associated QC samples for each sampling effort and matrix.

7. Internal Quality Control Checks

This section presents the internal quality control checks that will be employed for field and laboratory measurements.

7.1 FIELD QUALITY CONTROL

7.1.1 Field Blanks

Internal quality control checks will include analysis of field blanks to validate equipment cleanliness. Whenever possible, dedicated equipment will be employed to reduce the possibility of cross-contamination of samples.

7.1.2 Trip Blanks

Trip blanks samples will be prepared by the project laboratory using ASTM Type II or equivalent water placed within pre-cleaned 40 milliliter (ml) VOC vials equipped with Teflon septa. Trip blanks will accompany each sample delivery group (SDG) of environmental samples collected for analysis of VOCs.

Trip blank samples will be placed in each cooler that stores and transports project samples that are to be analyzed for VOCs.

7.2 LABORATORY PROCEDURES

Procedures which contribute to maintenance of overall laboratory quality assurance and control include appropriately cleaned sample containers, proper sample identification and logging, applicable sample preservation, storage, and analysis within prescribed holding times, and use of controlled materials.

7.2.1 Field Duplicate Samples

The precision or reproducibility of the data generated will be monitored through the use of field duplicate samples. Field duplicate analysis will be performed at a frequency of 1 in 20 project samples.

Precision will be measured in terms of the absolute value of the relative percent difference (RPD) as expressed by the following equation:

$$RPD = [|R1-R2|/[(R1+R2)/2]] \times 100\%$$

Acceptance criteria for duplicate analyses performed on solid matrices will be 100% and aqueous matrices will be 35%. RPD values outside these limits will require an evaluation of the sampling and/or analysis procedures by the project QA Officer and/or laboratory QA Director. Corrective actions may include re-analysis of additional sample aliquots and/or qualification of the data for use.

7.2.2 Matrix Spike Samples

Ten percent of each project sample matrix for each analytical method performed will be spiked with known concentrations of the specific target compounds/analytes.

The amount of the compound recovered from the sample compared to the amount added will be expressed as a percent recovery. The percent recovery of an analyte is an indication of the accuracy of an analysis within the site-specific sample matrix. Percent recovery will be calculated for MS/MSD using the following equation.

$$\% \text{ Recovery} = \frac{\text{Spiked Sample} - \text{Background}}{\text{Known Value of Spike}} \times 100\%$$

If the quality control value falls outside the control limits (UCL or LCL) due to sample matrix effects, the results will be reported with appropriate data qualifiers. To determine the effect a non-compliant MS recovery has on the reported results, the recovery data will be evaluated as part of the validation process.

7.2.3 Laboratory Control Sample (LCS) Analyses

The laboratory will perform LCS analyses prepared from Standard Reference Materials (SRMs). The SRMs will be supplied from an independent manufacturer and traceable to NIST materials with known concentrations of each target analyte to be determined by the analytical methods performed. In cases where an independently supplied SRM is not available, the LCS may be prepared by the laboratory from a reagent lot other than that used for instrument calibration.

The laboratory will evaluate LCS analyses in terms of percent recovery using the most recent laboratory generated control limits.

LCS recoveries that do not meet acceptance criteria will be deemed invalid. Analysis of project samples will cease until an acceptable LCS analysis has been performed. If sample analysis is performed in association with an out-of-control LCS sample analysis, the data will be deemed invalid.

Corrective actions will be initiated by the Haley & Aldrich QA Officer and/or Laboratory QA Officer to investigate the problem. After the problem has been identified and corrected, the solution will be noted in the instrument run logbook and re-analysis of project samples will be performed, if possible.

The analytical anomaly will be noted in the sample delivery group (SDG) Case Narrative and reviewed by the data validator. The data validator will confirm that appropriate corrective actions were implemented and recommend the applicable use of the affected data.

7.2.4 Surrogate Compound/Internal Standard Recoveries

For VOCs, surrogates will be added to each sample prior to analysis to establish purge and trap efficiency. Quantitation will be accomplished via internal standardization techniques.

The recovery of surrogate compounds and internal standards will be monitored by laboratory personnel to assess possible site-specific matrix effects on instrument performance.

For semi-volatile organics analyses, surrogates will be added to the raw sample to assess extraction efficiency. Internal standards will be added to all sample extracts and instrument calibration standard immediately before analysis for quantitation via internal standardization techniques.

Method specific quality control (QC) limits are provided in the attached laboratory method SOPs. Surrogate compound/internal standard recoveries that do not fall within accepted QC limits for the analytical methodology performed will have the analytical results flagged with data qualifiers as appropriate by the laboratory and will not be noted in the laboratory report Case Narrative.

To ascertain the effect non-compliant surrogate compound/internal standard recoveries may have on the reported results, the recovery data will be evaluated as part of the validation process. The data validator will provide recommendations for corrective actions including but not limited to additional data qualification.

7.2.5 Calibration Verification Standards

Calibration verification (CV) standards will be utilized to confirm instrument calibrations and performance throughout the analytical process. CV standards will be prepared as prescribed by the respective analytical protocols. Continuing calibration will be verified by compliance with method-specific criteria prior to additional analysis of project samples.

Non-compliant analysis of CV standards will require immediate corrective action by the project laboratory QA officer and/or designated personnel. Corrective action may include re-analysis of each affected project sample, a detailed description of the problem, the corrective action undertaken, the person who performed the action, and the resolution of the problem.

7.2.6 Laboratory Method Blank Analyses

Method blank sample analysis will be performed as part of each analytical batch for each methodology performed. If target compounds are detected in the method blank samples, the reported results will be flagged by the laboratory in accordance with standard operating procedures. The data validator will provide recommendations for corrective actions including but not limited to additional data qualification.

8. Data Quality Objectives

Sampling that will be performed as described in the SIWP is designed to produce data of the quality necessary to achieve the minimum standard requirements of the field and laboratory analytical objectives described below. These data are being obtained with the primary objective to assess levels of contaminants of concern associated with the Site.

The overall project data quality objective (DQO) is to implement procedures for field data collection, sample collection, handling, and laboratory analysis and reporting that achieve the project objectives. The following section is a general discussion of the criteria that will be used to measure achievement of the project DQO.

8.1 PRECISION

8.1.1 Definition

Precision is defined as a quantitative measure of the degree to which two or more measurements are in agreement. Precision will be determined by collecting and analyzing field duplicate samples and by creating and analyzing laboratory duplicates from one or more of the field samples. The overall precision of measurement data is a mixture of sampling and analytical factors. The analytical results from the field duplicate samples will provide data on sampling precision. The results from duplicate samples created by the laboratory will provide data on analytical precision. The measurement of precision will be stated in terms of relative percent difference (RPD).

8.1.2 Field Precision Sample Objectives

Field precision will be assessed through collection and measurement of field duplicate samples at a rate of 1 duplicate per 20 investigative samples. The RPD criteria for the project field duplicate samples will be +/- 100% for soil, +/- 35 % for groundwater for parameters of analysis detected at concentrations greater than 5 times (5X) the laboratory reporting limit (RL).

8.1.3 Laboratory Precision Sample Objectives

Laboratory precision will be assessed through the analysis of laboratory control and laboratory control duplicate samples (LCS/LCSD) and matrix spike and matrix spike duplicate (MS/MSD) samples.

8.2 ACCURACY

8.2.1 Definition

Accuracy relates to the bias in a measurement system. Bias is the difference between the observed and the "true" value. Sources of error are the sampling process, field contamination, preservation techniques, sample handling, sample matrix, sample preparation and analytical procedure limitations.

8.2.2 Field Accuracy Objectives

Sampling bias will be assessed by evaluating the results of field equipment rinse and trip blanks. Equipment rinse and trip blanks will be collected as appropriate based on sampling and analytical methods for each sampling effort.

If non-dedicated sampling equipment is used, equipment rinse blanks will be collected by passing ASTM Type II water over and/or through the respective sampling equipment utilized during each sampling effort. One equipment rinse blank will be collected for each type of non-dedicated sampling equipment used for the sampling effort. Equipment rinse blanks will be analyzed for each target parameter for the respective sampling effort for which environmental media have been collected. (Note: If dedicated or disposable sampling equipment is used, equipment rinse samples will not be collected as part of that field effort.)

Trip blank samples will be prepared by the laboratory and provided with each shipping container that includes containers for the collection of groundwater samples for the analysis of VOC. Trip blank samples will be analyzed for each VOC for which groundwater samples have been collected for analysis.

8.3 LABORATORY ACCURACY OBJECTIVES

Analytical bias will be assessed through the use of laboratory control samples (LCS) and Site-specific matrix spike (MS) sample analyses. LCS analyses will be performed with each analytical batch of project samples to determine the accuracy of the analytical system.

One (1) set of MS/MSD analyses will be performed with each batch of twenty (20) project samples collected for analysis to assess the accuracy of the identification and quantification of analytes. Additional sample volume will be collected at sample locations selected for the preparation of MS/MSD samples so that the standard laboratory reporting limits (RLs) are achieved.

The accuracy of analyses that include a sample extraction procedure will be evaluated through the use of system monitoring or surrogate compounds. Surrogate compounds will be added to each sample, standard, blank, and QC sample prior to sample preparation and analysis. Surrogate compound percent recoveries will provide information on the effect of the sample matrix on the accuracy of the analyses.

8.4 REPRESENTATIVENESS

8.4.1 Definition

Representativeness expresses the degree to which sample data represent a characteristic of a population, a parameter variation at a sampling point or an environmental condition. Representativeness is a qualitative parameter that is dependent upon the design of the sampling program. The representativeness criterion is satisfied through the proper selection of sampling locations, the quantity of samples and the use of appropriate procedures to collect and analyze the samples.

8.4.2 Measures to Ensure Representativeness of Field Data

Representativeness will be addressed by prescribing sampling techniques and the rationale used to select sampling locations. Sampling locations may be biased (based on existing data, instrument surveys, observations, etc.) or unbiased (completely random or stratified-random approaches).

8.5 COMPLETENESS

8.5.1 Definition

Completeness is a measure of the amount of valid (usable) data obtained from a measuring system compared to the total amount of the anticipated to be obtained. The completeness goal for all data uses is that a sufficient amount of valid data be generated so that determinations can be made related to the intended data use with a sufficient degree of confidence.

8.5.2 Field Completeness Objectives

Completeness is a measure of the amount of valid measurements obtained from measurements taken in this project versus the number planned.

8.5.3 Laboratory Completeness Objectives

Laboratory data completeness objective is a measure of the amount of valid data obtained from laboratory measurements. The evaluation of the data completeness will be performed at the conclusion of each sampling and analysis effort.

The completeness of the data generated will be determined by comparing the amount of valid data, based on independent validation, with the total laboratory data set.

8.6 COMPARABILITY

8.6.1 Definition

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared to another.

8.6.2 Measures to Ensure Comparability of Laboratory Data

Comparability of laboratory data will be measured from the analysis of Standard Reference Materials (SRM) obtained from either EPA Cooperative Research and Development Agreement (CRADA) suppliers or the National Institute of Standards and Technology (NIST). The reported analytical data will also be presented in standard units of mass of contaminant within a known volume of environmental media. The standard units for various sample matrices are as follows:

- Solid Matrices – mg/kg of media (Dry Weight).
- Aqueous Matrices – ng/L for PFAS analyses, ug/L of media for organic analyses, and mg/L for inorganic analyses.

8.7 LEVEL OF QUALITY CONTROL EFFORT

If non-dedicated sampling equipment is used, equipment rinse blanks will be prepared by field personnel and submitted for analysis of target parameters. Equipment rinse blank samples will be analyzed to check for potential cross-contamination between sampling locations that may be introduced during the investigation. One (1) equipment rinse blank will be collected per sampling event to the extent that non-dedicated sampling equipment is used.

If necessary, A separate equipment rinse blank sample will be collected for PFAS using the sample collection procedure described in Section 8.1.1 of the NYSDEC-approved Avangrid Field Sampling Plan. (Note: If dedicated or disposable sampling equipment is used, equipment rinse samples will not be collected as part of that field effort.)

Trip blanks will be used to assess the potential for contamination during sample storage and shipment. Trip blanks will be provided with the sample containers to be used for the collection of groundwater samples for the analysis of VOC. Trip blanks will be preserved and handled in the same manner as the project samples. One (1) trip blank will be included along with each shipping container containing project samples to be analyzed for VOC.

Method blank samples will be prepared by the laboratory and analyzed concurrently with all project samples to assess potential contamination introduced during the analytical process.

Field duplicate samples will be collected and analyzed to determine sampling and analytical reproducibility. One (1) field duplicate will be collected for every 20 or fewer investigative samples collected for off-Site laboratory analysis.

Matrix spikes will provide information to assess the precision and accuracy of the analysis of the target parameters within the environmental media collected. One (1) matrix spike/matrix spike duplicate (MS/MSD) will be collected for every 20 or fewer investigative samples.

9. Data Reduction, Validation and Reporting

Data generated by the laboratory operation will be reduced and validated prior to reporting in accordance with the following procedures:

9.1 DATA REDUCTION

9.1.1 Field Data Reduction Procedures

Field data reduction procedures will be minimal in scope compared to those implemented in the laboratory setting. The pH, conductivity, temperature, turbidity, DO, ORP and breathing zone VOC readings collected in the field will be generated from direct read instruments. The data will be written into field logbooks immediately after measurements are taken. If errors are made, data will be legibly crossed out, initialed and dated by the field member, and corrected in a space adjacent to the original entry.

9.1.2 Laboratory Data Reduction Procedures

Laboratory data reduction procedures are provided by the appropriate chapter of USEPA, "Test Methods for Evaluating Solid Waste", SW-846, Third Edition. Errors will be noted; corrections made with the original notations crossed out legibly. Analytical results for soil samples will be calculated and reported on a dry weight basis.

9.1.3 Quality Control Data

Quality control data (e.g., laboratory duplicates, surrogates, matrix spikes, and matrix spike duplicates) will be compared to the method acceptance criteria. Data determined to be acceptable will be entered into the laboratory information management system.

Unacceptable data will be appropriately qualified in the project report. Case narratives will be prepared which will include information concerning data that fell outside acceptance limits and any other anomalous conditions encountered during sample analysis.

9.2 DATA VALIDATION

Data validation procedures of the analytical data will be performed by the Haley & Aldrich QA Officer or designee using the following documents as guidance for the review process:

- "U.S. EPA National Functional Guidelines for Organic Data Review", and the "U.S. EPA National Functional Guidelines for Inorganic Data Review".
- The specific data qualifiers used will be applied to the reported results as presented and defined in the EPA National Functional Guidelines. Validation will be performed by qualified personnel at the direction of the Haley & Aldrich QAO.
- The completeness of each data package will be evaluated by the Data Validator. Completeness checks will be administered on all data to determine that the deliverables are consistent with

the NYSDEC Analytical Services Protocol (ASP) Category A and Category B data package requirements. The validator will determine whether the required items are present and request copies of missing deliverables (if necessary) from the laboratory.

9.3 DATA REPORTING

Data reporting procedures will be carried out for field and laboratory operations as indicated below:

- **Field Data Reporting:** Field data reporting will be conducted principally through the transmission of report sheets containing tabulated results of measurements made in the field and documentation of field calibration activities.
- **Laboratory Data Reporting:** The laboratory data reporting package will enable data validation based on the protocols described above. The final laboratory data report format will include the QA/QC sample analysis deliverables to enable the development of a data usability summary report (DUSR) based on Department DER-10 Appendix 2B.

10. Performance and System Audits

A performance audit is an independent quantitative comparison with data routinely obtained in the field or the laboratory. Performance audits include two separate, independent parts: internal and external audits.

10.1 FIELD PERFORMANCE AND SYSTEM AUDITS

10.1.1 Internal Field Audit Responsibilities

Internal audits of field activities will be initiated at the discretion of the Project Manager and will include the review of sampling and field measurements. The audits will verify that all procedures are being followed. Internal field audits will be conducted periodically during the project. The audits will include examination of the following:

- Field sampling records, screening results, instrument operating records
- Sample collection
- Handling and packaging in compliance with procedures
- Maintenance of QA procedures
- Chain-of-custody reports

10.1.2 External Field Audit Responsibilities

External audits may be conducted by the Project Coordinator at any time during the field operations. These audits may or may not be announced and are at the discretion of the NYSDEC. The external field audits can include (but are not limited to) the following:

- Sampling equipment decontamination procedures
- Sample bottle preparation procedures
- Sampling procedures
- Examination of health and safety plans
- Procedures for verification of field duplicates
- Field screening practices

10.2 LABORATORY PERFORMANCE AND SYSTEM AUDITS

10.2.1 Internal Laboratory Audit Responsibilities

The laboratory system audits are typically conducted by the laboratory QA Officer or designee on an annual basis. The system audit will include an examination of laboratory documentation including sample receiving logs, sample storage, chain-of-custody procedures, sample preparation and analysis and instrument operating records.

At the conclusion of internal system audits, reports will be provided to the laboratory's operating divisions for appropriate comment and remedial/corrective action where necessary. Records of audits and corrective actions will be maintained by the Laboratory QA Officer.

10.2.2 External Laboratory Audit Responsibilities

External audits will be conducted as required, by the NYSDOH or designee. External audits may include any of the following:

- Review of laboratory analytical procedures
- Laboratory on-site visits
- Submission of performance evaluation samples for analysis

Failure of any of the above audit procedures can lead to laboratory de-certification. An audit may consist of but not limited to:

- Sample receipt procedures
- Custody, sample security and log-in procedures
- Review of instrument calibration logs
- Review of QA procedures
- Review of log books
- Review of analytical SOPs
- Personnel interviews

A review of a data package from samples recently analyzed by the laboratory can include (but not be limited to) the following:

- Comparison of resulting data to the SOP or method
- Verification of initial and continuing calibrations within control limits
- Verification of surrogate recoveries and instrument timing results
- Review of extended quantitation reports for comparisons of library spectra to instrument spectra, where applicable
- Assurance that samples are run within holding times

11. Preventive Maintenance

11.1 FIELD INSTRUMENT PREVENTIVE MAINTENANCE

The field equipment preventive maintenance program is designed to ensure the effective completion of the sampling effort and to minimize equipment down time. Program implementation is concentrated in three areas:

- Maintenance responsibilities
- Maintenance schedules
- Inventory of critical spare parts and equipment

The maintenance responsibilities for field equipment will be assigned to the task leaders in charge of specific field operations. Field personnel will be responsible for daily field checks and calibrations and for reporting any problems with the equipment. The maintenance schedule will follow the manufacturer's recommendations. In addition, the field personnel will be responsible for determining that an inventory of spare parts will be maintained with the field equipment. The inventory will primarily contain parts that are subject to frequent failure, have limited useful lifetimes and/or cannot be obtained in a timely manner.

11.2 LABORATORY INSTRUMENT PREVENTIVE MAINTENANCE

Analytical instruments at the laboratory will undergo routine and/or preventive maintenance. The extent of the preventive maintenance will be a function of the complexity of the equipment.

Generally, annual preventive maintenance service will involve cleaning, adjusting, inspecting and testing procedures designed to deduce instrument failure and/or extend useful instrument life. Between visits, routine operator maintenance and cleaning will be performed according to manufacturer's specifications by laboratory personnel.

Maintenance records will be placed on file at the laboratory and can be made available upon request.

12. Specific Routine Procedures Used to Assess Data Precision, Accuracy, and Completeness

12.1 FIELD MEASUREMENTS

Field generated information will be reviewed by the Field Coordinator and typically include evaluation of bound logbooks/forms, data entry and calculation checks. Field data will be assessed by the Project Coordinator who will review the field results for compliance with the established QC criteria that are specified in Section 7.0 of this QAPP. The accuracy of pH and specific conductance will be assessed using daily instrument calibration, calibration check, and blank data. Accuracy will be measured by determining the percent recovery (% R) of calibration check standards. Precision of the pH and specific conductance measurements will be assessed on the basis of the reproducibility of duplicate readings of a field sample and will be measured by determining the relative percent difference (RPD). Accuracy and precision of the soil VOC screening will be determined using duplicate readings of calibration checks. Field data completeness will be calculated using the following equation:

$$\text{Completeness} = \frac{\text{Valid (usable) Data Obtained}}{\text{Total Data Planned}} \times 100$$

12.2 LABORATORY DATA

Surrogate, internal standard and matrix spike recoveries will be used to evaluate data quality. The laboratory quality assurance/quality control program will include the following elements:

- Precision, in terms of relative percent difference (RPD), will be determined by relative sample analysis at a frequency of one duplicate analysis for each batch of ten project samples or a frequency of 10 percent (10%). RPD is defined as the absolute difference of duplicate measurements divided by the mean of these analyses normalized to percentage.
- Accuracy, in terms of percent recovery (recovery of known constituent additions or surrogate recoveries), will be determined by the analysis of spiked and unspiked samples. MS/MSD will be used to determine analytical accuracy. The frequency of MS/MSD analyses will be one project sample MS/MSD per set of 20 project samples.
- One method blank will be prepared and analyzed with each batch of project samples. The total number of method blank sample analyses will be determined by the laboratory analytical batch size.
- Standard Reference Materials (SRMs) will be used for each analysis. Sources of SRM's include the U.S. EPA, commercially available material from CRADA certified vendors and/or laboratory produced solutions. SRMs, when available and appropriate, will be processed and analyzed on a frequency of one per set of samples.
- Completeness is the evaluation of the amount of valid data generated versus the total set of data produced from a particular sampling and analysis event. Valid data is determined by independent confirmation of compliance with method-specific and project-specific data quality

objectives. The calculation of data set completeness will be performed by the following equation.

$$\frac{\text{Number of Valid Sample Results}}{\text{Total Number of Samples Planned}} \times 100 = \% \text{ Complete}$$

13. Quality Assurance (QA) Reports

Critically important to the successful implementation of the QA Plan is a reporting system that provides the means by which the program can be reviewed, problems identified, and programmatic changes made to improve the plan.

QA reports to management can include:

- Audit reports, internal and external audits with responses
- Performance evaluation sample results; internal and external sources
- Daily QA/QC exception reports/corrective actions

QA/QC corrective action reports will be prepared by the Haley & Aldrich QA Officer when appropriate and presented to the project and/or laboratory management personnel so that performance criteria can be monitored for all analyses from each analytical department. The updated trend/QA charts prepared by the laboratory QA personnel will be distributed and reviewed by various levels of the laboratory management.

References

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TABLES

TABLE I
SUMMARY OF ANALYSIS METHOD, PRESERVATION METHOD, HOLDING TIME, SAMPLE SIZE REQUIREMENTS AND SAMPLE CONTAINERS
 65 Eckford Street
 Brooklyn, NY

Analysis/Method	Sample Type	Preservation	Holding Time	Volume/Weight	Container	Required Reporting Limit/Method Detection Limit
Volatile Organic Compounds/8260C	Soil	1 - 1 Vial MeOH/2 Vial Water	14 days	120 mL	3 - 40ml glass vials	See Below ²
Semivolatile Organic Compounds/8270D	Soil	Cool, 4 ± 2 °C	14 days	8 oz	1 - 8 oz Glass	
Metals/6010D	Soil	Cool, 4 ± 2 °C	180 days	2 oz	1 - 2 oz Glass	
1,4-Dioxane/8270 SIM	Soil	Cool, 4 ± 2 °C	7 days	8 oz	1 - 8 oz Glass	
PFAS/537	Soil	H ₂ O Cool, 4 ± 2 °C	14 days	8 oz	1 - 8 oz Glass	2 ppt
Volatile Organic Compounds/8260C	Groundwater	HCl, Cool, 4 ± 2 °C	14 days	120 mL	3 - 40ml glass vials	See Below ²
Semivolatile Organic Compounds/8270D	Groundwater	Cool, 4 ± 2 °C	7 days	500 mL	2 - 250 mL amber glass	
TAL Metals 6020	Groundwater	HNO ₃ Cool, 4 ± 2 °C	180 days	500 mL	1 - 500 mL plastic bottle	
1,4-Dioxane	Groundwater	Cool, 4 ± 2 °C	7 days	120 mL	3 - 40ml glass vials	
PFAS 537	Groundwater	H ₂ O Cool, 4 ± 2 °C	14 days	500 mL	2 - teflon free 250 ml plastic containers	2 ppt
Volatile Organic Compounds/TO-15	Soil Vapor	N/A	30 days	2.7 - 6 L	1 2.7 or 6 L Summa Canister	1 ppb

Notes:

1. Refer to text for additional information.
2. Achieve a detection limit or minimum reporting limit that is below the applicable cleanup level (DER-10 Section 2.1 Sampling and Analysis Requirements)

ppt - parts per trillion

ppb - parts per billion

APPENDIX D

NYSDEC Emerging Contaminant Field Sampling Guidance



Department of
Environmental
Conservation

SAMPLING, ANALYSIS, AND ASSESSMENT OF PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS)

Under NYSDEC's Part 375 Remedial Programs

June 2021



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ERRATA SHEET for

**SAMPLING, ANALYSIS, AND ASSESSMENT OF PER- AND POLYFLUOROALKYL SUBSTANCES
 (PFAS) Under NYSDEC's Part 375 Remedial Programs Issued January 17, 2020**

Citation and Page Number	Current Text	Corrected Text	Date
Title of Appendix I, page 32	Appendix H	Appendix I	2/25/2020
Document Cover, page 1	Guidelines for Sampling and Analysis of PFAS	Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (PFAS) Under NYSDEC's Part 375 Remedial Programs	9/15/2020
Routine Analysis, page 9	"However, laboratories analyzing environmental samples...PFOA and PFOS in drinking water by EPA Method 537, 537.1 or ISO 25101."	"However, laboratories analyzing environmental samples...PFOA and PFOS in drinking water by EPA Method 537, 537.1, ISO 25101, or Method 533."	9/15/2020
Additional Analysis, page 9, new paragraph regarding soil parameters	None	"In cases where site-specific cleanup objectives for PFOA and PFOS are to be assessed, soil parameters, such as Total Organic Carbon (EPA Method 9060), soil pH (EPA Method 9045), clay content (percent), and cation exchange capacity (EPA Method 9081), should be included in the analysis to help evaluate factors affecting the leachability of PFAS in site soils."	9/15/2020
Data Assessment and Application to Site Cleanup Page 10	Until such time as Ambient Water Quality Standards (AWQS) and Soil Cleanup Objectives (SCOs) for PFAS are published, the extent of contaminated media potentially subject to remediation should be determined on a case-by-case basis using the procedures discussed below and the criteria in DER-10. Target levels for cleanup of PFAS in other media, including biota and sediment, have not yet been established by the DEC.	Until such time as Ambient Water Quality Standards (AWQS) and Soil Cleanup Objectives (SCOs) for PFOA and PFOS are published, the extent of contaminated media potentially subject to remediation should be determined on a case-by-case basis using the procedures discussed below and the criteria in DER-10. Preliminary target levels for cleanup of PFOA and PFOS in other media, including biota and sediment, have not yet been established by the DEC.	9/15/2020

Citation and Page Number	Current Text	Corrected Text	Date
Water Sample Results Page 10	PFAS should be further assessed and considered as a potential contaminant of concern in groundwater or surface water (...) If PFAS are identified as a contaminant of concern for a site, they should be assessed as part of the remedy selection process in accordance with Part 375 and DER-10.	PFOA and PFOS should be further assessed and considered as potential contaminants of concern in groundwater or surface water (...) If PFOA and/or PFOS are identified as contaminants of concern for a site, they should be assessed as part of the remedy selection process in accordance with Part 375 and DER-10.	9/15/2020
Soil Sample Results, page 10	“The extent of soil contamination for purposes of delineation and remedy selection should be determined by having certain soil samples tested by Synthetic Precipitation Leaching Procedure (SPLP) and the leachate analyzed for PFAS. Soil exhibiting SPLP results above 70 ppt for either PFOA or PFOS (individually or combined) are to be evaluated during the cleanup phase.”	“Soil cleanup objectives for PFOA and PFOS will be proposed in an upcoming revision to 6 NYCRR Part 375-6. Until SCOs are in effect, the following are to be used as guidance values. “ [Interim SCO Table] “PFOA and PFOS results for soil are to be compared against the guidance values listed above. These guidance values are to be used in determining whether PFOA and PFOS are contaminants of concern for the site and for determining remedial action objectives and cleanup requirements. Site-specific remedial objectives for protection of groundwater can also be presented for evaluation by DEC. Development of site-specific remedial objectives for protection of groundwater will require analysis of additional soil parameters relating to leachability. These additional analyses can include any or all the parameters listed above (soil pH, cation exchange capacity, etc.) and/or use of SPLP. As the understanding of PFAS transport improves, DEC welcomes proposals for site-specific remedial objectives for protection of groundwater. DEC will expect that those may be dependent on additional factors including soil pH, aqueous pH, % organic carbon, % Sand/Silt/Clay, soil cations: K, Ca, Mg, Na, Fe, Al, cation exchange capacity, and anion exchange capacity. Site-specific remedial objectives should also consider the dilution attenuation factor (DAF). The NJDEP publication on DAF can be used as a reference: https://www.nj.gov/dep/srp/guidance/rs/daf.pdf. ”	9/15/2020

Citation and Page Number	Current Text	Corrected Text	Date
Testing for Imported Soil Page 11	Soil imported to a site for use in a soil cap, soil cover, or as backfill is to be tested for PFAS in general conformance with DER-10, Section 5.4(e) for the PFAS Analyte List (Appendix F) using the analytical procedures discussed below and the criteria in DER-10 associated with SVOCs. If PFOA or PFOS is detected in any sample at or above 1 µg/kg, then soil should be tested by SPLP and the leachate analyzed for PFAS. If the SPLP results exceed 10 ppt for either PFOA or PFOS (individually) then the source of backfill should be rejected, unless a site-specific exemption is provided by DER. SPLP leachate criteria is based on the Maximum Contaminant Levels proposed for drinking water by New York State's Department of Health, this value may be updated based on future Federal or State promulgated regulatory standards. Remedial parties have the option of analyzing samples concurrently for both PFAS in soil and in the SPLP leachate to minimize project delays. Category B deliverables should be submitted for backfill samples, though a DUSR is not required.	Testing for PFAS should be included any time a full TAL/TCL analyte list is required. Results for PFOA and PFOS should be compared to the applicable guidance values. If PFOA or PFOS is detected in any sample at or above the guidance values then the source of backfill should be rejected, unless a site-specific exemption is provided by DER based on SPLP testing, for example. If the concentrations of PFOA and PFOS in leachate are at or above 10 ppt (the Maximum Contaminant Levels established for drinking water by the New York State Department of Health), then the soil is not acceptable. PFOA, PFOS and 1,4-dioxane are all considered semi-volatile compounds, so composite samples are appropriate for these compounds when sampling in accordance with DER-10, Table 5.4(e)10. Category B deliverables should be submitted for backfill samples, though a DUSR is not required.	9/15/2020

Citation and Page Number	Current Text	Corrected Text	Date
Footnotes	None	¹ TOP Assay analysis of highly contaminated samples, such as those from an AFFF (aqueous film-forming foam) site, can result in incomplete oxidation of the samples and an underestimation of the total perfluoroalkyl substances. ² The movement of PFAS in the environment is being aggressively researched at this time; that research will eventually result in more accurate models for the behaviors of these chemicals. In the meantime, DEC has calculated the soil cleanup objective for the protection of groundwater using the same procedure used for all other chemicals, as described in Section 7.7 of the Technical Support Document (http://www.dec.ny.gov/docs/remediation_hudson_pdf/techsuppdoc.pdf).	9/15/2020
Additional Analysis, page 9	In cases... soil parameters, such as Total Organic Carbon (EPA Method 9060), soil...	In cases... soil parameters, such as Total Organic Carbon (Lloyd Kahn), soil...	1/8/2021
Appendix A, General Guidelines, fourth bullet	List the ELAP-approved lab(s) to be used for analysis of samples	List the ELAP- certified lab(s) to be used for analysis of samples	1/8/2021
Appendix E, Laboratory Analysis and Containers	Drinking water samples collected using this protocol are intended to be analyzed for PFAS by ISO Method 25101.	Drinking water samples collected using this protocol are intended to be analyzed for PFAS by EPA Method 537, 537.1, 533, or ISO Method 25101	1/8/2021
Water Sample Results Page 9	“In addition, further assessment of water may be warranted if either of the following screening levels are met: a. any other individual PFAS (not PFOA or PFOS) is detected in water at or above 100 ng/L; or b. total concentration of PFAS (including PFOA and PFOS) is detected in water at or above 500 ng/L”	Deleted	6/15/2021

Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (PFAS) Under NYSDEC's Part 375 Remedial Programs

Objective

New York State Department of Environmental Conservation's Division of Environmental Remediation (DER) performs or oversees sampling of environmental media and subsequent analysis of PFAS as part of remedial programs implemented under 6 NYCRR Part 375. To ensure consistency in sampling, analysis, reporting, and assessment of PFAS, DER has developed this document which summarizes currently accepted procedures and updates previous DER technical guidance pertaining to PFAS.

Applicability

All work plans submitted to DEC pursuant to one of the remedial programs under Part 375 shall include PFAS sampling and analysis procedures that conform to the guidelines provided herein.

As part of a site investigation or remedial action compliance program, whenever samples of potentially affected media are collected and analyzed for the standard Target Analyte List/Target Compound List (TAL/TCL), PFAS analysis should also be performed. Potentially affected media can include soil, groundwater, surface water, and sediment. Based upon the potential for biota to be affected, biota sampling and analysis for PFAS may also be warranted as determined pursuant to a Fish and Wildlife Impact Analysis. Soil vapor sampling for PFAS is not required.

Field Sampling Procedures

DER-10 specifies technical guidance applicable to DER's remedial programs. Given the prevalence and use of PFAS, DER has developed "best management practices" specific to sampling for PFAS. As specified in DER-10 Chapter 2, quality assurance procedures are to be submitted with investigation work plans. Typically, these procedures are incorporated into a work plan, or submitted as a stand-alone document (e.g., a Quality Assurance Project Plan). Quality assurance guidelines for PFAS are listed in Appendix A - Quality Assurance Project Plan (QAPP) Guidelines for PFAS.

Field sampling for PFAS performed under DER remedial programs should follow the appropriate procedures outlined for soils, sediments or other solids (Appendix B), non-potable groundwater (Appendix C), surface water (Appendix D), public or private water supply wells (Appendix E), and fish tissue (Appendix F).

QA/QC samples (e.g. duplicates, MS/MSD) should be collected as specified in DER-10, Section 2.3(c). For sampling equipment coming in contact with aqueous samples only, rinsate or equipment blanks should be collected. Equipment blanks should be collected at a minimum frequency of one per day per site or one per twenty samples, whichever is more frequent.

Analysis and Reporting

As of October 2020, the United States Environmental Protection Agency (EPA) does not have a validated method for analysis of PFAS for media commonly analyzed under DER remedial programs (non-potable waters, solids). DER has developed the following guidelines to ensure consistency in analysis and reporting of PFAS.

The investigation work plan should describe analysis and reporting procedures, including laboratory analytical procedures for the methods discussed below. As specified in DER-10 Section 2.2, laboratories should provide a full Category B deliverable. In addition, a Data Usability Summary Report (DUSR) should be prepared by an independent, third party data validator. Electronic data submissions should meet the requirements provided at: <https://www.dec.ny.gov/chemical/62440.html>.

DER has developed a *PFAS Analyte List* (Appendix F) for remedial programs to understand the nature of contamination at sites. It is expected that reported results for PFAS will include, at a minimum, all the compounds listed. If lab and/or matrix specific issues are encountered for any analytes, the DER project manager, in consultation with the DER chemist, will make case-by-case decisions as to whether certain analytes may be temporarily or permanently discontinued from analysis at each site. As with other contaminants that are analyzed for at a site, the *PFAS Analyte List* may be refined for future sampling events based on investigative findings.

Routine Analysis

Currently, New York State Department of Health's Environmental Laboratory Approval Program (ELAP) does not offer certification for PFAS in matrices other than finished drinking water. However, laboratories analyzing environmental samples for PFAS (e.g., soil, sediments, and groundwater) under DER's Part 375 remedial programs need to hold ELAP certification for PFOA and PFOS in drinking water by EPA Method 537, 537.1, ISO 25101, or Method 533. Laboratories should adhere to the guidelines and criteria set forth in the DER's laboratory guidelines for PFAS in non-potable water and solids (Appendix H - Laboratory Guidelines for Analysis of PFAS in Non-Potable Water and Solids). Data review guidelines were developed by DER to ensure data comparability and usability (Appendix H - Data Review Guidelines for Analysis of PFAS in Non-Potable Water and Solids).

LC-MS/MS analysis for PFAS using methodologies based on EPA Method 537.1 is the procedure to use for environmental samples. Isotope dilution techniques should be utilized for the analysis of PFAS in all media. Reporting limits for PFOA and PFOS in aqueous samples should not exceed 2 ng/L. Reporting limits for PFOA and PFOS in solid samples should not exceed 0.5 µg/kg. Reporting limits for all other PFAS in aqueous and solid media should be as close to these limits as possible. If laboratories indicate that they are not able to achieve these reporting limits for the entire *PFAS Analyte List*, site-specific decisions regarding acceptance of elevated reporting limits for specific PFAS can be made by the DER project manager in consultation with the DER chemist.

Additional Analysis

Additional laboratory methods for analysis of PFAS may be warranted at a site, such as the Synthetic Precipitation Leaching Procedure (SPLP) and Total Oxidizable Precursor Assay (TOP Assay).

In cases where site-specific cleanup objectives for PFOA and PFOS are to be assessed, soil parameters, such as Total Organic Carbon (Lloyd Kahn), soil pH (EPA Method 9045), clay content (percent), and cation exchange capacity (EPA Method 9081), should be included in the analysis to help evaluate factors affecting the leachability of PFAS in site soils.

SPLP is a technique used to determine the mobility of chemicals in liquids, soils and wastes, and may be useful in determining the need for addressing PFAS-containing material as part of the remedy. SPLP by EPA Method 1312 should be used unless otherwise specified by the DER project manager in consultation with the DER chemist.

Impacted materials can be made up of PFAS that are not analyzable by routine analytical methodology. A TOP Assay can be utilized to conceptualize the amount and type of oxidizable PFAS which could be liberated in the environment, which approximates the maximum concentration of perfluoroalkyl substances that could be generated

if all polyfluoroalkyl substances were oxidized. For example, some polyfluoroalkyl substances may degrade or transform to form perfluoroalkyl substances (such as PFOA or PFOS), resulting in an increase in perfluoroalkyl substance concentrations as contaminated groundwater moves away from a source. The TOP Assay converts, through oxidation, polyfluoroalkyl substances (precursors) into perfluoroalkyl substances that can be detected by routine analytical methodology.¹

Commercial laboratories have adopted methods which allow for the quantification of targeted PFAS in air and biota. The EPA's Office of Research and Development (ORD) is currently developing methods which allow for air emissions characterization of PFAS, including both targeted and non-targeted analysis of PFAS. Consult with the DER project manager and the DER chemist for assistance on analyzing biota/tissue and air samples.

Data Assessment and Application to Site Cleanup

Until such time as Ambient Water Quality Standards (AWQS) and Soil Cleanup Objectives (SCOs) for PFOA and PFOS are published, the extent of contaminated media potentially subject to remediation should be determined on a case-by-case basis using the procedures discussed below and the criteria in DER-10. Preliminary target levels for cleanup of PFOA and PFOS in other media, including biota and sediment, have not yet been established by the DEC.

Water Sample Results

PFOA and PFOS should be further assessed and considered as potential contaminants of concern in groundwater or surface water if PFOA or PFOS is detected in any water sample at or above 10 ng/L (ppt) and is determined to be attributable to the site, either by a comparison of upgradient and downgradient levels, or the presence of soil source areas, as defined below.

If PFOA and/or PFOS are identified as contaminants of concern for a site, they should be assessed as part of the remedy selection process in accordance with Part 375 and DER-10.

Soil Sample Results

Soil cleanup objectives for PFOA and PFOS will be proposed in an upcoming revision to 6 NYCRR Part 375-6. Until SCOs are in effect, the following are to be used as guidance values.

Guidance Values for Anticipated Site Use	PFOA (ppb)	PFOS (ppb)
Unrestricted	0.66	0.88
Residential	6.6	8.8
Restricted Residential	33	44
Commercial	500	440
Industrial	600	440
Protection of Groundwater ²	1.1	3.7

¹ TOP Assay analysis of highly contaminated samples, such as those from an AFFF (aqueous film-forming foam) site, can result in incomplete oxidation of the samples and an underestimation of the total perfluoroalkyl substances.

² The movement of PFAS in the environment is being aggressively researched at this time; that research will eventually result in more accurate models for the behaviors of these chemicals. In the meantime, DEC has calculated the guidance value for the protection of groundwater using the same procedure used for all other chemicals, as described in Section 7.7 of the Technical Support Document (http://www.dec.ny.gov/docs/remediation_hudson_pdf/techsuppdoc.pdf).

PFOA and PFOS results for soil are to be compared against the guidance values listed above. These guidance values are to be used in determining whether PFOA and PFOS are contaminants of concern for the site and for determining remedial action objectives and cleanup requirements. Site-specific remedial objectives for protection of groundwater can also be presented for evaluation by DEC. Development of site-specific remedial objectives for protection of groundwater will require analysis of additional soil parameters relating to leachability. These additional analyses can include any or all the parameters listed above (soil pH, cation exchange capacity, etc.) and/or use of SPLP.

As the understanding of PFAS transport improves, DEC welcomes proposals for site-specific remedial objectives for protection of groundwater. DEC will expect that those may be dependent on additional factors including soil pH, aqueous pH, % organic carbon, % Sand/Silt/Clay, soil cations: K, Ca, Mg, Na, Fe, Al, cation exchange capacity, and anion exchange capacity. Site-specific remedial objectives should also consider the dilution attenuation factor (DAF). The NJDEP publication on DAF can be used as a reference:

<https://www.nj.gov/dep/srp/guidance/rs/daf.pdf>.

Testing for Imported Soil

Testing for PFAS should be included any time a full TAL/TCL analyte list is required. Results for PFOA and PFOS should be compared to the applicable guidance values. If PFOA or PFOS is detected in any sample at or above the guidance values then the source of backfill should be rejected, unless a site-specific exemption is provided by DER based on SPLP testing, for example. If the concentrations of PFOA and PFOS in leachate are at or above 10 ppt (the Maximum Contaminant Levels established for drinking water by the New York State Department of Health), then the soil is not acceptable.

PFOA, PFOS and 1,4-dioxane are all considered semi-volatile compounds, so composite samples are appropriate for these compounds when sampling in accordance with DER-10, Table 5.4(e)10. Category B deliverables should be submitted for backfill samples, though a DUSR is not required.

Appendix A - Quality Assurance Project Plan (QAPP) Guidelines for PFAS

The following guidelines (general and PFAS-specific) can be used to assist with the development of a QAPP for projects within DER involving sampling and analysis of PFAS.

General Guidelines in Accordance with DER-10

- Document/work plan section title – Quality Assurance Project Plan
- Summarize project scope, goals, and objectives
- Provide project organization including names and resumes of the project manager, Quality Assurance Officer (QAO), field staff, and Data Validator
 - The QAO should not have another position on the project, such as project or task manager, that involves project productivity or profitability as a job performance criterion
- List the ELAP certified lab(s) to be used for analysis of samples
- Include a site map showing sample locations
- Provide detailed sampling procedures for each matrix
- Include Data Quality Usability Objectives
- List equipment decontamination procedures
- Include an “Analytical Methods/Quality Assurance Summary Table” specifying:
 - Matrix type
 - Number or frequency of samples to be collected per matrix
 - Number of field and trip blanks per matrix
 - Analytical parameters to be measured per matrix
 - Analytical methods to be used per matrix with minimum reporting limits
 - Number and type of matrix spike and matrix spike duplicate samples to be collected
 - Number and type of duplicate samples to be collected
 - Sample preservation to be used per analytical method and sample matrix
 - Sample container volume and type to be used per analytical method and sample matrix
 - Sample holding time to be used per analytical method and sample matrix
- Specify Category B laboratory data deliverables and preparation of a DUSR

Specific Guidelines for PFAS

- Include in the text that sampling for PFAS will take place
- Include in the text that PFAS will be analyzed by LC-MS/MS for PFAS using methodologies based on EPA Method 537.1
- Include the list of PFAS compounds to be analyzed (*PFAS Analyte List*)
- Include the laboratory SOP for PFAS analysis
- List the minimum method-achievable Reporting Limits for PFAS
 - Reporting Limits should be less than or equal to:
 - Aqueous – 2 ng/L (ppt)
 - Solids – 0.5 µg/kg (ppb)
- Include the laboratory Method Detection Limits for the PFAS compounds to be analyzed
- Laboratory should have ELAP certification for PFOA and PFOS in drinking water by EPA Method 537, 537.1, EPA Method 533, or ISO 25101
- Include detailed sampling procedures
 - Precautions to be taken
 - Pump and equipment types
 - Decontamination procedures
 - Approved materials only to be used
- Specify that regular ice only will be used for sample shipment
- Specify that equipment blanks should be collected at a minimum frequency of 1 per day per site for each matrix

Appendix B - Sampling Protocols for PFAS in Soils, Sediments and Solids

General

The objective of this protocol is to give general guidelines for the collection of soil, sediment and other solid samples for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Containers

Samples collected using this protocol are intended to be analyzed for PFAS using methodologies based on EPA Method 537.1.

The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in to contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials including sample bottle cap liners with a PTFE layer.

A list of acceptable equipment is provided below, but other equipment may be considered appropriate based on sampling conditions.

- stainless steel spoon
- stainless steel bowl
- steel hand auger or shovel without any coatings

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Sampling is often conducted in areas where a vegetative turf has been established. In these cases, a pre-cleaned trowel or shovel should be used to carefully remove the turf so that it may be replaced at the conclusion of sampling. Surface soil samples (e.g. 0 to 6 inches below surface) should then be collected using a pre-cleaned, stainless steel spoon. Shallow subsurface soil samples (e.g. 6 to ~36 inches below surface) may be collected by digging a hole using a pre-cleaned hand auger or shovel. When the desired subsurface depth is reached, a pre-cleaned hand auger or spoon shall be used to obtain the sample.

When the sample is obtained, it should be deposited into a stainless steel bowl for mixing prior to filling the sample containers. The soil should be placed directly into the bowl and mixed thoroughly by rolling the material into the middle until the material is homogenized. At this point the material within the bowl can be placed into the laboratory provided container.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at $4 \pm 2^{\circ}$ Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- Request appropriate data deliverable (Category B) and an electronic data deliverable

Documentation

A soil log or sample log shall document the location of the sample/borehole, depth of the sample, sampling equipment, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate. Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appropriate rain gear (PVC, polyurethane, or rubber rain gear are acceptable), bug spray, and sunscreen should be used that does not contain PFAS. Well washed cotton coveralls may be used as an alternative to bug spray and/or sunscreen.

PPE that contains PFAS is acceptable when site conditions warrant additional protection for the samplers and no other materials can be used to be protective. Documentation of such use should be provided in the field notes.

Appendix C - Sampling Protocols for PFAS in Monitoring Wells

General

The objective of this protocol is to give general guidelines for the collection of groundwater samples for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Container

Samples collected using this protocol are intended to be analyzed for PFAS using methodologies based on EPA Method 537.1.

The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include: stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials including plumbers tape and sample bottle cap liners with a PTFE layer.

A list of acceptable equipment is provided below, but other equipment may be considered appropriate based on sampling conditions.

- stainless steel inertia pump with HDPE tubing
- peristaltic pump equipped with HDPE tubing and silicone tubing
- stainless steel bailer with stainless steel ball
- bladder pump (identified as PFAS-free) with HDPE tubing

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Monitoring wells should be purged in accordance with the sampling procedure (standard/volume purge or low flow purge) identified in the site work plan, which will determine the appropriate time to collect the sample. If sampling using standard purge techniques, additional purging may be needed to reduce turbidity levels, so samples contain a limited amount of sediment within the sample containers. Sample containers that contain sediment may cause issues at the laboratory, which may result in elevated reporting limits and other issues during the sample preparation that can compromise data usability. Sampling personnel should don new nitrile gloves prior to sample collection due to the potential to contact PFAS containing items (not related to the sampling equipment) during the purging activities.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at $4 \pm 2^\circ$ Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- Collect one equipment blank per day per site and minimum 1 equipment blank per 20 samples. The equipment blank shall test the new and decontaminated sampling equipment utilized to obtain a sample for residual PFAS contamination. This sample is obtained by using laboratory provided PFAS-free water and passing the water over or through the sampling device and into laboratory provided sample containers
- Additional equipment blank samples may be collected to assess other equipment that is utilized at the monitoring well
- Request appropriate data deliverable (Category B) and an electronic data deliverable

Documentation

A purge log shall document the location of the sample, sampling equipment, groundwater parameters, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate. Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appropriate rain gear (PVC, polyurethane, or rubber rain gear are acceptable), bug spray, and sunscreen should be used that does not contain PFAS. Well washed cotton coveralls may be used as an alternative to bug spray and/or sunscreen.

PPE that contains PFAS is acceptable when site conditions warrant additional protection for the samplers and no other materials can be used to be protective. Documentation of such use should be provided in the field notes.

Appendix D - Sampling Protocols for PFAS in Surface Water

General

The objective of this protocol is to give general guidelines for the collection of surface water samples for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Container

Samples collected using this protocol are intended to be analyzed for PFAS using methodologies based on EPA Method 537.1.

The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include: stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials including sample bottle cap liners with a PTFE layer.

A list of acceptable equipment is provided below, but other equipment may be considered appropriate based on sampling conditions.

- stainless steel cup

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Where conditions permit, (e.g. creek or pond) sampling devices (e.g. stainless steel cup) should be rinsed with site medium to be sampled prior to collection of the sample. At this point the sample can be collected and poured into the sample container.

If site conditions permit, samples can be collected directly into the laboratory container.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at $4 \pm 2^\circ$ Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- Collect one equipment blank per day per site and minimum 1 equipment blank per 20 samples. The equipment blank shall test the new and decontaminated sampling equipment utilized to obtain a sample for residual PFAS contamination. This sample is obtained by using laboratory provided PFAS-free water and passing the water over or through the sampling device and into laboratory provided sample containers
- Request appropriate data deliverable (Category B) and an electronic data deliverable

Documentation

A sample log shall document the location of the sample, sampling equipment, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate. Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appropriate rain gear (PVC, polyurethane, or rubber rain gear are acceptable), bug spray, and sunscreen should be used that does not contain PFAS. Well washed cotton coveralls may be used as an alternative to bug spray and/or sunscreen.

PPE that contains PFAS is acceptable when site conditions warrant additional protection for the samplers and no other materials can be used to be protective. Documentation of such use should be provided in the field notes.

Appendix E - Sampling Protocols for PFAS in Private Water Supply Wells

General

The objective of this protocol is to give general guidelines for the collection of water samples from private water supply wells (with a functioning pump) for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Container

Drinking water samples collected using this protocol are intended to be analyzed for PFAS by EPA Method 537, 537.1, 533, or ISO Method 25101. The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials (e.g. plumbers tape), including sample bottle cap liners with a PTFE layer.

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Locate and assess the pressure tank and determine if any filter units are present within the building. Establish the sample location as close to the well pump as possible, which is typically the spigot at the pressure tank. Ensure sampling equipment is kept clean during sampling as access to the pressure tank spigot, which is likely located close to the ground, may be obstructed and may hinder sample collection.

Prior to sampling, a faucet downstream of the pressure tank (e.g., washroom sink) should be run until the well pump comes on and a decrease in water temperature is noted which indicates that the water is coming from the well. If the homeowner is amenable, staff should run the water longer to purge the well (15+ minutes) to provide a sample representative of the water in the formation rather than standing water in the well and piping system including the pressure tank. At this point a new pair of nitrile gloves should be donned and the sample can be collected from the sample point at the pressure tank.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at $4 \pm 2^\circ$ Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- If equipment was used, collect one equipment blank per day per site and a minimum 1 equipment blank per 20 samples. The equipment blank shall test the new and decontaminated sampling equipment utilized to obtain a sample for residual PFAS contamination. This sample is obtained by using laboratory provided PFAS-free water and passing the water over or through the sampling device and into laboratory provided sample containers.
- A field reagent blank (FRB) should be collected at a rate of one per 20 samples. The lab will provide a FRB bottle containing PFAS free water and one empty FRB bottle. In the field, pour the water from the one bottle into the empty FRB bottle and label appropriately.
- Request appropriate data deliverable (Category B) and an electronic data deliverable
- For sampling events where multiple private wells (homes or sites) are to be sampled per day, it is acceptable to collect QC samples at a rate of one per 20 across multiple sites or days.

Documentation

A sample log shall document the location of the private well, sample point location, owner contact information, sampling equipment, purge duration, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate and available (e.g. well construction, pump type and location, yield, installation date). Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appendix F - Sampling Protocols for PFAS in Fish

This appendix contains a copy of the latest guidelines developed by the Division of Fish and Wildlife (DFW) entitled “General Fish Handling Procedures for Contaminant Analysis” (Ver. 8).

Procedure Name: General Fish Handling Procedures for Contaminant Analysis

Number: FW-005

Purpose: This procedure describes data collection, fish processing and delivery of fish collected for contaminant monitoring. It contains the chain of custody and collection record forms that should be used for the collections.

Organization: Environmental Monitoring Section
Bureau of Ecosystem Health
Division of Fish and Wildlife (DFW)
New York State Department of Environmental Conservation (NYSDEC)
625 Broadway
Albany, New York 12233-4756

Version: 8

Previous Version Date: 21 March 2018

Summary of Changes to this Version: Updated bureau name to Bureau of Ecosystem Health. Added direction to list the names of all field crew on the collection record. Minor formatting changes on chain of custody and collection records.

Originator or Revised by: Wayne Richter, Jesse Becker

Date: 26 April 2019

Quality Assurance Officer and Approval Date: Jesse Becker, 26 April 2019

**NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION**

GENERAL FISH HANDLING PROCEDURES FOR CONTAMINANT ANALYSES

- A. Original copies of all continuity of evidence (i.e., Chain of Custody) and collection record forms must accompany delivery of fish to the lab. A copy shall be directed to the Project Leader or as appropriate, Wayne Richter. All necessary forms will be supplied by the Bureau of Ecosystem Health. Because some samples may be used in legal cases, it is critical that each section is filled out completely. Each Chain of Custody form has three main sections:
1. The top box is to be filled out **and signed** by the person responsible for the fish collection (e.g., crew leader, field biologist, researcher). This person is responsible for delivery of the samples to DEC facilities or personnel (e.g., regional office or biologist).
 2. The second section is to be filled out **and signed** by the person responsible for the collections while being stored at DEC, before delivery to the analytical lab. This may be the same person as in (1), but it is still required that they complete the section. Also important is the **range of identification numbers** (i.e., tag numbers) included in the sample batch.
 3. Finally, the bottom box is to record any transfers between DEC personnel and facilities. Each subsequent transfer should be **identified, signed, and dated**, until laboratory personnel take possession of the fish.
- B. The following data are required on each **Fish Collection Record** form:
1. Project and Site Name.
 2. DEC Region.
 3. All personnel (and affiliation) involved in the collection.
 4. Method of collection (gill net, hook and line, etc.)
 5. Preservation Method.
- C. The following data are to be taken on each fish collected and recorded on the **Fish Collection Record** form:
1. Tag number - Each specimen is to be individually jaw tagged at time of collection with a unique number. Make sure the tag is turned out so that the number can be read without opening the bag. Use tags in sequential order. For small fish or composite samples place the tag inside the bag with the samples. The Bureau of Ecosystem Health can supply the tags.
 2. Species identification (please be explicit enough to enable assigning genus and species). Group fish by species when processing.
 3. Date collected.
 4. Sample location (waterway and nearest prominent identifiable landmark).
 5. Total length (nearest mm or smallest sub-unit on measuring instrument) and weight (nearest g or

smallest sub-unit of weight on weighing instrument). Take all measures as soon as possible with calibrated, protected instruments (e.g. from wind and upsets) and prior to freezing.

6. Sex - fish may be cut enough to allow sexing or other internal investigation, but do not eviscerate. Make any incision on the right side of the belly flap or exactly down the midline so that a left-side fillet can be removed.

D. General data collection recommendations:

1. It is helpful to use an ID or tag number that will be unique. It is best to use metal striped bass or other uniquely numbered metal tags. If uniquely numbered tags are unavailable, values based on the region, water body and year are likely to be unique: for example, R7CAY11001 for Region 7, Cayuga Lake, 2011, fish 1. If the fish are just numbered 1 through 20, we have to give them new numbers for our database, making it more difficult to trace your fish to their analytical results and creating an additional possibility for errors.
 2. Process and record fish of the same species sequentially. Recording mistakes are less likely when all fish from a species are processed together. Starting with the bigger fish species helps avoid missing an individual.
 3. If using Bureau of Ecosystem Health supplied tags or other numbered tags, use tags in sequence so that fish are recorded with sequential Tag Numbers. This makes data entry and login at the lab and use of the data in the future easier and reduces keypunch errors.
 4. Record length and weight as soon as possible after collection and before freezing. Other data are recorded in the field upon collection. An age determination of each fish is optional, but if done, it is recorded in the appropriate "Age" column.
 5. For composite samples of small fish, record the number of fish in the composite in the Remarks column. Record the length and weight of each individual in a composite. All fish in a composite sample should be of the same species and members of a composite should be visually matched for size.
 6. Please submit photocopies of topographic maps or good quality navigation charts indicating sampling locations. GPS coordinates can be entered in the Location column of the collection record form in addition to or instead for providing a map. These records are of immense help to us (and hopefully you) in providing documented location records which are not dependent on memory and/or the same collection crew. In addition, they may be helpful for contaminant source trackdown and remediation/control efforts of the Department.
 7. When recording data on fish measurements, it will help to ensure correct data recording for the data recorder to call back the numbers to the person making the measurements.
- E. Each fish is to be placed in its own individual plastic bag. For small fish to be analyzed as a composite, put all of the fish for one composite in the same bag but use a separate bag for each composite. It is important to individually bag the fish to avoid difficulties or cross contamination when processing the fish for chemical analysis. Be sure to include the fish's tag number inside the bag, preferably attached to the fish with the tag number turned out so it can be read. Tie or otherwise secure the bag closed. **The Bureau of Ecosystem Health will supply the bags.** If necessary, food grade bags may be procured from a suitable vendor (e.g., grocery store). It is preferable to redundantly label each bag with a manila tag tied between the knot and the body of the bag. This tag should be labeled with the project name, collection location, tag number, collection date, and fish species. If scales are collected, the scale envelope should be labeled with

the same information.

