# SUPPLEMENTAL REMEDIAL INVESTIGATION REPORT
8 WALWORTH STREET
BROOKLYN, NY
NYSDEC SITE C224239

**PREPARED FOR**

TOLDOS YEHUDAH LLC

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File No. 134860-002

## *Certification*

*This report documents remedial investigation activities conducted at the Site at 8 Walworth 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 Revised Supplemental Remedial Investigation Report[1] 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.*

James M. Bellew

25 November 2020

*James M. Bellew, Senior Associate* *Date*

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[1] *Certification applies to remedial investigation activities conducted after the execution of the Brownfield Cleanup Agreement dated [1 March 2018].*

## Table of Contents

## Table of Contents

## List of Tables

## List of Figures

## List of Acronyms and Abbreviations

| | |
|---|---|
| **A** | |
| AA | Alternatives Analysis |
| AAR | Alternatives Analysis Report |
| Alpha | Alpha Analytical Laboratories, Inc. |
| AOCs | Areas of Concern |
| ASP | Analytical Services Protocol |
| AWQS | Ambient Water Quality Standards |
| **B** | |
| BCA | Brownfield Cleanup Agreement |
| BCP | Brownfield Cleanup Program |
| bgs | below ground surface |
| **C** | |
| cis-1,2-DCE | cis-1,2-dichloroethene |
| Coastal | Coastal Environmental Solutions, Inc. |
| COCs | Contaminants of Concern |
| CP-51 | Commissioners Policy-51 *(specifically "October 2010 NYSDEC Commissioners Policy 51")* |
| CSM | Conceptual Site Model |
| CVOCs | chlorinated volatile organic compounds |
| **D** | |
| 1,1-DCA | 1,1-dichloroethane |
| 1,1-DCE | 1,1-dichlroethene |
| DCE | Dichloroethene |
| DER-10 | Division of Environmental Remediation-10 *(specifically "May 2010 NYSDEC Technical Guidance for Site Investigation and Remediation")* |
| DOT | Department of Transportation |
| DUSR | Data Usability Summary Report |
| **E** | |
| EBC | Environmental Business Consultants |
| Eastern | Eastern Environmental Solutions |
| EPA | U.S. Environmental Protection Agency |
| **H** | |
| FER | Final Engineering Report |
| FWRIA | Fish and Wildlife Resources Impact Analysis |
| Haley & Aldrich | Haley & Aldrich of New York |
| **M** | |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| MDL | method detection limit |

| | |
|---|---|
| mg/kg | milligrams per kilogram |
| Microbial Insights | Microbial Insights, Inc. |

**N**

| | |
|---|---|
| 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 |
| PCB | polychlorinated biphenyl |
| PCE | perchloroethene/tetrachloroethene |
| PFAS | Per- and Polyfluoroalkyl Substances |
| PFOA | Perfluorooctanoic Acid |
| PVC | polyvinyl chloride |
| PWG | P.W. Grosser Consulting |
| 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 |
| RI | Remedial Investigation |
| RIR | Remedial Investigation Report |
| RIWP | Remedial Investigation Work Plan |

**S**

| | |
|---|---|
| SCG | Standards, Criteria and Guidelines |
| SCO | Soil Cleanup Objective |
| Site | the property located at 8 Walworth Street, Brooklyn, New York |
| SMP | Site Management Plan |
| SRI | Supplemental Remedial Investigation |
| SRIR | Supplemental Remedial Investigation Report |
| SRIWP | Supplemental Remedial Investigation Work Plan |
| SSDS | Sub-Slab Depressurization System |
| SVOC | Semi-Volatile Organic Compound |

**T**

| | |
|---|---|
| 1,1,1-TCA | 1,1,1-trichloroethane |
| TCE | trichloroethene |
| TCL | Target Compound List |

| | |
|---|---|
| Techtronic | Techtronics Ecological Corporation |
| TOGS 1.1.1 | Technical and Operational Guidance Series 1.1.1 *(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")* |
| TPH | Total Petroleum Hydrocarbons |
| Toldos Yehudah | Toldos Yehudah LLC |
| 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 |
| 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 Toldos Yehudah LLC (Toldos Yehudah) for the property located at 8 Walworth Street, Brooklyn, New York (the Site). The Site location is shown in Figure 1.

The Site is currently in the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) identified as NYSDEC Site Number C224239 with Toldos Yehudah listed as a participant. The Site was operated by Techtronics Ecological Corporation (Techtronics) from 1962 through the 1990s. The Site is also identified in the Resource Conservation and Recovery Act (RCRA) database as a Large Quantity Generator under RCRA ID NYD000824334.

The activities of this Supplemental Remedial Investigation (SRI) were completed on 15 June through 15 July 2020 and were implemented in accordance with the "Supplemental Remedial Investigation Work Plan" (SRIWP) approved by NYSDEC on 1 May 2020 and provided in Appendix A.

## 1.1 PURPOSE AND OBJECTIVES

As part of the BCP requirements, a Remedial Investigation (RI) was conducted at the Site from November 2018 through February 2019. Environmental Business Consultants (EBC) submitted a "Remedial Investigation Report" (RIR) to NYSDEC dated 9 September 2019. On 12 November 2019, NYSDEC responded to EBC's submission noting that the RIR indicated the presence of elevated chlorinated volatile organic compounds (CVOCs) in soil, groundwater, and soil vapor at the Site. Based on the RIR findings, NYSDEC requested additional vertical delineation of the nature and extent of CVOC contamination both on and off Site.

This SRI addressed the comments discussed in the 12 November 2019 and the 27 January 2020 response letters from NYSDEC, the 17 January 2020 response letter from the New York State Department of Health (NYSDOH), as well as comments discussed during an on-Site meeting attended by Haley & Aldrich, NYSDEC, and NYSDOH on 26 February 2020. The supplemental investigation activities provided the additional delineation requested and confirmed the direction of groundwater flow beneath the Site.

# 2. Site Background

## 2.1 SITE LOCATION AND DESCRIPTION

The Site, identified as Block 1715 Lot 33 on the New York City tax map, is 3,910 square feet and bounded by a vacant lot to the north, a warehouse to the south, Walworth Street to the east, and a vacant lot to the west. The Site location is shown on Figure 1. Existing Site features are shown on Figure 2. The Site is currently a vacant one-story warehouse encompassing the entire lot, and the land is currently zoned as manufacturing M1-2. The Site is located in an urban area surround by light industrial, commercial, and residential properties served by municipal water.

## 2.2 GEOLOGY AND HYDROGEOLOGY

The Site's elevation ranges from 16 to 17 feet above sea level, and the depth to bedrock is greater than 100 feet. The Site's stratigraphy, from the surface down, consists of historical fill material to depths as great as 4 to 5 feet, underlain by 14 to 15 feet of brown fine- to coarse-grained sand with silt. A brown silty clay layer was encountered at approximately 30 feet below ground surface (bgs), where the stratigraphy changes to a light brown to brown, medium- to coarse-grained sand with cobbles extending to at least 45 feet bgs. Depth to groundwater ranges from 14 to 15 feet bgs, and groundwater beneath the Site is generally to the south-southeast. A groundwater contour map is provided in Figure 3.

## 2.3 SITE HISTORY

The Site was developed as early as 1887 with a one-story residence and shed on the south side of the property, a two-story storefront building with a single story garage in the middle of the Site along Walworth Street, and a three-story residence on the north side of the Site. The surrounding vicinity was primarily developed with residences, commercial buildings, and industrial/manufacturing use facilities. The Site remained largely unchanged through the early 1900s.

By 1918, the adjoining property to the west was occupied by a junk yard and was developed into an indoor parking garage by 1935. The Site remained developed with residences until 1950, when only the two-story residential structure and sheds remained present on the south side of the property. A one-story warehouse used for chemical drum storage was erected on the north side of the Site by 1965 and the northern and southern adjacent properties were used for paint storage and mixing in the mid-1960s. By 1977, the two-story residence to the north was no longer present, but the chemical drum warehouse remained. In 1982, the Site was redeveloped with the existing one-story warehouse building, occupied by Techtronics, and utilized for the mixing and storage of paints and other coatings. The adjoining property to the north was partially included in the Techtronics facility and labeled as "Techtronics A" with the 8 Walworth Site reported as "Techtronics B." Techtronics ceased operations in the 1900s. The Site and neighboring properties have remained largely unchanged through the present.

## 2.4 REDEVELOPMENT PLANS

The redevelopment plan includes construction of a four-story mixed-use commercial and community facility. The proposed redevelopment will not include a cellar space. The upper floors will reach 57 feet above grade. A bulkhead will extend above the top of the fourth floor to 67 feet above grade. The first floor will consist of a lobby, worship areas, mechanical and meter rooms, an elevator, and bathrooms. The second through fourth floors will be used for storage and office space totaling 11 storage units and 15 offices. Each floor will be equipped with two bathrooms. A bulkhead located on the roof will house the elevator and machine rooms.

# 3. Summary of Previous Investigations

*Phase II Environmental Site Assessment*, 26 December 2007, Prepared by P.W. Grosser Consulting

P.W. Grosser Consulting (PWG) performed a Phase II Environmental Site Assessment (ESA) at the Site in December 2007. Investigation activities included collection of four soil samples, two groundwater samples from temporary groundwater sampling points and two groundwater samples from existing on-Site monitoring wells. Analytical results indicated that soil and groundwater beneath the Site have been impacted with VOCs, including trichloroethene (TCE), tetrachloroethene (PCE), 1,1-dichlroethene (1,1-DCE) and cis-1,2-dichlroethene (cis-1,2-DCE) and polycyclic aromatic hydrocarbons (PAHs), including benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, naphthalene, and phenanthrene.

*Soil Vapor Intrusion Report*, 15 May 2017, Prepared by Environmental Business Consultants

In accordance with the “Soil Vapor Intrusion Work Plan” submitted in March 2017, EBC performed a vapor intrusion sampling event at the Site in order to determine if the chlorinated solvents detected in shallow soil and groundwater on an adjacent property (BCP Site No. C224204) were off-gassing and migrating into the Site building. In March 2017, EBC installed two sub-slab soil vapor implants and collected one indoor air and one outdoor air sample. Results found CVOCs, including PCE, TCE, carbon tetrachloride, 1,1-DCE, 1,1-dichloroethane (1,1-DCA), 1,1,1-trichloroethane (1,1,1-TCA), cis-1,2-DCE, and vinyl chloride in both of the sub-slab soil vapor samples. PCE and TCE were also detected in indoor air at concentrations above the NYSDOH recommended action levels. Based on elevated CVOC concentrations in indoor air and sub-slab vapor, EBC concluded that sub-slab vapors were affecting indoor air quality of the Site. However, the source of the impact was not determined to be on-Site or from the adjacent BCP site(s) where CVOC impacts were reported at concentrations an order of magnitude higher than at the Site.

*Phase I Environmental Site Assessment Screening,* May 2017, Prepared by Environmental Business Consultants

EBC completed a partial Phase I Environmental Site Assessment in May 2017 in which historical Sanborn fire insurance maps, historical aerial photographs, historical topographic maps and city directory listings were reviewed. According to the review of these sources, the Site was formerly used by Techtronics, a manufacturer of paints and coatings. The Site was listed in the CORRACTS, RCRA and NY MANIFEST databases for handling and generation of hazardous materials have been handled at the Site dating back as early as 1980. Techtronics was also listed as a large quantity generator (LQG) for a few years in the early 1980s (RCRA ID NYD000824334). Materials handled at the Site includes ignitable waste, CVOCs, chlorinated fluorocarbons, halogenated solvents, acetone, and petroleum-based materials. The Site is also listed on the NYSPILLS database related to one open spill incident (Spill No. 0710116), which was reported on 21 December 2007 when chlorinated solvent contamination was identified in soil and groundwater by PWG during the Phase II Investigation. The contaminants identified were thought to be associated with the historical manufacturing of lacquer and paints at the Site.

*Remedial Investigation Report,* 9 September 2019, Prepared by Environmental Business Consultants, Prepared for NYSDEC

As part of the BCP requirements, EBC performed an RI at the Site from November 2018 through February 2019 and submitted an RIR summarizing the findings to NYSDEC on 9 September 2019. The RI included collection of soil, groundwater, and soil vapor samples throughout the Site. A total of eight soil borings were advanced to 15 feet bgs. Four to six soil samples were collected from each boring from depth intervals including 0 to 6 inches, 6 to 12 inches, 0 to 24 inches, and the depth of the soil groundwater interface (approximately 12 feet bgs) for a total of 39 soil samples. Five monitoring wells (MW1701 through MW1705) were installed at the Site to depths of 18 to 21 feet bgs with 10 feet of 0.010-inch polyvinyl chloride (PVC) well screen at the base of the well. Groundwater samples were collected from each well using low-flow groundwater purging techniques in January and February 2019.

The RIR findings reported CVOC contamination in soil, specifically PCE, TCE, and cis-1,2-DCE, across the Site; the highest concentrations were identified in the borings installed on the northern portion of the property. The highest concentrations were found in SB1708 (located in the northeast corner of the Site) with PCE detected at 3,200,000 micrograms per kilogram (µg/kg), TCE detected at 200,000 µg/kg, and cis-1,2-DCE detected at 210,000 µg/kg. Elevated CVOC concentrations were also detected in the deeper intervals of SB1705 from 13 to 15 feet bgs (PCE at 440,000 µg/kg, TCE at 26,000 µg/kg, and cis-1,2-DCE at 38,000 µg/kg) and in SB1702 from 7 to 9 feet bgs (PCE at 680,000 µg/kg and TCE 28,000 µg/kg). Except for SB1703, shallow soil samples found slightly elevated CVOC concentrations above Unrestricted Use Soil Cleanup Objectives (UUSCOs) but below Restricted Commercial Soil Cleanup Objectives (RCSCOs). The soil sample collected from 6 to 12 inches bgs in SB1703 found elevated PCE at 370,000 µg/kg, exceeding the Industrial Use Soil Cleanup Objectives (IUSCOs).

Elevated CVOCs in groundwater were found above NYSDEC Ambient Water Quality Standards (AWQS) throughout the Site; the areas of greatest impact correlated with the areas of greatest soil impact. PCE, TCE, and cis-1,2-DCE were detected above the AWQS in each monitoring well. The highest PCE and TCE concentrations were found in MW1702, located on the central western Site boundary, and MW1701, located in the southwest corner. In MW1702, PCE was detected at 20,000 micrograms per liter (µg/L), TCE at 11,000 µg/L, and cis-1,2-DCE at 5,700 µg/L. In MW1701, PCE was detected at 11,000 µg/L, TCE at 6,200 µg/L and cis-1,2-DCE at 270 µg/L. The highest concentrations of cis-1,2-DCE were detected in MW1703, located in the northwest corner, at 11,000 µg/L and PCE at 9,400 µg/L and TCE at 4,300 µg/L. CVOC concentrations at MW1704 and MW1705, located in the southeast and northeast corners of the Site respectively, also showed elevated CVOCs in groundwater but at levels lower than observed on the northern and western portions of the Site.

Results of soil vapor sampling found elevated CVOCs in all soil vapor samples with total concentrations ranging from 825 micrograms per cubic meter ($\mu g/m^3$) to 1,150,564 $\mu g/m^3$. The greatest concentrations were reported in SS1, near the western property line, with PCE detected at 590,000 $\mu g/m^3$, TCE detected at 488,000 $\mu g/m^3$ and cis-1,2-DCE detected at 36,400 $\mu g/m^3$.

Additional contaminants of concern (COCs) include metals, specifically copper, lead, zinc, barium, cadmium, selenium, mercury, arsenic, chromium, manganese, and nickel, which were found above UUSCOs in shallow soil samples reaching 2 feet bgs in multiple locations throughout the Site. Mercury, barium, lead, and cadmium were also identified above RCSCOs in several shallow samples and arsenic was found above ISCOs) in shallow soil at two locations. Semi-volatile organic compounds, including PAHs such as benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, and indeno(1,2,3-cd)pyrene were also identified above UUSCOs in shallow soil samples reaching 2 feet bgs in multiple locations throughout the Site. Dibenzo(a,h)anthracene and benzo(a)anthracene were found above RCSCOs in the 0.5 to 1 foot bgs interval in three locations. Benzo(a)pyrene was found exceeding Restricted Industrial SCOs in shallow soils extending to 2 feet bgs in multiple locations. Evidence of metals and PAHs in shallow soils is consistent with urban fill found throughout the area.

# 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.

The NYSDEC Case Manager/Project Manager was Mr. Aaron Fisher. The Case Manager/Project Manager was responsible for overseeing the successful completion of the project work and adherence to the approved SRIWP on behalf of NYSDEC.

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 this work plan and in accordance with the DER-10 guidance.

Mari Conlon 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 work plan and oversight of project schedule. As the Project Manager, Ms. Conlon was responsible for communications with the NYSDEC Case Manager regarding project status, schedule, issues and updates for project work.

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

The drilling subcontractors included Coastal Environmental Solutions, Inc., (Coastal) and Eastern Environmental Solutions (Eastern). Coastal and Eastern provided a Geoprobe operator to implement the scope of work of the approved SRIWP.

Samples (with the exception of microbial array samples discussed in Section 4.3) were collected in 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. (Alpha) of Westborough, Massachusetts (Certification No. 07010T). Alpha was responsible for analyzing the samples as per the analyses and methods identified in the approved SRIWP.

## 4.2 SOIL BORING INSTALLATION AND SOIL SAMPLING

Five soil borings were installed to 45 feet bgs by a track-mounted direct push drill rig (Geoprobe®) operated by Coastal and Eastern. Soil samples were collected from 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 was logged continuously by an engineer. The presence of staining, odors, and photoionization detector response was noted.

Samples were collected from 10 to 12 feet bgs, 30 to 35 feet bgs and from 40 to 45 feet bgs. Soil samples were collected directly into laboratory provided containers using stainless steel spoons decontaminated after each use. Soil samples were analyzed for:

- Target Compound List (TCL) VOCs using U.S. Environmental Protection Agency (EPA) Method 8260B;
- Polychlorinated biphenyls (PCBs) using EPA Method 8082; and
- Target Analyte List / Part 375 List Metals (including cyanide and hexavalent chromium) by EPA Methods 6010C/7471B/9010C/7196A.

As per NYDSEC DER-10 requirements, soil samples were collected for emerging contaminants. Soil collected from 10 to 12 feet bgs in soil borings B-01 (located outside of the source area) and B-05 (located within the source area) was also sampled and analyzed for:

- NYSDEC and Per- and Polyfluoroalkyl Substances (PFAS) List (21 compounds) by USEPA Method 537.1; and
- 1,4-dioxane by USEPA Method 8270

Samples analyzed for PFAS and 1,4-dioxane were 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 DECs Part 375 Remedial Programs,” respectively. Laboratory data were reported in Analytical Service Protocol (ASP) Category B deliverable format and are available in Appendix G.

Soil sample locations and sample depths are summarized in Table 3.

## 4.3 PERMANENT MONITORING WELL INSTALLATION AND GROUNDWATER SAMPLING

Two-inch clustered permanent monitoring wells were installed in five locations on Site. Monitoring well clusters included a shallow well to 17 to 20 feet bgs, intermediate well to 31 to 35 feet bgs and a deep well to 42 to 45 feet bgs. Groundwater was encountered at approximately 14 to 15 feet bgs. Wells were installed with two inches of annular space, with flush mount manhole covers and concrete pads and were screened with 5 to 7 feet of 0.010-inch slotted PVC. Wells were installed with #00 Morie or equivalent placed to a minimum of 2 feet above the screen, and a bentonite seal was placed directly above the filter pack. Installation techniques included a combination of hollow stem auger, mud rotary, and direct push drilling further detailed in Section 4.3.1. Monitoring well installation and construction details are provided in Table 5. On average, 1 to 2 monitoring wells were installed per day as detailed in the daily reports submitted to NYSDEC included in Appendix J.

Monitoring wells were developed by surging a pump. Development was completed until the water turbidity measured 50 nephelometric turbidity units (NTU) or less or 10 well volumes were removed, if possible. Well development logs are provided in Appendix D.

The well casings were surveyed by a New York State licensed surveyor on 23 July 2020. During surveying, Haley & Aldrich performed a synoptic monitoring well gauging event. Results of the gauging event are provided in Table 4. Groundwater flows from north-northwest to south-southeast. A groundwater contour map is provided in Figure 3. The previously installed wells by a former consultant will be decommissioned in accordance with NYSDEC CP-43 during the remedial action implementation.

Groundwater monitoring wells were sampled utilizing low flow sampling procedures for groundwater sampling. Prior to sampling each monitoring well the water level was measured 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. Peristaltic and bladder pumps were used during this groundwater sampling event. Dedicated disposable field equipment used at each well included high density polyethylene and silicon tubing. The bladder pumps were decontaminated, and the bladders were replaced between monitoring wells. Wells were purged until turbidity, pH, temperature, dissolved oxygen, and specific conductivity stabilized. Field measurements collected from the flow cell were logged and are included in Appendix E.

Samples were collected from the shallow, intermediate, and deep zones of monitoring wells MW-02, MW-03, MW-04 and MW-05 and from the shallow and intermediate zones of monitoring well MW-01 and analyzed for:

- TCL VOCs using EPA Method 8260; and
- PCBs using EPA Method 8082A.

Groundwater samples in the shallow and intermediate groundwater zones from MW-01 (outside source zone) and in the shallow, intermediate, and deep groundwater zones from MW-05 (within source area) were also analyzed for the following emerging contaminants:

- NYSDEC and PFAS List (21 compounds) by EPA Method 537; and
- 1,4-dioxane by EPA Method 8270

Samples analyzed for PFAS and 1,4-dioxane were 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 DECs Part 375 Remedial Programs,” respectively. Laboratory data were reported in ASP Category B deliverable format and are available in Appendix G.

Groundwater samples in the shallow, intermediate, and deep groundwater zones from MW-05 (within source area) were also analyzed for the following parameters:

- Biogeochemical parameters; and
- Microbial array.

The microbial array was collected into bottles provided by Microbial Insights, Inc. (Microbial Insights) of Knoxville, Tennessee. Samples were transported under standard chain of custody procedures via next-day air to the Microbial Insights facility.

### 4.3.1 Deviations from the SRIWP

Difficulties with the proposed drilling technique and conditions of the subsurface were encountered during the SRI. The initially proposed drilling technique of hollow stem auger encountered refusal and was unable to penetrate the subsurface to the proposed depths for intermediate and deep wells. After evaluating the feasibility of other drilling techniques and receiving confirmation from NYSDEC, the drilling equipment was altered to include mud rotary.

Drilling difficulty was also encountered when installing the MW-01 cluster on the southern Site boundary. The shallow monitoring well MW-01S was installed at this location to 20 feet bgs via hollow stem auger. During installation of the intermediate monitoring well in this cluster, a subsurface anomaly was encountered at 15 to 16 feet bgs, at which depth the mud and water used during the mud rotary process rapidly dissipated and rendered the drilling technique ineffective. After further evaluation of the feasibility of other drilling techniques and upon confirmation from NYSDEC, MW01-I was installed using 3.25-inch casings via direct push.

During the attempted installation of MW01-D using 3.25-inch casing via direct push, multiple locations were probed; however, refusal was encountered at each location between 26 to 31 feet bgs. The final attempt began damaging the drill rig and the drilling subcontractor determined depth could not be achieved using direct push with 3.25-inch casing because of cobbles and pebbles in the area. After further evaluation, it was determined due to limitations of the overhead clearance and subsurface conditions, other drilling technology was not feasible for installation of a deep well in the MW01 cluster and it was determined with NYSDEC that the need for additional data in this area would be re-evaluated upon completion of the SRI.

Deviations and approval dates are summarized in Table 6.

### 4.3.2 Previously Installed Groundwater Monitoring Wells

During the RI completed in 2018 five permanent groundwater monitoring wells were installed to 18 to 21 feet bgs at the Site. These five monitoring wells were not sampled during this SRI due to lack of direct involvement in the RI and concerns regarding the integrity of the well construction. Five new permanent shallow groundwater monitoring wells were installed as part of this SRI in order to ensure consistency in analytical data and confirm the groundwater flow direction. The previously installed monitoring wells remaining on Site will be decommissioned in accordance with NYSDEC CP-43 during the remedial action implementation.

## 4.4 QUALITY ASSURANCE/QUALITY CONTROL

The SRI was conducted in accordance with Haley & Aldrich's Quality Assurance Project Plan (QAPP) provided in Appendix B. Haley & Aldrich's sampling program included several types of quality assurance/quality control (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 report are provided in Appendix G. Data was validated as detailed in Section 6.4 and summarized in Data Usability Summary Reports (DUSRs) included in Appendix K. As further detailed in the DUSRs and laboratory narratives from the Category B reports, elevated detection limits were observed due to matrix interferences during analysis and elevated target compound concentrations present in the native samples.

## 4.5 REPORTING

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

## 4.6 INVESTIGATION DERIVED WASTE

Soil cuttings generated during monitor well installation was 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 collection was placed into a DOT -approved 55-gallon drum pending off-Site disposal. Groundwater analytical data have been sent to Cyclechem and will be transported by Eastern to the Cyclechem facility located in Elizabeth, New Jersey, within 90 days of generation.

# 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 remedial investigation 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 J.

# 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.

Groundwater analytical results were compared to 6NYCRR Part 703.5 NYSDEC AWQS.

## 6.2 SOIL SAMPLING RESULTS

Tables 2A through 2D summarize the analytical results from the soil sampling event. Figure 4 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 F.

*Volatile Organic Compounds*

PCE was detected at concentrations of 1.8 milligrams per kilogram (mg/kg) and 2.2 mg/kg, respectively, above the UUSCOs in the soil samples collected from boring B02 at 30 to 35 ft bgs and B05 at 30 to 35 ft bgs. VOCs were not detected in remaining soil samples above the UUSCOs or RRSCOs.

Several metals were detected above the UUSCOs and RRSCOs in two soil samples collected from borings B03 and B05. Nickel was detected in B03 (40 to 45 feet) at 41.9 mg/kg and in B05 (30 to 35 feet) at 38.8 mg/kg, respectively. Metals were detected in remaining soil samples above the UUSCOs or RRSCOs.

*Polychlorinated biphenyls*

PCBs were not detected in soil samples above the UUSCOs or RRSCOs.

*Emerging Contaminants*

1,4-dioxane was detected at 1.4 mg/kg above the UUSCOs in the soil sample collected from boring B02 at 10 to 12 ft bgs. 1,4-dioxane was not detected at concentrations above the laboratory detection limit in any other soil samples.

Perfluorooctanoic Acid (PFOA)/PFAS were not detected above the laboratory detection limits in soil samples.

*Metals*

Trivalent chromium was detected at 37 mg/kg above the UUSCOs in the soil sample collected from boring B03 at 40 to 45 ft bgs. Trivalent chromium and hexavalent chromium were not detected in remaining soil samples above the UUSCOs or RRSCOs.

## 6.3 GROUNDWATER SAMPLING RESULTS

Tables 1A through 1D 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. Sample logs are provided in Appendix E.

*Volatile Organic Compounds*

CVOCs, including PCE and TCE and daughter products cis-1,2-DCE, 1,1-DCA, vinyl chloride and 1,1,1-TCA, were detected above the NYSDEC AWQS in multiple groundwater samples collected during the SRI. PCE and TCE was detected above the AWQS in each groundwater sample at concentrations ranging from 190 µg/L to 58,000 µg/L and 52 µg/L to 69,000 µg/L, respectively. The highest concentrations of CVOC were found in shallow groundwater; with the maximum CVOCs concentrations detected in monitoring well MW02-S, located adjacent to the western Site boundary abutting 11 Spencer Street. In MW02-S, PCE was detected at 58,000 µg/L and TCE at 69,000 µg/L. 1,2,4-Trichlorobenzene was also detected in MW02-S at 640 µg/L. Daughter products of PCE and TCE were found at elevated concentrations in MW04-S and MW05-S, located on the southern portion of the Site, with cis-1,2-DCE at 120,000 µg/L, 1,1-DCA at 2,200 µg/L, and 1,1,1-TCA at 15,000 µg/L in MW05-S. Vinyl chloride was identified above the AWQS in shallow, intermediate and deep groundwater at locations MW04 and MW05 with a maximum concentration of 66 µg/L in MW04-S.

Other VOCs detected above the AWQS include benzene, toluene, ethylbenzene and xylenes (collectively BTEX) found at maximum concentrations in MW05-S (total concentration of 17,500 µg/L), MW05-I (total concentration of 11,312 µg/L) and in MW04-S (total concentration of 5,260 µg/L). 1,2-dichlorobenzene and 1,4-dichlorobenzene were detected at maximum concentrations in MW03-S at 710 µg/L and 130 µg/L, respectively. Naphthalene and 1,2,4,5-tetramethylbenzene were detected at maximum concentrations in MW02-S at 320 µg/L and 36 µg/L, respectively. 1,3,5-Trimethylbenzene and 1,2,4-trimethylbenzene were detected in MW05-I at 200 µg/L and an estimated concentration of 81 µg/L.

*Polychlorinated biphenyls*

Aroclor 1254 was detected above the AWQS in shallow, intermediate, and deep groundwater at locations MW02 with the lowest concertation of 0.486 µg/L in deep groundwater and highest concentration of 0.962 µg/L found in shallow groundwater. Aroclor 1254 was also detected in MW04-S at 0.51 µg/L and at the maximum concentration encountered for the Site, 15.1 µg/L, in MW03-S.

*Emerging Contaminants*

Emerging contaminants 1,4-dioxane and PFOA/PFAS were compared to the New York Maximum Concentrations Limit (NY-MCL) for drinking water, adopted by NYSDOH in July 2020.

1,4-dioxane was detected at concentrations above the NY-MCL of 1 µg/L in each groundwater sample analyzed for this contaminants with the exception of the groundwater sample collected from MW01-I. 1,4-dioxane concentrations ranged from 0.253 µg/L in MW01-I to 980 µg/L in MW05-S. Concentrations decreased with depth in MW05 with concentrations of 286 µg/L detected in MW05-I and 288 µg/L detected in MW05-D. 1,4-dioxane was detected at much lower concentrations in location MW01, including 1.86 µg/L in MW01-S.

PFOA/PFAS compounds were detected above the NY-MCL for drinking water of 0.01 µg/L in each groundwater sample analyzed for these contaminants. Elevated PFOA/PFAS compounds include Perfluorobutanoic Acid (PFBA), Perfluoropentanoic Acid (PFPeA), Perfluorohexanoic Acid (PFHxA), Perfluoroheptanoic Acid (PFHpA), Perfluorohexanesulfonic Acid (PFHxS), Perfluorooctanoic Acid (PFOA, Perfluoroheptanesulfonic Acid (PFHpS), Perfluorononanoic Acid (PFNA), Perfluorooctanesulfonic Acid (PFOS), N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA) and Perfluorooctanesulfonamide (FOSA). The total concentration of PFAS compounds ranged from 0.111 µg/L in MW01-I to a maximum of 11 µg/L in MW05-I.

*Biogeochemical Parameters and Microbial Array*

Declining concentrations of CVOCs including PCE and TCE provide primary evidence of intrinsic biodegradation via reductive dechlorination. When PCE concentrations are high, TCE concentrations can be stable or increasing, because TCE is a degradation product of PCE. Secondary evidence of intrinsic biodegradation includes increases in biodegradation intermediates DCE and vinyl chloride and changes in biogeochemical parameters including elevated genetic markers for dechlorinating bacteria and their enzyme functional genes, low redox potential (ORP), neutral pH (6 to 8 in standard units), elevated alkalinity, low oxygen, nitrate, and sulfate concentrations, and elevated concentrations of organic carbon (TOC), dissolved iron and manganese, methane, ethane, and ethene. A summary of the analytical results for biogeochemical parameters collected during this baseline sampling is provided in Table 1C.

Groundwater samples in the shallow, intermediate, and deep groundwater zones from MW05 were analyzed for biogeochemical parameters and microbial array. Concentrations of target bacterial populations give an overview of the potential for biodegradation of groups of compounds by anaerobic and aerobic pathways. At MW05-S, bacterial populations (e.g., Dehalococcoides (DHCs) and Dehalobacter spp. (DHBt) capable of reductive dechlorination of TCE, DCE, and vinyl chloride were detected at low to moderate concentrations. At MW05-I, bacterial populations capable of reductive dechlorination for the abovementioned CVOCs were detected at low concentrations. Results of the microbial array analyzed by Microbial Insights are included in Appendix I.

## 6.4 DATA VALIDATION

DUSRs were created to confirm the compliance of methods with the protocols described in the NYSDEC ASP. DUSRs are provided in Appendix K.

## 6.5 DATA USE

Validated analytical data, supplied in ASP Category B Data Packages in Appendix G, have been submitted to the NYSDEC EQuIS database in an Electronic Data Deliverable package.

# 7. Conceptual Site Model

## 7.1 AREAS OF CONCERN

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

AOC 1 – Groundwater

Shallow:

VOC contamination at the Site consists of CVOC-related contaminants with elevated concentrations exhibited in the groundwater at different depth intervals. Based on the vertical distribution of CVOC-related contamination, the highest concentrations were detected in the shallow groundwater interface (12 to 17 feet bgs) in the suspected source area located in the northern half of the Site. The highest concentrations of PCE and TCE were detected in samples from location MW02 located on the western boundary of the Site abutting 11 Spencer Street. The highest concentrations of daughter products, including cis-1,2-DCE, 1,1-DCA and 1,1,1-TCA, were detected at elevated concentrations in MW05, indicating the presumed source area is potentially located on the northwestern boundary of the Site. Shallow TCE and PCE plumes are shown in Figures 7 and 10, respectively.

Intermediate Groundwater

Analytical results indicate that as depth increases, CVOCs concentrations generally dissipate with the exception of CVOC contamination in groundwater increases at MW05-I, located on the northern central portion of the Site. The intermediate groundwater sample detected PCE at 7,500 µg/L and TCE at 2,500 µg/L, both of which are an order of magnitude greater than concentrations found in MW05-S.

AOC 2 – Soil Source Area Impacts

Based on a review of analytical data collected during this SRI as well as historical analytical data collected at the Site in the past three years, there is a source area of CVOC impacts in soils located on the northern portion of the Site. The source area boundaries are shown on Figure 4. Impacted soils extend to the groundwater interface at approximately 14 to 15 feet bgs.