- F. Groups of fish, by species, are to be placed in one large plastic bag per sampling location. **The Bureau of Ecosystem Health will supply the larger bags.** Tie or otherwise secure the bag closed. Label the site bag with a manila tag tied between the knot and the body of the bag. The tag should contain: project, collection location, collection date, species and **tag number ranges**. Having this information on the manila tag enables lab staff to know what is in the bag without opening it.
- G. Do not eviscerate, fillet or otherwise dissect the fish unless specifically asked to. If evisceration or dissection is specified, the fish must be cut along the exact midline or on the right side so that the left side fillet can be removed intact at the laboratory. If filleting is specified, the procedure for taking a standard fillet (SOP PREPLAB 4) must be followed, including removing scales.
- H. Special procedures for PFAS: Unlike legacy contaminants such as PCBs, which are rarely found in day to day life, PFAS are widely used and frequently encountered. Practices that avoid sample contamination are therefore necessary. While no standard practices have been established for fish, procedures for water quality sampling can provide guidance. The following practices should be used for collections when fish are to be analyzed for PFAS:
 - No materials containing Teflon.
 - No Post-it notes.
 - No ice packs; only water ice or dry ice.
 - Any gloves worn must be powder free nitrile.
 - No Gore-Tex or similar materials (Gore-Tex is a PFC with PFOA used in its manufacture).
 - No stain repellent or waterproof treated clothing; these are likely to contain PFCs.
 - Avoid plastic materials, other than HDPE, including clipboards and waterproof notebooks.
 - Wash hands after handling any food containers or packages as these may contain PFCs.
 - Keep pre-wrapped food containers and wrappers isolated from fish handling.
 - Wear clothing washed at least six times since purchase.
 - Wear clothing washed without fabric softener.
 - Staff should avoid cosmetics, moisturizers, hand creams and similar products on the day of sampling as many of these products contain PFCs (Fujii et al. 2013). Sunscreen or insect repellent should not contain ingredients with “fluor” in their name. Apply any sunscreen or insect repellent well downwind from all materials. Hands must be washed after touching any of these products.
- I. All fish must be kept at a temperature <45° F (<8° C) immediately following data processing. As soon as possible, freeze at -20° C ± 5° C. Due to occasional freezer failures, daily freezer temperature logs are required. The freezer should be locked or otherwise secured to maintain chain of custody.
- J. In most cases, samples should be delivered to the Analytical Services Unit at the Hale Creek field station. Coordinate delivery with field station staff and send copies of the collection records, continuity of evidence forms and freezer temperature logs to the field station. For samples to be analyzed elsewhere, non-routine collections or other questions, contact Wayne Richter, Bureau of Ecosystem Health, NYSDEC, 625 Broadway, Albany, New York 12233-4756, 518-402-8974, or the project leader about sample transfer. Samples will then be directed to the analytical facility and personnel noted on specific project descriptions.
- K. A recommended equipment list is at the end of this document.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF FISH AND WILDLIFE
FISH COLLECTION RECORD

page _____ of _____

Project and Site Name _____ DEC Region _____

Collections made by (include all crew) _____

Sampling Method: Electrofishing Gill netting Trap netting Trawling Seining Angling Other _____

Preservation Method: Freezing Other _____ Notes (SWFDB survey number): _____

FOR LAB USE ONLY- LAB ENTRY NO.	COLLECTION OR TAG NO.	SPECIES	DATE TAKEN	LOCATION	AGE	SEX &/OR REPROD. CONDIT	LENGTH ()	WEIGHT ()	REMARKS

richter: revised 2011, 5/7/15, 10/4/16, 3/20/17; becker: 3/23/17, 4/26/19

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION CHAIN OF CUSTODY

I, _____, of _____ collected the
(Print Name) (Print Business Address)
 following on _____, 20____ from _____
(Date) (Water Body)
 in the vicinity of _____
(Landmark, Village, Road, etc.)
 Town of _____, in _____ County.
 Item(s) _____

Said sample(s) were in my possession and handled according to standard procedures provided to me prior to collection. The sample(s) were placed in the custody of a representative of the New York State Department of Environmental Conservation on _____, 20____.

Signature Date

I, _____, received the above mentioned sample(s) on the date specified and assigned identification number(s) _____ to the sample(s). I have recorded pertinent data for the sample(s) on the attached collection records. The sample(s) remained in my custody until subsequently transferred, prepared or shipped at times and on dates as attested to below.

Signature Date

SECOND RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	UNIT	
THIRD RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	UNIT	
FOURTH RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	UNIT	
RECEIVED IN LABORATORY BY (Print Name)	TIME & DATE	REMARKS
SIGNATURE	UNIT	
LOGGED IN BY (Print Name)	TIME & DATE	ACCESSION NUMBERS
SIGNATURE	UNIT	

NOTICE OF WARRANTY

By signature to the chain of custody (reverse), the signatory warrants that the information provided is truthful and accurate to the best of his/her ability. The signatory affirms that he/she is willing to testify to those facts provided and the circumstances surrounding the same. Nothing in this warranty or chain of custody negates responsibility nor liability of the signatories for the truthfulness and accuracy of the statements provided.

HANDLING INSTRUCTIONS

On day of collection, collector(s) name(s), address(es), date, geographic location of capture (attach a copy of topographic map or navigation chart), species, number kept of each species, and description of capture vicinity (proper noun, if possible) along with name of Town and County must be indicated on reverse.

Retain organisms in manila tagged plastic bags to avoid mixing capture locations. Note appropriate information on each bag tag.

Keep samples as cool as possible. Put on ice if fish cannot be frozen within 12 hours. If fish are held more than 24 hours without freezing, they will not be retained or analyzed.

Initial recipient (either DEC or designated agent) of samples from collector(s) is responsible for obtaining and recording information on the collection record forms which will accompany the chain of custody. This person will seal the container using packing tape and writing his signature, the time and the date across the tape onto the container with indelible marker. Any time a seal is broken, for whatever purpose, the incident must be recorded on the Chain of Custody (reason, time, and date) in the purpose of transfer block. Container then is resealed using new tape and rewriting signature, with time and date.

EQUIPMENT LIST

Scale or balance of appropriate capacity for the fish to be collected.

Fish measuring board.

Plastic bags of an appropriate size for the fish to be collected and for site bags.

Individually numbered metal tags for fish.

Manila tags to label bags.

Small envelopes, approximately 2" x 3.5", if fish scales are to be collected.

Knife for removing scales.

Chain of custody and fish collection forms.

Clipboard.

Pens or markers.

Paper towels.

Dish soap and brush.

Bucket.

Cooler.

Ice.

Duct tape.

Appendix G – PFAS Analyte List

Group	Chemical Name	Abbreviation	CAS Number
Perfluoroalkyl sulfonates	Perfluorobutanesulfonic acid	PFBS	375-73-5
	Perfluorohexanesulfonic acid	PFHxS	355-46-4
	Perfluoroheptanesulfonic acid	PFHpS	375-92-8
	Perfluorooctanesulfonic acid	PFOS	1763-23-1
	Perfluorodecanesulfonic acid	PFDS	335-77-3
Perfluoroalkyl carboxylates	Perfluorobutanoic acid	PFBA	375-22-4
	Perfluoropentanoic acid	PFPeA	2706-90-3
	Perfluorohexanoic acid	PFHxA	307-24-4
	Perfluoroheptanoic acid	PFHpA	375-85-9
	Perfluorooctanoic acid	PFOA	335-67-1
	Perfluorononanoic acid	PFNA	375-95-1
	Perfluorodecanoic acid	PFDA	335-76-2
	Perfluoroundecanoic acid	PFUA/PFUdA	2058-94-8
	Perfluorododecanoic acid	PFDoA	307-55-1
	Perfluorotridecanoic acid	PFTriA/PFTTrDA	72629-94-8
	Perfluorotetradecanoic acid	PFTA/PFTeDA	376-06-7
Fluorinated Telomer Sulfonates	6:2 Fluorotelomer sulfonate	6:2 FTS	27619-97-2
	8:2 Fluorotelomer sulfonate	8:2 FTS	39108-34-4
Perfluorooctane-sulfonamides	Perfluorooctanesulfonamide	FOSA	754-91-6
Perfluorooctane-sulfonamidoacetic acids	N-methyl perfluorooctanesulfonamidoacetic acid	N-MeFOSAA	2355-31-9
	N-ethyl perfluorooctanesulfonamidoacetic acid	N-EtFOSAA	2991-50-6

Appendix H - Laboratory Guidelines for Analysis of PFAS in Non-Potable Water and Solids

General

New York State Department of Environmental Conservation's Division of Environmental Remediation (DER) developed the following guidelines for laboratories analyzing environmental samples for PFAS under DER programs. If laboratories cannot adhere to the following guidelines, they should contact DER's Quality Assurance Officer, Dana Barbarossa, at dana.barbarossa@dec.ny.gov prior to analysis of samples.

Isotope Dilution

Isotope dilution techniques should be utilized for the analysis of PFAS in all media.

Extraction

For water samples, the entire sample bottle should be extracted, and the sample bottle rinsed with appropriate solvent to remove any residual PFAS.

For samples with high particulates, the samples should be handled in one of the following ways:

1. Spike the entire sample bottle with isotope dilution analytes (IDAs) prior to any sample manipulation. The sample can be passed through the SPE and if it clogs, record the volume that passed through.
2. If the sample contains too much sediment to attempt passing it through the SPE cartridge, the sample should be spiked with isotope dilution analytes, centrifuged and decanted.
3. If higher reporting limits are acceptable for the project, the sample can be diluted by taking a representative aliquot of the sample. If isotope dilution analytes will be diluted out of the sample, they can be added after the dilution. The sample should be homogenized prior to taking an aliquot.

If alternate sample extraction procedures are used, please contact the DER remedial program chemist prior to employing. Any deviations in sample preparation procedures should be clearly noted in the case narrative.

Signal to Noise Ratio

For all target analyte ions used for quantification, signal to noise ratio should be 3:1 or greater.

Blanks

There should be no detections in the method blanks above the reporting limits.

Ion Transitions

The ion transitions listed below should be used for the following PFAS:

PFOA	413 > 369
PFOS	499 > 80
PFHxS	399 > 80
PFBS	299 > 80
6:2 FTS	427 > 407
8:2 FTS	527 > 507
N-EtFOSAA	584 > 419
N-MeFOSAA	570 > 419

Branched and Linear Isomers

Standards containing both branched and linear isomers should be used when standards are commercially available. Currently, quantitative standards are available for PFHxS, PFOS, NMeFOSAA, and NEtFOSAA. As more standards become available, they should be incorporated in to the method. All isomer peaks present in the standard should be integrated and the areas summed. Samples should be integrated in the same manner as the standards.

Since a quantitative standard does not exist for branched isomers of PFOA, the instrument should be calibrated using just the linear isomer and a technical (qualitative) PFOA standard should be used to identify the retention time of the branched PFOA isomers in the sample. The total response of PFOA branched and linear isomers should be integrated in the samples and quantitated using the calibration curve of the linear standard.

Secondary Ion Transition Monitoring

Quantifier and qualifier ions should be monitored for all target analytes (PFBA and PFPeA are exceptions). The ratio of quantifier ion response to qualifier ion response should be calculated for each target analyte and the ratio compared to standards. Lab derived criteria should be used to determine if the ratios are acceptable.

Reporting

Detections below the reporting limit should be reported and qualified with a J qualifier.

The acid form of PFAS analytes should be reported. If the salt form of the PFAS was used as a stock standard, the measured mass should be corrected to report the acid form of the analyte.

Appendix I - Data Review Guidelines for Analysis of PFAS in Non-Potable Water and Solids

General

These guidelines are intended to be used for the validation of PFAS analytical results for projects within the Division of Environmental Remediation (DER) as well as aid in the preparation of a data usability summary report. Data reviewers should understand the methodology and techniques utilized in the analysis. Consultation with the end user of the data may be necessary to assist in determining data usability based on the data quality objectives in the Quality Assurance Project Plan. A familiarity with the laboratory's Standard Operating Procedure may also be needed to fully evaluate the data. If you have any questions, please contact DER's Quality Assurance Officer, Dana Barbarossa, at dana.barbarossa@dec.ny.gov.

Preservation and Holding Time

Samples should be preserved with ice to a temperature of less than 6°C upon arrival at the lab. The holding time is 14 days to extraction for aqueous and solid samples. The time from extraction to analysis for aqueous samples is 28 days and 40 days for solids.

Temperature greatly exceeds 6°C upon arrival at the lab*	Use professional judgement to qualify detects and non-detects as estimated or rejected
Holding time exceeding 28 days to extraction	Use professional judgement to qualify detects and non-detects as estimated or rejected if holding time is grossly exceeded

*Samples that are delivered to the lab immediately after sampling may not meet the thermal preservation guidelines. Samples are considered acceptable if they arrive on ice or an attempt to chill the samples is observed.

Initial Calibration

The initial calibration should contain a minimum of five standards for linear fit and six standards for a quadratic fit. The relative standard deviation (RSD) for a quadratic fit calibration should be less than 20%. Linear fit calibration curves should have an R^2 value greater than 0.990.

The low-level calibration standard should be within 50% - 150% of the true value, and the mid-level calibration standard within 70% - 130% of the true value.

%RSD >20%	J flag detects and UJ non detects
$R^2 > 0.990$	J flag detects and UJ non detects
Low-level calibration check <50% or >150%	J flag detects and UJ non detects
Mid-level calibration check <70% or >130%	J flag detects and UJ non detects

Initial Calibration Verification

An initial calibration verification (ICV) standard should be from a second source (if available). The ICV should be at the same concentration as the mid-level standard of the calibration curve.

ICV recovery <70% or >130%	J flag detects and non-detects

Continuing Calibration Verification

Continuing calibration verification (CCV) checks should be analyzed at a frequency of one per ten field samples. If CCV recovery is very low, where detection of the analyte could be in question, ensure a low level CCV was analyzed and use to determine data quality.

CCV recovery <70 or >130%	J flag results

Blanks

There should be no detections in the method blanks above the reporting limits. Equipment blanks, field blanks, rinse blanks etc. should be evaluated in the same manner as method blanks. Use the most contaminated blank to evaluate the sample results.

Blank Result	Sample Result	Qualification
Any detection	<Reporting limit	Qualify as ND at reporting limit
Any detection	>Reporting Limit and >10x the blank result	No qualification
>Reporting limit	>Reporting limit and <10x blank result	J+ biased high

Field Duplicates

A blind field duplicate should be collected at rate of one per twenty samples. The relative percent difference (RPD) should be less than 30% for analyte concentrations greater than two times the reporting limit. Use the higher result for final reporting.

RPD >30%	Apply J qualifier to parent sample

Lab Control Spike

Lab control spikes should be analyzed with each extraction batch or one for every twenty samples. In the absence of lab derived criteria, use 70% - 130% recovery criteria to evaluate the data.

Recovery <70% or >130% (lab derived criteria can also be used)	Apply J qualifier to detects and UJ qualifier to non detects

Matrix Spike/Matrix Spike Duplicate

One matrix spike and matrix spike duplicate should be collected at a rate of one per twenty samples. Use professional judgement to reject results based on out of control MS/MSD recoveries.

Recovery <70% or >130% (lab derived criteria can also be used)	Apply J qualifier to detects and UJ qualifier to non detects of parent sample only
RPD >30%	Apply J qualifier to detects and UJ qualifier to non detects of parent sample only

Extracted Internal Standards (Isotope Dilution Analytes)

Problematic analytes (e.g. PFBA, PFPeA, fluorotelomer sulfonates) can have wider recoveries without qualification. Qualify corresponding native compounds with a J flag if outside of the range.

Recovery <50% or >150%	Apply J qualifier
Recovery <25% or >150% for poor responding analytes	Apply J qualifier
Isotope Dilution Analyte (IDA) Recovery <10%	Reject results

Secondary Ion Transition Monitoring

Quantifier and qualifier ions should be monitored for all target analytes (PFBA and PFPeA are exceptions). The ratio of quantifier ion response to qualifier ion response should be calculated from the standards for each target analyte. Lab derived criteria should be used to determine if the ratios are acceptable. If the ratios fall outside of the laboratory criteria, qualify results as an estimated maximum concentration.

Signal to Noise Ratio

The signal to noise ratio for the quantifier ion should be at least 3:1. If the ratio is less than 3:1, the peak is discernable from the baseline noise and symmetrical, the result can be reported. If the peak appears to be baseline noise and/or the shape is irregular, qualify the result as tentatively identified.

Branched and Linear Isomers

Observed branched isomers in the sample that do not have a qualitative or quantitative standard should be noted and the analyte should be qualified as biased low in the final data review summary report. Note: The branched isomer peak should also be present in the secondary ion transition.

Reporting Limits

If project-specific reporting limits were not met, please indicate that in the report along with the reason (e.g. over dilution, dilution for non-target analytes, high sediment in aqueous samples).

Peak Integrations

Target analyte peaks should be integrated properly and consistently when compared to standards. Ensure branched isomer peaks are included for PFAS where standards are available. Inconsistencies should be brought to the attention of the laboratory or identified in the data review summary report.

APPENDIX E

Health and Safety Plan



**HALEY & ALDRICH, INC.
SITE-SPECIFIC SAFETY PLAN**

FOR

Former Carter Spray Finishing Corp.

65 Eckford Street, Brooklyn, NY

Project/File No. **0202156**

Gensuite EZ Scan®



BI - Developers

Prepared By: Yanxia Lin

Date: 8/17/2021

Project Manager: Mari Cate Conlon

Date: 8/26/2021

HASP Valid Through: 3-10-2023

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STOP WORK AUTHORITY

In accordance with Haley & Aldrich (Haley & Aldrich) Stop Work Authority Operating Procedure (OP1035), any individual has the right to refuse to perform work that he or she believes to be unsafe without fear of retaliation. He or she also has the authority, obligation, and responsibility to stop others from working in an unsafe manner.

STOP Work Authority is the stop work policy for all personnel and subcontractors on the Site. When work has been stopped due to an unsafe condition, Haley & Aldrich site management (e.g., Project Manager [PM], Site Health & Safety Officer [SHSO], etc.) and the Haley & Aldrich Senior Project Manager (SPM) will be notified immediately.

Reasons for issuing a stop work order include, but are not limited to:

- The belief/perception that injury to personnel or accident causing significant damage to property or equipment is imminent.
- An Haley & Aldrich subcontractor is in breach of site safety requirements and/or their own site HASP.
- Identifying a substandard condition (e.g., severe weather) or activity that creates an unacceptable safety risk as determined by a qualified person.

Work will not resume until the unsafe act has been stopped OR sufficient safety precautions have been taken to remove or mitigate the risk to an acceptable degree. Stop work orders will be documented as part of an on-site stop work log, on daily field reports to include the activity/activities stopped, the duration, person stopping work, person in-charge of stopped activity/activities, and the corrective action agreed to and/or taken. Once work has been stopped, only the Haley & Aldrich SPM or SHSO can give the order to resume work. Haley & Aldrich senior management is committed to support anyone who exercises his or her "Stop Work" authority.

ISSUANCE AND COMPLIANCE

This HASP has been prepared in accordance with Occupational Safety and Health Administration (OSHA) regulations (CFR 29, Parts 1904, 1910, and 1926) if such are applicable.

The specific requirements of this HASP include precautions for hazards that exist during this project and may be revised as new information is received or as site conditions change.

- This HASP must be signed by all Haley & Aldrich personnel involved in implementation of the SOW (Section 2 of this HASP).
- This HASP, or a current signed copy, must be retained at all times when Haley & Aldrich staff are present.
- Revisions to this HASP must be outlined within the contents of the HASP. If immediate or minor changes are necessary, the Field Safety Manager (FSM), Haley & Aldrich, SSO and/or Project Manager (PM) may use Attachment 1 (HASP Amendment Form), presented at the end of this HASP. Any revision to the HASP requires employees and subcontractors to be informed of the changes so that they understand the requirements of the change.
- Deviations from this HASP are permitted with approval from the Haley & Aldrich FSM, PM, or Senior Health & Safety Manager (SHSM). Unauthorized deviations may constitute a violation of Haley & Aldrich company procedures/policies and may result in disciplinary action.
- This HASP will be relied upon by Haley & Aldrich's subcontractors and visitors to the site. Haley & Aldrich's subcontractors must have their own HASP which will address hazards specific to their trade that is not included in this HASP. This HASP will be made available for review to Haley & Aldrich's subcontractors and other interested parties (e.g. Facility personnel and regulatory agencies) to ensure that Haley & Aldrich has properly informed our subcontractors and others of the potential hazards associated with the implementation of the SOW to the extent that Haley & Aldrich is aware.

This site-specific HASP provides only site-specific descriptions and work procedures. General safety and health compliance programs in support of this HASP (e.g., injury reporting, medical surveillance, personal protective equipment (PPE) selection, etc.) are described in detail in the Haley & Aldrich Corporate Health and Safety Program Manual and within Haley & Aldrich's Standard Operating Procedures. Both the manual and SOPs can be located on the Haley & Aldrich's Company Intranet. When appropriate, users of this HASP should always refer to these resources and incorporate to the extent possible. The manual and SOPs are available to clients and regulators upon request.

EMERGENCY EVENT PROCEDURES	
1 - ASSESS THE SCENE	
• STOP WORK • Review the situation and ascertain if it's safe to enter the area. • Evacuate the site if the conditions are unsafe.	
2 - EVALUATE THE EMERGENCY	
• Call 911, or designated emergency number, if required. • Provide first aid for the victim if qualified and safe to do so. ○ First aid will be addressed using the onsite first aid kit. * ▪ If providing first aid, remember to use proper first aid universal precautions if blood or bodily fluids are present. • If exposure to hazardous substance is suspected, immediately vacate the contaminated area. ○ Remove any contaminated clothing and/or equipment. ○ Wash any affected dermal/ocular area(s) with water for at least 15 minutes. ○ Seek immediate medical assistance if any exposure symptoms are present. <i>* Note: Haley & Aldrich employees are not required or expected to administer first aid / CPR to any Haley & Aldrich staff member, Contractor, or Civilian personnel at any time; it is Haley & Aldrich's position that those who do are doing so on their own behalf and not as a function of their job.</i>	
3 - SECURE THE AREA	
• Cordon off the incident area, if possible. ○ Notify any security personnel, if required. ○ Escort all non-essential personnel out of the area, if able.	
4 - REPORT ON-SITE ACCIDENTS / INCIDENTS TO PM / SSO	
• Notify the PM and SSO as soon as it is safe to do so. ○ Assist PM and SSO in completing any additional tasks, as required.	
5 - INVESTIGATE / REPORT THE INCIDENT	
• Record details of the incident for input to the Gensuite. ○ Complete any additional forms as requested by the PM and SSO.	
6 - TAKE CORRECTIVE ACTION	
• Implement corrective actions per the PM following root cause analysis. ○ Complete Lessons Learned form.	

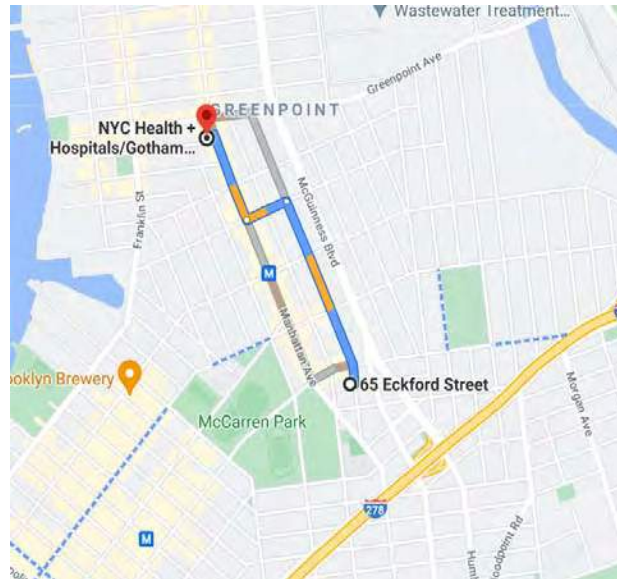
PROJECT INFORMATION AND CONTACTS	
Project Name: Former Carter Spray Finishing Corp.	Haley & Aldrich File No.: 0202156
Location: 65 Eckford Street, Brooklyn, NY	
Client/Site Contact: Phone Number:	Z65 Realty LLC Enter Phone Number
Haley & Aldrich Field Representative: Phone Number: Emergency Phone Number:	Zachary Simmel 646.277.5690 646.787.7669
Haley & Aldrich Project Manager: Phone Number: Emergency Phone Number:	Mari Cate Conlon 646.277.5688 347.271.1521
Field Safety Manager: Phone Number: Emergency Phone Number:	Mari Cate Conlon 646.277.5688 347.271.1521
Subcontractor Project Manager: Phone Number:	Marc Morgenstern 631.319.6536
Nearest Hospital: Address: (see map on next page) Phone Number:	NYC Health + Hospitals/Gotham Health, Greenpoint 875 Manhattan Avenue Brooklyn, NY 11222 844.692.4692
Nearest Occ. Health Clinic: http://www.talispoint.com/liberty/ext/ Address: (see map on next page) Phone Number:	Northside Medical Care 66 Nassau Ave, Brooklyn, NY 11222 718.383.4600
Liberty Mutual Claim Policy	WC6Z11254100030
Emergency Response Number:	911
Other Local Emergency Response Number:	N/A
Other Ambulance, Fire, Police, or Environmental Emergency Resources:	911

DIRECTIONS TO THE NEAREST HOSPITAL

[Liberty Mutual Medical Location Directory](#)

NYC Health + Hospitals/Gotham Health, Greenpoint

875 Manhattan Avenue
Brooklyn, NY 11222
844.692.4692



Directions to the Nearest Hospital:

5 min (0.7 mile)

via Eckford St and Manhattan Ave
Fastest route, lighter traffic than usual



65 Eckford St

Brooklyn, NY 11222

↑ Head north on Eckford St toward Driggs Ave

0.4 mi

↩ Turn left onto Meserole Ave

0.1 mi

↗ Turn right at the 2nd cross street onto Manhattan Ave

Destination will be on the left

0.2 mi

NYC Health + Hospitals/Gotham Health, Greenpoint

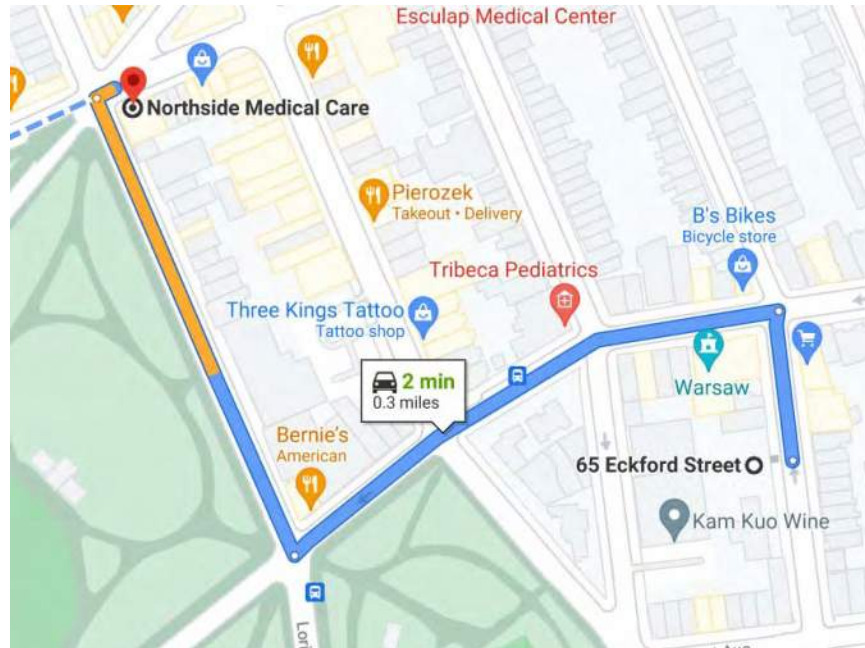
875 Manhattan Ave, Brooklyn, NY 11222

DIRECTIONS TO THE NEAREST URGENT CARE

[Liberty Mutual Medical Location Directory](#)

Northside Medical Care

66 Nassau Ave,
Brooklyn, NY 11222
718.383.4600



Directions to the Nearest Urgent Care:

2 min (0.3 mile)

via Driggs Ave and Lorimer St
Fastest route, the usual traffic



65 Eckford St

Brooklyn, NY 11222

↑ Head north on Eckford St toward Driggs Ave

213 ft

↩ Turn left onto Driggs Ave

0.1 mi

↪ Turn right onto Lorimer St

0.1 mi

↪ Turn right onto Nassau Ave

Destination will be on the right.

30 ft

Northside Medical Care

66 Nassau Ave, Brooklyn, NY 11222

1. WORK SCOPE

This Site-Specific Health and Safety Plan addresses the health and safety practices and procedures that will be exercised by all Haley & Aldrich employees participating in all work on the Project Site. This plan is based on an assessment of the site-specific health and safety risks available to Haley & Aldrich and Haley & Aldrich's experience with other similar project sites. The scope of work includes the following:

Work tasks will include 1) Site walk and field measurements 2) Corrective action oversight (oversee fluid evacuation and backfilling) 3) Drilling (install soil borings and groundwater wells for an investigation) soil and 4) Groundwater, soil vapor sampling.

Project Task Breakdown

Task No.	Task Description	Employee(s) Assigned	Work Date(s) or Duration
1	Site walk, field measurements	Zachary Simmel	1 day
2	Corrective Action Implementation – Remedial Oversight and Air Monitoring	Zachary Simmel	2-3 months
3	Drilling, install soil borings and groundwater wells for an investigation	Zachary Simmel	2 days
4	Soil sampling/Soil vapor sampling, collect soil samples, soil vapor samples into laboratory provided containers	Zachary Simmel	2 days
5	Groundwater sampling, collect groundwater samples into laboratory provided containers	Zachary Simmel	2 days

Subcontractor(s) Tasks

Firm Name	Work Activity	Work Date(s) or Duration
Eastern Environmental Solutions	Drilling	2 days

Projected Start Date: 11/17/2021

Projected Completion Date: 12/31/2021

Firm Name	Work Activity	Work Date(s) or Duration
Prestige NY LLC	Construction Contractor	2-3 months

Projected Start Date: 9/17/2021

Projected Completion Date: 12/31/2021

2. SITE OVERVIEW / DESCRIPTION
Site Classification
Commercial
Site Description
The address of the Site is 65 Eckford Street, Brooklyn, NY 11222. It is comprised of a single tax parcels identified as Block 2698, Lot 26. The Site is located on the west side of Eckford Street in the Greenpoint neighborhood of Brooklyn, New York. The Site is an irregular shaped lot consisting of approximately 85 ft of frontage along Eckford Street. The Site is currently a vacant industrial building which was the eastern portion of the former NuHart plastics manufacturing facility. The western portion of the former NuHart facility is listed in the NYSDEC Inactive Hazardous Waste Registry as a Class 2 Site (Site No. 224136). Historically, the former NuHart facility was used for the manufacturing of plastic and vinyl products.
Background and Historic Site Usage
The Site was developed since at least 1887 and was used for metalworking, manufacturing of light fixtures, soaps, and water proofing materials through 1950. From 1950 until 2004, the Site and associated manufacturing buildings to the west were used by the NuHart company for the production, storage, and shipping of plastic and vinyl products. Operations ceased in 2004 and the Site buildings have been vacant since that time.
Site Status
Indicate current activity status and describe operations at the site: Inactive Operations ceased in 2004 and the Site buildings have been vacant since that time.
Site Plan
Is a site plan or sketch available? Yes
Work Areas
List and identify each specific work areas(s) on the job site and indicate its location(s) on the site plan: Whole site Enter work area description Enter work area description Enter work area description

Site Plan



3. HAZARD ASSESSMENT

Indicate all hazards that may be present at the site and for each task. If any of these potential hazards are checked, it is the Project Manager's responsibility to determine how to eliminate / minimize the hazard to protect onsite personnel.

Site Chemical Hazards

Is this Site impacted with chemical contamination? Yes

Source of information about contaminants: Owner Knowledge

Contaminant of Concern	Location/Media	Concentration	Units
Volatile Organic Compounds (VOCs)	Soil	102.7	mg/kg
Volatile Organic Compounds (VOCs)	Groundwater	135-457	ug/L
Arsenic	Soil	13.4-31.5	mg/kg
Barium	Soil	743-818	mg/kg
Lead	Soil	103-2790	mg/kg
Mercury	Soil	0.4-14	mg/kg

VOCs: include all organic compounds (substances made up of predominantly carbon and hydrogen) with boiling temperatures in the range of 50-260 degrees C, excluding pesticides. This means that they are likely to be present as a vapor or gas in normal ambient temperatures. Substances which are included in the VOC category include aliphatic hydrocarbons (such as hexane), aldehydes, aromatic hydrocarbons (such as benzene, toluene, and the xylenes or BTEX), and oxygenated compounds (such as acetone and similar ketones). The term VOC often is used in a legal or regulatory context and in such cases the precise definition is a matter of law.

VOCs are released from oil and gasoline refining, storage and combustion as well as from a wide range of industrial processes. Processes involving fuels, solvents, paints or the use of chemicals are the most significant sources. VOCs may also be emitted from cleaning products, degreasing products, fabrics, carpets, plastic products, glues, printed material, varnishes, wax, disinfectants, and cosmetics.

Typically, VOCs are present in gas or vapor and will enter the body by breathing contaminated air. Higher concentrations of VOCs may occur in areas of poor ventilation.

Arsenic: The Occupational Safety and Health Administration has set limits of 10 microgram arsenic per cubic meter of workplace air (10 µg/m³) for 8 hour shifts and 40 hour work weeks. Several studies have shown that inorganic arsenic can increase the risk of lung cancer, skin cancer, bladder cancer, liver cancer, kidney cancer, and prostate cancer. The World Health Organization (WHO), the Department of

Health and Human Services (DHHS), and the EPA have determined that inorganic arsenic is a human carcinogen.

Breathing high levels of inorganic arsenic can give you a sore throat or irritated lungs. Ingesting high levels of inorganic arsenic can result in death. Lower levels of arsenic can cause nausea and vomiting, decreased production of red and white blood cells, abnormal heart rhythm, damage to blood vessels, and a sensation of "pins and needles" in hands and feet.

Barium: is a soft, silvery metal that rapidly tarnishes in air and reacts with water. It is mostly used in drilling fluids for oil and gas wells and used in paint and in glassmaking. All barium compounds are toxic; however, barium sulfate is insoluble and so can be safely swallowed. A suspension of barium sulfate is sometimes given to patients suffering from digestive disorders.

Barium has no known biological role, although barium sulfate has been found in one type of algae. Barium is toxic, as are its water- or acid-soluble compounds. Barium occurs only in combination with other elements. The major ores are barite (barium sulfate) and witherite (barium carbonate). Barium metal can be prepared by electrolysis of molten barium chloride, or by heating barium oxide with aluminum powder.

Lead: The effects of lead are the same whether it enters the body through breathing or swallowing. Lead can affect almost every organ and system in your body. The main target for lead toxicity is the nervous system. Long-term exposure to lead can result in decreased performance in some tests measuring functions of the nervous system in adults. It may also cause weakness in fingers, wrists, or ankles. Lead exposure also causes small increases in blood pressure, particularly in middle-aged and older people and can cause anemia. Exposure to high lead levels can severely damage the brain and kidneys and ultimately cause death.

Mercury: is an odorless, silver metallic liquid. It can be inhaled or absorbed through the skin. Contact may cause irritation to the skin or eyes. Toxic if ingested. Fume inhalation may cause irritation in the nose, throat or lungs. This is a corrosive chemical. Symptoms of poisoning include, muscle tremors, loss of appetite, and nausea. Long-term exposure may have effects on the central nervous system and kidneys. The PEL is 0.1 mg/m³ averaged over an 8 hour shift.

Site Hazards Checklist

Weather

Hot Temperatures	Cold Temperatures	High Winds	Select Hazard

Hot Temperatures

Heat stress may occur at any time work is being performed at elevated ambient temperatures. Because heat stress is one of the most common and potentially serious illnesses associated with

outdoor work during hot seasons, regular monitoring and other preventative measures are vital. Site workers must learn to recognize and treat the various forms of heat stress. The best approach is preventative heat stress management.

H&A employees and their subcontractors should be aware of potential health effects and/or physical hazards of working when there are hot temperatures or a high heat index. Refer OP1015-Heat Stress for a discussion on hot weather hazards.

Cold Temperatures

Cold stress may occur at any time work is being performed at low ambient temperatures and high velocity winds. Because cold stress is common and has potentially serious illnesses associated with outdoor work during cold seasons, regular monitoring and other preventative measures are vital.

Refer to OP1003-Cold Stress for additional information and mitigation controls.

High Winds

While high winds are commonly associated with severe thunderstorms and hurricanes they may also occur as a result of differences in air pressures, such as when a cold front passes across the area. They can cause downed trees and power lines, and flying debris (such as dust or larger debris), which adds additional risks and could lead to power outages, transportation disruptions, damage to buildings and vehicles, and serious injury.

Wind Advisory are issued for sustained winds 25 to 39 mph and/or gusts to 57 mph. High Wind warnings are issued by the National Weather Service when high wind speeds may pose a hazard or is life threatening. The criteria for this warning will varies by state. The Beaufort Wind Scale is a helpful tool to when dealing with high winds.

Biological

Mosquitoes	Choose an item.	Choose an item.	Choose an item.

Mosquitos

Work outdoors with temperatures above freezing will likely bring staff into contact with mosquitos. There are a variety of mosquito species that can transmit a range of diseases. Birds act as reservoirs for

the viruses that can be collected by the mosquito and transmitted to a person. Majority of mosquitos are mainly a nuisance but staff need to take appropriate precautions to minimize the potential transmission of a virus that can result in one of the following diseases: West Nile, Eastern Equine Encephalitides and Western Encephalitides. Knowing some key steps that can minimize the risk of mosquito bites is, therefore, important in reducing the risks. Workers working outdoors should be aware that the use of PPE techniques is essential to preventing mosquito bites especially when working at sites where mosquitoes may be active and biting.

Use repellents containing DEET, picaridin, IR3535, and some oil of lemon eucalyptus and para-menthane-diol products provide longer-lasting protection. To optimize safety and effectiveness, repellents should be used according to the label instructions. Cover as much of your skin as possible by wearing shirts with long-sleeves, long pants, and socks whenever possible. Avoid use of perfumes and colognes when working outdoors during peak times when mosquitoes may be active; mosquitoes may be more attracted to individuals wearing perfumes and colognes.

Location/Terrain

Slip/Trip/Falls	Choose an item.	Choose an item.	Choose an item.

Slips, Trips & Falls

Slip and trip injuries are the most frequent injuries to workers. Statistics show most falls happen on the same level resulting from slips and trips. Both slips and trips result from unintended or unexpected change in the contact between the feet and the ground or walking surface. Good housekeeping, quality of walking surfaces (flooring), awareness of surroundings, selection of proper footwear, and appropriate pace of walking are critical for preventing fall accidents.

Site workers will be walking on a variety of irregular surfaces, that may affect their balance. Extra care must be taken to walk cautiously near rivers because the bottom of the riverbed maybe slick and may not be visible. Rocks, gradient changes, sandy bottoms, and debris may be present but not observable.

Take your time and pay attention to where you are going. Adjust your stride to a pace that is suitable for the walking surface and the tasks you are doing. Check the work area to identify hazards - beware of trip hazards such as wet floors, slippery floors, and uneven surfaces or terrain. Establish and utilize a pathway free of slip and trip hazards. Choose a safer walking route. Carry loads you can see over. Keep work areas clean and free of clutter. Communicate hazards to on-site personnel and remove hazards as appropriate.

Miscellaneous

Extended Shift	Choose an item.	Choose an item.	Choose an item.

Extended Shift

An extended shift can include extending a workday beyond eight hours. Extended or unusual work shifts may be more stressful physically, mentally, and emotionally. Non-traditional shifts and extended work hours may disrupt the body's regular schedule, leading to increased fatigue, stress, and lack of concentration. This leads to an increased risk of operator error, injuries and/or accidents. The degree to which an individual is exposed to fatigue risk factors depends upon the work schedule. As both the duration of the workday and the number of days worked increase so does the fatigue risk factors. Staff Managers need to be aware of the fatigue risk factors and ensure projects are structured to mitigate these factors. Staff Members also have a responsibility to manage the personal fatigue risk factors that they can control outside of work (e.g, duration and quality of sleep, diet, drugs, and alcohol)

Fatigue is a message to the body to rest and can be eliminated with proper rest. However, if rest is not possible, fatigue can increase and becomes distressing and eventually debilitating. Fatigue symptoms, both mental and physical, vary and depend on the person and degree of overexertion. Examples include: weariness, sleepiness, irritability, reduced alertness, lack of memory, concentration and motivation, increased susceptibility to illness, depression, headache, loss of appetite, and digestive problems.

When possible, managers should limit use of extended shifts and increase the number of days worked. Working shifts longer than 8 hours generally result in reduced productivity and alertness. Additional breaks and meals should be provided when working extended shift periods. Tasks requiring heavy physical labor or intense concentration should be performed at the beginning of the shift if possible. This is an important consideration for pre-emergency planning.

Make efforts, when feasible, to ensure that unavoidable extended work shifts and shift changes allow affected employees time for adequate rest and recovery. Project Managers need to plan to have an adequate number of personnel available to enable workers to take breaks, eat meals, relax, and sleep.

Plan for regular and frequent breaks throughout the work shift. If at remote sites, ensure if possible, that there is a quiet, secluded area designated for rest and recuperation. In addition to formal breaks such as lunch or dinner, encourage use of micro breaks to change positions, move about, and shift concentration. Personnel should look to obtain an adequate quantity and quality of sleep.

Task Hazard Summary

Task 1 - Site Walk

General hazards associated with site walk-throughs and site surveys include the following:

- Exposure to irritant and toxic plants such as poison ivy and sticker bushes may cause allergic reactions to personnel.
- Surfaces covered with heavy vegetation and undergrowth create a tripping hazard.
- Back strain due to carrying equipment, tools, and instruments.
- Native wildlife such as rodents, ticks, and snakes present the possibility of insect bites and associated diseases such as Lyme disease

Driving vehicles on uneven or unsafe surfaces can result in accidents such as overturned vehicles or flat tires.

- Heat stress/cold stress exposure.

HAZARD PREVENTION

- Wear long-sleeved clothing and slacks to minimize contact with irritant and toxic plants and to protect against insect bites. Appropriate first aid for individuals' known allergic reactions.
- Be alert and observe terrain while walking to minimize slips and falls.
- Use proper lifting techniques to prevent back strain.
- Avoid wildlife when possible. In case of an animal bite, perform first aid and capture the animal, if possible, for rabies testing. Perform a tick check after leaving a wooded or vegetated area.
- Ensure all maintenance is performed on vehicles before going to the field. A site surveillance on foot might be required to choose clear driving paths.
- Implement heat stress management techniques such as shifting work hours, fluid intake, and monitoring employees, especially high risk workers.

Task 2 – Remedial oversight and Air Monitoring

Remedial oversight includes community air monitoring, endpoint soil sampling and record keeping, may require working in close proximity to heavy equipment and may be exposed to many of the same hazards as the subcontractor. It is imperative that staff are aware of emergency stops and establish communication protocols with the contractors prior to the start of work.

See OP 1002 Drilling Safety for more information.

Task 3 – Drilling

Drilling is conducted for a range of services that can include but are not limited to: soil characterization, environmental investigation, well installation, and ore exploration. Familiarity with basic drilling safety is an essential component of all drilling projects. Potential hazards related to drilling operations include, but are not limited to encountering underground or overhead utilities, traffic and heavy equipment, hoisting heavy tools, steel impacts, open rotation entanglement, and the planned or unexpected encountering of toxic or hazardous substances. While staff members do not operate drilling equipment, they may work in close proximity to operating drilling equipment and may be exposed to many of the same hazards as the drilling subcontractor. It is imperative that staff are aware of emergency stops and establish communication protocols with the drillers prior to the start of work.

See OP 1002 Drilling Safety for more information.

Task 4 – Soil Sampling

Soil sampling by H&A staff on active construction sites can be conducted in conjunction with a wide range activities such as building construction, earthwork and soil management related activities. These activities can include, but are not limited to: drill spoil characterization and management during building foundation element installation, characterization of excavated soils for management/disposal/reuse during earthwork activities, and as part of environmental remedial activities such as delineation and confirmation sampling. Familiarity with basic heavy construction safety, site conditions (geotechnical and environmental), and potential soil contaminants are essential components of soil sampling performed on active sites. Potential hazards related to soil sampling at construction sites include, but are not limited to: encountering site vehicle traffic and heavy equipment operations, manual lifting, generated waste, contact or exposure to impacted soil, and encountering unknown toxic or hazardous substances. Although soil sampling is commonly performed within active excavations, from stockpiles, or within trench excavations, sampling locations and situations will vary depending on site conditions. Care should be taken while entering and exiting excavations or trenches, and when accessing (climbing up or down) soil stockpiles, ensuring that the sampling area is not being actively accessed by construction equipment. Care should also be taken with handling of potentially environmentally impacted soil during sampling, with appropriate PPE identified and used. At no time during classification activities are personnel to reach for debris near machinery that is in operation, place any samples in their mouth, or come in contact with the soils without the use of gloves. Staff will have to carry and use a variety of sampling tools, equipment, containers, and potentially heavy sample bags. It is imperative that staff are aware of emergency / communication protocols with the Contractor prior to the start of work.

Task 4– Soil Vapor Sampling

Soil gas sampling is employed as an indirect indicator of contamination in soil or groundwater particularly over and around landfill waste sites, or groundwater plumes. Soil gas sampling points can be installed manually using a slam bar or power driven mechanical devices (e.g., demolition hammer or Geoprobe) may be used based on site conditions (i.e., pavement, frozen ground, very dense clays, etc.). Soil gas samples can be drawn through the probe itself, or through Teflon tubing inserted through the probe and attached to the probe point. Samples are collected and analyzed as described below. Other field air monitoring devices, such as the Combustible Gas Indicator (CGI) and the Organic Vapor Analyzer (OVA), can also be used, depending on specific site conditions.

Because the sample is being drawn from underground, and no contamination is introduced into the breathing zone, soil gas sampling usually occurs in Level D. Nevertheless, ambient air should be constantly monitored to obtain background and breathing zone readings during the sampling procedure in the event the seal around the sampling point is breached. As long as the levels in ambient air do not

rise above background, no upgrade of the level of protection is needed. Also, an underground utility search must be performed prior to sampling.

Task 5 – Groundwater Sampling

Environmental water sampling could include activities such as groundwater sampling from permanent or temporary wells, or surface water sampling from streams, rivers, lakes, ponds, lagoons, and surface impoundments.

Sampling tasks could involve uncapping, purging (pumping water out of the well), and sampling, and/or monitoring, new or existing monitoring wells. A mechanical pump may be used to purge the wells and can be hand-, gas-, or electric-operated. Water samples taken from the wells are then placed in containers and shipped to an analytical laboratory for analysis. The physical hazards of these operations are primarily associated with the collection methods and procedures used.

When sampling bodies of water containing known or suspected hazardous substances, adequate precautions must be taken to ensure the safety of sampling personnel. The sampling team member collecting the sample should not get too close to the edge, where ground failure or slips, trips or falls may cause him/her to lose his/her balance. The person performing the sampling should have fall restraint or protection for the task. When conducting sampling from a boat in an impoundment or flowing waters, appropriate vessel safety procedures should be followed. Avoid lifting heavy coolers with back muscles; instead, use ergonomic lifting techniques, team lift or mechanical lifts. Wear proper gloves, such as when handling sample containers to avoid contacting any materials that may have spilled out of the sample containers.

Inhalation and absorption of COCs are the primary routes of entry associated with water sampling, due to the manipulation of sample media and equipment, manual transfer of media into sample containers, and proximity of operations to the breathing zone. During this project, several different groundwater sampling methodologies may be used based on equipment accessibility and the types of materials to be sampled. These sampling methods may include hand or mechanical bailing. The primary hazards associated with these specific sampling procedures are not potentially serious; however, other operations in the area or the conditions under which samples must be collected may present chemical and physical hazards. The hazards directly associated with groundwater sampling procedures are generally limited to strains or sprains from hand bailing, and potential eye hazards. Exposure to water containing COCs is also possible. All tools and equipment that will be used at the site must be intrinsically safe (electronics and electrical equipment) and non-sparking or explosion-proof (hand tools).

Task Physical Hazards Checklist					
Potential Task Hazards	Task 1 Site walk, field measurement	Task 2 Remedial oversight and air monitoring	Task 3 Drilling	Task 4 Soil sampling/ soil vapor sampling	Task 5 Groundwater sampling
Noise	☐	☒	☒	☐	☐
Heavy Equipment	☐	☒	☒	☐	☐
Hot Work	☒	☒	☒	☒	☒
Slippery Surfaces	☒	☒	☒	☒	☒
Ergonomics	☒	☒	☒	☒	☒
Congested Area	☒	☒	☒	☒	☒
Ground Disturbance	☐	☒	☒	☐	☐
Line of Fire	☒	☒	☒	☐	☐
Manual Lifting	☒	☒	☒	☒	☒
Sharp Objects	☒	☒	☒	☒	☒
Underground Utilities	☐	☒	☒	☐	☐

Summary of Physical Hazards & Controls

Noise

Working around heavy equipment (drill rigs, excavators, etc.) often creates excessive noise. The effects of noise include physical damage to the ear, pain, and temporary and/or permanent hearing loss. Workers can also be startled, annoyed, or distracted by noise during critical activities. Noise monitoring data that indicates that working within 25 feet of operating heavy equipment result in exposure to hazardous levels of noise (levels greater than 85 dBA).

See OP 1031 Hearing Conservation for additional information.

Controls

- Personnel are required to use hearing protection (earplugs or earmuffs) within 25 feet of any operating piece of heavy equipment.
- Limit the amount of time spent at a noise source.
- Move to a quiet area to gain relief from hazardous noise sources.
- Increase the distance from the noise source to reduce exposure.

Heavy Equipment

Staff must be careful and alert when working around heavy equipment, failure or breakage and limited visibility can lead to accidents and worker injury. Heavy equipment such as cranes, drills, haul trucks, or other can fail during operation increasing chances of worker injury. Equipment of this nature shall be visually inspected and checked for proper working order prior to commencement of field work. Those operating heavy equipment must meet all requirements to operate the equipment. Haley & Aldrich, Inc. staff that supervise projects or are associated with high risk projects that involve digging or drilling should use due diligence when working with a construction firm.

See OP1052 Heavy Equipment for additional information.

Controls

- Only approach equipment once you have confirmed contact with the operator (e.g., operator places the bucket on the ground).
- Always maintain visual contact with operators and keep out of the strike zone whenever possible.
- Always be alert to the position of the equipment around you.
- Always approach heavy equipment with an awareness of the swing radius and traffic routes of all equipment and never go beneath a hoisted load.
- Avoid fumes created by heavy equipment exhaust.

Hot Work

Hot work is any work that could produce a source of ignition or temperature high enough to cause the ignition of flammable gases and combustible materials. Hot work activities include burning, welding, grinding, braising, soldering, using fire or spark-producing tools. The main hazards associated with hot

work are getting burned directly by the hot work activity or by fires or explosions that result from an accumulation of combustible materials in the work area.

Performing hot work in Classified and Non-Classified areas are considered a hazardous activity, and a Permit to Work may be required. In general, the Hot Work Permit has five purposes:

- To serve as written permission to do the work;
- To provide a minimum checklist prior to the commencement of hot work;
- To outline the steps necessary for making the work site safe for conducting hot work;
- To alert operating personnel to the hot work in progress; and
- To provide a record of safe work practices performed during the permitted activity.

Work shall be conducted in accordance with OP1034 Hot Work.

Controls

- Hot Work Permit must be completed.
- Conduct a risk assessment of the proposed work area to identify combustible or flammable material.
- If potential for flammable gases exists in the work area they must be monitored with a gas detector prior to starting any hot work.
- The hot work equipment shall be in satisfactory operating condition and in good repair.
- All combustible and flammable materials shall be relocated at least 35' in all directions from the work site.

If relocating these materials is impractical, the following precautions shall be taken:

- Materials shall be shielded with fire-retardant covers or metal or fire-retardant guards or curtains.
- The edges of covers at the floor shall be tight to prevent the entrance of sparks, including at the point where several covers overlap when a large pile is being protected.
- A fire watch may be required.
- A fully charged and operable fire extinguisher appropriate for the type of potential fire shall be available for use in the work area (20lbs minimum).
- A nonflammable, impervious material shall seal sewer openings, ducts and drains. Where sealing is insecure or impractical, water spray or stream should be directed across openings.
- The location of the hot work relative to combustible and flammable materials and classified areas shall determine the need for a fire watch
- Personnel within the vicinity of the hot work shall be suitably protected against such dangers as heat, sparks, flash and slag.

Slippery Surfaces

Both slips and trips result from unintended or unexpected change in the contact between the feet and ground or walking surface. Good housekeeping, quality of walking surfaces, selection of proper footwear, and appropriate pace of walking are critical for preventing fall accidents. Slips happen where there is too little friction or traction between the footwear and walking surface.

Common causes of slips are wet or oily surfaces, spills, weather hazards, loose unanchored rugs or mats and flooring or other walking surfaces that do not have same degree of traction in all areas.

Weather-related slips and falls become a serious hazard as winter conditions often make for wet or icy surfaces outdoors. Even wet organic material or mud can create hazardous walking conditions. Spills and leaks can also lead to slips and falls.

Controls

- Evaluate the work area to identify any conditions that may pose a slip hazard.
- Address any spills, drips or leaks immediately.
- Mark areas where slippery conditions exist.
- Select proper footwear or enhance traction with additional PPE.
- Where conditions are uncertain or environmental conditions result in slippery surfaces walk slowly, take small steps, and slide feet on wet or slippery surfaces.

Congested Areas

Working in congested areas can expose both workers and the public to a wide range of hazards depending upon the specific activities taking place. Staff Members need to understand the work scope, work areas, equipment on-site, and internal traffic patterns to minimize or eliminate exposure potential.

Controls

- Provide barricades, fencing, warning signs/signals and adequate lighting to protect people while working in or around congested areas.
- Vehicles and heavy equipment with restricted views to the rear should have functioning back-up alarms that are audible above the surrounding noise levels. Whenever possible, use a signaler to assist heavy equipment operators and/or drivers in backing up or maneuvering in congested areas.
- Lay out traffic control patterns to eliminate excessive congestion.
- Workers in congested areas should always wear high visibility clothing.
- Be aware of Line of Fire hazards when performing work activities in congested areas.
- Hazards associated with SIMOPs should be discussed daily at Tailgate Safety Meetings.

Ground Disturbance

Ground disturbance is defined as any activity disturbing the ground. Ground disturbance activities include, but are not limited to, excavating, trenching, drilling (either mechanically or by hand), digging, plowing, grading, tunneling and pounding posts or stakes.

Because of the potential hazards associated with striking an underground utility or structure, the operating procedure for underground utility clearance shall be followed prior to performing any ground disturbance activities.

See OP1020 Working Near Utilities

Controls

Prior to performing ground disturbance activities, the following requirements should be applied:

- Confirm all approvals and agreements (as applicable) either verbal or written have been obtained.

- Request for line location has been registered with the applicable One-Call or Dial Before You Dig organization, when applicable.
 - Whenever possible, ground disturbance areas should be adequately marked or staked prior to the utility locators site visit.
- Notification to underground facility operator/owner(s) that may not be associated with any known public notification systems such as the One-Call Program regarding the intent to cause ground disturbance within the search zone.
- Notifications to landowners and/or tenant, where deemed reasonable and practicable.
- Proximity and Common Right of Way Agreements shall be checked if the line locator information is inconclusive.

Line of Fire

Line of fire refers to the path an object will travel. Examples of line of fire situations typically observed on project sites include lifting/hoisting, lines under tension, objects that can fall or roll, pressurized objects or lines, springs or stored energy, work overhead, vehicles and heavy equipment.

Controls

- Never walk under a suspended load.
- Be aware and stay clear of tensioned lines such as cable, chain and rope.
- Be cautious of torque stresses that drilling equipment and truck augers can generate. Equipment can rotate unexpectedly long after applied torque force has been stopped.
- Springs and other items can release tremendous energy if compressed and suddenly released
- Items under tension and pressure can release tremendous energy if it is suddenly released.
- Not all objects may be overhead; be especially mindful of top-heavy items and items being transported by forklift or flatbed.
- Secure objects that can roll such as tools, cylinders, and pipes.
- Stay clear of soil cuttings or soil stockpiles generated during drilling operations and excavations, be aware that chunks of soil, rocks, and debris can fall or roll.

Manual Lifting/Moving

Most materials associated with investigation, remedial, or construction-related activities are moved by hand. The human body is subject to damage in the forms of back injury, muscle strains, and hernia if caution is not observed in the handling process.

Controls

- Under no circumstances should any one person lift more than 49 pounds unassisted.
- Always push, not pull, the object when possible.
- Size up the load before lifting. If it is heavy or clumsy, get a mechanical aid or help from a worker.
- Bend the knees; it is the single most important aspect of lifting.
- When performing the lift:
 - Place your feet close to the object and center yourself over the load.
 - Get a good handhold.

- o Lift straight up, smoothly and let your legs do the work, not your back!
- o Avoid overreaching or stretching to pick up or set down a load.
- o Do not twist or turn your body once you have made the lift.
- o Make sure beforehand that you have a clear path to carry the load.
- o Set the load down properly.

Sharp Objects

Workers who handle sharp edged objects like sheets of steel or glass are at risk of cuts. Workers who handle sharp edged objects are also at risk of cuts. Injuries may occur to hands, fingers, or legs when they are in the way of the blade, when the blade slips, or if an open blade is handled unexpectedly. Other hazards at job sites include stepping on sharp objects (e.g. wooden boards with protruding nails, sharp work-tools, chisels, etc.) and colliding with sharp and/or protruding objects.

Controls

Always be alert when handling sharps. Never look away or become distracted while handling sharp objects. Use caution when working with tools; use right tool for the job. Keep tools sharp, dull blades are a safety hazard, requiring more force to make cuts which can lead to tool slippage. Wear appropriate PPE and do not handle sharp objects (i.e., broken glass) with bare hands. Use mechanical devices, when possible. Stay away from building debris; avoid handling site debris or placing your hand where you cannot see. Watch out for barbed wire and electrical fences; cover with a car mat or equivalent to cross or walk around; use the buddy system to avoid entanglement; wear gloves. Do not leave unprotected sharps unattended. Use protective shields, cases, styrofoam blocks, etc. Pass a sharp by handing it over carefully by the handle with the blade down or retracted. Fixed open blades are prohibited. Always cut away from the body, making several passes when cutting thicker materials. Make sure blades are fitted properly into the knife. Never cut items with a blade or other sharp object on your lap. Never try to catch a blade or cutting tool that is falling.

Underground Utilities

Various forms of underground/overhead utility lines or conveyance pipes may be encountered during site activities. Prior to the start of intrusive operations, utility clearance is mandated, as well as obtaining authorization from all concerned public utility department offices. Should intrusive operations cause equipment to come into contact with utility lines, the SHSO, Project Manager, and Regional H&S Manager shall be notified immediately. Work will be suspended until the client and applicable utility agency is contacted and the appropriate actions for the situation can be addressed.

See OP1020 Work Near Utilities for complete information.

Controls

- Obtain as-built drawings for the areas being investigated from the property owner;
- Visually review each proposed soil boring locations with the property owner or knowledgeable site representative;
- Perform a geophysical survey to locate utilities;
- Hire a private line locating firm to determine location of utility lines that are present at the property;

- Identifying a no-drill or dig zone;
- Hand dig or use vacuum excavation in the proposed ground disturbance locations if insufficient data is unavailable to accurately determine the location of the utility lines.

4. PROTECTIVE MEASURES

The personal protective equipment and safety equipment (if listed) is specific to the associated task. The required PPE and equipment listed must be onsite during the task being performed. Work shall not commence unless the required PPE or Safety Equipment is present.

Required Safety & Personal Protective Equipment

Required Personal Protective Equipment (PPE)	Task 1	Task 2	Task 3	Task 4&5
	Site walk, field measurement	Remedial oversight and air monitoring	Drilling	Soil sampling/Soil vapor sampling & Groundwater Sampling
Hard hat	☒	☒	☐	☐
Safety Glasses	☐	☒	☒	☒
Hearing Protection	☐	☒	☐	☐
Safety Toed Shoes	☒	☒	☒	☒
Class 2 Safety Vest	☒	☒	☒	☒
Face Shield	☐	☒	☒	☒
Level of protection required	D	D	D	D
Required Safety Equipment				
First Aid Kit	☒	☒	☒	☒

5. TRAINING REQUIREMENTS

The table below lists the training requirements staff must have respective to their assigned tasks and that are required to access the Site.

Site Specific Training Requirements

HAZWOPER - 40 Hour (Initial); HAZPOWER -8 Hour (Annual Refresher); OSHA - 10 hour Construction; Site Specific Orientation

Task Specific Training Requirements

Required Training Type	Task 1	Task 2	Task 3	Task 4&5
	Site walk, field measurement	Remedial oversight and air monitoring	Drilling	Soil sampling/Soil vapor sampling & Groundwater Sampling
HAZWOPER – 40 Hour (Initial); HAZPOWER – 8 Hour (Annual Refresher); and Site – Specific Orientation	☒	☐	☒	☒
DOT HAZMAT Transporter Training	☒	☒	☐	☐
10 hour OSHA Construction	☐	☒	☐	☐

6. AIR MONITORING PLAN AND EQUIPMENT

Exposures to airborne substances shall be fully characterized throughout project operations to ensure that exposure controls are effectively selected and modified as needed.

Is air/exposure monitoring required at this work site for personal protection? No

Is perimeter monitoring required for community protection? No

Air monitoring plan not applicable No

7. DECONTAMINATION & DISPOSAL METHODS

All possible and necessary steps shall be taken to reduce or minimize contact with chemicals and contaminated/impacted materials while performing field activities (e.g., avoid sitting or leaning on, walking through, dragging equipment through or over, tracking, or splashing potential or known contaminated/impacted materials.)

Personal Hygiene Safeguards		
The following minimum personal hygiene safeguards shall be adhered to: 1. No smoking or tobacco products in any project work areas. 2. No eating or drinking in the exclusion zone. 3. It is required that personnel present on site wash hands before eating, smoking, taking medication, chewing gum/tobacco, using the restroom, or applying cosmetics and before leaving the site for the day. It is recommended that personnel present on site shower or bathe at home at the end of each day of working on the site.		
Decontamination Supplies		
All decontamination should be conducted at the project site in designated zones or as dictated by Client requirements. Decontamination should not be performed on Haley & Aldrich owned or leased premises.		
☐ Acetone	☒ Distilled Water	☐ Polyethylene Sheeting
☒ Alconox Soap	☐ Drums	☐ Pressure/Steam Cleaner
☐ Brushes	☐ Hexane	☒ Tap Water
☒ Disposal Bags	☐ Methanol	☐ Wash tubs
☒ 5 Gallon Buckets	☒ Paper Towels	☐ Other: Specify
Location of Decontamination Station		
Decontamination will take place prior to leaving the site at the exit.		

Standard Personal Decontamination Procedures

Outer gloves and boots should be decontaminated periodically as necessary and at the end of the day. Brush off solids with a hard brush and clean with soap and water or other appropriate cleaner whenever possible. Remove inner gloves carefully by turning them inside out during removal. Wash hands and forearms frequently. It is good practice to wear work-designated clothing while on-site which can be removed as soon as possible. Non-disposable overalls and outer work clothing should be bagged onsite prior to laundering. If gross contamination is encountered on-site contact the Project Manager and Field Safety Manager to discuss proper decontamination procedures.

The steps required for decontamination will depend upon the degree and type of contamination but will generally follow the sequence below.

1. Remove and wipe clean hard hat
2. Rinse boots and gloves of gross contamination
3. Scrub boots and gloves clean
4. Rinse boots and gloves
5. Remove outer boots (if applicable)
6. Remove outer gloves (if applicable)
7. Remove Tyvek coverall (if applicable)
8. Remove respirator, wipe clean and store (if applicable)
9. Remove inner gloves (if outer gloves were used)

PPE that is not grossly contaminated can be bagged and disposed in regular trash receptacles.

Small Equipment Decontamination

Pretreatment of heavily contaminated equipment may be conducted as necessary:

1. Remove gross contamination using a brush or wiping with a paper towel
2. Soak in a solution of Alconox and water (if possible)
3. Wipe off excess contamination with a paper towel

Standard decontamination procedure:

4. Wash using a solution of Alconox and water
5. Rinse with potable water
6. Rinse with methanol (or equivalent)
7. Rinse with distilled/deionized water

Inspect the equipment for any remaining contamination and repeat as necessary.

Disposal Methods
Procedures for disposal of contaminated materials, decontamination waste, and single use personal protective equipment shall meet applicable client, local, State, and Federal requirements.
Disposal of Single Use Personal Protective Equipment
PPE that is not grossly contaminated can be bagged and disposed in regular trash receptacles. PPE that is grossly contaminated must be bagged (sealed and field personnel should communicate with the Project Manager to determine proper disposal).
Disposal Method for Contaminated Soil
- Contaminated soil cuttings and spoils must be containerized for disposal off-site unless otherwise specifically directed. - Soil cuttings and spoils determined to be free of contamination through field screening can usually be returned to the boreholes or excavations from which they came. Any additional requirements that are designated by the workplan or by client specifications should be entered here.

8. SITE CONTROL

The overall purpose of site control is to minimize potential contamination of workers, protect the public from the site's hazards, and prevent vandalism. Site control is especially important in emergency situations. The degree of site control necessary depends on site characteristics, site size, and the surrounding community. The following information identifies the elements used to control the activities and movements of people and equipment at the project site.

Communication
Internal Haley & Aldrich site personnel will communicate with other Haley & Aldrich staff member and/or subcontractors or contractors with: Face to Face Communication
External H&S site personnel will use the following means to communicate with off-site personnel or emergency services. Cellular Phones
Visitors
Project Site Will visitors be required to check-in prior to accessing the project site? Yes
Visitor Access Authorized visitors that require access to the project site need to be provided with known information with respect to the site operations and hazards as applicable to the purpose of their site visit. Authorized visitors must have the required PPE and appropriate training to access the project site. Zachary Simmel is responsible for facilitating authorized visitor access.
Zoning
Work Zone The work zone will be clearly delineated to ensure that the general public or unauthorized worker access is prevented. The following will be used: Cones

9. SITE SPECIFIC EMERGENCY RESPONSE PLAN

The Emergency Response Plan addresses potential emergencies at this site, procedures for responding to these emergencies, roles, responsibilities during emergency response, and training. This section also describes the provisions this project has made to coordinate its emergency response with other contractors onsite and with offsite emergency response organizations (as applicable).

During the development of this emergency response plan, local, state, and federal agency disaster, fire, and emergency response organizations were consulted (if required) to ensure that this plan is compatible and integrated with plans of those organizations. Documentation of the dates of these consultations are the names of individuals contacted is kept on file and available upon request.

The site has been evaluated for potential emergency occurrences, based on site hazards, and the major categories of emergencies that could occur during project work are:

- Fire(s)/Combustion
- Hazardous Material Event
- Medical Emergency
- Natural Disaster

A detailed list of emergency types and response actions are summarized in Table X below. Prior to the start of work, the SSO will update the table with any additional site-specific information regarding evacuations, muster points, or additional emergency procedures. The SSO will establish evacuation routes and assembly areas for the Site. All personnel entering the Site will be informed of these routes and assembly areas.

Pre-Emergency Planning

Before the start of field activities, the Project Manager will ensure preparation has been made in anticipation of emergencies. Preparatory actions include the following:

Meeting with the subcontractor/and or client concerning the emergency procedures in the event a person is injured. Appropriate actions for specific scenarios will be reviewed. These scenarios will be discussed, and responses determined before the sampling event commences. A form of emergency communication (i.e.; Cell phone, Air horn, etc.) between the Project Manager and subcontractor and/or client will be agreed on before the work commences.

A training session (i.e., “safety meeting”) given by the Project Manager or their designee informing all field personnel of emergency procedures, locations of emergency equipment and their use, and proper evacuation procedures.

Ensuring field personnel are aware of the existence of the emergency response HASP and ensuring a copy of the HASP accompanies the field team(s).

Onsite Emergency Response Equipment

Emergency procedures may require specialized equipment to facilitate work rescue, contamination control and reduction or post-emergency cleanup. Emergency response equipment stocked

Table 9.1 Emergency Equipment and Emergency PPE			
Emergency Equipment	Specific Type	Quantity Stocked	Location Stored
First Aid Kit	General First Aid Kit	1	With H&A personnel

EVACUATION ALARM
Verbal Communication (Site Personnel are adjacent in work zone)
EVACUATION ROUTES
Will be given a map after site specific training
EVACUATION MUSTER POINT(S)/ SHELTER AREA(S)
Will be given a location after site specific training
EVACUTION RESPONSE DRILLS
The Site relies on outside emergency responders and a drill is not required.

Table 9-2 – Emergency Planning

Emergency Type	Notification	Response Action	Evacuation Plan/Route
Chemical Exposure	Report event to SSO immediately	Refer to Safety Data Sheet for required actions	Remove personnel from work zone
Fire - Small	Notify SSO and contact 911	Use fire extinguisher if safe and qualified to do so	Mobilize to <i>Muster Point</i>
Fire – Large/Explosion	Notify SSO and contact 911	Evacuate immediately	Mobilize to <i>Muster Point</i>
Hazardous Material – Spill/Release	Notify SSO; SSO will contact PM to determine if additional agency notification is	If practicable don PPE and use spill kit and applicable procedures to contain the release	See Evacuation Map for route, move at least 100 ft upwind of spill location
Medical – Bloodborne Pathogen	Notify SSO	If qualified dispose in container or call client or city to notify for further instruction.	None Anticipated
Medical – First Aid	Notify SSO	If qualified perform first aid duties	None Anticipated
Medical – Trauma	If life threatening or transport is required call 911, immediately	Wait at site entrance for ambulance	Noe Anticipated
Security Threat	Notify SSO who will call 911 as warranted	Keep all valuables out of site and work zones delineated.	None Anticipated
Weather – Earthquake/Tsunami’s	STOP WORK and evacuate Site upon any earthquake	Turn off equipment and evacuate as soon as is safe to do so	Mobilize to <i>Shelter Location</i>
Weather – Lightning Storm	STOP WORK	Work may resume 30 minutes after the last observed lightning.	None Anticipated
Weather – Tornadoes/Hurricanes	Monitor weather conditions STOP WORK and evacuate the site	Evacuate to shelter location or shelter in place immediately	Mobilize to <i>Shelter Location</i>
<u>MUSTER POINT</u> Site walk along the Eckdord street		<u>SHELTER LOCATION</u> Personal vehicle	
In case of site emergencies, site personnel shall be evacuated per this table and will not participate in emergency response activities. Site emergencies shall be reported to local, state, and federal governmental agencies as required.			

10. HASP ACKNOWLEDGEMENT FORM

All Haley & Aldrich employees onsite must sign this form prior to entering the site.

I hereby acknowledge receipt of, and briefing on, this HASP prior to the start of on-site work. I declare that I understand and agree to follow the provisions, processes, and procedures set forth herein at all times while working on this site.

[illegible]

**ATTACHMENT A
HASP AMENDMENT FORM**

HASP AMENDMENT FORM

This form is to be used whenever there is an immediate change in the project scope that will require an amendment to the HASP. For project scope changes associated with “add-on” tasks, the changes must be made in the body of the HASP. Before changes can be made, a review of the potential hazards must be initiated by the Haley & Aldrich Project Manager.

This original form must remain on site with the original HASP. If additional copies of this HASP have been distributed, it is the Project Manager’s responsibility to forward a signed copy of this amendment to those who have copies.

Amendment No.	
Site Name	
Work Assignment No.	
Date	
Type of Amendment	
Reason for Amendment	
Alternate Safeguard Procedures	
Required Changes in PPE	

Project Manager Name (Print)

Project Manager Signature

Date

Health & Safety Approver Name
(Print)

Health & Safety Approver Signature

Date

**ATTACHMENT B
TRAINING REQUIREMENTS**

TRAINING REQUIREMENTS
Health and Safety Training Requirements
Personnel will not be permitted to supervise or participate in field activities until they have been trained to a level required by their job function and responsibility. Haley & Aldrich staff members, contractors, subcontractors, and consultants who have the potential to be exposed to contaminated materials or physical hazards must complete the training described in the following sections. The Haley & Aldrich Project Manager/FSM will be responsible for maintaining and providing to the client/site manager documentation of Haley & Aldrich staff members' compliance with required training as requested. Records shall be maintained per OSHA requirements.
40-Hour Health and Safety Training
The 40-Hour Health and Safety Training course provides instruction on the nature of hazardous waste work, protective measures, proper use of personal protective equipment, recognition of signs and symptoms which might indicate exposure to hazardous substances, and decontamination procedures. It is required for all personnel working on-site, such as equipment operators, general laborers, and supervisors, who may be potentially exposed to hazardous substances, health hazards, or safety hazards consistent with 29 CFR 1910.120.
8-hour Annual Refresher Training
Personnel who complete the 40-hour health and safety training are subsequently required to attend an annual 8-hour refresher course to remain current in their training. When required, site personnel must be able to show proof of completion (i.e., certification) at an 8-hour refresher training course within the past 12 months.
8-Hour Supervisor Training
On-site managers and supervisors directly responsible for, or who supervise staff members engaged in hazardous waste operations, should have eight additional hours of Supervisor training in accordance with 29 CFR 1910.120. Supervisor Training includes, but is not limited to, accident reporting/investigation, regulatory compliance, work practice observations, auditing, and emergency response procedures.
Additional Training for Specific Projects
Haley & Aldrich personnel will ensure their personnel have received additional training on specific instrumentation, equipment, confined space entry, construction hazards, etc., as necessary to perform their duties. This specialized training will be provided to personnel before engaging in the specific work activities including: • Client specific training or orientation • Competent person excavations • Confined space entry (entrant, supervisor, and attendant) • Heavy equipment including aerial lifts and forklifts • First aid/ CPR • Use of fall protection • Use of nuclear density gauges • Asbestos awareness

ATTACHMENT C
ROLES AND RESPONSIBILITIES

SITE ROLES AND RESPONSIBILITIES	
Haley & Aldrich Personnel	
Field Safety Manager (FSM)	The Haley & Aldrich FSM is a full-time Haley & Aldrich staff member, trained as a safety and health professional, who is responsible for the interpretation and approval of this Safety Plan. Modifications to this Safety Plan cannot be undertaken by the PM or the SSO without the approval of the FSM. Specific duties of the FSM include: • Approving and amending the Safety Plan for this project • Advising the PM and SHSOs on matter relating to health and safety • Recommending appropriate personal protective equipment (PPE) and air monitoring instrumentation • Maintaining regular contact with the PM and SSO to evaluate the conditions at the property and new information which might require modifications to the HASP and • Reviewing and approving JSAs developed for the site-specific hazards.
Project Manager (PM)	The Haley & Aldrich PM is responsible for ensuring that the requirements of this HASP are implemented at that project location. Some of the PM's specific responsibilities include: • Assuring that all personnel to whom this HASP applies have received a copy of it; • Providing the FSM with updated information regarding environmental conditions at the site and the scope of site work; • Providing adequate authority and resources to the on-site SHSO to allow for the successful implementation of all necessary safety procedures; • Supporting the decisions made by the SHSO; • Maintaining regular communications with the SHSO and, if necessary, the FSM; • Coordinating the activities of all subcontractors and ensuring that they are aware of the pertinent health and safety requirements for this project; • Providing project scheduling and planning activities; and • Providing guidance to field personnel in the development of appropriate Job Safety Analysis (JSA) relative to the site conditions and hazard assessment.
Site Health & Safety Officer (SHSO)	The SHSO is responsible for field implementation of this HASP and enforcement of safety rules and regulations. SHSO functions may include some or all of the following: • Act as Haley & Aldrich's liaison for health and safety issues with client, staff, subcontractors, and agencies. • Verify that utility clearance has been performed by Haley & Aldrich subcontractors. • Oversee day-to-day implementation of the Safety Plan by Haley & Aldrich personnel on site.

- Interact with subcontractor project personnel on health and safety matters.
- Verify use of required PPE as outlined in the safety plan.
- Inspect and maintain Haley & Aldrich safety equipment, including calibration of air monitoring instrumentation used by Haley & Aldrich.
- Perform changes to HASP and document in Appendix A of the HASP as needed and notify appropriate persons of changes.
- Investigate and report on-site accidents and incidents involving Haley & Aldrich and its subcontractors.
- Verify that site personnel are familiar with site safety requirements (e.g., the hospital route and emergency contact numbers).
- Report accidents, injuries, and near misses to the Haley & Aldrich PM and FSM as needed.

The SHSO will conduct initial site safety orientations with site personnel (including subcontractors) and conduct toolbox and safety meetings thereafter with Haley & Aldrich employees and Haley & Aldrich subcontractors at regular intervals and in accordance with Haley & Aldrich policy and contractual obligations. The SHSO will track the attendance of site personnel at Haley & Aldrich orientations, toolbox talks, and safety meetings.

Field Personnel

Haley & Aldrich personnel are responsible for following the health and safety procedures specified in this HASP and for performing their work in a safe and responsible manner. Some of the specific responsibilities of the field personnel are as follows:

- Reading the HASP in its entirety prior to the start of on-site work;
- Submitting a completed Safety Plan Acceptance Form and documentation of medical surveillance and training to the SHSO prior to the start of work;
- Attending the pre-entry briefing prior to beginning on-site work;
- Bringing forth any questions or concerns regarding the content of the Safety Plan to the PM or the SHSO prior to the start of work;
- Stopping work when it is not believed it can be performed safely;
- Reporting all accidents, injuries and illnesses, regardless of their severity, to the SHSO;
- Complying with the requirements of this safety plan and the requests of the SHSO; and
- Reviewing the established JSAs for the site-specific hazards on a daily basis and prior to each shift change, if applicable.

Visitors

Authorized visitors (e.g., Client Representatives, Regulators, Haley & Aldrich management staff, etc.) requiring entry to any work location on the site will be briefed by the Site Supervisor on the hazards present at that location. Visitors will be escorted at all times at the work location and will be responsible for compliance with their employer's health and safety policies. In addition, this safety plan specifies the minimum acceptable qualifications, training and personal protective equipment which are required for entry to any controlled work area; visitors must comply with these

requirements at all times. Unauthorized visitors, and visitors not meeting the specified qualifications, will not be permitted within established controlled work areas.

SUBCONTRACTOR PERSONNEL

Subcontractor Site Representative

Each contractor and subcontractor shall designate a Contractor Site Representative. The Contractor Site Representative will interface directly with Insert Staff Name Here, the Subcontractor Site Safety Manager, with regards to all areas that relate to this safety plan and safety performance of work conducted by the contractor and/or subcontractor workforce. Contractor Site Representatives for this site are listed in the Contact Summary Table at the beginning of the Safety Plan.

Subcontractor Site Safety Manager

Each contractor / subcontractor will provide a qualified representative who will act as their Site Safety Manager (Sub-SSM). This person will be responsible for the planning, coordination, and safe execution of subcontractor tasks, including preparation of job hazard analyses (JHA), performing daily safety planning, and coordinating directly with the Haley & Aldrich SHSO for other site safety activities. This person will play a lead role in safety planning for Subcontractor tasks, and in ensuring that all their employees and lower tier subcontractors are in adherence with applicable local, state, and/or federal regulations, and/or industry and project specific safety standards or best management practices.

General contractors / subcontractors are responsible for preparing a site-specific HASP and/or other task specific safety documents (e.g., JHAs), which are, at a minimum, in compliance with local, state, and/or federal other regulations, and/or industry and project specific safety standards or best management practices. The contractor(s)/subcontractor(s) safety documentation will be at least as stringent as the health and safety requirements of the Haley & Aldrich Project specific HASP.

Safety requirements include, but are not limited to: legal requirements, contractual obligations and industry best practices. Contractors/subcontractors will identify a site safety representative during times when contractor/subcontractor personnel are on the Site. All contractor/subcontractor personnel will undergo a field safety orientation conducted by the Haley & Aldrich SHSO and/or PM prior to commencing site work activities. All contractors / subcontractors will participate in Haley & Aldrich site safety meetings and their personnel will be subject to training and monitoring requirements identified in this Safety Plan. If the contractors / subcontractors means and methods deviate from the scope of work described in Section 1 of this Safety Plan, the alternate means and methods must be submitted, reviewed and approved by the Haley & Aldrich SHSO and/or PM prior to the commencement of the work task. Once approved by the Haley & Aldrich SHSO and/or PM, the alternate means and methods submittal will be attached to this Safety Plan as an Addendum.

**ATTACHMENT D
JOB SAFETY ANALYSES**



FORMER CARTER SPRAY FINISHING CORP.

KEY TASK ENTER TASK NUMBER.: ENTER TASK NAME.

Subtask Category	Potential Hazards	Controls
Drilling	Slips, Trips, and Falls	Keep work area clear
Drilling	Utility locators and underground hazards	Utility markout
Drilling	Noise reduction	Wear appropriate noise reducing PPE
Drilling	Heavy equipment	Avoid line of fire, wear PPE
Sampling	Slips, trips, and falls	Keep work area clear
Sampling	General site hazards	Wear PPE
Enter subtask information.	Choose category.	Enter control(s) for each hazard.
Enter subtask information.	Choose category.	Enter control(s) for each hazard.
Enter subtask information.	Choose category.	Enter control(s) for each hazard.
Enter subtask information.	Choose category.	Enter control(s) for each hazard.
Enter subtask information.	Choose category.	Enter control(s) for each hazard.
Enter subtask information.	Choose category.	Enter control(s) for each hazard.
Enter subtask information.	Choose category.	Enter control(s) for each hazard.



APPENDIX B

Soil Boring Logs

HALEY ALDRICH GEOPROBE BORING REPORT										BORING NO. SB-01													
Page1of1																							
PROJECT		Supplemental Investigation - 65 Eckford St								PROJECT MGR.		M.Conlon											
LOCATION		65 Eckford Street, Brooklyn, NY								FIELD REP.		Z.Simmel											
CLIENT		65-73 Eckford Realty LLC								DATE STARTED		1/6/2022											
CONTRACTOR		Lakewood Environmental								DATE FINISHED		1/6/2022											
DRILLER		A.Hutchinson																					
Elevation		ft.		Datum		Boring Location						See Plan											
Item		Casing		Sampler		Core Barrel		Rig Make & Model		6610DT		Hammer Type		Drilling Mud		Casing Advance							
Type		Steel		Macrocore				☐ Truck		☐ Tripod		☐ Cat-Head		☐ Safety		☐ Bentonite							
Inside Diameter (in.)		2-in						☐ ATV		☒ Geoprobe		☐ Winch		☐ Doughnut		☐ Polymer							
Hammer Weight (lb.)		Macrocore						☒ Track		☐ Air Track		☐ Roller Bit		☒ Automatic		☒ None							
Hammer Fall (in.)		NA						☐ Skid		☐ Other		☒ Cutting Head		Drilling Notes:									
Depth (ft.)		Recovery (in/total)		PID (ppm)		Sample ID		Sample Description		Depth (ft)		Visual-Manual Identification & Description (density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)											
0																							
5				0.0		SB-01 (0-2")		5-7'				Brown to dark brown medium to fine silty SAND, fine gravel, brick, loose, moist, no odor (FILL)											
6				0.0																			
7		24/48		12.3																			
8																							
9																							
10																							
11		24/48		84.8				11-13'				Gray medium to fine silty SAND, some coarse sand, trace fill constituents, moderate petroleum odor, staining, wet											
12				107.8																			
13				13.9																			
14				24.7																			
15		24/48		1.6				15-17'				Gray medium to fine silty SAND, some coarse sand, moderate petroleum odor, staining, wet											
16				5.8																			
17				4.3																			
18				0.7		SB-01 (18-20')		18-21'				Dark brown organic/peat layer, roots and organic matter, no odor, wet											
19		36/48		0.5																			
20				0.3																			
21				6.0								END OF BORING AT 21 FT											
Water Level Data												Sample ID				Summary							
Date		Time		Elapsed Time (hr.)		Depth in feet to:						O Open End Rod T Thin Wall Tube U Undisturbed Sample S Split Spoon Sample G Geoprobe				Overburden (Linear ft.)				21			
						Bottom of Casing										Rock Cored (Linear ft.)				-			
						Bottom of Hole										Number of Samples				2			
						Water										BORING NO.				SB-01			
1/6/2022																							
*NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.																							
NOTE: Soil descriptions based on a modified Burmister method of visual-manual identification as practiced by Haley & Aldrich, Inc.																							



SB-02

Page 1 of 1

Elevation		ft.	Datum		Boring Location						See Plan
Item	Casing		Sampler	Core Barrel	Rig Make & Model			6610DT	Hammer Type	Drilling Mud	Casing Advance
Type	Steel		Macrocore		☐ Truck	☐ Tripod	☐ Cat-Head	☐ Safety	☐ Bentonite	Type Method Depth	
Inside Diameter (in.)	2-in				☐ ATV	☒ Geoprobe	☐ Winch	☐ Doughnut	☐ Polymer	Direct Push	
Hammer Weight (lb.)	Macrocore				☒ Track	☐ Air Track	☐ Roller Bit	☒ Automatic	☒ None		
Hammer Fall (in.)	NA				☐ Skid	☐ Other	☒ Cutting Head	Drilling Notes:			

Water Level Data						Sample ID		Summary	
Date	Time	Elapsed Time (hr.)	Depth in feet to:			O Open End Rod T Thin Wall Tube U Undisturbed Sample S Split Spoon Sample G Geoprobe	Overburden (Linear ft.)		
			Bottom of Casing	Bottom of Hole	Water			21	
							Rock Cored (Linear ft.)		
							Number of Samples		
							2		
						BORING NO.			
						SB-02			

NOTE: Soil descriptions based on a modified Burmister method of visual-manual identification as practiced by Haley & Aldrich, Inc.



SB-03

Page 1 of 1

Elevation		ft.	Datum		Boring Location							See Plan
Item	Casing		Sampler	Core Barrel	Rig Make & Model			6610DT	Hammer Type	Drilling Mud	Casing Advance	
Type	Steel		Macrocore		☐ Truck	☐ Tripod	☐ Cat-Head	☐ Safety	☐ Bentonite	Direct Push		
Inside Diameter (in.)	2-in				☐ ATV	☒ Geoprobe	☐ Winch	☐ Doughnut	☐ Polymer			
Hammer Weight (lb.)	Macrocore				☒ Track	☐ Air Track	☐ Roller Bit	☒ Automatic	☒ None			
Hammer Fall (in.)	NA				☐ Skid	☐ Other	☒ Cutting Head	Drilling Notes:				

Water Level Data						Sample ID	Summary	
Date	Time	Elapsed Time (hr.)	Depth in feet to:			O T U S G Open End Rod Thin Wall Tube Undisturbed Sample Split Spoon Sample Geoprobe	Overburden (Linear ft.)	21
			Bottom of Casing	Bottom of Hole	Water		Rock Cored (Linear ft.)	-
Date							Number of Samples	3
							BORING NO. SB-03	

NOTE: Soil descriptions based on a modified Burmister method of visual-manual identification as practiced by Haley & Aldrich, Inc.



SB-04

Page 1 of 1

Elevation		ft.	Datum		Boring Location							See Plan
Item	Casing		Sampler	Core Barrel	Rig Make & Model			6610DT	Hammer Type	Drilling Mud	Casing Advance	
Type	Steel		Macrocore		☐ Truck	☐ Tripod	☐ Cat-Head	☐ Safety	☐ Bentonite	Type Method Depth		
Inside Diameter (in.)	2-in				☐ ATV	☒ Geoprobe	☐ Winch	☐ Doughnut	☐ Polymer			
Hammer Weight (lb.)	Macrocore				☒ Track	☐ Air Track	☐ Roller Bit	☒ Automatic	☒ None			
Hammer Fall (in.)	NA				☐ Skid	☐ Other	☒ Cutting Head	Drilling Notes:				

Water Level Data						Sample ID		Summary	
Date	Time	Elapsed Time (hr.)	Depth in feet to:			O Open End Rod T Thin Wall Tube U Undisturbed Sample S Split Spoon Sample G Geoprobe	Overburden (Linear ft.)		
			Bottom of Casing	Bottom of Hole	Water			21	
							Rock Cored (Linear ft.)		
							-		
							Number of Samples		
						2			
						BORING NO.			
						SB-04			

NOTE: Soil descriptions based on a modified Burmister method of visual-manual identification as practiced by Haley & Aldrich, Inc.



SB-05

Page 1 of 1

Elevation		ft.	Datum		Boring Location						See Plan
Item	Casing		Sampler	Core Barrel	Rig Make & Model			6610DT	Hammer Type	Drilling Mud	Casing Advance
Type	Steel		Macrocore		☐ Truck	☐ Tripod	☐ Cat-Head	☐ Safety	☐ Bentonite	Type Method Depth	
Inside Diameter (in.)	2-in				☐ ATV	☒ Geoprobe	☐ Winch	☐ Doughnut	☐ Polymer	Direct Push	
Hammer Weight (lb.)	Macrocore				☒ Track	☐ Air Track	☐ Roller Bit	☒ Automatic	☒ None		
Hammer Fall (in.)	NA				☐ Skid	☐ Other	☒ Cutting Head	Drilling Notes:			

Water Level Data						Sample ID		Summary	
Date	Time	Elapsed Time (hr.)	Depth in feet to:			O Open End Rod T Thin Wall Tube U Undisturbed Sample S Split Spoon Sample G Geoprobe			
			Bottom of Casing	Bottom of Hole	Water				
Date							Overburden (Linear ft.)	20	
							Rock Cored (Linear ft.)	-	
							Number of Samples	2	
							BORING NO. SB-05		

NOTE: Soil descriptions based on a modified Burmister method of visual-manual identification as practiced by Haley & Aldrich, Inc.



SB-06

Page 1 of 1

Elevation		ft.	Datum		Boring Location						See Plan
Item	Casing		Sampler	Core Barrel	Rig Make & Model			6610DT	Hammer Type	Drilling Mud	Casing Advance
Type	Steel		Macrocore		☐ Truck	☐ Tripod	☐ Cat-Head		☐ Safety	☐ Bentonite	Type Method Depth
Inside Diameter (in.)	2-in				☐ ATV	☒ Geoprobe	☐ Winch		☐ Doughnut	☐ Polymer	Direct Push
Hammer Weight (lb.)	Macrocore				☒ Track	☐ Air Track	☐ Roller Bit		☒ Automatic	☒ None	
Hammer Fall (in.)	NA				☐ Skid	☐ Other	☒ Cutting Head	Drilling Notes:			

Water Level Data						Sample ID		Summary	
Date	Time	Elapsed Time (hr.)	Depth in feet to:			O T U S G Open End Rod Thin Wall Tube Undisturbed Sample Split Spoon Sample Geoprobe			
			Bottom of Casing	Bottom of Hole	Water				
Date							Overburden (Linear ft.)	20	
							Rock Cored (Linear ft.)	-	
							Number of Samples	2	
							BORING NO. SB-06		

NOTE: Soil descriptions based on a modified Burmister method of visual-manual identification as practiced by Haley & Aldrich, Inc.



SB-07

Page 1 of 1

Elevation		ft.	Datum		Boring Location							See Plan
Item	Casing		Sampler	Core Barrel	Rig Make & Model			6610DT	Hammer Type	Drilling Mud	Casing Advance	
Type	Steel		Macrocore		☐ Truck	☐ Tripod	☐ Cat-Head	☐ Safety	☐ Bentonite	Type Method Depth		
Inside Diameter (in.)	2-in				☐ ATV	☒ Geoprobe	☐ Winch	☐ Doughnut	☐ Polymer			
Hammer Weight (lb.)	Macrocore				☒ Track	☐ Air Track	☐ Roller Bit	☒ Automatic	☒ None			
Hammer Fall (in.)	NA				☐ Skid	☐ Other	☒ Cutting Head	Drilling Notes:				

Water Level Data						Sample ID		Summary	
Date	Time	Elapsed Time (hr.)	Depth in feet to:			O Open End Rod T Thin Wall Tube U Undisturbed Sample S Split Spoon Sample G Geoprobe	Overburden (Linear ft.)		
			Bottom of Casing	Bottom of Hole	Water			21	
							Rock Cored (Linear ft.)		
							Number of Samples		
							2		
						BORING NO.			
						SB-07			

NOTE: Soil descriptions based on a modified Burmister method of visual-manual identification as practiced by Haley & Aldrich, Inc.



SB-08

Page 1 of 1

Elevation		ft.	Datum		Boring Location							See Plan
Item	Casing		Sampler	Core Barrel	Rig Make & Model			6610DT	Hammer Type	Drilling Mud	Casing Advance	
Type	Steel		Macrocore		☐ Truck	☐ Tripod	☐ Cat-Head	☐ Safety	☐ Bentonite	Type Method Depth		
Inside Diameter (in.)	2-in				☐ ATV	☒ Geoprobe	☐ Winch	☐ Doughnut	☐ Polymer			
Hammer Weight (lb.)	Macrocore				☒ Track	☐ Air Track	☐ Roller Bit	☒ Automatic	☒ None			
Hammer Fall (in.)	NA				☐ Skid	☐ Other	☒ Cutting Head	Drilling Notes:				

Water Level Data						Sample ID		Summary	
Date	Time	Elapsed Time (hr.)	Depth in feet to:			O Open End Rod T Thin Wall Tube U Undisturbed Sample S Split Spoon Sample G Geoprobe	Overburden (Linear ft.)		
			Bottom of Casing	Bottom of Hole	Water			21	
							Rock Cored (Linear ft.)	-	
Date							Number of Samples	2	
							BORING NO.		
							SB-08		

NOTE: Soil descriptions based on a modified Burmister method of visual-manual identification as practiced by Haley & Aldrich, Inc.



SB-09

Page 1 of 1

Elevation		ft.	Datum		Boring Location						See Plan
Item	Casing		Sampler	Core Barrel	Rig Make & Model			6610DT	Hammer Type	Drilling Mud	Casing Advance
Type	Steel		Macrocore		☐ Truck	☐ Tripod	☐ Cat-Head	☐ Safety	☐ Bentonite	Type Method Depth	
Inside Diameter (in.)	2-in				☐ ATV	☒ Geoprobe	☐ Winch	☐ Doughnut	☐ Polymer	Direct Push	
Hammer Weight (lb.)	Macrocore				☒ Track	☐ Air Track	☐ Roller Bit	☒ Automatic	☒ None		
Hammer Fall (in.)	NA				☐ Skid	☐ Other	☒ Cutting Head	Drilling Notes:			

Water Level Data						Sample ID		Summary		
Date	Time	Elapsed Time (hr.)	Depth in feet to:			O T U S G Open End Rod Thin Wall Tube Undisturbed Sample Split Spoon Sample Geoprobe	Overburden (Linear ft.) Rock Cored (Linear ft.) Number of Samples 20 - 2			
			Bottom of Casing	Bottom of Hole	Water					
Date										
						BORING NO.		SB-09		

NOTE: Soil descriptions based on a modified Burmister method of visual-manual identification as practiced by Haley & Aldrich, Inc.



SB-10

Page 1 of 1

Elevation		ft.	Datum		Boring Location						See Plan
Item	Casing		Sampler	Core Barrel	Rig Make & Model			6610DT	Hammer Type	Drilling Mud	Casing Advance
Type	Steel		Macrocore		☐ Truck	☐ Tripod	☐ Cat-Head		☐ Safety	☐ Bentonite	Type Method Depth
Inside Diameter (in.)	2-in				☐ ATV	☒ Geoprobe	☐ Winch		☐ Doughnut	☐ Polymer	Direct Push
Hammer Weight (lb.)	Macrocore				☒ Track	☐ Air Track	☐ Roller Bit		☒ Automatic	☒ None	
Hammer Fall (in.)	NA				☐ Skid	☐ Other	☒ Cutting Head	Drilling Notes:			

Water Level Data						Sample ID		Summary	
Date	Time	Elapsed Time (hr.)	Depth in feet to:			O Open End Rod T Thin Wall Tube U Undisturbed Sample S Split Spoon Sample G Geoprobe			
			Bottom of Casing	Bottom of Hole	Water				
Date							Overburden (Linear ft.)	20	
							Rock Cored (Linear ft.)	-	
							Number of Samples	2	
							BORING NO. SB-10		

NOTE: Soil descriptions based on a modified Burmister method of visual-manual identification as practiced by Haley & Aldrich, Inc.

**SB-11**

Page 1 of 1

Elevation		ft.	Datum		Boring Location							See Plan
Item	Casing		Sampler	Core Barrel	Rig Make & Model			6610DT	Hammer Type	Drilling Mud	Casing Advance	
Type	Steel		Macrocore		☐ Truck	☐ Tripod	☐ Cat-Head	☐ Safety	☐ Bentonite	Type Method Depth		
Inside Diameter (in.)	2-in				☐ ATV	☒ Geoprobe	☐ Winch	☐ Doughnut	☐ Polymer			
Hammer Weight (lb.)	Macrocore				☒ Track	☐ Air Track	☐ Roller Bit	☒ Automatic	☒ None			
Hammer Fall (in.)	NA				☐ Skid	☐ Other	☒ Cutting Head	Drilling Notes:				

Water Level Data						Sample ID		Summary	
Date	Time	Elapsed Time (hr.)	Depth in feet to:			O Open End Rod T Thin Wall Tube U Undisturbed Sample S Split Spoon Sample G Geoprobe			
			Bottom of Casing	Bottom of Hole	Water				
Date							Overburden (Linear ft.)	21	
							Rock Cored (Linear ft.)	-	
							Number of Samples	3	
							BORING NO.		
							SB-11		

NOTE: Soil descriptions based on a modified Burmister method of visual-manual identification as practiced by Haley & Aldrich, Inc.



SB-12

Page 1 of 1

Elevation		ft.	Datum		Boring Location							See Plan
Item	Casing		Sampler	Core Barrel	Rig Make & Model			6610DT	Hammer Type	Drilling Mud	Casing Advance	
Type	Steel		Macrocore		☐ Truck	☐ Tripod	☐ Cat-Head	☐ Safety	☐ Bentonite	Type Method Depth		
Inside Diameter (in.)	2-in				☐ ATV	☒ Geoprobe	☐ Winch	☐ Doughnut	☐ Polymer			
Hammer Weight (lb.)	Macrocore				☒ Track	☐ Air Track	☐ Roller Bit	☒ Automatic	☒ None			
Hammer Fall (in.)	NA				☐ Skid	☐ Other	☒ Cutting Head	Drilling Notes:				

Water Level Data						Sample ID		Summary	
Date	Time	Elapsed Time (hr.)	Depth in feet to:			O Open End Rod T Thin Wall Tube U Undisturbed Sample S Split Spoon Sample G Geoprobe	Overburden (Linear ft.)		
			Bottom of Casing	Bottom of Hole	Water			21	
							Rock Cored (Linear ft.)		
							-		
							Number of Samples		
						2			
						BORING NO.			
						SB-12			

NOTE: Soil descriptions based on a modified Burmister method of visual-manual identification as practiced by Haley & Aldrich, Inc.

APPENDIX C

Well Construction Diagrams



OBSERVATION WELL INSTALLATION REPORT

Well No.
MW-01
Boring No.
SB-01

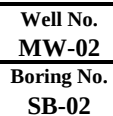
PROJECT	Supplemental Investigation - 65 Eckford St	H&A FILE NO.	0202156
LOCATION	65 Eckford Street, Brooklyn, NY	PROJECT MGR.	M.Conlon
CLIENT	65-73 Eckford Realty LLC	FIELD REP.	Z.Simmel
CONTRACTOR	Lakewood Environmental	DATE INSTALLED	12/27/2021
DRILLER	T.Kelly	WATER LEVEL	4.70'

Ground El.	_____ ft	Location	See Plan	☒ Guard Pipe
El. Datum	_____			☐ Roadway Box

SOIL/ROCK CONDITIONS	BOREHOLE BACKFILL																		
_____ 0.0 _____	_____ 0.0 _____																		
Soil Cuttings		Type of protective cover/lock (circle one):	Pent.bolt 9/16" hex. 1/2" hex. 7/10" hex.																
		Padlock key no.	_____																
		Height/Depth of top of guard pipe/roadway box above/below ground surface	_____ NA _____	ft															
		Height/Depth of top of riser pipe above/below ground surface	_____ 30.0 _____	in															
		(Above)																	
		Type of protective casing:	_____ NA _____																
		Length	_____ NA _____	ft															
		Inside Diameter	_____ NA _____	in															
		Depth of bottom of guard pipe/roadway box	_____ NA _____	ft															
				<table><thead><tr><th>Type of Seals</th><th>Top of Seal (ft)</th><th>Thickness (ft)</th></tr></thead><tbody><tr><td>Concrete</td><td>_____ NA _____</td><td>_____ NA _____</td></tr><tr><td>Soil Cuttings</td><td>_____ 0.0 _____</td><td>_____ 1.0 _____</td></tr><tr><td>Bentonite Seal</td><td>_____ 1.0 _____</td><td>_____ 2.0 _____</td></tr><tr><td>#2 Filter Sand</td><td>_____ 3.0 _____</td><td>_____ 12.0 _____</td></tr></tbody></table>	Type of Seals	Top of Seal (ft)	Thickness (ft)	Concrete	_____ NA _____	_____ NA _____	Soil Cuttings	_____ 0.0 _____	_____ 1.0 _____	Bentonite Seal	_____ 1.0 _____	_____ 2.0 _____	#2 Filter Sand	_____ 3.0 _____	_____ 12.0 _____
Type of Seals	Top of Seal (ft)	Thickness (ft)																	
Concrete	_____ NA _____	_____ NA _____																	
Soil Cuttings	_____ 0.0 _____	_____ 1.0 _____																	
Bentonite Seal	_____ 1.0 _____	_____ 2.0 _____																	
#2 Filter Sand	_____ 3.0 _____	_____ 12.0 _____																	
Bentonite Seal		Type of riser pipe:	_____ Solid PVC _____																
		Inside diameter of riser pipe	_____ 2.0 _____	in															
		Type of backfill around riser	_____ Soil Cuttings _____																
		Diameter of borehole	_____ 6.0 _____	in															
		Depth to top of well screen	_____ 5.0 _____	ft															
		Type of screen	_____ Machine Slotted PVC _____																
		Screen gauge or size of openings	_____ 0.010 _____	in															
		Diameter of screen	_____ 2.0 _____	in															
		Type of backfill around screen	_____ #2 Filter Sand _____																
		Filter Sand		Depth of bottom of well screen	_____ 15.0 _____	ft													
Bottom of Silt trap	_____ N/A _____			ft															
Depth of bottom of borehole	_____ 15.0 _____			ft															
20	20																		
(Bottom of Exploration) (Numbers refer to depth from ground surface in feet)		(Not to Scale)																	

$$\begin{array}{rclcl} \text{5} & \text{ft} & + & \text{10} & \text{ft} & + & \text{0} & \text{ft} & = & \text{15} & \text{ft} \\ \text{Riser Pay Length (L1)} & & & \text{Length of screen (L2)} & & & \text{Length of silt trap (L3)} & & & \text{Pay length} \end{array}$$

COMMENTS: Water level measured from current grade (approx. 5')



☒	Guard Pipe
☐	Roadway Box

Depth of bottom of borehole	13.0	ft

Form 2007



OBSERVATION WELL INSTALLATION REPORT

Well No.
MW-03
Boring No.
SB-03

PROJECT Supplemental Investigation - 65 Eckford St
LOCATION 65 Eckford Street, Brooklyn, NY

H&A FILE NO. 0202156
PROJECT MGR. M.Conlon

CLIENT 65-73 Eckford Realty LLC
CONTRACTOR Lakewood Environmental
DRILLER T.Kelly

FIELD REP. Z.Simmel
DATE INSTALLED 12/27/2021
WATER LEVEL 4.70'

Ground El. _____ ft
El. Datum _____

Location See Plan

☐ Guard Pipe
☐ Roadway Box

SOIL/ROCK
CONDITIONS

BOREHOLE
BACKFILL

0.0

Soil Cuttings

1.0
Bentonite Seal

3.0

Filter Sand

20 20

(Bottom of Exploration)
(Numbers refer to depth from ground surface in feet)

Type of protective cover/lock (circle one): Pent.bolt 9/16" hex. 1/2" hex. 7/10" hex.

Padlock key no. _____

Height/Depth of top of guard pipe/roadway box
above/below ground surface NA ft

Height/Depth of top of riser pipe
above/below ground surface 31.0 in
(Above)

Type of protective casing: NA

Length NA ft

Inside Diameter NA in

Depth of bottom of guard pipe/roadway box NA ft

Type of Seals

Top of Seal (ft)

Thickness (ft)

Concrete

NA

NA

Soil Cuttings

0.0

1.0

Bentonite Seal

1.0

2.0

#2 Filter Sand

3.0

12.0

Type of riser pipe: Solid PVC

Inside diameter of riser pipe 2.0 in

Type of backfill around riser Soil Cuttings

Diameter of borehole 6.0 in

Depth to top of well screen 5.0 ft

Type of screen Machine Slotted PVC

Screen gauge or size of openings 0.010 in

Diameter of screen 2.0 in

Type of backfill around screen #2 Filter Sand

Depth of bottom of well screen 15.0 ft

Bottom of Silt trap N/A ft

Depth of bottom of borehole 15.0 ft

(Not to Scale)

5 ft + 10 ft + 0 ft = 15 ft
Riser Pay Length (L1) Length of screen (L2) Length of silt trap (L3) Pay length

COMMENTS: Water level measured from current grade (approx. 5')



OBSERVATION WELL INSTALLATION REPORT

Well No.
MW-04
Boring No.
SB-04

PROJECT Supplemental Investigation - 65 Eckford St
LOCATION 65 Eckford Street, Brooklyn, NY

H&A FILE NO. 0202156
PROJECT MGR. M.Conlon

CLIENT 65-73 Eckford Realty LLC
CONTRACTOR Lakewood Environmental
DRILLER T.Kelly

FIELD REP. Z.Simmel
DATE INSTALLED 12/27/2021
WATER LEVEL 4.84'

Ground El. _____ ft
El. Datum _____

Location See Plan

☐ Guard Pipe
☐ Roadway Box

SOIL/ROCK CONDITIONS	BOREHOLE BACKFILL
0.0	0.0
	Soil Cuttings
	1.0 Bentonite Seal
	3.0
	Filter Sand
20	20
(Bottom of Exploration) (Numbers refer to depth from ground surface in feet)	

Type of protective cover/lock (circle one): Pent.bolt 9/16" hex. 1/2" hex. 7/10" hex.
Padlock key no. _____

Height/Depth of top of guard pipe/roadway box above/below ground surface NA ft

Height/Depth of top of riser pipe above/below ground surface 32.0 in
(Above)

Type of protective casing: NA

Length NA ft

Inside Diameter NA in

Depth of bottom of guard pipe/roadway box NA ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Concrete	NA	NA
Soil Cuttings	0.0	1.0
Bentonite Seal	1.0	2.0
#2 Filter Sand	3.0	12.0

Type of riser pipe: Solid PVC

Inside diameter of riser pipe 2.0 in

Type of backfill around riser Soil Cuttings

Diameter of borehole 6.0 in

Depth to top of well screen 5.0 ft

Type of screen Machine Slotted PVC

Screen gauge or size of openings 0.010 in

Diameter of screen 2.0 in

Type of backfill around screen #2 Filter Sand

Depth of bottom of well screen 15.0 ft

Bottom of Silt trap N/A ft

Depth of bottom of borehole 15.0 ft

(Not to Scale)

5 ft + 10 ft + 0 ft = 15 ft
Riser Pay Length (L1) Length of screen (L2) Length of silt trap (L3) Pay length

COMMENTS: Water level measured from current grade (approx. 5')



OBSERVATION WELL INSTALLATION REPORT

Well No.
MW-05
Boring No.
SB-05

PROJECT Supplemental Investigation - 65 Eckford St
LOCATION 65 Eckford Street, Brooklyn, NY

H&A FILE NO. 0202156
PROJECT MGR. M.Conlon

CLIENT 65-73 Eckford Realty LLC
CONTRACTOR Lakewood Environmental
DRILLER T.Kelly

FIELD REP. Z.Simmel
DATE INSTALLED 12/27/2021
WATER LEVEL 5.11'

Ground El. _____ ft
El. Datum _____

Location See Plan

☒ Guard Pipe
☐ Roadway Box

SOIL/ROCK CONDITIONS	BOREHOLE BACKFILL																	
	0.0	Type of protective cover/lock (circle one): Pent.bolt 9/16" hex. 1/2" hex. 7/10" hex. Padlock key no. _____																
		Height/Depth of top of guard pipe/roadway box above/below ground surface	NA ft															
		Height/Depth of top of riser pipe above/below ground surface	32.0 in (Above)															
		Type of protective casing:	NA															
		Length	NA ft															
		Inside Diameter	NA in															
		Depth of bottom of guard pipe/roadway box	NA ft															
	Bentonite Seal	<table border="1"><thead><tr><th>Type of Seals</th><th>Top of Seal (ft)</th><th>Thickness (ft)</th></tr></thead><tbody><tr><td>Concrete</td><td>NA</td><td>NA</td></tr><tr><td>Soil Cuttings</td><td>NA</td><td>NA</td></tr><tr><td>Bentonite Seal</td><td>0.0</td><td>1.0</td></tr><tr><td>#2 Filter Sand</td><td>1.0</td><td>12.0</td></tr></tbody></table>		Type of Seals	Top of Seal (ft)	Thickness (ft)	Concrete	NA	NA	Soil Cuttings	NA	NA	Bentonite Seal	0.0	1.0	#2 Filter Sand	1.0	12.0
Type of Seals	Top of Seal (ft)	Thickness (ft)																
Concrete	NA	NA																
Soil Cuttings	NA	NA																
Bentonite Seal	0.0	1.0																
#2 Filter Sand	1.0	12.0																
		Type of riser pipe:	Solid PVC															
		Inside diameter of riser pipe	2.0 in															
		Type of backfill around riser	Portland Cement															
	1.0	Diameter of borehole	6.0 in															
		Depth to top of well screen	3.0 ft															
		Type of screen	Machine Slotted PVC															
		Screen gauge or size of openings	0.010 in															
		Diameter of screen	2.0 in															
		Type of backfill around screen	#2 Filter Sand															
	Filter Sand	Depth of bottom of well screen	13.0 ft															
		Bottom of Silt trap	N/A ft															
		Depth of bottom of borehole	13.0 ft															
18	18	(Bottom of Exploration) (Numbers refer to depth from ground surface in feet)																
		(Not to Scale)																

3 ft + 10 ft + 0 ft = 13 ft
Riser Pay Length (L1) Length of screen (L2) Length of silt trap (L3) Pay length

COMMENTS: Water level measured from current grade (approx. 5')

APPENDIX D

Well Development Logs



WELL DEVELOPMENT LOG

Well No.

MW-01

Comments

Used whale pump

PROJECT	65 Eckford Street Supplement Investigation	DEVELOPMENT DATE	1/6/2022
LOCATION	65 Eckford Street, Brooklyn, NY	DEVELOPMENT START	1300
CLIENT	65-73 Eckford Realty LLC	DEVELOPMENT END	1325
H&A FILE NO.	0202156	WELL DEPTH (FT)	17.89
PROJECT MANAGER	Mari Cate Conlon	STATIC WATER LEVEL (FT)	4.65
FIELD REP.	Zach Simmel	WATER COLUMN HEIGHT (FT)	13.24
DATE INSTALLED	1/6/2022	WELL VOLUME (GAL)	2.158
DRILLER	Lakewood Environmetnal	TOTAL VOLUME PURGED (GAL)	30

Time	Time Elapsed (min)	Volume (gal)	Color	Comments
13:00	0	5.0	Turbid	
13:05	5	10.0	Turbid	
13:10	10	15.0	Cloudy	
13:15	15	20.0	Cloudy	
13:20	20	25.0	Slightly Cloudy	
13:25	25	30.0	Clear	Extracted >10 Well Vol., turbidity <50 NTU



WELL DEVELOPMENT LOG

Well No.

MW-02

Comments

Used whale pump

PROJECT	65 Eckford Street Supplemental Investigation	DEVELOPMENT DATE	1/6/2022
LOCATION	65 Eckford Street, Brooklyn, NY	DEVELOPMENT START	1230
CLIENT	65-73 Eckford Realty LLC	DEVELOPMENT END	1300
H&A FILE NO.	0202156	WELL DEPTH (FT)	15.1
PROJECT MANAGER	Mari Cate Conlon	STATIC WATER LEVEL (FT)	2.87
FIELD REP.	Zach Simmel	WATER COLUMN HEIGHT (FT)	12.23
DATE INSTALLED	12/27/2021	WELL VOLUME (GAL)	1.993
DRILLER	Lakewood Environmental	TOTAL VOLUME PURGED (GAL)	30

Time	Time Elapsed (min)	Volume (gal)	Color	Comments
12:30	0	5.0	Turbid	
12:35	5	10.0	Turbid	
12:40	10	15.00	Cloudy	
12:45	15	20.00	Cloudy	
12:50	20	25.0	Slightly Cloudy	
12:55	25	30.00	Clear	Extracted >10 Well Vol., turbidity <50 NTU



WELL DEVELOPMENT LOG

Well No.

MW-03

Comments

Used peristaltic pump

PROJECT	65 Eckford Street Supplemental Investigation	DEVELOPMENT DATE	1/6/2022
LOCATION	65 Eckford Street, Brooklyn, NY	DEVELOPMENT START	1200
CLIENT	65-73 Eckford Realty LLC	DEVELOPMENT END	1225
H&A FILE NO.	0202156	WELL DEPTH (FT)	17.63
PROJECT MANAGER	Mari Cate Conlon	STATIC WATER LEVEL (FT)	4.7
FIELD REP.	Zach Simmel	WATER COLUMN HEIGHT (FT)	12.93
DATE INSTALLED	12/27/2021	WELL VOLUME (GAL)	2.108
DRILLER	Lakewood Environmental	TOTAL VOLUME PURGED (GAL)	30

Time	Time Elapsed (min)	Volume (gal)	Color	Comments
12:00	0	5.0	Turbid	
12:05	5	10.0	Turbid	
12:10	10	15.0	Turbid	
12:15	15	20.0	Cloudy	
12:20	20	25.0	Slightly Cloudy	
12:25	25	30.0	Clear	Extracted >10 Well Vol., turbidity <50 NTU



WELL DEVELOPMENT LOG

Well No.

MW-04

Comments

Used whale pump

PROJECT	65 Eckford Street Supplemental Investigation	DEVELOPMENT DATE	12/27/2021
LOCATION	65 Eckford Street, Brooklyn, NY	DEVELOPMENT START	1015
CLIENT	65-73 Eckford Realty LLC	DEVELOPMENT END	1100
H&A FILE NO.	0202156	WELL DEPTH (FT)	18
PROJECT MANAGER	Mari Cate Conlon	STATIC WATER LEVEL (FT)	6.43
FIELD REP.	Zach Simmel	WATER COLUMN HEIGHT (FT)	11.57
DATE INSTALLED	12/27/2021	WELL VOLUME (GAL)	1.886
DRILLER	Lakewood Environmental	TOTAL VOLUME PURGED (GAL)	48

Time	Time Elapsed (min)	Volume (gal)	Color	Comments
10:15	0	5.0	Turbid	
10:20	5	10.0	Turbid	
10:25	10	15.0	Turbid	
10:30	15	20.0	Turbid	
10:35	20	25.0	Turbid	
10:40	25	30.0	Cloudy	
10:45	30	35.0	Cloudy	
10:50	35	40.0	Slightly Cloudy	
10:55	40	45.0	Slightly Cloudy	
11:00	45	48.0	Clear	Extracted >10 Well Vol., turbidity <50 NTU



WELL DEVELOPMENT LOG

Well No.

MW-05

Comments

Used whale pump

PROJECT	65 Eckford Street Supplemental Investigation	DEVELOPMENT DATE	1/6/2022
LOCATION	65 Eckford Street, Brooklyn, NY	DEVELOPMENT START	1130
CLIENT	65-73 Eckford Realty LLC	DEVELOPMENT END	1200
H&A FILE NO.	0202156	WELL DEPTH (FT)	15.4
PROJECT MANAGER	Mari Cate Conlon	STATIC WATER LEVEL (FT)	5.02
FIELD REP.	Zach Simmel	WATER COLUMN HEIGHT (FT)	10.38
DATE INSTALLED	12/27/2021	WELL VOLUME (GAL)	1.692
DRILLER	Lakewood Environmental	TOTAL VOLUME PURGED (GAL)	35

Time	Time Elapsed (min)	Volume (gal)	Color	Comments
11:30	0	5.0	Turbid	
11:35	5	10.0	Turbid	
11:40	10	15.0	Trubid	
11:45	15	20.0	Turbid	
11:50	20	25.0	Cloudy	
11:55	25	30.0	Slightly Cloudy	
12:00	30	35.0	Clear	Extracted >10 Well Vol., turbidity <50 NTU

APPENDIX E

Groundwater Sampling Logs



GROUNDWATER SAMPLING INFORMATION

[illegible]

Comments:



GROUNDWATER SAMPLING INFORMATION

[illegible]

Comments:



GROUNDWATER SAMPLING INFORMATION

[illegible]

Comments:



GROUNDWATER SAMPLING INFORMATION

[illegible]

Comments: Error with Horiba probes encountered at 0855; pause low-flow sampling; disassembling aparatus and spraying probes with deionized water; resume low-flow sampling at 0910.									