AOC 3 – Soil Vapor Impacts

Based on a review of analytical data collected during this SRI as well as historical analytical data collected at the Site in the past three years, CVOCs have also partitioned to the vapor phase from impacted soil and groundwater.

## 7.2 POTENTIAL ON-SITE SOURCES

Analytical results indicate that as depth increases, CVOCs concentrations generally dissipate as evidenced by decreasing concentrations identified in the intermediate and deep interface zones. Concentrations of CVOCs indicated a one to two order of magnitude reduction in the intermediate and deep wells at MW-02, with TCE detected at 130 µg/L in intermediate groundwater and 52 µg/L in deep groundwater, and PCE detected at 2,300 µg/L in intermediate groundwater and 1,400 µg/L in deep groundwater. Concentrations of TCE and PCE in intermediate and deep groundwater intervals are shown on Figures 8 and 9 and 11 and 12, respectively.

Due to the determination of groundwater flow direction to the south-southeast, it is highly probable that impacts on the Site are comingled with impacts from the upgradient properties, including 11 Spencer Street, BCP Project Sites C224204, and 480 Flushing Avenue, BCP Project Site C224259. Groundwater samples collected at MW01, located in the southern portion of the Site and not in the suspected source area, contain much lower CVOC concentrations, further indicating impacts from upgradient.

Based on the elevated CVOC concentrations in soil and groundwater in the northwestern portion of the Site, it is likely chemicals were released to the surface in this area during historical paint and coating manufacturing operations conducted by Techtronics.

## 7.3 CONSIDERATIONS REGARDING OFFSITE SOURCES

While an on-Site source area was identified through the SRI activities, it should be noted that the surrounding area was formerly used for manufacturing, which could indicate additional source areas with migrating impacts. Of note, the vacant lot to the north, 480 Flushing Avenue, and the vacant lot to the west, 11 Spencer Street, are both located upgradient from the Site and currently enrolled in the NYSDEC BCP due to similar contaminants of concern. As shown on Figure 10, an elevated hit of PCE at 23,000 µg/L in shallow groundwater from off-Site well MW1607, installed to 20 feet at 11 Spencer Street, indicates a possible off-Site upgradient source and comingling with the 8 Walworth plume. In addition, the anomalous elevated intermediate concentrations of PCE and TCE detected in MW05-I potentially indicate another upgradient source area on the 480 Flushing Avenue property located north of the Site, as indicated on Figure 10.

Groundwater flows to the south-southeast towards properties such as an adhesive manufacturer (still in operation), a tannery, a foundry and a casting cleaning and grinding operation. An off-Site investigation work plan will be submitted to the NYSDEC prior to the submission of the Remedial Action Work Plan. The off-Site investigation will evaluate potential downgradient impacts, the results of which will be submitted as an addendum to this SRIR.

# 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, therefore, receptors would only include construction/maintenance workers that may be employed to perform work on the property and exposure routes would including direct contact activities and/or inhalation of soil vapor during ground intrusive activities.

The reasonably anticipated future use of the Site is for mixed use commercial and community facility purposes, which is consistent with surrounding property use and zoning. Exposed receptors under the future use scenario may comprise community members utilizing the facility, 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 may 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 4.0 and 5.0 discusses the COCs present in the Site media at elevated concentrations. In general, these are limited to CVOCs.

### 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 CVOCs in soil and exceedance of groundwater quality standards for VOCs in groundwater, 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 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:

<u>Current Use Scenario</u>

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

<u>Future Use Scenario</u>

- Construction/Utility Worker – skin contact, inhalation, and incidental ingestion; and
- Employee/Visitor – 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 CVOCs present in soil and groundwater, the potential exists for exposure through pathways associated with soil vapor intrusion. 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 volatile organics present in soil and groundwater when and where construction workers are involved in subsurface activities where volatiles are present at elevated concentration.

Concerning the indoor air pathway, the NYSDOH has issued a guidance document for assessing potential impacts to indoor air via soil vapor intrusion. As such, under the current and future use scenario, soil vapor intrusion is a relevant transport mechanism. Soil vapor intrusion would entail soil vapor migrating from under the building slab and potentially impacting the indoor air above the slab. 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.

### 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

- Construction/Utility Worker – direct contact, incidental ingestion, and inhalation of volatile contaminants present in soil and groundwater during intrusive activities.

Future Use Scenario

- Construction/Utility Worker – direct contact, incidental ingestion, and inhalation of volatile contaminants present in soil and groundwater during intrusive activities and inhalation of volatile organics present in soil and groundwater via soil vapor intrusion.
- Employees/Visitors: inhalation of volatile organics present in soil and groundwater via soil vapor intrusion.

In most instances, these exposures can be mitigated through the use of engineering controls, including, soil vapor extraction, placement of asphalt, and construction of vapor barriers or sub-slab depressurization systems in existing or newly constructed buildings; proper soil/fill management during intrusive activities; and PPE.

## 8.2 FISH AND WILDLIFE IMPACT ANALYSIS

The Site is a former manufacturing facility from the 1960s through 2007 located within a developed commercial/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 future use is a commercial redevelopment. 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 Site investigations, the following conclusions have been identified:

- Contaminants of concern for the Site are primarily CVOCs including TCE, PCE and cis-1,2-dichloroethene which impact soil, groundwater and soil vapor.
- There is a source area of contamination located on the northwestern portion of the Site in the vicinity of MW02.
- The origin of the CVOC contamination source is unknown but is likely attributed to former operations by Techtronics, a paints and coatings manufacturer. Additional impact to Site coming from the upgradient adjoining properties, 480 Flushing Avenue and 11 Spencer Street, is highly probable due to the direction of groundwater flow from north-northwest to south-southeast. Analytical results of the SRI also provide further evidence of the presence of comingling groundwater plumes throughout the area as noted in previous investigations for the adjoining properties.
- The on-Site CVOC contamination has been both horizontally and vertically delineated. CVOC concentrations dissipate in groundwater with depth throughout the Site, indicating contamination is highest at the groundwater interface and smear zone.
- Off-Site contamination is likely partially a result of former and current area operations, including adhesive manufacturing, tannery operations, foundry operations, and casting, cleaning, and grinding operations.

## 9.2 RECOMMENDATIONS

Based on the results of the SRI, the on-Site source area has been identified on the northwestern portion of the Site. To proceed with the anticipated redevelopment plan, remedial action in the source area will be necessary as well as implementation of engineering controls throughout the Site to protect health of humans 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 of downgradient engineering controls. Viable technologies will need to be further evaluated for protection of public health downgradient of the Site. With respect to the upgradient plumes and the regional subsurface impacts, it is assumed that the 11 Spencer Street site and 480 Flushing Avenue site will undergo a similar remedial technology evaluation to remediate and isolate their respective site(s) from the neighboring property source areas, comingling plumes, and regional subsurface impacts.

# References

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3. Soil Vapor Intrusion Report – 8 Walworth Street, May 2017, Prepared by Environmental Business Consultants, Prepared for the New York State Department of Environmental Conservation

4. Brownfield Cleanup Program Application. 8 Walworth Street, Brooklyn, New York, June 2017, Prepared by Toldos Yehudah, LLC & Environmental Business Consultants, Prepared for the New York State Department of Environmental Conservation

5. Remedial Investigation Report - 8 Walworth Street Site, September 2019, Prepared by Environmental Business Consultants, Prepared for the New York State Department of Environmental Conservation

6. Program Policy DER-10, “Technical Guidance for Site Investigation and Remediation,” May 2010, Prepared by New York State Department of Environmental Conservation

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# TABLES

**Table 1a. Volatile Organic Compound Analytical Results in Groundwater**
8 Walworth Street, Brooklyn, NY
BCP Site C224239

| LOCATION | | | MW01-S | | MW01-S | | MW01-I | | MW02-S | | MW02-I | | MW02-D | | MW03-S | | MW03-I | | MW03-I | | MW03-D | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | 7/2/2020 | | 7/2/2020 | | 7/15/2020 | | 7/1/2020 | | 7/1/2020 | | 7/13/2020 | | 7/15/2020 | | 7/14/2020 | | 7/14/2020 | | 7/14/2020 | |
| LAB SAMPLE ID | | | L2028075-01 | | L2028075-01 R1 | | L2029975-02 | | L2027860-01 | | L2027860-02 | | L2029456-03 | | L2029975-01 | | L2029638-02 | | L2029638-02 R1 | | L2029638-03 | |
| SAMPLE TYPE | | | WATER | | WATER | | WATER | | WATER | | WATER | | WATER | | WATER | | WATER | | WATER | | WATER | |
| SAMPLE DEPTH (ft.) | | | | | | | | | | | | | | | | | | | | | | |
| | NY-AWQS | Units | Results | Qual | Results | Qual | Results | Qual | Results | Qual | Results | Qual | Results | Qual | Results | Qual | Results | Qual | Results | Qual | Results | Qual |
| **Dissolved Gases by GC** | | | | | | | | | | | | | | | | | | | | | | |
| Carbon Dioxide | | ug/l | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Volatile Organics by GC/MS** | | | | | | | | | | | | | | | | | | | | | | |
| Methylene chloride | 5 | ug/l | 25 | U | - | - | 2.5 | U | 1000 | U | 50 | U | 25 | U | 120 | U | 62 | U | - | - | 25 | U |
| 1,1-Dichloroethane | 5 | ug/l | 25 | U | - | - | 2.5 | U | 1000 | U | 50 | U | 25 | U | 120 | U | 62 | U | - | - | 25 | U |
| Chloroform | 7 | ug/l | 25 | U | - | - | 1.4 | J | 1000 | U | 50 | U | 25 | U | 120 | U | 62 | U | - | - | 25 | U |
| Carbon tetrachloride | 5 | ug/l | 5 | U | - | - | 0.5 | U | 200 | U | 10 | U | 5 | U | 25 | U | 12 | U | - | - | 5 | U |
| 1,2-Dichloropropane | 1 | ug/l | 10 | U | - | - | 1 | U | 400 | U | 20 | U | 10 | U | 50 | U | 25 | U | - | - | 10 | U |
| Dibromochloromethane | 50 | ug/l | 5 | U | - | - | 0.5 | U | 200 | U | 10 | U | 5 | U | 25 | U | 12 | U | - | - | 5 | U |
| 1,1,2-Trichloroethane | 1 | ug/l | 15 | U | - | - | 1.5 | U | 600 | U | 30 | U | 15 | U | 75 | U | 38 | U | - | - | 15 | U |
| Tetrachloroethene | 5 | ug/l | 2200 | E | 1500 | | 41 | | 58000 | | 2300 | | 1400 | | 7200 | | 5100 | E | 4300 | | 1400 | |
| Chlorobenzene | 5 | ug/l | 25 | U | - | - | 2.5 | U | 1000 | U | 50 | U | 25 | U | 120 | U | 62 | U | - | - | 25 | U |
| Trichlorofluoromethane | 5 | ug/l | 25 | U | - | - | 2.5 | U | 1000 | U | 50 | U | 25 | U | 120 | U | 62 | U | - | - | 25 | U |
| 1,2-Dichloroethane | 0.6 | ug/l | 5 | U | - | - | 0.5 | U | 200 | U | 10 | U | 5 | U | 25 | U | 12 | U | - | - | 5 | U |
| 1,1,1-Trichloroethane | 5 | ug/l | 13 | J | - | - | 2.5 | U | 730 | J | 50 | U | 25 | U | 240 | | 230 | | - | - | 84 | |
| Bromodichloromethane | 50 | ug/l | 5 | U | - | - | 0.5 | U | 200 | U | 10 | U | 5 | U | 25 | U | 12 | U | - | - | 5 | U |
| trans-1,3-Dichloropropene | 0.4 | ug/l | 5 | U | - | - | 0.5 | U | 200 | U | 10 | U | 5 | U | 25 | U | 12 | U | - | - | 5 | U |
| cis-1,3-Dichloropropene | 0.4 | ug/l | 5 | U | - | - | 0.5 | U | 200 | U | 10 | U | 5 | U | 25 | U | 12 | U | - | - | 5 | U |
| 1,3-Dichloropropene, Total | | ug/l | 5 | U | - | - | 0.5 | U | 200 | U | 10 | U | 5 | U | 25 | U | 12 | U | - | - | 5 | U |
| 1,1-Dichloropropene | 5 | ug/l | 25 | U | - | - | 2.5 | U | 1000 | U | 50 | U | 25 | U | 120 | U | 62 | U | - | - | 25 | U |
| Bromoform | 50 | ug/l | 20 | U | - | - | 2 | U | 800 | U | 40 | U | 20 | U | 100 | U | 50 | U | - | - | 20 | U |
| 1,1,2,2-Tetrachloroethane | 5 | ug/l | 5 | U | - | - | 0.5 | U | 72 | J | 10 | U | 5 | U | 25 | U | 12 | U | - | - | 5 | U |
| Benzene | 1 | ug/l | 5 | U | - | - | 0.5 | U | 200 | U | 10 | U | 5 | U | 25 | U | 12 | U | - | - | 5 | U |
| Toluene | 5 | ug/l | 25 | U | - | - | 2.5 | U | 1000 | U | 50 | U | 25 | U | 120 | U | 62 | U | - | - | 25 | U |
| Ethylbenzene | 5 | ug/l | 25 | U | - | - | 2.5 | U | 1000 | U | 50 | U | 25 | U | 120 | U | 62 | U | - | - | 25 | U |
| Chloromethane | | ug/l | 25 | U | - | - | 2.5 | U | 1000 | U | 50 | U | 25 | U | 120 | U | 62 | U | - | - | 25 | U |
| Bromomethane | 5 | ug/l | 25 | U | - | - | 2.5 | U | 1000 | U | 50 | U | 25 | U | 120 | U | 62 | U | - | - | 25 | U |
| Vinyl chloride | 2 | ug/l | 10 | U | - | - | 1 | U | 400 | U | 20 | U | 10 | U | 50 | U | 25 | U | - | - | 10 | U |
| Chloroethane | 5 | ug/l | 25 | U | - | - | 2.5 | U | 1000 | U | 50 | U | 25 | U | 120 | U | 62 | U | - | - | 25 | U |
| 1,1-Dichloroethene | 5 | ug/l | 5 | U | - | - | 0.5 | U | 200 | U | 10 | U | 5 | U | 25 | U | 19 | | - | - | 6.2 | |
| trans-1,2-Dichloroethene | 5 | ug/l | 25 | U | - | - | 2.5 | U | 1000 | U | 50 | U | 25 | U | 120 | U | 62 | U | - | - | 25 | U |
| Trichloroethene | 5 | ug/l | 960 | | - | - | 17 | | 69000 | | 130 | | 52 | | 1200 | | 100 | | - | - | 39 | |
| 1,2-Dichlorobenzene | 3 | ug/l | 25 | U | - | - | 2.5 | U | 1000 | U | 50 | U | 25 | U | 710 | | 62 | U | - | - | 25 | U |
| 1,3-Dichlorobenzene | 3 | ug/l | 25 | U | - | - | 2.5 | U | 1000 | U | 50 | U | 25 | U | 120 | U | 62 | U | - | - | 25 | U |
| 1,4-Dichlorobenzene | 3 | ug/l | 25 | U | - | - | 2.5 | U | 1000 | U | 50 | U | 25 | U | 130 | | 62 | U | - | - | 25 | U |
| Methyl tert butyl ether | 10 | ug/l | 25 | U | - | - | 2.5 | U | 1000 | U | 50 | U | 25 | U | 120 | U | 62 | U | - | - | 25 | U |
| p/m-Xylene | 5 | ug/l | 25 | U | - | - | 2.5 | U | 1000 | U | 50 | U | 25 | U | 120 | U | 62 | U | - | - | 25 | U |
| o-Xylene | 5 | ug/l | 25 | U | - | - | 2.5 | U | 880 | J | 81 | | 47 | | 130 | | 62 | U | - | - | 25 | U |
| Xylenes, Total | | ug/l | 25 | U | - | - | 2.5 | U | 880 | J | 81 | | 47 | | 130 | | 62 | U | - | - | 25 | U |
| cis-1,2-Dichloroethene | 5 | ug/l | 73 | | - | - | 4.5 | | 5000 | | 50 | U | 25 | U | 590 | | 34 | J | - | - | 10 | J |
| 1,2-Dichloroethene, Total | | ug/l | 73 | | - | - | 4.5 | | 5000 | | 50 | U | 25 | U | 590 | | 34 | J | - | - | 10 | J |
| Dibromomethane | 5 | ug/l | 50 | U | - | - | 5 | U | 2000 | U | 100 | U | 50 | U | 250 | U | 120 | U | - | - | 50 | U |
| 1,2,3-Trichloropropane | 0.04 | ug/l | 25 | U | - | - | 2.5 | U | 1000 | U | 50 | U | 25 | U | 120 | U | 62 | U | - | - | 25 | U |
| Acrylonitrile | 5 | ug/l | 50 | U | - | - | 5 | U | 2000 | U | 100 | U | 50 | U | 250 | U | 120 | U | - | - | 50 | U |
| Styrene | 5 | ug/l | 25 | U | - | - | 2.5 | U | 1000 | U | 50 | U | 25 | U | 120 | U | 62 | U | - | - | 25 | U |
| Dichlorodifluoromethane | 5 | ug/l | 50 | U | - | - | 5 | U | 2000 | U | 100 | U | 50 | U | 250 | U | 120 | U | - | - | 50 | U |
| Acetone | 50 | ug/l | 50 | U | - | - | 5 | U | 2000 | U | 100 | U | 50 | U | 250 | U | 120 | U | - | - | 50 | U |
| Carbon disulfide | 60 | ug/l | 50 | U | - | - | 5 | U | 2000 | U | 100 | U | 50 | U | 250 | U | 120 | U | - | - | 50 | U |
| 2-Butanone | 50 | ug/l | 50 | U | - | - | 5 | U | 2000 | U | 100 | U | 50 | U | 250 | U | 120 | U | - | - | 50 | U |
| Vinyl acetate | | ug/l | 50 | U | - | - | 5 | U | 2000 | U | 100 | U | 50 | U | 250 | U | 120 | U | - | - | 50 | U |
| 4-Methyl-2-pentanone | | ug/l | 50 | U | - | - | 5 | U | 2000 | U | 100 | U | 50 | U | 250 | U | 120 | U | - | - | 50 | U |
| 2-Hexanone | 50 | ug/l | 50 | U | - | - | 5 | U | 2000 | U | 100 | U | 50 | U | 250 | U | 120 | U | - | - | 50 | U |
| Bromochloromethane | 5 | ug/l | 25 | U | - | - | 2.5 | U | 1000 | U | 50 | U | 25 | U | 120 | U | 62 | U | - | - | 25 | U |
| 2,2-Dichloropropane | 5 | ug/l | 25 | U | - | - | 2.5 | U | 1000 | U | 50 | U | 25 | U | 120 | U | 62 | U | - | - | 25 | U |
| 1,2-Dibromoethane | 0.0006 | ug/l | 20 | U | - | - | 2 | U | 800 | U | 40 | U | 20 | U | 100 | U | 50 | U | - | - | 20 | U |
| 1,3-Dichloropropane | 5 | ug/l | 25 | U | - | - | 2.5 | U | 1000 | U | 50 | U | 25 | U | 120 | U | 62 | U | - | - | 25 | U |
| 1,1,1,2-Tetrachloroethane | 5 | ug/l | 25 | U | - | - | 2.5 | U | 1000 | U | 50 | U | 25 | U | 120 | U | 62 | U | - | - | 25 | U |
| Bromobenzene | 5 | ug/l | 25 | U | - | - | 2.5 | U | 1000 | U | 50 | U | 25 | U | 120 | U | 62 | U | - | - | 25 | U |
| n-Butylbenzene | 5 | ug/l | 25 | U | - | - | 2.5 | U | 1000 | U | 50 | U | 25 | U | 120 | U | 62 | U | - | - | 25 | U |
| sec-Butylbenzene | 5 | ug/l | 25 | U | - | - | 2.5 | U | 1000 | U | 50 | U | 25 | U | 120 | U | 62 | U | - | - | 25 | U |
| tert-Butylbenzene | 5 | ug/l | 25 | U | - | - | 2.5 | U | 1000 | U | 50 | U | 25 | U | 120 | U | 62 | U | - | - | 25 | U |
| o-Chlorotoluene | 5 | ug/l | 25 | U | - | - | 2.5 | U | 1000 | U | 50 | U | 25 | U | 120 | U | 62 | U | - | - | 25 | U |
| p-Chlorotoluene | 5 | ug/l | 25 | U | - | - | 2.5 | U | 1000 | U | 50 | U | 25 | U | 120 | U | 62 | U | - | - | 25 | U |
| 1,2-Dibromo-3-chloropropane | 0.04 | ug/l | 25 | U | - | - | 2.5 | U | 1000 | U | 50 | U | 25 | U | 120 | U | 62 | U | - | - | 25 | U |
| Hexachlorobutadiene | 0.5 | ug/l | 25 | U | - | - | 2.5 | U | 1000 | U | 50 | U | 25 | U | 120 | U | 62 | U | - | - | 25 | U |
| Isopropylbenzene | 5 | ug/l | 25 | U | - | - | 2.5 | U | 1000 | U | 50 | U | 25 | U | 120 | U | 62 | U | - | - | 25 | U |
| p-Isopropyltoluene | 5 | ug/l | 25 | U | - | - | 2.5 | U | 1000 | U | 50 | U | 25 | U | 120 | U | 62 | U | - | - | 25 | U |
| Naphthalene | 10 | ug/l | 25 | U | - | - | 2.5 | U | 1000 | U | 50 | U | 25 | U | 320 | | 62 | U | - | - | 25 | U |
| n-Propylbenzene | 5 | ug/l | 25 | U | - | - | 2.5 | U | 1000 | U | 50 | U | 25 | U | 120 | U | 62 | U | - | - | 25 | U |
| 1,2,3-Trichlorobenzene | 5 | ug/l | 25 | U | - | - | 2.5 | U | 1000 | U | 50 | U | 25 | U | 120 | U | 62 | U | - | - | 25 | U |
| 1,2,4-Trichlorobenzene | 5 | ug/l | 25 | U | - | - | 2.5 | U | 640 | J | 50 | U | 25 | U | 120 | U | 62 | U | - | - | 25 | U |
| 1,3,5-Trimethylbenzene | 5 | ug/l | 25 | U | - | - | 2.5 | U | 1000 | U | 50 | U | 25 | U | 120 | U | 62 | U | - | - | 25 | U |
| 1,2,4-Trimethylbenzene | 5 | ug/l | 25 | U | - | - | 2.5 | U | 1000 | U | 50 | U | 25 | U | 120 | U | 62 | U | - | - | 25 | U |
| 1,4-Dioxane | | ug/l | 2500 | U | - | - | 250 | U | 100000 | U | 5000 | U | 2500 | U | 12000 | U | 6200 | U | - | - | 2500 | U |
| p-Diethylbenzene | | ug/l | 20 | U | - | - | 2 | U | 800 | U | 40 | U | 20 | U | 100 | U | 50 | U | - | - | 20 | U |
| p-Ethyltoluene | | ug/l | 20 | U | - | - | 2 | U | 800 | U | 40 | U | 20 | U | 100 | U | 50 | U | - | - | 20 | U |
| 1,2,4,5-Tetramethylbenzene | 5 | ug/l | 20 | U | - | - | 2 | U | 800 | U | 40 | U | 20 | U | 36 | J | 50 | U | - | - | 20 | U |
| Ethyl ether | | ug/l | 25 | U | - | - | 2.5 | U | 1000 | U | 50 | U | 25 | U | 120 | U | 62 | U | - | - | 25 | U |
| trans-1,4-Dichloro-2-butene | 5 | ug/l | 25 | U | - | - | 2.5 | U | 1000 | U | 50 | U | 25 | U | 120 | U | 62 | U | - | - | 25 | U |

Notes
NY-AWQS: New York TOGS 111 Ambient Water Quality Standards criteria
U - Not detected at the reported detection limit for the sample.
J - Estimated result
E - Analyte exceeds range of the calibration curve and/or linear range of instrument.
F - Ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are estimated maximum concentration.
RE - Analytical results are from sample re-extraction.

**Table 1a. Volatile Organic Compound Analytical Results in Groundwater**
8 Walworth Street, Brooklyn, NY
BCP Site C224239

| LOCATION | | | MW04-S | | MW04-I | | MW04-D | | MW05-S | | MW05-I | | MW05-I | | MW05-D | | TRIP BLANK | | FIELD BLANK | | DUP-07012020 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | 7/8/2020 | | 7/10/2020 | | 7/9/2020 | | 7/13/2020 | | 7/14/2020 | | 7/14/2020 | | 7/13/2020 | | 6/8/2020 | | 7/15/2020 | | 7/1/2020 | |
| LAB SAMPLE ID | | | L2028717-01 | | L2029244-01 | | L2029044-01 | | L2029456-01 | | L2029638-01 | | L2029638-01 R1 | | L2029456-02 | | L2028717-02 | | L2029975-03 | | L2027860-03 | |
| SAMPLE TYPE | | | WATER | | WATER | | WATER | | WATER | | WATER | | WATER | | WATER | | Trip Blank (aqueous) | | Field Blank | | WATER | |
| SAMPLE DEPTH (ft.) | | | | | | | | | | | | | | | | | | | | | | |
| | NY-AWQS | Units | Results | Qual | Results | Qual | Results | Qual | Results | Qual | Results | Qual | Results | Qual | Results | Qual | Results | Qual | Results | Qual | Results | Qual |
| **Dissolved Gases by GC** | | | | | | | | | | | | | | | | | | | | | | |
| Carbon Dioxide | | ug/l | - | - | - | - | - | - | 79700 | | 3000 | U | - | - | 30200 | | - | - | - | - | - | - |
| **Volatile Organics by GC/MS** | | | | | | | | | | | | | | | | | | | | | | |
| Methylene chloride | 5 | ug/l | 250 | U | 25 | U | 2.5 | U | 2500 | U | 160 | | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |
| 1,1-Dichloroethane | 5 | ug/l | 80 | J | 25 | U | 2.1 | J | 2200 | J | 2000 | | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |
| Chloroform | 7 | ug/l | 250 | U | 25 | U | 5.6 | | 2500 | U | 120 | U | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |
| Carbon tetrachloride | 5 | ug/l | 50 | U | 5 | U | 0.5 | U | 500 | U | 25 | U | - | - | 5 | U | 0.5 | U | 0.5 | U | 200 | U |
| 1,2-Dichloropropane | 1 | ug/l | 100 | U | 10 | U | 1 | U | 1000 | U | 50 | U | - | - | 10 | U | 1 | U | 1 | U | 400 | U |
| Dibromochloromethane | 50 | ug/l | 50 | U | 5 | U | 0.5 | U | 500 | U | 25 | U | - | - | 5 | U | 0.5 | U | 0.5 | U | 200 | U |
| 1,1,2-Trichloroethane | 1 | ug/l | 150 | U | 15 | U | 1.5 | U | 1500 | U | 75 | U | - | - | 15 | U | 1.5 | U | 1.5 | U | 600 | U |
| Tetrachloroethene | 5 | ug/l | 5300 | | 900 | | 190 | | 3000 | | 16000 | E | 7500 | - | 1700 | | 0.5 | U | 0.43 | J | 57000 | |
| Chlorobenzene | 5 | ug/l | 250 | U | 25 | U | 2.5 | U | 2500 | U | 120 | U | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |
| Trichlorofluoromethane | 5 | ug/l | 250 | U | 25 | U | 2.5 | U | 2500 | U | 120 | U | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |
| 1,2-Dichloroethane | 0.6 | ug/l | 50 | U | 5 | U | 0.5 | U | 500 | U | 25 | U | - | - | 5 | U | 0.5 | U | 0.5 | U | 200 | U |
| 1,1,1-Trichloroethane | 5 | ug/l | 460 | | 13 | J | 7.5 | | 15000 | | 410 | | - | - | 51 | | 2.5 | U | 2.5 | U | 710 | J |
| Bromodichloromethane | 50 | ug/l | 50 | U | 5 | U | 0.5 | U | 500 | U | 25 | U | - | - | 5 | U | 0.5 | U | 0.5 | U | 200 | U |
| trans-1,3-Dichloropropene | 0.4 | ug/l | 50 | U | 5 | U | 0.5 | U | 500 | U | 25 | U | - | - | 5 | U | 0.5 | U | 0.5 | U | 200 | U |
| cis-1,3-Dichloropropene | 0.4 | ug/l | 50 | U | 5 | U | 0.5 | U | 500 | U | 25 | U | - | - | 5 | U | 0.5 | U | 0.5 | U | 200 | U |
| 1,3-Dichloropropene, Total | | ug/l | 50 | U | 5 | U | 0.5 | U | 500 | U | 25 | U | - | - | 5 | U | 0.5 | U | 0.5 | U | 200 | U |
| 1,1-Dichloropropene | 5 | ug/l | 250 | U | 25 | U | 2.5 | U | 2500 | U | 120 | U | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |
| Bromoform | 50 | ug/l | 200 | U | 20 | U | 2 | U | 2000 | U | 100 | U | - | - | 20 | U | 2 | U | 2 | U | 800 | U |
| 1,1,2,2-Tetrachloroethane | 5 | ug/l | 50 | U | 5 | U | 0.5 | U | 500 | U | 25 | U | - | - | 5 | U | 0.5 | U | 0.5 | U | 200 | U |
| Benzene | 1 | ug/l | 50 | U | 5 | U | 0.28 | J | 500 | U | 12 | J | - | - | 5 | U | 0.5 | U | 0.5 | U | 200 | U |
| Toluene | 5 | ug/l | 2600 | | 280 | | 19 | | 9300 | | 5700 | | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |
| Ethylbenzene | 5 | ug/l | 410 | | 41 | | 4.1 | | 1500 | J | 900 | | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |
| Chloromethane | | ug/l | 250 | U | 25 | U | 2.5 | U | 2500 | U | 120 | U | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |
| Bromomethane | 5 | ug/l | 250 | U | 25 | U | 2.5 | U | 2500 | U | 120 | U | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |
| Vinyl chloride | 2 | ug/l | 66 | J | 0.99 | J | 2.5 | | 880 | J | 38 | J | - | - | 10 | U | 1 | U | 1 | U | 400 | U |
| Chloroethane | 5 | ug/l | 250 | U | 25 | U | 2.5 | U | 2500 | U | 120 | U | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |
| 1,1-Dichloroethene | 5 | ug/l | 32 | J | 4.2 | J | 0.91 | | 360 | J | 52 | | - | - | 3.7 | J | 0.5 | U | 0.5 | U | 200 | U |
| trans-1,2-Dichloroethene | 5 | ug/l | 250 | U | 25 | U | 2.5 | U | 2500 | U | 120 | U | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |
| Trichloroethene | 5 | ug/l | 8100 | | 730 | | 52 | | 390 | J | 2500 | | - | - | 68 | | 0.5 | U | 0.5 | U | 68000 | |
| 1,2-Dichlorobenzene | 3 | ug/l | 78 | J | 25 | U | 2.5 | U | 2500 | U | 120 | U | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |
| 1,3-Dichlorobenzene | 3 | ug/l | 250 | U | 25 | U | 2.5 | U | 2500 | U | 120 | U | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |
| 1,4-Dichlorobenzene | 3 | ug/l | 250 | U | 25 | U | 2.5 | U | 2500 | U | 120 | U | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |
| Methyl tert butyl ether | 10 | ug/l | 250 | U | 25 | U | 2.5 | U | 2500 | U | 120 | U | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |
| p/m-Xylene | 5 | ug/l | 1600 | | 190 | | 19 | | 4400 | | 3300 | | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |
| o-Xylene | 5 | ug/l | 600 | | 69 | | 12 | | 1800 | J | 1400 | | - | - | 17 | J | 2.5 | U | 2.5 | U | 860 | J |
| Xylenes, Total | | ug/l | 2200 | | 260 | | 31 | | 6200 | J | 4700 | | - | - | 17 | J | 2.5 | U | 2.5 | U | 860 | J |
| cis-1,2-Dichloroethene | 5 | ug/l | 9800 | | 120 | | 93 | | 120000 | | 4600 | | - | - | 65 | | 2.5 | U | 2.5 | U | 5000 | |
| 1,2-Dichloroethene, Total | | ug/l | 9800 | | 120 | | 93 | | 120000 | | 4600 | | - | - | 65 | | 2.5 | U | 2.5 | U | 5000 | |
| Dibromomethane | 5 | ug/l | 500 | U | 50 | U | 5 | U | 5000 | U | 250 | U | - | - | 50 | U | 5 | U | 5 | U | 2000 | U |
| 1,2,3-Trichloropropane | 0.04 | ug/l | 250 | U | 25 | U | 2.5 | U | 2500 | U | 120 | U | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |
| Acrylonitrile | 5 | ug/l | 500 | U | 50 | U | 5 | U | 5000 | U | 250 | U | - | - | 50 | U | 5 | U | 5 | U | 2000 | U |
| Styrene | 5 | ug/l | 250 | U | 25 | U | 2.5 | U | 2500 | U | 120 | U | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |
| Dichlorodifluoromethane | 5 | ug/l | 500 | U | 50 | U | 5 | U | 5000 | U | 250 | U | - | - | 50 | U | 5 | U | 5 | U | 2000 | U |
| Acetone | 50 | ug/l | 500 | U | 50 | U | 5.3 | | 1700 | J | 350 | | - | - | 50 | U | 5 | U | 5 | U | 2000 | U |
| Carbon disulfide | 60 | ug/l | 500 | U | 50 | U | 5 | U | 5000 | U | 250 | U | - | - | 50 | U | 5 | U | 5 | U | 2000 | U |
| 2-Butanone | 50 | ug/l | 500 | U | 50 | U | 5 | U | 2600 | J | 780 | | - | - | 50 | U | 5 | U | 5 | U | 2000 | U |
| Vinyl acetate | | ug/l | 500 | U | 50 | U | 5 | U | 5000 | U | 250 | U | - | - | 50 | U | 5 | U | 5 | U | 2000 | U |
| 4-Methyl-2-pentanone | | ug/l | 500 | U | 50 | U | 5 | U | 2800 | J | 760 | | - | - | 50 | U | 5 | U | 5 | U | 2000 | U |
| 2-Hexanone | 50 | ug/l | 500 | U | 50 | U | 5 | U | 5000 | U | 250 | U | - | - | 50 | U | 5 | U | 5 | U | 2000 | U |
| Bromochloromethane | 5 | ug/l | 250 | U | 25 | U | 2.5 | U | 2500 | U | 120 | U | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |
| 2,2-Dichloropropane | 5 | ug/l | 250 | U | 25 | U | 2.5 | U | 2500 | U | 120 | U | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |
| 1,2-Dibromoethane | 0.0006 | ug/l | 200 | U | 20 | U | 2 | U | 2000 | U | 100 | U | - | - | 20 | U | 2 | U | 2 | U | 800 | U |
| 1,3-Dichloropropane | 5 | ug/l | 250 | U | 25 | U | 2.5 | U | 2500 | U | 120 | U | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |
| 1,1,1,2-Tetrachloroethane | 5 | ug/l | 250 | U | 25 | U | 2.5 | U | 2500 | U | 120 | U | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |
| Bromobenzene | 5 | ug/l | 250 | U | 25 | U | 2.5 | U | 2500 | U | 120 | U | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |
| n-Butylbenzene | 5 | ug/l | 250 | U | 25 | U | 2.5 | U | 2500 | U | 120 | U | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |
| sec-Butylbenzene | 5 | ug/l | 250 | U | 25 | U | 2.5 | U | 2500 | U | 120 | U | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |
| tert-Butylbenzene | 5 | ug/l | 250 | U | 25 | U | 2.5 | U | 2500 | U | 120 | U | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |
| o-Chlorotoluene | 5 | ug/l | 250 | U | 25 | U | 2.5 | U | 2500 | U | 120 | U | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |
| p-Chlorotoluene | 5 | ug/l | 250 | U | 25 | U | 2.5 | U | 2500 | U | 120 | U | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |
| 1,2-Dibromo-3-chloropropane | 0.04 | ug/l | 250 | U | 25 | U | 2.5 | U | 2500 | U | 120 | U | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |
| Hexachlorobutadiene | 0.5 | ug/l | 250 | U | 25 | U | 2.5 | U | 2500 | U | 120 | U | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |
| Isopropylbenzene | 5 | ug/l | 250 | U | 25 | U | 2.5 | U | 2500 | U | 120 | U | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |
| p-Isopropyltoluene | 5 | ug/l | 250 | U | 25 | U | 2.5 | U | 2500 | U | 120 | U | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |
| Naphthalene | 10 | ug/l | 250 | U | 12 | J | 0.97 | J | 2500 | U | 120 | | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |
| n-Propylbenzene | 5 | ug/l | 250 | U | 25 | U | 2.5 | U | 2500 | U | 120 | U | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |
| 1,2,3-Trichlorobenzene | 5 | ug/l | 250 | U | 25 | U | 2.5 | U | 2500 | U | 120 | U | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |
| 1,2,4-Trichlorobenzene | 5 | ug/l | 250 | U | 25 | U | 2.5 | U | 2500 | U | 120 | U | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |
| 1,3,5-Trimethylbenzene | 5 | ug/l | 250 | U | 25 | U | 2.5 | U | 2500 | U | 81 | J | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |
| 1,2,4-Trimethylbenzene | 5 | ug/l | 250 | U | 11 | J | 0.74 | J | 2500 | U | 200 | | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |
| 1,4-Dioxane | | ug/l | 25000 | U | 2500 | U | 250 | U | 250000 | U | 12000 | U | - | - | 2500 | U | 250 | U | 250 | U | 100000 | U |
| p-Diethylbenzene | | ug/l | 200 | U | 8.3 | J | 2 | U | 2000 | U | 100 | U | - | - | 20 | U | 2 | U | 2 | U | 800 | U |
| p-Ethyltoluene | | ug/l | 200 | U | 8.4 | J | 0.7 | J | 2000 | U | 190 | | - | - | 20 | U | 2 | U | 2 | U | 800 | U |
| 1,2,4,5-Tetramethylbenzene | 5 | ug/l | 200 | U | 5.9 | J | 2 | U | 2000 | U | 100 | U | - | - | 20 | U | 2 | U | 2 | U | 800 | U |
| Ethyl ether | | ug/l | 250 | U | 25 | U | 2.5 | U | 2500 | U | 120 | U | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |
| trans-1,4-Dichloro-2-butene | 5 | ug/l | 250 | U | 25 | U | 2.5 | U | 2500 | U | 120 | U | - | - | 25 | U | 2.5 | U | 2.5 | U | 1000 | U |

Notes
NY-AWQS: New York TOGS 111 Ambient Water Quality Standards criteria
U - Not detected at the reported detection limit for the sample.
J - Estimated result
E - Analyte exceeds range of the calibration curve and/or linear range of instrument.
F - Ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are estimated maximum concentration.
RE - Analytical results are from sample re-extraction.