LOW-FLOW GROUNDWATER SAMPLING RECORD

PROJECT	Supplemental Investigation - 65 Eckford St	H&A FILE NO.	0202156
LOCATION	65 Eckford Street, Brooklyn, NY	PROJECT MGR.	M.Conlon
CLIENT	65-73 Eckford Realty LLC	FIELD REP	Y.Lin
CONTRACTOR	N/A	DATE	1/14/2022

GROUNDWATER SAMPLING INFORMATION

Well ID:	MW-05	Well Volume:	1.69 gallons	Start Time:	10:05
Well Depth:	15.40' (from top of riser pipe)	Equipment:	Peristaltic Pump; Horiba	Sample Time:	11:35
Depth to Water:	5.02'	Purge Rate:	300 mL/min		

Time	Volume purged, gallons	Temp, C (+/- 3%)	Conductivity, ms/cm (+/- 3%)	Dissolved Oxygen, mg/L (+/- 10%)	pH (+/- 0.1)	ORP/eH, mv (+/- 10mv)	Turbidity, NTU (<5 NTU)	Depth to Water (ft)
10:10	0.5	10.74	0.998	0.0	6.99	-124	360	5.07
10:15	1	11.07	0.995	0.0	6.96	-135	368	5.07
10:20	1.5	11.68	0.988	0.0	6.92	-138	439	5.07
10:25	2	11.88	0.977	0.0	6.88	-139	306	5.07
10:30	2.5	12.04	0.968	0.0	6.84	-139	285	5.07
10:35	3	12.2	0.964	0.0	6.81	-139	221	5.07
10:40	3.5	12.41	0.958	0.0	6.79	-139	176	5.06
10:45	4	12.51	0.957	0.0	6.78	-139	162	5.06
10:50	4.5	12.54	0.952	0.0	6.78	-139	140	5.06
10:55	5	12.63	0.949	0.0	6.76	-139	118	5.06
11:00	5.5	12.64	0.949	0.0	6.74	-140	112	5.05
11:05	6	12.47	0.949	0.0	6.75	-140	100	5.06
11:10	6.5	12.51	0.946	0.0	6.74	-140	64.4	5.06
11:15	7	12.54	0.941	0.0	6.73	-140	80.6	5.06
11:20	7.5	12.63	0.938	0.0	6.72	-140	67.7	5.06
11:25	8	12.58	0.937	0.0	6.72	-140	57.8	5.06
11:30	9	12.58	0.945	0.0	6.72	-140	50	5.06

Comments:

APPENDIX F

Soil Vapor Purge Log



SOIL VAPOR SAMPLING LOG

Supplemental Investigation - 65 Eckford Street, Brooklyn, NY

Site: 65 Eckford Street, Brooklyn, NY
Date Collected: 1/6/2022
Personnel: Z.Simmel
Weather: Sunny, 38°F
Humidity: 55%

Sample ID	Canister ID	Caniser Size	Flow Controller ID	Sample Start Time	Canister Start Pressure ("Hg)	Sample End Time	Canister End Pressure ("Hg)	Sample Start Date	Sample Type	Analyses Method
SV-01	525	2.7L	01932	12:08	-30.33	14:08	-7.34	1/6/2022	Soil Vapor	TO-15
SV-02	416	2.7L	01903	12:10	-30.49	14:10	-8.08	1/6/2022	Soil Vapor	TO-15
SV-03	2247	2.7L	01874	12:16	-30.57	14:16	-7.00	1/6/2022	Soil Vapor	TO-15
SV-04	544	2.7L	01087	12:20	-30.37	14:20	-5.86	1/6/2022	Soil Vapor	TO-15
SV-05	2788	2.7L	01264	12:20	-30.74	14:20	-7.24	1/6/2022	Soil Vapor	TO-15

Notes:

Summas and flow regulators provided by Alpha Analytical Laboratory

Analyses for VOCs by Method TO-15 completed by Alpha Analytical Laboratory

APPENDIX G

Analytical Laboratory Reports (Sharefile)

APPENDIX H

Daily Reports



DAILY FIELD REPORT

Page 1 of 1

Project	BCP C224218 - Former Carter Spray Finishing Site Supplemental Investigation	Report No.	1
Location	65 Eckford Street, Brooklyn, NY	Date	12/27/2021
Client	65-73 Eckford Realty LLC	Page	1 of 1
Subcontractor	Lakewood Environmental Services Corp.	File No.	0202156-000
Weather	Partly Cloudy	Temperature	36° F
Humidity	59%	Wind Direction	E

0700 Z. Simmel of H&A and Lakewood Environmental Services Corp. (Lakewood) on site

0705 Health and safety tailgate, mobilize on site, site walk, set up CAMP

0730 Mobilize to and install SB06 to 20 ft below sidewalk grade (ft bgs)

0815 Mobilize to and install SB09 to 20 ft bgs

0930 Mobilize to and begin installation of MW04

1000 Set MW04 to approximately 20 ft bgs

1015 Mobilize to and begin installation of MW01

1015 Begin developing MW04

1045 Set MW01 to approximately 20 ft bgs

1115 Finish development at MW04, 48 gallons total

1130 Mobilize to and begin installation of MW02

1200 Set MW02 to approximately 20 ft bgs

1205 Mobilize to and begin installation of MW05

1340 Set MW05 to approximately 20 ft bgs

1355 Install SB05 to 20 ft bgs

1415 Mobilize to and install SB10 to 20 ft bgs

1435 Site preparation

1500 Lakewood off site

1525 Relinquish samples to Alpha Analytical Laboratory

1530 All off site

NYSDEC Site C224218 - Former Carter Spray Finishing Site
65 Eckford Street, Brooklyn, NY
File No. 0202156
Date Photographs Taken: 27 December 2021



Photo 1: Installation of SB06.



Photo 2: Installation of MW03.

NYSDEC Site C224218 - Former Carter Spray Finishing Site
65 Eckford Street, Brooklyn, NY
0202156-000
Air Monitoring Log

Date: 12/27/2021
Personnel: Z. Simmel
Weather: Partly Cloudy
Humidity: 59%
Temperature: 36° F
Wind Direction: E

PID Background (ppm): 0.0

Site Map:



Time	Visual Dust Particulates (Y/N)	PID (ppm)	Odors (Y/N)	Notes/Comments
	Downwind	Downwind		
715	N	0.0	N	
730	N	0.0	N	
745	N	0.0	N	
800	N	0.0	N	
815	N	0.0	N	
830	N	0.0	N	
845	N	0.0	N	
900	N	0.0	N	
915	N	0.0	N	
930	N	0.0	N	
945	N	0.0	N	
1000	N	0.0	N	
1015	N	0.0	N	
1030	N	0.0	N	
1045	N	0.0	N	
1100	N	0.0	N	
1115	N	0.0	N	
1130	N	0.0	N	

NYSDEC Site C224218 - Former Carter Spray Finishing Site
65 Eckford Street, Brooklyn, NY
0202156-000
Air Monitoring Log

[illegible]

GIS FILE PATH: C:\Users\hwachholz\Documents\working\pers\2021\56\GIS\Maps\2021_08\202156_000_0002_SITE_PLAN.mxd — USER: hwachholz — LAST SAVED: 8/5/2021 1:00:46 PM

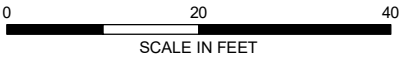


LEGEND

- SITE BOUNDARY
- PROPOSED SOIL BORING/PERMANENT MONITORING WELL LOCATION
- PROPOSED SOIL BORING LOCATION
- PROPOSED SOIL VAPOR POINT LOCATION
- PROPOSED ENDPOINT SAMPLE LOCATION FROM THE CORRECTIVE ACTION WORK PLAN
- APPROXIMATE LOCATION OF 550-GALLON UST REMOVED IN JUNE 2018

NOTES

1. ALL LOCATIONS ARE APPROXIMATE.
2. AERIAL IMAGERY SOURCE: NEARMAP, 12 MARCH 2021



HALEY
ALDRICH

65 ECKFORD STREET
BROOKLYN, NEW YORK

PROPOSED SAMPLE LOCATION MAP

SEPTEMBER 2021

FIGURE 3



DAILY FIELD REPORT

Page 1 of 1

Project	BCP C224218 - Former Carter Spray Finishing Site Supplemental Investigation	Report No.	2
Location	65 Eckford Street, Brooklyn, NY	Date	1/6/2022
Client	65-73 Eckford Realty LLC	Page	1 of 1
Subcontractor	Lakewood Environmental Services Corp.	File No.	0202156-000
Weather	Sunny	Temperature	38° F
Humidity	55%	Wind Direction	W to E

0700 Z. Simmel of H&A and Lakewood Environmental Services Corp. (Lakewood) on site

0715 Y. Lin of H&A on site, health and safety tailgate meeting

0720 Mobilize to and install SB04 to 20 ft below sidewalk grade (ft bgs)

0800 Mobilize to and install SB11 to 20 ft bgs

0830 Mobilize to and install SB01 to 20 ft bgs

0900 Mobilize to and install SB02 to 20 ft bgs, offset approx. 4-5' from east from MW01

0920 Mobilize to and install SB07 to 20 ft bgs

1000 Mobilize to and install SB08 to 20 ft bgs

1020 Mobilize to and install SB12 to 20 ft bgs

1040 Mobilize to and install SB03 to 20 ft bgs

1130 Begin developing at MW05

1145 Finish development at MW05, 35 gallons

1200 Begin developing MW01 through MW04, 25-30 gallons for each well

1200 Mobilize to and install SV01 to 6 ft bgs

1205 Mobilize to and install SV02 to 6 ft bgs

1210 Mobilize to and install SV03 to 6 ft bgs

1215 Mobilize to and install SV04 to 6 ft bgs

1220 Mobilize to and install SV05 to 6 ft bgs

1300 Y.Lin of H&A offsite

1330 Site cleanup; demobilize

1400 Lakewood offsite

1500 Relinquish samples to Alpha Analytical

1515 Z.Simmel of H&A offsite

NYSDEC Site C224218 - Former Carter Spray Finishing Site
65 Eckford Street, Brooklyn, NY
File No. 0202156
Date Photographs Taken: 06 January 2022



Photo 1: Installation of SB02.



Photo 2: Location of SV01.

NYSDEC Site C224218 - Former Carter Spray Finishing Site
65 Eckford Street, Brooklyn, NY
0202156-000
Air Monitoring Log

Date: <u>1/6/2022</u> Personnel: <u>Z. Simmel</u> Weather: <u>Sunny</u> Humidity: <u>55%</u> Temperature: <u>38° F</u> Wind Direction: <u>W to E</u> PID Background (ppm): <u>0.0</u>			Site Map: 	
Time	Visual Dust Particulates (Y/N)	PID (ppm)	Odors (Y/N)	Notes/Comments
	Downwind	Downwind		
715	N	0.0	N	
730	N	0.0	N	
745	N	0.0	N	
800	N	0.0	N	
815	N	0.0	N	
830	N	0.0	N	
845	N	0.0	N	
900	N	0.0	N	
915	N	0.0	N	
930	N	0.0	N	
945	N	0.0	N	
1000	N	0.0	N	
1015	N	0.0	N	
1030	N	0.0	N	
1045	N	0.0	N	
1100	N	0.0	N	
1115	N	0.0	N	
1130	N	0.0	N	

NYSDEC Site C224218 - Former Carter Spray Finishing Site
65 Eckford Street, Brooklyn, NY
0202156-000
Air Monitoring Log

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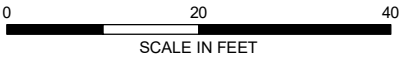


LEGEND

- SITE BOUNDARY
- PROPOSED SOIL BORING/PERMANENT MONITORING WELL LOCATION
- PROPOSED SOIL BORING LOCATION
- PROPOSED SOIL VAPOR POINT LOCATION
- PROPOSED ENDPOINT SAMPLE LOCATION FROM THE CORRECTIVE ACTION WORK PLAN
- APPROXIMATE LOCATION OF 550-GALLON UST REMOVED IN JUNE 2018

NOTES

1. ALL LOCATIONS ARE APPROXIMATE.
2. AERIAL IMAGERY SOURCE: NEARMAP, 12 MARCH 2021



HALEY
ALDRICH

65 ECKFORD STREET
BROOKLYN, NEW YORK

PROPOSED SAMPLE LOCATION MAP

SEPTEMBER 2021

FIGURE 3



DAILY FIELD REPORT

Page 1 of 1

Project	BCP C224218 - Former Carter Spray Finishing Site Supplemental Investigation	Report No.	3
Location	65 Eckford Street, Brooklyn, NY	Date	1/14/2022
Client	65-73 Eckford Realty LLC	Page	1 of 1
Subcontractor	N/A	File No.	0202156-000
Weather	Windy	Temperature	36° F
Humidity	66%	Wind Direction	N

0700 Z. Y. Lin of H&A on site, Alpha Analytical Laboratories on site, organize and calibrate equipment

0750 M. Boland and Z. Simmel of H&A on site

0800 Health & Safety tailgate, site walk

0810 Mobilize to MW-01, begin low flow groundwater sampling

0825 Mobilize to MW-04, begin low flow groundwater sampling

0915 Collect groundwater samples at MW-01

0945 Collect groundwater samples at MW-04

1000 Mobilize to MW-02, begin low flow groundwater sampling

1005 Mobilize to MW-05, begin low flow groundwater sampling

1045 Collect groundwater samples at MW-02

1115 Mobilize to MW-03, begin low flow groundwater sampling

1145 Collect groundwater samples at MW-05

1220 Collect groundwater samples at MW-03

1300 Site preparation, drum purge water, housekeeping

1315 Z. Simmel and M. Boland offsite

1345 Secure site

1400 Relinquish samples to Alpha Analytical Laboratories

1400 All offsite

NYSDEC Site C224218 - Former Carter Spray Finishing Site
65 Eckford Street, Brooklyn, NY
File No. 0202156
Date Photographs Taken: 14 January 2022



Photo 1: View of Horiba U-52 calibration.



Photo 2: View of low flow purging at MW-01.

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LEGEND

- SITE BOUNDARY
- PROPOSED SOIL BORING/PERMANENT MONITORING WELL LOCATION
- PROPOSED SOIL BORING LOCATION
- PROPOSED SOIL VAPOR POINT LOCATION
- PROPOSED ENDPOINT SAMPLE LOCATION FROM THE CORRECTIVE ACTION WORK PLAN
- APPROXIMATE LOCATION OF 550-GALLON UST REMOVED IN JUNE 2018

NOTES

1. ALL LOCATIONS ARE APPROXIMATE.
2. AERIAL IMAGERY SOURCE: NEARMAP, 12 MARCH 2021



0 20 40
SCALE IN FEET

HALEY
ALDRICH

65 ECKFORD STREET
BROOKLYN, NEW YORK

PROPOSED SAMPLE LOCATION MAP

SEPTEMBER 2021

FIGURE 3

APPENDIX I

Data Usability Summary Reports and Electronic Data Deliverable Submittal Correspondence

Data Usability Summary Report

Project Name: 65 Eckford Street Supplemental

Project Description: Groundwater, Soil, and Air Samples

Sample Date(s): 27 December 2021 through 14 January 2022

Analytical Laboratory: Alpha Analytical. – Westborough, MA

Validation Performed by: Sean Fischer

Validation Reviewed by: Katherine Miller

Validation Date: 5 February 2022

Haley & Aldrich, Inc. prepared this Data Usability Summary Report (DUSR) to summarize the review and validation of the samples described above. The analytical results for Sample Delivery Group(s) (SDG) listed below were reviewed to determine the data's usability:

1. Sample Delivery Group Numbers L2171041, L2200831, L2200873, L2202387, L2205282

This data validation and usability assessment was performed per the guidance and requirements established by the U.S. Environmental Protection Agency's (USEPA) *National Functional Guidelines (NFG) for Inorganic Data Review* and *National Functional Guidelines (NFG) for Organic Data Review* and *Analysis of Volatile Organic Compounds in Air Contained in Canisters by Method TO-15* and *Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (PFAS) Under NYSDEC's Part 375 Remedial Programs* and the project-specific Work Plan (WP)/Sampling Analysis Plan (SAP)/Quality Assurance Project Plan (QAPP), herein referred to as the specified limits (see references section). Data in this report has been reviewed against the most recent NFG.

Data reported in this sampling event were reported to the laboratory method detection limit (MDL). Results found between the MDL and the laboratory reporting limit (RL) are flagged "J" as estimated.

Sample data were qualified in accordance with laboratory's standard operating procedures (SOP). The results presented in each laboratory report were found to be compliant with the data quality objectives for the project and therefore usable; any exceptions are noted in the following pages.

For more detailed quality control (QC) information see Explanations section.

1. Sample Delivery Group Numbers L2171041, L2200831, L2200873, L2202387, L2205282

1.1 SAMPLE MANAGEMENT

This DUSR summarizes the review of SDG numbers:

- L2171041, dated 11 January 2022
- L2200831, dated 12 January 2022
- L2200873, dated 21 January 2022
- L2202387, dated 26 January 2022
- L2205282, dated 4 February 2022

Samples were collected, preserved, and shipped following standard chain of custody (COC) protocol.

Samples were also received appropriately, identified correctly, and analyzed according to the COC.

Issues noted with sample management are listed below:

- Custody seals were not used on the sample cooler(s).

Analyses were performed on the following samples:

Sample ID	Sample Type	Lab ID	Sample Date	Matrix	Methods
SB-05 (0-2)	N	L2171041-01	12/27/2021	SO	A, B, C, D, E, H, L
SB-05 (18-20)	N	L2171041-02	12/27/2021	SO	A, B, C, D, E, H, L
SB-06 (0-2)	N	L2171041-03	12/27/2021	SO	A, B, C, D, E, H, L
SB-06 (18-20)	N	L2171041-04	12/27/2021	SO	A, B, C, D, E, H
SB-09 (0-2)	N	L2171041-05	12/27/2021	SO	A, B, C, D, E, H
SB-09 (18-20)	N	L2171041-06	12/27/2021	SO	A, B, C, D, E, H, L
SB-10 (0-2)	N	L2171041-07	12/27/2021	SO	A, B, C, D, E, H
SB-10 (18-20)	N	L2171041-08	12/27/2021	SO	A, B, C, D, E, H, K, L
TB01-20211227	TB	L2171041-09	12/27/2021	WQ	D
SV-01-20220106	N	L2200831-01	01/06/2022	GS	F
SV-02-20220106	N	L2200831-02	01/06/2022	GS	F
SV-03-20220106	N	L2200831-03	01/06/2022	GS	F
SV-04-20220106	N	L2200831-04	01/06/2022	GS	F
SV-05-20220106	N	L2200831-05	01/06/2022	GS	F
SB-01 (0-2)	N	L2200873-01	01/06/2022	SO	A, B, C, D, E, H, K, L
SB-01 (18-20)	N	L2200873-02	01/06/2022	SO	A, B, C, D, E, H, L
SB-02 (0-2)	N	L2200873-03	01/06/2022	SO	A, B, C, D, E, H, L
SB-02 (18-20)	N	L2200873-04	01/06/2022	SO	A, B, C, D, E, H
SB-03 (0-2)	N	L2200873-05	01/06/2022	SO	A, B, C, D, E, H, L
SB-03 (18-20)	N	L2200873-06	01/06/2022	SO	A, B, C, D, E, H
SB-04 (0-2)	N	L2200873-07	01/06/2022	SO	A, B, C, D, E, H, L
SB-04 (18-20)	N	L2200873-08	01/06/2022	SO	A, B, C, D, E, H
SB-07 (0-2)	N	L2200873-09	01/06/2022	SO	A, B, C, D, E, H, L
SB-07 (18-20)	N	L2200873-10	01/06/2022	SO	A, B, C, D, E, H
SB-08 (0-2)	N	L2200873-11	01/06/2022	SO	A, B, C, D, E, H, L
SB-08 (18-20)	N	L2200873-12	01/06/2022	SO	A, B, C, D, E, H
SB-11 (0-2)	N	L2200873-13	01/06/2022	SO	A, B, C, D, E, H

Sample ID	Sample Type	Lab ID	Sample Date	Matrix	Methods
SB-11 (18-20)	N	L2200873-14	01/06/2022	SO	A, B, C, D, E, H, L
SB-12 (0-2)	N	L2200873-15	01/06/2022	SO	A, B, C, D, E, H
SB-12 (18-20)	N	L2200873-16	01/06/2022	SO	A, B, C, D, E, H, L
DUP01_20220106	FD	L2200873-17	01/06/2022	SO	A, B, C, D, E, H, L
DUP02_20220106	FD	L2200873-18	01/06/2022	SO	A, B, C, D, E, H, L
FIELD BLANK-20220106	FB	L2200873-19	01/06/2022	WQ	D, G, H, I
TB02_20220106	TB	L2200873-20	01/06/2022	WQ	D
MW-01-20220114	N	L2202387-01	01/14/2022	WG	D, E, G, H, I, J
MW-04-20220114	N	L2202387-02	01/14/2022	WG	D, E, G, H, I, J
DUP-20220114	FD	L2202387-03	01/14/2022	WG	D, E, G, H, I, J
MW-05-20220114	N	L2202387-04	01/14/2022	WG	D, E, G, H, I, J
MW-02-20220114	N	L2202387-05	01/14/2022	WG	D, E, G, H, I, J
MW-03-20220114	N	L2202387-06	01/14/2022	WG	D, E, G, H, I, J
FB-20220114	FB	L2202387-07	01/14/2022	WQ	D, E, G, H, I, J
TB-20220114	TB	L2202387-08	01/14/2022	WQ	D

Method Holding Times			
A	SM2540G	Total Solids	7 days for solid, unpreserved
B	SW6010D	Metals (by Optical Emission Spectrometry)	180 days for solid, unpreserved
C	SW7471B	Mercury (in solids)	28 days for solid, unpreserved
D	SW8260C	Volatile Organic Compounds (VOCs)	14 days for liquid, preserved, 14 days for solid, unpreserved
E	SW8270D	Semivolatile Organic Compounds (SVOCs)	7 days / 40 days for liquid, unpreserved,* 14 days / 40 days for solid, unpreserved
F	TO15	Volatile Organic Compounds (VOCs) in Air	30 days for SUMMA canisters
G	SW6020B	Metals	180 days for liquid, preserved
H	ALPHA23528	PFAS**	14 days / 28 days for liquid, unpreserved, 14 days / 40 days for solids, unpreserved
I	SW7470A	Mercury (in liquids)	28 days for liquid, preserved
J	SW8270DSIM	Semivolatile Organic Compounds (SVOCs)	7 days / 40 days for liquid, unpreserved
K	SW7470AR	Mercury, TCLP	28 days for solid, unpreserved
L	SW6010DR	Metals, TCLP	180 days / 180 days for solid, unpreserved

**** days/# days notation indicates the holding time is # days for extraction and then an additional # hours or days for analysis.**

****Holding time specified by NYSDEC Guidance**

1.2 CASE NARRATIVE

The laboratory report case narrative lists various additional quality control issues such as internal standard exceedances and initial calibration verification (ICV) and/or continuing calibration verification (CCV) exceedances.

The laboratory report case narratives included the following issues:

- L2171041
 - L2171041-07: The analysis of Volatile Organics by EPA Method 5035/8260 Low Level could not be performed due to the elevated concentrations of non-target compounds in the sample.
 - L2171041-01: The collection date and time on the chain of custody was 27-DEC-21 13:46; however, the collection date/time on the container label was 27-DEC-21 13:40. At the client's request, the collection date/time is reported as 27-DEC-21 13:46.
- L2200831
 - L2200873-19: The Semivolatile Organics and 1,4-Dioxane analyses were requested on the Chain of Custody; however, the appropriate sample containers were not received. This was verified by the client.
 - L2200873-03, -07, -11, -13, and -15: The analysis of Volatile Organics by EPA Method 5035/8260 Low Level could not be performed due to the elevated concentrations of non-target compounds in the sample.
- L2202387
 - L2202387-01 through -06 and WG1595621-3/-4: The sample was centrifuged and decanted prior to extraction due to sample matrix.
- L2205282
 - L2205282-12: The collection date and time on the chain of custody was 27-DEC-21 13:46; however, the collection date/time on the container label was 27-DEC-21 13:40. At the client's request, the collection date/time is reported as 27-DEC-21 13:46.

1.3 HOLDING TIMES/PRESERVATION

The samples arrived at the laboratory at the proper temperature and were prepared and analyzed within the holding time and preservation criteria specified per method protocol with the following exceptions:

Method	Matrix	Holding Time	Preservation	Sample ID, Violation, Qualification
SW7470AR	Soil	28 days, unpreserved, 28 days, unpreserved	Cool to $\leq 6^{\circ}\text{C}$	The following sample was analyzed outside of holding time and qualified "R": SB-10 (18-20)

1.4 REPORTING LIMITS AND SAMPLE DILUTIONS

All dilutions were reviewed and found to be justified. Any non-detects with elevated reported limits are noted and explained below.

Sample ID	Lab ID	Analyte/Method	Dilution Factor	Issue/Explanation
SB-05 (0-2)	L2171041-01	SW6010D	2x	Dilution required due to matrix interferences encountered during analysis
SB-05 (18-20)	L2171041-02	SW6010D	2x	Dilution required due to matrix interferences encountered during analysis
SB-06 (0-2)	L2171041-03	SW6010D	2x	Dilution required due to matrix interferences encountered during analysis
SB-06 (0-2)	L2171041-03	SW8260C	10x	Dilution required due to the elevated

Sample ID	Lab ID	Analyte/ Method	Dilution Factor	Issue/Explanation
				concentrations of non-target compounds in the sample.
SB-06 (0-2)	L2171041-03	SW8270D	5x	Dilution required due to the nature of the sample matrix.
SB-06 (18-20)	L2171041-04	SW6010D	2X	Dilution required due to matrix interferences encountered during analysis
SB-09 (0-2)	L2171041-05	SW6010D	2X	Dilution required due to matrix interferences encountered during analysis
SB-09 (18-20)	L2171041-06	SW6010D	10X	Dilution required due to matrix interferences encountered during analysis
SB-10 (0-2)	L2171041-07	SW6010D	2X	Dilution required due to matrix interferences encountered during analysis
SB-10 (18-20)	L2171041-08	SW6010D	2X	Dilution required due to matrix interferences encountered during analysis
SV-01-20220106	L2200831-01	TO15	1.398x	Dilution required due to the elevated concentrations of non-target compounds in the sample.
SV-02-20220106	L2200831-02	TO15	10x	Dilution required due to the elevated concentrations of non-target compounds in the sample.
SV-03-20220106	L2200831-03	TO15	2x	Dilution required due to the elevated concentrations of target compounds in the sample.
SV-04-20220106	L2200831-04	TO15	2.5x	Dilution required due to the elevated concentrations of target compounds in the sample.
SV-05-20220106	L2200831-05	TO15	27.5	Dilution required due to the elevated concentrations of target compounds in the sample.
SB-01 (0-2)	L2200873-01	SW6010D	2x	Dilution required due to matrix interferences encountered during analysis
SB-01 (18-20)	L2200873-02	SW6010D	2x	Dilution required due to matrix interferences encountered during analysis
SB-02 (0-2)	L2200873-03	SW6010D	2x	Dilution required due to matrix interferences encountered during analysis
SB-02 (18-20)	L2200873-04	SW6010D	2x	Dilution required due to matrix interferences encountered during analysis
SB-03 (0-2)	L2200873-05	SW6010D	2x	Dilution required due to matrix interferences encountered during analysis
SB-03 (18-20)	L2200873-06	SW6010D	2x	Dilution required due to matrix interferences encountered during analysis
SB-04 (0-2)	L2200873-07	SW6010D	2x	Dilution required due to matrix interferences encountered during analysis
SB-04 (18-20)	L2200873-08	SW6010D	2x	Dilution required due to matrix interferences encountered during analysis
SB-07 (0-2)	L2200873-09	SW6010D	2x	Dilution required due to matrix interferences encountered during analysis
SB-07 (18-20)	L2200873-10	SW6010D	2x	Dilution required due to matrix interferences encountered during analysis
SB-08 (0-2)	L2200873-11	SW6010D	2x	Dilution required due to matrix interferences encountered during analysis

Sample ID	Lab ID	Analyte/Method	Dilution Factor	Issue/Explanation
SB-08 (18-20)	L2200873-12	SW6010D	2x	Dilution required due to matrix interferences encountered during analysis
SB-11 (0-2)	L2200873-13	SW6010D	2x	Dilution required due to matrix interferences encountered during analysis
SB-11 (18-20)	L2200873-14	SW6010D	2x	Dilution required due to matrix interferences encountered during analysis
SB-12 (0-2)	L2200873-15	SW6010D	2x	Dilution required due to matrix interferences encountered during analysis
SB-12 (18-20)	L2200873-16	SW6010D	2x	Dilution required due to matrix interferences encountered during analysis
DUP01_20220106	L2200873-17	SW6010D	2x	Dilution required due to matrix interferences encountered during analysis
DUP02_20220106	L2200873-18	SW6010D	2x	Dilution required due to matrix interferences encountered during analysis

1.5 REPORTING BASIS (WET/DRY)

[Refer to section E 1.1.](#) Soil data in this SDG were reported on a dry weight basis.

Where reported, percent solid results were reviewed and found to be within limits, with the following exceptions:

- DUP01_20220106 – 22.4%
- SB-01 (18-20) – 28.4 %
- SB-02 (18-20) – 29.3%
- SB-04 (18-20) – 24.5%
- SB-07 (18-20) – 27.5 %
- SB-11 (18-20) – 24.6 %
- SB-12 (18-20) – 22.8 %

1.6 SURROGATE RECOVERY COMPLIANCE

[Refer to section E 1.2.](#) The percent recovery (%R) for each surrogate compound added to each project sample were determined to be within the laboratory specified QC limits, with the following exceptions:

Method	Sample ID	Lab ID	Surrogate	Dilution	%R	Qualification
SW8270D	SB-05 (0-2)	L2171041-01	2,4,6-Tribromophenol	1x	2%	J-/UJ target compounds*
SW8270D	SB-05 (0-2) RE	L2171041-01	2,4,6-Tribromophenol	1x	3%	J-/UJ target compounds*
SW8270D	SB-05 (0-2)	L2171041-01	2-Fluorophenol	1x	8%	J-/R target compounds**
SW8270D	SB-05 (0-2) RE	L2171041-01	2-Fluorophenol	1x	17%	J-/UJ target compounds**
SW8260C	SB-06 (0-2)	L2171041-03	4-Bromofluorobenzene	10x	248%	None, dilution >5x
SW8270D	SB-06 (0-2)	L2171041-03	Nitrobenzene-D5	5x	165%	None, dilution >5x
SW8260C	SB-06 (18-20) R	L2171041-04	4-Bromofluorobenzene	1x	131%	J+/None target compounds***

Method	Sample ID	Lab ID	Surrogate	Dilution	%R	Qualification
SW8260C	SB-10 (0-2)	L2171041-07	4-Bromofluorobenzene	1x	177%	J+/None target compounds***
SW8260C	SB-01 (0-2)	L2200873-01	4-Bromofluorobenzene	1X	190%	J+/None target compounds***
SW8260C	SB-02 (0-2)	L2200873-03	4-Bromofluorobenzene	1X	156%	J+/None target compounds***
SW8260C	SB-03 (0-2)	L2200873-05	4-Bromofluorobenzene	1X	371%	J+/None target compounds***
SW8260C	SB-04 (0-2)	L2200873-07	4-Bromofluorobenzene	1X	140%	J+/None target compounds***
SW8260C	SB-07 (0-2)	L2200873-09	4-Bromofluorobenzene	1x	446%	J+/None target compounds***
SW8260C	SB-08 (0-2)	L2200873-11	4-Bromofluorobenzene	1x	180%	J+/None target compounds***
SW8260C	SB-11 (0-2)	L2200873-13	4-Bromofluorobenzene	1x	136%	J+/None target compounds***
SW8260C	SB-12 (0-2)	L2200873-15	4-Bromofluorobenzene	1x	363%	J+/None target compounds***
SW8260C	SB-12 (18-20)	L2200873-16	4-Bromofluorobenzene	1x	206%	J+/None target compounds***
SW8260C	DUP02_20220106	L2200873-18	4-Bromofluorobenzene	1x	150%	J+/None target compounds***

* Compounds targeted by 2,4,6-Tribromophenol: Pentachlorophenol, Phenanthrene, Anthracene, Carbazole, Di-n-Butylphthalate, Fluoranthene, Pyrene, Butyl benzylphthalate

** Compounds targeted by 2-Fluorophenol: Phenol, Bis(2-chloroethyl)ether, 2-Chlorophenol, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, Benzyl Alcohol, 1,2-Dichlorobenzene, 2-Methylphenol, N-Nitrosodi-n-propylamine, Hexachloroethane, Acetophenone, Isophorone, 2-Nitrophenol, 2,4-Dimethylphenol, Bis(2-chloroethoxy)methane

*** Compounds targeted by 4-Bromofluorobenzene: Isopropylbenzene, n-propylbenzene, 4-ethyltoluene, 1,3,5-trimethylbenzene, tert-butylbenzene, 1,2,4-trimethylbenzene, 2-Phenylbutane (sec-Butylbenzene), Cymene (p-isopropyltoluene), n-butylbenzene, 1,4-diethylbenzene, 1,2,4,5-tetramethylbenzene, Naphthalene

1.7 LABORATORY CONTROL SAMPLES

[Refer to section E 1.3.](#) Compounds associated with the laboratory control samples/laboratory control sample duplicates (LCS/LCSD) analyses exhibited recoveries and RPDs within the specified limits with the following exceptions:

Sample Type	Method	Batch ID	Analyte	%R	Qualifier	Affected Samples
LCS/LCSD	SW8260C	WG1588956 Reanalysis	Trichlorofluoro methane	69%/65%	UJ	SB-06 (18-20) RE, SB-09 (18-20) RE
LCS/LCSD	SW8260C	WG1588956	Trichlorofluoro methane	65%/63%	UJ	SB-05 (0-2), SB-05 (18-20), SB-06 (18-20), SB-09 (0-2), SB-09 (18-20)
LCSD	SW8260C	WG1588956	Bromomethane	56%	UJ	SB-05 (0-2) SB-05 (18-20) SB-06 (18-20) SB-09 (0-2) SB-09 (18-20)
LCS/LCSD	SW8260C	WG1588987	Trichlorofluoro methane	65%/63%,	UJ	SB-06 (0-2), SB-10 (0-2)
LCSD	SW8260C	WG1588987	Bromomethane	56%	UJ	SB-06 (0-2), SB-10 (0-2)
LCSD	SW8260C	WG1589250	Chloroethane	140%	NA	None, samples are ND
LCS/LCSD	SW8260C	WG1589250	2-Butanone	88%/110%, RPD = 22	NA	None, samples are ND
LCS/LCSD	SW8260C	WG1589609	Trichlorofluorom ethane	68%/64%	UJ	SB-10 (18-20)
LCS	SW8260C	WG1592232	2-Chlorotoluene	136%	NA	None, samples are ND
LCS	SW8260C	WG1592243	2-Chlorotoluene	136%	NA	None, samples are ND
LCS/LCSD	SW8260C	WG1592401	Bromomethane	92%/73%, RPD = 23	NA	None, samples are ND
LCSD	SW8260C	WG1592401	Acrylonitrile	140%	NA	None, samples are ND
LCS/LCSD	SW8260C	WG1592401	Acetone	100%/130%, RPD = 26	NA	None, samples are ND
LCS/LCSD	SW8260C	WG1592401	2-Hexanone	97%/120%, RPD = 21	NA	None, samples are ND
LCS/LCSD	SW8260C	WG1592401	1,4-Dioxane	72%/90%, RPD = 22	NA	None, samples are ND
LCS/LCSD	SW8260C	WG1592743	Trichlorofluoro methane	64%/64%	UJ	DUP02_20220106, SB-01 (0-2), SB-03 (0-2)
LCS/LCSD	SW8270D	WG1589559	Hexachlorocyclo pentadiene	11%/11%	R	SB-05 (0-2), SB-05 (18-20), SB-06 (0-2), SB-06 (18-20), SB-09 (0-2), SB-09 (18-20), SB-10 (0-2), SB-10 (18-20)

Sample Type	Method	Batch ID	Analyte	%R	Qualifier	Affected Samples
LCSD	SW8270D	WG1589559	4,6-Dinitro-2-methylphenol	7%	R	SB-05 (0-2) SB-05 (18-20) SB-06 (0-2) SB-06 (18-20) SB-09 (0-2) SB-09 (18-20) SB-10 (0-2) SB-10 (18-20)
LCS/LCSD	SW8270D	WG1589559	Benzoic Acid	2%/1%	R	SB-05 (0-2) SB-05 (18-20) SB-06 (0-2) SB-06 (18-20) SB-09 (0-2) SB-09 (18-20) SB-10 (0-2) SB-10 (18-20)
LCS	SW8270D	WG1589559	1,4-Dioxane	37%	R	SB-05 (0-2) SB-05 (18-20) SB-06 (0-2) SB-06 (18-20) SB-09 (0-2) SB-09 (18-20) SB-10 (0-2) SB-10 (18-20)
LCSD	SW8270D	WG1590273 Reanalysis	3,3'-Dichloro benzidine	36%	R	SB-05 (0-2) RE
LCS/LCSD	SW8270D	WG1590273 Reanalysis	Benzoic Acid	0%/0%, RPD = NC	R	SB-05 (0-2) RE
LCS/LCSD	SW8270D	WG1592153	Benzoic Acid	0%/0%, RPD = NC	R	DUP01_20220106, DUP02_20220106, SB-01 (0-2), SB-01 (18-20), SB-02 (0-2), SB-02 (18-20), SB-03 (0-2), SB-03 (18-20), SB-04 (0-2), SB-04 (18-20), SB-07 (0-2), SB-07 (18-20), SB-08 (0-2), SB-08 (18-20), SB-11 (0-2), SB-11 (18-20), SB-12 (0-2), SB-12 (18-20)

Sample Type	Method	Batch ID	Analyte	%R	Qualifier	Affected Samples
LCSD	SW8270D	WG1594403	4-Chloroaniline	35%, RPD = 33	R	DUP-20220114, FB-20220114, MW-01-20220114, MW-02-20220114, MW-03-20220114, MW-04-20220114, MW-05-20220114
LCS/LCSD	SW8270D	WG1594403	4-Nitroaniline	48%/50%	R	DUP-20220114, FB-20220114, MW-01-20220114, MW-02-20220114, MW-03-20220114, MW-04-20220114, MW-05-20220114
LCS	SW8270D	WG1594403	Carbazole	47%	J-/R	DUP-20220114, FB-20220114, MW-01-20220114, MW-02-20220114, MW-03-20220114, MW-04-20220114, MW-05-20220114
LSC/LCSD	SW8270D SIM	WG1594482	Pentachlorophe nol	55%/83%, RPD = 41	J+/None	MW-03-20220114, MW-05-20220114

1.8 MATRIX SPIKE SAMPLES

[Refer to section E 1.4.](#) The sample(s) below were used for matrix spike/matrix spike duplicate (MS/MSD):

Lab Sample Number	Matrix Spike/ Matrix Spike Duplicate Sample Client ID	Method(s)
WG1594277-4-MS WG1594277-5-SD	MW-01-20220114	SW8240D
WG1594278-4-MS WG1594278-5-SD WG1594471-4-MS WG1594471-5-SD	MW-01-20220114	SW8270DSIM
WG1594722-3-MS WG1594722-4-SD	MW-01-20220114	SW6020B
WG1594724-3-MS WG1594724-4-SD	MW-01-20220114	SW7470A
WG1594752-6-MS WG1594752-7-SD	MW-01-20220114	SW8260C
WG1595621-3-MS WG1595621-4-SD	MW-01-20220114	ALPHA23528

Lab Sample Number	Matrix Spike/ Matrix Spike Duplicate Sample Client ID	Method(s)
WG1591734-3-MS	SB-01 (0-2)	SW6010D
WG1591735-3-MS	SB-01 (0-2)	SW7471B
WG1593929-3-MS	SB-01 (0-2)	ALPHA23528
WG1600786-3-MS	SB-01 (0-2)	SW6010DR
WG1600787-3-MS	SB-01 (0-2)	SW7470AR

The MS/MSD recoveries and the between the MS and MSD results were within the specified limits with the following exceptions:

Sample Type	Method	Parent Sample	Analyte	%R/RPD	Qualifier	Affected Samples
MS	ALPHA23528	SB-01 (0-2)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	150%	UJ	SB-01 (0-2)
MS	SW6010D	SB-01 (0-2)	Aluminum	570%	NA	None, native sample > 4x the spike added
MS	SW6010D	SB-01 (0-2)	Arsenic	314%	J	DUP01_20220106 DUP02_20220106 SB-01 (0-2) SB-01 (18-20) SB-02 (0-2) SB-02 (18-20) SB-03 (0-2) SB-03 (18-20) SB-04 (0-2) SB-04 (18-20) SB-07 (0-2) SB-07 (18-20) SB-08 (0-2) SB-08 (18-20) SB-11 (0-2) SB-11 (18-20) SB-12 (0-2) SB-12 (18-20)
MS	SW6010D	SB-01 (0-2)	Chromium	51%	J	DUP01_20220106 DUP02_20220106 SB-01 (0-2) SB-01 (18-20) SB-02 (0-2) SB-02 (18-20) SB-03 (0-2) SB-03 (18-20) SB-04 (0-2)

Sample Type	Method	Parent Sample	Analyte	%R/RPD	Qualifier	Affected Samples
MS	SW6010D	SB-01 (0-2)	Chromium	51%	J	SB-04 (18-20) SB-07 (0-2) SB-07 (18-20) SB-08 (0-2) SB-08 (18-20) SB-11 (0-2) SB-11 (18-20) SB-12 (0-2) SB-12 (18-20)
MS	SW6010D	SB-01 (0-2)	Copper	259%	NA	None, native sample > 4x the spike added
MS	SW6010D	SB-01 (0-2)	Iron	2710%	NA	None, native sample > 4x the spike added
MS	SW6010D	SB-01 (0-2)	Lead	0%	NA	None, native sample > 4x the spike added
MS	SW6010D	SB-01 (0-2)	Magnesium	73%	J	DUP01_20220106 DUP02_20220106 SB-01 (0-2) SB-01 (18-20) SB-02 (0-2) SB-02 (18-20) SB-03 (0-2) SB-03 (18-20) SB-04 (0-2) SB-04 (18-20) SB-07 (0-2) SB-07 (18-20) SB-08 (0-2) SB-08 (18-20) SB-11 (0-2) SB-11 (18-20) SB-12 (0-2) SB-12 (18-20)
MS	SW6010D	SB-01 (0-2)	Nickel	74%	J	DUP01_20220106 DUP02_20220106 SB-01 (0-2) SB-01 (18-20) SB-02 (0-2) SB-02 (18-20) SB-03 (0-2) SB-03 (18-20) SB-04 (0-2)

Sample Type	Method	Parent Sample	Analyte	%R/RPD	Qualifier	Affected Samples
MS	SW6010D	SB-01 (0-2)	Nickel	74%	J	SB-04 (18-20) SB-07 (0-2) SB-07 (18-20) SB-08 (0-2) SB-08 (18-20) SB-11 (0-2) SB-11 (18-20) SB-12 (0-2) SB-12 (18-20)
MS	SW6010D	SB-01 (0-2)	Thallium	66%	UJ	DUP01_20220106 DUP02_20220106 SB-01 (0-2) SB-01 (18-20) SB-02 (0-2) SB-02 (18-20) SB-03 (0-2) SB-03 (18-20) SB-04 (0-2) SB-04 (18-20) SB-07 (0-2) SB-07 (18-20) SB-08 (0-2) SB-08 (18-20) SB-11 (0-2) SB-11 (18-20) SB-12 (0-2) SB-12 (18-20)
MS	SW6010D	SB-01 (0-2)	Zinc	132%	J	DUP01_20220106 DUP02_20220106 SB-01 (0-2) SB-01 (18-20) SB-02 (0-2) SB-02 (18-20) SB-03 (0-2) SB-03 (18-20) SB-04 (0-2) SB-04 (18-20) SB-07 (0-2) SB-07 (18-20) SB-08 (0-2) SB-08 (18-20) SB-11 (0-2) SB-11 (18-20) SB-12 (0-2) SB-12 (18-20)
MS	SW7471B	SB-01 (0-2)	Mercury	179%	NA	None, native sample > 4x the spike added
MS/MSD	SW6020B	MW-01-20220114	Calcium	290%/290%	NA	None, native sample > 4x the spike added

Sample Type	Method	Parent Sample	Analyte	%R/RPD	Qualifier	Affected Samples
MS/MSD	SW6020B	MW-01-20220114	Iron	148%/153%	NA	None, native sample > 4x the spike added
MS/MSD	SW6020B	MW-01-20220114	Magnesium	151%/144%	J	DUP-20220114 MW-01-20220114 MW-02-20220114 MW-03-20220114 MW-04-20220114 MW-05-20220114
					None	FB-20220114
MS/MSD	SW6020B	MW-01-20220114	Potassium	127%/127%	J	DUP-20220114 MW-01-20220114 MW-02-20220114 MW-03-20220114 MW-04-20220114 MW-05-20220114
					None	FB-20220114
MS/MSD	SW6020B	MW-01-20220114	Sodium	297%/287%	NA	None, native sample > 4x the spike added
MS/MSD	SW8270D	MW-01-20220114	3,3'-Dichlorobenzidine	0%/0%, RPD = 0	R	MW-01-20220114
MS	SW8270D	MW-01-20220114	4-Chloro-3-methylphenol	110%	NA	None, samples are ND
MS/MSD	SW8270D	MW-01-20220114	4-Nitrophenol	130%/120%	NA	None, samples are ND

1.9 BLANK SAMPLE ANALYSIS

[Refer to section E 1.5.](#) Method blank samples had no detections, indicating that no contamination from laboratory activities occurred with the following exceptions:

Blank Type	Batch ID	Analyte Detected in Blank	Concentration	Qualifier	Affected Samples
Method Blank	WG1590284	Perfluorotetradecanoic acid (PFTeDA)	0.092 J ng/g	RL U	SB-05 (0-2), SB-05 (18-20), SB-06 (0-2), SB-06 (18-20), SB-09 (0-2), SB-09 (18-20), SB-10 (0-2), SB-10 (18-20)
	WG1590241	Iron	0.696 J mg/kg	NA	None, samples are >10x blank
		Manganese	0.064 J mg/kg		
		Sodium	4.60 J mg/kg	RL U	SB-05 (0-2), SB-05 (18-20), SB-09 (0-2), SB-09 (18-20), SB-10 (18-20)
Method Blank	WG1590241	Sodium	4.60 J mg/kg	RL U	

Blank Type	Batch ID	Analyte Detected in Blank	Concentration	Qualifier	Affected Samples
				NA	Samples >10x blank
		Zinc	0.564 J mg/kg	NA	None, samples are >10x blank
	WG1592632	Iron	3.75 mg/kg	NA	None, samples are >10x blank
		Manganese	0.084 J mg/kg		
		Zinc	0.124 J mg/kg		
	WG1594161	Perfluorotetradecanoic acid (PFTeDA)	0.800 J ng/L	RL U	FIELD BLANK-20220106

The analysis of the blank samples for field quality control was free of target compounds, with the following exceptions:

Blank Type	Date of Blank	Analyte Detected in Blank	Concentration	Qualifier	Affected Samples
Field Blank	1/6/2022	Perfluorotetradecanoic acid (PFTeDA)	0.906 J ng/L	NA	None, samples are ND
Field Blank	1/6/2022	Barium	0.00026 J mg/L	NA	None, samples are >10x blank
Field Blank	1/6/2022	Iron	0.0198 J mg/L	NA	None, samples are >10x blank
Field Blank	1/6/2022	Thallium	0.00026 J mg/L	NA	None, samples are ND
Field Blank	1/14/2022	Perfluorooctanesulfonic acid (PFOS)	3.09 ng/L	J+	DUP-20220114 MW-01-20220114 MW-02-20220114, MW-04-20220114 MW-05-20220114
				RL U	MW-03-20220114
Field Blank	1/14/22	Barium	0.00039 J mg/L	NA	None, samples are >10x blank
Field Blank	1/14/22	Calcium	0.0744 J mg/L	NA	None, samples are >10x blank
Field Blank	1/14/22	Chromium	0.00020 J mg/L	RL U	DUP-20220114, MW-01-20220114, MW-02-20220114, MW-03-20220114, MW-04-20220114
				J+	MW-05-20220114
Field Blank	1/14/22	Sodium	0.360 mg/L	NA	None, samples are >10x blank
Field Blank	1/14/22	Benzoic Acid	7.4 J ug/L	NA	None, samples are ND

1.10 DUPLICATE SAMPLE ANALYSIS

[Refer to section E 1.6.](#) The following sample(s) were used for laboratory duplicate analysis and the RPDs were all below 20 percent (or the absolute difference rule was satisfied if detects were less than 5x the RL) with the following exceptions:

Lab Sample Number	Laboratory Duplicate Sample Client ID	Method(s)	Analyte	% RPD	Qualification
WG1591734-4-DUP	SB-01 (0-2)	SW6010D	Calcium	21%	J
WG1591734-4-DUP	SB-01 (0-2)	SW6010D	Chromium	41%	J
WG1591734-4-DUP	SB-01 (0-2)	SW6010D	Iron	27%	J
WG1591734-4-DUP	SB-01 (0-2)	SW6010D	Lead	102%	J
WG1591734-4-DUP	SB-01 (0-2)	SW6010D	Nickel	24%	J

The following samples were used for field duplicate analysis. RPDs were all below 35 percent for water/air and 100 percent for soil (or the absolute difference rule was satisfied if detects were less than 5x the RL). Any exceptions are noted below and qualified.

Primary Sample ID	Duplicate Sample ID	Method(s)
SB-11 (18-20)	DUP01_20220106	ALPHA23528, SM2540G, SW6010D, SW6010DR, SW7471B, SW8260C, SW8270D
SB-03 (0-2)	DUP02_20220106	ALPHA23528, SM2540G, SW6010D, SW6010DR, SW7471B, SW8260C, SW8270D
MW-04-20220114	DUP-20220114	ALPHA23528, SW6020B, SW7470A, SW8260C, SW8270D, SW8270DSIM

Field Duplicate RPD Calculations:

Method	Analyte	Units	Primary Sample ID	Duplicate Sample ID	% RPD	Qualification
			MW-04-20220114	DUP-20220114		
SW6020B	Lead	mg/L	0.00545	0.00418	NA	J/UJ, Abs. Diff. > RL
Method	Analyte	Units	Primary Sample ID	Duplicate Sample ID	% RPD	Qualification
			SB-11 (18-20)	DUP01_20220106		
SW6010D	Arsenic	mg/kg	10.7	28	NA	J/UJ, Abs. Diff. > RL
SW6010D	Chromium	mg/kg	13.3	35.7	NA	J/UJ, Abs. Diff. > RL
SW6010D	Cobalt	mg/kg	2.38 J	10.8	NA	J/UJ, Abs. Diff. > RL
SW6010D	Copper	mg/kg	15.3	49.4	NA	J/UJ, Abs. Diff. > RL
SW7471B	Mercury	mg/kg	1.06	2.37	NA	J/UJ, Abs. Diff. > RL
SW6010D	Potassium	mg/kg	853	1770	NA	J/UJ, Abs. Diff. > RL
SW6010D	Sodium	mg/kg	2960	1140	NA	J/UJ, Abs. Diff. > RL
SW8260C	Toluene	ug/kg	9	22	NA	J/UJ, Abs. Diff. > RL
SW6010D	Vanadium	mg/kg	14.2	49.3	NA	J/UJ, Abs. Diff. > RL
SW6010D	Aluminum	mg/kg	3890	17600	128	J/UJ, RPD>100
SW6010D	Barium	mg/kg	67.2	201	100	J/UJ, RPD>100
SW6010D	Lead	mg/kg	140	419	100	J/UJ, RPD>100
SW6010D	Manganese	mg/kg	74.2	311	123	J/UJ, RPD>100

SW6010D	Zinc	mg/kg	85.3	257	100	J/UJ, RPD>100
Method	Analyte	Units	Primary Sample ID	Duplicate Sample ID	% RPD	Qualification
			SB-03 (0-2)	DUP02_20220106		
SW8260C	1,2,4,5-Tetramethylbenzene	ug/kg	41	4.3	NA	J/UJ, Abs. Diff. > RL
SW8260C	1,4-Diethylbenzene	ug/kg	8	1.5 J	NA	J/UJ, Abs. Diff. > RL
SW8260C	2-Phenylbutane (sec-Butylbenzene)	ug/kg	25	5.3	NA	J/UJ, Abs. Diff. > RL
SW8270D	Benzo(a)anthracene	ug/kg	730	110 J	NA	J/UJ, Abs. Diff. > RL
SW8270D	Benzo(b)fluoranthene	ug/kg	840	170 J	NA	J/UJ, Abs. Diff. > RL
SW8270D	Chrysene	ug/kg	660	110 J	NA	J/UJ, Abs. Diff. > RL
SW6010D	Cobalt	mg/kg	10.7	5.78	NA	J/UJ, Abs. Diff. > RL
SW8270D	Fluoranthene	ug/kg	1500	140 J	NA	J/UJ, Abs. Diff. > RL
SW8260C	Isopropylbenzene (Cumene)	ug/kg	3	0.84 J	NA	J/UJ, Abs. Diff. > RL
SW8270D	Phenanthrene	ug/kg	870	85 J	NA	J/UJ, Abs. Diff. > RL
SW8270D	Pyrene	ug/kg	1400	160 J	NA	J/UJ, Abs. Diff. > RL
SW8260C	Trichloroethene	ug/kg	2.5	3.4	NA	J/UJ, Abs. Diff. > RL
SW8260C	n-Butylbenzene	ug/kg	5.6	1.1 J	NA	J/UJ, Abs. Diff. > RL
SW8260C	n-Propylbenzene	ug/kg	2.5	0.73 J	NA	J/UJ, Abs. Diff. > RL
SW8260C	tert-Butylbenzene	ug/kg	8.6	1.7 J	NA	J/UJ, Abs. Diff. > RL
SW8270D	bis(2-Ethylhexyl)phthalate	ug/kg	620 U	18000	186%	J/UJ, RPD>100

1.11 PRECISION AND ACCURACY

Refer to section E 1.7. Where required by the method, some measurement of analytical accuracy and precision was reported for each method with the site samples, with the following exceptions:

- No precision was reported for SM2540G.
- No accuracy was reported for TO15.

1.12 CLEAN CANISTER CERTIFICATION

The canisters used for the TO-15 SIM sample collection were certified clean by batch can analysis prior to sampling to ensure that no target analytes were present. These analysis sheets were reviewed, and no target analytes were detected in the laboratory-provided canisters.

1.13 PFAS SAMPLE PREPARATION

Refer to section E 1.14. The laboratory's SOP was reviewed and the reviewer confirmed it is the laboratory's procedure to use solid phase extraction (SPE) was used for sample preparation. No data qualification required.

Analysis of Per- and Polyfluoroalkyl Substances (PFAS) requires specific sample preparation. Solid samples must be homogenized thoroughly prior to subsampling. The laboratory's SOP was reviewed and the reviewer confirmed it is the laboratory's procedure to homogenize samples. No data qualification required.

1.14 PFAS IDENTIFICATION

Refer to section E 1.15. Ion ratios were reviewed and were within the laboratory specified limits with the following exceptions:

Lab Sample ID	Analyte	Qualifier	Affected Samples
L2171041-01	Perfluorooctanoic acid (PFOA)	J	SB-05 (0-2)
L2171041-02	Perfluorohexanoic acid (PFHxA)	J	SB-05 (18-20)
L2171041-06	Perfluorohexanoic acid (PFHxA)	J	SB-09 (18-20)
L2171041-07	Perfluorotetradecanoic acid (PFTeDA)*	UJ	SB-10 (0-2)
L2200873-11	Perfluorodecanesulfonic acid (PFDS)	J	SB-08 (0-2)
	Perfluorohexanesulfonic acid (PFHxS)		
L2202387-01	Perfluorooctanesulfonic acid (PFOS)	J	MW-01-20220114
L2202387-02	Perfluorohexanesulfonic acid (PFHxS)	J	MW-04-20220114
	Perfluorononanoic acid (PFNA)		
L2202387-03	Perfluorooctanesulfonic acid (PFOS)	J	DUP-20220114
L2202387-04	Perfluorohexanesulfonic acid (PFHxS)	J	MW-05-20220114
	Perfluorobutanesulfonic acid (PFBS)		
	Perfluorononanoic acid (PFNA)		
L2202387-06	Perfluorooctanesulfonic acid (PFOS)**	UJ	MW-03-20220114
L2202387-06	Perfluorohexanesulfonic acid (PFHxS)	J	MW-03-20220114
	Perfluorobutanesulfonic acid (PFBS)		
L2202387-07	Perfluorooctanesulfonic acid (PFOS)	J	FB-20220114

* **Qualified non-detect (ND) based on method blank contamination.**

** **Qualified non-detect (ND) based on field blank contamination**

Signal to noise ratios were reviewed and were ≥ 3 for all ions used for quantitation.

A portion of sample chromatographs were reviewed, and the reviewer confirmed that, when applicable, the laboratory summed the branched and linear peaks.

1.15 EXTRACTION INTERNAL STANDARDS

Refer to section E 1.16. Recoveries were reviewed and found to be within the limits of 50 to 150 percent of the ICAL midpoint standard/ initial CCV, with the following exceptions:

Sample ID	Lab ID or Batch ID	Standard Name	%Recovery	Qualifier	Affected Samples
SB-05 (0-2")	L2171041-01	d3-NMeFOSAA	25%	J/UJ MeFOSAA	SB-05 (0-2")
		d5-NEtFOSAA	38%	J/UJ NEtFOSAA	
SB-05 (18-20')	L2171041-02	13C8-M8FOSA	47%	J/UJ PFOSA	SB-05 (19-20')

Sample ID	Lab ID or Batch ID	Standard Name	%Recovery	Qualifier	Affected Samples
		13C4-MPFBA	20%	J/UJ PFBA	
		13C4- M4PFHpA	34%	J/UJ PFHpA	
		13C5-M5PFHxA	26%	J/UJ PFHxA	
		13C5-M5PFPeA	21%	J/UJ PFPeA	
		13C8-M8PFOA	43%	J/UJ PFOA	
		d3-NMeFOSAA	41%	J/UJ MeFOSAA	
		d5-NEtFOSAA	48%	J/UJ NEtFOSAA	
SB-06 (18-20)	L2171041-04	13C8-M8FOSA	15%	J/UJ PFOSA	SB-06 (18-20)
SB-09 (0-2)	L2171041-05	13C8-M8FOSA	38%	J/UJ PFOSA	SB-09 (0-2)
SB-09 (18-20)	L2171041-06	13C8-M8FOSA	44%	J/UJ PFOSA	SB-09 (18-20)
SB-01 (18-20)	L2200873-02	d3-NMeFOSAA	49%	J/UJ MeFOSAA	SB-01 (18-20)
		d5-NEtFOSAA	45%	J/UJ NEtFOSAA	
SB-07 (18-20)	L2200873-10	13C8- M8FOSA	11%	J/UJ PFOSA	SB-07 (18-20)
SB-08 (0-2)	L2200873-11	13C2-M2-6:2 FTS	158%	J/UJ 6:2 FTS	SB-08 (0-2)
		13C2-M2-8:2 FTS	164%	J/UJ 8:2 FTS	
		13C7- M7-PFUDA	48%	J/UJ PFUnDA	
		13C8- M8FOSA	27%	J/UJ PFOSA	
		d3-NMeFOSAA	43%	J/UJ MeFOSAA	
SB-08 (18-20)	L2200873-12	13C4-M4PFHpA	39%	J/UJ PFHpA	SB-08 (18-20)
		13C5- M5PFHxA	37%	J/UJ PFHxA	
		d3-NMeFOSAA	33%	J/UJ MeFOSAA	
		d5-NEtFOSAA	33%	J/UJ NEtFOSAA	
		13C4- MPFBA	36%	J/UJ PFBA	
		13C5- M5PFPeA	40%	J/UJ PFPeA	
SB-11 (18-20)	L2200873-14	13C2-M2-6:2 FTS	176%	J/UJ 6:2 FTS	SB-11 (18-20)
		13C2-M2-8:2 FTS	168%	J/UJ 8:2 FTS	
SB-12 (18-20)	L2200873-16	13C2- M2PFTEDA	49%	J/UJ PFTeDA	SB-12 (18-20)
		d3-NMeFOSAA	38%	J/UJ MeFOSAA	
		d5-NEtFOSAA	33%	J/UJ NEtFOSAA	
		13C4- MPFBA	49%	J/UJ PFBA	
MW-01-20220114	L2202387-01	13C2-M2-6:2 FTS	283%	J/UJ 6:2 FTS	MW-01-20220114
		13C2-M2-8:2 FTS	160%	J/UJ 8:2 FTS	
		13C8- M8FOSA	28%	J/UJ PFOSA	
MW-04-20220114	L2202387-02	13C2-M2-6:2 FTS	316%	J/UJ 6:2 FTS	MW-04-20220114
		13C2-M2-8:2 FTS	188%	J/UJ 8:2 FTS	

Sample ID	Lab ID or Batch ID	Standard Name	%Recovery	Qualifier	Affected Samples
		13C2- MPFDOA	49%	J/UJ PFDODA, PFTrDA	
		13C8- M8FOSA	23%	J/UJ PFOSA	
DUP-20220114	L2202387-03	13C2-6:2 FTS	339%	J/UJ 6:2 FTS	DUP-20220114
		13C2-M2-8:2 FTS	179%	J/UJ 8:2 FTS	
		13C2-MPFDOA	47%	J/UJ PFDODA, PFTrDA	
		13C2-M2PFTEDA	45%	J/UJ PFTeDA	
		13C8-M8FOSA	20%	J/UJ PFOSA	
MW-05-20220114	L2202387-04	13C2-M2-6:2 FTS	347%	J/UJ 6:2 FTS	MW-05-20220114
		13C2-M2-8:2 FTS	269%	J/UJ 8:2 FTS	
		13C8- M8FOSA	30%	J/UJ PFOSA	
MW-02-20220114	L2202387-05	13C2-M2-6:2 FTS	313%	J/UJ 6:2 FTS	MW-02-20220114
		13C2-M2-8:2 FTS	198%	J/UJ 8:2 FTS	
		13C2- M2PFTEDA	49%	J/UJ PFTeDA	
		13C8- M8FOSA	20%	J/UJ PFOSA	
MW-03-20220114	L2202387-06	13C2-M2-6:2 FTS	387%	J/UJ 6:2 FTS	MW-03-20220114
		13C2-M2-8:2 FTS	233%	J/UJ 8:2 FTS	
		13C8- M8FOSA	34%	J/UJ PFOSA	
FB-20220114	L2202387-07	13C8- M8FOSA	35%	J/UJ PFOSA	FB-20220114

1.16 GAS CHROMATOGRAPH/MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECKS

Refer to section E 1.17. Ion abundance criteria were within the specified limits.