**Table 1b. Polychlorinated Biphenyls Analytical Results in Groundwater**
8 Walworth Street, Brooklyn, NY
BCP Site C224239

| LOCATION | | | MW01-S | | MW01-I | | MW02-S | | MW02-I | | MW02-D | | MW03-S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | 7/2/2020 | | 7/15/2020 | | 7/1/2020 | | 7/1/2020 | | 7/13/2020 | | 7/15/2020 | |
| LAB SAMPLE ID | | | L2028075-01 | | L2029975-02 | | L2027860-01 | | L2027860-02 | | L2029456-03 | | L2029975-01 | |
| | NY-AWQS | Units | Results | Qual | Results | Qual | Results | Qual | Results | Qual | Results | Qual | Results | Qual |
| **Polychlorinated Biphenyls by GC** | | | | | | | | | | | | | | |
| Aroclor 1016 | 0.09 | ug/l | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U | 0.414 | U |
| Aroclor 1221 | 0.09 | ug/l | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U | 0.414 | U |
| Aroclor 1232 | 0.09 | ug/l | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U | 0.414 | U |
| Aroclor 1242 | 0.09 | ug/l | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U | 0.414 | U |
| Aroclor 1248 | 0.09 | ug/l | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U | 0.414 | U |
| Aroclor 1254 | 0.09 | ug/l | 0.083 | U | 0.083 | U | 0.962 | | 0.555 | | 0.486 | | 14.9 | |
| Aroclor 1260 | 0.09 | ug/l | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U | 0.414 | U |
| Aroclor 1262 | 0.09 | ug/l | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U | 0.414 | U |
| Aroclor 1268 | 0.09 | ug/l | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U | 0.414 | U |
| PCBs, Total | | ug/l | 0.083 | U | 0.083 | U | 0.962 | | 0.555 | | 0.486 | | 14.9 | |

Notes

NY-AWQS: New York TOGS 111 Ambient Water Quality Standards criteria

U - Not detected at the reported detection limit for the sample.

J - Estimated result

E - Analyte exceeds range of the calibration curve and/or linear range of instrument.

F - Ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are estimated maximum concentration.

RE - Analytical results are from sample re-extraction.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

**Table 1b. Polychlorinated Biphenyls Analytical Results in Groundwater**
8 Walworth Street, Brooklyn, NY
BCP Site C224239

| LOCATION | | | MW03-I | | MW03-D | | MW04-S | | MW04-I | | MW04-D | | MW05-S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | 7/14/2020 | | 7/14/2020 | | 7/8/2020 | | 7/10/2020 | | 7/9/2020 | | 7/13/2020 | |
| LAB SAMPLE ID | | | L2029638-02 | | L2029638-03 | | L2028717-01 | | L2029244-01 | | L2029044-01 | | L2029456-01 | |
| | NY-AWQS | Units | Results | Qual | Results | Qual | Results | Qual | Results | Qual | Results | Qual | Results | Qual |
| **Polychlorinated Biphenyls by GC** | | | | | | | | | | | | | | |
| Aroclor 1016 | 0.09 | ug/l | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U |
| Aroclor 1221 | 0.09 | ug/l | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U |
| Aroclor 1232 | 0.09 | ug/l | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U |
| Aroclor 1242 | 0.09 | ug/l | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U |
| Aroclor 1248 | 0.09 | ug/l | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U |
| Aroclor 1254 | 0.09 | ug/l | 0.083 | U | 0.083 | U | 0.51 | P | 0.083 | U | 0.065 | J | 0.083 | U |
| Aroclor 1260 | 0.09 | ug/l | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U |
| Aroclor 1262 | 0.09 | ug/l | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U |
| Aroclor 1268 | 0.09 | ug/l | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U |
| PCBs, Total | | ug/l | 0.083 | U | 0.083 | U | 0.51 | | 0.083 | U | 0.065 | J | 0.083 | U |

Notes

NY-AWQS: New York TOGS 111 Ambient Water Quality Standards criteria

U - Not detected at the reported detection limit for the sample.

J - Estimated result

E - Analyte exceeds range of the calibration curve and/or linear range of instrument.

F - Ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are estimated maximum concentration.

RE - Analytical results are from sample re-extraction.

P - The RPD between the results for the two columns exceeds the method-specified cr

**Table 1b. Polychlorinated Biphenyls Analytical Results in Groundwater**
8 Walworth Street, Brooklyn, NY
BCP Site C224239

| LOCATION | | | MW05-I | | MW05-D | | FIELD BLANK | | DUP-07012020 | |
|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | 7/14/2020 | | 7/13/2020 | | 7/15/2020 | | 7/1/2020 | |
| LAB SAMPLE ID | | | L2029638-01 | | L2029456-02 | | L2029975-03 | | L2027860-03 | |
| | NY-AWQS | Units | Results | Qual | Results | Qual | Results | Qual | Results | Qual |
| **Polychlorinated Biphenyls by GC** | | | | | | | | | | |
| Aroclor 1016 | 0.09 | ug/l | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U |
| Aroclor 1221 | 0.09 | ug/l | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U |
| Aroclor 1232 | 0.09 | ug/l | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U |
| Aroclor 1242 | 0.09 | ug/l | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U |
| Aroclor 1248 | 0.09 | ug/l | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U |
| Aroclor 1254 | 0.09 | ug/l | 0.083 | U | 0.083 | U | 0.083 | U | 0.919 | |
| Aroclor 1260 | 0.09 | ug/l | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U |
| Aroclor 1262 | 0.09 | ug/l | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U |
| Aroclor 1268 | 0.09 | ug/l | 0.083 | U | 0.083 | U | 0.083 | U | 0.083 | U |
| PCBs, Total | | ug/l | 0.083 | U | 0.083 | U | 0.083 | U | 0.919 | |

Notes

NY-AWQS: New York TOGS 111 Ambient Water Quality Standards criteria

U - Not detected at the reported detection limit for the sample.

J - Estimated result

E - Analyte exceeds range of the calibration curve and/or linear range of instrument.

F - Ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are estimated maximum concentration.

RE - Analytical results are from sample re-extraction.

P - The RPD between the results for the two columns exceeds the method-specified cr

**Table 1c. General Chemistry Analytical Results in Groundwater**
8 Walworth Street, Brooklyn, NY
BCP Site C224239

| LOCATION | | | MW05-S | | MW05-I | | MW05-D | |
|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | 7/13/2020 | | 7/14/2020 | | 7/13/2020 | |
| LAB SAMPLE ID | | | L2029456-01 | | L2029638-01 | | L2029456-02 | |
| | NY-AWQS | Units | Results | Qual | Results | Qual | Results | Qual |
| General Chemistry | | | | | | | | |
| Alkalinity, Total | | mg CaCO3/L | 196 | | 92.2 | | 194 | |
| Nitrogen, Nitrate | 10000 | ug/l | 124 | | 8070 | | 14400 | |
| Sulfate | 250000 | ug/l | 210000 | | 270000 | | 140000 | |
| Total Organic Carbon | | ug/l | 46000 | | 34000 | | 2200 | |
| Iron, Ferrous | | ug/l | 20000 | | 80 | J | 500 | U |

Notes
NY-AWQS: New York TOGS 111 Ambient Water Quality Standards criteria
U - Not detected at the reported detection limit for the sample.
J - Estimated result
E - Analyte exceeds range of calibration curve and/or linear range of instrument.
laboratory criteria. Results are estimated maximum concentration.
RE - Analytical results are from sample re-extraction.

**Table 1d. Emerging Contaminants Analytical Results in Groundwater**
8 Walworth Street, Brooklyn, NY
BCP Site C224239

| LOCATION | | | MW01-S | | MW01-I | | MW05-S | | MW05-S | | MW05-I | | MW05-I | | MW05-D | | FIELD BLANK | | FIELD BLANK | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | 7/2/2020 | | 7/15/2020 | | 7/13/2020 | | 7/13/2020 | | 7/14/2020 | | 7/14/2020 | | 7/13/2020 | | 7/13/2020 | | 7/15/2020 | |
| LAB SAMPLE ID | | | L2028075-01 | | L2029975-02 | | L2029456-01 | | L2029456-01 R1 | | L2029638-01 | | L2029638-01 R1 | | L2029456-02 | | L2029456-04 | | L2029975-03 | |
| SAMPLE DEPTH (ft.) | | | | | | | | | | | | | | | | | | | | |
| | NY-MCL | Units | Results | Qual | Results | Qual | Results | Qual | Results | Qual | Results | Qual | Results | Qual | Results | Qual | Results | Qual | Results | Qual |
| **1,4 Dioxane by 8270D-SIM** | | | | | | | | | | | | | | | | | | | | |
| 1,4-Dioxane | 1 | ug/l | 1.86 | | 0.253 | | 980 | | - | - | 286 | | - | - | 288 | | - | - | 0.139 | U |
| **Perfluorinated Alkyl Acids by Isotope Dilution** | | | | | | | | | | | | | | | | | | | | |
| Perfluorobutanoic Acid (PFBA) | 0.01 | ug/l | 0.00661 | | 0.00971 | | 0.0653 | | - | - | 0.0449 | | - | - | 0.0114 | | 0.00188 | U | - | - |
| Perfluoropentanoic Acid (PFPeA) | 0.01 | ug/l | 0.00866 | | 0.0124 | | 0.0745 | | - | - | 0.0333 | | - | - | 0.0201 | | 0.00188 | U | - | - |
| Perfluorobutanesulfonic Acid (PFBS) | 0.01 | ug/l | 0.0024 | | 0.00661 | | 0.00734 | | - | - | 0.00491 | | - | - | 0.00593 | | 0.00188 | U | - | - |
| Perfluorohexanoic Acid (PFHxA) | 0.01 | ug/l | 0.0092 | | 0.0106 | | 0.121 | | - | - | 0.046 | | - | - | 0.0171 | | 0.000338 | J | - | - |
| Perfluoroheptanoic Acid (PFHpA) | 0.01 | ug/l | 0.00701 | | 0.00964 | | 0.241 | | - | - | 0.0741 | | - | - | 0.0131 | | 0.00188 | U | - | - |
| Perfluorohexanesulfonic Acid (PFHxS) | 0.01 | ug/l | 0.00192 | | 0.00351 | F | 0.0677 | F | - | - | 0.0408 | | - | - | 0.00563 | F | 0.00188 | U | - | - |
| Perfluorooctanoic Acid (PFOA) | 0.01 | ug/l | 0.0522 | | 0.0398 | | 1.26 | E | 1.26 | | 0.675 | | - | - | 0.0785 | | 0.00188 | U | - | - |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS) | 0.01 | ug/l | 0.00183 | U | 0.00272 | U | 0.00187 | U | - | - | 0.00193 | U | - | - | 0.00189 | U | 0.00188 | U | - | - |
| Perfluoroheptanesulfonic Acid (PFHpS) | 0.01 | ug/l | 0.00183 | U | 0.00272 | U | 0.0847 | | - | - | 0.191 | | - | - | 0.00148 | J | 0.00188 | U | - | - |
| Perfluorononanoic Acid (PFNA) | 0.01 | ug/l | 0.00118 | J | 0.0013 | J | 0.0132 | | - | - | 0.0174 | | - | - | 0.00175 | J | 0.00188 | U | - | - |
| Perfluorooctanesulfonic Acid (PFOS) | 0.01 | ug/l | 0.0609 | | 0.071 | | 2.32 | E | 2.18 | | 9.58 | E | 10.3 | | 0.17 | | 0.00188 | U | - | - |
| Perfluorodecanoic Acid (PFDA) | 0.01 | ug/l | 0.000686 | J | 0.00272 | U | 0.00626 | | - | - | 0.00244 | | - | - | 0.000349 | JF | 0.00188 | U | - | - |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS) | 0.01 | ug/l | 0.00183 | U | 0.00272 | U | 0.00187 | U | - | - | 0.00193 | U | - | - | 0.00189 | U | 0.00188 | U | - | - |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA) | 0.01 | ug/l | 0.00183 | U | 0.00272 | U | 0.00267 | F | - | - | 0.0307 | F | - | - | 0.00189 | U | 0.00188 | U | - | - |
| Perfluoroundecanoic Acid (PFUnA) | 0.01 | ug/l | 0.00183 | U | 0.00272 | U | 0.000974 | JF | - | - | 0.000418 | J | - | - | 0.00189 | U | 0.00188 | U | - | - |
| Perfluorodecanesulfonic Acid (PFDS) | 0.01 | ug/l | 0.00183 | U | 0.00272 | U | 0.00187 | U | - | - | 0.00193 | U | - | - | 0.00189 | U | 0.00188 | U | - | - |
| Perfluorooctanesulfonamide (FOSA) | 0.01 | ug/l | 0.00456 | F | 0.00903 | F | 0.0317 | F | - | - | 1.36 | E | 1.06 | F | 0.0108 | F | 0.00188 | U | - | - |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA) | 0.01 | ug/l | 0.00241 | F | 0.00125 | J | 0.00334 | F | - | - | 0.00718 | F | - | - | 0.00189 | U | 0.00188 | U | - | - |
| Perfluorododecanoic Acid (PFDoA) | 0.01 | ug/l | 0.00183 | U | 0.00272 | U | 0.00187 | U | - | - | 0.00193 | U | - | - | 0.00189 | U | 0.00188 | U | - | - |
| Perfluorotridecanoic Acid (PFTrDA) | 0.01 | ug/l | 0.00183 | U | 0.00272 | U | 0.00187 | U | - | - | 0.00193 | U | - | - | 0.00189 | U | 0.00188 | U | - | - |
| Perfluorotetradecanoic Acid (PFTA) | 0.01 | ug/l | 0.00183 | U | 0.00272 | U | 0.00187 | U | - | - | 0.00193 | U | - | - | 0.00189 | U | 0.00188 | U | - | - |
| PFOA/PFOS, Total | 0.01 | ug/l | 0.113 | | 0.111 | | 4.14 | | - | - | 12.51 | | - | - | 0.249 | | 0.00188 | U | - | - |

Notes

MCL - Maximum Contaminant Level

MCL for drinking water as per July 2020 adpotion by New York State Department of Health

U - Not detected at the reported detection limit for the sample.

J - Estimated result

E - Analyte exceeds range of the calibration curve and/or linear range of instrument.

F - Ratio of quantifier ion response to qualifier ion response falls outside of
the laboratory criteria. Results are estimated maximum concentration.

RE - Analytical results are from sample re-extraction.

**Table 2a. Volatile Organic Compound Analytical Results in Soil**
8 Walworth Street, Brooklyn, NY
BCP Site C224239

| LOCATION | | | | | | B01 (30-35') | | B01 (40-45') | | B02 (30-35') | | B02 (40-45') | | B03 (30-35') | | B03 (40-45') | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | | | | 6/16/2020 | | 6/16/2020 | | 6/16/2020 | | 6/16/2020 | | 6/22/2020 | | 6/22/2020 | |
| LAB SAMPLE ID | | | | | | L2025143-04 | | L2025143-05 | | L2025143-01 | | L2025143-02 | | L2026129-01 | | L2026129-02 | |
| | NY-RESC | NY-RESRR | NY-UNRES | NY-RESGW | Units | Results | Qual | Results | Qual | Results | Qual | Results | Qual | Results | Qual | Results | Qual |
| **Volatile Organics by EPA 5035** | | | | | | | | | | | | | | | | | |
| Methylene chloride | 500 | 100 | 0.05 | 0.05 | mg/kg | 0.0026 | U | 0.0025 | U | 0.17 | U | 0.0022 | U | 0.004 | U | 0.0038 | U |
| 1,1-Dichloroethane | 240 | 26 | 0.27 | 0.27 | mg/kg | 0.00052 | U | 0.00049 | U | 0.034 | U | 0.00045 | U | 0.0008 | U | 0.00075 | U |
| Chloroform | 350 | 49 | 0.37 | 0.37 | mg/kg | 0.00078 | U | 0.00074 | U | 0.052 | U | 0.00067 | U | 0.0012 | U | 0.0011 | U |
| Carbon tetrachloride | 22 | 2.4 | 0.76 | 0.76 | mg/kg | 0.00052 | U | 0.00049 | U | 0.034 | U | 0.00034 | J | 0.0008 | U | 0.00075 | U |
| 1,2-Dichloropropane | | | | | mg/kg | 0.00052 | U | 0.00049 | U | 0.034 | U | 0.00045 | U | 0.0008 | U | 0.00075 | U |
| Dibromochloromethane | | | | | mg/kg | 0.00052 | U | 0.00049 | U | 0.034 | U | 0.00045 | U | 0.0008 | U | 0.00075 | U |
| 1,1,2-Trichloroethane | | | | | mg/kg | 0.00052 | U | 0.00049 | U | 0.034 | U | 0.00045 | U | 0.0008 | U | 0.00075 | U |
| Tetrachloroethene | 150 | 19 | 1.3 | 1.3 | mg/kg | 0.0022 | | 0.0032 | | 1.8 | | 0.74 | E | 0.29 | E | 0.0063 | |
| Chlorobenzene | 500 | 100 | 1.1 | 1.1 | mg/kg | 0.00026 | U | 0.00025 | U | 0.017 | U | 0.00022 | U | 0.0004 | U | 0.00038 | U |
| Trichlorofluoromethane | | | | | mg/kg | 0.0021 | U | 0.002 | U | 0.14 | U | 0.0018 | U | 0.0032 | U | 0.003 | U |
| 1,2-Dichloroethane | 30 | 3.1 | 0.02 | 0.02 | mg/kg | 0.00052 | U | 0.00049 | U | 0.034 | U | 0.00045 | U | 0.0008 | U | 0.00075 | U |
| 1,1,1-Trichloroethane | 500 | 100 | 0.68 | 0.68 | mg/kg | 0.00026 | U | 0.00025 | U | 0.017 | U | 0.00091 | | 0.012 | | 0.00017 | J |
| Bromodichloromethane | | | | | mg/kg | 0.00026 | U | 0.00025 | U | 0.017 | U | 0.00022 | U | 0.0004 | U | 0.00038 | U |
| trans-1,3-Dichloropropene | | | | | mg/kg | 0.00052 | U | 0.00049 | U | 0.034 | U | 0.00045 | U | 0.0008 | U | 0.00075 | U |
| cis-1,3-Dichloropropene | | | | | mg/kg | 0.00026 | U | 0.00025 | U | 0.017 | U | 0.00022 | U | 0.0004 | U | 0.00038 | U |
| 1,3-Dichloropropene, Total | | | | | mg/kg | 0.00026 | U | 0.00025 | U | 0.017 | U | 0.00022 | U | 0.0004 | U | 0.00038 | U |
| 1,1-Dichloropropene | | | | | mg/kg | 0.00026 | U | 0.00025 | U | 0.017 | U | 0.00022 | U | 0.0004 | U | 0.00038 | U |
| Bromoform | | | | | mg/kg | 0.0021 | U | 0.002 | U | 0.14 | U | 0.0018 | U | 0.0032 | U | 0.003 | U |
| 1,1,2,2-Tetrachloroethane | | | | | mg/kg | 0.00026 | U | 0.00025 | U | 0.017 | U | 0.00014 | J | 0.0004 | U | 0.00038 | U |
| Benzene | 44 | 4.8 | 0.06 | 0.06 | mg/kg | 0.00026 | U | 0.00025 | U | 0.017 | U | 0.00022 | U | 0.0004 | U | 0.00038 | U |
| Toluene | 500 | 100 | 0.7 | 0.7 | mg/kg | 0.00052 | U | 0.00049 | U | 0.034 | U | 0.00054 | | 0.0008 | U | 0.00075 | U |
| Ethylbenzene | 390 | 41 | 1 | 1 | mg/kg | 0.00052 | U | 0.00049 | U | 0.034 | U | 0.00077 | | 0.0008 | U | 0.00075 | U |
| Chloromethane | | | | | mg/kg | 0.0021 | U | 0.002 | U | 0.14 | U | 0.0018 | U | 0.0032 | U | 0.003 | U |
| Bromomethane | | | | | mg/kg | 0.001 | U | 0.00099 | U | 0.069 | U | 0.0009 | U | 0.0016 | U | 0.0015 | U |
| Vinyl chloride | 13 | 0.9 | 0.02 | 0.02 | mg/kg | 0.00052 | U | 0.00049 | U | 0.034 | U | 0.00045 | U | 0.0008 | U | 0.00075 | U |
| Chloroethane | | | | | mg/kg | 0.001 | U | 0.00099 | U | 0.069 | U | 0.0009 | U | 0.0016 | U | 0.0015 | U |
| 1,1-Dichloroethene | 500 | 100 | 0.33 | 0.33 | mg/kg | 0.00052 | U | 0.00049 | U | 0.034 | U | 0.00045 | U | 0.00078 | J | 0.00075 | U |
| trans-1,2-Dichloroethene | 500 | 100 | 0.19 | 0.19 | mg/kg | 0.00078 | U | 0.00074 | U | 0.052 | U | 0.00067 | U | 0.0012 | U | 0.0011 | U |
| Trichloroethene | 200 | 21 | 0.47 | 0.47 | mg/kg | 0.0016 | | 0.0029 | | 0.23 | | 0.09 | | 0.004 | | 0.0027 | |
| 1,2-Dichlorobenzene | 500 | 100 | 1.1 | 1.1 | mg/kg | 0.001 | U | 0.00099 | U | 0.069 | U | 0.0009 | U | 0.0016 | U | 0.0015 | U |
| 1,3-Dichlorobenzene | 280 | 49 | 2.4 | 2.4 | mg/kg | 0.001 | U | 0.00099 | U | 0.069 | U | 0.0009 | U | 0.0016 | U | 0.0015 | U |
| 1,4-Dichlorobenzene | 130 | 13 | 1.8 | 1.8 | mg/kg | 0.001 | U | 0.00099 | U | 0.069 | U | 0.0009 | U | 0.0016 | U | 0.0015 | U |
| Methyl tert butyl ether | 500 | 100 | 0.93 | 0.93 | mg/kg | 0.001 | U | 0.00099 | U | 0.069 | U | 0.0009 | U | 0.0016 | U | 0.0015 | U |
| p/m-Xylene | | | | | mg/kg | 0.001 | U | 0.00099 | U | 0.069 | U | 0.00048 | J | 0.0016 | U | 0.0015 | U |
| o-Xylene | | | | | mg/kg | 0.00052 | U | 0.00049 | U | 0.041 | | 0.0096 | | 0.0008 | U | 0.00075 | U |
| Xylenes, Total | 500 | 100 | 0.26 | 1.6 | mg/kg | 0.00052 | U | 0.00049 | U | 0.041 | | 0.01 | J | 0.0008 | U | 0.00075 | U |
| cis-1,2-Dichloroethene | 500 | 100 | 0.25 | 0.25 | mg/kg | 0.00016 | J | 0.00025 | J | 0.0088 | J | 0.001 | | 0.0013 | | 0.00046 | J |
| 1,2-Dichloroethene, Total | | | | | mg/kg | 0.00016 | J | 0.00025 | J | 0.0088 | J | 0.001 | | 0.0013 | | 0.00046 | J |
| Dibromomethane | | | | | mg/kg | 0.001 | U | 0.00099 | U | 0.069 | U | 0.0009 | U | 0.0016 | U | 0.0015 | U |
| Styrene | | | | | mg/kg | 0.00052 | U | 0.00049 | U | 0.034 | U | 0.00045 | U | 0.0008 | U | 0.00075 | U |
| Dichlorodifluoromethane | | | | | mg/kg | 0.0052 | U | 0.0049 | U | 0.34 | U | 0.0045 | U | 0.008 | U | 0.0075 | U |
| Acetone | 500 | 100 | 0.05 | 0.05 | mg/kg | 0.0052 | U | 0.0049 | U | 0.34 | U | 0.0045 | U | 0.008 | U | 0.0075 | U |
| Carbon disulfide | | | | | mg/kg | 0.0052 | U | 0.0049 | U | 0.34 | U | 0.0045 | U | 0.008 | U | 0.0075 | U |
| 2-Butanone | 500 | 100 | 0.12 | 0.12 | mg/kg | 0.0052 | U | 0.0049 | U | 0.34 | U | 0.0045 | U | 0.008 | U | 0.0075 | U |
| Vinyl acetate | | | | | mg/kg | 0.0052 | U | 0.0049 | U | 0.34 | U | 0.0045 | U | 0.008 | U | 0.0075 | U |
| 4-Methyl-2-pentanone | | | | | mg/kg | 0.0052 | U | 0.0049 | U | 0.34 | U | 0.0045 | U | 0.008 | U | 0.0075 | U |
| 1,2,3-Trichloropropane | | | | | mg/kg | 0.001 | U | 0.00099 | U | 0.069 | U | 0.0009 | U | 0.0016 | U | 0.0015 | U |
| 2-Hexanone | | | | | mg/kg | 0.0052 | U | 0.0049 | U | 0.34 | U | 0.0045 | U | 0.008 | U | 0.0075 | U |
| Bromochloromethane | | | | | mg/kg | 0.001 | U | 0.00099 | U | 0.069 | U | 0.0009 | U | 0.0016 | U | 0.0015 | U |
| 2,2-Dichloropropane | | | | | mg/kg | 0.001 | U | 0.00099 | U | 0.069 | U | 0.0009 | U | 0.0016 | U | 0.0015 | U |
| 1,2-Dibromoethane | | | | | mg/kg | 0.00052 | U | 0.00049 | U | 0.034 | U | 0.00045 | U | 0.0008 | U | 0.00075 | U |
| 1,3-Dichloropropane | | | | | mg/kg | 0.001 | U | 0.00099 | U | 0.069 | U | 0.0009 | U | 0.0016 | U | 0.0015 | U |
| 1,1,1,2-Tetrachloroethane | | | | | mg/kg | 0.00026 | U | 0.00025 | U | 0.017 | U | 0.00013 | J | 0.0004 | U | 0.00038 | U |
| Bromobenzene | | | | | mg/kg | 0.001 | U | 0.00099 | U | 0.069 | U | 0.0009 | U | 0.0016 | U | 0.0015 | U |
| n-Butylbenzene | 500 | 100 | 12 | 12 | mg/kg | 0.00052 | U | 0.00049 | U | 0.034 | U | 0.00045 | U | 0.0008 | U | 0.00075 | U |
| sec-Butylbenzene | 500 | 100 | 11 | 11 | mg/kg | 0.00052 | U | 0.00049 | U | 0.034 | U | 0.00045 | U | 0.0008 | U | 0.00075 | U |
| tert-Butylbenzene | 500 | 100 | 5.9 | 5.9 | mg/kg | 0.001 | U | 0.00099 | U | 0.069 | U | 0.0009 | U | 0.0016 | U | 0.0015 | U |
| o-Chlorotoluene | | | | | mg/kg | 0.001 | U | 0.00099 | U | 0.069 | U | 0.0009 | U | 0.0016 | U | 0.0015 | U |
| p-Chlorotoluene | | | | | mg/kg | 0.001 | U | 0.00099 | U | 0.069 | U | 0.0009 | U | 0.0016 | U | 0.0015 | U |
| 1,2-Dibromo-3-chloropropane | | | | | mg/kg | 0.0016 | U | 0.0015 | U | 0.1 | U | 0.0013 | U | 0.0024 | U | 0.0022 | U |
| Hexachlorobutadiene | | | | | mg/kg | 0.0021 | U | 0.002 | U | 0.14 | U | 0.0018 | U | 0.0032 | U | 0.003 | U |
| Isopropylbenzene | | | | | mg/kg | 0.00052 | U | 0.00049 | U | 0.034 | U | 0.00015 | J | 0.0008 | U | 0.00075 | U |
| p-Isopropyltoluene | | | | | mg/kg | 0.00052 | U | 0.00049 | U | 0.034 | U | 0.00007 | J | 0.0008 | U | 0.00075 | U |
| Naphthalene | 500 | 100 | 12 | 12 | mg/kg | 0.0021 | U | 0.002 | U | 0.14 | U | 0.0018 | U | 0.00066 | J | 0.003 | U |
| Acrylonitrile | | | | | mg/kg | 0.0021 | U | 0.002 | U | 0.14 | U | 0.0018 | U | 0.0032 | U | 0.003 | U |
| n-Propylbenzene | 500 | 100 | 3.9 | 3.9 | mg/kg | 0.00052 | U | 0.00049 | U | 0.034 | U | 0.00045 | U | 0.0008 | U | 0.00075 | U |
| 1,2,3-Trichlorobenzene | | | | | mg/kg | 0.001 | U | 0.00099 | U | 0.069 | U | 0.0009 | U | 0.0016 | U | 0.0015 | U |
| 1,2,4-Trichlorobenzene | | | | | mg/kg | 0.001 | U | 0.00099 | U | 0.069 | U | 0.0009 | U | 0.0016 | U | 0.0015 | U |
| 1,3,5-Trimethylbenzene | 190 | 52 | 8.4 | 8.4 | mg/kg | 0.001 | U | 0.00099 | U | 0.069 | U | 0.00037 | J | 0.0016 | U | 0.0015 | U |
| 1,2,4-Trimethylbenzene | 190 | 52 | 3.6 | 3.6 | mg/kg | 0.001 | U | 0.00099 | U | 0.069 | U | 0.0003 | J | 0.0016 | U | 0.0015 | U |
| 1,4-Dioxane | 130 | 13 | 0.1 | 0.1 | mg/kg | 0.041 | U | 0.039 | U | 2.7 | U | 0.036 | U | 0.064 | U | 0.06 | U |
| p-Diethylbenzene | | | | | mg/kg | 0.001 | U | 0.00099 | U | 0.069 | U | 0.00041 | J | 0.0016 | U | 0.0015 | U |
| p-Ethyltoluene | | | | | mg/kg | 0.001 | U | 0.00099 | U | 0.069 | U | 0.0004 | J | 0.0016 | U | 0.0015 | U |
| 1,2,4,5-Tetramethylbenzene | | | | | mg/kg | 0.001 | U | 0.00099 | U | 0.069 | U | 0.00028 | J | 0.0016 | U | 0.0015 | U |
| Ethyl ether | | | | | mg/kg | 0.001 | U | 0.00099 | U | 0.069 | U | 0.0009 | U | 0.0016 | U | 0.0015 | U |
| trans-1,4-Dichloro-2-butene | | | | | mg/kg | 0.0026 | U | 0.0025 | U | 0.17 | U | 0.0022 | U | 0.004 | U | 0.0038 | U |

Notes:
NY-RESC: New York NYCRR Part 375 Commercial Criteria
NY-RESRR: New York NYCRR Part 375 Restricted-Residential Criteria
NY-UNRES: New York NYCRR Part 375 New York Unrestricted use Criteria
NY-RESGW: New York NYCRR Part 375 Groundwater Criteria
U - Not detected at the reported detection limit for the sample.
J - Estimated result
E - Concentration of analyte exceeds range of the calibration curve and/or linear range of the instrument.

**Table 2a. Volatile Organic Compound Analytical Results in Soil**
8 Walworth Street, Brooklyn, NY
BCP Site C224239

| LOCATION | | | | | | B01 (30-35') | | B01 (40-45') | | B02 (30-35') | | B02 (40-45') | | B03 (30-35') | | B03 (40-45') | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | | | | 6/16/2020 | | 6/16/2020 | | 6/16/2020 | | 6/16/2020 | | 6/22/2020 | | 6/22/2020 | |
| LAB SAMPLE ID | | | | | | L2025143-04 | | L2025143-05 | | L2025143-01 | | L2025143-02 | | L2026129-01 | | L2026129-02 | |
| | NY-RESC | NY-RESRR | NY-UNRES | NY-RESGW | Units | Results | Qual | Results | Qual | Results | Qual | Results | Qual | Results | Qual | Results | Qual |
| **Volatile Organics by EPA 5035 High** | | | | | | | | | | | | | | | | | |
| Methylene chloride | 500 | 100 | 0.05 | 0.05 | mg/kg | - | - | - | - | - | - | 0.16 | U | 0.21 | U | - | - |
| 1,1-Dichloroethane | 240 | 26 | 0.27 | 0.27 | mg/kg | - | - | - | - | - | - | 0.031 | U | 0.043 | U | - | - |
| Chloroform | 350 | 49 | 0.37 | 0.37 | mg/kg | - | - | - | - | - | - | 0.047 | U | 0.064 | U | - | - |
| Carbon tetrachloride | 22 | 2.4 | 0.76 | 0.76 | mg/kg | - | - | - | - | - | - | 0.031 | U | 0.043 | U | - | - |
| 1,2-Dichloropropane | | | | | mg/kg | - | - | - | - | - | - | 0.031 | U | 0.043 | U | - | - |
| Dibromochloromethane | | | | | mg/kg | - | - | - | - | - | - | 0.031 | U | 0.043 | U | - | - |
| 1,1,2-Trichloroethane | | | | | mg/kg | - | - | - | - | - | - | 0.031 | U | 0.043 | U | - | - |
| Tetrachloroethene | 150 | 19 | 1.3 | 1.3 | mg/kg | - | - | - | - | - | - | 0.38 | | 0.63 | | - | - |
| Chlorobenzene | 500 | 100 | 1.1 | 1.1 | mg/kg | - | - | - | - | - | - | 0.016 | U | 0.021 | U | - | - |
| Trichlorofluoromethane | | | | | mg/kg | - | - | - | - | - | - | 0.12 | U | 0.17 | U | - | - |
| 1,2-Dichloroethane | 30 | 3.1 | 0.02 | 0.02 | mg/kg | - | - | - | - | - | - | 0.031 | U | 0.043 | U | - | - |
| 1,1,1-Trichloroethane | 500 | 100 | 0.68 | 0.68 | mg/kg | - | - | - | - | - | - | 0.016 | U | 0.013 | J | - | - |
| Bromodichloromethane | | | | | mg/kg | - | - | - | - | - | - | 0.016 | U | 0.021 | U | - | - |
| trans-1,3-Dichloropropene | | | | | mg/kg | - | - | - | - | - | - | 0.031 | U | 0.043 | U | - | - |
| cis-1,3-Dichloropropene | | | | | mg/kg | - | - | - | - | - | - | 0.016 | U | 0.021 | U | - | - |
| 1,3-Dichloropropene, Total | | | | | mg/kg | - | - | - | - | - | - | 0.016 | U | 0.021 | U | - | - |
| 1,1-Dichloropropene | | | | | mg/kg | - | - | - | - | - | - | 0.016 | U | 0.021 | U | - | - |
| Bromoform | | | | | mg/kg | - | - | - | - | - | - | 0.12 | U | 0.17 | U | - | - |
| 1,1,2,2-Tetrachloroethane | | | | | mg/kg | - | - | - | - | - | - | 0.016 | U | 0.021 | U | - | - |
| Benzene | 44 | 4.8 | 0.06 | 0.06 | mg/kg | - | - | - | - | - | - | 0.016 | U | 0.021 | U | - | - |
| Toluene | 500 | 100 | 0.7 | 0.7 | mg/kg | - | - | - | - | - | - | 0.031 | U | 0.043 | U | - | - |
| Ethylbenzene | 390 | 41 | 1 | 1 | mg/kg | - | - | - | - | - | - | 0.031 | U | 0.043 | U | - | - |
| Chloromethane | | | | | mg/kg | - | - | - | - | - | - | 0.12 | U | 0.17 | U | - | - |
| Bromomethane | | | | | mg/kg | - | - | - | - | - | - | 0.063 | U | 0.086 | U | - | - |
| Vinyl chloride | 13 | 0.9 | 0.02 | 0.02 | mg/kg | - | - | - | - | - | - | 0.031 | U | 0.043 | U | - | - |
| Chloroethane | | | | | mg/kg | - | - | - | - | - | - | 0.063 | U | 0.086 | U | - | - |
| 1,1-Dichloroethene | 500 | 100 | 0.33 | 0.33 | mg/kg | - | - | - | - | - | - | 0.031 | U | 0.043 | U | - | - |
| trans-1,2-Dichloroethene | 500 | 100 | 0.19 | 0.19 | mg/kg | - | - | - | - | - | - | 0.047 | U | 0.064 | U | - | - |
| Trichloroethene | 200 | 21 | 0.47 | 0.47 | mg/kg | - | - | - | - | - | - | 0.075 | | 0.0095 | J | - | - |
| 1,2-Dichlorobenzene | 500 | 100 | 1.1 | 1.1 | mg/kg | - | - | - | - | - | - | 0.063 | U | 0.086 | U | - | - |
| 1,3-Dichlorobenzene | 280 | 49 | 2.4 | 2.4 | mg/kg | - | - | - | - | - | - | 0.063 | U | 0.086 | U | - | - |
| 1,4-Dichlorobenzene | 130 | 13 | 1.8 | 1.8 | mg/kg | - | - | - | - | - | - | 0.063 | U | 0.086 | U | - | - |
| Methyl tert butyl ether | 500 | 100 | 0.93 | 0.93 | mg/kg | - | - | - | - | - | - | 0.063 | U | 0.086 | U | - | - |
| p/m-Xylene | | | | | mg/kg | - | - | - | - | - | - | 0.063 | U | 0.086 | U | - | - |
| o-Xylene | | | | | mg/kg | - | - | - | - | - | - | 0.031 | U | 0.043 | U | - | - |
| Xylenes, Total | 500 | 100 | 0.26 | 1.6 | mg/kg | - | - | - | - | - | - | 0.031 | U | 0.043 | U | - | - |
| cis-1,2-Dichloroethene | 500 | 100 | 0.25 | 0.25 | mg/kg | - | - | - | - | - | - | 0.031 | U | 0.043 | U | - | - |
| 1,2-Dichloroethene, Total | | | | | mg/kg | - | - | - | - | - | - | 0.031 | U | 0.043 | U | - | - |
| Dibromomethane | | | | | mg/kg | - | - | - | - | - | - | 0.063 | U | 0.086 | U | - | - |
| Styrene | | | | | mg/kg | - | - | - | - | - | - | 0.031 | U | 0.043 | U | - | - |
| Dichlorodifluoromethane | | | | | mg/kg | - | - | - | - | - | - | 0.31 | U | 0.43 | U | - | - |
| Acetone | 500 | 100 | 0.05 | 0.05 | mg/kg | - | - | - | - | - | - | 0.31 | U | 0.43 | U | - | - |
| Carbon disulfide | | | | | mg/kg | - | - | - | - | - | - | 0.31 | U | 0.43 | U | - | - |
| 2-Butanone | 500 | 100 | 0.12 | 0.12 | mg/kg | - | - | - | - | - | - | 0.31 | U | 0.43 | U | - | - |
| Vinyl acetate | | | | | mg/kg | - | - | - | - | - | - | 0.31 | U | 0.43 | U | - | - |
| 4-Methyl-2-pentanone | | | | | mg/kg | - | - | - | - | - | - | 0.31 | U | 0.43 | U | - | - |
| 1,2,3-Trichloropropane | | | | | mg/kg | - | - | - | - | - | - | 0.063 | U | 0.086 | U | - | - |
| 2-Hexanone | | | | | mg/kg | - | - | - | - | - | - | 0.31 | U | 0.43 | U | - | - |
| Bromochloromethane | | | | | mg/kg | - | - | - | - | - | - | 0.063 | U | 0.086 | U | - | - |
| 2,2-Dichloropropane | | | | | mg/kg | - | - | - | - | - | - | 0.063 | U | 0.086 | U | - | - |
| 1,2-Dibromoethane | | | | | mg/kg | - | - | - | - | - | - | 0.031 | U | 0.043 | U | - | - |
| 1,3-Dichloropropane | | | | | mg/kg | - | - | - | - | - | - | 0.063 | U | 0.086 | U | - | - |
| 1,1,1,2-Tetrachloroethane | | | | | mg/kg | - | - | - | - | - | - | 0.016 | U | 0.021 | U | - | - |
| Bromobenzene | | | | | mg/kg | - | - | - | - | - | - | 0.063 | U | 0.086 | U | - | - |
| n-Butylbenzene | 500 | 100 | 12 | 12 | mg/kg | - | - | - | - | - | - | 0.031 | U | 0.043 | U | - | - |
| sec-Butylbenzene | 500 | 100 | 11 | 11 | mg/kg | - | - | - | - | - | - | 0.031 | U | 0.043 | U | - | - |
| tert-Butylbenzene | 500 | 100 | 5.9 | 5.9 | mg/kg | - | - | - | - | - | - | 0.063 | U | 0.086 | U | - | - |
| o-Chlorotoluene | | | | | mg/kg | - | - | - | - | - | - | 0.063 | U | 0.086 | U | - | - |
| p-Chlorotoluene | | | | | mg/kg | - | - | - | - | - | - | 0.063 | U | 0.086 | U | - | - |
| 1,2-Dibromo-3-chloropropane | | | | | mg/kg | - | - | - | - | - | - | 0.094 | U | 0.13 | U | - | - |
| Hexachlorobutadiene | | | | | mg/kg | - | - | - | - | - | - | 0.12 | U | 0.17 | U | - | - |
| Isopropylbenzene | | | | | mg/kg | - | - | - | - | - | - | 0.031 | U | 0.043 | U | - | - |
| p-Isopropyltoluene | | | | | mg/kg | - | - | - | - | - | - | 0.031 | U | 0.043 | U | - | - |
| Naphthalene | 500 | 100 | 12 | 12 | mg/kg | - | - | - | - | - | - | 0.12 | U | 0.17 | U | - | - |
| Acrylonitrile | | | | | mg/kg | - | - | - | - | - | - | 0.12 | U | 0.17 | U | - | - |
| n-Propylbenzene | 500 | 100 | 3.9 | 3.9 | mg/kg | - | - | - | - | - | - | 0.031 | U | 0.043 | U | - | - |
| 1,2,3-Trichlorobenzene | | | | | mg/kg | - | - | - | - | - | - | 0.063 | U | 0.086 | U | - | - |
| 1,2,4-Trichlorobenzene | | | | | mg/kg | - | - | - | - | - | - | 0.063 | U | 0.086 | U | - | - |
| 1,3,5-Trimethylbenzene | 190 | 52 | 8.4 | 8.4 | mg/kg | - | - | - | - | - | - | 0.063 | U | 0.086 | U | - | - |
| 1,2,4-Trimethylbenzene | 190 | 52 | 3.6 | 3.6 | mg/kg | - | - | - | - | - | - | 0.063 | U | 0.086 | U | - | - |
| 1,4-Dioxane | 130 | 13 | 0.1 | 0.1 | mg/kg | - | - | - | - | - | - | 2.5 | U | 3.4 | U | - | - |
| p-Diethylbenzene | | | | | mg/kg | - | - | - | - | - | - | 0.063 | U | 0.086 | U | - | - |
| p-Ethyltoluene | | | | | mg/kg | - | - | - | - | - | - | 0.063 | U | 0.086 | U | - | - |
| 1,2,4,5-Tetramethylbenzene | | | | | mg/kg | - | - | - | - | - | - | 0.063 | U | 0.086 | U | - | - |
| Ethyl ether | | | | | mg/kg | - | - | - | - | - | - | 0.063 | U | 0.086 | U | - | - |
| trans-1,4-Dichloro-2-butene | | | | | mg/kg | - | - | - | - | - | - | 0.16 | U | 0.21 | U | - | - |

Notes:
NY-RESC: New York NYCRR Part 375 Commercial Criteria
NY-RESRR: New York NYCRR Part 375 Restricted-Residential Criteria
NY-UNRES: New York NYCRR Part 375 New York Unrestricted use Criteria
NY-RESGW: New York NYCRR Part 375 Groundwater Criteria
U - Not detected at the reported detection limit for the sample.
J - Estimated result
E - Concentration of analyte exceeds range of the calibration curve and/or linear range of the instrument.

## Table 2a. Volatile Organic Compound Analytical Results in Soil

8 Walworth Street, Brooklyn, NY

BCP Site C224239

| LOCATION | | | | | | B04 (30-35') | | B04 (40-45') | | B05 (30-35) | | B05 (40-45) | | DUP-061620 | | DUP-061620 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | | | | 6/22/2020 | | 6/22/2020 | | 6/15/2020 | | 6/15/2020 | | 6/16/2020 | | 6/16/2020 | |
| LAB SAMPLE ID | | | | | | L2026129-03 | | L2026129-04 | | L2024999-02 | | L2024999-03 | | L2025143-06 | | L2025143-06 R1 | |
| | NY-RESC | NY-RESRR | NY-UNRES | NY-RESGW | Units | Results | Qual | Results | Qual | Results | Qual | Results | Qual | Results | Qual | Results | Qual |
| **Volatile Organics by EPA 5035** | | | | | | | | | | | | | | | | | |
| Methylene chloride | 500 | 100 | 0.05 | 0.05 | mg/kg | 0.0033 | U | 0.004 | U | 0.17 | U | 0.002 | U | 0.11 | U | - | - |
| 1,1-Dichloroethane | 240 | 26 | 0.27 | 0.27 | mg/kg | 0.00066 | U | 0.00081 | U | 0.034 | U | 0.0004 | U | 0.022 | U | - | - |
| Chloroform | 350 | 49 | 0.37 | 0.37 | mg/kg | 0.0001 | J | 0.0012 | U | 0.051 | U | 0.00006 | J | 0.033 | U | - | - |
| Carbon tetrachloride | 22 | 2.4 | 0.76 | 0.76 | mg/kg | 0.00066 | U | 0.00081 | U | 0.034 | U | 0.0004 | U | 0.022 | U | - | - |
| 1,2-Dichloropropane | | | | | mg/kg | 0.00066 | U | 0.00081 | U | 0.034 | U | 0.0004 | U | 0.022 | U | - | - |
| Dibromochloromethane | | | | | mg/kg | 0.00066 | U | 0.00081 | U | 0.034 | U | 0.0004 | U | 0.022 | U | - | - |
| 1,1,2-Trichloroethane | | | | | mg/kg | 0.00066 | U | 0.00081 | U | 0.034 | U | 0.0004 | U | 0.022 | U | - | - |
| Tetrachloroethene | 150 | 19 | 1.3 | 1.3 | mg/kg | 0.036 | | 0.0016 | | 2.2 | | 0.063 | | 11 | | 13 | E |
| Chlorobenzene | 500 | 100 | 1.1 | 1.1 | mg/kg | 0.00033 | U | 0.0004 | U | 0.017 | U | 0.0002 | U | 0.011 | U | - | - |
| Trichlorofluoromethane | | | | | mg/kg | 0.0026 | U | 0.0032 | U | 0.14 | U | 0.0016 | U | 0.089 | U | - | - |
| 1,2-Dichloroethane | 30 | 3.1 | 0.02 | 0.02 | mg/kg | 0.00066 | U | 0.00081 | U | 0.034 | U | 0.0004 | U | 0.022 | U | - | - |
| 1,1,1-Trichloroethane | 500 | 100 | 0.68 | 0.68 | mg/kg | 0.00092 | | 0.0004 | U | 0.045 | | 0.0023 | | 0.017 | | - | - |
| Bromodichloromethane | | | | | mg/kg | 0.00033 | U | 0.0004 | U | 0.017 | U | 0.0002 | U | 0.011 | U | - | - |
| trans-1,3-Dichloropropene | | | | | mg/kg | 0.00066 | U | 0.00081 | U | 0.034 | U | 0.0004 | U | 0.022 | U | - | - |
| cis-1,3-Dichloropropene | | | | | mg/kg | 0.00033 | U | 0.0004 | U | 0.017 | U | 0.0002 | U | 0.011 | U | - | - |
| 1,3-Dichloropropene, Total | | | | | mg/kg | 0.00033 | U | 0.0004 | U | 0.017 | U | 0.0002 | U | 0.011 | U | - | - |
| 1,1-Dichloropropene | | | | | mg/kg | 0.00033 | U | 0.0004 | U | 0.017 | U | 0.0002 | U | 0.011 | U | - | - |
| Bromoform | | | | | mg/kg | 0.0026 | U | 0.0032 | U | 0.14 | U | 0.0016 | U | 0.089 | U | - | - |
| 1,1,2,2-Tetrachloroethane | | | | | mg/kg | 0.00033 | U | 0.0004 | U | 0.017 | U | 0.0002 | U | 0.011 | U | - | - |
| Benzene | 44 | 4.8 | 0.06 | 0.06 | mg/kg | 0.00033 | U | 0.0004 | U | 0.017 | U | 0.0001 | J | 0.011 | U | - | - |
| Toluene | 500 | 100 | 0.7 | 0.7 | mg/kg | 0.0012 | | 0.00081 | U | 0.027 | J | 0.0004 | U | 0.043 | | - | - |
| Ethylbenzene | 390 | 41 | 1 | 1 | mg/kg | 0.0003 | J | 0.00081 | U | 0.0093 | J | 0.0004 | U | 0.045 | | - | - |
| Chloromethane | | | | | mg/kg | 0.0026 | U | 0.0032 | U | 0.14 | U | 0.0016 | U | 0.089 | U | - | - |
| Bromomethane | | | | | mg/kg | 0.0013 | U | 0.0016 | U | 0.068 | U | 0.0008 | U | 0.044 | U | - | - |
| Vinyl chloride | 13 | 0.9 | 0.02 | 0.02 | mg/kg | 0.00066 | U | 0.00081 | U | 0.034 | U | 0.0004 | U | 0.022 | U | - | - |
| Chloroethane | | | | | mg/kg | 0.0013 | U | 0.0016 | U | 0.068 | U | 0.0008 | U | 0.044 | U | - | - |
| 1,1-Dichloroethene | 500 | 100 | 0.33 | 0.33 | mg/kg | 0.00066 | U | 0.00081 | U | 0.034 | U | 0.00015 | J | 0.022 | U | - | - |
| trans-1,2-Dichloroethene | 500 | 100 | 0.19 | 0.19 | mg/kg | 0.00098 | U | 0.0012 | U | 0.051 | U | 0.0006 | U | 0.033 | U | - | - |
| Trichloroethene | 200 | 21 | 0.47 | 0.47 | mg/kg | 0.011 | | 0.0035 | | 0.058 | | 0.0028 | | 2 | | - | - |
| 1,2-Dichlorobenzene | 500 | 100 | 1.1 | 1.1 | mg/kg | 0.0013 | U | 0.0016 | U | 0.011 | J | 0.0008 | U | 0.044 | U | - | - |
| 1,3-Dichlorobenzene | 280 | 49 | 2.4 | 2.4 | mg/kg | 0.0013 | U | 0.0016 | U | 0.068 | U | 0.0008 | U | 0.044 | U | - | - |
| 1,4-Dichlorobenzene | 130 | 13 | 1.8 | 1.8 | mg/kg | 0.0013 | U | 0.0016 | U | 0.068 | U | 0.0008 | U | 0.044 | U | - | - |
| Methyl tert butyl ether | 500 | 100 | 0.93 | 0.93 | mg/kg | 0.0013 | U | 0.0016 | U | 0.068 | U | 0.0008 | U | 0.044 | U | - | - |
| p/m-Xylene | | | | | mg/kg | 0.001 | J | 0.0016 | U | 0.029 | J | 0.0008 | U | 0.11 | | - | - |
| o-Xylene | | | | | mg/kg | 0.00029 | J | 0.00081 | U | 0.012 | J | 0.0004 | U | 0.18 | | - | - |
| Xylenes, Total | 500 | 100 | 0.26 | 1.6 | mg/kg | 0.0013 | J | 0.00081 | U | 0.041 | J | 0.0004 | U | 0.29 | | - | - |
| cis-1,2-Dichloroethene | 500 | 100 | 0.25 | 0.25 | mg/kg | 0.0038 | | 0.0013 | | 0.12 | | 0.0014 | | 0.015 | J | - | - |
| 1,2-Dichloroethene, Total | | | | | mg/kg | 0.0038 | | 0.0013 | | 0.12 | | 0.0014 | | 0.015 | J | - | - |
| Dibromomethane | | | | | mg/kg | 0.0013 | U | 0.0016 | U | 0.068 | U | 0.0008 | U | 0.044 | U | - | - |
| Styrene | | | | | mg/kg | 0.00066 | U | 0.00081 | U | 0.034 | U | 0.0004 | U | 0.022 | U | - | - |
| Dichlorodifluoromethane | | | | | mg/kg | 0.0066 | U | 0.0081 | U | 0.34 | U | 0.004 | U | 0.22 | U | - | - |
| Acetone | 500 | 100 | 0.05 | 0.05 | mg/kg | 0.0066 | U | 0.0062 | J | 0.34 | U | 0.004 | U | 0.22 | U | - | - |
| Carbon disulfide | | | | | mg/kg | 0.0066 | U | 0.0081 | U | 0.34 | U | 0.004 | U | 0.22 | U | - | - |
| 2-Butanone | 500 | 100 | 0.12 | 0.12 | mg/kg | 0.0066 | U | 0.0081 | U | 0.34 | U | 0.004 | U | 0.22 | U | - | - |
| Vinyl acetate | | | | | mg/kg | 0.0066 | U | 0.0081 | U | 0.34 | U | 0.004 | U | 0.22 | U | - | - |
| 4-Methyl-2-pentanone | | | | | mg/kg | 0.0066 | U | 0.0081 | U | 0.34 | U | 0.004 | U | 0.22 | U | - | - |
| 1,2,3-Trichloropropane | | | | | mg/kg | 0.0013 | U | 0.0016 | U | 0.068 | U | 0.0008 | U | 0.044 | U | - | - |
| 2-Hexanone | | | | | mg/kg | 0.0066 | U | 0.0081 | U | 0.34 | U | 0.004 | U | 0.22 | U | - | - |
| Bromochloromethane | | | | | mg/kg | 0.0013 | U | 0.0016 | U | 0.068 | U | 0.0008 | U | 0.044 | U | - | - |
| 2,2-Dichloropropane | | | | | mg/kg | 0.0013 | U | 0.0016 | U | 0.068 | U | 0.0008 | U | 0.044 | U | - | - |
| 1,2-Dibromoethane | | | | | mg/kg | 0.00066 | U | 0.00081 | U | 0.034 | U | 0.0004 | U | 0.022 | U | - | - |
| 1,3-Dichloropropane | | | | | mg/kg | 0.0013 | U | 0.0016 | U | 0.068 | U | 0.0008 | U | 0.044 | U | - | - |
| 1,1,1,2-Tetrachloroethane | | | | | mg/kg | 0.00033 | U | 0.0004 | U | 0.017 | U | 0.0002 | U | 0.011 | U | - | - |
| Bromobenzene | | | | | mg/kg | 0.0013 | U | 0.0016 | U | 0.068 | U | 0.0008 | U | 0.044 | U | - | - |
| n-Butylbenzene | 500 | 100 | 12 | 12 | mg/kg | 0.00066 | U | 0.00081 | U | 0.034 | U | 0.0004 | U | 0.022 | U | - | - |
| sec-Butylbenzene | 500 | 100 | 11 | 11 | mg/kg | 0.00066 | U | 0.00081 | U | 0.034 | U | 0.0004 | U | 0.022 | U | - | - |
| tert-Butylbenzene | 500 | 100 | 5.9 | 5.9 | mg/kg | 0.0013 | U | 0.0016 | U | 0.068 | U | 0.0008 | U | 0.044 | U | - | - |
| o-Chlorotoluene | | | | | mg/kg | 0.0013 | U | 0.0016 | U | 0.068 | U | 0.0008 | U | 0.044 | U | - | - |
| p-Chlorotoluene | | | | | mg/kg | 0.0013 | U | 0.0016 | U | 0.068 | U | 0.0008 | U | 0.044 | U | - | - |
| 1,2-Dibromo-3-chloropropane | | | | | mg/kg | 0.002 | U | 0.0024 | U | 0.1 | U | 0.0012 | U | 0.066 | U | - | - |
| Hexachlorobutadiene | | | | | mg/kg | 0.0026 | U | 0.0032 | U | 0.14 | U | 0.0016 | U | 0.089 | U | - | - |
| Isopropylbenzene | | | | | mg/kg | 0.00066 | U | 0.00081 | U | 0.034 | U | 0.0004 | U | 0.0031 | J | - | - |
| p-Isopropyltoluene | | | | | mg/kg | 0.00066 | U | 0.00081 | U | 0.034 | U | 0.0004 | U | 0.0026 | J | - | - |
| Naphthalene | 500 | 100 | 12 | 12 | mg/kg | 0.00052 | J | 0.0032 | U | 0.14 | U | 0.0016 | U | 0.089 | U | - | - |
| Acrylonitrile | | | | | mg/kg | 0.0026 | U | 0.0032 | U | 0.14 | U | 0.0016 | U | 0.089 | U | - | - |
| n-Propylbenzene | 500 | 100 | 3.9 | 3.9 | mg/kg | 0.00066 | U | 0.00081 | U | 0.034 | U | 0.0004 | U | 0.022 | U | - | - |
| 1,2,3-Trichlorobenzene | | | | | mg/kg | 0.0013 | U | 0.0016 | U | 0.068 | U | 0.0008 | U | 0.044 | U | - | - |
| 1,2,4-Trichlorobenzene | | | | | mg/kg | 0.0013 | U | 0.0016 | U | 0.068 | U | 0.0008 | U | 0.044 | U | - | - |
| 1,3,5-Trimethylbenzene | 190 | 52 | 8.4 | 8.4 | mg/kg | 0.0013 | U | 0.0016 | U | 0.068 | U | 0.0008 | U | 0.0092 | J | - | - |
| 1,2,4-Trimethylbenzene | 190 | 52 | 3.6 | 3.6 | mg/kg | 0.0013 | U | 0.0016 | U | 0.013 | J | 0.0008 | U | 0.011 | J | - | - |
| 1,4-Dioxane | 130 | 13 | 0.1 | 0.1 | mg/kg | 0.052 | U | 0.064 | U | 2.7 | U | 0.032 | U | 1.8 | U | - | - |
| p-Diethylbenzene | | | | | mg/kg | 0.0013 | U | 0.0016 | U | 0.068 | U | 0.0008 | U | 0.013 | J | - | - |
| p-Ethyltoluene | | | | | mg/kg | 0.0013 | U | 0.0016 | U | 0.068 | U | 0.0008 | U | 0.012 | J | - | - |
| 1,2,4,5-Tetramethylbenzene | | | | | mg/kg | 0.0013 | U | 0.0016 | U | 0.068 | U | 0.0008 | U | 0.0096 | J | - | - |
| Ethyl ether | | | | | mg/kg | 0.0013 | U | 0.0016 | U | 0.068 | U | 0.0008 | U | 0.044 | U | - | - |
| trans-1,4-Dichloro-2-butene | | | | | mg/kg | 0.0033 | U | 0.004 | U | 0.17 | U | 0.002 | U | 0.11 | U | - | - |

Notes:

NY-RESC: New York NYCRR Part 375 Commercial Criteria

NY-RESRR: New York NYCRR Part 375 Restricted-Residential Criteria

NY-UNRES: New York NYCRR Part 375 New York Unrestricted use Criteria

NY-RESGW: New York NYCRR Part 375 Groundwater Criteria

U - Not detected at the reported detection limit for the sample.

J - Estimated result

E - Concentration of analyte exceeds range of the calibration curve and/or linear range of the instrument.

**Table 2b. Polyclorinated Biphenyls Analytical Results in Soil**
8 Walworth Street, Brooklyn, NY
BCP Site C224239

| LOCATION | | | | | | B01 (30-35') | | B01 (40-45') | | B02 (30-35') | | B02 (40-45') | | B03 (30-35') | | B03 (40-45') | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | | | | 6/16/2020 | | 6/16/2020 | | 6/16/2020 | | 6/16/2020 | | 6/22/2020 | | 6/22/2020 | |
| LAB SAMPLE ID | | | | | | L2025143-04 | | L2025143-05 | | L2025143-01 | | L2025143-02 | | L2026129-01 | | L2026129-02 | |
| | NY-RESC | NY-RESRR | NY-UNRES | NY-RESGW | Units | Results | Qual | Results | Qual | Results | Qual | Results | Qual | Results | Qual | Results | Qual |
| **Polychlorinated Biphenyls by GC** | | | | | | | | | | | | | | | | | |
| Aroclor 1016 | 1 | 1 | 0.1 | 3.2 | mg/kg | 0.0368 | U | 0.035 | U | 0.0373 | U | 0.0385 | U | 0.0366 | U | 0.0412 | U |
| Aroclor 1221 | 1 | 1 | 0.1 | 3.2 | mg/kg | 0.0368 | U | 0.035 | U | 0.0373 | U | 0.0385 | U | 0.0366 | U | 0.0412 | U |
| Aroclor 1232 | 1 | 1 | 0.1 | 3.2 | mg/kg | 0.0368 | U | 0.035 | U | 0.0373 | U | 0.0385 | U | 0.0366 | U | 0.0412 | U |
| Aroclor 1242 | 1 | 1 | 0.1 | 3.2 | mg/kg | 0.0368 | U | 0.035 | U | 0.0373 | U | 0.0385 | U | 0.0366 | U | 0.0412 | U |
| Aroclor 1248 | 1 | 1 | 0.1 | 3.2 | mg/kg | 0.0368 | U | 0.035 | U | 0.0373 | U | 0.0385 | U | 0.0366 | U | 0.0412 | U |
| Aroclor 1254 | 1 | 1 | 0.1 | 3.2 | mg/kg | 0.0368 | U | 0.035 | U | 0.0773 | | 0.0588 | | 0.0366 | U | 0.0412 | U |
| Aroclor 1260 | 1 | 1 | 0.1 | 3.2 | mg/kg | 0.0368 | U | 0.035 | U | 0.0373 | U | 0.0385 | U | 0.0366 | U | 0.0412 | U |
| Aroclor 1262 | 1 | 1 | 0.1 | 3.2 | mg/kg | 0.0368 | U | 0.035 | U | 0.0373 | U | 0.0385 | U | 0.0366 | U | 0.0412 | U |
| Aroclor 1268 | 1 | 1 | 0.1 | 3.2 | mg/kg | 0.0368 | U | 0.035 | U | 0.0373 | U | 0.0385 | U | 0.0366 | U | 0.0412 | U |
| PCBs, Total | 1 | 1 | 0.1 | 3.2 | mg/kg | 0.0368 | U | 0.035 | U | 0.0773 | | 0.0588 | | 0.0366 | U | 0.0412 | U |

Notes:

NY-RESC: New York NYCRR Part 375 Commercial Criteria

NY-RESRR: New York NYCRR Part 375 Restricted-Residential Criteria

NY-UNRES: New York NYCRR Part 375 New York Unrestricted use Criteria

NY-RESGW: New York NYCRR Part 375 Groundwater Criteria

U - Not detected at the reported detection limit for the sample.

J - Estimated result

E - Concentration of analyte exceeds range of the calibration curve and/or linear range of the instrument.