1.17 CALIBRATION BLANKS

Refer to section E 1.18. Calibration blanks had no detections with the following exceptions:

Blank Type	Date of Blank	Time	Analyte Detected in Blank	Concentration (mg/L)	Qualifier	Affected Samples
ICB	1/4/22	13:18	Antimony	0.00690 J	RL U	SB-06 (0-2), SB-06 (18-20), SB-10 (0-2)
CCB	1/4/22	14:14	Antimony	0.00580 J	NA	None, samples either ND or >10x CBB concentration
			Calcium	0.0433 J		
			Iron	0.0130 J		
			Magnesium	0.0267 J		
CCB	1/4/22	15:34	Antimony	0.00550 J	RL U	SB-06 (0-2), SB-06 (18-20), SB-10 (0-2)
CCB	1/4/22	17:25	Antimony	0.00620 J	NA	None, samples either ND or >10x CBB concentration
			Iron	0.0109 J		
ICB	1/11/22	7:28	Antimony	0.0110 J	RL U	DUP01_20220106, DUP02_20220106,

Blank Type	Date of Blank	Time	Analyte Detected in Blank	Concentration (mg/L)	Qualifier	Affected Samples
						SB-01 (0-2), SB-02 (0-2), SB-02 (18-20), SB-03 (0-2), SB-04 (0-2), SB-07 (0-2), SB-08 (0-2), SB-08 (18-20) SB-11 (0-2), SB-11 (18-20) SB-12 (0-2)
CCB	1/11/22	9:11	Antimony	0.0127 J	RL U	SB-02 (0-2)
CCB	1/11/22	10:34	Antimony	0.0102 J	RL U	SB-02 (18-20), SB-03 (0-2)
CCB	1/11/22	11:29	Antimony	0.0143 J	NA	None, samples ND
CCB	1/11/22	12:30	Antimony	0.0133 J	RL U	SB-01 (0-2), SB-04 (0-2) SB-07 (0-2), SB-08 (0-2)
			Sodium	0.424 J	RL U	SB-01 (0-2)
					J+	SB-04 (0-2), SB-07 (0-2), SB-08 (0-2)
CCB	1/11/22	13:25	Antimony	0.0148 J	RL U	DUP01_20220106, DUP02_20220106, SB-08 (18-20), SB-11 (0-2), SB-11 (18-20), SB-12 (0-2)
			Sodium	0.166 J	NA	None, samples >10x CBB concentration
ICB	1/12/22	13:02	Iron	22.7 J	RL U	FIELD BLANK-20220106
CCB	1/13/22	1:42	Iron	43.1 J	RL U	FIELD BLANK-20220106
ICB	1/18/22	9:17	Iron	23.8 J	J+	DUP-20220114 MW-01-20220114 MW-02-20220114 MW-03-20220114 MW-04-20220114 MW-05-20220114
			Thallium	0.407 J	RL U	MW-01-20220114 MW-05-20220114
CCB	1/18/22	9:41	Iron	31.0 J	J+	MW-01-20220114
			Thallium	0.260 J	RL U	MW-01-20220114
CCB	1/18/22	10:43	Iron	26.4 J	J+	DUP-20220114 MW-03-20220114 MW-04-20220114
			Thallium	0.297 J	NA	None, samples are ND
CCB	1/18/22	11:42	Iron	32.3 J	J+	MW-02-20220114 MW-05-20220114
			Thallium	0.269 J	RL U	MW-05-20220114

1.18 INTERFERENCE CHECK SAMPLES AND INDUCTIVELY COUPLED PLASMA/MASS SPECTROMETRY TUNE

[Refer to section E 1.19.](#) Percent recoveries were within the specified limits.

The tune check was reviewed, and the resolution of the mass calibration was within 0.1 unified atomic mass unit (u) and the Percent Relative Standard Deviation (%RSD) less than 5 percent.

1.19 INITIAL CALIBRATION

Refer to section E 1.20. Proper concentrations for standards were used for the instruments and Relative Response Factors (RRF) and Percent Relative Standard Deviation (%RSD) were within the specified limits with the following exceptions:

Instrument	Ical Ref #	Analyte	%D/RRF	Action
VOA105	ICAL18369	Acrolein	RRF < 0.05	No action. Analytes not reported.
		Tert-Butyl alcohol		
		Tetrahydrofuran		
		1,4 Dioxane	RRF < 0.2	"J+" Detects, "UJ" Non-detects
		Trichloroethene		"J+" Detects, "UJ" Non-detects
		1,1,2-Trichloroethane		
VOA123	ICAL18401	Acrolein	RRF < 0.05	No action. Analytes not reported.
		Tert-Butyl alcohol		
		1,4 Dioxane		
		Bromodichloromethane	RRF < 0.3	"J+" Detects, "UJ" Non-detects
AIRLAB15	ICAL18600	2-methylnaphthalene	RSD = 34.72%	No action. Analytes not reported

initial calibration curves were reviewed for all reported parameters and were found to be within limits.

For PFAS analysis, a selection of initial calibration curves was reviewed. The minimum number of standards was used for initial calibration. The %RSD for quadratic fit calibrations were within the specified limits, the R² values for linear fit calibrations were within specific limits, and standard recoveries were within the specified limits, with the following exceptions:

Calibration Date	Ical Ref	Standard	Concentration	%R, %RSD, or R2	Qualifier	Affected Samples
12/27/21	18603	NFDHA	0.4	44.2% R	NA	Analyte not analyzed
12/27/21	18603	br-NMeFOSAA	0.5	23.8%	J/UJ MeFOSAA	SB-05 (0-2) SB-05 (18-20) SB-06 (0-2) SB-06 (18-20) SB-09 (0-2) SB-09 (18-20)
12/27/21	18603	br-NMeFOSAA	0.5	23.8%	J/UJ MeFOSAA	SB-10 (0-2) SB-10 (18-20) FIELD BLANK-20220106

1.20 INITIAL AND CONTINUING CALIBRATION VERIFICATION

Refer to section E 1.21. RRFs and the Percent Difference (%D) were reported for SW8260C, SW8270D, SW8270DSIM, and TO15 and were within the specified limits with the following exceptions:

Type	Instrument	Date	Time	Analyte	%D/RRF	Action
ICV	VOA105	10/8/21	12:59	Carbon Disulfide	24.6%	Qualify data J/UJ.
				1,4-Dioxane	-23.5%/ RRF < Min RRF	

Type	Instrument	Date	Time	Analyte	%D/RRF	Action
				Acetone	RFF < Min RRF	
				2- Butanone	RFF < Min RRF	
				Vinyl acetate	25.7%	
				4-Methyl-2-pentanone	RFF < Min RRF	
				Acrolein	23.1%/ RFF < Min RRF	No action. Analyte not reported.
				Tert-butyl alcohol	RFF < Min RRF	
				Methyl Acetate	RFF < Min RRF	
				Tetrahydrofuran	RFF < Min RRF	
				Methyl cyclohexane	21.2%	
CCV	VOA105	12/30/21	7:11	Chloromethane	-22.9%	Qualify data J/UJ.
				Vinyl Chloride	-31.5%	
				Chloroethane	-30.3%	
				Bromodichloromethane	RFF < Min RRF	
				1,4-Dioxane	32.9%/ RFF < Min RRF	
				1,1,2-Trichloroethane	RFF < Min RRF	
				Bromoform	21.6%	
				1,2-Dibromo-3-chloropropane	27.9%	
				Naphthalene	25%	
				1,4-Dichlorobutane	-20.7%	No action. Analyte not reported.
				Tert-butyl alcohol	35%/ RFF < Min RRF	
				Cyclohexane	-38.4%	
ICV	VOA123	10/21/21	2:41	Carbon Disulfide	33.0%	Qualify data J/UJ.
				2-Butanone	RFF < Min RRF	
				1,4-Dioxane	RFF < Min RRF	
				4-Methyl-2-pentanone	RFF < Min RRF	
				Acrolein	22.7%/ RFF < Min RRF	No action. Analyte not reported.
				Tert-butyl alcohol	RFF < Min RRF	
CCV	VOA123	12/28/21	18:07	Vinyl Chloride	23.3%	Qualify data J/UJ
				Bromomethane	40.3%	
CCV	VOA123	12/28/21	18:07	Chloroethane	43.6%	Qualify data J/UJ
				Trichlorofluoromethane	34.7%	
				1,2-Dichloroethane	21.7%	
				Dibromomethane	21%	
				2-Chloroethyl vinyl ether	20.5%	
				1,4-Dioxane	RFF < Min RRF	
				4-methyl-2-pentanone	20.2%	
				1,1,2-Trichloroethane	RFF < Min RRF	
CCV	VOA123	12/28/21	18:07	Styrene	21.2%	Qualify data J/UJ
CCV	VOA123	12/29/21	5:42	Bromomethane	36%	Qualify data J/UJ
				Chloroethane	36.2%	
				Trichlorofluoromethane	31.1%	
				1,4-Dioxane	RFF < Min RRF	
				2-Chlorotoluene	-22.3%	
CCV	VOA123	12/30/21	6:41	Dichlorodifluoromethane	21.7%	Qualify data J/UJ
				Vinyl Chloride	22.9%	

Type	Instrument	Date	Time	Analyte	%D/RRF	Action
				Bromomethane	38.4%	
				Chloroethane	41.3%	
				Trichlorofluoromethane	32%	
				1,4-Dioxane	RRF < Min RRF	
				1,1,2-Trichloroethane	RRF < Min RRF	
CCV	GCMS5	1/1/22	8:33	2-Nitrophenol	-31.5%	Qualify data J/UJ
				2-Nitroaniline	-23.6%	
				2,6-Dinitrotoluene	-21.1%	
				2,4-Dinitrotoluene	-20.5%	
				2,4,6-Tribromophenol	-30.5%	
				1,4-Dinitrobenzene	-32.3%	No action. Analyte not reported.
				1,3-Dinitrobenzene	-27.5%	
CCV	GCMS5	1/1/22	8:58	Dichloran	-31%	No action. Analyte not reported.
				Pentachloronitrobenzene	-24.9%	
CCV	GCMS5	1/1/22	9:22	Parathion	-23.7%	No action. Analyte not reported.
CCV	BUFFY	1/2/22	7:05	Benzoic Acid	-23.1%	Qualify data J/UJ
				4-chloro-3-methylphenol	-22.4%	
				Din-n-butylphthalate	-29%	
				Butyl benzylphthalate	-23.7%	
				Bis(2-ethylhexyl)phthalate	-35%	
				Din-n-octylphthalate	-33.2%	
				Azobenzene	-31.6%	No action. Analyte not reported.
CCV	BUFFY	1/2/22	7:27	3-Chloroaniline	-20.4%	No action. Analyte not reported.
CCV	BUFFY	1/2/22	7:49	Parathion	-35.7%	No action. Analyte not reported.
CCV	SV103	1/3/22	7:12	Benzyl alcohol	-29.2%	Qualify data J/UJ
				n-nitrosodi-n-propylamine	-26.4%	
				4-Chloroaniline	-24.4%	
				4-Nitrophenol	-46.2%	
CCV	SV103	1/3/22	7:12	Bis(2-chloroisopropyl)ether	-38.9	No action. Analyte not reported
CCV	SV103	1/3/22	7:35	a-Terpineol	-23.8%	No action. Analyte not reported
				3-Chloroaniline	-25.9%	
				Caprolactam	-22.2%	
CCV	SV103	1/3/22	7:59	n-Decane	-28.5%	No action. Analyte not reported
				n-Octadecane	-45.9%	
				Paration	-35.7%	
CCV	BUFFY	1/4/22	8:13	1,3-Dinitrobenzene	22.9%	No action. Analyte not reported
				1,2-Dinitrobenzene	31.3%	
CCV	BUFFY	1/4/22	8:35	Caprolactam	26.1%	No action. Analyte not reported
ICV	AIRLAB15	12/22/21	14:28	Tert-butyl alcohol	-31.3%	Qualify data J/UJ
CCV	VOA105	1/7/22	7:30	Chloromethane	-30.3%	Qualify data J/UJ
				Vinyl Chloride	-32.2%	
				Chloroethane	-34.5%	
				1,1-Dichloroethane	-24.3%	
				1,4-Dioxane	27.1%/	

Type	Instrument	Date	Time	Analyte	%D/RRF	Action
					RRF < Min RRF	
				Bromoform	24.4%	
				1,2-Dibromo-3-chloropropane	30.9%	
				Naphthalene	26%	
				Tert-butyl alcohol	33%/ RRF < Min RRF	No action. Analyte not reported
				Cyclohexane	-49%	
				Tert-Amyl methyl ether	29.6%	
				1,4-Dichlorobutane	-24.1%	
				Freon 113	-20.5%	
CCV	VOA123	1/8/22	10:36	Bromomethane	38.4%	Qualify data J/UJ
				Chloroethane	42.2%	
				Trichlorofluoromethane	25.8%	
				1,4 Dioxane	RRF < Min RRF	
				Isopropylbenzene	-21%	
				2-Chlorotoluene	-35.8%	
				Hexachlorobutadiene	-27%	
CCV	VOA123	1/10/22	7:03	Dichlorodifluoromethane	21.7%	Qualify data J/UJ
				Vinyl Chloride	24%	
				Bromomethane	39.5%	
				Chloroethane	42.7%	
				Trichlorofluoromethane	36%	
				1,4-Dioxane	RRF < Min RRF	
				2-Chlorotoluene	-21.3%	
CCV	SV103	1/9/22	20:06	Hexachlorocyclopentadiene	25.3%	Qualify data J/UJ
				Pyridine	22.7%	No action. Analyte not reported
				n-Nitrosodimethylamine	22.9%	
				Bis(2-chloroisopropyl)ether	27.9%	
CCV	SV103	1/9/22	20:29	a-Terpineol	29.8%	No action. Analyte not reported
				Caprolactam	36.6%	
				Dichloran	22.1%	
CCV	SV103	1/9/22	20:53	1,4-Dioxane	26.8%	Qualify data J/UJ
				n-Decane	33%	No action. Analyte not reported
				n-Octadecane	25.7%	
CCV	VOA105	1/17/22	6:57	Chloromethane	-28.9%	Qualify data J/UJ
				Vinyl Chloride	-31.1%	
				Chloroethane	-26.7%	
				Trichlorofluoromethane	-23.2%	
CCV	VOA105	1/17/22	6:57	1,4-Dioxane	RRF < Min RRF	Qualify data J/UJ
				Trans-1,3-Dichloropropene	23.2%/ RRF < Min RRF	
				Trans-1,4-Dichloro-2-butene	20.7%	
				1,2-dibromo-3-chloropropane	26.5%	
				Naphthalene	20.2%	
				Tert-butyl alcohol	24.2%/ RRF < Min RRF	No action. Analyte not reported
				Cyclohexane	-33.6%	
				Tert-Amyl methyl ether	25.3%	
				Ethyl methacrylate	21.2%	

Type	Instrument	Date	Time	Analyte	%D/RRF	Action
CCV	DAKOTA	1/16/22	8:39	2-Fluorophenol	-21.7%	No action. Analyte is a surrogate
CCV	DAKOTA	1/16/22	9:05	2-Chloroaniline	-20.6%	No action. Analyte not reported
				Diphenamid	-24%	
CCV	DAKOTA	1/16/22	9:31	N-Octadecane	-24%	No action. Analyte not reported
CCV	SV106	1/19/22	23:51	2-Nitrophenol	-27.6%	Qualify data J/UJ
				Benzoic Acid	-24.6%	
				2,4-Dinitrophenol	-43.4%	
				4,6-Dinitro-2-methylphenol	-28.9%	
CCV	SV106	1/20/22	00:38	n-Octadecane	-21.3%	No action. Analyte not reported
				Parathion	-29.4%	
				3,3'-Dimethylbenzidine	24.2%	
CCV	SV125	1/16/22	7:35	2,6-Dinitrotoluene	-21%	No action. Analyte not reported
				Bis(2-ethylhexyl)phthalate	-20.2%	

Percent Recovery (%R) for SW6010D, SW7471B, SW6020B, SW7470A, SW7470AR, SW6010DR were reviewed and were found to be within limits.

Percent Recovery (%R) were reviewed for PFAS analysis and were found to be within limits with the following exceptions:

Type	Instrument	Date	Time	Analyte	%R	Action
ICV	LCMS02	12/28/21	10:27	L-NMeFOSAA	137.1%	J/UJ MeFOSAA
CCV	LCMS02	1/4/22	23:39	br-NMeFOSAA	37%	"None ND" MeFOSAA
				L-NMeFOSAA	66%	
				br-NEtFOSAA	63.3%	"None ND" NEtFOSAA
				PFTA	136.1%	"None ND" PFTeDA*
				PFHxDA	167.3%	NA analyte not analyzed
				10:2 FTS	50%	NA, analyte not analyzed
CCV	LCMS02	1/14/22	22:49	PFODA	135.8%	NA, analyte not analyzed
CCV	LCMS01	1/16/22	13:43	PFNA	66.9%	"None ND" PFNA
				PFDA	59.6%	"None ND" PFDA
				PFNS	68.8%	NA, analyte not analyzed
				br-NMeFOSAA	64%	"None ND" MeFOSSA
				br-NEtFOSAA	48.6%	"None ND" NEtFOSSA
				L-NEtFOSAA	69.9%	"None ND" NEtFOSSA
CCV	LCMS01	1/19/22	21:14	PFODA	47.25	NA, analyte not analyzed
				L-NEtFOSAA	69%	"None ND" NEtFOSAA
				PFTA	65.2%	"None ND" PFTA

* Qualified non-detect (ND) based on method blank contamination

1.21 INTERNAL STANDARDS

[Refer to section E 1.22.](#) Area response and retention time [organics] or percent relative intensity [inorganics 60 to 125 percent] were reviewed and found to be within the specified limits with the following exceptions:

Sample ID	Date	Time	Internal Standard	Response	Qualifier
SB-06 (18-20)	12/28/21	18:07	1,4-Dichlorobenzene-D4	55344	J+/UJ Target Compounds*
SB-09 (18-20)	12/28/21	18:07	1,4-Dichlorobenzene-D4	50551	J+/UJ Target Compounds
SB-06 (18-20) RE	12/29/21	5:42	1,4-Dichlorobenzene-D4	48172	J+/UJ Target Compounds
SB-09 (18-20) RE	12/29/21	5:42	Chlorobenzene-d5	95939	J+/UJ Target Compounds**
			1,4-Dichlorobenzene-D4	46277	J+/UJ Target Compounds

*Analytes targeted for 1,4-Dichlorobenzene-D4: Isopropylbenzene, Bromoform, 1,1,2,2-tetrachloroethane, 1,2,3-trichloropropane, trans-1,4-dichloro-2-butene, n-Propylbenzene, Bromobenzene, 4-ethyltoluene, 1,3,5-trimethylbenzene, 2-chlorotoluene, 4-chlorotoluene, tert-butylbenzene, 1,2,4-trimethylbenzene, 2-Phenylbutane (sec-Butylbenzene), Cymene (p-Isopropyltoluene), 1,3-dichlorobenzene, 1,4-dichlorobenzene, n-butylbenzene, 1,4-Diethylbenzene, 1,2-dichlorobenzene, 1,2,4,5-tetramethylbenzene, 1,2-dibromo-3-chloropropane, 1,2,4-trichlorobenzene, Hexachlorobutadiene, Naphthalene, 1,2,3-trichlorobenzene

**Analytes targeted for Chlorobenzene-d5: Toluene, trans-1,3-dichloropropene, 1,1,2-trichloroethane, 2-Hexanone, 1,3-dichloropropane, Tetrachloroethene, Dibromochloromethane, 1,2-dibromoethane, Chlorobenzene, 1,1,1,2-Tetrachloroethane, Ethylbenzene, p/m xylene, o xylene, Styrene

1.22 TARGET ANALYTE IDENTIFICATION

A review of a portion of the sample chromatographs and retention times for organic compounds indicated no problems with target compound identification.

1.23 SERIAL DILUTIONS

[Refer to section E 1.23](#). The %Ds for the serial dilution performed on samples L2200873-01 and L2202387-01 were within the limits required by the EPA with the following exceptions:

Sample ID	Metal	Sample Result (mg/kg)	Dilution Result (mg/kg)	Sample MDL (mg/kg)	50x MDL (mg/kg)	%D	Qualifier	Affected Samples/Explanation
SB-01 (0-2)	Aluminum	4650 mg/kg	6300 mg/kg	2.73 mg/kg	136.5 mg/kg	35%	J/None	SB-01 (0-2)
	Barium	123 mg/kg	165 mg/kg	0.176 mg/kg	8.8 mg/kg	34%	J/None	
	Calcium	20400 mg/kg	27600 mg/kg	3.54 mg/kg	177 mg/kg	35%	J/None	
	Chromium	30.0 mg/kg	40.1 mg/kg	0.097 mg/kg	4.85 mg/kg	34%	J/None	
	Copper	129 mg/kg	165 mg/kg	0.261 mg/kg	13.05 mg/kg	28%	J/None	
	Iron	13100 mg/kg	18200 mg/kg	0.914 mg/kg	45.7 mg/kg	39%	J/None	
	Lead	1240 mg/kg	1520 mg/kg	0.271 mg/kg	13.55 mg/kg	23%	J/None	
	Magnesium	1590 mg/kg	2170 mg/kg	1.56 mg/kg	78 mg/kg	36%	J/None	
	Manganese	212 mg/kg	294 mg/kg	0.161 mg/kg	8.05 mg/kg	39%	J/None	
	Vanadium	28.4 mg/kg	37.4 mg/kg	0.205 mg/kg	10.25 mg/kg	32%	J/None	

Sample ID	Metal	Sample Result (mg/kg)	Dilution Result (mg/kg)	Sample MDL (mg/kg)	50x MDL (mg/kg)	%D	Qualifier	Affected Samples/Explanation
	Zinc	178 mg/kg	220 mg/kg	0.296 mg/kg	14.8 mg/kg	24%	J/None	
MW-01-20220114	Sodium	77.3 mg/L	93.3 mg/L	0.0293 mg/L	1.465 mg/L	21%	J/None	All Groundwater Samples

1.24 SAMPLE RESULT VERIFICATION

A portion of the sample result(s) were tracked through the relevant sample preparation steps, raw data outputs, transcriptions, conversions and/or calculations and have been confirmed to be accurate and representative of the site.

1.25 SYSTEM PERFORMANCE AND OVERALL ASSESSMENT

The results presented in this report were found to comply with the data quality objectives for the project and the guidelines specified by the analytical method. Based on the review of this report, the data are useable and acceptable except for rejected data noted in Table 1. A summary of qualifiers applied to this SDG are shown in Table 1.

Explanations

The following explanations include more detailed information regarding each of the sections in the DUSR above. Not all sections in the Explanations are represented:

- E 1.1 Reporting Basis (Wet/Dry)
 - Soil samples can be reported on either a wet (as received) or dry weight basis. Dry weight data indicate calculations were made to compensate for the moisture content of the soil sample.
 - Percent (%) solids should be appropriately considered when evaluating analytical results for non-aqueous samples. Sediments with high moisture content may or may not be successfully analyzed by routine analytical methods. Samples should have $\geq 30\%$ solids to be appropriately quantified.
- E 1.2 Surrogate Recovery Compliance
 - Surrogates, also known as system monitoring compounds, are compounds added to each sample prior to sample preparation to determine the efficiency of the extraction procedure by evaluating the percent recovery (%R) of the compounds.
- E 1.3 Laboratory Control Samples
 - The laboratory control sample/laboratory control sample duplicate (LCS/LCSD) analyses are used to assess the precision and accuracy of the analytical method independent of matrix interferences.
- E 1.4 Matrix Spike Samples
 - Matrix spike/matrix spike duplicate (MS/MSD) data are used to assess the precision and accuracy of the analytical method and evaluate the effects of the sample matrix on the sample preparation procedures and measurement methodologies.
 - For inorganic methods, when a matrix spike recovery falls outside of the control limits and the sample result is less than four times the spike added, a post digestion spike (PDS) is performed.
- E 1.5 Blank Sample Analysis
 - Method blanks are prepared by the analytical laboratory and analyzed concurrently with the project samples to assess possible laboratory contamination.
 - Field blanks are prepared to identify contamination that may have been introduced during field activity. Equipment blanks are prepared to identify contamination that may have been introduced while decontaminating sampling equipment. Trip blanks are prepared when volatile analysis is requested to identify contamination that may have been introduced during transport.
- E 1.6 Laboratory and Field Duplicate Sample Analysis
 - The laboratory duplicate sample analysis is used by the laboratory at the time of the analysis to demonstrate acceptable method precision. The RPD or absolute difference was evaluated for each duplicate sample pair to monitor the reproducibility of the data.
 - The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. The RPD or absolute difference was evaluated for each duplicate sample pair to monitor the reproducibility of the data.
- E 1.7 Precision and Accuracy

- Precision measures the reproducibility of repetitive measurements. In a laboratory environment, this will be measured by determining the relative percent difference (%RPD) found between a primary and a duplicate sample. This can be an LCS/LCSD pair, a MS/MSD pair, a laboratory duplicate performed on a site sample, or a field duplicate collected and analyzed concurrently with a site sample.
 - Accuracy is a statistical measurement of the correctness of a measured value and includes components of random error (variability caused by imprecision) and systematic error. In a laboratory environment, this will be measured by determining the percent recovery (%Rec) of certain spiked compounds. This can be assessed using LCS, BS, MS, and/or surrogate recoveries.
- E 1.14 PFAS Sample Preparation
 - Analysis of PFAS requires specific sample preparation. Aqueous samples must be prepared using Solid Phase Extraction (SPE), unless samples are known to contain high PFAS concentrations or the samples are injected directly into the LC/MS/MS instrument. Samples with > 1% solids may require centrifugation prior to SPE. The entire sample plus bottle rinsate must be extracted using SPE. If high PFAS concentrations are known, the samples may alternately be prepared using serial dilution performed in duplicate. If prepared by serial dilution, there must be documented project approval for this deviation.
- E 1.15 PFAS Identification
 - Identification of PFAS requires dual confirmation. The chemical derivation of the ion transitions must be documented. A minimum of two ion transitions per analyte are required (except for PFBA and PFPeA). Ratios of the quantitation ion to the confirmation ion should be calculated for samples and be within 50-150% of the ratios of the quantitation ion to the confirmation ion for standards.
 - Identification of PFAS also requires the proper assessment of branched and linear peaks. Standards for both isomers are not currently available for every PFAS compound, resulting in the common error of quantifying the area of only the branched or the linear isomers, which results in erroneous concentrations.
- E 1.16 Extraction Internal Standards
 - Analysis of PFAS by isotope dilution includes the use of extracted internal standards, which are stable isotope analogs of the PFAS compounds of interest added to each sample prior to extraction of the sample matrix. Matrix interferences that affect the quantification of the internal standard will affect the calculated target compound concentrations.
- E 1.17 Gas Chromatograph/Mass Spectrometer Instrument Performance Checks
 - When analyzing organic compounds, the instrument performance check solution known as Bromofluorobenzene for volatiles or Decafluorotriphenylphosphine for semi-volatiles is run every 12 hours to ensure adequate mass resolution, identification, and sensitivity, and to document this level of performance prior to analyzing any sequence of standards or samples.
- E 1.18 Calibration Blanks
 - Calibration blanks help determine the validity of the analytical results by determining the presence and magnitude of contamination resulting from laboratory activities or baseline drift during analysis. Initial Calibration Blanks are analyzed after the standards and prior to the Initial Calibration Verification (ICV) sample. Continuing Calibration

Blanks (CCB) are analyzed immediately after every Continuing Calibration Verification (CCV) sample.

- E 1.19 Interference Check Samples and Inductively Coupled Plasma/Mass Spectrometry Tune
 - Inorganic analysis requires an interference check sample be run to determine the validity of the analytical results based on the instrument's ability to overcome interferences typical of those found in samples. Percent recoveries of the interferents or analytes must be between 80 and 120%.
 - Inorganic analysis performed by a mass spectrometer also requires an Inductively Coupled Plasma/Mass Spectrometry (ICP/MS) tune check that serves as an initial demonstration of instrument stability and precision.
 - The Contract Laboratory Program no longer requires the Contract Required Quantitation Limit Check Standard (CRI) for inorganic analysis, which is run after calibrations, though some laboratories still provide the CRI as well as the required RL standard check.
- E 1.20 Initial Calibration
 - Organic methods require an initial calibration to ensure the instrument is capable of producing acceptable qualitative and quantitative data. Standards of varying concentrations are run to create a calibration curve, which is then used to ensure the validity of compound quantitation.
 - Inorganic methods require an Initial Calibration to ensure the instrument is capable of producing acceptable qualitative and quantitative data. Instruments should be calibrated each time the instrument is set up and after CCV failure. A blank and at least five standards of varying concentrations should be run to create a calibration curve. At least one of these must be at or below the RL but above the method detection limit (MDL).
 - The curve must have a correlation coefficient of ≥ 0.995 and the calculated percent differences (%D) for all non-zero standards must be within $\pm 30\%$ of the true value.
 - For PFAS analysis in compliance with NYSDEC Part 375, the initial calibration should contain a minimum of five standards for linear fit and six standards for quadratic fit. The relative standard deviation (RSD) for a quadratic fit calibration should be less than 20% and the R² value should be greater than 0.990 for a linear fit calibration. The low-level calibration standards should be within 50-150% of the true value and the mid-level calibration standards should be within 70-130% of the true value.
- E 1.21 Initial and Continuing Calibration Verification
 - Organic methods require an additional ICV and CCV to ensure that the instrument continues to meet the sensitivity and linearity criteria to produce acceptable qualitative and quantitative data throughout each analytical sequence. CCVs must be run at the beginning and end of every 12-hour period of operation.
 - Inorganic methods require an ICV and CCV to ensure that the instrument continues to meet the sensitivity and linearity criteria to produce acceptable qualitative and quantitative data throughout each analytical sequence. Initial calibrations must be run each time the instrument is set up and after each CCV failure. ICVs are analyzed immediately after initial calibration to verify ICAL accuracy, and CCVs are analyzed every two hours during an analytical sequence. %R is reported and must be within the specified limits (90 to 110%).
 - For PFAS analysis in compliance with NYSDEC Part 375, the ICV should be at the same concentration as the mid-level standard of the calibration curve. %R for ICV and CCV must be within 70-130%.

- E 1.22 Internal Standards
 - Internal standards are compounds added to each sample by the laboratory prior to volatile [OR] metals sample analysis to ensure that instrument sensitivity and response are stable during each analysis.
 - Internal standards are compounds added to each sample by the laboratory prior to metals sample analysis to ensure that instrument sensitivity and response are stable during each analysis. Yttrium (89) is the only internal standard used for the atomic emission spectrometry metals analysis performed by method USEPA 200.7 [OR] USEPA 6010. The lab uses a single internal standard to make sure they are getting good intake of the sample into the instrument. Corrections are not made to any of the elements' responses based on this standard.
- E 1.23 Serial Dilutions
 - Inorganic analysis requires a serial dilution analysis, which determines whether significant physical or chemical interferences exists because of the sample matrix. If the original sample concentration is greater than 50x the MDL, the %D must be $\leq 10\%$.

Glossary

Not all of the following symbols, acronyms, or qualifiers occur in this document.

- Sample Types:
 - EB Equipment Blank Sample
 - FB Field Blank Sample
 - FD Field Duplicate Sample
 - N Primary Sample
 - TB Trip Blank Sample
- Units:
 - $\mu\text{g}/\text{kg}$ microgram per kilogram
 - $\mu\text{g}/\text{L}$ microgram per liter
 - $\mu\text{g}/\text{m}^3$ microgram per cubic meter
 - mg/kg milligram per kilogram
 - mg/L milligram per liter
 - ppb v/v parts per billion volume/volume
 - pCi/L picocuries per liter
- Matrices:
 - AA Ambient Air
 - GS Soil Gas
 - GW/WG Groundwater
 - QW Water Quality
 - IA Indoor Air
 - SE Sediment
 - SO Soil
 - WQ Water Quality control matrix
- Table Footnotes
 - NA Not applicable
 - ND Non-detect
 - NR Not reported
- Abbreviations
 - %D Percent Difference
 - %R Percent Recovery
 - %RSD Percent Relative Standard Deviation
 - Abs Diff Absolute Difference
 - VOC Volatile Organic Compounds
 - SVOC Semi-Volatile Organic Compounds
 - BPJ Best Professional Judgement
 - CCB Continuing Calibration Blank
 - CCV Continuing Calibration Verification
 - CCVL Continuing Calibration Verification Low
 - COC Chain of Custody
 - CRI Collision Reaction Interface
 - DUSR Data Usability Summary Report
 - EMPC Estimated Maximum Possible Concentration
 - GC Gas Chromatograph

– GPC	Gel Permeation Chromatography
– ICAL	Initial Calibration
– ICB	Initial Calibration Blank
– ICP/MS	Inductively Coupled Plasma/ Mass Spectrometry
– ICV	Initial Calibration Verification
– ICVL	Initial Calibration Verification Low
– IPA	Isopropyl Alcohol
– LCS/LCSD	Laboratory Control Sample/Laboratory Control Sample Duplicate
– MDL	Laboratory Method Detection Limit
– MS/MSD	Matrix Spike/Matrix Spike Duplicate
– ND	Non-Detect
– NFG	National Functional Guidelines
– GC/MS	Gas Chromatography/Mass Spectrometry
– BS	Blank Spike
– TIC	Tentatively Identified Compound
– PCB	Polychlorinated Biphenyl
– PDS	Post Digestion Spike
– PEM	Performance Evaluation Mixture
– PFAS	Per- and Polyfluoroalkyl Substances
– QAPP	Quality Assurance Project Plan
– QC	Quality Control
– Ra-226	Radium-226
– Ra-228	Radium-228
– RL	Laboratory Reporting Limit
– RPD	Relative Percent Difference
– TPU	Total Propagated Uncertainty
– RT	Retention Time
– RRF	Relative Response Factors
– SDG	Sample Delivery Group
– SOP	Laboratory Standard Operating Procedures
– SPE	Solid Phase Extraction
– USEPA	U.S. Environmental Protection Agency

Qualifiers

The qualifiers below are from the USEPA National Functional Guidelines and the data in the DUSR may contain these qualifiers:

- Concentration (C) Qualifiers:
 - U The compound was analyzed for but not detected. The associated value is either the compound quantitation limit if not detected by the analytical instrument or could be the reported or blank concentration if qualified by blank contamination. This can also be displayed as less than the associated compound quantitation limit (<RL or <MDL), or “ND”.
 - B The compound was found in the sample and its associated blank. Its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers:
 - E The compound was quantitated above the calibration range.
 - D The concentration is based on a diluted sample analysis.
- Validation Qualifiers:
 - J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
 - J+ The result is an estimated quantity, but the result may be biased high.
 - J- The result is an estimated quantity, but the result may be biased low.
 - UJ The compound was not detected above the reported sample quantitation limit; however, the reported limit is estimated and may or may not represent the actual limit of quantitation.
 - NJ The analysis indicated the presence of a compound for which there is presumptive evidence to make a tentative identification; the associated numerical value is an estimated concentration only.
 - R The sample results were rejected as unusable; the compound may or may not be present in the sample.
 - S Result is suspect. See DUSR for details.

References

1. United States Environmental Protection Agency, 2014. Analysis of Volatile Organic Compounds in Air Contained in Canisters by Method TO-15, SOP NO. HW-31, Revision 6. June.
2. United States Environmental Protection Agency, 2020a. National Functional Guidelines for Inorganic Superfund Methods Data Review. EPA-542-R-20-006. November.
3. United States Environmental Protection Agency, 2020b. National Functional Guidelines for Organic Superfund Methods Data Review. EPA-540-R-20-005. November.
4. New York State Department of Environmental Conservation (NYSDEC), 2021a. Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances Under NYSDEC's Part 375 Remedial Programs. January.
5. Haley and Aldrich of New York, 2021b. Quality Assurance Project Plan, 65 Eckford Street, Brooklyn, New York. November.

Conlon, Mari

From: Munz, Keila
Sent: Tuesday, March 29, 2022 1:28 PM
To: nyenvdata@dec.ny.gov
Cc: bob.corcoran@dec.ny.gov; Conlon, Mari
Subject: 65 Eckford Street - C224218 - Data Submittal (1/3)
Attachments: 20220329 1315.C224218.NYSDEC_MERGE.zip

Please find attached the data submittal for the 65 Eckford Street - C224218 facility. Submittal includes soil gas sampling data from January 2022. Please note, I have input a code for the new contractor in the data provider tab (COC Mapping Corp – code: COC)

Keila T. Munz
Senior Scientist

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From: Munz, Keila
Sent: Tuesday, March 29, 2022 1:28 PM
To: nyenvdata@dec.ny.gov
Cc: bob.corcoran@dec.ny.gov; Conlon, Mari
Subject: 65 Eckford Street - C224218 - Data Submittal (3/3)
Attachments: 20220329 1318.C224218.NYSDEC_MERGE.zip

Please find attached the data submittal for the 65 Eckford Street - C224218 facility. Submittal includes groundwater sampling data from January 2022. Please note, I have input a code for the new contractor in the data provider tab (COC Mapping Corp – code: COC)

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From: Munz, Keila
Sent: Tuesday, March 29, 2022 1:28 PM
To: nyenvdata@dec.ny.gov
Cc: bob.corcoran@dec.ny.gov; Conlon, Mari
Subject: 65 Eckford Street - C224218 - Data Submittal (2/3)
Attachments: 20220329 1312.C224218.NYSDEC_MERGE.zip

Please find attached the data submittal for the 65 Eckford Street - C224218 facility. Submittal includes soil sampling data from December 2021-January 2022. Please note, I have input a code for the new contractor in the data provider tab (COC Mapping Corp – code: COC)

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APPENDIX D

Construction Health and Safety Plan



HALEY & ALDRICH, INC.

CONSTRUCTION HEALTH AND SAFETY PLAN

FOR

**65 Eckford Street
Project/File No. 0202156-000**



Prepared By: Simmel, Zachary

Date: 02-10-2022

Revised By:

Date:

EMERGENCY INFORMATION

Project Name: Former Carter Spray Finishing Corp.		H&A File No: 0202156-000
Location: 93 Gerry Street, Brooklyn, NY		
Client/Site Contact: Phone Number:	65-73 Eckford Realty LLC Abraham Posner 718.302.3180	
H&A Project Manager: Office Phone Number: Cell Phone Number:	Conlon, Mari Cate 646.277.5688 347.271.1521	
Regional Health & Safety Manager: Office Phone Number: Cell Phone Number:	Ferguson, Brian 617.886.7439 617.908.2761	
Nearest Hospital: Address: (see map on next page) Phone Number:	NYC Health + Hospitals/Gotham Health, Greenpoint 875 Manhattan Avenue Brooklyn, NY 11222 844.692.4692	
Nearest Occ. Health Clinic: Address: (see map on next page) Phone Number:	Northside Medical Care 66 Nassau Avenue Brooklyn, NY 11222 718.383.4600	
Liberty Mutual Claim Policy	WC6-Z11-254100-032	
Other Local Emergency Response Number:	911	
Other Ambulance, Fire, Police, or Environmental Emergency Resources:	911	

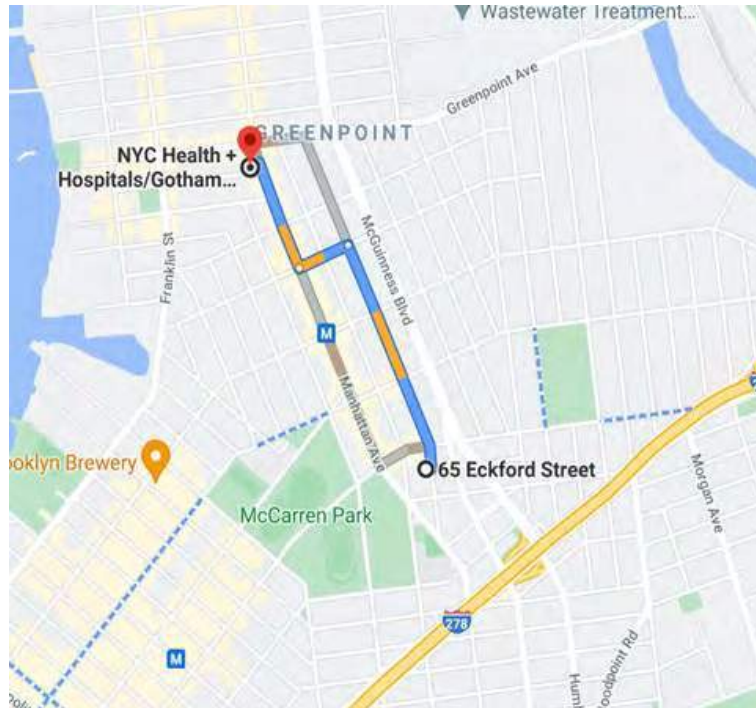
Emergency Hospital

NYC Health + Hospitals/Gotham Health, Greenpoint

875 Manhattan Avenue

Brooklyn, NY 11222

844.692.4692



5 min (0.7 mile)



via Eckford St and Manhattan Ave

Fastest route, lighter traffic than usual

65 Eckford St

Brooklyn, NY 11222

↑ Head north on Eckford St toward Driggs Ave

0.4 mi

↩ Turn left onto Meserole Ave

0.1 mi

↪ Turn right at the 2nd cross street onto Manhattan Ave

i Destination will be on the left

0.2 mi

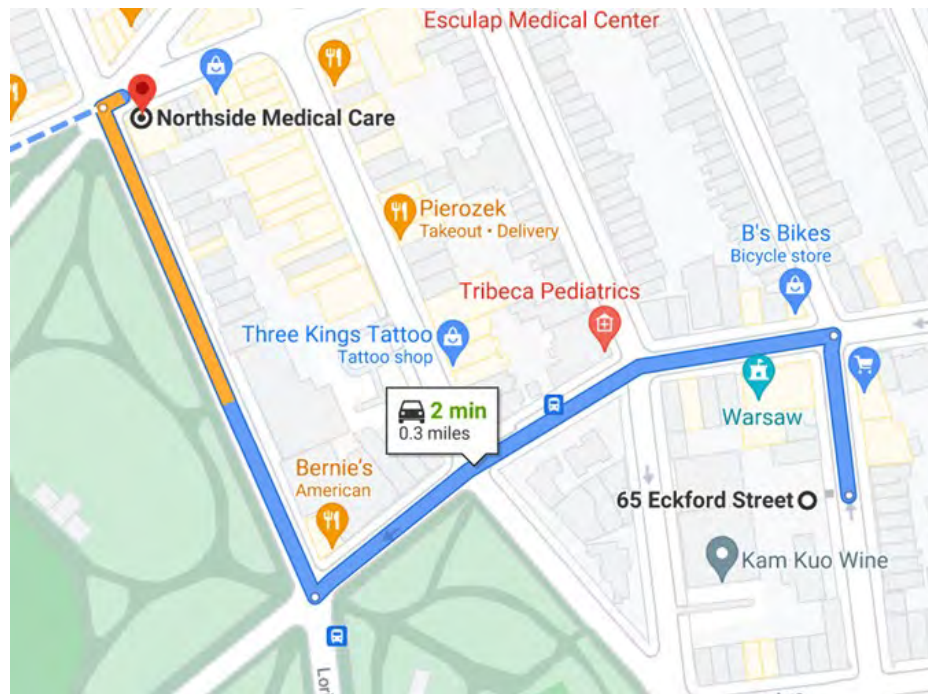
NYC Health + Hospitals/Gotham Health, Greenpoint

875 Manhattan Ave, Brooklyn, NY 11222

Clinic

Northside Medical Care

66 Nassau Ave,
Brooklyn, NY 11222
718.383.4600



2 min (0.3 mile)

via Driggs Ave and Lorimer St
Fastest route, the usual traffic



65 Eckford St

Brooklyn, NY 11222

↑ Head north on Eckford St toward Driggs Ave

213 ft

↙ Turn left onto Driggs Ave

0.1 mi

↘ Turn right onto Lorimer St

0.1 mi

↘ Turn right onto Nassau Ave

i Destination will be on the right

30 ft

Northside Medical Care

66 Nassau Ave, Brooklyn, NY 11222

STOP WORK

In accordance with H&A Stop Work Policy (OP1035), any individual has the right to refuse to do work that they believe to be unsafe and they have the obligation and responsibility to stop others from working in an unsafe manner without fear of retaliation. STOP Work Policy is the stop work policy for all personnel and subcontractors on the Site. When work has been stopped due to an unsafe condition, H&A site management (e.g., Project Manager, Site Safety Manager) and the H&A Senior Project Manager will be notified immediately. Reasons for issuing a stop work order include, but are not limited to:

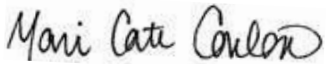
- The belief/perception that injury to personnel or accident causing significant damage to property or equipment is imminent.
- A H&A subcontractor is in breach of site safety requirements and / or their own site HASP.
- Identifying a sub-standard condition (e.g., severe weather) or activity that creates an unacceptable safety risk as determined by a qualified person.

Work will not resume until the unsafe act has been stopped OR sufficient safety precautions have been taken to remove or mitigate the risk to an acceptable degree. Stop work orders will be documented as part of an on-site stop work log, on daily field reports to include the activity(ies) stopped, the duration, person stopping work, person in-charge of stopped activity(ies), and the corrective action agreed to and/or taken. Once work has been stopped, only the H&A SM or SSO can give the order to resume work. H&A senior management is committed to support anyone who exercises his or her "Stop Work" authority.

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ADMINISTRATIVE INFORMATION

Project Name	65 Eckford Street	Project Number	0202156-000
Project Start Date	04/1/2022	Project End Date	12/30/2022
Client Site/Contact: Office Phone Number:	Posner, Abraham 718.302.3180		
H&A Project Manager: Office Phone Number: Cell Phone Number:	Conlon, Mari Cate 646.277.5688 347.271.1521		
H&A Site Safety Officer: Office Phone Number: Cell Phone Number:	Simmel, Zach 646.277.5690 646.787.7669		
APPROVALS: The following signatures constitute approval of this Health & Safety Plan			
Electronic Signatures  Project Manager – Mari Cate Conlon <u>3-28-2022</u> Date			
This document is valid for a maximum time period of one year after completion. The document must be reviewed if the scope of work or nature of site hazards changes and must be updated as warranted.			

PROJECT INFORMATION

Site Overview/History					
Site Classification	Vacant	Site Status	Open Excavation	Regulatory Authority	OSHA
Project Summary					
The approximately 10,200 square-foot property located in the Greenpoint neighborhood of Brooklyn is identified as Block 2698, Lot 26 on the New York City Tax Map. The Site has been vacant since 2008 and is currently excavated to approximately 5 to 6 feet below grade Site-wide from former construction operations. The project is currently within the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) identified as NYSDEC Site Number C224218 and listed with an environmental E-Designation (E-138) for hazardous materials resulting from a City Environmental Quality Review (CEQR) effective 11 May 2005 (CEQR #04DCP003K). The proposed development will include the construction of a multi-story residential building with two cellars encompassing the entire Site footprint and extending to approximately 25 feet below sidewalk grade. Scope of Work: Remedial Oversight					
Project Tasks					
Task 1:			Remedial Oversight		
Perform remedial oversight during implementation of the approved remedy including community air monitoring, documentation soil sampling, and performance of a Soil Vapor Intrusion (SVI) Evaluation.					
Start Date: 04/01/2022			End Date: 12/20/2022		
H&A Site Supervisor: Conlon, Mari Cate			Subcontractor: N/A		
Task 2:			Soil Sampling		
Perform soil sampling during implementation of the approved remedy as needed.					
Start Date: 04/01/2022			End Date: 12/20/2022		
H&A Site Supervisor: Conlon, Mari Cate			Subcontractor: N/A		
Task 3:			Soil Vapor Sampling (if required)		
Perform soil vapor/indoor air sampling (if required) during implementation of the SVI evaluation post-construction and prior to occupancy of new building(s).					
Start Date: 04/01/2022			End Date: 12/20/2022		
H&A Site Supervisor: Conlon, Mari Cate			Subcontractor: N/A		

INTRODUCTION

This project specific Construction Health and Safety Plan (CHASP) has been developed by Haley & Aldrich, Inc. (Haley & Aldrich) to establish the procedures necessary for protection from potential contaminated soils resulting from the excavation of soil at 65 Eckford Street, Brooklyn, New York (the Site) due to the redevelopment plans for the Site. This CHASP is intended to supplement the Client's Corporate Safety Management Program (CSMP). The procedures in this plan have been developed based on current knowledge regarding the hazards which are known or anticipated for the operations to be conducted at this Site.

SITE HAZARDS

This CHASP covers only the hazards associated with potential chemical exposures. Physical hazards such as injuries from typical excavation field work activities, including the operation of heavy equipment, noise exposure, heat and cold stress, electrical hazards, fire hazards, and general safety hazards associated with walking on working surfaces (trip and fall) are covered by the Client's CSMP.

Site activities may pose chemical exposure hazards. Potential chemical exposure hazards include skin contact, ingestion and inhalation hazards which may result from the presence of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) and inorganic metallic elements (metals) on-Site. The potential adverse health effects from these detected contaminants are diverse. Many of these compounds are known or suspected to result in chronic illness from long-term exposures. However, due to the limited nature of the proposed work, only acute effects are a potential concern. See Section 2.0 for detailed chemical hazard information.

PROJECT TEAM

The organizational structure established for the implementation of health and safety requirements established by this CHASP are outlined in the CSMP. Personnel who have been assigned specific authority to implement and enforce the provisions of this CHASP are identified below.

Name	Project Title/Assigned Role	Phone Numbers
Mari Cate Conlon	Project Manager	Work: 646.277.5688 Mobile: 347.271.1521
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The control of Site hazards is dependent upon the degree to which management enforces compliance and employees cooperate with the specified health and safety requirements. Therefore, personnel at all levels of the organization must recognize their individual responsibility to comply. All activities covered by this CHASP must be conducted in compliance with this CHASP and with applicable federal, state, and local health and safety regulations, including 29 CFR 1910.120. Personnel covered by this CHASP who cannot or will not comply must be excluded from Site activities by the Project Superintendent, as defined in the CSMP.

WORK ACTIVITIES

Excavation and Soil Screening

Field personnel will screen excavated material for visual, olfactory, and instrumental indicators suggestive of a potential chemical or petroleum release. Instrument screening for the presence of VOCs may be performed with a duly calibrated Photoionization detector (PID). Impacted material shall be segregated and disposed in accordance with federal, state and city regulations.

Stockpiling

As part of excavation activities, potentially impacted soil may be stockpiled pending waste characterization analysis. Visibly contaminated soil shall be segregated and stockpiled on at least 10 millimeters of plastic sheeting; reusable soil and fill shall be segregated and stockpiled separately from unusable fill, concrete and other debris. Stockpiles will be covered with 6 millimeters anchored plastic sheeting when not in use and overnight.

Soil Sampling

Soil samples (waste characterization, endpoint or delineation, may be collected during construction, as required.

Backfilling

Areas of the Site that were over-excavated may be backfilled to development grade. Imported material will consist of clean fill that meets the 6 New York Codes, Rules and Regulations (NYCRR) Part 375-6.8(a) Unrestricted Use Soil Cleanup Objectives (UU SCOs) or other acceptable fill material such as virgin stone from a permitted mine or quarry or recycled concrete aggregate (RCA), from a New York State Department of Environmental Conservation (NYSDEC)-registered facility.

Dewatering

Dewatering may be part of construction activities. In this case, a dewatering contractor will be responsible for handling contaminated dewatering fluids in accordance with federal, state and local regulations. Dewatering fluids may be discharged to the local sewer system after treatment and with an approved permit. Alternatively, containerized storage may allow for testing of groundwater prior to, and after, treatment and before disposal.

HAZARD ASSESSMENT

The following hazard assessment applies only to the activities within the scope of this CHASP.

CHEMICAL HAZARDS AND KNOWN/SUSPECT CHEMICALS OF CONCERN

The chemical hazard information provided below is based on the data provided in previous environmental investigations including the Remedial Investigation Report (RIR) (prepared Environmental Business Consultants dated February 2021) and the Supplemental Remedial Investigation Report (prepared by Haley & Aldrich dated February 2022). During the investigations, representative Site soils were sampled for VOCs, SVOCs, Target Analyte List (TAL) metals, pesticides and polychlorinated biphenyl (PCBs), per- and polyfluoroalkyl substances (PFAS) and 1,4-dioxane. Groundwater was encountered approximately 9 to 10 (ft) below ground surface (bgs). Contaminants of concern identified at the Site during these investigations include: metals, SVOCs (specifically PAHs), and VOCs in soil; SVOCs, VOCs, and metals in groundwater; and CVOCs in soil vapor. Constituents with exceeding concentrations and their respective health effects are listed below for reference. Information presented is based upon established Occupational Safety and Health Administration (OSHA) permissible exposure limits (PEL) and The National Institute for Occupational Safety and Health (NIOSH) recommended exposure limits (RELs). All other analytical parameters were reported within acceptable levels for Site urban residential land use. See Section 4.0 for a description of the PPE that should be used for this Site.

Table 1. Health Hazards for Site Contaminants of Concern

Chemicals	REL/PEL/STEL (ppm)	Health Hazards
Benzo(a)anthracene	PEL = 0.2 mg/m ³ TWA REL = 0.1 mg/m ³ TWA	Irritation to respiratory system, bladder, kidneys, skin; dermatitis, bronchitis, cumulative lung damage; suspect human carcinogen.
Benzo(a)pyrene	PEL = 0.2 mg/m ³ TWA REL = 0.1 mg/m ³ TWA	Irritation to respiratory system, bladder, kidneys, skin; dermatitis, bronchitis, cumulative lung damage; suspect human carcinogen.
Benzo(b)fluoranthene	PEL = 0.2 mg/m ³ TWA REL = 0.1 mg/m ³ TWA	Irritation to respiratory system, bladder, kidneys, skin; dermatitis, bronchitis, cumulative lung damage; suspect human carcinogen.
Dibenzo(a,h)anthracene	PEL = 0.2 mg/m ³ TWA REL = 0.1 mg/m ³ TWA	Irritation to respiratory system, bladder, kidneys, skin; dermatitis, bronchitis, cumulative lung damage; suspect human carcinogen.
Indeno(1,2,3-cd)pyrene	PEL = 0.2 mg/m ³ TWA REL = 0.1 mg/m ³ TWA	Irritation to respiratory system, bladder, kidneys, skin; dermatitis, bronchitis, cumulative lung damage; suspect human carcinogen.
Benzo(k)fluoranthene	PEL = 0.2 mg/m ³ TWA REL = 0.1 mg/m ³ TWA	Irritation to respiratory system, bladder, kidneys, skin; dermatitis, bronchitis, cumulative lung damage; suspect human carcinogen.
Chrysene	PEL = 0.2 mg/m ³ TWA REL = 0.1 mg/m ³ TWA	Irritation to respiratory system, bladder, kidneys, skin; dermatitis, bronchitis, cumulative lung damage; suspect human carcinogen.
3-Methylphenol/4-Methylphenol	PEL = 22 mg/m ³ TWA REL = 10 mg/m ³ TWA	Irritation to respiratory system, bladder, kidneys, skin; dermatitis, bronchitis, cumulative lung damage; suspect human carcinogen.

Lead	PEL = 0.05 mg/m ³ TWA REL = 0.05 mg/m ³ TWA	Lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; paralysis wrist, ankles; encephalopathy; kidney disease; irritation eyes; hypertension
Mercury	PEL = 0.1 mg/m ³ TWA REL = 0.05 mg/m ³ TWA	irritation eyes, skin; cough, chest pain, dyspnea (breathing difficulty), bronchitis, pneumonitis; tremor, insomnia, irritability, indecision, headache, lassitude (weakness, exhaustion); stomatitis, salivation; gastrointestinal disturbance, anorexia, weight loss; proteinuria
Arsenic	PEL = 0.010 mg/m ³ TWA REL = 0.002 mg/m ³ TWA	Ulceration of nasal septum, dermatitis, gastrointestinal disturbances, peripheral neuropathy, resp irritation, hyperpigmentation of skin, [potential occupational carcinogen]
Copper, Total	PEL = 1 mg/m ³ TWA REL = 1 mg/m ³ TWA	irritation eyes, nose, pharynx; nasal septum perforation; metallic taste; dermatitis; In Animals: lung, liver, kidney damage; anemia
Nickel, Total	PEL = 1 mg/m ³ TWA REL = 0.015 mg/m ³ TWA	irritation eyes, nose, pharynx; nasal septum perforation; metallic taste; dermatitis; In Animals: lung, liver, kidney damage; anemia
Zinc, Total	PEL = 5 mg/m ³ TWA REL = 5 mg/m ³ TWA	irritation eyes, skin, nose, throat; visual disturbance; headache; chills, fever; dyspnea (breathing difficulty), bronchitis; metallic taste, garlic breath, gastrointestinal disturbance; dermatitis; eye, skin burns; In Animals: anemia; liver necrosis, cirrhosis; kidney, spleen damage

VOLATILE AND SEMI-VOLATILE ORGANIC COMPOUNDS

The SVOC compounds identified in the soils at the Site exceeded the New York State Department of Environmental Conservation (NYSDEC) standards promulgated in the Part 375 Unrestricted Residential criteria. If Site conditions are dry, the generation of contaminated dusts may pose a potential inhalation hazard. Therefore, dust levels should be controlled with wetting if necessary, as described in Section 3.2. Odors will also be controlled and monitored via photoionization detectors stationed at the perimeters in accordance with standard CAMP procedures. In addition, repeated contact with certain SVOC compounds have been associated with the development of skin cancer. Contact with the skin may cause photosensitization of the skin, producing skin burns after subsequent exposure to ultraviolet radiation. Protective measures, such as the wearing of chemically resistant gloves, are appropriate when handling SVOC contaminated materials.