**Table 2b. Polyclorinated Biphenyls Analytical Results in Soil**
8 Walworth Street, Brooklyn, NY
BCP Site C224239

| LOCATION | | | | | | B04 (30-35') | | B04 (40-45') | | B05 (30-35) | | B05 (40-45) | | DUP-061620 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | | | | 6/22/2020 | | 6/22/2020 | | 6/15/2020 | | 6/15/2020 | | 6/16/2020 | |
| LAB SAMPLE ID | | | | | | L2026129-03 | | L2026129-04 | | L2024999-02 | | L2024999-03 | | L2025143-06 | |
| | NY-RESC | NY-RESRR | NY-UNRES | NY-RESGW | Units | Results | Qual | Results | Qual | Results | Qual | Results | Qual | Results | Qual |
| **Polychlorinated Biphenyls by GC** | | | | | | | | | | | | | | | |
| Aroclor 1016 | 1 | 1 | 0.1 | 3.2 | mg/kg | 0.035 | U | 0.0352 | U | 0.0382 | U | 0.0372 | U | 0.0349 | U |
| Aroclor 1221 | 1 | 1 | 0.1 | 3.2 | mg/kg | 0.035 | U | 0.0352 | U | 0.0382 | U | 0.0372 | U | 0.0349 | U |
| Aroclor 1232 | 1 | 1 | 0.1 | 3.2 | mg/kg | 0.035 | U | 0.0352 | U | 0.0382 | U | 0.0372 | U | 0.0349 | U |
| Aroclor 1242 | 1 | 1 | 0.1 | 3.2 | mg/kg | 0.035 | U | 0.0352 | U | 0.0382 | U | 0.0372 | U | 0.0349 | U |
| Aroclor 1248 | 1 | 1 | 0.1 | 3.2 | mg/kg | 0.035 | U | 0.0352 | U | 0.0382 | U | 0.0372 | U | 0.0349 | U |
| Aroclor 1254 | 1 | 1 | 0.1 | 3.2 | mg/kg | 0.035 | U | 0.0352 | U | 0.0382 | U | 0.0372 | U | 0.0349 | U |
| Aroclor 1260 | 1 | 1 | 0.1 | 3.2 | mg/kg | 0.035 | U | 0.0352 | U | 0.0382 | U | 0.0372 | U | 0.0349 | U |
| Aroclor 1262 | 1 | 1 | 0.1 | 3.2 | mg/kg | 0.035 | U | 0.0352 | U | 0.0382 | U | 0.0372 | U | 0.0349 | U |
| Aroclor 1268 | 1 | 1 | 0.1 | 3.2 | mg/kg | 0.035 | U | 0.0352 | U | 0.0382 | U | 0.0372 | U | 0.0349 | U |
| PCBs, Total | 1 | 1 | 0.1 | 3.2 | mg/kg | 0.035 | U | 0.0352 | U | 0.0382 | U | 0.0372 | U | 0.0349 | U |

Notes:

NY-RESC: New York NYCRR Part 375 Commercial Criteria

NY-RESRR: New York NYCRR Part 375 Restricted-Residential Criteria

NY-UNRES: New York NYCRR Part 375 New York Unrestricted use Criteria

NY-RESGW: New York NYCRR Part 375 Groundwater Criteria

U - Not detected at the reported detection limit for the sample.

J - Estimated result

E - Concentration of analyte exceeds range of the calibration curve and/or linear range of the instrument.

**Table 2c. Metals Analytical Results in Soil**
8 Walworth Street, Brooklyn, NY
BCP Site C224239

| LOCATION | | | | | | B01 (30-35') | | B01 (40-45') | | B02 (30-35') | | B02 (40-45') | | B03 (30-35') | | B03 (40-45') | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | | | | 6/16/2020 | | 6/16/2020 | | 6/16/2020 | | 6/16/2020 | | 6/22/2020 | | 6/22/2020 | |
| LAB SAMPLE ID | | | | | | L2025143-04 | | L2025143-05 | | L2025143-01 | | L2025143-02 | | L2026129-01 | | L2026129-02 | |
| | NY-RESC | NY-RESRR | NY-UNRES | NY-RESGW | Units | Results | Qual | Results | Qual | Results | Qual | Results | Qual | Results | Qual | Results | Qual |
| **General Chemistry** | | | | | | | | | | | | | | | | | |
| Chromium, Trivalent | 1500 | 180 | 30 | | mg/kg | 17 | | 10 | J | 9.2 | J | 17 | J | 13 | J | 37 | |
| **Total Metals** | | | | | | | | | | | | | | | | | |
| Aluminum, Total | | | | | mg/kg | 4950 | | 3240 | | 2990 | | 3250 | | 2620 | | 6390 | |
| Antimony, Total | | | | | mg/kg | 4.43 | U | 4.42 | U | 4.45 | U | 4.58 | U | 4.56 | U | 4.89 | U |
| Arsenic, Total | 16 | 16 | 13 | 16 | mg/kg | 1.57 | | 1.84 | | 1.24 | | 1.29 | | 0.301 | J | 1.47 | |
| Barium, Total | 400 | 400 | 350 | 820 | mg/kg | 25.7 | | 16.3 | | 16.5 | | 19.6 | | 14.5 | | 29.2 | |
| Beryllium, Total | 590 | 72 | 7.2 | 47 | mg/kg | 0.363 | J | 0.194 | J | 0.16 | J | 0.302 | J | 0.246 | J | 0.362 | J |
| Cadmium, Total | 9.3 | 4.3 | 2.5 | 7.5 | mg/kg | 0.886 | U | 0.884 | U | 0.891 | U | 0.916 | U | 0.912 | U | 0.978 | U |
| Calcium, Total | | | | | mg/kg | 1650 | | 1970 | | 1690 | | 1520 | | 2020 | | 3110 | |
| Chromium, Total | | | | | mg/kg | 17 | | 10.9 | | 9.46 | | 17.5 | | 12.9 | | 36.6 | |
| Cobalt, Total | | | | | mg/kg | 9.74 | | 5.34 | | 4.7 | | 6.22 | | 5.07 | | 8.58 | |
| Copper, Total | 270 | 270 | 50 | 1720 | mg/kg | 23.2 | | 16.9 | | 13.3 | | 15.5 | | 12.6 | | 30.7 | |
| Iron, Total | | | | | mg/kg | 15100 | | 11400 | | 8580 | | 14700 | | 8190 | | 23400 | |
| Lead, Total | 1000 | 400 | 63 | 450 | mg/kg | 8.98 | | 8.8 | | 5.77 | | 14.5 | | 6.54 | | 11.4 | |
| Magnesium, Total | | | | | mg/kg | 10800 | | 3320 | | 3530 | | 4120 | | 4130 | | 7950 | |
| Manganese, Total | 10000 | 2000 | 1600 | 2000 | mg/kg | 168 | | 151 | | 102 | | 196 | | 132 | | 258 | |
| Mercury, Total | 2.8 | 0.81 | 0.18 | 0.73 | mg/kg | 0.073 | U | 0.078 | U | 0.081 | U | 0.078 | U | 0.078 | U | 0.085 | U |
| Nickel, Total | 310 | 310 | 30 | 130 | mg/kg | 72.8 | | 16.4 | | 21.1 | | 29.6 | | 27.7 | | 41.9 | |
| Potassium, Total | | | | | mg/kg | 1510 | | 829 | | 862 | | 777 | | 681 | | 1290 | |
| Selenium, Total | 1500 | 180 | 3.9 | 4 | mg/kg | 1.77 | U | 1.77 | U | 1.78 | U | 1.83 | U | 1.82 | U | 1.96 | U |
| Silver, Total | 1500 | 180 | 2 | 8.3 | mg/kg | 0.886 | U | 0.884 | U | 0.891 | U | 0.916 | U | 0.912 | U | 0.978 | U |
| Sodium, Total | | | | | mg/kg | 576 | | 131 | J | 122 | J | 137 | J | 84.6 | J | 356 | |
| Thallium, Total | | | | | mg/kg | 1.77 | U | 1.77 | U | 1.78 | U | 1.83 | U | 1.82 | U | 1.96 | U |
| Vanadium, Total | | | | | mg/kg | 26.8 | | 19.1 | | 16.5 | | 20.6 | | 9.73 | | 33.2 | |
| Zinc, Total | 10000 | 10000 | 109 | 2480 | mg/kg | 42.6 | | 27.8 | | 26.6 | | 50 | | 32.6 | | 66.1 | |

Notes:

NY-RESC: New York NYCRR Part 375 Commercial Criteria

NY-RESRR: New York NYCRR Part 375 Restricted-Residential Criteria

NY-UNRES: New York NYCRR Part 375 New York Unrestricted use Criteria

NY-RESGW: New York NYCRR Part 375 Groundwater Criteria

U - Not detected at the reported detection limit for the sample.

J - Estimated result

E - Concentration of analyte exceeds range of the calibration curve and/or linear range of the instrument.

**Table 2c. Metals Analytical Results in Soil**
8 Walworth Street, Brooklyn, NY
BCP Site C224239

| LOCATION | | | | | | B04 (30-35') | | B04 (40-45') | | B05 (30-35) | | B05 (40-45) | | DUP-061620 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | | | | 6/22/2020 | | 6/22/2020 | | 6/15/2020 | | 6/15/2020 | | 6/16/2020 | |
| LAB SAMPLE ID | | | | | | L2026129-03 | | L2026129-04 | | L2024999-02 | | L2024999-03 | | L2025143-06 | |
| | NY-RESC | NY-RESRR | NY-UNRES | NY-RESGW | Units | Results | Qual | Results | Qual | Results | Qual | Results | Qual | Results | Qual |
| **General Chemistry** | | | | | | | | | | | | | | | |
| Chromium, Trivalent | 1500 | 180 | 30 | | mg/kg | 9.7 | | 8.1 | | 7.9 | | 12 | J | 5.6 | |
| **Total Metals** | | | | | | | | | | | | | | | |
| Aluminum, Total | | | | | mg/kg | 3760 | | 3120 | | 3180 | | 3100 | | 2230 | |
| Antimony, Total | | | | | mg/kg | 4.29 | U | 4.25 | U | 4.56 | U | 0.546 | J | 4.32 | U |
| Arsenic, Total | 16 | 16 | 13 | 16 | mg/kg | 1.02 | | 0.604 | J | 0.802 | J | 1.04 | | 0.752 | J |
| Barium, Total | 400 | 400 | 350 | 820 | mg/kg | 22.3 | | 15.4 | | 16.1 | | 16.9 | | 10.3 | |
| Beryllium, Total | 590 | 72 | 7.2 | 47 | mg/kg | 0.231 | J | 0.187 | J | 0.21 | J | 0.349 | J | 0.156 | J |
| Cadmium, Total | 9.3 | 4.3 | 2.5 | 7.5 | mg/kg | 0.857 | U | 0.851 | U | 0.912 | U | 0.895 | U | 0.864 | U |
| Calcium, Total | | | | | mg/kg | 1690 | | 2300 | | 1320 | | 2940 | | 1080 | |
| Chromium, Total | | | | | mg/kg | 9.7 | | 8.14 | | 7.94 | | 12.3 | | 5.57 | |
| Cobalt, Total | | | | | mg/kg | 5.89 | | 4.61 | | 5.87 | | 5.02 | | 4.9 | |
| Copper, Total | 270 | 270 | 50 | 1720 | mg/kg | 41.3 | | 15.8 | | 20.5 | | 22 | | 12.1 | |
| Iron, Total | | | | | mg/kg | 9950 | | 9320 | | 8740 | | 11200 | | 6170 | |
| Lead, Total | 1000 | 400 | 63 | 450 | mg/kg | 8.8 | | 7.68 | | 7.54 | | 12.7 | | 4.17 | J |
| Magnesium, Total | | | | | mg/kg | 5130 | | 3720 | | 4990 | | 2930 | | 4830 | |
| Manganese, Total | 10000 | 2000 | 1600 | 2000 | mg/kg | 110 | | 576 | | 114 | | 185 | | 74.7 | |
| Mercury, Total | 2.8 | 0.81 | 0.18 | 0.73 | mg/kg | 0.069 | U | 0.069 | U | 0.083 | U | 0.079 | U | 0.07 | U |
| Nickel, Total | 310 | 310 | 30 | 130 | mg/kg | 26.9 | | 17 | | 38.8 | | 18.6 | | 37.2 | |
| Potassium, Total | | | | | mg/kg | 1770 | | 915 | | 668 | | 935 | | 455 | |
| Selenium, Total | 1500 | 180 | 3.9 | 4 | mg/kg | 1.71 | U | 1.7 | U | 1.82 | U | 1.79 | U | 1.73 | U |
| Silver, Total | 1500 | 180 | 2 | 8.3 | mg/kg | 0.857 | U | 0.851 | U | 0.912 | U | 0.895 | U | 0.864 | U |
| Sodium, Total | | | | | mg/kg | 130 | J | 281 | | 137 | J | 108 | J | 85.2 | J |
| Thallium, Total | | | | | mg/kg | 1.71 | U | 1.7 | U | 1.82 | U | 1.79 | U | 1.73 | U |
| Vanadium, Total | | | | | mg/kg | 17.6 | | 13.6 | | 16.9 | | 22.5 | | 9.93 | |
| Zinc, Total | 10000 | 10000 | 109 | 2480 | mg/kg | 25.8 | | 25.3 | | 28.6 | | 38 | | 19.4 | |

Notes:

NY-RESC: New York NYCRR Part 375 Commercial Criteria

NY-RESRR: New York NYCRR Part 375 Restricted-Residential Criteria

NY-UNRES: New York NYCRR Part 375 New York Unrestricted use Criteria

NY-RESGW: New York NYCRR Part 375 Groundwater Criteria

U - Not detected at the reported detection limit for the sample.

J - Estimated result

E - Concentration of analyte exceeds range of the calibration curve and/or linear range of the instrument.

**Table 2d. Emerging Contaminants Analytical Results in Soil**
8 Walworth Street, Brooklyn, NY
BCP Site C224239

| LOCATION | | | | | | B01 (10-12') | | B01 (30-35') | | B01 (40-45') | | B02 (30-35') | | B02 (40-45') | | B03 (30-35') | | B03 (40-45') | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | | | | 6/16/2020 | | 6/16/2020 | | 6/16/2020 | | 6/16/2020 | | 6/16/2020 | | 6/22/2020 | | 6/22/2020 | |
| LAB SAMPLE ID | | | | | | L2025143-03 | | L2025143-04 | | L2025143-05 | | L2025143-01 | | L2025143-02 | | L2026129-01 | | L2026129-02 | |
| | NY-RESC | NY-RESRR | NY-UNRES | NY-RESGW | Units | Results | Qual | Results | Qual | Results | Qual | Results | Qual | Results | Qual | Results | Qual | Results | Qual |
| **General Chemistry** | | | | | | | | | | | | | | | | | | | |
| Solids, Total | | | | | % | 92.9 | | 87.7 | | 90.2 | | 86.9 | | 85 | | 87.4 | | 78.8 | |
| Chromium, Hexavalent | 400 | 110 | 1 | 19 | mg/kg | - | - | 0.912 | U | 0.322 | J | 0.219 | J | 0.412 | J | 0.229 | J | 1.02 | U |
| **Perfluorinated Alkyl Acids by Isotope Dilution** | | | | | | | | | | | | | | | | | | | |
| Perfluorobutanoic Acid (PFBA) | | | | | mg/kg | 0.000524 | U | - | - | - | - | - | - | - | - | - | - | - | - |
| Perfluoropentanoic Acid (PFPeA) | | | | | mg/kg | 0.000524 | U | - | - | - | - | - | - | - | - | - | - | - | - |
| Perfluorobutanesulfonic Acid (PFBS) | | | | | mg/kg | 0.000524 | U | - | - | - | - | - | - | - | - | - | - | - | - |
| Perfluorohexanoic Acid (PFHxA) | | | | | mg/kg | 0.000524 | U | - | - | - | - | - | - | - | - | - | - | - | - |
| Perfluoroheptanoic Acid (PFHpA) | | | | | mg/kg | 0.000524 | U | - | - | - | - | - | - | - | - | - | - | - | - |
| Perfluorohexanesulfonic Acid (PFHxS) | | | | | mg/kg | 0.000524 | U | - | - | - | - | - | - | - | - | - | - | - | - |
| Perfluorooctanoic Acid (PFOA) | | | | | mg/kg | 0.000524 | U | - | - | - | - | - | - | - | - | - | - | - | - |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS) | | | | | mg/kg | 0.000524 | U | - | - | - | - | - | - | - | - | - | - | - | - |
| Perfluoroheptanesulfonic Acid (PFHpS) | | | | | mg/kg | 0.000524 | U | - | - | - | - | - | - | - | - | - | - | - | - |
| Perfluorononanoic Acid (PFNA) | | | | | mg/kg | 0.000524 | U | - | - | - | - | - | - | - | - | - | - | - | - |
| Perfluorooctanesulfonic Acid (PFOS) | | | | | mg/kg | 0.00419 | | - | - | - | - | - | - | - | - | - | - | - | - |
| Perfluorodecanoic Acid (PFDA) | | | | | mg/kg | 0.000524 | U | - | - | - | - | - | - | - | - | - | - | - | - |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS) | | | | | mg/kg | 0.000524 | U | - | - | - | - | - | - | - | - | - | - | - | - |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA) | | | | | mg/kg | 0.000524 | U | - | - | - | - | - | - | - | - | - | - | - | - |
| Perfluoroundecanoic Acid (PFUnA) | | | | | mg/kg | 0.000524 | U | - | - | - | - | - | - | - | - | - | - | - | - |
| Perfluorodecanesulfonic Acid (PFDS) | | | | | mg/kg | 0.000524 | U | - | - | - | - | - | - | - | - | - | - | - | - |
| Perfluorooctanesulfonamide (FOSA) | | | | | mg/kg | 0.000524 | U | - | - | - | - | - | - | - | - | - | - | - | - |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA) | | | | | mg/kg | 0.00351 | | - | - | - | - | - | - | - | - | - | - | - | - |
| Perfluorododecanoic Acid (PFDoA) | | | | | mg/kg | 0.000524 | U | - | - | - | - | - | - | - | - | - | - | - | - |
| Perfluorotridecanoic Acid (PFTrDA) | | | | | mg/kg | 0.000524 | U | - | - | - | - | - | - | - | - | - | - | - | - |
| Perfluorotetradecanoic Acid (PFTA) | | | | | mg/kg | 0.000524 | U | - | - | - | - | - | - | - | - | - | - | - | - |
| PFOA/PFOS, Total | | | | | mg/kg | 0.00419 | | - | - | - | - | - | - | - | - | - | - | - | - |
| **Semivolatile Organics by GC/MS** | | | | | | | | - | - | - | - | - | - | - | - | - | - | - | - |
| 1,4-Dioxane | 130 | 13 | 0.1 | 0.1 | mg/kg | 0.027 | U | - | - | - | - | - | - | - | - | - | - | - | - |

Notes:

NY-RESC: New York NYCRR Part 375 Commercial Criteria

NY-RESRR: New York NYCRR Part 375 Restricted-Residential Criteria

NY-UNRES: New York NYCRR Part 375 New York Unrestricted use Criteria

NY-RESGW: New York NYCRR Part 375 Groundwater Criteria

U - Not detected at the reported detection limit for the sample.

J - Estimated result

E - Concentration of analyte exceeds range of the calibration curve and/or linear range of the instrument.

**Table 2d. Emerging Contaminants Analytical Results in Soil**
8 Walworth Street, Brooklyn, NY
BCP Site C224239

| LOCATION | | | | | | B04 (30-35') | | B04 (40-45') | | B05 (10-12) | | B05 (30-35) | | B05 (40-45) | | DUP-061620 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DATE | | | | | | 6/22/2020 | | 6/22/2020 | | 6/15/2020 | | 6/15/2020 | | 6/15/2020 | | 6/16/2020 | |
| LAB SAMPLE ID | | | | | | L2026129-03 | | L2026129-04 | | L2024999-01 | | L2024999-02 | | L2024999-03 | | L2025143-06 | |
| | NY-RESC | NY-RESRR | NY-UNRES | NY-RESGW | Units | Results | Qual | Results | Qual | Results | Qual | Results | Qual | Results | Qual | Results | Qual |
| **General Chemistr** | | | | | | | | | | | | | | | | | |
| Solids, Total | | | | | % | 92.8 | | 91.6 | | 90.2 | | 82.7 | | 89.2 | | 91.5 | |
| Chromium, Hexavalent | 400 | 110 | 1 | 19 | mg/kg | 0.862 | U | 0.873 | U | - | - | 0.967 | U | 0.269 | J | 0.874 | U |
| **Perfluorinated Alkyl Acids by Isotope Diluti** | | | | | | | | | | | | | | | | | |
| Perfluorobutanoic Acid (PFBA) | | | | | mg/kg | - | - | - | - | 0.000059 | J | - | - | - | - | - | - |
| Perfluoropentanoic Acid (PFPeA) | | | | | mg/kg | - | - | - | - | 0.000076 | J | - | - | - | - | - | - |
| Perfluorobutanesulfonic Acid (PFBS) | | | | | mg/kg | - | - | - | - | 0.00052 | U | - | - | - | - | - | - |
| Perfluorohexanoic Acid (PFHxA) | | | | | mg/kg | - | - | - | - | 0.000165 | J | - | - | - | - | - | - |
| Perfluoroheptanoic Acid (PFHpA) | | | | | mg/kg | - | - | - | - | 0.000214 | J | - | - | - | - | - | - |
| Perfluorohexanesulfonic Acid (PFHxS) | | | | | mg/kg | - | - | - | - | 0.00052 | U | - | - | - | - | - | - |
| Perfluorooctanoic Acid (PFOA) | | | | | mg/kg | - | - | - | - | 0.000915 | | - | - | - | - | - | - |
| 1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS) | | | | | mg/kg | - | - | - | - | 0.00052 | U | - | - | - | - | - | - |
| Perfluoroheptanesulfonic Acid (PFHpS) | | | | | mg/kg | - | - | - | - | 0.00052 | U | - | - | - | - | - | - |
| Perfluorononanoic Acid (PFNA) | | | | | mg/kg | - | - | - | - | 0.00052 | U | - | - | - | - | - | - |
| Perfluorooctanesulfonic Acid (PFOS) | | | | | mg/kg | - | - | - | - | 0.0268 | | - | - | - | - | - | - |
| Perfluorodecanoic Acid (PFDA) | | | | | mg/kg | - | - | - | - | 0.00052 | U | - | - | - | - | - | - |
| 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS) | | | | | mg/kg | - | - | - | - | 0.00052 | U | - | - | - | - | - | - |
| N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA) | | | | | mg/kg | - | - | - | - | 0.00052 | U | - | - | - | - | - | - |
| Perfluoroundecanoic Acid (PFUnA) | | | | | mg/kg | - | - | - | - | 0.00052 | U | - | - | - | - | - | - |
| Perfluorodecanesulfonic Acid (PFDS) | | | | | mg/kg | - | - | - | - | 0.00052 | U | - | - | - | - | - | - |
| Perfluorooctanesulfonamide (FOSA) | | | | | mg/kg | - | - | - | - | 0.00216 | | - | - | - | - | - | - |
| N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA) | | | | | mg/kg | - | - | - | - | 0.00052 | U | - | - | - | - | - | - |
| Perfluorododecanoic Acid (PFDoA) | | | | | mg/kg | - | - | - | - | 0.00052 | U | - | - | - | - | - | - |
| Perfluorotridecanoic Acid (PFTrDA) | | | | | mg/kg | - | - | - | - | 0.00052 | U | - | - | - | - | - | - |
| Perfluorotetradecanoic Acid (PFTA) | | | | | mg/kg | - | - | - | - | 0.00052 | U | - | - | - | - | - | - |
| PFOA/PFOS, Total | | | | | mg/kg | - | - | - | - | 0.0277 | | - | - | - | - | - | - |
| **Semivolatile Organics by GC/M** | | | | | | - | - | - | - | | | - | - | - | - | - | - |
| 1,4-Dioxane | 130 | 13 | 0.1 | 0.1 | mg/kg | - | - | - | - | 0.14 | | - | - | - | - | - | - |

Notes:

NY-RESC: New York NYCRR Part 375 Commercial Criteria

NY-RESRR: New York NYCRR Part 375 Restricted-Residential Criteria

NY-UNRES: New York NYCRR Part 375 New York Unrestricted use Criteria

NY-RESGW: New York NYCRR Part 375 Groundwater Criteria

U - Not detected at the reported detection limit for the sample.

J - Estimated result

E - Concentration of analyte exceeds range of the calibration curve and/or linear range of the instrument.

**Table 3. Soil Sample Location Summary**
8 Walworth Street, Brooklyn, NY
BCP Site C224239

| Sample Location | Latitude | Longitude | Soil Sample Depth | Sample ID | Target Compound List VOCs | Total Analyte List Metals | Cyanide, Hexavalent Chromium, Trivalent Chromium | PCBs | PFAS | 1,4-Dioxane |
|---|---|---|---|---|---|---|---|---|---|---|
| B01 | 40.6986389 | -73.9552908 | 10-12' | B01 (10-12') | | | | | X | X |
| | | | 30-35' | B01 (30-35') | X | X | X | X | | |
| | | | 40-45' | B01 (40-45') | X | X | X | X | | |
| B02 | 40.6987307 | -73.9553214 | 30-35' | B02 (30-35') | X | X | X | X | | |
| | | | 40-45' | B02 (40-45') | X | X | X | X | | |
| B03 | 40.6988019 | -73.9553353 | 30-35' | B03 (30-35') | X | X | X | X | | |
| | | | 40-45' | B03 (40-45') | X | X | X | X | | |
| B04 | 40.6987495 | -73.9552848 | 30-35' | B04 (30-35') | X | X | X | X | | |
| | | | 40-45' | B04 (40-45') | X | X | X | X | | |
| B05 | 40.6987897 | -73.9552914 | 10-12' | B05 (10-12') | | | | | X | X |
| | | | 30-35' | B05 (30-35') | X | X | X | X | | |
| | | | 40-45' | B05 (40-45') | X | X | X | X | | |

**Notes:**
VOCs - Volatile Organic Compounds
PCBs - Polychlorinated biphenyls
PFAS - Per- and Polyfluoroalkyl Substances

**Table 4. Synoptic Monitoring Well Gauging Results**

8 Walworth Street, Brooklyn, NY

BCP Site C224239

| MONITORING WELL ID | TIME | DEPTH TO WATER (FT BELOW TOC) | TOP OF CASING (FT) | GROUNDWATER ELEVATION (FT) |
|---|---|---|---|---|
| MW-01(S) | 1431 | 14.89 | 13.95 | -0.94 |
| MW-01(I) | 1430 | 14.71 | 13.99 | -0.72 |
| MW-02(S) | 1415 | 14.88 | 14.07 | -0.81 |
| MW-02(I) | 1413 | 14.90 | 14.05 | -0.85 |
| MW-02(D) | 1417 | 14.85 | 14.04 | -0.81 |
| MW-03(S) | 1428 | 14.72 | 13.97 | -0.75 |
| MW-03(I) | 1425 | 14.91 | 14.05 | -0.86 |
| MW-03(D) | 1426 | 14.72 | 14.04 | -0.68 |
| MW-04(S) | 1420 | 14.94 | 14.07 | -0.87 |
| MW-04(I) | 1418 | 14.94 | 14.08 | -0.86 |
| MW-04(D) | 1421 | 14.90 | 14.05 | -0.85 |
| MW-05(S) | 1423 | 14.89 | 14.06 | -0.83 |
| MW-05(I) | 1423 | 14.69 | 14.04 | -0.65 |
| MW-05(D) | 1422 | 14.92 | 14.07 | -0.85 |

**Notes:**

1. Monitoring wells were surveyed by NY Land Surveyors on 23 July 2020.
2. Elevation refers to the North American Vertical Datum of 1988 (NAVD88).
3. All dimensions are in US survey feet.
4. All wells gauged on 23 July 2020 by Zach Simmel and Sarah Commisso

**Table 5. Monitoring Well Installation and Construction Details**

8 Walworth Street, Brooklyn, NY

BCP Site C224239

| MONITORING WELL ID | WELL INSTALLATION METHOD | TERMINAL DEPTH (FT BGS) | SCREEN INTERVAL (FT BGS) | #00 MOIRE INTERVAL (FT BGS) | BENTONITE SEAL INTERVAL (FT BGS) | DIAMETER (INCHES) | ANNULAR SPACE (INCHES) |
|---|---|---|---|---|---|---|---|
| MW-01(S) | HSA/Mud Rotary | 20 | 12-20 | 10-20 | 0.5-10 | 2 | 2 |
| MW-01(I) | Direct Push | 31 | 26-31 | 24-31 | 0.5-24 | 2 | 1.25 |
| MW-02(S) | HAS | 19 | 12-19 | 10-19 | 0.5-10 | 2 | 2 |
| MW-02(I) | Mud Rotary | 34 | 29-34 | 27-34 | 0.5-27 | 2 | 2 |
| MW-02(D) | Mud Rotary | 42 | 37-42 | 35-42 | 0.5-35 | 2 | 2 |
| MW-03(S) | HAS | 17 | 12-17 | 10-17 | 0.5-10 | 2 | 2 |
| MW-03(I) | Mud Rotary | 35 | 30-35 | 28-35 | 0.5-28 | 2 | 2 |
| MW-03(D) | Mud Rotary | 42 | 37-42 | 35-42 | 0.5-35 | 2 | 2 |
| MW-04(S) | HSA/Mud Rotary | 20 | 12-20 | 10-20 | 0.5-10 | 2 | 2 |
| MW-04(I) | Mud Rotary | 34 | 29-34 | 27-34 | 0.5-27 | 2 | 2 |
| MW-04(D) | Mud Rotary | 42 | 37-42 | 35-42 | 0.5-35 | 2 | 2 |
| MW-05(S) | HSA/Mud Rotary | 17 | 12-17 | 10-17 | 0.5-10 | 2 | 2 |
| MW-05(I) | Mud Rotary | 34 | 29-34 | 27-34 | 0.5-27 | 2 | 2 |
| MW-05(D) | Mud Rotary | 42 | 37-42 | 35-42 | 0.5-35 | 2 | 2 |

**Notes:**

HSA - Hollow stem auger

Drilling method of hollow stem auger/mud rotary indicates a switch to mud rotary was required when the hollow stem auger no longer advance the boring

Riser pipe consisted of Schedule 40 PVC

Screened intervals were installed with 0.010-inch machine slotted PVC

Grout was installed in the upper 6-8 inches below ground surface

Monitoring wells were protected with manhole covers

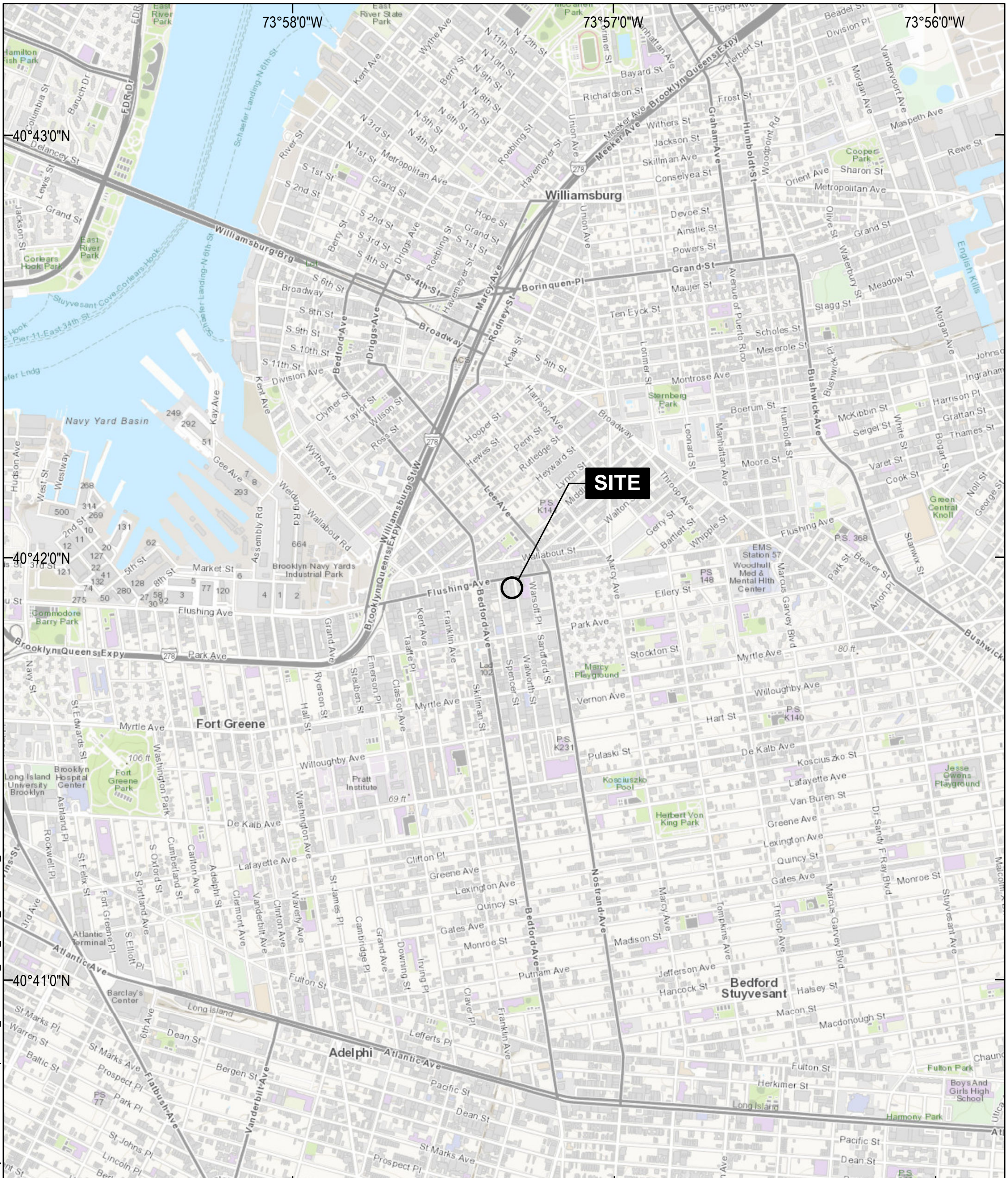
MW-01(I) was installed via direct push due to subsurface limitations

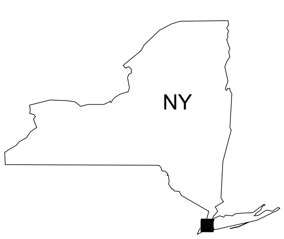
**Table 6. Deviation from Approved SRIWP Summary**
8 Walworth Street, Brooklyn, NY
BCP Site C224239

| DEVIATION ITEM | DEVIATION DESCRIPTION | NYSDEC APPROVAL/ CONFIRMATION DATE | COMMENTS |
|---|---|---|---|
| 1 | Drilling methodology altered to include mud rotary in addition to hollow stem auger | 16 June 2020 | Due to the tight subsurface formation, the hollow stem auger technology could not advance to the depth of the proposed intermediate and deep monitoring wells |
| 2 | Drilling methodology altered for installation of the intermediate and deep monitoring well in cluster MW01 to include installation of 3.25-inch casings via direct push | 8 July 2020 | Due to subsurface conditions and an anomaly at approximately 15-16 ft bgs, mud rotary technology could not advance to the depth of the proposed intermediate and deep monitoring wells. |
| 3 | Inability to install MW01-D to proposed depth of 50 ft bgs | 13 July 2020 | After multiple attempts to install MW01-D to proposed depth of 50 ft bgs, the drilling subcontractor noted damage to the drill rig and it was determined that depth could not be achieved using direct push with 3.25-inch casing due to cobbles and pebbles in the area. NYSDEC responded to the notification of the deviation stating, "the need for additional groundwater data at depth in the southern portion of the site will be examined through the analysis of groundwater data from all intervals throughout the site as well as an established groundwater contour." |