METALS

Various metals including lead, mercury, arsenic, nickel, and zinc were detected in concentrations exceeding NYSDEC Part 375 Unrestricted Residential criteria in soil samples collected and are attributed to historic fill materials and deeper native soils present throughout the Site. Overexposure to metal compounds has been associated with a variety of local and systemic health hazards, both acute and chronic in nature, including lung damage, neurological effects, gastrointestinal effects, kidney and liver damage, allergic dermatitis and other skin disorders. Exposure to metals is most commonly through

inhalation and ingestion of dust. Therefore, dust levels should be controlled with wetting, if necessary, as described in Section 3.2.

ADDITIONAL HAZARD ASSESSMENTS

Additional site-specific hazards present during project work include simultaneous operations, cold temperatures, sun and slips and trips.

Site Hazards and Controls

Site Hazard Summary

Slips, Trips, Falls	Cold Temperatures	Sun
High Winds	Urban Fill	

SUN

Hazard Information

Acute excessive exposure to solar radiation may cause painful sunburn, and chronic exposure may contribute to eye damage and skin cancer. The average peak intensity of solar ultraviolet (UV) radiation is at midday. Most of the total daily UV is received between 10 AM and 2 PM. UV radiation can reflect off of water, concrete, light colored surfaces, and snow. Cloud cover can reduce UV levels, but overexposure may still occur.

Use the shadow test to determine sun strength: If your shadow is shorter than you are, the sun's rays are at their peak, and it is important to protect yourself.

Controls

- Wear light-colored, closely woven clothing, which covers as much of the body as practicable.
- Use sunscreens with broad spectrum protection (against both UVA and UVB rays) and sun protection factor (SPF) values of 30 or higher. Ideally, about 1 ounce of sunscreen (about a shot glass or palmful) should be used to cover the arms, legs, neck, and face of the average adult. Sunscreen needs to be reapplied at least every 2 hours to maintain protection.
- Hats should be worn and should be wide brimmed, protecting as much of the face, ears, and neck as possible. Hats should also provide ventilation around the head. Sunscreen should be applied to areas around the head not protected by the hat (ears, lips, neck, etc.).
- Wear sunglasses while working outdoors. Sunglasses should allow no more than 5% of UVA and UVB penetration and must also meet the ANSI Z87.1 standard for safety glasses.
- Use natural or artificial shade, where possible.

COLD TEMPERATURES

Hazard Information

Cold stress may occur at any time work is being performed during low ambient temperatures and high velocity winds. Because cold stress is common and potentially serious illnesses are associated with outdoor work during cold seasons, regular monitoring and other preventative measures are vital.

Staff members should consult OP1003-Cold Stress for additional information on cold weather hazards.

Cold Stress Conditions

Frostbite: Localized injury resulting from cold is included in the generic term "frostbite. There are several degrees of damage.

Symptoms: Frost nip or incident frostbite; sudden blanching or whitening of the skin.

- Superficial frostbite: Skin has a waxy or white appearance and is firm to the touch, but tissue beneath is resilient.
- Deep frostbite: Tissues are cold, pale, and solid; extremely serious injury.

Treatment:

- Bring the victim indoors and heat the areas quickly in water between 102° and 105° F.
 - o Never place frostbitten tissue in hot water as the area will have a reduced heat awareness and such treatment could result in burns.
- Give the victim a warm drink (not coffee, tea, or alcohol).
 - o The victim should not smoke or do anything that will inhibit blood circulation.
- Keep the frozen parts in warm water or covered with warm clothes for 30 minutes even though the tissue will be very painful as it thaws.
 - o Elevate the injured area and protect it from injury.
 - o Do not allow blisters to be broken. Use sterile, soft, dry material to cover the injured areas.
- Keep victim warm and get medical care immediately following first aid treatment.
- After thawing, the victim should try to move the injured areas slightly, but no more than can be done without assistance.

Do NOT:

- Rub the frostbitten area(s)
- Use ice, snow, gasoline, or anything cold on frostbite
- Use heat lamps or hot water bottles to rewarm the frostbitten area
- Place the frostbitten area near a hot stove

Hypothermia: Significant loss of body heat that is also a potential hazard during cold weather operations. Hypothermia is characterized as "moderate" or "severe".

Symptoms:

- Early hypothermia - Chills, pale skin, cold skin, muscle rigidity, depressed heart rate, and disorientation

- Moderate hypothermia - Any combination of severe shivering, abnormal behavior, slowing of movements, stumbling, weakness, repeated falling, inability to walk, collapse, stupor, or unconsciousness
- Severe hypothermia - Extreme skin coldness, loss of consciousness, faint pulse, and shallow, infrequent or apparently absent respiration

Death is the ultimate result of untreated hypothermia. The onset of severe shivering signals danger to personnel; exposure to cold shall be immediately terminated for any severely shivering worker.

Treatment: Staff members should seek emergency medical treatment in the event of hypothermia. The following actions can be taken prior to obtaining medical treatment:

- Gently place patients in an environment most favorable to reducing further heat loss from evaporation, radiation, conduction, or convection.
- Remove wet clothing and replace it with dry blankets or sleeping bags.
- Initiate active external rewarming with heat packs (e.g., hot water bottles, chemical packs, etc.) placed in the areas of the armpits, groin, and abdomen.
- Be aware of the risk of causing body surface burns from excessive active external rewarming.

In dire circumstances, rescuers may provide skin-to-skin contact with patients when heat packs are unavailable and such therapy would not delay evacuation.

Controls

- Recognize the environmental and workplace conditions that may be dangerous.
 - When the temperature is below 41° F, workers should be aware that cold stress is a potential hazard.
- Learn signs of cold-induced illnesses and injuries and how to help affected staff members.
 - Observe fellow staff members for signs of cold stress and administer first aid, where necessary.
- Staff members should maintain a clothing level that keeps them warm but dry (not sweating).
 - Staff should wear thermal clothing including gloves and footwear and beneath chemical resistant clothing, when appropriate.
 - Workers should have a spare set of clothing in case work clothes are not warm enough or become wet.
 - If a worker begins to sweat, he/she should remove a layer.
 - If clothing becomes wet and temperatures are below 36° F, clothing must be immediately replaced with dry clothing.
- A warm area for rest breaks should be designated.
 - In cold temperatures, rotate shifts of workers with potential cold stress exposure or take periodic breaks to allow recovery from cold stress.
 - Do not go into the field alone when cold stress could occur.
- Avoid fatigue or exhaustion because energy is needed to keep muscles warm.
- Workers should drink warm liquids (non-alcoholic, non-caffeinated) periodically throughout their shifts so they do not get dehydrated.

URBAN FILL

Hazard Information

Urban Fill consists of historically placed soil materials commonly found in urban areas, and typically comprised of a heterogeneous mixture of granular and fine-grained solids containing various proportions of gravel and cobbles, construction and demolition debris, coal ash, wood ash or other deleterious materials. Urban fill usually contains anthropogenic levels of metals, petroleum hydrocarbons and/or PAHs due to non-point sources and/or which originated prior to placement.

Controls

- Physical Hazards: Urban fill can contain debris such as glass, ceramics, rebar, wire, wood, nails and other objects that contain sharp edges. Personnel should use caution and wear appropriate gloves (e.g., leather) to prevent cuts associated with handling material contain sharp and abrasive edges.
- Personal Hygiene: Always wash hands prior and after eating and drinking. Take off work boots prior to getting in your car and going home which will help prevent introducing potentially contaminated soils to your car and home. Wash work clothing separately from non-work clothes to prevent clothing impacted by soil from urban fill to be cross contaminated with other clothing. Use chemical resistant gloves when handling soil to prevent contact with skin.
- Control the dust from urban fill material. Measures should be taken to prevent dust, such as wetting the material or covering the stockpiles.

SLIPS AND TRIPS

Hazard Information

Slip and trip injuries are the most frequent injuries to workers. Both slips and trips result from some kind of unintended or unexpected change in the contact between the foot and the ground or walking surface. This shows that good housekeeping, quality of walking surfaces (flooring), awareness of surroundings, selection of proper footwear, and appropriate pace of walking are critical to preventing fall accidents.

Site workers will be walking on a variety of irregular surfaces that may affect their balance. Extra care must be taken to walk cautiously near any surfaces that are unfamiliar or may have unseen slip or trip hazards such as rivers because the bottom of the river bed maybe slick and may not be visible. Rocks, gradient changes, sandy bottoms, and debris may be present but not observable.

Controls

- Take your time and pay attention to where you are going.
- Adjust your stride to a pace that is suitable for the walking surface and the tasks you are doing.
- Check the work area to identify hazards - beware of trip hazards such as wet floors, slippery floors, and uneven surfaces or terrain.
- Establish and utilize a pathway free of slip and trip hazards.
- Choose a safer walking route.
- Carry loads you can see over and are not so heavy as to increase your trip/slip probability.

- Keep work areas clean and free of clutter.
- Communicate hazards to on-site personnel and mitigate hazards as appropriate.

HIGH WINDS

Hazard Information

While high winds are commonly associated with severe thunderstorms and hurricanes they may also occur as a result of differences in air pressures, such as when a cold front passes across the area. They can cause downed trees and power lines, and flying debris (such as dust or larger debris), which adds additional risks and could lead to power outages, transportation disruptions, damage to buildings and vehicles, and serious injury.

Wind Advisory are issued for sustained winds 25 to 39 mph and/or gusts to 57 mph. High Wind warnings are issued by the National Weather Service when high wind speeds may pose a hazard or is life threatening. The criterion for this warning will varies by state. The Beaufort Wind Scale is a helpful tool to when dealing with high winds.

Controls

- Monitor weather reports for high winds advisories and warnings
- Check the work area to identify hazards - beware of trip hazards such as wet floors, slippery floors, and uneven surfaces or terrain.
- Keep work areas clean and free of clutter.
- Communicate hazards to on-site personnel and mitigate hazards as appropriate.

TASK SPECIFIC HAZARDS

Task Description

Remedial Oversight –Remedial oversight may require working in close proximity to heavy equipment and may be exposed to many of the same hazards as the subcontractor. It is imperative that staff are aware of emergency stops and establish communication protocols with the drillers prior to the start of work. See OP 1002 Drilling Safety.

Potential Hazards

Noise	Heavy Equipment	Ergonomics	Line of Fire
Ground Disturbance	Congested Areas	Overhead Utilities	Underground Utilities
Slips, Trips & Falls			

Soil Sampling– Soil sampling by H&A staff on active construction sites can be conducted in conjunction with a wide range of activities such as building construction, earthwork, and soil management related activities. Familiarity with basic heavy construction safety, site conditions

(geotechnical and environmental), and potential soil contaminants are essential components of soil sampling performed on active sites. See OP 1002 Drilling Safety.

Potential Hazards			
Noise	Heavy Equipment	Ergonomics	Line of Fire
Ground Disturbance	Generated Waste	Slips, Trips & Falls	

Top Task Specific Hazards

Overhead Utilities

When work is undertaken near overhead electrical lines, the distance maintained from those lines shall also meet the minimum distances for electrical hazards as defined in Table 1 below. Note: utilities other than overhead electrical utilities need to be considered when performing work

Table 1 Minimal Radial Clearance Distances *

Normal System Voltage Kilovolts (kV)	Required Minimal Radial Clearance Distance (feet/meters)
0 – 50	10/3.05
51 – 100	12/3.66
101 – 200	15/4.57
201 – 300	20/6.1
301 – 500	25/7.62
501 – 750	35/10.67
750 – 1000	45/13.72

* For those locations where the utility has specified more stringent safe distances, those distances shall be observed.

Controls

- To prevent damage, guy wires shall be visibly marked and work barriers or spotters provided in those areas where work is being conducted.
 - When working around guy wires, the minimum radial clearance distances for electrical power shall be observed.
- The PM shall research and determine if the local, responsible utility or client has more restrictive requirements than those stated in Table 1.
- If equipment cannot be positioned in accordance with the requirements established in Table 1 the lines need to be de-energized.

Ground Disturbance

Ground disturbance is defined as any activity disturbing the ground. Ground disturbance activities include, but are not limited to, excavating, trenching, drilling (either mechanically or by hand), digging, plowing, grading, tunneling and pounding posts or stakes.

Because of the potential hazards associated with striking an underground utility or structure, the operating procedure for underground utility clearance shall be followed prior to performing any ground disturbance activities.

See OP1020 Working Near Utilities

Controls

Prior to performing ground disturbance activities, the following requirements should be applied:

- Confirm all approvals and agreements (as applicable) either verbal or written have been obtained.
- Request for line location has been registered with the applicable One-Call or Dial Before You Dig organization, when applicable
 - Whenever possible, ground disturbance areas should be adequately marked or staked prior to the utility locators site visit.
- Notification to underground facility operator/owner(s) that may not be associated with any known public notification systems such as the One-Call Program regarding the intent to cause ground disturbance within the search zone.
- Notifications to landowners and/or tenant, where deemed reasonable and practicable.
- Proximity and Common Right of Way Agreements shall be checked, if the line locator information is inconclusive.

Underground Utilities

Various forms of underground/overhead utility lines or conveyance pipes may be encountered during site activities. Prior to the start of intrusive operations, utility clearance is mandated, as well as obtaining authorization from all concerned public utility department offices. Should intrusive operations cause equipment to come into contact with utility lines, the SSO, Project Manager, and Regional H&S Manager shall be notified immediately. Work will be suspended until the client and applicable utility agency is contacted and the appropriate actions for the situation can be addressed.

See OP1020 Work Near Utilities for complete information.

Controls

- Obtain as-built drawings for the areas being investigated from the property owner;
- Visually review each proposed soil boring locations with the property owner or knowledgeable site representative;
- Perform a geophysical survey to locate utilities;
- Hire a private line locating firm to determine the location of utility lines that are present at the property;
- Identifying a no-drill or dig zone;
- Hand dig or use vacuum excavation in the proposed ground disturbance locations if insufficient data is unavailable to accurately determine the location of the utility lines.

Noise

Working around heavy equipment (drill rigs, excavators, etc.) often creates excessive noise. The effects of noise can include physical damage to the ear, pain, and temporary and/or permanent hearing loss. Workers can also be startled, annoyed, or distracted by noise during critical activities. Noise monitoring data that indicates that work locations within 25 feet of operating heavy equipment (e.g., drill rigs, earthwork equipment) can result in exposure to hazardous levels of noise (levels greater than 85 dBA).

See OP 1031 Hearing Conservation for additional information.

Controls

- Personnel are required to use hearing protection (earplugs or earmuffs) within 25 feet of any operating piece of heavy equipment.
- Limit the amount of time spent at a noise source.
- Move to a quiet area to gain relief from hazardous noise sources.
- Increase the distance from the noise source to reduce exposure.

Heavy Equipment

Staff members must be careful and alert when working around heavy equipment, since equipment failure or breakage and limited visibility can lead to accidents and worker injury. Heavy equipment such as cranes, drills, haul trucks, or other can fail during operation increasing the likelihood of worker injury. Equipment of this nature should be visually inspected and checked for proper working order prior to the commencement of field work. Those that operate heavy equipment must meet all of the requirements to operate heavy equipment. Haley & Aldrich, Inc. staff members that supervise projects or are associated with such high risk projects that involve digging or drilling should use due diligence when working with a construction firm.

See OP1052 Heavy Equipment for additional information.

Controls

- Only approach equipment once you have confirmed contact with the operator (e.g., the operator places the bucket on the ground).
- Maintain visual contact with operators at all times and keep out of the strike zone whenever possible.
- Always be alert to the position of the equipment around you.
- Always approach heavy equipment with an awareness of the swing radius and traffic routes of each piece of equipment and never go beneath a hoisted load.
- Avoid fumes created by heavy equipment exhaust.
- Understand the site traffic pattern and position yourself accordingly.

Line of Fire

Line of fire refers to the path an object will travel. Examples of line of fire typically observed on project sites include lifting/hoisting, lines under tension, objects that can fall or roll, pressurized objects, springs or stored energy, work overhead, and vehicles and heavy equipment.

Controls

The following precautions should be observed for work overhead:

- Never walk under a suspended load.
- Communicate to other workers when entering a lifting/hoisting zone, even if for a short period.
- Balance the load prior to lifting.
- Rigging equipment shall never be loaded in excess of its maximum safe loading limit.
- Establish a drop zone, an area below any work being performed aloft. Drop zone size depends on work scope and potential for falling tools and equipment. Keep the drop zone clear of people.
- If work at the structure base is unavoidable, inform the worker above. Make sure work stops and they secure tools and equipment prior to performing the work below.
- Materials should never be dropped from height. Use tool bags and hand lines when providing tools and equipment to the employee aloft

The following precautions should be observed for tension and pressure:

- Be aware and stay clear of tensioned lines such as cable, chain and rope.
- Use only correct gripping devices. Select proper equipment based on size and load limit.
- Be cautious of torque stresses that drilling equipment and truck augers can generate. Equipment can rotate unexpectedly long after applied torque force has been stopped.
- Springs come in a variety of shapes and sizes, and can release tremendous energy if compression as tension is suddenly released.
- Ensure tanks are stored upright and are in good condition, and be aware of potential failures or pressurized lines and fittings
- Items under tension and pressure can release tremendous energy if it is suddenly released.

The following precautions should be observed for objects that can fall or roll:

- Not all objects may be overhead; be especially mindful of top-heavy items and items being transported by forklift or flatbed.
- Secure objects that can roll such as tools, cylinders and pipes.
- Stay well clear of soil cuttings, soil stockpiles generated during drilling operations and excavations, be aware that chunks of dirt, rocks, and debris can fall or roll.
- Establish a drop zone that is free of any tools and/or debris.

The following precautions should be observed for working in proximity to vehicles and heavy equipment:

- Use parking brakes and wheel chocks for any vehicle or equipment parked on an incline.
- When working near moving, heavy equipment such as line trucks and cranes, remain in operator's full view. Obtain operator's attention prior to approaching equipment.
- Vacate the back of the bucket truck when the boom is being moved or cradled. Get the operator's attention if you must get into the back of the truck so he or she can stop boom movement.

Take precautions for all pedestrian and vehicle traffic when positioning vehicles and equipment at a job site.

Posture/Ergonomics

Most Work-related Musculoskeletal Disorders (WMSDs) are caused by Ergonomic Stressors. Ergonomic Stressors are caused by poor workplace practices and/or insufficient design, which may present ergonomic risk factors. These stressors include, but are not limited to, repetition, force, extreme postures, static postures, quick motions, contact pressure, vibration, and cold temperatures.

WMSDs are injuries to the musculoskeletal system, which involves bones, muscles, tendons, ligaments, and other tissues in the system. Symptoms may include numbness, tightness, tingling, swelling, pain, stiffness, fatigue, and/or redness. WMSD are usually caused by one or more Ergonomic Stressors. There may be individual differences in susceptibility and symptoms among employees performing similar tasks. Any symptoms are to be taken seriously and reported immediately.

Controls

Recommended controls, including Administrative, Work Practice, and/or Engineering Controls, will be put in place based on the interview results and/or after an ergonomic assessment. H&S and/or HP will work with staff members and their staff managers to implement Administrative and Work Practice Controls to control risk associated with ergonomic stressors. In addition, simple Engineering Controls may be implemented, such as use of a keyboard and/or mouse tray, replacing a mouse with a more ergonomic model, and/or changing workstation set up.

Generated Waste

Excess sample solids, decontamination materials, rags, brushes, poly sheeting, etc. that are determined to be free of contamination through field or laboratory screening can usually be disposed into client-approved, on-site trash receptacles. Uncontaminated wash water may be discarded onto the ground surface away from surface water bodies in areas where infiltration can occur. Contaminated materials must be segregated into liquids or solids and drummed separately for off-site disposal.

All wastes generated shall be containerized in an appropriate container (i.e. open or closed top 55-gallon drum, roll-off container, poly tote, cardboard box, etc.) as directed by the PM. Prior to putting waste containers into service, the containers should be inspected for damages or defects. Waste containers should be appropriately labeled indicating the contents, date the container was filled, owner of the material (including address) and any unique identification number, if necessary. Upon completion of filling the waste container, the container should be inspected for leaks and an appropriate seal.

Slips, Trips & Falls

Both slips and trips result from some a kind of unintended or unexpected change in the contact between the feet and the ground or walking surface. This shows that good housekeeping, quality of walking surfaces (flooring), selection of proper footwear, and appropriate pace of walking are critical for preventing fall accidents.

Slips happen where there is too little friction or traction between the footwear and the walking surface. Common causes of slips are:

- wet or oily surfaces
- occasional spills
- weather hazards
- loose, unanchored rugs or mats
- flooring or other walking surfaces that do not have same degree of traction in all areas

Weather-related slips and falls become a serious hazard as winter conditions often make for wet or icy surfaces outdoors. Even wet leaves or mud can create treacherous walking conditions. Spills and leaks inside can also lead to slips and falls.

- Evaluate the work area to identify any conditions that may pose a slip hazard.
- Address any spills, drips or leaks immediately.
- Mark areas where slippery conditions exist.
- Select proper footwear or enhance traction with additional PPE.

Where conditions are uncertain or environmental conditions result in slippery surfaces walk slowly, take small steps, and slide feet on wet or slippery surfaces.

Congested Area

- Provide barricades, fencing, warning signs or signals and adequate lighting to protect people while working in or around congested areas.
- Vehicles and heavy equipment with restricted views to the rear should have functioning back-up alarms that are audible above the surrounding noise levels. Whenever possible, use a signaler to assist heavy equipment operators and/or drivers in backing up or maneuvering in congested areas.
- Lay out traffic control patterns to eliminate excessive congestion.
- Workers in congested areas must wear high visibility clothing at all times.
- Be aware of Line of Fire hazards when performing work activities in congested areas.
- Hazards associated with SIMOPs should be discussed daily at Tailgate Safety Meetings.

VAPOR EMISSION RESPONSE

If the ambient air concentration of organic vapors exceeds 5 ppm above background, activities will be halted, or odor controls will be employed and monitoring continued. Work practices to minimize odors and vapors include limiting the time that the excavations remain open, minimizing stockpiling of contaminated-source soil, and minimizing the handling of contaminated material. Offending odor and organic vapor controls may include the application of foam suppressants or tarps over the odor or VOC source areas. Foam suppressants may include biodegradable foams applied over the source material for short-term control of the odor and VOCs.

If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: direct load-out of soils to trucks for off-site disposal; use of chemical odorants in spray or misting systems; and, use of staff to monitor odors in surrounding neighborhoods.

If the organic vapor level decreases below 5 ppm above background, sampling and boring and well installation can resume, provided:

- The organic vapor level 200 feet downwind of the hot zone or half the distance to the nearest residential or commercial structure, whichever is less, is below 1 ppm over background, and
- More frequent intervals of monitoring, as directed by the HSO or FTL, are conducted

If any organic levels greater than 5 ppm over background are identified 200 feet downwind from the work site, or half the distance to the nearest residential or commercial property, whichever is less, all work activities must be halted, or odor controls must be implemented.

If, following the cessation of the work activities, or as the result of an emergency, organic levels persist above 5 ppm above background 200 feet downwind or half the distance to the nearest residential or commercial property from the hot zone, then the air quality must be monitored within 20 feet of the perimeter of the nearest residential or commercial structure (20 Foot Zone). If either of the following criteria is exceeded in the 20 Foot Zone, then the Major Vapor Emission Response Plan shall automatically be implemented.

- Sustained organic vapor levels approaching 5 ppm above background for a period of more than 30 minutes, or
- Organic vapor levels greater than 5 ppm above background for any time period.

Upon activation, the following tasks will occur:

- The local police authorities will immediately be contacted by the HSO or FTL and advised of the situation;
- Frequent air monitoring will be conducted at 30-minute intervals within the 20 Foot Zone. If two successive readings below action levels are measured, air monitoring may be halted or modified by the HSO or FTL; and
- All Emergency contacts will go into effect as appropriate.

DUST SUPPRESSION TECHNIQUES

Preventative measures for dust generation may include wetting site fill and soil, construction of an engineered construction entrance with gravel pad, a truck wash area, covering soils with tarps, and limiting vehicle speeds to five miles per hour.

PERSONAL EXPOSURE MONITORING

No asbestos, lead-based paint, or radiological hazards have been identified within the vicinity of the proposed excavation area at the Site (see Section 2.0). Therefore, personal exposure monitoring is not required during excavation.

DUST SUPPRESSION TECHNIQUES

Preventative measures for dust generation may include wetting site fill and soil, construction of an engineered construction entrance with gravel pad, a truck wash area, covering soils with tarps, and limiting vehicle speeds to five miles per hour.

PERSONAL EXPOSURE MONITORING

No asbestos, lead-based paint, or radiological hazards have been identified within the vicinity of the proposed excavation area at the Site (see Section 2.0). Therefore, personal exposure monitoring is not required during excavation.

PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment (PPE) will be donned as detailed below for the activities covered by this CHASP. Based on available analytical data and the proposed intrusive activities, the contractor anticipates that all activities will require Level D or Modified Level D PPE.

GENERAL SITE WORK

General Site work conducted outside the soil excavation areas, operators of heavy equipment, and non-intrusive activities which do not generate dust will require Level D protective equipment. Level D is defined as:

- Steel-toed boots
- Hardhat
- Eye protection
- Hearing protection (carried on person at all time and donned when appropriate)
- Work clothes (sleeved shirts and pants)

Workers shall wear appropriate hearing protection during designated hearing protection-required tasks (such as, jack hammering, pile driving etc.). To reduce the exposure to noise, personnel working in areas of excessive noise must use hearing protectors (earplugs or earmuffs) in accordance with the CSMP. When lacking actual data from sound level meters or noise dosimeters is unavailable, if it is necessary to raise one's voice above a normal conversational level to communicate with others within 3 to 5 feet away, hearing protection should be worn.

EXCAVATION AREAS AND OTHER SOIL HANDLING

Personnel working in the areas of excavation, but not operating heavy equipment, and any other personnel potentially contacting contaminated materials will be required to wear Modified Level D PPE. Modified Level D PPE provides minimal skin protection (i.e., hand/glove protection along with standard work clothes with optional coveralls). Modified Level D is defined as:

- Hardhat
- Eye protection
- Hearing protection (as warranted see above)
- Steel-toed work boots
- Tyvek Coveralls
- Disposable nitrile chemically resistant gloves

Increased PPE, such as Level C or Level B, is not anticipated to be required on the Site.

SITE CONTROL

The overall purpose of site control is to minimize potential contamination of workers, protect the public from the site's hazards, and prevent vandalism. Site control is especially important in emergency situations. The degree of site control necessary depends on site characteristics, site size, and the surrounding community. The following information identifies the elements used to control the activities and movements of people and equipment at the project site.

Communication
Internal H&A site personnel will communicate with other H&A staff member and/or subcontractors or contractors with: • Face-to-Face Communication at a minimum of 6ft distance
External H&S site personnel will use the following means to communicate with off-site personnel or emergency services. • Cell Phones
Visitors
Project Site Will visitors be required to check-in prior to accessing the project site? • Yes • All Visitors shall be briefed on COVID-19 protocols and PPE. Visitors not briefed, or that do not have the appropriate PPE will be asked to leave the site.
Visitor Access Authorized visitors that require access to the project site need to be provided with known information with respect to the site operations and hazards as applicable to the purpose of their site visit. Authorized visitors must have the required PPE and appropriate training to access the project site.
Zoning
Work Zone The work zone will be clearly delineated to ensure that the general public or unauthorized worker access is prevented. The following will be used: • Flagging tape • Cones • Proper Signage
Project Site - Access
Work Hours The following measure(s) will be used to control site entry and exit during site hours. • Site is gated a fenced
After Hours The following measure(s) will be used to control site entry and exit during hours that the site is not operating. • None
Site Traffic Control Is the work planned to be conducted on a public roadway or a public right-of-way? • No

DECONTAMINATION AND WORK ZONES

Work zones are intended to control the potential spread of contamination throughout the site and to assure that only authorized individuals are permitted into potentially hazardous areas. Any person working in an area where the potential for exposure to site contaminants exists will only be allowed access after providing the HSO with proper training and medical documentation.

Work zones on Site will be temporary or dynamic, encompassing the work area(s) actively being worked in on that particular day(s). Site personnel will be advised of the current work area(s) as part of site safety meetings.

Exclusion Zone (EZ) is the area where contamination does or could occur. Decontamination of field equipment will also be conducted in the Contaminant Reduction Zone (CRZ) which will be located on the perimeter of the EZ. The EZ and the CRZ will be clearly delineated by cones, tapes or other means.

Support zone will consist of an area outside the areas of excavation and soil handling, where equipment and support vehicles will be located. Eating, drinking and smoking will be permitted only in this area and not in the work zone. Sanitary facilities will be located on Site. In addition, potable water and water and soap for hand washing will be available on Site.

OTHER SITE CONTROL AND SAFETY MEASURES

The following measures are designed to augment the specific health and safety guidelines provided in this plan. These issues will form the basis of the Site coordination and daily safety meetings discussed (Section 7.4).

- The Site hazards will be evaluated by the Client's Project Superintendent using the Site Safety Checklist as defined by the CSMP.
- No one is to perform field work alone. Team members must be intimately familiar with the procedures for initiating an emergency response.
- Avoidance of contamination is of the utmost importance. Whenever possible, avoid contact with contaminated (or potentially contaminated) surfaces or materials. Walk around (not through) puddles and dis-colored surfaces. Do not kneel on the ground or set equipment on the ground.
- Eating, drinking, chewing gum or tobacco, smoking or any practice that increases the probability of hand-to-mouth transfer and ingestion of materials is prohibited except in the support zone after proper decontamination as defined in Section 6.0.
- The use of alcohol or drugs is prohibited during the conduct of field operations.
- Safety equipment (PPE) will be required for all field personnel unless otherwise approved by the subcontractor's health and safety representatives and/or the Project Superintendent.

SITE SECURITY

The Site shall be unoccupied during Site work except for Contractor personnel and subcontractors. If possible, access to the work areas during field work will be limited by closing site gates to reduce unauthorized pedestrian traffic. The Client's Project Superintendent is responsible for identifying the presence of all employees on Site.

Equipment left on Site during off hours must be locked, immobilized and/or otherwise secured to prevent theft or unauthorized use or access. The Contractor and subcontractors' employees will not be permitted on Site during off-hours without specific client approval.

PERSONAL DECONTAMINATION STATION

Personal decontamination will be conducted by following a systematic procedure of cleaning and removal of PPE. The Contractor will supply decontamination equipment to allow PPE to be brushed to remove gross contamination and then scrubbed clean in a detergent solution and then rinsed clean. To facilitate this, a three-basin wash system will be set up on site by the Contractor.

Disposable PPE, such as Tyvek coveralls, gloves, and hearing protection, etc. will be placed in trash bags in an on-Site container pending a disposal. Alternative chemical decontamination procedures, such as steam-cleaning reusable rubber outer boots, may be used if necessary. Steps required in a decontamination sequence will depend on the level of protection worn in accordance with Section 4.0:

1. Remove and wipe clean hard hat
2. Brush boots and gloves of gross contamination
3. Scrub boots and gloves clean
4. Rinse boots and gloves
5. Dry non-disposable equipment with paper towels
6. Remove Tyvek coveralls
7. Remove eye protection
8. Remove chemically resistant gloves

EQUIPMENT DECONTAMINATION

Hand tools and portable equipment will be decontaminated upon leaving the site using the same procedures for personal decontamination. Wooden tools are difficult to decontaminate because they absorb chemicals. Wooden hand tools will be kept on Site for the project duration and handled only by protected workers. At the end of the Site activities, wooden tools will be discarded if they cannot be decontaminated properly.

Large equipment (i.e. trucks, vehicles, etc.) will be decontaminated in an area near the entrance to the Site. Decontamination of large equipment will mitigate the risk of spreading potentially-contaminated soil off-Site. The contractor will use a combination of long-handled brushes, rods and shovels for general exterior cleaning and dislodging contaminated soil caught in tires and the undersides of vehicles and equipment.

Prior to leaving the Site, large equipment will be inspected to assure that excess material has not adhered to the equipment. If needed, the contractor will clean the large equipment, including washing tires and undercarriages with a hose to remove excess adhered soil prior to leaving the Site. Exposed excavated material will be covered on each truck after loading. The cover will be secured and remain in place until the container has reached the disposal facility.

MEDICAL MONITORING AND TRAINING REQUIREMENTS

Training records for Site personnel and subcontractors shall be provided by the Contractor prior to on-Site work, and will be maintained on Site.

MEDICAL MONITORING

Respiratory protection is not required by the levels of soil contamination. Therefore, no medical monitoring requirements will be instituted for this project.

TRAINING

All personnel covered by this CHASP must have completed the appropriate training requirements specified in 29 CFR 1910.1200 Hazard Communication and 29 CFR 1910.120(e).

Completion of the 40-hour HAZWOPER training program as detailed in OSHA's 29 CFR 1910.120(e) is required for all employees as well as an annual 8-hour refresher training required to maintain competency and ensure a safe work environment. In addition, all employees must complete the OSHA 10 hour Construction Safety and Health training. Site specific training will also be provided including summary of the site hazards, chemical hazards, site layout, rally points, etc. for all new employees entering the site.

Also, at least one contractor employee must be on Site during all activities to act as the Site Foreman and will be responsible for identifying existing and predictable hazards in surroundings or working conditions that are unsanitary, hazardous, or dangerous to Site workers and or the community, and will have the authorization to take prompt corrective measures to eliminate them. This individual must have documentation of at least three days of supervised field experience as well as completion of the specified 8-hour training course for managers and supervisors. Records of certifications and training should be kept by the Contractor.

SUBCONTRACTORS

Subcontractors will be required to provide to the Contractor Project (Site) Manager specific written documentation that each individual assigned to this project has completed the medical monitoring and training requirements specified above. This information must be provided prior to their performing any work on site.

SITE SAFETY MEETINGS

Prior to the commencement of on-Site investigative activities, a Site safety meeting will be held to review the specific requirements of this CHASP. Sign-off sheets will be collected at this meeting (see Appendix A). Short safety refresher meetings will be conducted daily or as conditions or work activates change. In addition, the Project Superintendent will document that Site visitors have had the required training in accordance with 29 CFR 1910.120 and will provide documented pre-entry safety briefings.

EMERGENCY ACTION

OSHA defines emergency response as any "response effort by employees from outside the immediate release area or by other designated responders (i.e., mutual-aid groups, local fire departments, etc.) to an occurrence which results, or is likely to result in an uncontrolled release of a hazardous substance." The Contractor personnel covered by this CHASP may not participate in any emergency response where there are potential safety or health hazards (i.e., fire, explosion, or chemical exposure). The Contractor response actions will be limited to evacuation and medical/first aid as described within this section below.

The basic elements of an emergency evacuation plan include employee training, alarm systems, escape routes, escape procedures, critical operations or equipment, rescue and medical duty assignments, designation of responsible parties, emergency reporting procedures, and methods to account for all employees after evacuation.

EMPLOYEE INFORMATION

General training regarding emergency evacuation procedures are included in the Contractor initial and refresher training courses. Also as described, employees must be instructed in the specific aspects of emergency evacuation applicable to the Site as part of the site safety meeting prior to the commencement of all on-site activities. On-Site refresher or update training is required anytime escape routes or procedures are modified or personnel assignments are changed. This information will be provided during the Site safety meetings (see Section 7.4) will be documented by the contractor.

EMERGENCY SIGNAL AND ALARM SYSTEM

An emergency communication system must be in effect at all sites. The most simple and effective emergency communication system in many situations will be direct verbal communications. Each site must be assessed at the time of initial Site activity and periodically as the work progresses. Verbal communications must be supplemented anytime voices cannot be clearly perceived above ambient noise levels (i.e., noise from heavy equipment, trucks, etc.) and anytime a clear line-of-sight cannot be easily maintained amongst all personnel because of distance, terrain or other obstructions. The Contractor will maintain an air horn (or whistle) on-Site that will be used to signal an emergency so that it can be heard over other construction noises on-Site.

EMERGENCY CONTACTS

Police:	911
Fire:	911
Ambulance:	911
NYC Health + Hospitals/Gotham Health, Greenpoint:	844.692.4692 (non-emergency)

HOSPITAL LOCATION

NYC Health and Hospitals/Greenpoint is located at 875 Manhattan Avenue in Brooklyn, New York 11222. Appendix B presents a hospital route map.

INCIDENT REPORTING PROCEDURES

Any incident (other than minor first aid treatment) resulting in injury, illness or property damage requires an accident investigation and report. The investigation should be initiated as soon as emergency conditions are under control. The purpose of this investigation is not to attribute blame but to determine the pertinent facts so that repeat or similar occurrences can be avoided.

The investigation should begin while details are still fresh in the mind of anyone involved. The person administering first aid may be able to start the fact gathering process if the injured are able to speak. Pertinent facts must be determined. Questions beginning with who, what, when, where, and how are usually most effective to discover ways to improve job performance in terms of efficiency and quality of work, as well as safety and health concerns.

SPILL CONTROL

Small spills/releases will be contained as close to the source as possible and an MSDS will be reviewed to determine the proper containment and clean up procedures. Procedures for containment can include sorbent materials such as sorbent pads and sand. Contractors should maintain spill kits for potential releases from on site vehicles. In the event a spill cannot be contained and is above the reportable requirements, NYSDEC will be notified.

APPENDICES

Appendix A – Emergency Response Plan

Appendix B – COVID-19 Documents

APPENDIX A: EMERGENCY RESPONSE PLAN

Medical

If there is an injury or illness associated with an H&A staff member on the job-site stop work, stabilize the situation and secure the site. Assess the severity of the injury or illness to determine the appropriate course of action as listed below.

First Aid Injury

First aid will be addressed using the on-site first aid kit. H&A employees are not required or expected to administer first aid/CPR to any H&A staff member, Contractor, or Civilian personnel at any time and it is H&A's position that those who do are doing it do so on their behalf and not as a function of their job.

- Injury or illness requiring clinic/hospital visit **WITHOUT** ambulance service
Injuries or illnesses requiring hospital service without ambulance services include minor lacerations, minor sprains, etc. The following action will be taken:
 - o The H&A SSO will ensure prompt transportation of the injured person to the clinic or hospital identified in the safety plan.
 - o Another H&A staff member, or contractor on-site, will always drive the injured staff member to the medical facility and remain at the facility until the staff member has been discharged. Staff members will not self-transport to the clinic or hospital.
 - o If the injured staff member is able to return to the job site the same day, he/she will bring with him/her a statement from the doctor containing such information as:
- Date
- Employee's name
- Diagnosis
- Date he/she is able to return to work, regular or light duty
- Date he/she is to return to doctor for follow-up appointment, if necessary
- Signature and address of doctor

Injury or illness requiring a hospital visit **WITH** ambulance service

Injuries or illnesses requiring hospital service with ambulance services include severe head injuries, severe lacerations, heart attacks, heat stroke, etc. The following steps will be taken immediately:

- Call for ambulance service and notify the H&A SSO.
- Comfort the individual until ambulance service arrives.
- While the injured employee is being transported, the H&A SSO will contact the medical facility to be utilized.
- One designated representative will accompany the injured employee to the medical facility and remain at the facility until final diagnosis and other relevant information is obtained.

Notifications

For all injuries or illness notify the SSO and PM who in turn will contact Corporate H&S. Within 24 hours the injured staff member or PM will complete the H&S Reporting Form found on HANK. Minor cuts, scratches, and bruises shall also be reported through the H&S Reporting Form. Notify the client in accordance with their notification protocol. Depending on severity, Human Potential will as promptly as possible following an injury or illness, ensure appropriate notification has been made to the family of the individual involved.

Severe Weather

Where the threat of electrical storms and the hazard of lightning exist, staff shall ensure that there is the ability to detect when lightning is in the near vicinity and when there is a potential for lightning and to notify appropriate site personnel of these conditions. The weather forecast will be checked on a daily basis and communicated at the daily safety tailgate meetings.

When lightning is detected or observed the information will be communicated to all crews in the field for appropriate action. Field supervisors will make the decision to stay put or to leave the work site. A location will be identified to marshal field staff in the event that staff are required to leave the job site. A similar decision process will be used during heavy rain events.

Staff shall seek appropriate shelter and not stay in the open

Evacuation Alarms

Verbal Communication will be used to communicate the evacuation alarm.

Emergency Services

Cellular phone will be used to contact Emergency Services.

Emergency Evacuation Plan

The site evacuation plan is as follows:

1. Establish a designated meeting area to conduct a head count in the event of an emergency evacuation.
2. If the work area is not near an emergency exit, exit via the closest route and meet at the designated meeting area.
3. Notify emergency response personnel (fire, police and ambulance) of the number of missing or unaccounted for employees and their suspected location.
4. Administer first aid will in the meeting area as necessary.

Under no circumstances should any personnel re-enter the site area without the approval of the corporate H&S manager, the H&S coordinator, and the fire department official in charge.

ROLES AND RESPONSIBILITIES

REGIONAL HEALTH AND SAFETY MANAGER (RHSM)

The Haley & Aldrich RHSM, Brian Ferguson, is a full-time Haley & Aldrich staff member, trained as a safety and health professional, who is responsible for the interpretation and approval of this Safety Plan. Modifications to this Safety Plan cannot be undertaken by the PM or the SSO without the approval of the RHSM.

Specific duties of the RHSM include:

- Approving and amending the Safety Plan for this project
- Advising the PM and SSOs on matter relating to health and safety
- Recommending appropriate personal protective equipment (PPE) and air monitoring instrumentation
- Maintaining regular contact with the PM and SSO to evaluate the conditions at the property and new information which might require modifications to the HASP and
- Reviewing and approving JSAs developed for the site-specific hazards.

PROJECT MANAGER (PM)

The Haley & Aldrich PM, Mari Cate Conlon, is responsible for ensuring that the requirements of this HASP are implemented at that project location. Some of the PM's specific responsibilities include:

- Assuring that all personnel to whom this HASP applies have received a copy of it;
- Providing the RHSM with updated information regarding environmental conditions at the site and the scope of site work;
- Providing adequate authority and resources to the on-site SSO to allow for the successful implementation of all necessary safety procedures;
- Supporting the decisions made by the SSO;
- Maintaining regular communications with the SSO and, if necessary, the RHSM;
- Coordinating the activities of all subcontractors and ensuring that they are aware of the pertinent health and safety requirements for this project;
- Providing project scheduling and planning activities; and
- Providing guidance to field personnel in the development of appropriate Job Safety Analysis (JSA) relative to the site conditions and hazard assessment.

SITE SAFETY OFFICER

The SSO, Zach Simmel, is responsible for field implementation of this HASP and enforcement of safety rules and regulations. SSO functions may include some or all:

- Act as H&A's liaison for health and safety issues with client, staff, subcontractors, and agencies.
- Verify that utility clearance has been performed by H&A subcontractors.
- Oversee day-to-day implementation of the Safety Plan by H&A personnel on site.
- Interact with subcontractor project personnel on health and safety matters.
- Verify use of required PPE as outlined in the safety plan.
- Inspect and maintain H&A safety equipment, including calibration of air monitoring instrumentation used by H&A.
- Perform changes to HASP and document as needed and notify appropriate persons of changes.
- Investigate and report on-site accidents and incidents involving H&A and its subcontractors.
- Verify that site personnel are familiar with site safety requirements (e.g., the hospital route and emergency contact numbers).
- Report accidents, injuries, and near misses to the H&A PM and Regional Health and Safety Manager (RHSM) as needed.

The SSO will conduct initial site safety orientations with site personnel (including subcontractors) and conduct toolbox and safety meetings thereafter with H&A employees and H&A subcontractors at regular intervals and in accordance with H&A policy and contractual obligations. The SSO will track the attendance of site personnel at H&A orientations, toolbox talks, and safety meetings.

FIELD PERSONNEL

Haley & Aldrich personnel are responsible for following the health and safety procedures specified in this HASP and for performing their work in a safe and responsible manner. Some of the specific responsibilities of the field personnel are as follows:

- Reading the HASP in its entirety prior to the start of on-site work;
- Submitting a completed Safety Plan Acceptance Form and documentation of medical surveillance and training to the SSO prior to the start of work;
- Attending the pre-entry briefing prior to beginning on-site work;
- Bringing forth any questions or concerns regarding the content of the Safety Plan to the PM or the SSO prior to the start of work;
- Stopping work when it is not believed it can be performed safely;
- Reporting all accidents, injuries and illnesses, regardless of their severity, to the SSO;
- Complying with the requirements of this safety plan and the requests of the SSO; and
- Reviewing the established JSAs for the site-specific hazards on a daily basis and prior to each shift 3 applicable.

VISITORS

Authorized visitors (e.g., Client Representatives, Regulators, Haley & Aldrich management staff, etc.) requiring entry to any work location on the site will be briefed by the Site Supervisor on the hazards present at that location. Visitors will be escorted at all times at the work location and will be responsible for compliance with their employer's health and safety policies. In addition, this safety plan specifies the minimum acceptable qualifications, training and personal protective equipment which are required for entry to any controlled work area; visitors must comply with these requirements at all times. Unauthorized visitors, and visitors not meeting the specified qualifications, will not be permitted within established controlled work areas.

APPENDIX B: HEALTH & SAFETY PLAN ACKNOWLEDGEMENT FORM

Note: Only H&A employees sign this page.

I hereby acknowledge receipt and briefing on this Health & Safety Plan prior to the start of on-site work and declare that I understand and agree to follow the provisions and procedures set forth herein while working on this site.

PRINTED NAME

SIGNATURE

DATE

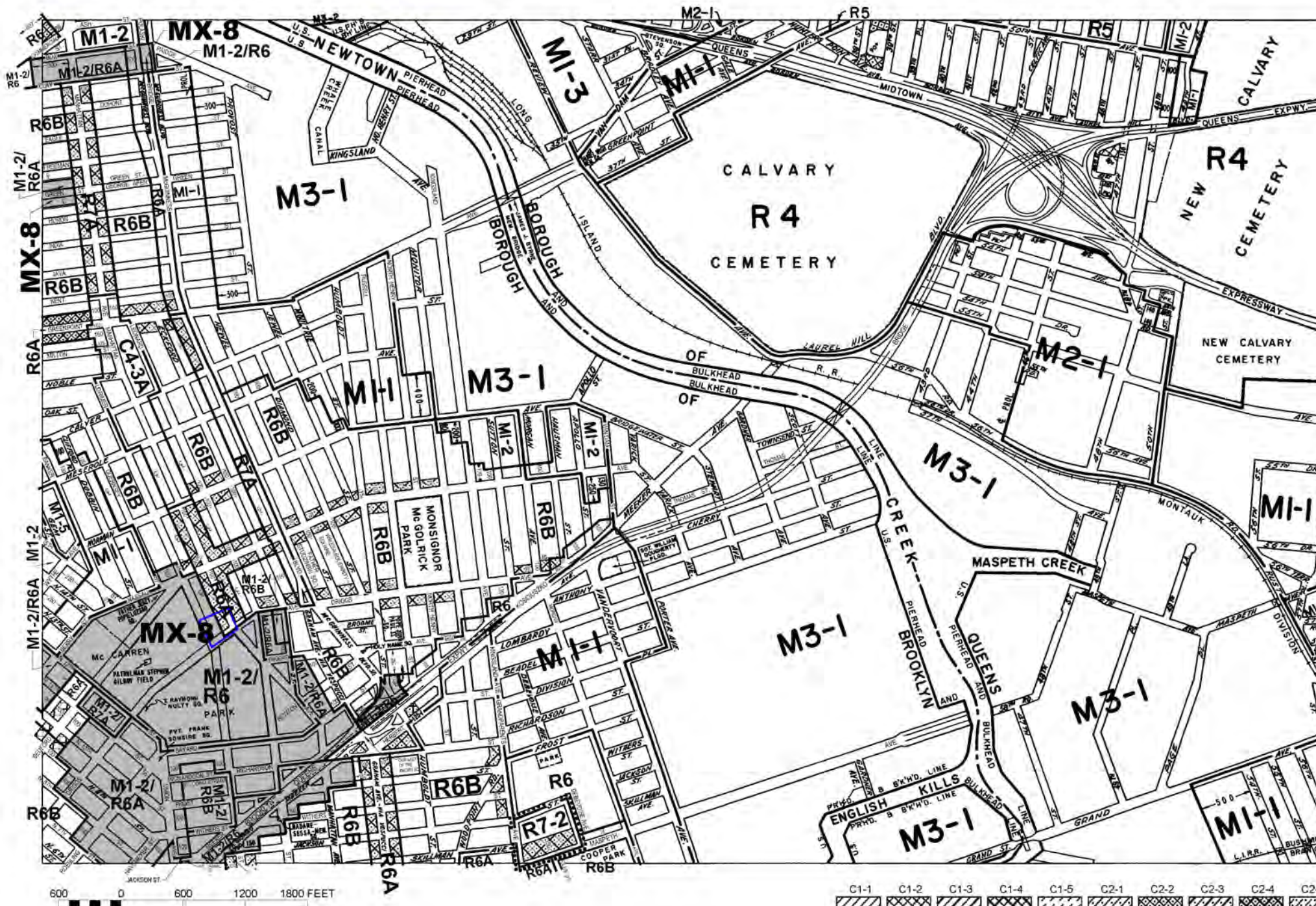
APPENDIX E

Citizen Participation Plan

APPENDIX F

Zoning Map

Click blue outline on map to view diagram of **proposed** zoning change



ZONING MAP

THE NEW YORK CITY PLANNING COMMISSION

Major Zoning Classifications:

The number(s) and/or letter(s) that follows an R, C or M District designation indicates use, bulk and other controls as described in the text of the Zoning Resolution.

R - RESIDENTIAL DISTRICT

C - COMMERCIAL DISTRICT

M - MANUFACTURING DISTRICT

SPECIAL PURPOSE DISTRICT
The letter(s) within the shaded area designates the special purpose district as described in the text of the Zoning Resolution.

AREA(S) REZONED

Effective Date(s) of Rezoning:

11-23-2021 C-210486 JMK

Special Requirements:

For a list of lots subject to GEQR environmental requirements, see APPENDIX C.

For a list of lots subject to "D" restrictive declarations, see APPENDIX D.

For Inclusionary Housing designated areas and Mandatory Inclusionary Housing areas on this map, see APPENDIX F.

MAP KEY

8d	9b	9d
12c	13a	13c
12d	13b	13d

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C1-1	C1-2	C1-3	C1-4	C1-5	C2-1	C2-2	C2-3	C2-4	C2-5

NOTE: Where no dimensions for zoning district boundaries appear on the zoning maps, such dimensions are determined in Article VII, Chapter 6 (Location of District Boundaries) of the Zoning Resolution.

ZONING
MAP **13a**

NOTE: Zoning information as shown on this map is subject to change. For the most up-to-date zoning information for this map, visit the Zoning section of the Department of City Planning website: www.nyc.gov/planning or contact the Zoning Information Desk at (212) 720-3291.

APPENDIX G

Project Personnel Resumes

**SCOTT A. UNDERHILL, P.E.**

Senior Environmental Remediation Engineer

EDUCATION

M.S., Environmental Engineering, State University of New York

B.S., Civil Engineering, State University of New York

PROFESSIONAL REGISTRATIONS

1998/ NY: Professional Engineer (Reg. No. 075332)

SPECIAL STUDIES AND COURSES

40-Hour OSHA Hazardous Waste Operations and Emergency Response Training (29 CFR 1910.120)

8-Hour Hazardous Waste Operations and Emergency Response Supervisor Training
Project Management Training

8-Hour Hazardous Waste Operations and Emergency Response Refresher

Scott has 25 years of experience as an environmental engineer. His diverse background includes the investigation, design, installation, and operation of remediation systems for soil, water, and air; design of water and wastewater treatment facilities; energy studies; and numerical modeling of environmental media. Scott has worked for federal, state and industrial clients throughout the United States, most recently working on the remediation of contaminated sites, such as manufactured gas plant (MGP) and chlorinated solvent, in the Northeast and Midwest.

RELEVANT PROJECT EXPERIENCE

New Jersey Natural Gas, Former MGP Remediation, Toms River, New Jersey. Construction project manager for the construction inspection oversight of a former MGP that consists of the removal and off-site disposal of 6,800 cubic yards of impacted soils, dewatering during excavation that produced over 12,000,000 gallons of water to handle, treat and dispose, and in situ solidification (ISS) of 85,000 cubic yards of soil to depths of 45 feet. Engineering oversight services provided during construction included attending weekly meetings, reviewing contractor submittals, issuing field orders and work change directives, reviewing and responding to change order requests, developing change orders, responding to request for information, and documenting remediation activities in a remedial action report.

Duke Energy, Former MGP Remediation, Cincinnati, Ohio. Lead design engineer for a design/build remediation project at a former MGP that consists of the removal and off-site disposal of 75,000 cubic yards of impacted soils, dewatering during excavations, and ISS of over 150,000 cubic yards of soil to depths of 60 feet below ground surface. Engineering services provided during construction included weekly engineering calls, working with contractor to develop engineering solutions to changes in field conditions, reviewing contractor submittals, issuing field orders, developing change orders, and documenting remediation activities in a construction completion report.

AEP, Former MGP Remediation, Three Rivers, Michigan. Lead design engineer for a design/build remediation project at a former manufactured gas plant (MGP) that consists of the installation of a four-cell sheeting system, installation and operation of a dewatering system that removed and discharged 420,000 gallons of water, and removal and off-site disposal of 5,400 cubic yards of impacted soils. Engineering services included developing full set of design drawings and specifications and provided engineering oversight during construction included weekly engineering calls, working to develop engineering solutions to changes in field conditions, and documenting remediation activities in a construction completion report.

American Electric Power, Former MGP Remediation, Dowagiac, Michigan. Lead design engineer for a design/build remediation project at a former manufactured gas plant (MGP) that consists of the removal and off-site disposal of 1,000 tons of impacted soils. Engineering services included developing full set of design drawings and specifications

and provided engineering oversight during construction included weekly engineering calls, working to develop engineering solutions to changes in field conditions, and documenting remediation activities in a construction completion report.

New York State Energy and Gas, Former MGP Remediation, Lockport, New York. Project manager for the remedial design of a former MGP that consists of the removal of 4,000 cubic yards of impacted soils, overburden non-aqueous phase liquid (NAPL) collection trench, 600 linear feet of bedrock grout wall, bedrock NAPL collection wells and the removal of 1,200 cubic yards of impacted sediment from the NYS Barge Canal. Design required submission of work plan, pilot test for grout wall implementation, and New York State Department of Environmental Conservation (NYSDEC) approval of final design drawing, report and specifications. Program director for the engineering oversight services provided during construction which included attending weekly meetings, reviewing contractor submittals, reviewing and approving change orders, responding to request for information, and certifying the construction completion report.

New York State Energy and Gas, Former MGP Remediation, Norwich, New York. Project manager for design and construction management, including design of an ISS system of 52,000 cubic yards of soil and NAPL recovery, in situ chemical oxidation (ISCO) and enhanced in situ bioremediation systems for the off-site groundwater plume. Scott managed preparation of work plans for submission to the NYSDEC and on-site construction management services during remediation of the on-site ISS services. Scott managed the operation and maintenance of the NAPL recovery system from 2009-2016 which resulted in the recovery of almost 100,000 gallons of total fluids or 40,000 gallons of NAPL. Due to the large quantities of NAPL encountered off-site, initiated and obtained NYSDEC approval in 2015 for a modification to the Record of Decision to all for ISS of the off-site soils rather than NAPL recovery and ISCO. Program director for the design package for the ISS treatment of 11,500 cubic yards of soil and NAPL.

New York State Energy and Gas, Former MGP Remediation, Ithaca, New York. Project manager for remedial design of a former MGP plant that consisted of the removal of 11,000 tons of impacted soils within sheet piling down to a depth of 18 feet, temporary relocation of a sewer main, and three injection events for in situ chemical oxidation (ISCO) treatment of coal tar stringers. Design requires submission of work plan, pilot test for ISCO implementation, and NYSDEC approval of final design drawing, report and specifications. Program director for the engineering oversight services provided during construction which included attending weekly meetings, reviewing contractor submittals, reviewing and approving change orders, responding to request for information, and certifying the construction completion report.

New York State Department of Environmental Conservation, New York. Program manager of three standby engineering services contracts issued by the NYSDEC for the investigation, design, construction oversight, and site management of inactive hazardous waste sites within New York. Responsible for overall program management, including budgeting, schedule and quality deliverable to the NYSDEC for over 100 individual work assignments valued at over \$35,000,000, which was managed by a team of over 12 project managers. As required, acted as engineer-of-record for many sites, which required approval of feasibility studies, remedial designs, construction completion reports, and periodic review reports.

United States Army Corps of Engineers, Former Scotia Naval Depot, Scotia, New York. Project manager for the design and installation of a 900-foot-long, 45-foot-high and 0.25-foot-thick permeable reactive barrier (PRB) wall containing zero valent iron. The PRB was installed to treat a chlorinated solvent groundwater plume. In addition, four large commercial buildings (80,000 square feet) over a portion of the groundwater plume were fitted with sub-slab depressurization systems to mitigate indoor air concerns. As project manager, Scott was responsible for project deliverables, costs, schedule and quality for the \$10MM remediation project.

New York State Department of Environmental Conservation, Scotia New York. Remedial design lead and engineer of record for the development and issuance of two feasibility studies (on-site and off-site) for a large, complex inactive hazardous waste site. An estimated 7,000 gallons of tetrachloroethylene (PCE) released to the environment created a groundwater plume almost ¾ mile in length and impacting numerous residential supply wells. The on-site feasibility

study evaluated remedial technologies selecting excavation and in situ thermal treatment for a present worth cost of \$14,000,000. The off-site feasibility study selected ISCO/bioremediation and downgradient permeable reactive barrier wall to treat the plume with concentrations greater than 100 µg/L with a present worth cost of \$13,000,000. Also designed an aeration system as an interim remedial measure to treat PCE impacts to local surface water detention pond and stream.

New York State Department of Environmental Conservation, Scotia New York. Project manager for the design and construction oversight of the installation of water line to a residential neighborhood affected by a PCE plume. The design consisted of engineering calculations, basis of design, drawings, and specifications for the installation of 8,800 linear feet of water main and 100 residential connections. Construction services included reviewing contractor submittals and invoices, overseeing contractor work, responding to request for information and attending weekly construction meetings.

New York State Energy and Gas, Former MGP Remediation, Homer, New York. Project manager for design and construction management, including design of a permanent watertight barrier wall system, in situ stabilization system within the utility corridor and a temporary water treatment plant as part of the remediation of 25,000 cubic yards of soil. Scott managed preparation of work plans for submission to the NYSDEC and on-site construction management services during remediation. Scott managed air monitoring, scheduling of trucks for off-site disposal of impacted soil, and preparation of daily reports and a final closure report.

New York State Energy and Gas, Former MGP Remediation, Mechanicville, New York. Project manager for design and construction management, including the design of a temporary watertight barrier wall system and temporary water treatment system as part of a remediation of 10,000 cubic yards of soil. The project also included the evaluation and development of alternatives for the recovery of coal tar contamination in the fractured bedrock underlying the site, which included performing multiple long-term NAPL recovery pump tests. Project manager for the engineering oversight services provided during construction which included attending weekly meetings, reviewing contractor submittals, reviewing and approving change orders, responding to request for information, and certifying the construction completion report.

New York State Department of Environmental Conservation, Poughkeepsie, New York. Engineer of record for the design and construction oversight of the thermal treatment of soil and groundwater at an inactive hazardous waste site impacted with chlorinated solvents. The design consisted of engineering calculations, basis of design, drawings, and specifications for the installation 100 electrodes to treat the 0.5-acre plume. Construction services included reviewing contractor submittals and invoices, overseeing contractor work, responding to request for information and attending regular construction meetings.

New York State Department of Environmental Conservation, Poughkeepsie, New York. Project engineer for the design and implementation of a full-scale pilot test of in situ enhanced bioremediation to treatment of soil and groundwater at an inactive hazardous waste site impacted with chlorinated solvents. The pilot study consisted of direct injection of approximately 4,150 gallons of 60% edible vegetable oil (EVO) and 7,825 pounds zero-valent iron (ZVI) at 75 points. Scott managed development of design and bid package, selected and oversaw injection contractor, and reviewed follow-on sampling reports.

United States Army Corps of Engineers, Griffiss Air Force Base, Rome, New York. Project engineer for land farming treatment of over 50,000 cubic yards of petroleum impacted soils. Activities included design of a land farming approach in a performance based contract to successfully remediate the soils within a three-year contract period. Due to an aggressive remediation approach, all soils were remediated within two years.

New York State Electric and Gas, Cortland Homer Manufactured Gas Plant Demolition Procurement, Homer, New York. Project manager for procuring a contractor to demolish the southern portion of the MGP building as defined by the demolition drawings. Work included developing a request for proposal with final demolition drawings, specifications, and bid schedule and overseeing successful completion of the building demolition.

New York State Energy and Gas, Former MGP Remediation, Oneonta, New York. Project engineer for the design of temporary water treatment system as part of the remediation of a former MGP site.

US Air National Guard, Site Management and Project Close-Out for Site 2 – Pesticide Burial Pit, Stewart ANGB, Newburg, New York. Project manager for preparation of a site management plan (SMP) and periodic review report (PRR) for Site 2 - Pesticide Burial Pit Area at the 105th Airlift Wing (AW), New York Air National Guard (ANG), and Stewart International Airport. Due to negotiations with the NYSDEC, Site 2 was delisted.

US Air National Guard, Remedial Design and Remedial Action, Site 15, Hancock ANGB, New York. Project engineer for the bioremediation of a petroleum groundwater plume. The project included the design, installation and operation of a 15 well biosparging system for the on-site source area and the injection of calcium peroxide for the downgradient plume. Responsible for the remedial action work plan, construction completion report and annual periodic review reports.

US Air National Guard, Interim Remedial Action and Focused Feasibility Study, Sites 3 and 6, Stratton ANGB, New York. Project manager for an interim remedial measure and focused feasibility study at Site 3 contaminated with chlorinated solvents, and Site 6 contaminated with petroleum hydrocarbons. At Site 6, managed removal of 6,200 tons of contaminated soil, installation of a horizontal well network below the water table, and injection of a substrate into the groundwater to enhance biodegradation of the contaminants. At Site 3, managing removal of 600 tons of contaminated soils from four hot spots, delineation of the nature and extent of groundwater contamination by installing and sampling new wells.

BP, Pilot-Scale Soil Thermal Treatment, Rumaila, Iraq. Primary author of a pilot scale work plan for the treatment of heavily-impacted soils at the Rumaila Well Field. Work plan included the evaluation of several thermal desorption units capable of being shipped to the location, transportation logistics, compound design for placement of the unit and utility requirements to operate the TDU.

Confidential Client, Lagoon Biocell Design, Maybrook, New York. Project engineer for the design of a membrane lined biocell for the treatment of 25,000 cubic yards of soils impacted with petroleum and pyridine compounds associated with former waste lagoons. Design also included the use of enhanced bioremediation for the contaminants of concern in groundwater. Scott managed development of a design in accordance with the remedial design and remedial action framework developed by the United States Environmental Protection Agency (USEPA).

Chevron, Malabalay Remediation Project, Philippines. Project engineer for remedial design sub-slab depressurization system and vapor barrier for the redevelopment of a gasoline station for a Jolibee Store in Malabalay. Project was completed within budget and on-time given challenging field conditions.

Confidential Client, Solid Waste Disposal Area, Kisladag, Turkey. Project engineer responsible for the development of a feasibility study to evaluate 1,250 cubic meters of petroleum impacted soil as a waste storage area at an active mining facility in Turkey. Remedial alternatives evaluated included land farming, windrow composting, bioremediation in piles, in situ solidification, and capping.

Chevron, Remedial Design and construction Oversight, Service Station/Residential House, Manila, Philippines. Project engineer for the design and implementation of a sub-slab barrier system and vapor collection system at a residential home downgradient from a gas station. Travelled to site to oversee installation and quality control of the first sub-slab barrier system to be installed in the Philippines. Project was recognized by Chevron for being completed with zero accidents.

BEM Systems, Remedial Design and Remedial Action, Site 6, Schenectady ANGB, New York. Project manager for the design and implementation of the in situ chemical oxidation of chlorinated hydrocarbon impacted groundwater at Site 6. Project included supporting the development and issuance of the Record of Decision (ROD), submission and approval of the remedial design and implementation of the injection of sodium permanganate to treat the residual groundwater plume at Site 6.

Navy, Light Non-Aqueous Phase Liquid (LNAPL) Modeling Effort, Pearl Harbor, HI. Provided technical support for investigation and modeling of several large LNAPL plumes at the Shipyard GSA at Pearl Harbor. The modeling effort included applying the van Genuchten method to properly estimating the LNAPL plume size, volume, distribution, transport, and potential release to the harbor.

New York State Department of Environmental Conservation, Remediation System Installation, National Heatset Printing, East Farmingdale, New York. Project engineer supporting the installation and evaluation of a pilot study evaluating the use of an innovative technology - density driven convection (DDC) and in-well stripping – for the treatment of a large chlorinated solvent plume in a sandy aquifer on Long Island.

NYSDEC, Remedial Design and Construction Oversight, North East Alloy and Metals Site, Utica, New York. Project engineer for the design of a sub-slab depressurization system (SSDS) at a residential house above a chlorinated solvent plume. The design utilized two fans and six vacuum points installed over a concrete slab. Oversaw contractor's installation of the system including sealing of the concrete floor cracks and documented installed system met the performance requirements of the design.

Confidential Client, Remediation System Pilot Study and Evaluation, Schenectady, New York. Project engineer responsible for technical evaluation and comparison of a traditional and an innovative thermal enhanced soil vapor extraction system below a concrete slab. The innovative thermal enhanced soil vapor extraction (TESVE) system removed over 99.99% of the volatile compounds and over 96% of the semi volatile compounds in the unsaturated zone and outperformed the traditional TESVE system.

NYSDEC, Remedial Design and Construction Oversight, Utility Manufacturing Site, New Hempstead, New York. Project engineer for the design of nine SSDSs at three industrial buildings above a chlorinated solvent plume. The design utilized 30 fans and 30 vacuum points installed over a concrete slab. Oversaw contractor's installation of the system and documented that the installed system met the performance requirements of the design.

NYSDEC, Remediation System Optimization, Multiple Sites, New York. Provided technical support for the optimization and improvements of a number of remediation systems currently operated under the NYSDEC contract (D004445). System evaluations and improvements included the Becker Electronic pump-and treat system; NOW Corporation pump-and-treat system; SMS Industries biosparge (PhoSTER) system; Kingsbury Landfill pump and treat system, Fort Edward phytoremediation system; and Korkay soil vapor extraction/air sparging system.

NYSDEC, Site Management, Multiple Sites, New York. Provided technical support, final review and engineering certification for periodic reviews on the following sites: Armonk; Becker Electronics; Dzus Fasteners; Fort Edward Landfill; Kingsbury Landfill; Korkay; Liberty Industries; Now Corporation; Old Agway; ServeAll; and SMS Industries.

NYSDEC, Remedial Design, BB&S Treated Lumber Site, Southampton, New York. Project engineer reviewing preliminary design concepts of the groundwater remedy selected in the ROD for this former wood pressure treating site. The site was contaminated primarily with chromium, which was associated with the former wood preservative chromated copper arsenate (CCA). Using results from the pre-design investigations, prepared a Supplemental Feasibility Study (FS) that formed the basis for NYSDEC to amend the ROD for the site. The Amended ROD revised the groundwater remedy for the site from groundwater pump and treat to providing an alternative water-supply to authorized homes and businesses, and ongoing monitoring of plume attenuation.

New York State Department of Environmental Conservation, Construction Oversight, Freeman's Bridge Site, Scotia, New York. Quality assurance/quality control (QA/QC) manager for the certification report of completion for the remediation of contaminated soils using low-temperature thermal desorption at the 34 Freeman's Bridge Road site.

New York State Office of General Services (NYSOGS), Remediation System Optimization, Multiple Sites, New York. Provided technical support for optimization and improvements of a number of remediation systems operated under the NYSOGS contract. System evaluations and improvements included the Bedford Hills pump-and-treat system and the Highland Residential pump-and-treat system.

Bank of New York, Brownfield Remediation Monthly Site Visits, Flushing, New York. Project manager for periodic site visits to review progress of work performed by Creamer Environmental, Inc., the remedial contractor working on behalf of Muss Development. Scott managed the review of the remedial progress in relation to the proposed schedule, budget, and New York State Department of Environmental Conservation approved work plans. Scott managed preparation of a site observation report with information pertaining to construction status; permits, tests, and certifications; subcontracts; change orders; and contractor's completion schedule.

Remediation System Design, Fort Drum Military Reservation, New York. Scott designed a 150-well multiphase extraction and air sparging system for remediation of a 200,000-gallon gasoline-contaminated area and oversaw installation, start-up, and operation of the complex remedial systems.

Solvent Site Remediation, Batavia, New York. Scott designed and implemented injection of whey powder solution for the bioremediation of a chlorinated solvent site.

Railyard, Oneonta, New York. Scott designed, installed, and operated two 8-well soil vapor extraction and air sparging system at an industrial facility.

Railyard Site, North Creek, New York. Scott implemented an innovative application of Fenton's reagent to remediate diesel-contaminated soil at a historic railyard. Was awarded an Engineering Excellence Award by the American Consulting Engineering Council.

Toluene Site, Pittsburgh, Pennsylvania. Scott optimized a 20-well soil vapor extraction and air sparge system at an industrial facility in an urban area.

Town of Windham, Wastewater Treatment Plant, Windham, New York. Scott designed a new 250,000-gpd wastewater treatment plant that used tertiary filtration, microfiltration, and ultraviolet disinfection.

Ski Windham, Wastewater Treatment Plant, Windham, New York. Scott designed tertiary filtration, microfiltration, and ultraviolet disinfection for a treatment plant upgrade.

Wastewater Treatment Plant Upgrade, Endicott, New York. Scott designed solids contact tanks, secondary clarifiers, ultraviolet disinfection system, and pumping station as part of the upgrade of the 10-mgd wastewater treatment plant.

New York State, Gas-to-Energy Studies, New York. Scott evaluated the potential of using landfill gas from Colonie Landfill at Mohawk Paper mills boilers.

New York State, Sludge-to-Energy Study, Glens Falls, New York. Scott evaluated the potential of using dried paper sludge from a paper manufacturer as feed material and energy source at a cement kiln.

Groundwater and Soil Vapor Treatment, Pease AFB, NH, and Loring AFB, Maine. Scott designed, installed, and operated in-situ treatment systems at the former bases, including two groundwater pump-and-treat systems, four soil vapor extraction and air sparging systems, and 16 bioventing systems.

Hydrocarbon Cleanup, Pease AFB, New Hampshire. Scott evaluated and implemented the use of natural attenuation to remediate more than 60 petroleum hydrocarbon plumes.

Remedial Action, Loring AFB, Maine. Field engineer responsible for eight remedial actions including oversight of three subcontractors.

Oak Ridge National Laboratory, RI Report, Oak Ridge, Tennessee. Scott prepared remedial investigation report for a radioactive waste burial.

Radioactive Waste Disposal Siting Study, Nebraska. Scott provided hydrologic modeling support for the safety analysis and license application permit for siting a low-level radioactive waste disposal site.

PUBLICATIONS

"Subsurface Solution," with C.H. Floess, T. Blazicek, M. Thorpe, S. McDonough and R. Doshi, *American Society of Civil Engineering Magazine*, pp. 76-81,86. September 2012.

"In Situ Chemical Oxidation of Saturated and Unsaturated Petroleum-Containing Soils at a Historic Railroad Site," with A.R. Vitolins, B.R. Nelson, L.M. Thomas, *Contaminated Soil Sediment and Water, International Issue*, pp. 38-40, 2001.

"Development and Application of a Geographically-Based Groundwater Flow and Solute Transport Model," Master's Thesis, State University of New York at Buffalo, 1993.

INVITED LECTURER OR SPEAKER

"Developing a Water Supply System in Rural Haiti," Albany, New York Celebration of Engineer's Week. February 16, 2012.

"Remediation of a Former MGP Site in Norwich, New York: A Case Study," with C. Floess and T. Blazicek, 27th Annual Conference on Contaminated Soils, Amherst, Massachusetts, October 17-20, 2011.

"Developing a Water Supply System in Rural Zimbabwe," . Albany, 7 June 2016, New York Celebration of Engineer's Week. February 15, 2008.

"Remediation of Petroleum-Containing Soil and Groundwater at a Former Rail Yard Locomotive Fueling Area," with S. Compston, B.R. Nelson, L.M. Thomas, 20th Annual Conference on Contaminated Soils, Amherst, Massachusetts, October 18-21, 2004.

"Optimization of an LNAPL Recovery System Based on the Observational Approach," with S. Taylor and A. Ditto, ASCE International Water Resources Engineering Conference in Seattle, Washington, August 8-11, 1999.

"Natural Attenuation of 60 Petroleum Groundwater Plumes at Pease Air Force Base, New Hampshire, USA," with S. Szojka and J. Flagg, 6th FZK/TNO International Conference on Contaminated Soils, Edinburgh, Scotland. May 17-21, 1998.

"Bioremediation of Petroleum Contaminated Soils at Loring Air Force Base, Maine," with P. Forbes and J.A. Mueller, Fourth International Conference on Bioremediation, New Orleans, Louisiana, April 28-May 2, 1997.

"Expedited CERCLA Removal Actions at Loring AFB," with T.R. Wood, D. St. Peter, D.S. Hopkins and J.A. Mueller, Maine. 11th Annual Conference on Contaminated Soils, Amherst, Massachusetts, October 21-24, 1996.

"Innovative Investigative Technique for Characterization of Radioactive Disposal Trenches," with J.B. Cange and S.A. Blair, Superfund XVI Conference, Washington D.C., November 6-8, 1995.

"Development of a Geographically Based Groundwater Flow and Solute Transport Model," with S.W. Taylor and J.V. DePinto, ASCE International Groundwater Symposium, San Antonio, Texas, August 14-18, 1995.

"Modeling Surface Water Flow and Contaminant Flux from a Mixed Waste Burial Ground," with R.A. Lambert and J.B. Cange, 21st Environmental Symposium. San Diego, California, April 18-21, 1995.

"Who's Taking Out the Garbage?," ASCE Environmental Engineering Division Conference. Reno, Nevada, July 6-10, 1991.



JAMES BELLEW

Senior Client Leader

EDUCATION

M.S., Environmental Geology, Queens College

B.S., Geology, Pre-Law, Environmental Science, Binghamton University

PROFESSIONAL SOCIETIES

American Council of Engineering Companies, Member, 2017

Urban Land Institute, Member, 2016

Business Council of New York, Member, 2018

SPECIAL STUDIES AND COURSES

40-Hour OSHA Hazardous Waste Operations and Emergency Response Training
(29 CFR 1910.120)

30-Hour OSHA Construction Safety and Health

8-hour OSHA Site Supervisor Certification

OSHA Confined Space Entry Training Certification

Erosion and Sediment Control, New York, No. 006925

USDOT/IATA Training on the Shipping and/or Transportation of Hazardous Materials

James Bellew is a senior client leader and geologist with experience in bedrock, soil and groundwater investigation and an emphasis on remedial design and implementation and will focus his time at Haley & Aldrich serving the Buildings and Infrastructure markets. His experience also includes completion of numerous Phase I Environmental Site Assessments and Phase II Environmental Site Investigations, development of conceptual site models, site characterization, environmental permitting, environmental compliance reports as well as remedial design and implementation. He has been involved with numerous projects within the New York State Superfund Program, New York State Brownfield Clean-up Program and New York City Office of Environmental Remediation E-Designation Program.

James has designed, estimated and managed large-scale remediation jobs in a variety of settings in the New York/New Jersey metropolitan area. He has performed construction management services on large scale projects requiring abatement of asbestos-containing materials and polychlorinated biphenyls (PCBs). He has direct experience developing and implementing operation, maintenance and monitoring programs for groundwater and soil remediation systems.

James has also worked on large scale remediation projects for Manufactured Gas Product (MGP) in the lower New York Region from former operations associated with National Grid and Con Edison. He has also designed, installed, operated and maintained remedial systems at retail petroleum stations for Hess Amerada, British Petroleum, Sunoco and Shell in addition to providing operation and maintenance programs for chemical injection and petroleum systems for New York State Department of Environmental Conservation (NYSDEC) Superfund and Environmental Protection Agency (EPA) Superfund Sites.

RELEVANT PROJECT EXPERIENCE

Development, Former BP Station, Elmhurst Queens, NY. James was responsible for the preparation of a full environmental impact statement with respect to a mixed-use development proposed in Elmhurst Queens. The work includes a full impact assessment of the proposed construction with respect to the neighborhood, evaluation of green/open spaces for the community and environmental site investigation and remediation services.

New York State Superfund Site, Former Nuhart Plastics Site, New York State Superfund Site, Brooklyn, NY. Senior Project Manager for a feasibility study and remedial planning for a former plasticizer facility with on- and off-site pollutant concerns. Project was a high-profile New York State Superfund Site that required compliance with the

NYSDEC, the New York City Office of Environmental Remediation (NYCOER), and local regulatory agencies. Ongoing work was the operation and maintenance (O&M) activities related to two large groundwater plumes impacted by light non-aqueous liquids (LNAPL) with phthalates and trichloroethene (TCE), which extend downgradient of the Site. Completed the first remedial action design for Lot 57 which is enrolled in the NYCOER E-Designation program. The Site will include two additional developments within the former manufacturing building footprint.

New York State Brownfield Site, Former Delta Metals Site, Brooklyn, NY. Senior Project manager for the remedial investigation and remedial action design for the former Delta Metal Products Company. Project is under the New York State Brownfield Cleanup program as a Participant where TCE and tetrachloroethene (PCE) were encountered in soil and groundwater. James successfully delineated the vertical and lateral extents of the plumes which were identified as an upgradient, on-site and downgradient plume. Investigation results triggered the NYSDEC to utilize its call-out contract to perform a plume trackdown for the immediate area and identify additional Potentially Responsible Parties. The design for an Air Sparge Soil Vapor Extraction system has been accepted and the project is currently in construction.

Manufacturing-Industrial, Hess Amerada, Bogota and Edgewater, NJ. James provided construction management services for the demolition of two waterfront terminals, one each on the Hackensack and Hudson rivers. Demolition included oversight, planning and coordination of activities related to asbestos abatement, demolition of buildings, thirty holding tanks, piping structures, containment structures and storm water structures.

Manufacturing-Industrial, PQ Corporation, Northeastern United States. James designed and implemented a three phased program for handling PCBs containing materials on approximately 100 tank structures at large, active industrial sites, which included coating removal, encapsulation, demolition, and Toxic Substances Control Act (TSCA) remediation. He was responsible for development of the overall program, specifications, drawings, bid packages, construction oversight and project administration until closure. Program also included design and oversight of a new façade and roof upgrades completed concurrently to client operations.

Development, New York State Brownfield Site, Former Cascade Laundry, Brooklyn, NY. James was responsible for environmental and construction management services required to successfully navigate seven-building redevelopment project through the NYSDEC Brownfield Cleanup Program (BCP). Project included site investigation, design, and remediation for development of seven buildings within a 2-acre site in Brooklyn, New York. Remediation included excavation of approximately 40,000 cubic yards of soil, groundwater extraction and treatment, underground storage tank (UST) removal, design and installation of a Sub Slab Depressurization System (SSDS) and ex situ chemical oxidation of groundwater impacted by petroleum.

Development, New York City Brownfield Site - 520-534 West 29th Street, New York, NY. James was responsible for environmental site investigation and remediation activities required to successfully navigate the project through the New York City Office of Environmental Remediation's (NYCOER's) E-Designation and Voluntary Cleanup Programs. Project included demolition of existing buildings and development of two separate mixed-use buildings.

Development, New York State Brownfield Site, BJ's Wholesale, Brooklyn, NY. James managed construction oversight activities at an 8-acre peninsula in Gravesend Bay being redeveloped by BJ's Wholesale Club (BJ's) into a "big-box" warehouse and parking garage, and a publicly accessible, waterfront open space. Implemented a comprehensive community air monitoring plan (CAMP), managed the design and installation of a passive sub slab depressurization system, and oversaw handling and off-site disposal of impacted material generated by BJ's (the Lessee for the subject site) during their foundation construction activities.

Development, New York State Brownfield Site, Coney Island, Brooklyn, NY. James provided environmental services during the rehabilitation and expansion of a 1970s-era mixed-use complex, which covers an area equivalent to three city block. He facilitated the BCP applications for two adjacent parcels within the complex impacted by historic dry-cleaning uses. Site investigations performed had documented the presence of PCE in soil gas and was delineated over three separate structural slabs in commercial and residential space utilizing a mobile laboratory. He designed and installed two sub-slab depressurization systems and prepared Remedial Investigation Work Plan which outlined work

required to delineate the vertical and horizontal extent of the impacted soils, soil vapor and groundwater at both BCP sites. The system was designed with below slab suction pits, remote sensing vacuum monitoring points, and a variable frequency drive blower tied into the monitoring points for optimization and power savings.

Development, New York City Brownfield Site, Hospitals, Memorial Sloan Kettering Cancer Center (MSKCC), New York, NY. Project Manager for environmental remediation for this MSKCC development project. James was directly responsible for subsurface investigation and remediation activities, large MGP gas holder removal (from former Con Edison Operations), UST removal, daily status updates to the NYCOER, implementation of the CAMP and the management, handling, characterization, and off-site disposal of MGP impacted soil and dewatering fluids.

New York State Spill Remediation, Metropolitan Transportation Agency Bridges and Tunnels, New York, NY. James managed investigation for underground storage tank removal, excavation of 600 cubic yards of petroleum impacted soil, design and installation of a groundwater extraction and treatment system and post remediation samples. Implemented the In Situ Chemical Oxidation program for the injection of 54,000 gallons of 8 percent solution Fenton's Reagent and the O&M of the petroleum spill with respect to the Fenton's performance and the plume migration.

Various Public Schools, New York City School Construction Authority, New York, NY. James oversaw environmental remediation proposed for several school development sites, including PS 312, P.S. 281 and PS 27K. Assisted in the design and implementation of the remediation programs for the sites for petroleum spills, PCB TSCA contamination and hazardous lead hot spots.

Development, i.Park Edgewater, Edgewater, NJ. James designed and oversaw the environmental remediation on-site. Implemented the construction plan for remediation of arsenic, pitch- and PCB-impacted soil for excavation and off-site disposal of 20,000 tons. He managed the air monitoring system on-site which consisted of four permanent stations set upwind and downwind on-site for volatile organic compound (VOC) and particulate migration off-site. Also, James performed redesigns throughout the project to keep within the current schedule and budget.

Development, New York State Brownfield, Queens West, Long Island City, NY. Assistant Project Manager for oversight of the Environmental Remediation on-site. James implemented the construction plan for remediation of 20,000 cubic yards of LNAPL on the Site; he assisted in design and oversight of the In Situ Chemical Oxidation mixing on-site. The project was eventually developed into three large towers and a new school.

Manufactured Gas Plant, National Grid, Rockaway, NY. James aided in the design and implementation of the soil characterization plan for MGP impacted sands. After delineation of the contamination plume, helped draft work plans and site layout of the negative pressure tent. He performed and trained the on-site staff on the use of personal air monitoring equipment and provided assistance with design considerations on the installation of a waterloo barrier to be advanced to minus 80 feet below grade surface. James also helped with the design and permitting for the groundwater treatment system installed on-site.

Manufactured Gas Plant, Con Edison, New York, NY. Environmental engineer for responsible party for all environmental issues associated with this job, including transportation and disposal of 8,000 tons of MGP contaminated soil from former Con Edison operations. James scheduled weekly work for all civil and environmental tasks on the job. He was responsible for the design and installation of the dewatering treatment system with a daily discharge of 25,000 gallons per day of MGP-impacted water.

New York State Superfund Project, NYSDEC, Hicksville, NY. James performed O&M and reporting on the Site's Potassium Permanganate Injection system, which was on a timed system; maintained the system, troubleshooting problems and ensuring that the proper ratios were being injected. He performed the fieldwork for analysis and drafted interim reports for the project manager.

Retail Petroleum, New York State Spills Program, Hess Amerada, Various Locations, NY. James designed installed and maintained groundwater and soil vapor remedial systems at over 30 retail petroleum stations for Hess. Responsible for ensuring that the remedial systems were operating properly and performing repairs as necessary

during operation. He performed groundwater and soil vapor monitoring and drafted O&M reports for the NYSDEC. Plume size ranged from within the retail station property with monitoring off-site impacts in local neighborhoods greater than a 3-mile radius.

Retail Petroleum, New York State Spills Program, British Petroleum, Various Locations, NY. James designed installed and maintained groundwater and soil vapor remedial systems at over 10 retail petroleum stations for BP. He was responsible for ensuring that the remedial systems were operating properly and performing repairs necessary during operation. He performed groundwater and soil vapor monitoring and drafted O&M reports for the NYSDEC. Plume size ranged from within the retail station property with monitoring off-site impacts in local neighborhoods greater than a 2-mile radius.

Development, 524 West 19th Street, New York, NY (Metal Shutter Homes). Responsible party for all environmental and civil issues associated with this job, including transportation and disposal of 5,000 tons of MGP contaminated soil from former Con Edison operations. James scheduled weekly work for all civil and environmental tasks on the job. He successfully redesigned the grout cutoff wall connections to the installed steel sheeting with a secant wall installed off-site. He provided technical guidance for drilling 4-foot diameter exploratory casings for subsurface anomalies. Additionally, James was responsible for the design and installation of the dewatering treatment system with a daily discharge of 25,000 gallons per day of MGP impacted water.

EPA Superfund Site, Newtown Creek Superfund, Brooklyn, NY. James aided in the design of the pump and treat system installed at Peerless Importers. He also aided in the design and installation of the harbor boom set up. Operated and Maintained groundwater/LNAPL extraction systems on-site and performed monthly site gauging as part of the O&M plan.



MARI C. CONLON

Project Manager

EDUCATION

M.S., Geology, Boston College

B.S., Geology with a minor in Economics and Business, Lafayette College

PROFESSIONAL REGISTRATIONS

NY: Professional Geologist (License No. 000769)

PROFESSIONAL SOCIETIES

Big Apple Brownfield Awards, Co-Chair, 2018-2019

Big Apple Brownfield Awards Nomination Committee, 2016-2017

SPECIAL STUDIES AND COURSES

40-Hour OSHA Hazardous Waste Operations and Emergency Response Training (29 CFR 1910.120)

10-Hour OSHA Construction Safety

8-Hour OSHA Supervisor of Hazardous Waste (29 CFR 1910.120 & 29 CFR 1926.65)

Mari is a project manager with experience in soil, groundwater and soil vapor investigation and a focus on remedial design and implementation, and will focus her time at Haley & Aldrich serving the environmental and real estate markets. She is also experienced in completion of numerous Phase I Environmental Site Assessments and Phase II Environmental Site Investigations, site characterization, hazardous materials analysis, regulatory closure reports as well as remedial design and implementation.

Mari has experience in composing site closure documentation including Remedial Closure Reports and Noise Installation Reports reviewed by the Office of Environmental Remediation as well as Final Engineering Reports reviewed by the New York State Department of Environmental Conservation. Her background includes developing and complying with approved site management plans overseeing the operation and maintenance of on-site engineering controls and ensuring the protection of human health and the environment.

Mari has also worked on city rezoning proposals by performing work associated with and composing the Hazardous Materials Analysis chapter included in Final Environmental Impact Statements published by New York City Department of Planning. Analysis methods were performed in accordance with the City Environmental Quality Review (CEQR) guidelines for neighborhoods including East New York, Brooklyn, Jerome Avenue, Brooklyn, Inwood, and Manhattan.

RELEVANT PROJECT EXPERIENCE

State and City Agencies

School Construction Authority, Waste Characterization and Excavation Materials Disposal Plan, Brooklyn, New York.

Project manager for consulting services for New York Public School 127. Services included composition of an Excavated Materials Disposal Plan, collection of waste characterization samples and preparation of and preparation of a findings and recommendations report.

Department of City Planning, Rezoning Environmental Impact Statement, Bronx, New York. Project lead for analysis and composing the Hazardous Materials Chapter as per City Environmental Quality Review (CEQR) Technical Manual guidelines included in the Final Environmental Impact Statement (FEIS) for an approximately 92-block area primarily along Jerome Avenue and its east-west commercial corridors in the Bronx. The review assessed the potential for the presence of hazardous materials in soil and/or groundwater at both the projected and potential development sites identified in the reasonable worst-case development scenario under the proposed East New York Rezoning Proposal. Procedures involved site inspections and review of historic Sanborn fire insurance maps, city directories and city/state regulatory databases. The assessment identified that each of the 146 projected and potential development sites has

some associated concern regarding environmental conditions. As a result, the proposed zoning map actions include (E) designations (E-366) for all privately-held projected and potential development sites.

Department of City Planning, Rezoning Environmental Impact Statement, Brooklyn, New York. Project lead for performance analysis and composing the Hazardous Materials Chapter as per CEQR Technical Manual guidelines included in the FEIS for an approximately 190-block area of East New York, Cypress Hills, and Ocean Hill neighborhoods of Brooklyn, New York. The review assessed the potential for the presence of hazardous materials in soil and/or groundwater at both the projected and potential development sites identified in the reasonable worst-case development scenario under the proposed East New York Rezoning Proposal. Procedures involved site inspections and review of historic Sanborn fire insurance maps, city directories and city/state regulatory databases. The assessment identified that each of the 186 projected and potential development sites has some associated concern regarding environmental conditions. As a result, the proposed zoning map actions include (E) designations (E-366) for all privately-held projected and potential development sites.

Redevelopment and Remediation

Titan Equity Group, Hotel Redevelopment, Bronx, New York. Project manager for a hotel redevelopment in the south Bronx. The site has been assigned New York City Office of Environmental Remediation (NYC OER) E-Designation status for hazardous materials, noise and air quality. Services included completion of a remedial investigation, composition of a Remedial Investigation Report and development of Hazardous Material Remedial Action Work Plan and Air Quality/Noise Remedial Action Plan as per NYC OER requirements.

The Related Companies, Chelsea Mixed-Use Redevelopment, New York, New York. Field geologist for oversight of the remediation of a mixed-use residential and commercial building, the second of a two-building development on 30th Street. Contaminants of concern included volatile and semi-volatile organic compounds associated with historic operations and underground storage tanks (USTs) located on the Site. The Site was given an E-designation (E-142) for hazardous materials and noise as part of the Highline/West Chelsea rezoning proposal. To satisfy the requirements of the E-designation program, soil was excavated to at least 12 feet below grade and bottom endpoint collected showing no contaminants of concern exceeding the New York State Department of Environmental Conservation (NYSDEC) Unrestricted Use Soil Cleanup Objectives (SCO). By achieving Unrestricted Use SCOs, no engineering controls were necessary, although the building slab was included as part of development, and removal of the hazardous materials E-designation was requested.

Tishman Speyer, Long Island City Residential Development, Long Island City, New York. Field geologist for remedial oversight and implementation of a Community Air Monitoring Program during concurrent remediation and development of three Brownfield Cleanup Program (BCP) sites located in Long Island City, New York. The Sites were grossly contaminated with creosote, a carcinogenic chemical formed from the distillation of various tars. Remediation strategies included soil excavation and in-situ soil stabilization. To prevent migration of groundwater off-site, a temporary and later a permanent capture well system was installed on the western boundary of the property. The BCP site located on the western portion of the property left residual contamination in place requiring installation of a sub-slab depressurization system.

Queens West Development Corporation, Queens Waterfront Development, Long Island City, New York. Field geologist for performance of site management post remedial action. Services included annual groundwater monitoring, evaluation of engineering and institutional controls completion and Period Review Reports. In addition to conducting annual site management activities, responsibilities included composing a work plan to evaluate the transition from active sub-slab depressurization systems to passive. Upon NYSDEC approval, active systems were shut down for 30 days prior to a sub-slab vapor sampling event evaluation soil vapor, indoor and outdoor air conditions for potential vapor intrusion risk. As results indicated no evidence of vapor intrusion, continued pressure monitoring was conducted for from the existing monitoring ports for one year assessing whether negative pressure was held by the existing slab by stack-effect or other passive processes.

Jim Beam Brands Co., Brownfield Cleanup Program Remediation Site, Long Island City, New York. Field geologist for oversight of the installation of an Electrical Resistive Heating (ERH) system implemented in order to remediate trichloroethylene groundwater plumes in shallow/intermediate and deep groundwater on- and off-site. The Site, a former stapler manufacturing facility, underwent various remedies, including a Soil Vapor Extraction system, air sparging, ozone injection and chemical oxidation using potassium permanganate injections, which resulted in little reduction to contamination levels and rebounding chlorinated solvents. Components of the ERH system installed included electrodes for delivery of steam, vapor recovery wells, and groundwater monitoring wells. The site is currently under remediation in the state BCP program.

Due Diligence and Site Characterization

Manufacturing Plants, Multiple Investors, Environmental and Compliance Assessment Portfolio United States.

Project lead for completion of Phase I Environmental Site Assessments (ESAs) and Limited Compliance Reviews for multiple auto parts manufacturing facilities throughout the United States. Services included completion of Phase I ESAs in accordance with the American Society for Testing and Materials E1527-13 requirements and a limited review of each facility's compliance liabilities including issues pertaining to the Resource Conservation and Recovery Act, Greenhouse Gas Emission Standards and Tier II Emergency and Hazardous Chemical Inventory reporting requirements.

ARM Parking, Environmental Site Assessment and Subsurface Investigation, Brooklyn, New York. Project manager for site assessment and subsurface investigation of parking facility in Sunset Park neighborhood, Brooklyn, New York. Services included ground penetrating radar survey for former and current petroleum USTs, completion of a subsurface investigation of soils and composition of Limited Subsurface Investigation Report.

Spill Consulting

The Trump Organization, Spill Consulting Services, New York, New York. Project manager for consulting services provided after incidental release of calcium carbonate ice rink paint to the Central Park Pond from Wollman Rink. Services included liaising with NYSDEC regarding violations, consent order and required corrective action. Corrective action included designing alterations to the existing on-site drainage plans and routing all meltwater containing paint into the combined sewer system. Coordination was required with property owner, operations personnel, New York City Department of Parks and NYSDEC.

Richmond Gardens Apartments, Spill Management and Closure Services, Staten Island, New York. Project lead responsible for spill closure activities and reporting for Spill 1105661 located at the Richmond Gardens Apartment Complex in the Richmond neighborhood of Staten Island, New York. The spill was opened in 2011 when several underground storage tanks were identified adjacent to the apartments at Jersey Street and Hendricks Avenue. The tanks were cleaned and removed and impacted soils surrounding the tank area excavated to the extent possible. Excavation of all impacted material was not feasible due to the proximity of the tanks to the apartment buildings. Residual contamination in soil and groundwater remained and was monitored through 2016. Upon reviewing the groundwater monitoring data from over 12 consecutive quarters, it was apparent monitored natural attenuation was not a feasible option and an in situ chemical oxidation (ISCO) remedy was approved by NYSDEC. Due to success of the pilot test, the ISCO injection event was implemented utilizing pressure pulse technology to deliver the alkaline activated persulfate solution to the subsurface.

**BRIAN FITZPATRICK, CHMM**

Corporate Director, Health and Safety

EDUCATION

M.P.A., Environmental Policy, Syracuse University
B.S., Environmental Science, University of Massachusetts-Amherst
A.S., Chemistry, Valley Forge Military Junior College
Commissioned Officer, United States Army

CERTIFICATIONS

Certified Hazardous Materials Manager (Reg. No. 13454)
Certified Department of Transportation Shipper
Certified International Air Transport Authority Shipper

PROFESSIONAL SOCIETIES

Alliance of Hazardous Materials Professionals
Academy of Certified Hazardous Materials Managers, New England Chapter

SPECIAL STUDIES AND COURSES

Department of Transportation	Radiation Safety Officer
International Air Transport Authority	RCRA Hazardous Waste
Incident Commander	Massachusetts Industrial Waste Water
Confined Space Entry and Rescue	Operator Grade 2I (expired)

AWARDS

Presidents Club Award (one million hours worked without a recordable injury, Cabot Corporation)
Chancellors Award for Excellence, Syracuse University

Brian has over 25 years of experience in developing, implementing, and managing a wide range of environmental, health, and safety (EH&S) solutions for a variety of clients. Brian has served as the Health and Safety Manager and Incident Commander at several research and development sites and has managed extensive programs to maintain and clean contaminated sites under Federal and State regulatory programs. He has provided expertise in managing EH&S programs as a consultant, and has actively developed, implemented, and managed these programs as an EH&S professional for various industries.

Brian is currently working as the Chief Health and Safety Officer for Haley & Aldrich, Inc. He, and his staff, are involved in every project Haley & Aldrich, Inc. undertakes. Brian is involved on several projects, directly overseeing the health and safety on the project site of our staff, our contractors, and the public. Brian also acts as support for our on-site health and safety staff on other larger construction and remediation projects.

Through Brian's leadership our safety culture and focus extend from the top of our organization to each and every Haley & Aldrich employee as well as subconsultants and subcontractors. Utilizing a Behavior Based Safety approach, Haley & Aldrich expects every project team member to play an important role in making our projects safe and has given authority to every Haley & Aldrich employee, subconsultant, and subcontractor to stop any activity at any time for health or safety concerns. Our record illustrates that our hard work is paying off. The company has gone 4 years without a lost time injury, and our TRIR and EMR have consistently improved each of the last 3 years.

RELEVANT PROJECT EXPERIENCE

Haley & Aldrich, Inc., Burlington, Massachusetts. As Chief Health and Safety Officer, Brian has led and facilitated the development and implementation of corporate health and safety (H&S) improvement plans to enhance compliance and improve H&S performance. In Brian's time with Haley & Aldrich, Inc., the company has realized dramatic improvement on H&S goals and in Key Performance Indicators. Brian is responsible for developing a risk competence culture, where our staff are empowered to look for and engage to address risk before anyone is injured. Brian oversees the development, implementation and continuous improvement of all H&S programs for the company.

Additional responsibilities include:

- Developing a safety culture through incident reporting, root cause analysis, behavior-based safety, hazard recognition and risk assessment, communication, and developing leaders;
- Monitoring proposed and existing SH&E regulations and legislation to determine their impact on operations and to ensure continued compliance;
- Overseeing the safety, industrial hygiene, and toxicology programs for over 600 staff members engaged in remediation, construction, health and safety, consulting, and general office work across 28 offices in the United States and on assignment to international project sites;
- Continuously seeks to improve H&S performance as measured by the OSHA Incident Rating (IR) and Worker's Compensation Experience Modification Rating (EMR), as well as Leading Indicators developed with the management team; and
- Participating in the corporate audit program as an auditor or lead auditor;

Energy Client, California. As Chief Health and Safety Officer, Brian led and facilitated the Alliance Partnership Safety Council in 2017, is still an active contributor to the council, and hosts routine contractor safety forums for the client. Brian is actively involved in the development and implementation of program safety, health, and environmental (SH&E) plans to ensure safe operations on project sites. Brian developed permits and Health and Safety Plans for large projects and routinely audits the site safety. Additional responsibilities include:

- Driving reporting and behavior-based safety initiatives to support our internal safety culture and developing monthly summary reports to illustrate performance to our client.
- Develop, assess and continuously improve site safety plans and practices, including specific safety protocols for working safely over and around water.
- Worked as an extension of the client's organization to provide assurance that the remedy was completed safely and consistent with client-specific requirements.
- Support on-site safety personnel in ensuring the health and safety of the general public, our staff, and our sub-contracted employees.
- Audits and visits sites to ensure compliance with our internal policies and client-specific requirements.

Energy Client, Ohio. As Chief Health and Safety Officer, Brian supports the project team in developing and executing client and project specific health and safety measures, such as a site specific Health and Safety Plan, Job Hazard Analyses, Industrial Hygiene program, and site specific training. Brian also routinely visits the site to assess current practices and condition and to ensure continuous improvement. Additional responsibilities include:

- Develop, assess, and continuously improve site safety plans and practices, including specific safety protocols to comply with supplemental EH&S requirements such as the Duke Health and Safety Handbook, Environmental Supplemental, and EHS Keys to Life.
- Develop, assess, and continuously improve site safety plans and practices to address the risks associated with the work being performed on site, as well as the environmental conditions and simultaneous operations, including trenching and excavation, hot work, work over and near water, heavy equipment, HAZWOPER, etc.
- Worked as an extension of the client's organization to provide assurance that the remedy was completed safely and consistent with client-specific requirements.
- Support on-site safety personnel in ensuring the health and safety of the general public, our staff, and our sub-contracted employees.
- Audits and visits site to ensure compliance with our internal policies and client-specific requirements.



BRIAN A. FERGUSON

Senior Engineer

EDUCATION

M. S. Geotechnical Engineering, Tufts University, Medford, Massachusetts; 2012

B. S. Civil Engineering, State University of New York - Environmental, Science, and Forestry, Syracuse, New York; 2000

Ass. Science Degree in Applied Science and Technology (Nuclear Engineering), Thomas A. Edison State College, Trenton, New Jersey; 2000

PROFESSIONAL SOCIETIES

Order of the Engineer – 2000

Boston Society of Civil Engineers (BSCE)

American Society of Civil Engineers (ASCE)

SPECIAL STUDIES AND COURSES

American Concrete Institute – Certified Field Technician Certified Grade 1

Radiation Safety and Operations of Nuclear Testing Equipment – Troxler

40-Hour OSHA Hazardous Waste Operations Training (+ 8-Hour annual refresher)

10-Hour OSHA Construction training

Confined Space Entry Training

16-Hour Asbestos Operations and Maintenance

Mr. Ferguson has over six years of experience serving as project engineer on a variety of real estate development projects. His project experience has included monitoring field investigations and performing construction oversight, performing due diligence and engineering analyses, performing geotechnical analyses and developing geotechnical recommendations, and preparing geotechnical reports and project specifications.

In addition to providing engineering design support, Mr. Ferguson has managed and participated in a number of field service activities. Field work has included construction monitoring and documentation of contractors' deep and shallow foundation related construction, including slurry walls, caissons, pile driving, pile cap installation, earthwork, backfilling and compaction, installation of soldier pile and wood lagging support systems, installation of tie backs, reading inclinometers, conducting in-place field unit weight tests, tie-back load testing, seismograph installation, monitoring, and evaluating, and preparation of footing bearing surfaces. Other responsibilities have included site development activities, including placement of utilities and subgrade preparation for roads; observations and testing to determine that work is completed in compliance with contract documents; on-site soil management; sampling of soil and groundwater for chemical laboratory testing and conducting in situ field screening; maintenance of job records including pile driving logs, results of field density tests, records of caisson and footing installations; preparation of daily field reports; in contact with key personnel; and resolution of field related problems.

RELEVANT PROJECT EXPERIENCE

St. Elizabeths Hospital – West Campus Forensic Evaluations, Washington, D.C. Project Engineer for forensic evaluations on the adaptive reuse of former hospital buildings. Responsibilities included coordination of a field exploration program, including test borings and test pits to obtain subsurface information for project design and construction, overseeing multiple field personnel, subcontractors, assisting with project management, reviewing subcontractors invoices, reviewing and summarizing subsurface data and writing data reports.

TUFTS University, New Central Energy Plant, Medford, MA. Project engineer for a new Central Energy Plant that will house new co-generation steam boilers, centralized chilled water and electrical transformer switchgear that is planned to occupy approximately 20,000 square feet across two or three levels. Responsibilities included coordination of construction monitoring, observing SOE and footing installation, assisting with project management,

reviewing weekly field construction reports, reviewing and responding to geotechnical design submittals and attending project meetings.

Lahey Hospital and Medical Center – Stilts Infill Project, Burlington, MA Project Engineer for an addition to the existing Stilts building on the Lahey campus. Responsibilities included coordination and overseeing geotechnical and environmental subsurface investigations, coordination of construction monitoring, observing footing installation, assisting with project management, reviewing weekly field construction reports, reviewing and responding to geotechnical design submittals and attending project meetings.

Gloucester Beauport Hotel, Gloucester, MA Project engineer for a four story hotel with a seawall constructed adjacent to tidal beach. Responsibilities included coordination and overseeing geotechnical and environmental subsurface investigations, coordination of construction monitoring, assisting with project management, reviewing weekly field construction reports, reviewing and responding to geotechnical design submittals and attending project meetings, design and implementation of a sub-slab gas mitigation system.

275 Wyman Street, New Office Building, Waltham, MA. Project engineer for a new office building and parking garage founded on a shallow foundation system. Responsibilities included preparing proposals, assisting with management and planning of a subsurface investigation program, summarizing subsurface data and reviewing geotechnical test boring logs, coordination of construction monitoring and instrumentation monitoring programs, reviewing weekly field construction reports, reviewing and responding to specialty geotechnical design submittals and RFIs by others and attending project meetings.

Suffolk University - 20 Somerset Street, Boston, MA Project engineer for design of 8-story academic building with two levels of below grade finished space. Responsibilities included coordination of construction monitoring, observing SOE and footing installation, assisting with project management, reviewing weekly field construction reports, reviewing and responding to geotechnical design submittals and attending project meetings.

Worcester State University, New Student Housing, Worcester, MA Project engineer for design and construction of a 7-story residence/dining hall with a single level basement and a major site retaining wall structure. Responsibilities included overseeing geotechnical subsurface investigations, provided foundation recommendations and specifications, and prepared a retaining wall contract document. Responsibilities included coordination of construction monitoring, excavation and construction of footings, and soil reuse and management, assisting with project management, reviewing weekly field construction reports, reviewing and responding to geotechnical design submittals and attending project meetings.

University of Massachusetts Boston, General Academic Building No.1, Boston, MA. Project engineer responsible for assisting project manager in preliminary foundation engineering recommendations and construction considerations for a new academic building on a part of Columbia Point, a historic landfill area. Assisted in design phase services that included preparing foundation support design recommendations including the use of high allowable stresses for 190-ft long end-bearing H-piles and application of Slickcoat coating to address downdrag concerns and reduce foundation costs.

Waltham Watch Factory, Waltham, MA project engineer for redevelopment of former watch factory. Responsibilities included construction oversight of new precast parking garage, utility upgrades, soil remediation and management, installation of gas mitigation systems, assisting with project management, reviewing weekly field construction reports, reviewing and responding to geotechnical design submittals and attending project meetings.

Massachusetts Green High Performance Computing Center, Holyoke, MA. Project engineer for 60,000 sq. ft high level computing center and associated support utilities. Redevelopment of the site included recycling 50,000 cy of construction debris into the site fills at this historic site along the Connecticut River. Responsibilities included coordinating geotechnical and environmental field investigations, coordination of construction monitoring, seismic analysis, reviewing weekly field construction reports, reviewing and responding to geotechnical design submittals and attending project meetings.

The Shops at Riverwood, Hyde Park, MA. The project consisted of the redevelopment of a colonial era paper mill. The multi-building complex was demolished and the concrete and brick from the previous buildings were recycled. The project involved crushing 50,000 cy of brick and concrete and placement of excavated soils and recycled brick and concrete as compacted fill materials to support proposed buildings, pavement areas, and achieve 5 to 9 ft. raises in grade. Field Representative was responsible for management and reuse of brick and concrete stockpiles, in-place density testing, coordination of test pits, installation of soldier pile and versa-lok walls, and backfilling of underground vaults. Remedial activities included: excavation of 5,000 cy of petroleum contaminated soils, on-site cement batching in a pug mill, and placement of compacted recycled materials in roadway areas; delineation, excavation and off-site disposal of TSCA-regulated PCB contaminated soils associated with historical Askarel transformers and dioxin-contaminated soils associated with historical bleaching operations; and disposition of 1,000 tons of paper mill sludge encountered within an abandoned granite-walled sluiceway structure. In addition, assisted with weekly project meetings, maintaining a record of material reuse, and providing weekly field reports.

Harvard Law School, Cambridge, MA. The Harvard Law School project is located on Massachusetts Avenue in Cambridge. The project consisted of a multistory building above ground with 5 levels below ground for a parking garage. Field Representative was responsible for overseeing the installation of slurry walls into bedrock and LBEs with three installation rigs while monitoring the removal of urban fill and transfer to several different receiving facilities from another portion of the site. The slurry walls were constructed into bedrock. Other Field Representative activities were: testing of the slurry, management of the excavated soils, and record keeping of the Contractor's obstruction and down time of the equipment. In addition, assisted with weekly project meetings, maintaining a record of obstruction and machine time, and providing weekly field reports.

APPENDIX H

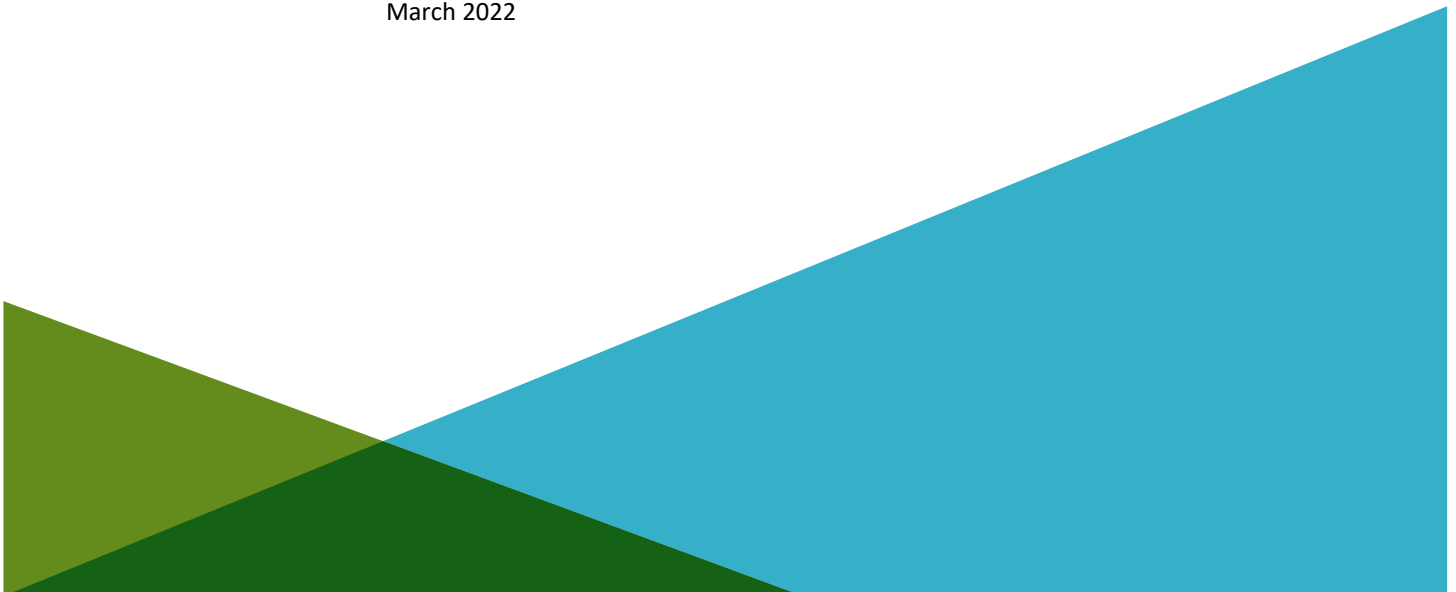
Quality Assurance Project Plan

QUALITY ASSURANCE PROJECT PLAN
65 ECKFORD STREET
BROOKLYN, NEW YORK

by
Haley & Aldrich of New York
New York, New York

for
New York State Department of Environmental Conservation
Albany, New York

File No. 0202156-002
March 2022



Executive Summary

This Quality Assurance Project Plan (QAPP) outlines the scope of the quality assurance and quality control (QA/QC) activities associated with the site monitoring activities associated with the Remedial Action Work Plan (RAWP) for 65 Eckford Street (Site) in Brooklyn, New York.

Protocols for sample collection, sample handling and storage, chain-of-custody procedures, and laboratory and field analyses are described herein or specifically referenced to related project documents.

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1. Project Description

This Quality Assurance Project Plan (QAPP) has been prepared as a component of the Remedial Action Work Plan (RAWP) for the 65 Eckford Street Site in Brooklyn, New York.

1.1 PROJECT OBJECTIVES

The primary objective for data collection activities is to collect sufficient data necessary to monitor the nature of any remaining groundwater and soil impacts.

1.2 SITE DESCRIPTION AND HISTORY

The general Site description and Site history is provided in the Site Description and History Summary that accompanies the RAWP.

1.3 LABORATORY PARAMETERS

The laboratory parameters for soil include:

- Target Compound List volatile organic compounds (VOCs) using EPA method 8260B
- Target Compound List semi-volatile organic compounds (SVOCs) using EPA method 8270C
- Total Analyte List (TAL) Metals using EPA method 6010
- Polychlorinated biphenyls (PCBs) using EPA method 8082
- Pesticides using EPA 8081
- Per- and polyfluoroalkyl substances (PFAS) using Modified EPA method 537
- 1,4-Dioxane using EPA method 8260B

The laboratory parameters for groundwater include:

- Target Compound List VOCs using EPA method 8260C
- Target Compound List SVOCs using EPA method 8270C
- Total Analyte List Metals using EPA method 6010
- Per- and polyfluoroalkyl substances (PFAS) using Modified EPA method 537
- 1,4-Dioxane using EPA method 8260B

Note: 1,4-Dioxane and PFAS sampling techniques will be conducted following the NYSDEC, Sampling, Analysis and Assessment of Per- and Polyfluoroalkyl Substances (PFAS) under NYSDEC Part 375 Remedial Program released in June 2021 and Sampling for 1,4-Dioxane and Per- and Polyfluoroalkyl Substances (PFAS) Under DEC's Part 375 Remedial Programs release June 2021.

During the collection of groundwater samples, pH, specific conductivity, temperature, dissolved oxygen (DO), and oxidation/reduction potential (ORP) will be measured.

The laboratory parameter for soil vapor includes:

- VOCs using EPA method TO-15

Laboratory parameters for disposal samples will be determined by the disposal facility after an approved facility has been determined.

1.4 SAMPLING LOCATIONS

The RAWP provides the locations of soil borings, soil vapor implants, and groundwater monitoring wells that will be sampled (as applicable).

2. Project Organization and Responsibilities

This section defines the roles and responsibilities of the individuals who will perform the SIWP monitoring activities. A NYSDOH certified analytical laboratory will perform the analyses of environmental samples collected at the Site.

2.1 MANAGEMENT RESPONSIBILITIES

The Project Manager is responsible for managing the implementation of the SIWP and monitoring and coordinating the collection of data. The Project Manager is responsible for technical quality control and project oversight. The Project Manager responsibilities include the following:

- Acquire and apply technical and corporate resources as needed to ensure performance within budget and schedule restraints;
- Review work performed to ensure quality, responsiveness, and timeliness;
- Communicate with the client point of contact concerning the progress of the monitoring activities;
- Assure corrective actions are taken for deficiencies cited during audits of SIWP monitoring activities; and
- Overall Site health and safety plan compliance.

2.2 QUALITY ASSURANCE RESPONSIBILITIES

The Quality Assurance (QA) team will consist of a QA Officer and the Data Validation staff. QA responsibilities are described as follows:

2.2.1 Quality Assurance (QA) Officer

The QA Officer reports directly to the Project Manager and will be responsible for overseeing the review of field and laboratory data. Additional responsibilities include the following:

- Assure the application and effectiveness of the QAPP by the analytical laboratory and the project staff;
- Provide input to the Project Manager as to corrective actions that may be required as a result of the above-mentioned evaluations;
- Prepare and/or review data validation and audit reports.

The QA Officer will be assisted by the data validation staff in the evaluation and validation of field and laboratory generated data.

2.2.2 Data Validation Staff

The data validation staff will be independent of the laboratory and familiar with the analytical procedures performed. The validation will include a review of each validation criterion as prescribed by the guidelines presented in Section 9.2 of this document and be presented in a Data Usability Summary Report (DUSR) for submittal to the QA Officer.

2.3 LABORATORY RESPONSIBILITIES

Laboratory services in support of the RAWP monitoring include the following personnel:

2.3.1 Laboratory Project Manager

The Laboratory Project Manager will report directly to the QA Officer and Project Manager and will be responsible for ensuring all resources of the laboratory are available on an as-required basis. The Laboratory Project Manager will also be responsible for the approval of the final analytical reports.

2.3.2 Laboratory Operations Manager

The Laboratory Operations Manager will report to the Laboratory Project Manager and will be responsible for coordinating laboratory analysis, supervising in-house chain-of-custody reports, scheduling sample analyses, overseeing data review and overseeing preparation of analytical reports.

2.3.3 Laboratory QA Officer

The Laboratory QA Officer will have sole responsibility for review and validation of the analytical laboratory data. The Laboratory QA Officer will provide Case Narrative descriptions of any data quality issues encountered during the analyses conducted by the laboratory. The QA Officer will also define appropriate QA procedures, overseeing QA/QC documentation.

2.3.4 Laboratory Sample Custodian

The Laboratory Sample Custodian will report to the Laboratory Operations Manager and will be responsible for the following:

- Receive and inspect the incoming sample containers;
- Record the condition of the incoming sample containers;
- Sign appropriate documents;
- Verify chain-of-custody and its correctness;
- Notify the Project Manager and Operations Manager of sample receipt and inspection;
- Assign a unique identification number and enter each into the sample receiving log;
- Initiate transfer of samples to laboratory analytical sections; and
- Control and monitor access/storage of samples and extracts.