**Notes:**
NYSDEC - New York State Department of Environmental Conservation
Approval/confirmation dates are based upon email correspondence from NYSDEC case manager, Mr. Aaron Fischer
Investigation activites were completed between 15 June 2020 and 15 July 2020

**FIGURES**




MAP SOURCE: ESRI
SITE COORDINATES: 40°41'55"N,73°57'18"W

HALEY ALDRICH

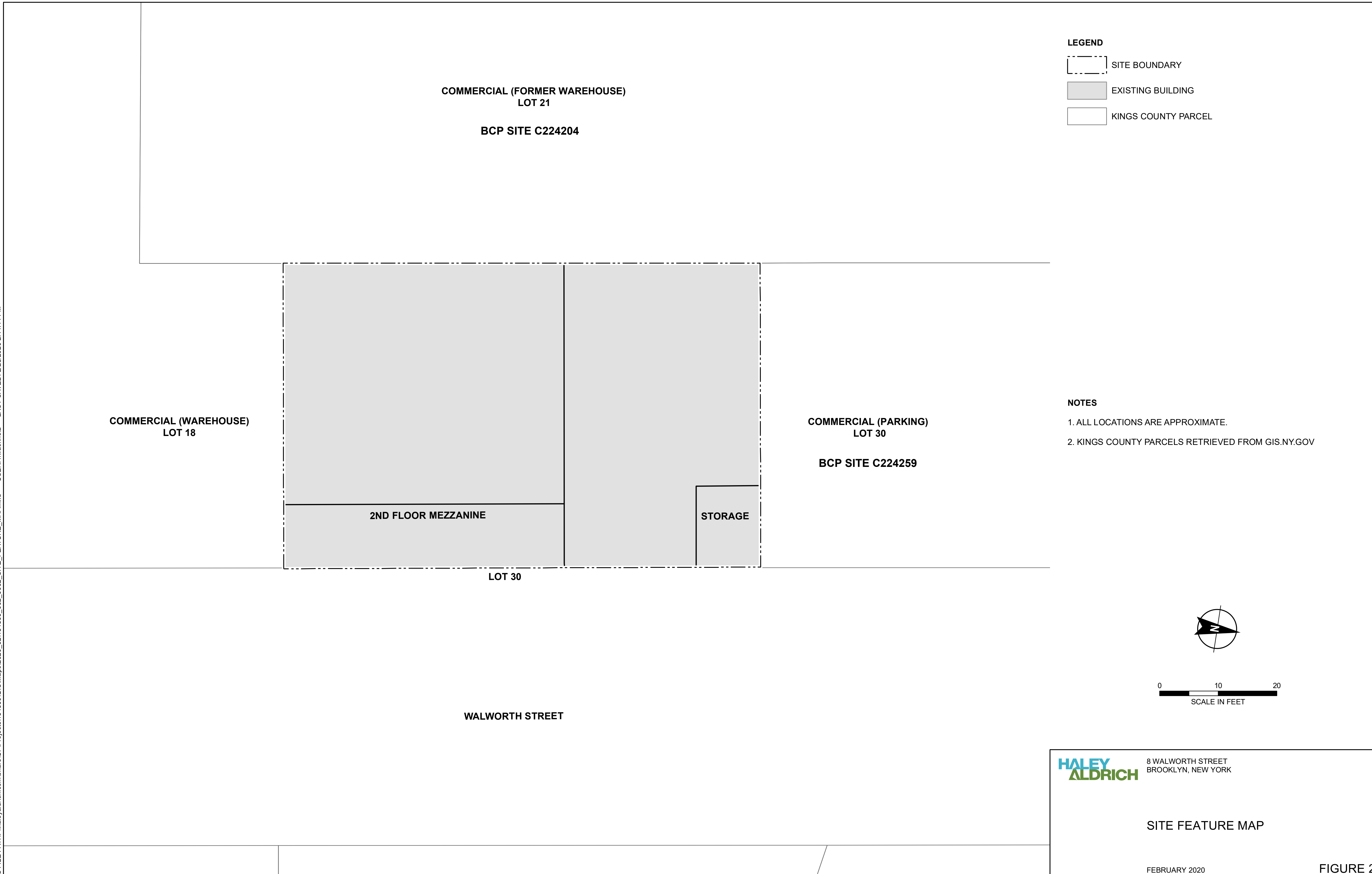
8 WALWORTH STREET
BROOKLYN, NEW YORK

PROJECT LOCUS

APPROXIMATE SCALE: 1 IN = 2000 FT
FEBRUARY 2020

FIGURE 1

GIS FILE PATH: \\haleyaldrich.com\share\CF\Projects\134860\GIS\Maps\2020_02\134860_002_0001_PROJECT_LOCUS.mxd — USER: hwachholz — LAST SAVED: 2/28/2020 4:33:58 PM

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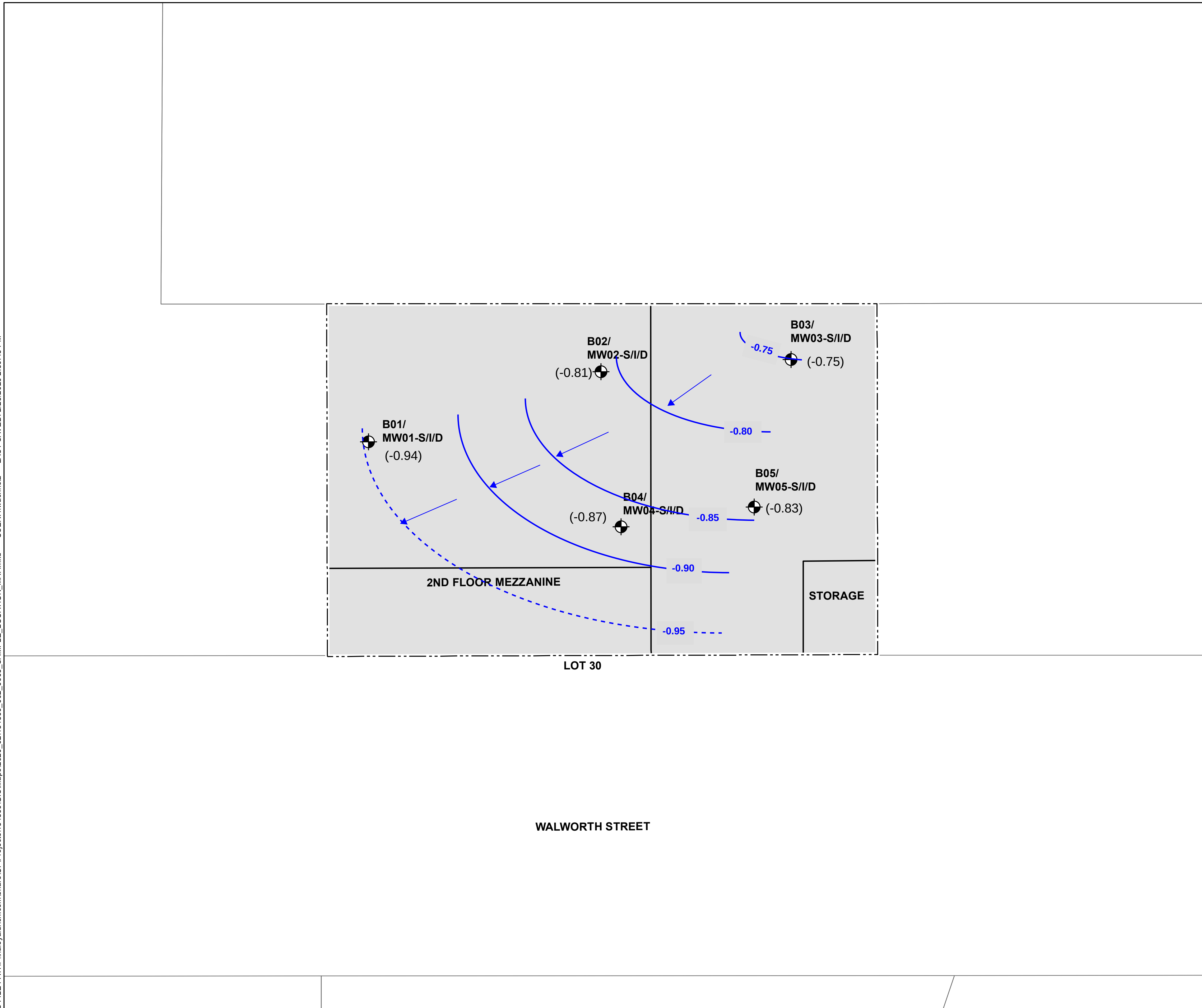



**LEGEND**

- SAMPLE LOCATION
- SITE BOUNDARY
- EXISTING BUILDING
- KINGS COUNTY PARCEL
- (-0.75) GROUNDWATER ELEVATION (NAVD 88)
- -0.75 GROUNDWATER CONTOUR
- -0.95 INFERRED GROUNDWATER CONTOUR
- GROUNDWATER FLOW DIRECTION

**NOTES**

1. ALL LOCATIONS ARE APPROXIMATE.
2. KINGS COUNTY PARCELS RETRIEVED FROM GIS.NY.GOV
3. GROUNDWATER ELEVATIONS CALCULATED FOR SHALLOW MONITORING WELLS GAUGED ON 23 JULY 2020

0 10 20
SCALE IN FEET

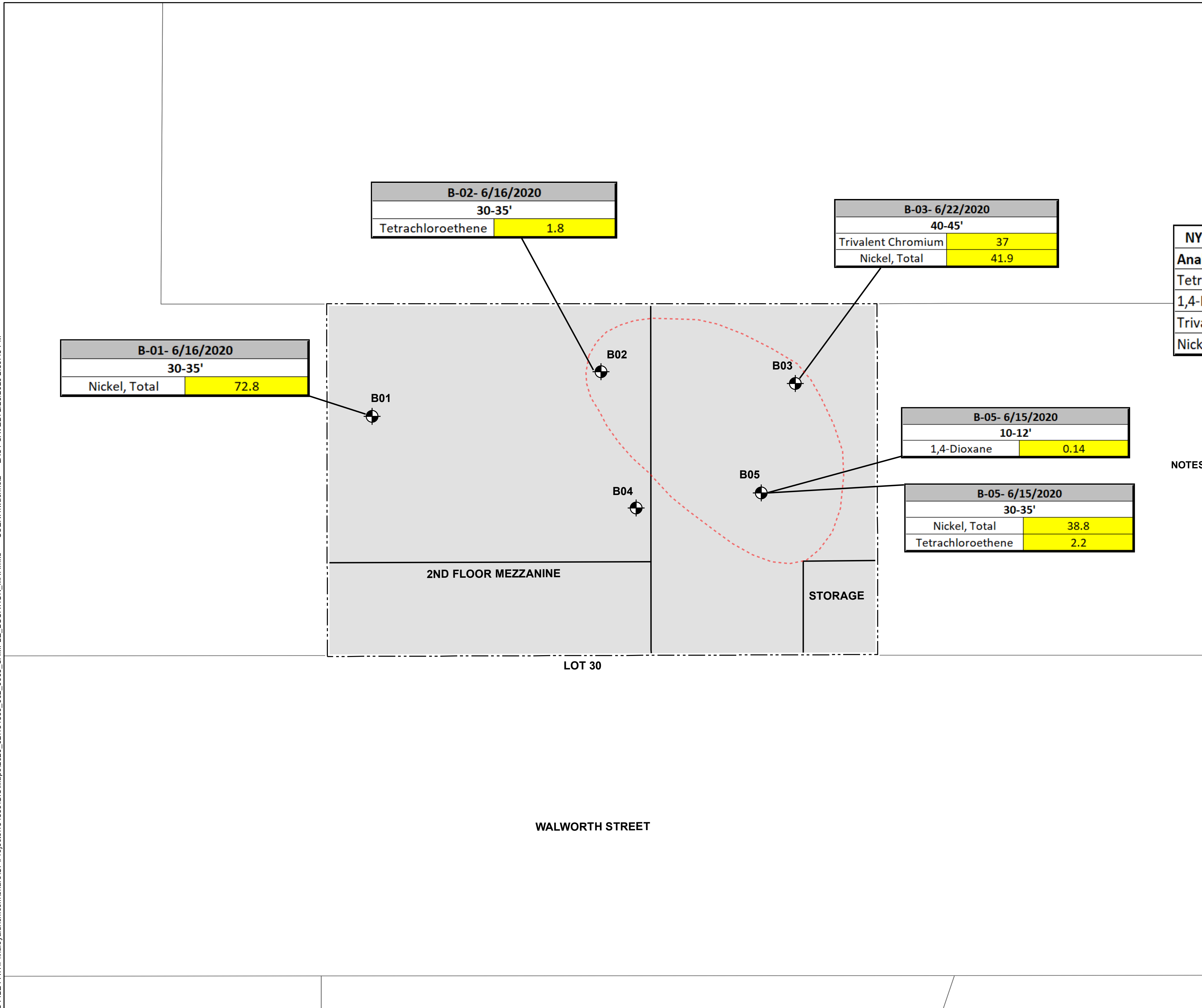
HALEY ALDRICH

8 WALWORTH STREET
BROOKLYN, NEW YORK

GROUNDWATER CONTOUR MAP

JULY 2020

FIGURE 3




**LEGEND**

SAMPLE LOCATION

SITE BOUNDARY

EXISTING BUILDING

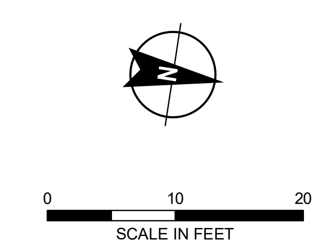
KINGS COUNTY PARCEL

INFERRED SOURCE AREA

| NYCRR Part 375 Unrestricted and Restricted Residential SCOs | | | |
|---|---|---|---|
| **Analyte** | **Units** | **NY-ResRestrict** | **NY-UnRestrict** |
| Tetrachloroethene | mg/Kg | 19 | 1.3 |
| 1,4-Dioxane | mg/Kg | 13 | 0.1 |
| Trivalent Chromium | mg/Kg | 180 | 30 |
| Nickel | mg/Kg | 310 | 30 |

**NOTES**

1. ALL LOCATIONS ARE APPROXIMATE.
2. KINGS COUNTY PARCELS RETRIEVED FROM GIS.NY.GOV




HALEY ALDRICH

8 WALWORTH STREET
BROOKLYN, NEW YORK

MAP OF SOIL
EXCEEDANCE RESULTS

AUGUST 2020

FIGURE 4

GIS FILE PATH: \\haleyaldrich.com\share\CF\Projects\134860\GIS\Maps\2020_02\134860_002_0003_SAMPLE_LOCATION_MAP.mxd — USER: hwacholz — LAST SAVED: 2/28/2020 2:50:43 PM

| MW-02 (S)- 7/1/2020 | |
|---|---|
| VOCs (µg/L) | |
| Tetrachloroethene | 58,000 |
| 1,1,1-Trichloroethane | 730 |
| Trichloroethene | 69,000 |
| 1,1,2,2-Tetrachloroethane | 730 |
| o-Xylene | 880 |
| cis,1,2-Dichloroethene | 5,000 |
| 1,2,4-Trimethlybenzene | 640 |
| PCBs (µg/L) | |
| Aroclor 1254 | 0.962 |

| MW-02 (I)- 7/1/2020 | |
|---|---|
| VOCs (µg/L) | |
| Tetrachloroethene | 2,300 |
| Trichloroethene | 130 |
| o-Xylene | 81 |
| PCBs (µg/L) | |
| Aroclor 1254 | 0.555 |

| MW-02 (D)- 7/13/2020 | |
|---|---|
| VOCs (µg/L) | |
| Tetrachloroethene | 1,400 |
| Trichloroethene | 52 |
| o-Xylene | 47 |
| PCBs (µg/L) | |
| Aroclor 1254 | 0.486 |

| MW-03 (S)- 7/15/2020 | |
|---|---|
| VOCs (µg/L) | |
| Tetrachloroethene | 7,200 |
| 1,1,1-Trichloroethane | 240 |
| 1,2-Dichlorobenzene | 710 |
| 1,4-Dichlorobenzene | 130 |
| 1,2,4,5-Tetramethylbenzene | 36 |
| Trichloroethene | 130 |
| Naphthalene | 320 |
| o-Xylene | 130 |
| cis-1,2-Dichloroethene | 590 |

| MW-03 (I)- 7/14/2020 | |
|---|---|
| VOCs (µg/L) | |
| Tetrachloroethene | 4,300 |
| 1,1,1-Trichloroethane | 230 |
| Trichloroethene | 100 |
| 1,1-Dichloroethene | 19 |
| cis-1,2-Dichloroethene | 34 |

| MW-03 (D)- 7/14/2020 | |
|---|---|
| VOCs (µg/L) | |
| Tetrachloroethene | 1,400 |
| 1,1,1-Trichloroethane | 84 |
| Trichloroethene | 39 |
| 1,1-Dichloroethene | 6 |
| cis-1,2-Dichloroethene | 10 |

LEGEND

SAMPLE LOCATION

SITE BOUNDARY

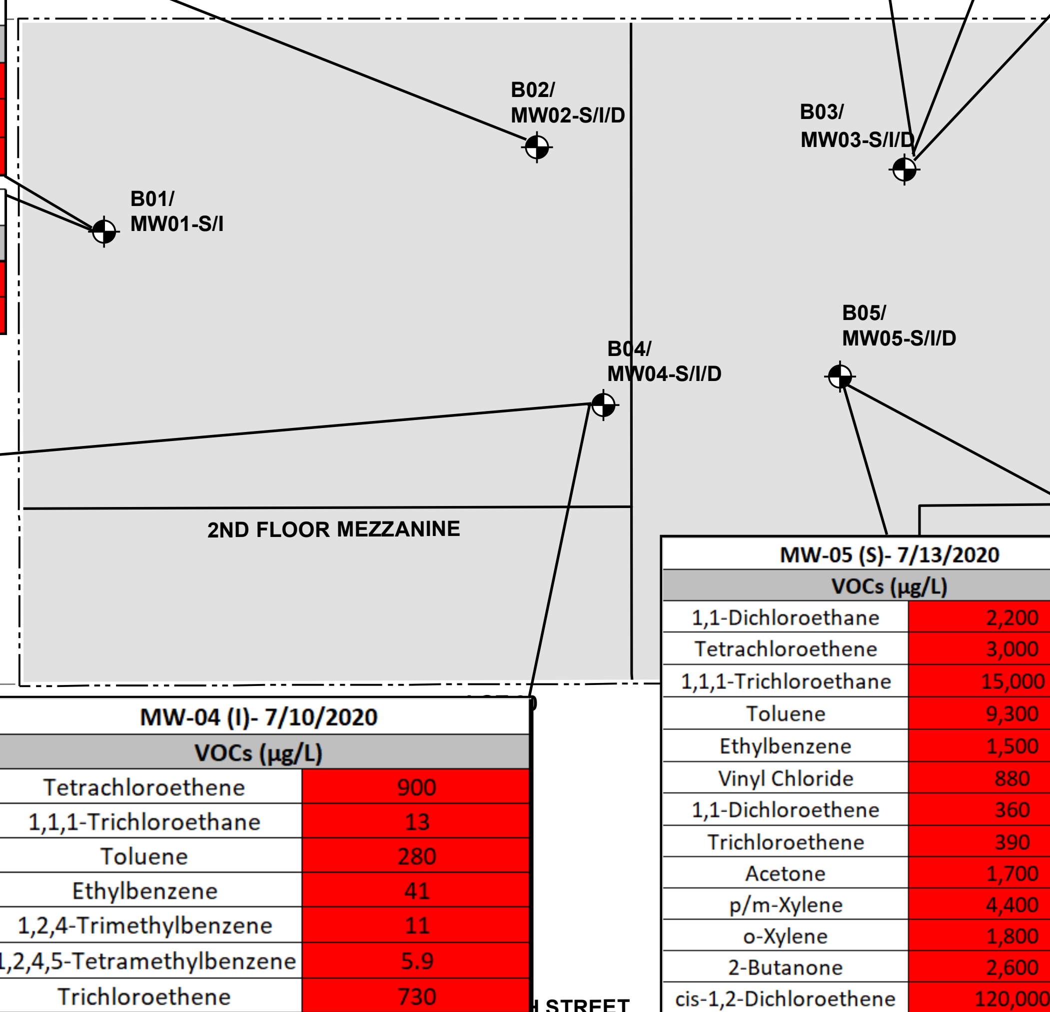
EXISTING BUILDING

KINGS COUNTY PARCEL

| New York TOGS 111 Ambient Water Quality Standards | | |
|---|---|---|
| Analyte | Units | NY-AWQS |
| 1,1-Dichloroethane | ug/L | 5 |
| Tetrachloroethene | ug/L | 5 |
| 1,1,1-Trichloroethane | ug/L | 5 |
| 1,2-Dichlorobenzene | ug/L | 3 |
| Trichloroethene | ug/L | 5 |
| Cis,1,2-Dichloroethene | ug/L | 5 |
| Vinyl Chloride | ug/L | 2 |
| 1,4-Dichlorobenzene | ug/L | 3 |
| Ethylbenzene | ug/L | 5 |
| p/m-Xylene | ug/L | 5 |
| o-Xylene | ug/L | 5 |
| 1,2,4-Trimethylbenzene | ug/L | 5 |
| 1,2,4,5-Tetramethylbenzene | ug/L | 5 |
| Acetone | ug/L | 50 |
| 2-Butanone | ug/L | 50 |
| Toluene | ug/L | 5 |
| Naphthalene | ug/L | 10 |
| 1,3,5-Trimethylbenzene | ug/L | 5 |

| MW-01 (S)- 7/2/2020 | |
|---|---|
| VOCs (µg/L) | |
| Tetrachloroethene | 1,500 |
| 1,1,1-Trichloroethane | 13 |
| Trichloroethene | 960 |

| MW-01 (I)- 7/15/2020 | |
|---|---|
| VOCs (µg/L) | |
| Tetrachloroethene | 41 |
| Trichloroethene | 17 |




| MW-04 (S)- 7/8/2020 | |
|---|---|
| VOCs (µg/L) | |
| 1,1-Dichloroethane | 80 |
| Tetrachloroethene | 5,300 |
| 1,1,1-Trichloroethane | 460 |
| Toluene | 2,600 |
| Ethylbenzene | 410 |
| Vinyl Chloride | 66 |
| 1,1-Dichloroethene | 32 |
| Trichloroethene | 8,100 |
| 1,2-Dichlorobenzene | 78 |
| p/m-Xylene | 1,600 |
| o-Xylene | 600 |
| cis-1,2-Dichloroethene | 9,800 |
| PCBs (µg/L) | |
| Aroclor 1254 | 0.51 |

| MW-04 (D)- 7/9/2020 | |
|---|---|
| VOCs (µg/L) | |
| Tetrachloroethene | 190 |
| 1,1,1-Trichloroethane | 7.5 |
| Toluene | 19 |
| Vinyl Chloride | 2.5 |
| Trichloroethene | 52 |
| p/m-Xylene | 19 |
| o-Xylene | 12 |
| cis-1,2-Dichloroethene | 93 |

| MW-04 (I)- 7/10/2020 | |
|---|---|
| VOCs (µg/L) | |
| Tetrachloroethene | 900 |
| 1,1,1-Trichloroethane | 13 |
| Toluene | 280 |
| Ethylbenzene | 41 |
| 1,2,4-Trimethylbenzene | 11 |
| 1,2,4,5-Tetramethylbenzene | 5.9 |
| Trichloroethene | 730 |
| Naphthalene | 12 |
| p/m-Xylene | 190 |
| o-Xylene | 69 |
| cis-1,2-Dichloroethene | 120 |

| MW-05 (S)- 7/13/2020 | |
|---|---|
| VOCs (µg/L) | |
| 1,1-Dichloroethane | 2,200 |
| Tetrachloroethene | 3,000 |
| 1,1,1-Trichloroethane | 15,000 |
| Toluene | 9,300 |
| Ethylbenzene | 1,500 |
| Vinyl Chloride | 880 |
| 1,1-Dichloroethene | 360 |
| Trichloroethene | 390 |
| Acetone | 1,700 |
| p/m-Xylene | 4,400 |
| o-Xylene | 1,800 |
| 2-Butanone | 2,600 |
| cis-1,2-Dichloroethene | 120,000 |
| PCBs (µg/L) | |
| Aroclor 1254 | 0.51 |

| MW-05 (D)- 7/13/2020 | |
|---|---|
| VOCs (µg/L) | |
| Tetrachloroethene | 1,700 |
| 1,1,1-Trichloroethane | 51 |
| Trichloroethene | 68 |
| o-Xylene | 17 |
| cis-1,2-Dichloroethene | 65 |
| General Chemistry | |
| Nitrogen | 14,400 |

| MW-05 (I)- 7/14/2020 | |
|---|---|
| VOCs (µg/L) | |
| 1,1-Dichloroethane | 2,000 |
| Tetrachloroethene | 7,500 |
| 1,1,1-Trichloroethane | 410 |
| Toluene | 5,700 |
| Ethylbenzene | 900 |
| Vinyl Chloride | 38 |
| 1,1-Dichloroethene | 52 |
| Trichloroethene | 2,500 |
| Naphthalene | 120 |
| Acetone | 350 |
| o-Xylene | 1,400 |
| p/m-Xylene | 3,300 |
| Toluene | 5,700 |
| Benzene | 12 |
| 2-Butanone | 780 |
| cis-1,2-Dichloroethene | 4,600 |
| 1,3,5-Trimethylbenzene | 81 |
| 1,2,4-Trimethylbenzene | 200 |
| General Chemistry | |
| Sulfate | 270,000 |

NOTES

1. ALL LOCATIONS ARE APPROXIMATE
2. KINGS COUNTY PARCELS RETRIEVED FROM GIS.NY.GOV

0 10 20
SCALE IN FEET

HALEY ALDRICH

8 WALWORTH STREET
BROOKLYN, NEW YORK

MAP OF GROUNDWATER EXCEEDANCE RESULTS

AUGUST 2020

FIGURE 5

| MW-01 (S)- 7/2/2020 | |
|---|---|
| Emerging Contaminants (µg/L) | |
| 1,4-dioxane | 1.86 |
| Perfluorooctanoic Acid (PFOA) | 0.0522 |
| Perfluorooctanesulfonic Acid (PFOS) | 0.0609 |
| PFOA/PFOS, Total | 0.113 |

| MW-01 (I)- 7/15/2020 | |
|---|---|
| Emerging Contaminants (µg/L) | |
| Perfluoropentanoic Acid (PFPeA) | 0.0124 |
| Perfluorohexanesulfonic Acid (PFHxS) | 0.0106 |
| Perfluorooctanoic Acid (PFOA) | 0.0398 |
| Perfluorooctanesulfonic Acid (PFOS) | 0.071 |
| PFOA/PFOS, Total | 0.111 |

LEGEND

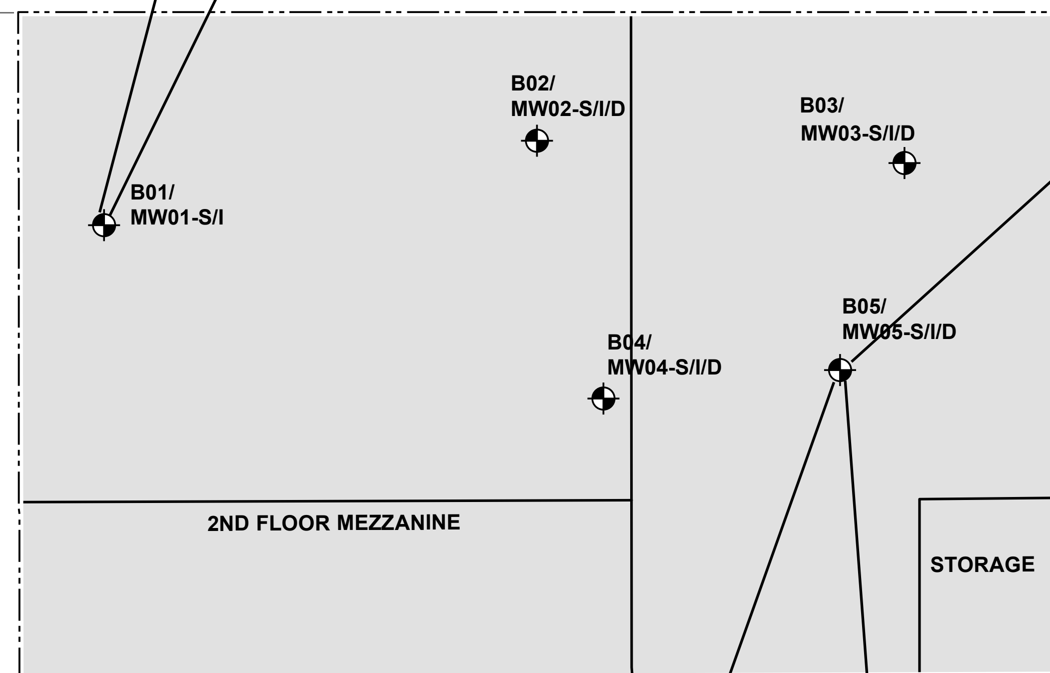
SAMPLE LOCATION

SITE BOUNDARY

EXISTING BUILDING

KINGS COUNTY PARCEL

| New York Maximum Contaminant Level for Drinking Water | | |
|---|---|---|
| Analyte | Units | MCL |
| 1,4-dioxane | µg/L | 1 |
| PFOA/PFAS | µg/L | 0.01 |




| MW-05 (S)- 7/13/2020 | |
|---|---|
| Emerging Contaminants (µg/L) | |
| 1,4-dioxane | 980 |
| Perfluorobutanoic Acid (PFBA) | 0.0653 |
| Perfluoropentanoic Acid (PFPeA) | 0.0745 |
| Perfluorohexanoic Acid (PFHxA) | 0.121 |
| Perfluoroheptanoic Acid (PFHpA) | 0.241 |
| Perfluorohexanesulfonic Acid (PFHxS) | 0.0677 |
| Perfluorooctanoic Acid (PFOA) | 1.26 |
| Perfluoroheptanesulfonic Acid (PFHpS) | 0.0847 |
| Perfluorononanoic Acid (PFNA) | 0.0132 |
| Perfluorooctanesulfonic Acid (PFOS) | 2.18 |
| Perfluorooctanesulfonamide (FOSA) | 0.0317 |
| PFOA/PFOS, Total | 4.14 |

NOTES

1. ALL LOCATIONS ARE APPROXIMATE
2. KINGS COUNTY PARCELS RETRIEVED FROM GIS.NY.GOV

| MW-05 (D)- 7/13/2020 | |
|---|---|
| Emerging Contaminants (µg/L) | |
| 1,4-dioxane | 288 |
| Perfluorobutanoic Acid (PFBA) | 0.0114 |
| Perfluoropentanoic Acid (PFPeA) | 0.0201 |
| Perfluorohexanoic Acid (PFHxA) | 0.0171 |
| Perfluoroheptanoic Acid (PFHpA) | 0.0131 |
| Perfluorooctanoic Acid (PFOA) | 0.0785 |
| Perfluorooctanesulfonic Acid (PFOS) | 0.17 |
| Perfluorooctanesulfonamide (FOSA) | 0.0108 |
| PFOA/PFOS, Total | 0.249 |

| MW-05 (I)- 7/14/2020 | |
|---|---|
| Emerging Contaminants (µg/L) | |
| 1,4-dioxane | 286 |
| Perfluorobutanoic Acid (PFBA) | 0.0449 |
| Perfluoropentanoic Acid (PFPeA) | 0.0333 |
| Perfluorohexanoic Acid (PFHxA) | 0.046 |
| Perfluoroheptanoic Acid (PFHpA) | 0.0741 |
| Perfluorohexanesulfonic Acid (PFHxS) | 0.0408 |
| Perfluorooctanoic Acid (PFOA) | 0.675 |
| Perfluoroheptanesulfonic Acid (PFHpS) | 0.191 |
| Perfluorononanoic Acid (PFNA) | 0.0174 |
| Perfluorooctanesulfonic Acid (PFOS) | 10.3 |
| N-Methyl Perfluorooctane-sulfonamidoacetic Acid (NMeFOSAA) | 0.0307 |
| Perfluorooctanesulfonamide (FOSA) | 1.36 |
| PFOA/PFOS, Total | 12.51 |

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SCALE IN FEET

HALEY ALDRICH

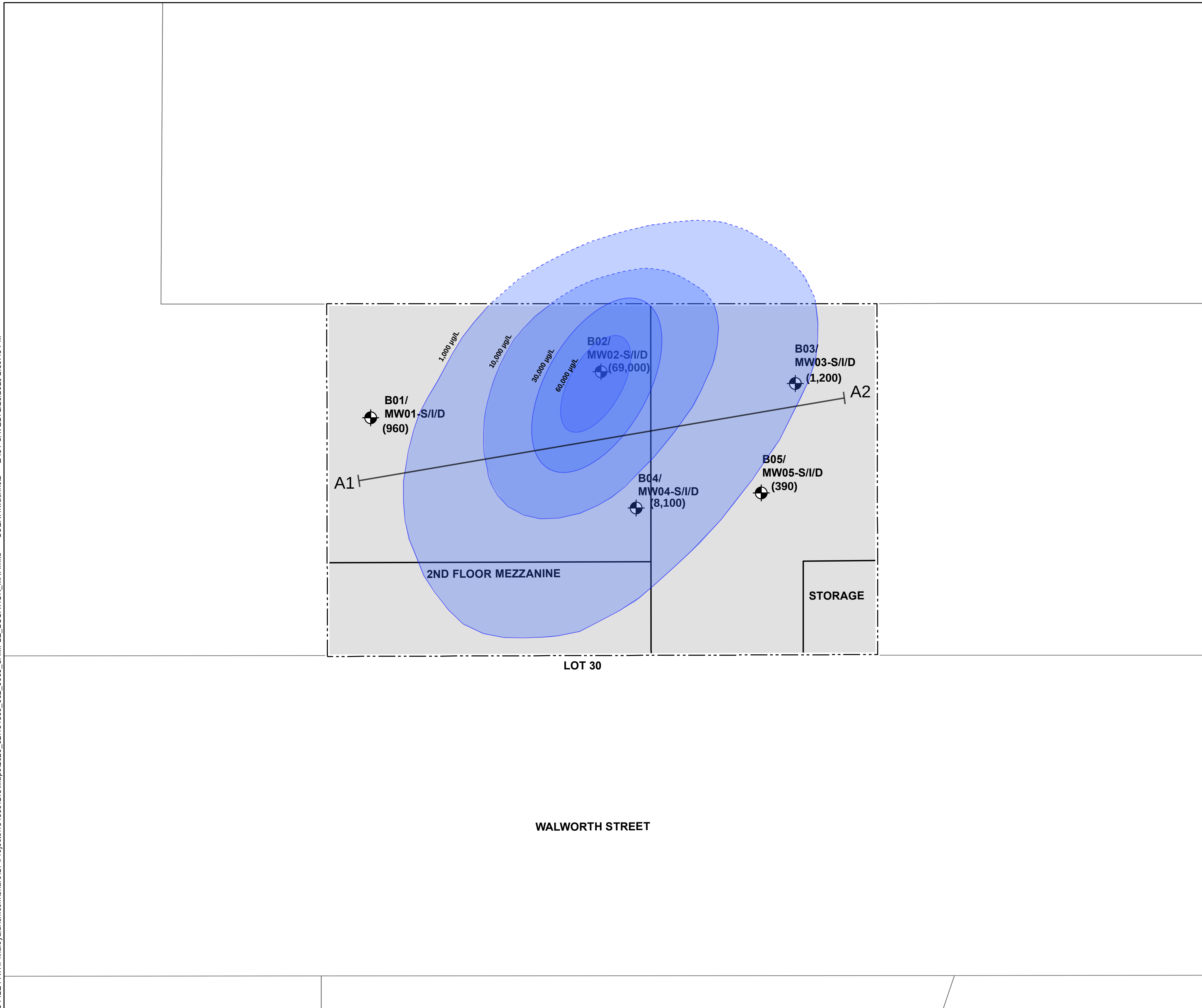
8 WALWORTH STREET
BROOKLYN, NEW YORK

# MAP OF EMERGING CONTAMINANT GROUNDWATER EXCEEDANCE RESULTS

AUGUST 2020

FIGURE 6

GIS FILE PATH: \\haleyaldrich.com\share\CF\Projects\134860\GIS\Maps\2020_02\134860_002_0003_SAMPLE_LOCATION_MAP.mxd — USER: hwachholz — LAST SAVED: 2/28/2020 2:50:43 PM




**LEGEND**

- SAMPLE LOCATION
- SITE BOUNDARY
- EXISTING BUILDING
- KINGS COUNTY PARCEL
- TCE CONTOUR
- INFERRED TCE CONTOUR
- **(8,100)** SHALLOW TCE CONCENTRATION (µg/L)

**NOTES**

1. ALL LOCATIONS ARE APPROXIMATE.
2. KINGS COUNTY PARCELS RETRIEVED FROM GIS.NY.GOV
3. SHALLOW GROUNDWATER PLUME AT 12-20 FT BGS.

0 10 20
SCALE IN FEET

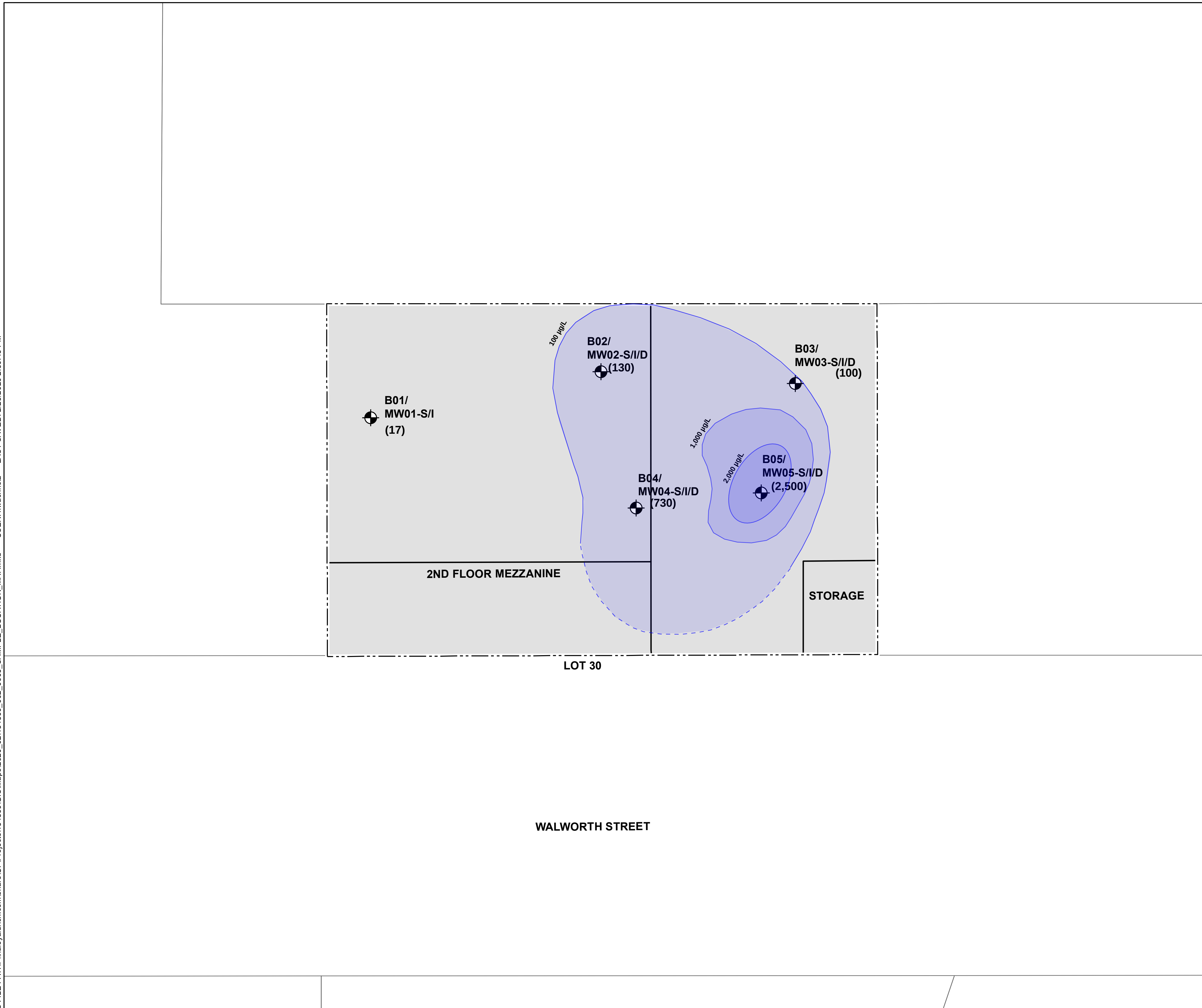
HALEY ALDRICH

8 WALWORTH STREET
BROOKLYN, NEW YORK

SHALLOW TCE GROUNDWATER CONTOUR MAP

AUGUST 2020

FIGURE 7




**LEGEND**

SAMPLE LOCATION

SITE BOUNDARY

EXISTING BUILDING

KINGS COUNTY PARCEL

TCE CONTOUR

INFERRED TCE CONTOUR

**(8,100)** INTERMEDIATE TCE CONCENTRATION (µg/L)

**NOTES**

1. ALL LOCATIONS ARE APPROXIMATE.
2. KINGS COUNTY PARCELS RETRIEVED FROM GIS.NY.GOV
3. INTERMEDIATE GROUNDWATER PLUME AT 26-35 FT BGS.

0 10 20

SCALE IN FEET

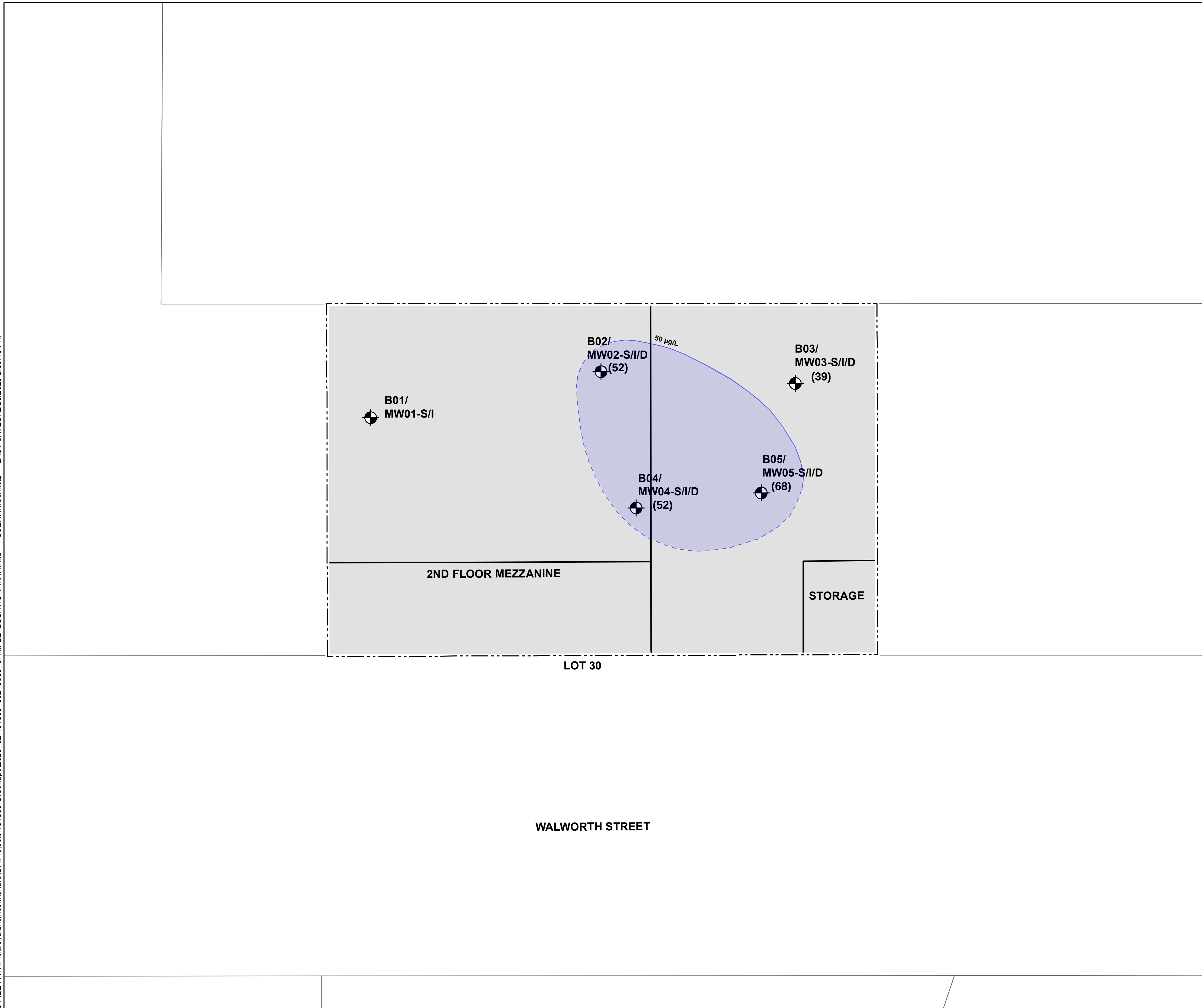
HALEY ALDRICH

8 WALWORTH STREET
BROOKLYN, NEW YORK

INTERMEDIATE TCE GROUNDWATER CONTOUR MAP

AUGUST 2020

FIGURE 8




**LEGEND**

- SAMPLE LOCATION
- SITE BOUNDARY
- EXISTING BUILDING
- KINGS COUNTY PARCEL
- TCE CONTOUR
- INFERRED TCE CONTOUR
- (50) DEEP TCE CONCENTRATION (µg/L)

**NOTES**

1. ALL LOCATIONS ARE APPROXIMATE.
2. KINGS COUNTY PARCELS RETRIEVED FROM GIS.NY.GOV
3. DEEP GROUNDWATER PLUME AT 37-42 FT BGS.

N

0 10 20
SCALE IN FEET

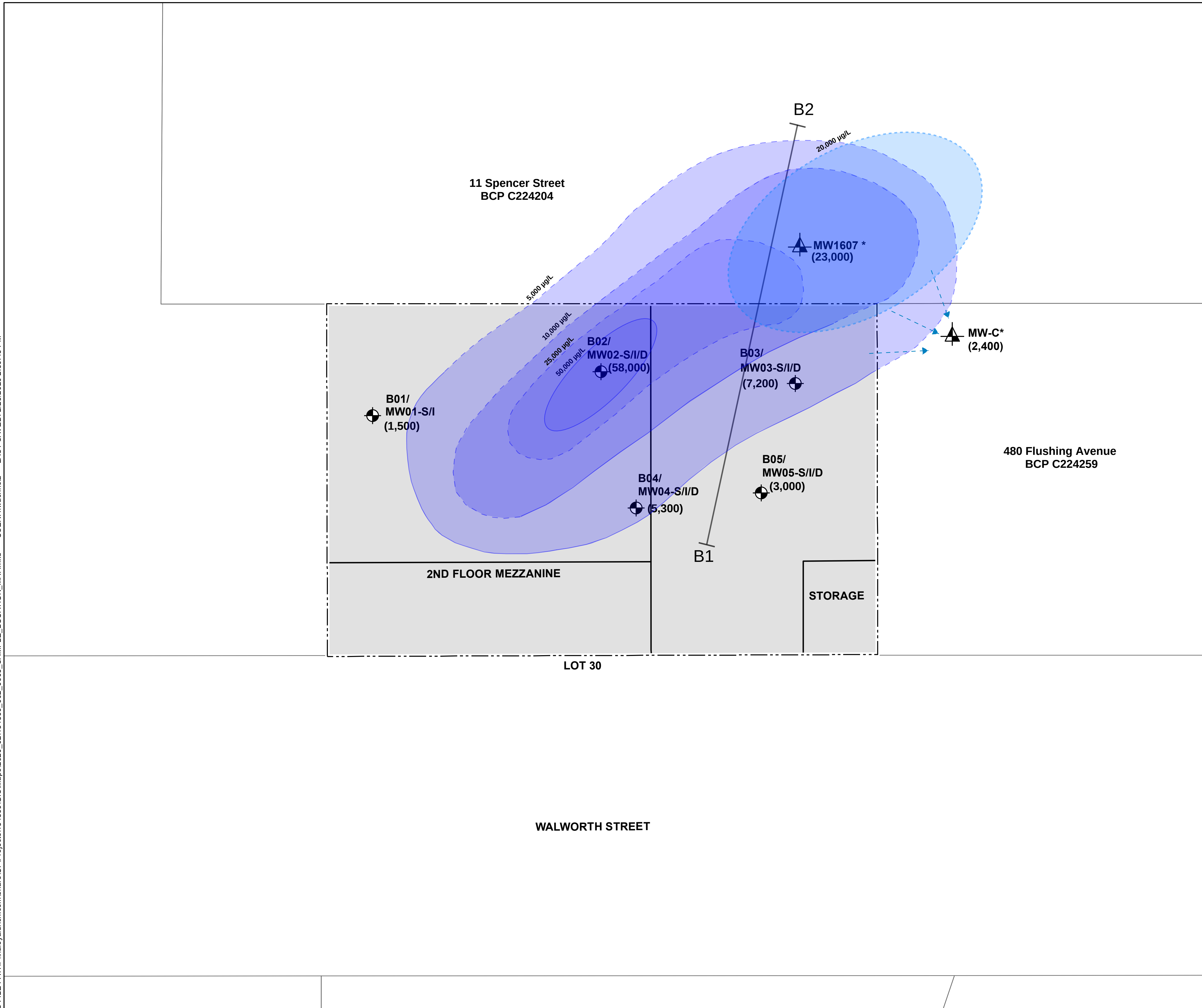
HALEY ALDRICH

8 WALWORTH STREET
BROOKLYN, NEW YORK

DEEP TCE GROUNDWATER
CONTOUR MAP

AUGUST 2020

FIGURE 9




**LEGEND**

- SAMPLE LOCATION
- SITE BOUNDARY
- EXISTING BUILDING
- KINGS COUNTY PARCEL
- PCE CONTOUR
- INFERRED PCE CONTOUR
- (7,200) SHALLOW PCE CONCENTRATION (µg/L)
- POTENTIAL EXTENSION/COMINGLING OF PCE GROUNDWATER PLUMES TO ADJOINING PROPERTY TO THE NORTH

**NOTES**

1. ALL LOCATIONS ARE APPROXIMATE.
2. KINGS COUNTY PARCELS RETRIEVED FROM GIS.NY.GOV
3. MW1607* WAS INSTALLED BY ENVIRONMENTAL BUSINESS CONSULTANTS IN ASSOCIATION WITH A SUPPLEMENTAL REMEDIAL INVESTIGATION OF THE 11 SPENCER STREET PROPERTY, BCP SITE C224204. MW1607 WAS INSTALLED TO 19 FT BGS IN 2016 AND REDEVELOPED AND SAMPLED BY GZA ON 3 APRIL 2017 YIELDING RESULT SHOWN ON FIGURE.
4. MW-C* WAS INSTALLED BY LAUREL ENVIRONMENTAL ASSOCIATES, LTD. DURING A SITE CHARACTERIZATION OF THE 480 FLUSHING AVENUE PROPERTY, BCP SITE C224259. MW-C WAS INSTALLED TO 20 FT BGS ON 4 JUNE 2018 AND SAMPLED ON 5 JUNE 2018 YIELDING THE RESULT SHOWN ON THE FIGURE.
5. SHALLOW GROUNDWATER PLUME AT 12-20 FT BGS

N

0 10 20
SCALE IN FEET

HALEY ALDRICH

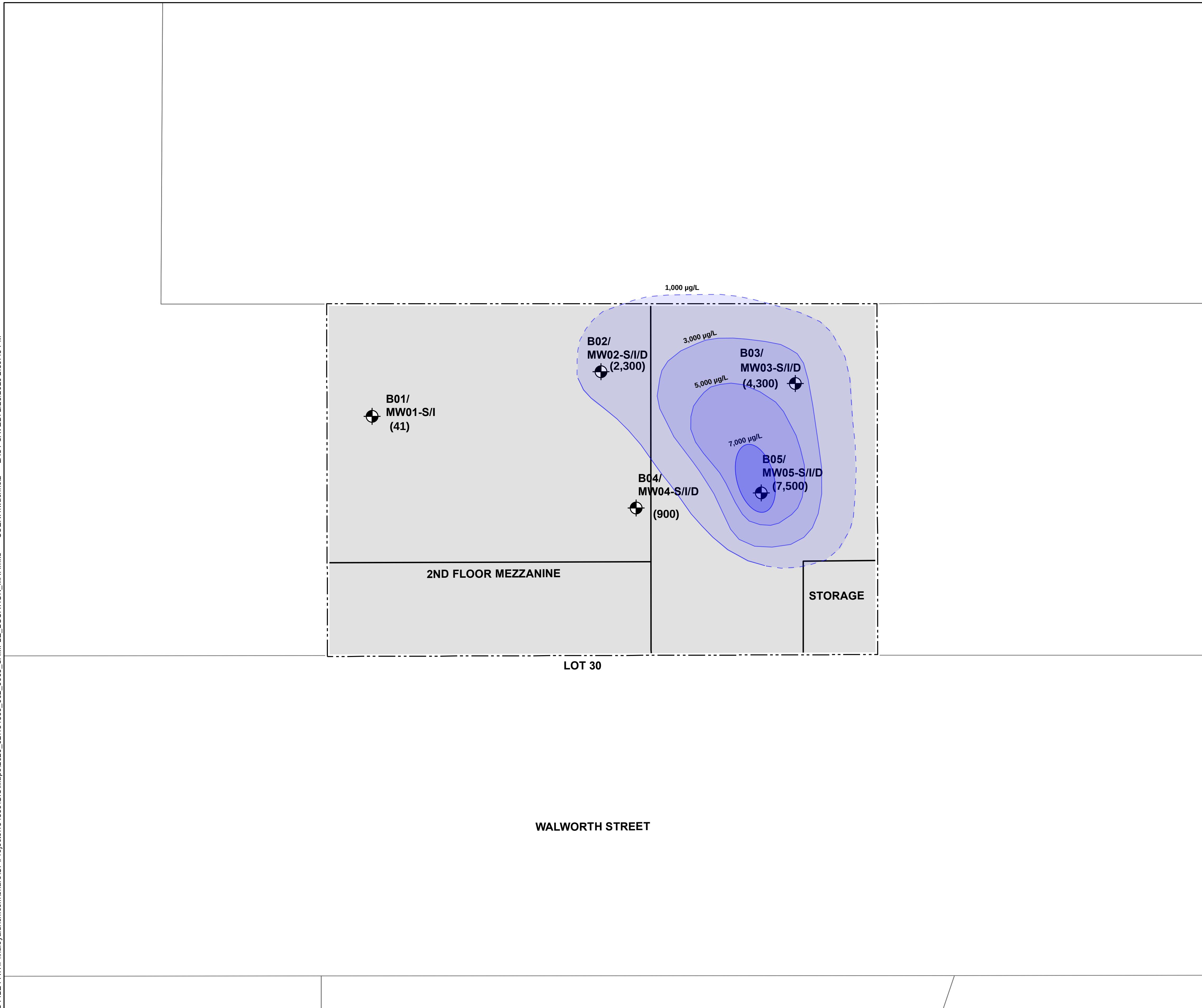
8 WALWORTH STREET
BROOKLYN, NEW YORK

SHALLOW PCE GROUNDWATER CONTOUR MAP

AUGUST 2020

FIGURE 10

GIS FILE PATH: \\haleyaldrich.com\share\CF\Projects\134860\GIS\Maps\2020_02\134860_002_0003_SAMPLE_LOCATION_MAP.mxd — USER: hwachholz — LAST SAVED: 2/28/2020 2:50:43 PM




**LEGEND**

- SAMPLE LOCATION
- SITE BOUNDARY
- EXISTING BUILDING
- KINGS COUNTY PARCEL
- PCE CONTOUR
- INFERRED PCE CONTOUR
- **(7,500)** INTERMEDIATE PCE CONCENTRATION (µg/L)

**NOTES**

1. ALL LOCATIONS ARE APPROXIMATE.
2. KINGS COUNTY PARCELS RETRIEVED FROM GIS.NY.GOV
3. INTERMEDIATE GROUNDWATER PLUME AT 26-35 FT BGS.

0 10 20
SCALE IN FEET

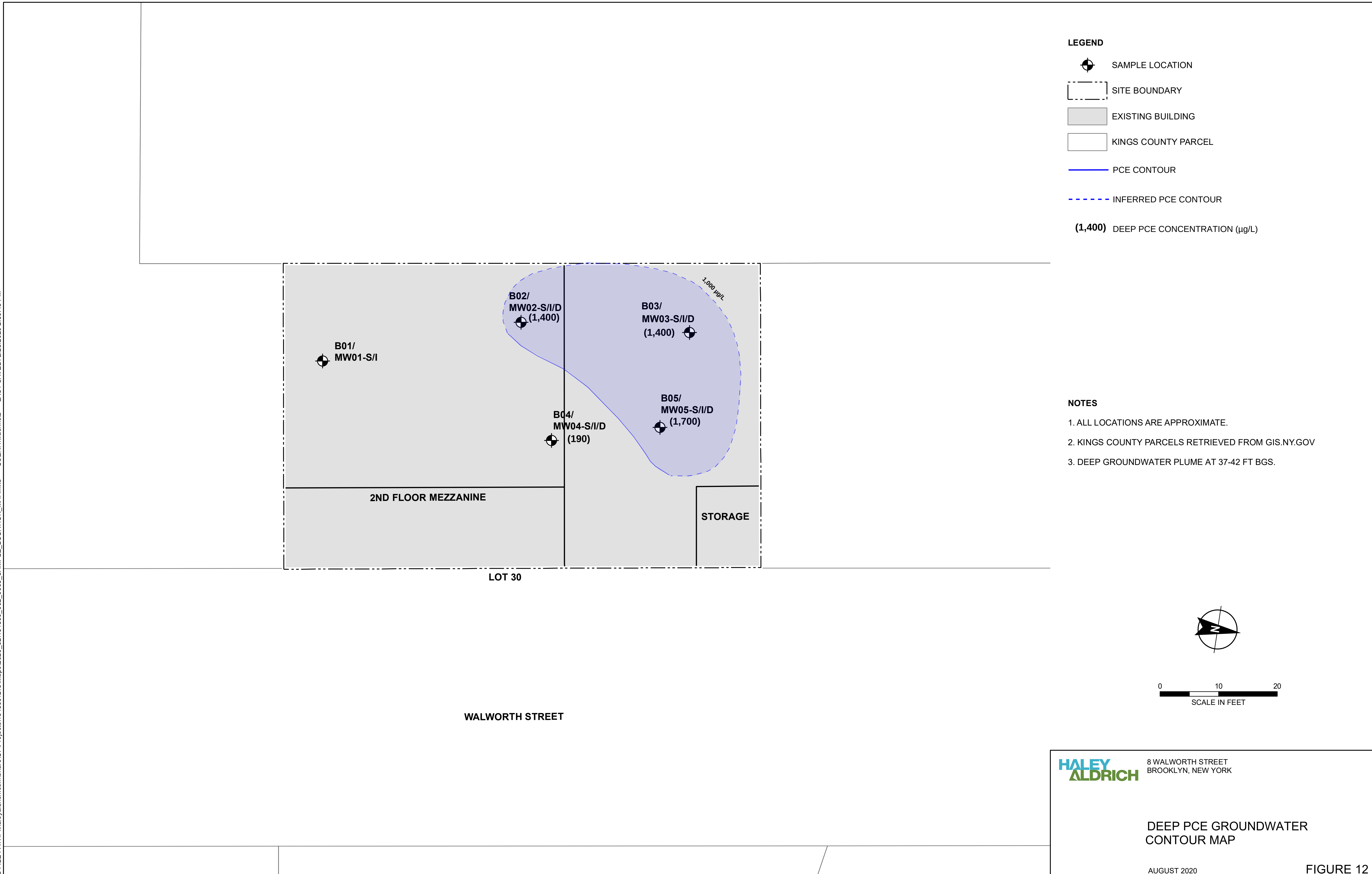
HALEY ALDRICH

8 WALWORTH STREET
BROOKLYN, NEW YORK

INTERMEDIATE PCE GROUNDWATER CONTOUR MAP

AUGUST 2020

FIGURE 11

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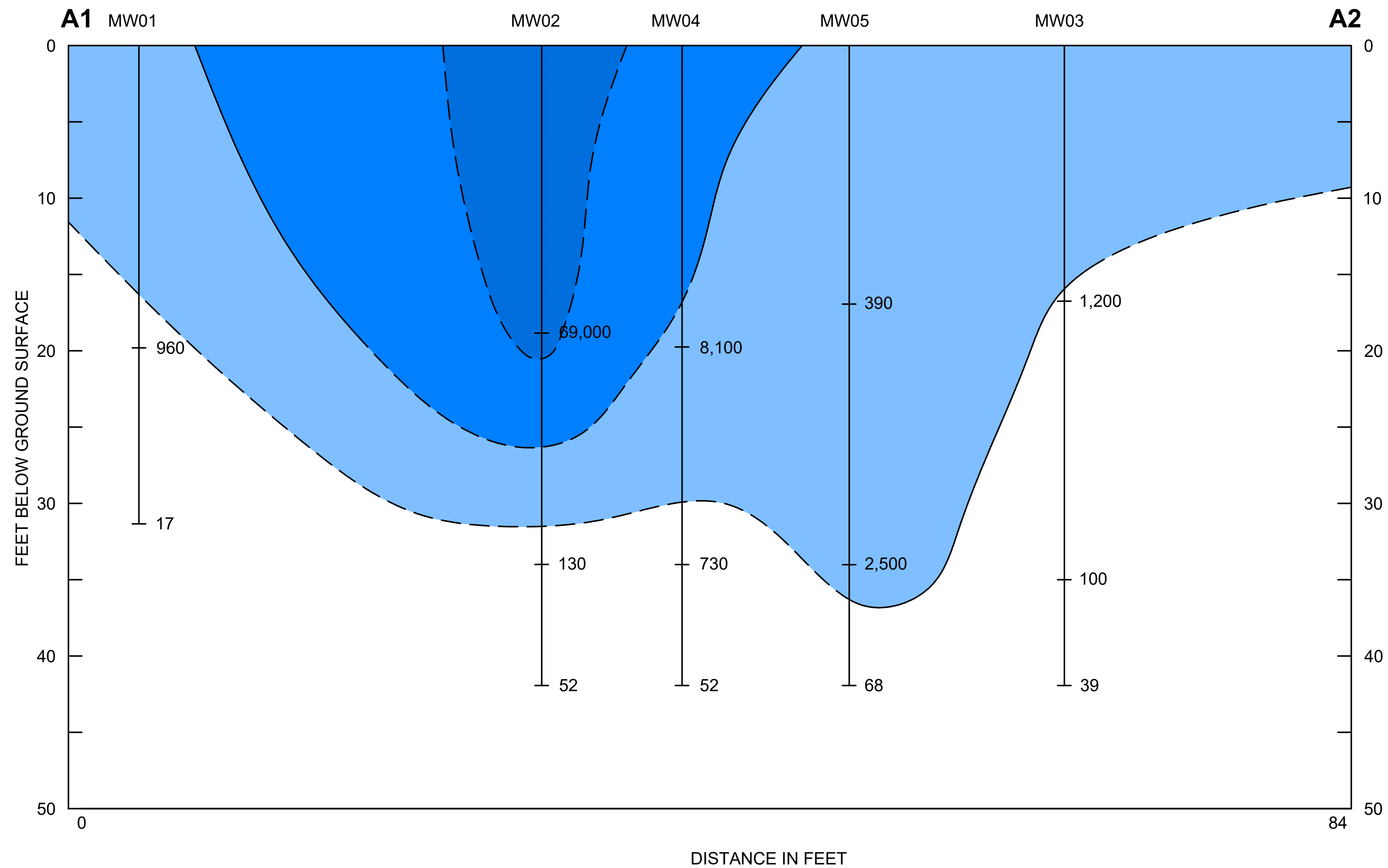


HORIZ. 0 20 40
VERT. 0 10 20
SCALE IN FEET

EXPLORATION LEGEND

MW01 —— EXPLORATION DESIGNATION

—— POINT OF STRATAGRAPHIC CHANGE

**LEGEND**

TCE CONCENTRATION CONTOUR IN MICROGRAMS PER LITER (UG/L). DASHED WHERE INFERRED.

TCE CONCENTRATION 1,000 (UG/L)

TCE CONCENTRATION 10,000 (UG/L)

TCE CONCENTRATION 60,000 (UG/L)

**NOTES**

1. STRATA LINES BASED ON LINEAR INTERPOLATION BETWEEN BORINGS. ACTUAL STRATA CHANGES MAY VARY FROM THOSE SHOWN BY LINEAR INTERPOLATION.
2. SEE BORING LOGS FOR DETAILED DESCRIPTIONS OF MATERIALS.

HALEY ALDRICH

8 WALWORTH STREET
BROOKLYN, NEW YORK

A1-A2 CROSS SECTION -
TCE CONCENTRATIONS

SCALE: AS SHOWN
SEPTEMBER 2020

FIGURE 13

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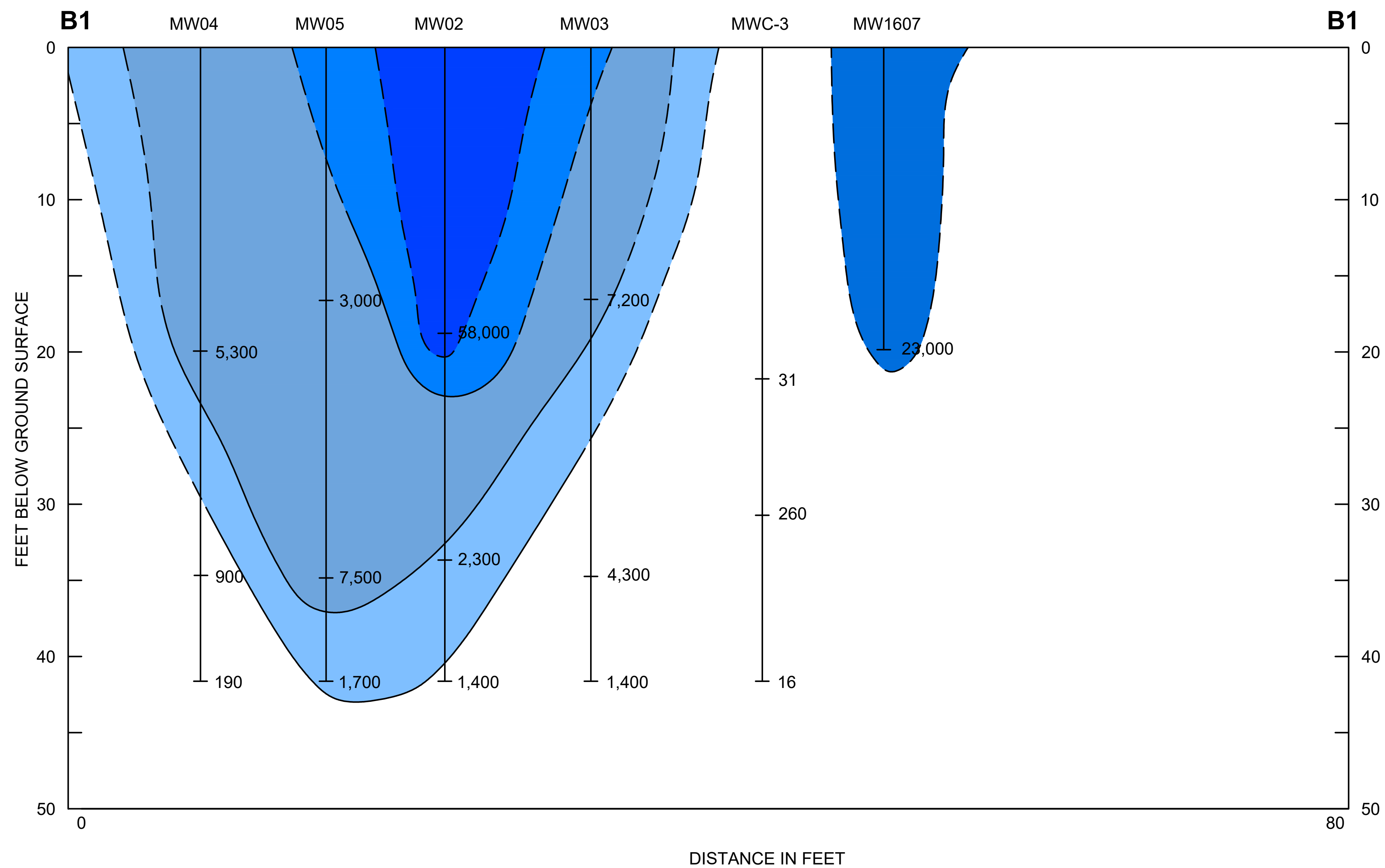


**NOTES**

1. STRATA LINES BASED ON LINEAR INTERPOLATION BETWEEN BORINGS. ACTUAL STRATA CHANGES MAY VARY FROM THOSE SHOWN BY LINEAR INTERPOLATION.