2.3.5 Laboratory Technical Personnel

The laboratory technical staff will have the primary responsibility in the performance of sample analysis and the execution of the QA procedures developed to determine the data quality. These activities will include the proper preparation and analysis of the project samples in accordance with the laboratory's Quality Assurance Manual (QAM) and associated Standard Operating Procedures (SOP).

2.4 FIELD RESPONSIBILITIES

2.4.1 Field Coordinator

The Field Coordinator is responsible for the overall operation of the field team and reports directly to the Project Manager. The Field Coordinator works with the project Health & Safety Officer (HSO) to conduct operations in compliance with the project Health & Safety Plan (HASP). The Field Coordinator will facilitate communication and coordinate efforts between the Project Manager and the field team members.

Other responsibilities include the following:

- Develop and implement field-related work plans, ensuring schedule compliance, and adhering to management-developed project requirements;
- Coordinate and manage field staff;
- Perform field system audits;
- Oversee quality control for technical data provided by the field staff;
- Prepare and approve text and graphics required for field team efforts;
- Coordinate and oversee technical efforts of subcontractors assisting the field team;
- Identify problems in the field; resolve difficulties in consultation with the Project QAO, and Project Manager; implement and document corrective action procedures; and,
- Participate in preparation of the final reports.

2.4.2 Field Team Personnel

Field Team Personnel will be responsible for the following:

- Perform field activities as detailed in the RAWP and in compliance with the Field Sampling Plan (FSP) and QAPP.
- Immediately report any accidents and/or unsafe conditions to the Site Health & Safety Officer and take reasonable precautions to prevent injury.

3. Sampling Procedures

The FSP provides the SOPs for sampling required by the RAWP.

3.1 SAMPLE CONTAINERS

Sample containers for each sampling task will be provided by the laboratory performing the analysis. The containers will be cleaned by the manufacturer to meet or exceed the analyte specifications established in the U.S. EPA, "Specifications and Guidance for Obtaining Contaminant-Free Sample Containers", April 1992, OSWER Directive #9240.0-0.5A. Certificates of analysis for each lot of sample containers used will be maintained by the laboratory.

The appropriate sample containers, preservation method, maximum holding times, and handling requirements for each sampling task are provided in Table I.

3.2 SAMPLE LABELING

Each sample will be labeled with a unique sample identifier that will facilitate tracking and cross-referencing of sample information. Equipment rinse blank and field duplicate samples also will be numbered with a unique sample identifier to prevent analytical bias of field QC samples.

Refer to the FSP for the sample labeling procedures.

3.3 FIELD QC SAMPLE COLLECTION

3.3.1 Field Duplicate Sample Collection

3.3.1.1 *Water Samples*

Field duplicate samples will be collected by filling the first sample container to the proper level and sealing and then repeated for the second set of sample container.

1. The samples are properly labeled as specified in Section 3.2.
2. Steps 1 through 4 are repeated for the bottles for each analysis. The samples are collected in order of decreasing analyte volatility as detailed in Section 3.3.1.
3. Chain-of-custody documents are executed.
4. The samples will be handled as specified in Table I.

3.3.1.2 *Soil Samples*

Soil field duplicates will be collected as specified in the following procedure:

1. Soils will be sampling directly from acetate liners.
2. Soil for VOC analysis will be removed from the sampling device as specified in the FSP.
3. Soil for non-VOC analysis will be removed from the sampling device and collected into clean laboratory provided containers.

4. Custody Procedures

Sample custody is addressed in three parts: field sample collection, laboratory analysis, and final project files. Custody of a sample begins when it is collected by or transferred to an individual and ends when that individual relinquishes or disposes of the sample.

A sample is under custody if:

1. The item is in actual possession of a person;
2. The item is in the view of the person after being in actual possession of the person;
3. The item was in actual possession and subsequently stored to prevent tampering; or
4. The item is in a designated and identified secure area.

4.1 FIELD CUSTODY PROCEDURES

Field personnel will keep written records of field activities on applicable preprinted field forms or in a bound field notebook to record data collecting activities. These records will be written legibly in ink and will contain pertinent field data and observations. Entry errors or changes will be crossed out with a single line, dated, and initialed by the person making the correction. Field forms and notebooks will be periodically reviewed by the Field Coordinator.

The beginning of each entry in the logbook or preprinted field form will contain the following information:

- Date
- Start time
- Weather
- Names of field personnel (including subcontractors)
- Level of personal protection used at the Site
- Names of all visitors and the purpose of their visit.

For each measurement and sample collected, the following information will be recorded:

- Detailed description of sample location,
- Equipment used to collect sample or make measurement and the date equipment was calibrated,
- Time sample was collected,
- Description of the sample conditions,
- Depth sample was collected (if applicable),
- Volume and number of containers filled with the sample; and,
- Sampler's identification.

4.1.1 Field Procedures

The following procedure describes the process to maintain the integrity of the samples:

- Upon collection samples are placed in the proper containers. In general, samples collected for organic analysis will be placed in pre-cleaned glass containers and samples collected for inorganic analysis will be placed in pre-cleaned plastic (polyethylene) bottles. Refer to the FSP for sample packaging procedures.
- Samples will be assigned a unique sample number and will be affixed to a sample label. Refer to the FSP for sample labeling procedures.
- Samples will be properly and appropriately preserved by field personnel in order to minimize loss of the constituent(s) of interest due to physical, chemical, or biological mechanisms.
- Appropriate volumes will be collected to ensure that the appropriate reporting limits can be successfully achieved and that the required QC sample analyses can be performed.

4.1.2 Transfer of Custody and Shipment Procedures

- A chain-of-custody (COC) record will be completed at the time of sample collection and will accompany each shipment of project samples to the laboratory. The field personnel collecting the samples will be responsible for the custody of the samples until the samples are relinquished to the laboratory. Sample transfer will require the individuals relinquishing and receiving the samples to sign, date and note the time of sample transfer on the COC record.
- Samples will be shipped or delivered in a timely fashion to the laboratory so that holding times and/or analysis times as prescribed by the methodology can be met.
- Samples will be transported in containers (coolers) which will maintain the refrigeration temperature for those parameters for which refrigeration is required in the prescribed preservation protocols.
- Samples will be placed in an upright position and limited to one layer of samples per cooler. Additional bubble wrap or packaging material will be added to fill the cooler. Shipping containers will be secured with strapping tape and custody tape for shipment to the laboratory.
- When samples are split with the NYSDEC representatives, a separate chain-of-custody will be prepared and marked to indicate with whom the samples are shared. The person relinquishing the samples will require the representative's signature acknowledging sample receipt.
- If samples are sent by a commercial carrier, a bill of lading will be used. A copy of the bill of lading will be retained as part of the permanent record. Commercial carriers will not sign the custody record as long as the custody record is sealed inside the sample cooler and the custody tape remains intact.
- Samples will be picked up by a laboratory courier or transported to the laboratory the same day they are collected unless collected on a weekend or holiday. In these cases, the samples will be

stored in a secure location until delivery to the laboratory. Additional ice will be added to the cooler as needed to maintain proper preservation temperatures.

4.2 LABORATORY CHAIN-OF-CUSTODY PROCEDURES

A sample custodian will be designated by the laboratory and will have the responsibility to receive all incoming samples. Once received, the custodian will document if the sample is received in good condition (i.e., unbroken, cooled, etc.) and that the associated paperwork, such as chain-of-custody forms have been completed. The custodian will sign the chain-of-custody forms.

The custodian will also document if sufficient sample volume has been received to complete the analytical program. The sample custodian will then place the samples into secure, limited access storage (refrigerated storage, if required). The sample custodian will assign a unique number to each incoming sample for use in the laboratory. The unique number will then be entered into the sample-receiving log with the verified time and date of receipt also noted.

Consistent with the analyses requested on the chain-of-custody form, analyses by the laboratory's analysts will begin in accordance with the appropriate methodologies. Samples will be removed from secure storage with internal chain-of-custody sign-out procedures followed.

4.3 STORAGE OF SAMPLES

Empty sample bottles will be returned to secure and limited access storage after the available volume has been consumed by the analysis. Upon completion of the entire analytical work effort, samples will be disposed of by the sample custodian. The length of time that samples are held will be at least thirty (30) days after reports have been submitted. Disposal of remaining samples will be completed in compliance with all Federal, State and local requirements.

4.4 FINAL PROJECT FILES CUSTODY PROCEDURES

The final project files will be the central repository for all documents with information relevant to sampling and analysis activities as described in this QAPP. The Haley & Aldrich Project Manager will be the custodian of the project file. The project files including all relevant records, reports, logs, field notebooks, pictures, subcontractor reports and data reviews will be maintained in a secured, limited access area and under custody of the Project Director or his designee.

The final project file will include the following:

- Project plans and drawings
- Field data records
- Sample identification documents and soil boring/monitoring well logs
- All chain-of-custody documentation
- Correspondence
- References, literature
- Laboratory data deliverables
- Data validation and assessment reports
- Progress reports, QA reports
- Final report

The laboratory will be responsible for maintaining analytical logbooks, laboratory data and sample chain of custody documents. Raw laboratory data files and copies of hard copy reports will be inventoried and maintained by the laboratory for a period of six (6) years at which time the laboratory will contact the Haley & Aldrich Project Manager regarding the disposition of the project related files.

5. Calibration Procedures and Frequency

5.1 FIELD INSTRUMENT CALIBRATION PROCEDURES

Several field instruments will be used for both on-site screening of samples and for health and safety monitoring, as described in the Health and Safety Plan (HASP). On-site air monitoring for health and safety purposes may be accomplished using a vapor detection device, such as a Photo-ionization Detector (PID).

Field instruments will be calibrated at the beginning of each day and checked during field activities to verify performance. Instrument specific calibration procedures will be performed in accordance with the instrument manufacturer's requirements.

5.2 LABORATORY INSTRUMENT CALIBRATION PROCEDURES

Reference materials of known purity and quality will be utilized for the analysis of environmental samples. The laboratory will carefully monitor the preparation and use of reference materials including solutions, standards, and reagents through well-documented procedures.

All solid chemicals and acids/bases used by the laboratory will be rated as "reagent grade" or better. All gases will be "high" purity or better. All Standard Reference Materials (SRMs) or Performance Evaluation (PE) materials will be obtained from approved vendors of the National Institute of Standards and Technology (formerly National Bureau of Standards), the U.S. EPA Environmental Monitoring Support Laboratories (EMSL), or reliable Cooperative Research and Development Agreement (CRADA) certified commercial sources.

6. Analytical Procedures

Analytical procedures to be utilized for analysis of environmental samples will be based on referenced USEPA analytical protocols and/or project specific SOP.

6.1 FIELD ANALYTICAL PROCEDURES

Field analytical procedures include the measurement of pH, temperature, ORP, DO and specific conductivity during sampling of groundwater, and the qualitative measurement of Volatile Organic Compounds (VOC) during the collection of soil samples.

6.2 LABORATORY ANALYTICAL PROCEDURES

Laboratory analyses will be based on the U.S. EPA methodology requirements promulgated in:

- "Test Methods for Evaluating Solid Waste," SW-846 EPA, Office of Solid Waste, and promulgated updates, 1986.

6.2.1 List of Project Target Compounds and Laboratory Detection Limits

The laboratory reporting limits (RLs) and associated method detection limits (MDLs) for the target analytes and compounds for the environmental media to be analyzed are presented in Table I. MDLs have been experimentally determined by the project laboratory using the method provided in 40 CFR, Part 136 Appendix B.

Laboratory parameters for soil samples are listed in the SIWP. Laboratory parameters for disposal samples will be determined by the disposal facility after an approved facility has been determined.

6.2.2 List of Method Specific Quality Control (QC) Criteria

The laboratory SOPs include a section that presents the minimum QC requirements for the project analyses. Section 7.0 references the frequency of the associated QC samples for each sampling effort and matrix.

7. Internal Quality Control Checks

This section presents the internal quality control checks that will be employed for field and laboratory measurements.

7.1 FIELD QUALITY CONTROL

7.1.1 Field Blanks

Internal quality control checks will include analysis of field blanks to validate equipment cleanliness. Whenever possible, dedicated equipment will be employed to reduce the possibility of cross-contamination of samples.

7.1.2 Trip Blanks

Trip blanks samples will be prepared by the project laboratory using ASTM Type II or equivalent water placed within pre-cleaned 40 milliliter (ml) VOC vials equipped with Teflon septa. Trip blanks will accompany each sample delivery group (SDG) of environmental samples collected for analysis of VOCs.

Trip blank samples will be placed in each cooler that stores and transports project samples that are to be analyzed for VOCs.

7.2 LABORATORY PROCEDURES

Procedures which contribute to maintenance of overall laboratory quality assurance and control include appropriately cleaned sample containers, proper sample identification and logging, applicable sample preservation, storage, and analysis within prescribed holding times, and use of controlled materials.

7.2.1 Field Duplicate Samples

The precision or reproducibility of the data generated will be monitored through the use of field duplicate samples. Field duplicate analysis will be performed at a frequency of 1 in 20 project samples.

Precision will be measured in terms of the absolute value of the relative percent difference (RPD) as expressed by the following equation:

$$RPD = [|R1 - R2| / [(R1 + R2) / 2]] \times 100\%$$

Acceptance criteria for duplicate analyses performed on solid matrices will be 100% and aqueous matrices will be 35%. RPD values outside these limits will require an evaluation of the sampling and/or analysis procedures by the project QA Officer and/or laboratory QA Director. Corrective actions may include re-analysis of additional sample aliquots and/or qualification of the data for use.

7.2.2 Matrix Spike Samples

Ten percent of each project sample matrix for each analytical method performed will be spiked with known concentrations of the specific target compounds/analytes.

The amount of the compound recovered from the sample compared to the amount added will be expressed as a percent recovery. The percent recovery of an analyte is an indication of the accuracy of an analysis within the site-specific sample matrix. Percent recovery will be calculated for MS/MSD using the following equation.

$$\% \text{ Recovery} = \frac{\text{Spiked Sample} - \text{Background}}{\text{Known Value of Spike}} \times 100\%$$

If the quality control value falls outside the control limits (UCL or LCL) due to sample matrix effects, the results will be reported with appropriate data qualifiers. To determine the effect a non-compliant MS recovery has on the reported results, the recovery data will be evaluated as part of the validation process.

7.2.3 Laboratory Control Sample (LCS) Analyses

The laboratory will perform LCS analyses prepared from Standard Reference Materials (SRMs). The SRMs will be supplied from an independent manufacturer and traceable to NIST materials with known concentrations of each target analyte to be determined by the analytical methods performed. In cases where an independently supplied SRM is not available, the LCS may be prepared by the laboratory from a reagent lot other than that used for instrument calibration.

The laboratory will evaluate LCS analyses in terms of percent recovery using the most recent laboratory generated control limits.

LCS recoveries that do not meet acceptance criteria will be deemed invalid. Analysis of project samples will cease until an acceptable LCS analysis has been performed. If sample analysis is performed in association with an out-of-control LCS sample analysis, the data will be deemed invalid.

Corrective actions will be initiated by the Haley & Aldrich QA Officer and/or Laboratory QA Officer to investigate the problem. After the problem has been identified and corrected, the solution will be noted in the instrument run logbook and re-analysis of project samples will be performed, if possible.

The analytical anomaly will be noted in the sample delivery group (SDG) Case Narrative and reviewed by the data validator. The data validator will confirm that appropriate corrective actions were implemented and recommend the applicable use of the affected data.

7.2.4 Surrogate Compound/Internal Standard Recoveries

For VOCs, surrogates will be added to each sample prior to analysis to establish purge and trap efficiency. Quantitation will be accomplished via internal standardization techniques.

The recovery of surrogate compounds and internal standards will be monitored by laboratory personnel to assess possible site-specific matrix effects on instrument performance.

For semi-volatile organics analyses, surrogates will be added to the raw sample to assess extraction efficiency. Internal standards will be added to all sample extracts and instrument calibration standard immediately before analysis for quantitation via internal standardization techniques.

Method specific quality control (QC) limits are provided in the attached laboratory method SOPs. Surrogate compound/internal standard recoveries that do not fall within accepted QC limits for the analytical methodology performed will have the analytical results flagged with data qualifiers as appropriate by the laboratory and will not be noted in the laboratory report Case Narrative.

To ascertain the effect non-compliant surrogate compound/internal standard recoveries may have on the reported results, the recovery data will be evaluated as part of the validation process. The data validator will provide recommendations for corrective actions including but not limited to additional data qualification.

7.2.5 Calibration Verification Standards

Calibration verification (CV) standards will be utilized to confirm instrument calibrations and performance throughout the analytical process. CV standards will be prepared as prescribed by the respective analytical protocols. Continuing calibration will be verified by compliance with method-specific criteria prior to additional analysis of project samples.

Non-compliant analysis of CV standards will require immediate corrective action by the project laboratory QA officer and/or designated personnel. Corrective action may include re-analysis of each affected project sample, a detailed description of the problem, the corrective action undertaken, the person who performed the action, and the resolution of the problem.

7.2.6 Laboratory Method Blank Analyses

Method blank sample analysis will be performed as part of each analytical batch for each methodology performed. If target compounds are detected in the method blank samples, the reported results will be flagged by the laboratory in accordance with standard operating procedures. The data validator will provide recommendations for corrective actions including but not limited to additional data qualification.

8. Data Quality Objectives

Sampling that will be performed as described in the SIWP is designed to produce data of the quality necessary to achieve the minimum standard requirements of the field and laboratory analytical objectives described below. These data are being obtained with the primary objective to assess levels of contaminants of concern associated with the Site.

The overall project data quality objective (DQO) is to implement procedures for field data collection, sample collection, handling, and laboratory analysis and reporting that achieve the project objectives. The following section is a general discussion of the criteria that will be used to measure achievement of the project DQO.

8.1 PRECISION

8.1.1 Definition

Precision is defined as a quantitative measure of the degree to which two or more measurements are in agreement. Precision will be determined by collecting and analyzing field duplicate samples and by creating and analyzing laboratory duplicates from one or more of the field samples. The overall precision of measurement data is a mixture of sampling and analytical factors. The analytical results from the field duplicate samples will provide data on sampling precision. The results from duplicate samples created by the laboratory will provide data on analytical precision. The measurement of precision will be stated in terms of relative percent difference (RPD).

8.1.2 Field Precision Sample Objectives

Field precision will be assessed through collection and measurement of field duplicate samples at a rate of 1 duplicate per 20 investigative samples. The RPD criteria for the project field duplicate samples will be +/- 100% for soil, +/- 35 % for groundwater for parameters of analysis detected at concentrations greater than 5 times (5X) the laboratory reporting limit (RL).

8.1.3 Laboratory Precision Sample Objectives

Laboratory precision will be assessed through the analysis of laboratory control and laboratory control duplicate samples (LCS/LCSD) and matrix spike and matrix spike duplicate (MS/MSD) samples.

8.2 ACCURACY

8.2.1 Definition

Accuracy relates to the bias in a measurement system. Bias is the difference between the observed and the "true" value. Sources of error are the sampling process, field contamination, preservation techniques, sample handling, sample matrix, sample preparation and analytical procedure limitations.

8.2.2 Field Accuracy Objectives

Sampling bias will be assessed by evaluating the results of field equipment rinse and trip blanks. Equipment rinse and trip blanks will be collected as appropriate based on sampling and analytical methods for each sampling effort.

If non-dedicated sampling equipment is used, equipment rinse blanks will be collected by passing ASTM Type II water over and/or through the respective sampling equipment utilized during each sampling effort. One equipment rinse blank will be collected for each type of non-dedicated sampling equipment used for the sampling effort. Equipment rinse blanks will be analyzed for each target parameter for the respective sampling effort for which environmental media have been collected. (Note: If dedicated or disposable sampling equipment is used, equipment rinse samples will not be collected as part of that field effort.)

Trip blank samples will be prepared by the laboratory and provided with each shipping container that includes containers for the collection of groundwater samples for the analysis of VOC. Trip blank samples will be analyzed for each VOC for which groundwater samples have been collected for analysis.

8.3 LABORATORY ACCURACY OBJECTIVES

Analytical bias will be assessed through the use of laboratory control samples (LCS) and Site-specific matrix spike (MS) sample analyses. LCS analyses will be performed with each analytical batch of project samples to determine the accuracy of the analytical system.

One (1) set of MS/MSD analyses will be performed with each batch of twenty (20) project samples collected for analysis to assess the accuracy of the identification and quantification of analytes. Additional sample volume will be collected at sample locations selected for the preparation of MS/MSD samples so that the standard laboratory reporting limits (RLs) are achieved.

The accuracy of analyses that include a sample extraction procedure will be evaluated through the use of system monitoring or surrogate compounds. Surrogate compounds will be added to each sample, standard, blank, and QC sample prior to sample preparation and analysis. Surrogate compound percent recoveries will provide information on the effect of the sample matrix on the accuracy of the analyses.

8.4 REPRESENTATIVENESS

8.4.1 Definition

Representativeness expresses the degree to which sample data represent a characteristic of a population, a parameter variation at a sampling point or an environmental condition. Representativeness is a qualitative parameter that is dependent upon the design of the sampling program. The representativeness criterion is satisfied through the proper selection of sampling locations, the quantity of samples and the use of appropriate procedures to collect and analyze the samples.

8.4.2 Measures to Ensure Representativeness of Field Data

Representativeness will be addressed by prescribing sampling techniques and the rationale used to select sampling locations. Sampling locations may be biased (based on existing data, instrument surveys, observations, etc.) or unbiased (completely random or stratified-random approaches).

8.5 COMPLETENESS

8.5.1 Definition

Completeness is a measure of the amount of valid (usable) data obtained from a measuring system compared to the total amount of the anticipated to be obtained. The completeness goal for all data uses is that a sufficient amount of valid data be generated so that determinations can be made related to the intended data use with a sufficient degree of confidence.

8.5.2 Field Completeness Objectives

Completeness is a measure of the amount of valid measurements obtained from measurements taken in this project versus the number planned.

8.5.3 Laboratory Completeness Objectives

Laboratory data completeness objective is a measure of the amount of valid data obtained from laboratory measurements. The evaluation of the data completeness will be performed at the conclusion of each sampling and analysis effort.

The completeness of the data generated will be determined by comparing the amount of valid data, based on independent validation, with the total laboratory data set.

8.6 COMPARABILITY

8.6.1 Definition

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared to another.

8.6.2 Measures to Ensure Comparability of Laboratory Data

Comparability of laboratory data will be measured from the analysis of Standard Reference Materials (SRM) obtained from either EPA Cooperative Research and Development Agreement (CRADA) suppliers or the National Institute of Standards and Technology (NIST). The reported analytical data will also be presented in standard units of mass of contaminant within a known volume of environmental media. The standard units for various sample matrices are as follows:

- Solid Matrices – mg/kg of media (Dry Weight).
- Aqueous Matrices – ng/L for PFAS analyses, ug/L of media for organic analyses, and mg/L for inorganic analyses.

8.7 LEVEL OF QUALITY CONTROL EFFORT

If non-dedicated sampling equipment is used, equipment rinse blanks will be prepared by field personnel and submitted for analysis of target parameters. Equipment rinse blank samples will be analyzed to check for potential cross-contamination between sampling locations that may be introduced during the investigation. One (1) equipment rinse blank will be collected per sampling event to the extent that non-dedicated sampling equipment is used.

If necessary, A separate equipment rinse blank sample will be collected for PFAS using the sample collection procedure described in Section 8.1.1 of the NYSDEC-approved Avangrid Field Sampling Plan. (Note: If dedicated or disposable sampling equipment is used, equipment rinse samples will not be collected as part of that field effort.)

Trip blanks will be used to assess the potential for contamination during sample storage and shipment. Trip blanks will be provided with the sample containers to be used for the collection of groundwater samples for the analysis of VOC. Trip blanks will be preserved and handled in the same manner as the project samples. One (1) trip blank will be included along with each shipping container containing project samples to be analyzed for VOC.

Method blank samples will be prepared by the laboratory and analyzed concurrently with all project samples to assess potential contamination introduced during the analytical process.

Field duplicate samples will be collected and analyzed to determine sampling and analytical reproducibility. One (1) field duplicate will be collected for every 20 or fewer investigative samples collected for off-Site laboratory analysis.

Matrix spikes will provide information to assess the precision and accuracy of the analysis of the target parameters within the environmental media collected. One (1) matrix spike/matrix spike duplicate (MS/MSD) will be collected for every 20 or fewer investigative samples.

9. Data Reduction, Validation and Reporting

Data generated by the laboratory operation will be reduced and validated prior to reporting in accordance with the following procedures:

9.1 DATA REDUCTION

9.1.1 Field Data Reduction Procedures

Field data reduction procedures will be minimal in scope compared to those implemented in the laboratory setting. The pH, conductivity, temperature, turbidity, DO, ORP and breathing zone VOC readings collected in the field will be generated from direct read instruments. The data will be written into field logbooks immediately after measurements are taken. If errors are made, data will be legibly crossed out, initialed and dated by the field member, and corrected in a space adjacent to the original entry.

9.1.2 Laboratory Data Reduction Procedures

Laboratory data reduction procedures are provided by the appropriate chapter of USEPA, "Test Methods for Evaluating Solid Waste", SW-846, Third Edition. Errors will be noted; corrections made with the original notations crossed out legibly. Analytical results for soil samples will be calculated and reported on a dry weight basis.

9.1.3 Quality Control Data

Quality control data (e.g., laboratory duplicates, surrogates, matrix spikes, and matrix spike duplicates) will be compared to the method acceptance criteria. Data determined to be acceptable will be entered into the laboratory information management system.

Unacceptable data will be appropriately qualified in the project report. Case narratives will be prepared which will include information concerning data that fell outside acceptance limits and any other anomalous conditions encountered during sample analysis.

9.2 DATA VALIDATION

Data validation procedures of the analytical data will be performed by the Haley & Aldrich QA Officer or designee using the following documents as guidance for the review process:

- "U.S. EPA National Functional Guidelines for Organic Data Review", and the "U.S. EPA National Functional Guidelines for Inorganic Data Review".
- The specific data qualifiers used will be applied to the reported results as presented and defined in the EPA National Functional Guidelines. Validation will be performed by qualified personnel at the direction of the Haley & Aldrich QAO.
- The completeness of each data package will be evaluated by the Data Validator. Completeness checks will be administered on all data to determine that the deliverables are consistent with

the NYSDEC Analytical Services Protocol (ASP) Category A and Category B data package requirements. The validator will determine whether the required items are present and request copies of missing deliverables (if necessary) from the laboratory.

9.3 DATA REPORTING

Data reporting procedures will be carried out for field and laboratory operations as indicated below:

- **Field Data Reporting:** Field data reporting will be conducted principally through the transmission of report sheets containing tabulated results of measurements made in the field and documentation of field calibration activities.
- **Laboratory Data Reporting:** The laboratory data reporting package will enable data validation based on the protocols described above. The final laboratory data report format will include the QA/QC sample analysis deliverables to enable the development of a data usability summary report (DUSR) based on Department DER-10 Appendix 2B.

10. Performance and System Audits

A performance audit is an independent quantitative comparison with data routinely obtained in the field or the laboratory. Performance audits include two separate, independent parts: internal and external audits.

10.1 FIELD PERFORMANCE AND SYSTEM AUDITS

10.1.1 Internal Field Audit Responsibilities

Internal audits of field activities will be initiated at the discretion of the Project Manager and will include the review of sampling and field measurements. The audits will verify that all procedures are being followed. Internal field audits will be conducted periodically during the project. The audits will include examination of the following:

- Field sampling records, screening results, instrument operating records
- Sample collection
- Handling and packaging in compliance with procedures
- Maintenance of QA procedures
- Chain-of-custody reports

10.1.2 External Field Audit Responsibilities

External audits may be conducted by the Project Coordinator at any time during the field operations. These audits may or may not be announced and are at the discretion of the NYSDEC. The external field audits can include (but are not limited to) the following:

- Sampling equipment decontamination procedures
- Sample bottle preparation procedures
- Sampling procedures
- Examination of health and safety plans
- Procedures for verification of field duplicates
- Field screening practices

10.2 LABORATORY PERFORMANCE AND SYSTEM AUDITS

10.2.1 Internal Laboratory Audit Responsibilities

The laboratory system audits are typically conducted by the laboratory QA Officer or designee on an annual basis. The system audit will include an examination of laboratory documentation including sample receiving logs, sample storage, chain-of-custody procedures, sample preparation and analysis and instrument operating records.

At the conclusion of internal system audits, reports will be provided to the laboratory's operating divisions for appropriate comment and remedial/corrective action where necessary. Records of audits and corrective actions will be maintained by the Laboratory QA Officer.

10.2.2 External Laboratory Audit Responsibilities

External audits will be conducted as required, by the NYSDOH or designee. External audits may include any of the following:

- Review of laboratory analytical procedures
- Laboratory on-site visits
- Submission of performance evaluation samples for analysis

Failure of any of the above audit procedures can lead to laboratory de-certification. An audit may consist of but not limited to:

- Sample receipt procedures
- Custody, sample security and log-in procedures
- Review of instrument calibration logs
- Review of QA procedures
- Review of log books
- Review of analytical SOPs
- Personnel interviews

A review of a data package from samples recently analyzed by the laboratory can include (but not be limited to) the following:

- Comparison of resulting data to the SOP or method
- Verification of initial and continuing calibrations within control limits
- Verification of surrogate recoveries and instrument timing results
- Review of extended quantitation reports for comparisons of library spectra to instrument spectra, where applicable
- Assurance that samples are run within holding times

11. Preventive Maintenance

11.1 FIELD INSTRUMENT PREVENTIVE MAINTENANCE

The field equipment preventive maintenance program is designed to ensure the effective completion of the sampling effort and to minimize equipment down time. Program implementation is concentrated in three areas:

- Maintenance responsibilities
- Maintenance schedules
- Inventory of critical spare parts and equipment

The maintenance responsibilities for field equipment will be assigned to the task leaders in charge of specific field operations. Field personnel will be responsible for daily field checks and calibrations and for reporting any problems with the equipment. The maintenance schedule will follow the manufacturer's recommendations. In addition, the field personnel will be responsible for determining that an inventory of spare parts will be maintained with the field equipment. The inventory will primarily contain parts that are subject to frequent failure, have limited useful lifetimes and/or cannot be obtained in a timely manner.

11.2 LABORATORY INSTRUMENT PREVENTIVE MAINTENANCE

Analytical instruments at the laboratory will undergo routine and/or preventive maintenance. The extent of the preventive maintenance will be a function of the complexity of the equipment.

Generally, annual preventive maintenance service will involve cleaning, adjusting, inspecting and testing procedures designed to deduce instrument failure and/or extend useful instrument life. Between visits, routine operator maintenance and cleaning will be performed according to manufacturer's specifications by laboratory personnel.

Maintenance records will be placed on file at the laboratory and can be made available upon request.

12. Specific Routine Procedures Used to Assess Data Precision, Accuracy, and Completeness

12.1 FIELD MEASUREMENTS

Field generated information will be reviewed by the Field Coordinator and typically include evaluation of bound logbooks/forms, data entry and calculation checks. Field data will be assessed by the Project Coordinator who will review the field results for compliance with the established QC criteria that are specified in Section 7.0 of this QAPP. The accuracy of pH and specific conductance will be assessed using daily instrument calibration, calibration check, and blank data. Accuracy will be measured by determining the percent recovery (% R) of calibration check standards. Precision of the pH and specific conductance measurements will be assessed on the basis of the reproducibility of duplicate readings of a field sample and will be measured by determining the relative percent difference (RPD). Accuracy and precision of the soil VOC screening will be determined using duplicate readings of calibration checks. Field data completeness will be calculated using the following equation:

$$\text{Completeness} = \frac{\text{Valid (usable) Data Obtained}}{\text{Total Data Planned}} \times 100$$

12.2 LABORATORY DATA

Surrogate, internal standard and matrix spike recoveries will be used to evaluate data quality. The laboratory quality assurance/quality control program will include the following elements:

- Precision, in terms of relative percent difference (RPD), will be determined by relative sample analysis at a frequency of one duplicate analysis for each batch of ten project samples or a frequency of 10 percent (10%). RPD is defined as the absolute difference of duplicate measurements divided by the mean of these analyses normalized to percentage.
- Accuracy, in terms of percent recovery (recovery of known constituent additions or surrogate recoveries), will be determined by the analysis of spiked and unspiked samples. MS/MSD will be used to determine analytical accuracy. The frequency of MS/MSD analyses will be one project sample MS/MSD per set of 20 project samples.
- One method blank will be prepared and analyzed with each batch of project samples. The total number of method blank sample analyses will be determined by the laboratory analytical batch size.
- Standard Reference Materials (SRMs) will be used for each analysis. Sources of SRM's include the U.S. EPA, commercially available material from CRADA certified vendors and/or laboratory produced solutions. SRMs, when available and appropriate, will be processed and analyzed on a frequency of one per set of samples.
- Completeness is the evaluation of the amount of valid data generated versus the total set of data produced from a particular sampling and analysis event. Valid data is determined by independent confirmation of compliance with method-specific and project-specific data quality

objectives. The calculation of data set completeness will be performed by the following equation.

$$\frac{\text{Number of Valid Sample Results}}{\text{Total Number of Samples Planned}} \times 100 = \% \text{ Complete}$$

13. Quality Assurance (QA) Reports

Critically important to the successful implementation of the QA Plan is a reporting system that provides the means by which the program can be reviewed, problems identified, and programmatic changes made to improve the plan.

QA reports to management can include:

- Audit reports, internal and external audits with responses
- Performance evaluation sample results; internal and external sources
- Daily QA/QC exception reports/corrective actions

QA/QC corrective action reports will be prepared by the Haley & Aldrich QA Officer when appropriate and presented to the project and/or laboratory management personnel so that performance criteria can be monitored for all analyses from each analytical department. The updated trend/QA charts prepared by the laboratory QA personnel will be distributed and reviewed by various levels of the laboratory management.

References

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9. New York State Department of Environmental Conservation, NYSDEC, Division of Environmental Remediation, Technical Guidance for Site Investigation and Remediation, DER-10, May 2010.

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TABLES

TABLE I
SUMMARY OF ANALYSIS METHOD, PRESERVATION METHOD, HOLDING TIME, SAMPLE SIZE REQUIREMENTS AND SAMPLE CONTAINERS
65 Eckford Street
Brooklyn, NY

Analysis/Method	Sample Type	Preservation	Holding Time	Volume/Weight	Container
Volatile Organic Compounds/8260C	Soil	1 - 1 Vial MeOH/2 Vial Water	14 days	120 mL	3 - 40ml glass vials
Semivolatile Organic Compounds/8270D	Soil	Cool, 4 ± 2 °C	14 days	250 mL	1 - 8 oz Glass
Metals/6010D	Soil	Cool, 4 ± 2 °C	180 days	60 mL	1 - 2 oz Glass
1,4-Dioxane/8270 SIM	Soil	Cool, 4 ± 2 °C	7 days	1 - 8 oz Glass	
PFAS/537	Soil	H2O Cool, 4 ± 2 °C	14 days	1 - 8 oz Glass	
Volatile Organic Compounds/8260C	Groundwater	HCl, Cool, 4 ± 2 °C	14 days	120 mL	3 - 40ml glass vials
Semivolatile Organic Compounds/8270D	Groundwater	Cool, 4 ± 2 °C	7 days	500 mL	2 - 250 mL amber glass
TAL Metals 6020	Groundwater	HNO ₃ Cool, 4 ± 2 °C	180 days	500 mL	1 - 500 mL plastic bottle
1,4-Dioxane	Groundwater	Cool, 4 ± 2 °C	7 days	120 mL	3 - 40ml glass vials
PFAS 537	Groundwater	H2O Cool, 4 ± 2 °C	14 days	500 mL	2 - teflon free 250 ml plastic containers
Volatile Organic Compounds/TO-15	Soil Vapor	N/A	30 days	2.7 - 6 L	1 2.7 or 6 L Summa Canister

Notes:

1. Refer to text for additional information.

APPENDIX I

DARAMEND® Safety Data Sheet and Instructions



Solid-Phase Treatment of Soils and Sediments

Daramend® *In Situ* Chemical Reduction (ISCR) Reagent represents a superior treatment technology for solid materials impacted by recalcitrant organic compounds. Since the first application in 1991, variations of the technology have been successfully used to treat millions of tons of soil, sediment and other solid materials. Daramend has treated soils containing chlorinated herbicides and pesticides, organic explosive compounds, and chlorinated VOCs at many sites throughout the world.

The Daramend technology is uniquely advantageous because it can often be applied *in situ* without excavation, is typically applied at less than 5 wt % of dry soil mass, and provides the ISCR benefits of very strongly reducing conditions (both biotic and abiotic degradation mechanisms), and near-neutral pH. Relative to traditional composting, Daramend treatment results in significantly shorter treatment durations and eliminates bulking. From a sustainability perspective, because the Daramend reagent is composed of recycled iron and agricultural byproducts, the technology offers many benefits over “dig-and-dump” approaches.



The benefits of Daramend

- Improved soil health: Improves soil tilth and fertility, and reduces toxicity
- Hydrophilic character: Increases soil water holding capacity
- Balanced range of nutrients: Provides a broad range of major, minor and micronutrients
- Recalcitrant contaminants: Promotes remediation of most persistent contaminants in soils

Application methods

- *In situ* landfarming
- *Ex situ* treatment cells or windrows
- Shallow groundwater trench and excavation backfill applications

Examples of Contaminants of Concern

ORGANIC EXPLOSIVES
TNT, RDX, HMX, Tetryl,
Nitrobenzene

CHLORINATED VOCs
Ethenes, Ethanes, Methanes

CHLORINATED PESTICIDES
Dieldrin, Toxaphene, Mirex,
Chlordane, DDT, HCH,
and others

For more information and detailed case studies please visit our website.



Contaminants Treated

Use this guide by locating the contaminant of concern sorted by contaminant type. The technologies recommended for treatment of each contaminant are located to the right.

✓ Recommended, lab or field data available demonstrating success ■ Recommended with site specific lab study

	ISCO Klozur® Persulfate	ISCR EHC® Reagent, EHC® Plus, Daramend® Reagent	ENHANCED ANAEROBIC BIOREMEDIATION EHC® Liquid, ELS® Microemulsion	METALS TREATMENT MetaFix® Reagents, EHC® Metals, Daramend® Metals	AEROBIC BIOREMEDIATION Terramend® Reagent	PermeOx® Ultra	BIOGEOCHEMICAL GeoForm™ Reagents
CHLORINATED SOLVENTS							
Tetrachloroethene (PCE)	✓	✓	✓	✓			✓
Trichloroethene (TCE)	✓	✓	✓	✓			✓
Dichloroethene (cis and trans DCE)	✓	✓	✓	✓			✓
Trichloroethane (TCA)	✓	✓	✓	✓			✓
Dichloroethane (DCA)	✓	✓	✓	✓			✓
Carbon tetrachloride	✓	✓	✓	✓			✓
Chloroethane	✓	✓	✓	✓			✓
Chloroform	✓	✓	✓	✓			✓
Chloromethane	✓	✓	✓	✓			✓
Chlorotoluene	✓	✓	✓	✓			✓
Methylene chloride	✓	✓	✓	✓			✓
Vinyl chloride	✓	✓	✓	✓		✓	✓
Dichloropropane	✓	✓	✓	✓			✓
Dichloropropene	✓	✓	✓	✓			✓
Hexachlorobutadiene	✓	✓	✓	✓			✓
Tetrachloroethane	✓	✓	✓	✓			✓
Trichloropropane	✓	✓	■	✓			✓
BTEX							
Benzene	✓				✓	✓	
Toluene	✓				✓	✓	
Ethylbenzene	✓				✓	✓	
Xylenes	✓				✓	✓	

Contaminants Treated

✓ Recommended, lab or field data available demonstrating success

▪ Recommended with site specific lab study

	ISCO Klozur® Persulfate	ISCR EHC® Reagent, EHC® Plus, Daramend® Reagent	ENHANCED ANAEROBIC BIOREMEDIATION EHC® Liquid, ELS® Microemulsion	METALS TREATMENT MetaFix® Reagents, EHC® Metals, Daramend® Metals	AEROBIC BIOREMEDIATION Terramend® Reagent	PermeOx® Ultra	BIOGEOCHEMICAL GeoForm™ Reagents
PAHs							
Acenaphthene	✓				✓		
Acenaphthylene	✓				✓		
Anthracene	✓				✓		
Benzo(a)anthracene	✓				✓		
Benzo(a)pyrene	✓				✓		
Benzo(b)fluoranthene	✓				✓		
Benzo(ghi)perylene	✓				✓		
Chrysene	✓				✓		
Dibenzo(ah)anthracene	✓				✓		
Fluorene	✓				✓		
Naphthalene	✓				✓	✓	
Phenathrene	✓				✓		
Pyrene	✓				✓		
OXYGENATES							
Methyl tert-butyl ether (MTBE)	✓					✓	
Tert-butyl alcohol (TBA)	✓					✓	
PETROLEUM HYDROCARBONS							
GRO (gasoline range organics)	✓				✓	✓	
DRO (diesel range organics)	✓				✓	✓	
ORO (oil range organics >C20 alkanes)	✓				✓		
Creosote (coal tar)	✓				✓		
PHENOLS							
Phenol	✓				✓		
4-chloro-3-methyl phenol	✓				✓		
2-chlorophenol	✓		▪		✓		
2,4-dichlorophenol	✓		▪		✓		
2,4-dinitrophenol	✓		▪		✓		
4-nitrophenol	✓		▪		✓		
Pentachlorophenol	✓	✓	▪	✓	✓		✓

Contaminants Treated

✓ Recommended, lab or field data available demonstrating success

▪ Recommended with site specific lab study

	ISCO Klozur® Persulfate	ISCR EHC® Reagent, EHC® Plus, Daramend® Reagent	ENHANCED ANAEROBIC BIOREMEDIATION EHC® Liquid, ELS® Microemulsion	METALS TREATMENT MetaFix® Reagents, EHC® Metals, Daramend® Metals	AEROBIC BIOREMEDIATION Terramend® Reagent	PermeOx® Ultra	BIOGEOCHEMICAL GeoForm™ Reagents
CHLOROBENZENES							
Chlorobenzene	✓	✓	▪	✓	✓	✓	▪
Dichlorobenzene	✓	✓	✓	✓			▪
Trichlorobenzene	✓	✓	✓	✓			▪
FLUORINATED COMPOUNDS							
Dichlorodifluoromethane	✓	✓	✓	✓			▪
Trichlorofluoromethane	✓	✓	✓	✓			▪
Trichlorotrifluoroethane	✓	✓	✓	✓			▪
PFCA/PFOA	✓						
PESTICIDES & HERBICIDES							
Chlordane	✓	✓	✓	✓			▪
Heptachlor Epoxide	✓	✓		✓			▪
Lindane (hexachlorocyclohexane)	✓	✓	✓	✓	✓		▪
DDT, DDD, DDE	✓	✓	✓	✓			▪
Toxaphene	✓	✓	✓	✓			▪
Dieldrin	✓	✓	✓	✓			▪
2,4-D	✓	✓	✓	✓	✓		▪
2,4,5-T	✓	✓	✓	✓	✓		▪
Endrin	✓	✓	✓	✓			▪
Kepone	▪	✓		✓			▪
ENERGETICS							
TNT	✓	✓	✓	✓			▪
DNT	✓	✓	✓	✓			▪
Nitroglycerine	✓	✓	✓	✓			▪
HMX	✓	✓	✓	✓			▪
RDX	✓	✓	✓	✓			▪
Perchlorate		✓	✓	✓			▪

Contaminants Treated

✓ Recommended, lab or field data available demonstrating success

■ Recommended with site specific lab study

	ISCO Klozur® Persulfate	ISCR EHC® Reagent, EHC® Plus, Daramend® Reagent	ENHANCED ANAEROBIC BIOREMEDIATION EHC® Liquid, ELS® Microemulsion	METALS TREATMENT MetaFix® Reagents EHC® Metals, Daramend® Metals	AEROBIC BIOREMEDIATION Terramend® Reagent	PermeOx® Ultra	BIOGEOCHEMICAL GeoForm™ Reagents
MISCELLANEOUS							
Acetone	✓				■	■	
4-methyl-2-pentanone	✓						
1,4-dioxane	✓						
Polychlorinated biphenyls (PCBs)	✓	■		■			
Nitrate		✓	✓	✓	✓		✓
Bis(2-ethyhexyl)phthalate	✓				✓		
Nitrobenzene	✓						
Propylbenzene	✓				■	■	
4-iso-propyltoluene	✓						
Styrene	✓						
Trimethylbenzene	✓				■	■	
n-butylbenzene	✓						
Carbon Disulfide (CS ₂)	✓						
Dioxins / Furans	■						
HEAVY METALS							
Antimony				✓			
Arsenic	✓			✓			■
Barium				✓			
Cadmium				✓			✓
Chromium		✓	✓	✓			✓
Cobalt				✓			✓
Copper				✓			✓
Lead				✓			✓
Mercury				✓			
Nickel				✓			✓
Selenium				✓			■
Vanadium				✓			
Zinc				✓			✓



peroxychem.com/remediation

The Contaminants Treated Guide is for guidance only. It is recommended that a suitable treatability study be performed to verify applicability to your specific contaminant and site conditions. Although the above information accurately reflects current knowledge, PeroxyChem makes no warranty or representation, expressed or inferred, and nothing herein should be construed as to guaranteeing actual results in field use, or permission or recommendation to infringe any patent. No agent, representative or employee of PeroxyChem is authorized to vary any terms of this notice. PeroxyChem is the owner or licensee under various patents and patent applications relating to the use of these activator chemistries. Daramend, EHC, ELS, Klozur, MetaFix, PermeOx, Terramend and GeoForm are trademarks of PeroxyChem. ©2019. All rights reserved.
Document 13-04-ESD-19

SAFETY DATA SHEET

DARAMEND® Reagent

SDS # : DARR-C
Revision date: 2019-05-13
Format: NA
Version 2.02



1. PRODUCT AND COMPANY IDENTIFICATION

Product Identifier

Product Name DARAMEND® Reagent

Recommended use of the chemical and restrictions on use

Recommended Use: Remediation of contaminated soil and groundwater

Restrictions on Use No uses to be advised against were identified.

Manufacturer/Supplier

PeroxyChem LLC
2005 Market Street
Suite 3200
Philadelphia, PA 19103
Phone: +1 267/ 422-2400 (General Information)
E-Mail: sdsinfo@peroxychem.com

Emergency telephone numbers

For leak, fire, spill or accident emergencies, call:
1 800 / 424 9300 (CHEMTREC - U.S.A.)
1 703 / 527 3887 (CHEMTREC - Collect - All Other Countries)
1 303/ 389-1409 (Medical - U.S. - Call Collect)

2. HAZARDS IDENTIFICATION

Classification

OSHA Regulatory Status

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the 2015 Workplace Hazardous Materials Information System (WHMIS)

Combustible dust

GHS Label elements, including precautionary statements

EMERGENCY OVERVIEW

Warning

Hazard Statements

May form combustible dust concentrations in air

Dry or powdered ingredients are combustible. Dispersal of finely divided dust from products into air may form mixtures that are ignitable or explosive. Minimize airborne dust generation and eliminate sources of ignition.

Hazards not otherwise classified (HNOC)

No hazards not otherwise classified were identified.

Other Information

CONTAINMENT HAZARD: Any vessel that contains wet DARAMEND must be vented due to potential pressure build up from fermentation gases. Powdered material may form explosive dust-air mixtures

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical name	CAS-No	Weight %
Iron	7439-89-6	40-50
Organic amendment	Proprietary	50-60

Occupational exposure limits, if available, are listed in section 8

4. FIRST AID MEASURES

Eye Contact	In case of contact, immediately flush skin with plenty of water. Get medical attention if irritation develops and persists.
Skin Contact	Wash off with soap and water. In the case of skin irritation or allergic reactions see a physician.
Inhalation	Remove person to fresh air. If signs/symptoms continue, get medical attention.
Ingestion	Rinse mouth with water and afterwards drink plenty of water or milk. Call a poison control center or doctor immediately for treatment advice. Never give anything by mouth to an unconscious person.
Most important symptoms and effects, both acute and delayed	Coughing and/ or wheezing.
Indication of immediate medical attention and special treatment needed, if necessary	Treat symptomatically

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media	Dry chemical, CO2, sand, earth, water spray or regular foam.
Specific Hazards Arising from the Chemical	Dry or powdered ingredients are combustible. Dispersal of finely divided dust from products into air may form mixtures that are ignitable and explosive. Minimize airborne dust generation and eliminate sources of ignition.
Flammable properties	Combustible material
Explosion data	
Sensitivity to Mechanical Impact	Not sensitive.
Sensitivity to Static Discharge	Fine dust dispersed in air, in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.
Protective equipment and precautions for firefighters	As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions	Avoid dust formation. Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). For personal protection see Section 8.
Other	For further clean-up instructions, call PeroxyChem Emergency Hotline number listed in Section 1 "Product and Company Identification" above.
Environmental Precautions	No special environmental precautions required.
Methods for Containment	Cover powder spill with plastic sheet or tarp to minimize spreading and keep powder dry.
Methods for cleaning up	Sweep or vacuum up spillage and return to container.

7. HANDLING AND STORAGE

Handling	Minimize dust generation and accumulation. Keep away from open flames, hot surfaces and sources of ignition. Refer to Section 8.
Storage	Keep tightly closed in a dry and cool place. Keep away from open flames, hot surfaces and sources of ignition. Any vessel that contains wet DARAMEND must be vented due to potential pressure build up from fermentation gases.
Incompatible products	Oxidizing agents. Strong acids.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION**Control parameters**

Exposure Guidelines	Local nuisance dust standards apply.

Appropriate engineering controls

Engineering measures	Provide appropriate exhaust ventilation at places where dust is formed. It is recommended that all dust control equipment such as local exhaust ventilation and material transport systems involved in the handling of this product contain explosion relief vents or an explosion suppression or an oxygen-deficient environment.

Individual protection measures, such as personal protective equipment

Eye/Face Protection	Safety glasses with side-shields.

Skin and Body Protection	No special precautions required.
Hand Protection	No special precautions required
Respiratory Protection	Whenever dust in the worker's breathing zone cannot be controlled with ventilation or other engineering means, workers should wear respirators or dust masks approved by NIOSH/MSHA, EU CEN or comparable organization to protect against airborne dust.
Hygiene measures	Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and immediately after handling the product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Flakes
Physical State	Solid
Color	Tan Brown
Odor	No information available
Odor threshold	No information available
pH	6.0
Melting point/freezing point	No information available Not applicable
Boiling Point/Range	Decomposes upon heating
Flash point	No information available
Evaporation Rate	No information available
Flammability (solid, gas)	Combustible material
Flammability Limit in Air	
Upper flammability limit:	No information available
Lower flammability limit:	No information available
Vapor pressure	No information available
Vapor density	No information available
Density	No information available
Specific gravity	No information available
Water solubility	Insoluble in water
Solubility in other solvents	No information available
Partition coefficient	No information available
Autoignition temperature	No information available
Decomposition temperature	No information available
Viscosity, kinematic	No information available (Solid)
Viscosity, dynamic	No information available
Explosive properties	Low level dust explosion hazard
K_{st}	17 bar-m/sec: St1 Class dust
Oxidizing properties	No information available
Molecular weight	No information available
Bulk density	0.75 - 0.95 kg/L

10. STABILITY AND REACTIVITY

Reactivity	None under normal use conditions.
Chemical Stability	Stable.
Possibility of Hazardous Reactions	Avoid generating dust; fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.
Hazardous polymerization	Hazardous polymerization does not occur.
Conditions to avoid	Heat, flames and sparks.
Incompatible materials	Oxidizing agents. Strong acids.
Hazardous Decomposition Products	Burning produces obnoxious and toxic fumes.

11. TOXICOLOGICAL INFORMATION**Product Information**

LD50 Oral Iron:: 98.6 g/kg (rat)
LD50 Dermal No information available
LC50 Inhalation Iron: > 100 mg/m³ 6 hr (rat)

Serious eye damage/eye irritation Not expected to be irritating based on the components.
Skin corrosion/irritation Not expected to be irritating based on the components.

Sensitization No information available.

Chemical name	LD50 Oral	LD50 Dermal	LC50 Inhalation	NOAEL Oral Value
Iron (7439-89-6)	98600 mg/kg (Rat)			

Information on toxicological effects

Symptoms Dust is irritating eyes, nose, throat, and lungs.

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

Irritation Not expected to be irritating based on the components.
corrosivity Not applicable.
Chronic toxicity No known chronic effects of components present at greater than 1%.

Carcinogenicity Contains no ingredient listed as a carcinogen.

Mutagenicity This product is not recognized as mutagenic by Research Agencies

Neurological effects None known

Reproductive toxicity This product does not contain any known or suspected reproductive hazards.

STOT - single exposure No information available.
STOT - repeated exposure No information available.

Aspiration hazard No information available.

12. ECOLOGICAL INFORMATION**Ecotoxicity****Ecotoxicity effects**

The environmental impact of this product has not been fully investigated Not expected to have significant environmental effects

Chemical name	Toxicity to algae	Toxicity to fish	Toxicity to Microorganisms	Toxicity to daphnia and other aquatic invertebrates
Iron		96 h LC50: = 13.6 mg/L (Morone saxatilis) static		48 h Daphnia magna EC50 = 8934.78 mg/l

Persistence and degradability

The organic components are biodegradable and can be expected to contribute to BOD.

Bioaccumulation

Bioaccumulation is unlikely.

Mobility

Is not likely mobile in the environment due its low water solubility.

Other Adverse Effects

None known.

13. DISPOSAL CONSIDERATIONS**Waste disposal methods**

Recovery/recycling recommended. Can be landfilled or incinerated, when in compliance with local regulations.

Contaminated Packaging

Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. TRANSPORT INFORMATION**DOT**

NOT REGULATED

15. REGULATORY INFORMATION**U.S. Federal Regulations****SARA 313**

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

SARA 311/312 Hazard Categories

This product has the following hazards that are reportable under The Emergency Planning and Community Right-to-Know rule (EPCRA Tier II):

- Combustible dust

Clean Water Act

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

CERCLA/EPCRA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive

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Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

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

This product contains the following substances regulated under state Right-to-Know laws:

California Proposition 65

This product does not contain any Proposition 65 chemicals

CANADA**Environmental Emergencies**

This product contains no substances listed under Canada's Environmental Emergency regulations.

Canadian National Pollutant Release Inventory

This product contains no substances reportable under Canada's National Pollutant Release Inventory regulations.

International Inventories

Component	TSCA (United States)	DSL (Canada)	EINECS/EL INCS (Europe)	ENCS (Japan)	China (IECSC)	KECL (Korea)	PICCS (Philippines)	AICS (Australia)	NZIoC (New Zealand)
Lecithin 8002-43-5 (3)	X	X	X		X	X	X	X	X
Iron 7439-89-6 (40-50)	X	X	X		X	X	X	X	X
Organic amendment (50-60)		X	X		X		X	X	X
Alfalfa 84082-36-0 (28.5)		X	X		X			X	X

Mexico**Mexico - Grade**

Minimum risk, Grade 0

16. OTHER INFORMATION

NFPA	Health Hazards 1	Flammability 1	Stability 0	Special Hazards -
HMIS	Health Hazards 1	Flammability 1	Physical hazard 0	Special precautions -
NFPA/HMIS Ratings Legend Severe = 4; Serious = 3; Moderate = 2; Slight = 1; Minimal = 0				

Revision date: 2019-05-13
Revision note: *** Indicates updated section,
, SDS sections updated: 9.
Issuing Date: 2015-07-14

Disclaimer

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PROVIDED HEREIN. The information provided herein relates only to the specified product designated and may not be applicable where such product is used in combination with any other materials or in any process. Further, since the conditions and methods of use are beyond the control of PeroxyChem, PeroxyChem expressly disclaims any and all liability as to any results obtained or arising from any use of the products or reliance on such information.

Prepared By:

PeroxyChem

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End of Safety Data Sheet

Daramend® Reagent for Excavation Backfill and Trench PRB

Shallow Groundwater Applications

Daramend® Reagent was originally formulated for surficial soil treatment via land farming techniques but is also frequently used in excavation / backfill applications to promote reductive dehalogenation of residual chlorinated solvents and their metabolites (e.g., cis-DCE and VC). Its coarse particle size provides cost advantages for backfill and trench applications in treating shallow groundwater, and may also enhance the longevity of treatment. Many soil mixing approaches, including simple excavator buckets and axial head mixers, can be used to achieve good distribution. Daramend is a cost-effective solution with approximate product costs of \$13 per ton of treated backfill, while providing active treatment for five or more years in these applications.

This document provides information regarding common approaches in utilizing Daramend for excavation backfills and trench style permeable reactive barrier applications.

Excavation Backfills

Where average contaminant concentrations and other project details, such as groundwater geochemistry and velocity, are available reagent dosing can be calculated. Absent any specific site data, a typical dosing of 1 % - 2 % by weight of Daramend in the backfilled material or mixed soil volume may be used. Daramend can be mixed directly into the soil using deep soil mixing equipment or mixed into an open excavation base where prior soil removal had been conducted. Daramend is generally applied dry for these applications to enable easy mixing. In very windy conditions, a slurry may be prepared to minimize dust.



Trench Permeable Reactive Barriers

For permeable reactive barrier (PRB) applications, thorough mixing of the Daramend and sand to be placed in the reactive barrier is essential to ensure uniform treatment in the reactive zone following construction. It is recommended to mix the Daramend and sand mixture as a wet slurry *ex situ* with soil mixing equipment, an excavator, or a cement mixer. Once a homogeneous slurry is created it can be placed into the trench for the PRB construction.

PRBs constructed using dry reagent mixing is generally not recommended; the Daramend will likely segregate from the sand due to varying material densities. In addition, trench PRBs constructed with standing water present will also run the risk of segregation of the Daramend and sand.

With any PRB installation technique one should consider the possible impacts to soil permeability as a result of both the installation technique and the reagent used. The relatively low Daramend dosages typically needed in PRB applications do not adversely impact hydraulic conductivity.

Health and Safety

Daramend is safe when handled properly in accordance with instructions for use and the safety data sheet (SDS). The SDS is posted on our web site at: <http://www.peroxychem.com/remediation>. When working with Daramend, the use of standard personal protective equipment, including safety glasses, protective clothing and gloves are recommended. Additional safety equipment may be required for mechanical and site operations.

Please contact PeroxyChem for additional guidance.

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APPENDIX J

Proposed Remedial Action Project Schedule

Proposed Remedial Action Project Schedule

65 Ekford Street, Brooklyn, NY

BCP Project C224218

ESTIMATED PROJECT SCHEDULE		2022									
Task	Description	April	May	June	July	Aug	Sept	Oct	Nov	Dec	
1	Design, Investigation and Permitting										
2	NYSDEC RAWP Review										
3	45-Day Public Comment Period										
4	Implementation of RAWP										
6	Preparation of FER and SMP (if required)										
7	NYSDEC & NYSDOH Review of FER & SMP (if required)										
8	Issuance of COC										

Notes:

1. Schedule is estimated and subject to change.
2. Implementation of RAWP does not include completion of building construction
3. NYSDEC - New York State Department of Environmental Conservation
4. NYSDOH - New York State Department of Health
5. BCP - Brownfield Cleanup Program
6. RAWP - Remedial Action Work Plan
7. FER - Final Engineering Report
8. SMP - Site Management Plan
9. COC - Certificate of Completion
10. COC issuance estimated for December 2022