2. SEE BORING LOGS FOR DETAILED DESCRIPTIONS OF MATERIALS.

HORIZ. 0 20 40
VERT. 0 10 20
SCALE IN FEET

EXPLORATION LEGEND

MW01 —— EXPLORATION DESIGNATION

—— POINT OF STRATAGRAPHIC CHANGE

**LEGEND**

PCE CONCENTRATION CONTOUR IN MICROGRAMS PER LITER (UG/L). DASHED WHERE INFERRED.

PCE CONCENTRATION 1,000 (UG/L)

PCE CONCENTRATION 5,000 (UG/L)

PCE CONCENTRATION 10,000 (UG/L)

PCE CONCENTRATION 20,000 (UG/L)

PCE CONCENTRATION 50,000 (UG/L)

HALEY ALDRICH

8 WALWORTH STREET
BROOKLYN, NEW YORK

B1-B2 CROSS SECTION -
PCE CONCENTRATIONS

SCALE: AS SHOWN
SEPTEMBER 2020

FIGURE 14

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\\HALEYALDRICH.COM\SHARE\CF\PROJECTS\134860\CAD\134860_002_CROSS SECTIONS.DWG

| SB1702 (0-6") 12/20/2018 | |
|---|---|
| VOCs (µg/Kg) | |
| 1,4-Dioxane | 430 |
| Acetone | 3,200 |
| cis-1,2-Dichloroethene | 550 |
| Methyl Ethyl Ketone | 1,800 |
| Methylene chloride | 79 |
| Tetrachloroethene | 37,000 |
| Trichloroethene | 3,400 |
| SVOCs (µg/Kg) | |
| Indeno(1,2,3-cd)pyrene | 540 |
| Phenol | 930 |
| Pesticides (µg/Kg) | |
| 4,4' -DDD | 37 |
| 4,4' -DDE | 22 |
| 4,4' -DDT | 52 |
| Dieldrin | 15 |
| PCB (µg/Kg) | |
| PCB-1254 | 590 |
| Metals (mg/Kg) | |
| Lead | 250 |
| Zinc | 168 |

| SB1702 (6-12") 12/20/2018 | |
|---|---|
| VOCs (µg/Kg) | |
| 1,4-Dioxane | 350 |
| Acetone | 970 |
| cis-1,2-Dichloroethene | 540 |
| Methyl Ethyl Ketone | 3,500 |
| Methylene chloride | 130 |
| Tetrachloroethene | 33,000 |
| Trichloroethene | 3,300 |
| SVOCs (µg/Kg) | |
| Benz(a)anthracene | 1,700 |
| Benzo(a)pyrene | 1,500 |
| Benzo(b)fluoranthene | 1,900 |
| Benzo(k)fluoranthene | 1,500 |
| Chrysene | 2,000 |
| Indeno(1,2,3-cd)pyrene | 1,200 |
| Phenol | 900 |
| Pesticides (µg/Kg) | |
| 4,4' -DDD | 10 |
| 4,4' -DDE | 18 |
| 4,4' -DDT | 17 |
| Dieldrin | 12 |
| PCB (µg/Kg) | |
| PCB-1254 | 540 |
| Metals (mg/Kg) | |
| Lead | 250 |
| Zinc | 168 |

| SB1702 (12-24") 12/20/2018 | |
|---|---|
| VOCs (µg/Kg) | |
| 1,4-Dioxane | 370 |
| Acetone | 1,100 |
| cis-1,2-Dichloroethene | 830 |
| Methyl Ethyl Ketone | 4,300 |
| Methylene chloride | 72 |
| Tetrachloroethene | 30,000 |
| Trichloroethene | 4,700 |
| SVOCs (µg/Kg) | |
| Benzo(b)fluoranthene | 1,100 |
| Benzo(k)fluoranthene | 960 |
| Indeno(1,2,3-cd)pyrene | 800 |
| Pesticides (µg/Kg) | |
| 4,4' -DDD | 24 |
| 4,4' -DDE | 47 |
| 4,4' -DDT | 54 |
| Dieldrin | 19 |
| PCB (µg/Kg) | |
| PCB-1254 | 2,800 |
| Metals (mg/Kg) | |
| Lead | 336 |
| Zinc | 249 |

| SB1702 (7-9') 11/19/2018 | |
|---|---|
| VOCs (µg/Kg) | |
| Tetrachloroethene | 680,000 |
| Trichloroethene | 28,000 |
| PCB (µg/Kg) | |
| PCB-1254 | 4,200 |

| SB1702 (13-15') 12/20/2018 | |
|---|---|
| VOCs (µg/Kg) | |
| cis-1,2-Dichloroethene | 13,000 |
| Tetrachloroethene | 3,600 |
| Trichloroethene | 650 |
| Vinyl Chloride | 100 |
| Pesticides (µg/Kg) | |
| 4,4' -DDD | 13 |
| 4,4' -DDE | 29 |
| PCB (µg/Kg) | |
| PCB-1254 | 220 |

| SB1701 (0-6") 11/19/2018 | |
|---|---|
| VOCs (µg/Kg) | |
| cis-1,2-Dichloroethene | 380 |
| Tetrachloroethene | 13,000 |
| Trichloroethene | 5,300 |
| SVOCs (µg/Kg) | |
| Benz(a)anthracene | 2,800 |
| Benzo(a)pyrene | 2,600 |
| Benzo(b)fluoranthene | 2,300 |
| Benzo(k)fluoranthene | 2,500 |
| Chrysene | 3,000 |
| Indeno(1,2,3-cd)pyrene | 1,300 |
| PCB (µg/Kg) | |
| PCB-1254 | 830 |
| Metals (mg/Kg) | |
| Copper | 50.6 |
| Lead | 600 |
| Mercury | 3.11 |
| Zinc | 184 |

| SB1701 (6-12") 11/19/2018 | |
|---|---|
| VOCs (µg/Kg) | |
| cis-1,2-Dichloroethene | 370 |
| Tetrachloroethene | 15,000 |
| Trichloroethene | 5,400 |
| SVOCs (µg/Kg) | |
| Benz(a)anthracene | 4,000 |
| Benzo(a)pyrene | 3,300 |
| Benzo(b)fluoranthene | 3,100 |
| Benzo(k)fluoranthene | 3,200 |
| Chrysene | 4,100 |
| Dibenz(a,h)anthracene | 560 |
| Indeno(1,2,3-cd)pyrene | 1,900 |
| PCB (µg/Kg) | |
| PCB-1254 | 250 |
| Metals (mg/Kg) | |
| Lead | 360 |
| Mercury | 1.06 |
| Zinc | 160 |

| SB1701 (12-24") 11/19/2018 | |
|---|---|
| VOCs (µg/Kg) | |
| cis-1,2-Dichloroethene | 300 |
| Tetrachloroethene | 15,000 |
| Trichloroethene | 4,700 |
| SVOCs (µg/Kg) | |
| Benz(a)anthracene | 2,400 |
| Benzo(a)pyrene | 2,200 |
| Benzo(b)fluoranthene | 2,100 |
| Benzo(k)fluoranthene | 2,100 |
| Chrysene | 2,500 |
| Indeno(1,2,3-cd)pyrene | 1,200 |
| PCB (µg/Kg) | |
| PCB-1254 | 440 |
| Metals (mg/Kg) | |
| Lead | 395 |
| Mercury | 2.4 |
| Zinc | 238 |

| SB1701 (11-13') 11/19/2018 | |
|---|---|
| VOCs (µg/Kg) | |
| Tetrachloroethene | 2,100 |
| Trichloroethene | 870 |

| SB1701 (13-15') 11/19/2018 | |
|---|---|
| No Exceedances | |

| SB1706 (0-6") 11/20/2018 | |
|---|---|
| SVOCs (µg/Kg) | |
| Benz(a)anthracene | 1,300 |
| Benzo(a)pyrene | 1,200 |
| Benzo(b)fluoranthene | 1,200 |
| Benzo(k)fluoranthene | 1,200 |
| Chrysene | 1,400 |
| Indeno(1,2,3-cd)pyrene | 790 |
| Pesticides (µg/Kg) | |
| 4,4' -DDT | 46 |
| a-Chlordane | 240 |
| Chlordane | 830 |
| Metals (mg/Kg) | |
| Lead | 457 |
| Mercury | 1.44 |
| Zinc | 230 |

| SB1706 (6-12") 11/20/2018 | |
|---|---|
| SVOCs (µg/Kg) | |
| Benz(a)anthracene | 2,000 |
| Benzo(a)pyrene | 1,900 |
| Benzo(b)fluoranthene | 1,700 |
| Benzo(k)fluoranthene | 1,800 |
| Chrysene | 2,100 |
| Dibenz(a,h)anthracene | 620 |
| Indeno(1,2,3-cd)pyrene | 1,400 |
| Pesticides (µg/Kg) | |
| 4,4' -DDT | 43 |
| a-Chlordane | 1,200 |
| Chlordane | 4,400 |
| Metals (mg/Kg) | |
| Barium | 354 |
| Chromium | 32.8 |
| Copper | 56.6 |
| Lead | 691 |
| Mercury | 2.41 |
| Zinc | 358 |

| SB1706 (12-24") 11/20/2018 | |
|---|---|
| VOCs (µg/Kg) | |
| 1,1,1-Trichlorethane | 1,700 |
| cis-1,2-Dichloroethene | 820 |
| M&P - Xylenes | 2,900 |
| Tetrachloroethene | 13,000 |
| Toluene | 1,500 |
| Trichloroethene | 840 |
| SVOCs (µg/Kg) | |
| Benz(a)anthracene | 1,200 |
| Benzo(a)pyrene | 1,500 |
| Benzo(b)fluoranthene | 1,600 |
| Benzo(k)fluoranthene | 1,400 |
| Chrysene | 1,300 |
| Indeno(1,2,3-cd)pyrene | 1,600 |
| Pesticides (µg/Kg) | |
| 4,4' -DDT | 16 |
| a-Chlordane | 260 |
| Chlordane | 970 |
| Metals (mg/Kg) | |
| Cadmium | 3.38 |
| Chromium | 42.2 |
| Lead | 301 |
| Mercury | 2.5 |
| Zinc | 235 |

| SB1706 (7-9') 11/20/2018 | |
|---|---|
| VOCs (µg/Kg) | |
| n-Propylbenzene | 4,000 |

| SB1706 (13-15') 11/20/2018 | |
|---|---|
| VOCs (µg/Kg) | |
| Acetone | 200 |

| SB1705 (0-6") 11/20/2018 | |
|---|---|
| VOCs (µg/Kg) | |
| 1,1,1-Tricholorethane | 740 |
| cis-1,2-Dichloroethene | 5,900 |
| m&p -Xylene | 1,200 |
| Methyl Ethyl Ketone | 470 |
| Methylene Chloride | 3,700 |
| Tetrachloroethene | 11,000 |
| Trichloroethene | 3,500 |
| Metals (mg/Kg) | |
| Arsenic | 43.4 |
| Barium | 351 |
| Cadmium | 3.76 |
| Copper | 54.8 |
| Lead | 1,840 |
| Mercury | 1.52 |
| Selenium | 10.6 |
| Zinc | 486 |

| SB1705 (6-12") 11/20/2018 | |
|---|---|
| VOCs (µg/Kg) | |
| 1,1,1-Tricholorethane | 1,100 |
| cis-1,2-Dichloroethene | 5,100 |
| m&p -Xylene | 330 |
| Methylene Chloride | 420 |
| Tetrachloroethene | 22,000 |
| Trichloroethene | 3,100 |
| SVOCs (µg/Kg) | |
| Benz(a)anthracene | 1,100 |
| Benzo(b)fluoranthene | 1,900 |
| Benzo(k)fluoranthene | 1,500 |
| Chrysene | 1,700 |
| Indeno(1,2,3-cd)pyrene | 1,600 |
| Pesticides (µg/Kg) | |
| 4,4' - DDE | 8.5 |
| PCB (µg/Kg) | |
| PCB-1254 | 1,700 |
| Metals (mg/Kg) | |
| Arsenic | 14.2 |
| Barium | 721 |
| Cadmium | 3.79 |
| Chromium | 44.7 |
| Copper | 110 |
| Lead | 1,090 |
| Mercury | 1.42 |
| Zinc | 675 |

| SB1705 (12-24") 11/20/2018 | |
|---|---|
| VOCs (µg/Kg) | |
| cis-1,2-Dichloroethene | 3,900 |
| Tetrachloroethene | 17,000 |
| Trichloroethene | 20,000 |
| SVOCs (µg/Kg) | |
| Indeno(1,2,3-cd)pyrene | 1,000 |
| Metals (mg/Kg) | |
| Arsenic | 78.1 |
| Barium | 5,630 |
| Cadmium | 10.9 |
| Copper | 66.8 |
| Lead | 8,970 |
| Mercury | 5.2 |
| Selenium | 24 |
| Zinc | 4,370 |

| SB1705 (11-13') 11/20/2018 | |
|---|---|
| VOCs (µg/Kg) | |
| 1,1,1-Trichloroethane | 70,000 |
| 1,1-Dichloroethane | 1,100 |
| 1,1-Dichloroethene | 340 |
| 1,2,4-Trimethylbenzene | 53,000 |
| 1,2-Dichlorobenzene | 13,000 |
| 1,3,5-Trimethylbenzene | 21,000 |
| 1,4-Dichlorobenzene | 2,700 |
| cis-1,2-Dichloroethene | 78,000 |
| Ethylbenzene | 38,000 |
| m&p-Xylenes | 140,000 |
| n-Propylbenzene | 8,900 |
| Tetrachloroethene | 96,000 |
| Toluene | 79,000 |
| Trichloroethene | 7,400 |
| Vinyl Chloride | 89 |
| SVOCs (µg/Kg) | |
| 1,2-Dicholorbenzene | 3,300 |
| PCB (µg/Kg) | |
| PCB-1254 | 340 |

| SB1705 (13-15') 11/20/2018 | |
|---|---|
| VOCs (µg/Kg) | |
| 1,1,1-Trichloroethane | 51,000 |
| 1,1-Dichloroethane | 710 |
| 1,2,4-Trimethylbenzene | 14,000 |
| 1,2-Dichlorobenzene | 2,700 |
| Acetone | 990 |
| cis-1,2-Dichloroethene | 38,000 |
| Ethylbenzene | 35,000 |
| m&p-Xylenes | 140,000 |
| Tetrachloroethene | 440,000 |
| Toluene | 88,000 |
| Trichloroethene | 26,000 |
| PCB (µg/Kg) | |
| PCB-1254 | 340 |

| SB1703 (0-6") 11/20/2018 | |
|---|---|
| VOCs (µg/Kg) | |
| 1,1,1-Tricholorethane | 2,800 |
| Acetone | 75 |
| cis-1,2-Dichloroethene | 3,300 |
| m&p -Xylene | 1,900 |
| Methylene Chloride | 130 |
| Tetrachloroethene | 110,000 |
| Trichloroethene | 7,900 |
| SVOCs (µg/Kg) | |
| Indeno(1,2,3-cd)pyrene | 650 |
| Pesticides (µg/Kg) | |
| 4,4' - DDT | 200 |
| PCB (µg/Kg) | |
| PCB-1254 | 3,200 |
| Metals (mg/Kg) | |
| Copper | 58.5 |
| Zinc | 284 |

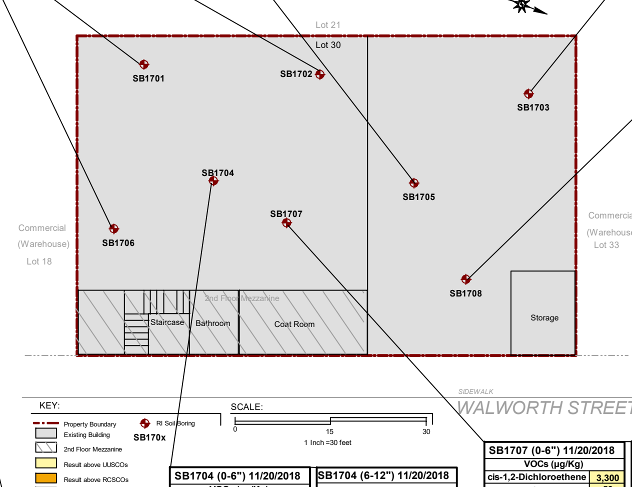
| SB1703 (6-12") 11/20/2018 | |
|---|---|
| VOCs (µg/Kg) | |
| 1,1,1-Tricholorethane | 4,300 |
| 1,1-Dichloroethane | 840 |
| cis-1,2-Dichloroethene | 16,000 |
| m&p -Xylene | 4,500 |
| Tetrachloroethene | 370,000 |
| Toluene | 2,800 |
| trans-1,2-Dichloroethene | 300 |
| Trichloroethene | 29,000 |
| SVOCs (µg/Kg) | |
| Benzo(b)fluoranthene | 1,300 |
| Benzo(k)fluoranthene | 1,100 |
| Chrysene | 1,200 |
| Indeno(1,2,3-cd)pyrene | 1,400 |
| Pesticides (µg/Kg) | |
| 4,4' - DDT | 46 |
| PCB (µg/Kg) | |
| PCB-1254 | 550 |
| Metals (mg/Kg) | |
| Copper | 76.6 |
| Zinc | 610 |

| SB1703 (12-24") 11/20/2018 | |
|---|---|
| VOCs (µg/Kg) | |
| cis-1,2-Dichloroethene | 2,200 |
| m&p -Xylene | 1,300 |
| Tetrachloroethene | 17,000 |
| Trichloroethene | 4,400 |
| Metals (mg/Kg) | |
| Zinc | 254 |

| SB1703 (7-9') 11/20/2018 | |
|---|---|
| VOCs (µg/Kg) | |
| 1,2-Dichlorobenzene | 1,500 |
| cis-1,2-Dichloroethene | 1,200 |
| Tetrachloroethene | 10,000 |
| Trichloroethene | 1,800 |

| SB1703 (11-13') 11/20/2018 | |
|---|---|
| VOCs (µg/Kg) | |
| 1,2-Dichlorobenzene | 2,500 |
| cis-1,2-Dichloroethene | 2,500 |
| Tetrachloroethene | 57,000 |
| Trichloroethene | 5,200 |

| SB1703 (13-15') 11/20/2018 | |
|---|---|
| VOCs (µg/Kg) | |
| 1,2-Dichlorobenzene | 1,600 |
| cis-1,2-Dichloroethene | 1,800 |
| Tetrachloroethene | 7,900 |
| Trichloroethene | 5,200 |




| SB1708 (0-6") 11/20/2018 | |
|---|---|
| VOCs (µg/Kg) | |
| 1,1,1-Tricholorethane | 1,000 |
| 1,1-Dichloroethane | 310 |
| Acetone | 170 |
| cis-1,2-Dichloroethene | 5,400 |
| m&p -Xylene | 640 |
| Methyl Ethyl Ketone | 500 |
| Tetrachloroethene | 7,600 |
| Trichloroethene | 1,600 |
| SVOCs (µg/Kg) | |
| Benzo(a)pyrene | 1,200 |
| Benzo(b)fluoranthene | 1,400 |
| Benzo(k)fluoranthene | 1,200 |
| Indeno(1,2,3-cd)pyrene | 1,400 |
| PCB (µg/Kg) | |
| PCB-1254 | 190 |
| Metals (mg/Kg) | |
| Lead | 282 |
| Mercury | 1.13 |
| Zinc | 182 |

| SB1708 (6-12") 11/20/2018 | |
|---|---|
| VOCs (µg/Kg) | |
| 1,1,1-Tricholorethane | 1,000 |
| cis-1,2-Dichloroethene | 3,500 |
| Tetrachloroethene | 6,500 |
| Trichloroethene | 1,200 |
| SVOCs (µg/Kg) | |
| Benzo(a)pyrene | 1,700 |
| Benzo(b)fluoranthene | 2,100 |
| Benzo(k)fluoranthene | 2,100 |
| Indeno(1,2,3-cd)pyrene | 1,300 |
| Benzo(k)fluoranthene | 870 |
| Indeno(1,2,3-cd)pyrene | 2,900 |
| Pesticides (µg/Kg) | |
| 4,4,4-DDT | 280 |
| PCB (µg/Kg) | |
| PCB-1260 | 5,400 |
| Metals (mg/Kg) | |
| Arsenic | 16.6 |
| Cadmium | 18.9 |
| Chromium | 56.8 |
| Copper | 224 |
| Lead | 851 |
| Manganese | 1,880 |
| Mercury | 0.99 |
| Nickel | 46.5 |
| Zinc | 679 |

| SB1708 (12-24") 11/20/2018 | |
|---|---|
| VOCs (µg/Kg) | |
| 1,1,1-Tricholorethane | 3,400 |
| 1,1-Dichloroethane | 690 |
| cis-1,2-Dichloroethene | 11,000 |
| m&p -Xylene | 4,100 |
| o -Xylene | 1,900 |
| Tetrachloroethene | 39,000 |
| Toluene | 4,800 |
| trans-1,2-Dichloroethene | 420 |
| Trichloroethene | 8,800 |
| SVOCs (µg/Kg) | |
| Indeno(1,2,3-cd)pyrene | 550 |
| PCB (µg/Kg) | |
| PCB-1254 | 390 |
| Metals (mg/Kg) | |
| Arsenic | 17 |
| Cadmium | 6.64 |
| Chromium | 51.5 |
| Copper | 188 |
| Lead | 1,240 |
| Manganese | 4,920 |
| Mercury | 1.87 |
| Nickel | 43.8 |
| Zinc | 222 |

| SB1708 (7-9') 11/20/2018 | |
|---|---|
| VOCs (µg/Kg) | |
| 1,1,1-Trichloroethane | 480,000 |
| 1,1-Dichloroethane | 5,600 |
| 1,1-Dichloroethene | 1,600 |
| 1,2,4-Trimethylbenzene | 39,000 |
| 1,2-Dichlorobenzene | 7,000 |
| 1,3,5-Trimethylbenzene | 17,000 |
| Benzene | 110 |
| cis-1,2-Dichloroethene | 210,000 |
| Ethylbenzene | 210,000 |
| m&p-Xylenes | 777,000 |
| n-Propylbenzene | 8,700 |
| o-Xylene | 200,000 |
| Tetrachloroethene | 3,200,000 |
| Toluene | 390,000 |
| Trichloroethene | 200,000 |
| Vinyl Chloride | 100 |
| PCB (µg/Kg) | |
| PCB-1254 | 440 |

| SB1708 (13-15') 11/20/2018 | |
|---|---|
| VOCs (µg/Kg) | |
| 1,1,1-Tricholorethane | 4,000 |
| 1,1-Dichloroethane | 600 |
| cis-1,2-Dichloroethene | 21,000 |
| m&p -Xylene | 2,800 |
| Tetrachloroethene | 1,700 |
| Trichloroethene | 170 |

| SB1704 (0-6") 11/20/2018 | |
|---|---|
| VOCs (µg/Kg) | |
| cis-1,2-Dichloroethene | 630 |
| Tetrachloroethene | 11,000 |
| Trichloroethene | 4,600 |
| SVOCs (µg/Kg) | |
| Benz(a)anthracene | 1,800 |
| Benzo(a)pyrene | 1,600 |
| Benzo(b)fluoranthene | 1,400 |
| Benzo(k)fluoranthene | 1,600 |
| Chrysene | 1,900 |
| Indeno(1,2,3-cd)pyrene | 870 |
| Pesticides (µg/Kg) | |
| 4,4,4-DDT | 9.4 |
| Metals (mg/Kg) | |
| Lead | 208 |
| Mercury | 1.47 |
| Zinc | 197 |

| SB1704 (6-12") 11/20/2018 | |
|---|---|
| Metals (mg/Kg) | |
| Copper | 83 |
| Lead | 0.28 |

| SB1704 (12-24") 11/20/2018 | |
|---|---|
| No Exceedances | |

| SB1704 (13-15') 11/20/2018 | |
|---|---|
| VOCs (µg/Kg) | |
| Tetrachloroethene | 4,500 |
| Trichloroethene | 2,200 |

| SB1707 (0-6") 11/20/2018 | |
|---|---|
| VOCs (µg/Kg) | |
| cis-1,2-Dichloroethene | 3,300 |
| Methylene Choloride | 53 |
| Trichloroethene | 28,000 |
| Trichloroethene | 6,700 |
| SVOCs (µg/Kg) | |
| Benz(a)anthracene | 1,400 |
| Benzo(b)fluoranthene | 1,300 |
| Benzo(k)fluoranthene | 1,400 |
| Chrysene | 1,900 |
| Indeno(1,2,3-cd)pyrene | 1,000 |
| Pesticides (µg/Kg) | |
| 4,4,4-DDT | 60 |
| Dieldrin | 20 |
| Pesticides (µg/Kg) | |
| 4,4,4-DDT | 890 |
| Metals (mg/Kg) | |
| Chromium | 30.5 |
| Copper | 51 |
| Lead | 483 |
| Zinc | 3.96 |

| SB1707 (6-12") 11/20/2018 | |
|---|---|
| VOCs (µg/Kg) | |
| cis-1,2-Dichloroethene | 1,300 |
| Tetrachloroethene | 11,000 |
| Trichloroethene | 2,000 |
| PCB (µg/Kg) | |
| PCB-1254 | 340 |
| Metals (mg/Kg) | |
| Lead | 302 |
| Mercury | 0.58 |

| SB1707 (12-24") 11/20/2018 | |
|---|---|
| No Exceedances | |

| SB1707 (13-15') 11/20/2018 | |
|---|---|
| VOCs (µg/Kg) | |
| cis-1,2-Dichloroethene | 4,500 |
| Tetrachloroethene | 120,000 |
| Trichloroethene | 11,000 |
| Pesticides (µg/Kg) | |
| 4,4,4-DDD | 6.2 |

NOTES:

1. DATA COLLECTED IN NOVEMBER-DECEMBER 2018 AND REPORTED IN SEPTEMBER 2019 REMEDIAL INVESTIGATION REPORT, PREPARED BY ENVIRONMENTAL BUSINESS CONSULTANTS

HALEY ALDRICH

8 WALWORTH STREET
BROOKLYN, NEW YORK

2019 RIR SOIL RESULTS SUMMARY MAP

AUGUST 2020

FIGURE 15

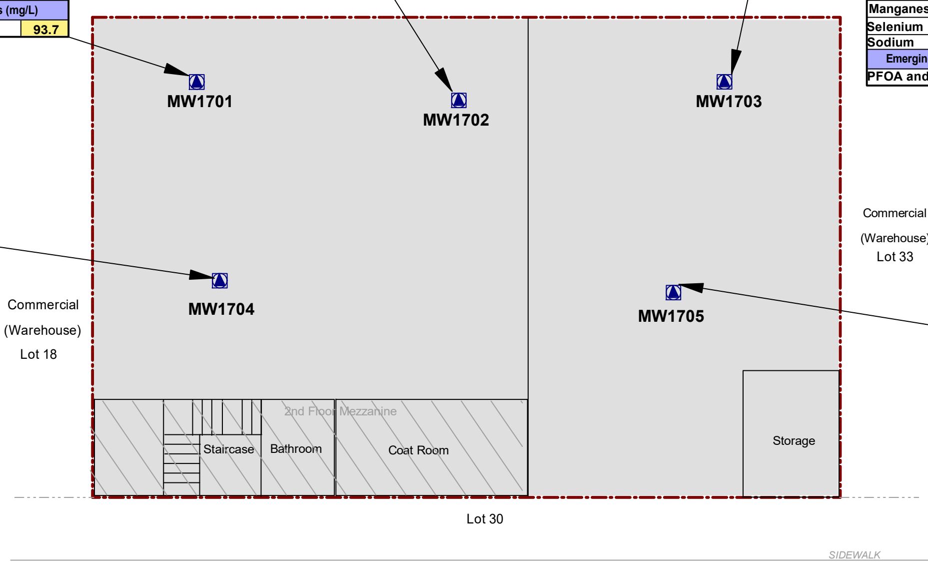
| MW1701 - 1/17/2019 | |
|---|---|
| VOCs (µg/L) | |
| 1,1,1-Trichloroethane | 140 |
| 1,1-Dichloroethane | 6.6 |
| Carbon Tetrachloride | 11 |
| Chloroform | 8.9 |
| cis-1,2-Dichloroethene | 270 |
| Tetrachloroethene | 11,000 |
| Trichloroethene | 6,200 |
| SVOCs (µg/L) | |
| Benz(a)anthracene | 0.06 |
| Benzo(a)pyrene | 0.04 |
| Benzo(b)fluoranthene | 0.05 |
| Benzo(k)fluoranthene | 0.05 |
| Chrysene | 0.05 |
| Indeno(1,2,3-cd)pyrene | 0.03 |
| Dissolved Metals (mg/L) | |
| Sodium | 93.7 |

| MW1702 - 1/17/2019 | |
|---|---|
| VOCs (µg/L) | |
| 1,1,1-Trichloroethane | 160 |
| 1,1-Dichloroethane | 29 |
| 1,1-Dichloroethene | 93 |
| 1,2,4-Trimethylbenzene | 12 |
| 1,2-Dichlorobenzene | 8.7 |
| 1,3,5-Trimethylbenzene | 11 |
| Chloroform | 29 |
| cis-1,2-Dichloroethene | 5,700 |
| Ethylbenzene | 96 |
| m&p-Xylenes | 240 |
| o-Xylene | 490 |
| Tetrachloroethene | 20,000 |
| Toluene | 200 |
| Trichloroethene | 11,000 |
| Vinyl Chloride | 130 |
| SVOCs (µg/L) | |
| Benz(a)anthracene | 0.03 |
| Benzo(b)fluoranthene | 0.03 |
| Benzo(k)fluoranthene | 0.03 |
| Chrysene | 0.04 |
| PCBs (µg/L) | |
| PCB-1254 | 29 |
| Pestcides (µg/L) | |
| 4,4'-DDD | 0.1 |
| Dieldrin | 0.044 |
| Dissolved Metals (mg/L) | |
| Iron | 3.8 |
| Manganese | 3.26 |
| Sodium | 137 |
| Emerging Contaminants (ng/L) | |
| PFOA and PFOS | 152.7 |

| MW1703 - 1/17/2019 | |
|---|---|
| VOCs (µg/L) | |
| 1,1,1-Trichloroethane | 1,100 |
| 1,1,2,2-Tetrachloroethane | 8.5 |
| 1,1-Dichloroethane | 220 |
| 1,1-Dichloroethene | 39 |
| 1,2-Dichlorobenzene | 680 |
| 1,3,5-Trimethylbenzene | 6.4 |
| 1,4-Dichlorobenzene | 100 |
| Carbon tetrachloride | 22 |
| Chloroform | 46 |
| cis-1,2-Dichloroethene | 11,000 |
| Ethylbenzene | 6.6 |
| m&p-Xylenes | 11 |
| Naphthalene | 51 |
| o-Xylene | 110 |
| Tetrachloroethene | 9,400 |
| Toluene | 22 |
| trans-1,2-Dichloroethene | 10 |
| Trichloroethene | 4,300 |
| Vinyl Chloride | 91 |
| SVOCs (µg/L) | |
| 2-Methylphenol (o-cresol) | 1.8 |
| Benz(a)anthracene | 0.05 |
| Benzo(a)pyrene | 0.03 |
| Benzo(b)fluoranthene | 0.04 |
| Benzo(k)fluoranthene | 0.03 |
| Chrysene | 0.05 |
| Indeno(1,2,3-cd)pyrene | 0.03 |
| Naphthalene | 42 |
| PCBs (µg/L) | |
| PCB-1254 | 0.24 |
| Dissolved Metals (mg/L) | |
| Manganese | 5.54 |
| Selenium | 0.136 |
| Sodium | 155 |
| Emerging Contaminants (ng/L) | |
| PFOA and PFOS | 211.1 |

| MW1705 - 1/17/2019 | |
|---|---|
| VOCs (µg/L) | |
| 1,1,1-Trichloroethane | 1,700 |
| 1,1-Dichloroethane | 550 |
| 1,1-Dichloroethene | 36 |
| 1,2,4-Trimethylbenzene | 91 |
| 1,2-Dichlorobenzene | 46 |
| 1,3,5-Trimethylbenzene | 34 |
| 1,4-Dichlorobenzene | 8.1 |
| Chloroethane | 5.9 |
| Chloroform | 1.9 |
| cis-1,2-Dichloroethene | 3,700 |
| Ethylbenzene | 320 |
| Isopropylbenzene | 11 |
| m&p-Xylenes | 1,100 |
| Naphthalene | 25 |
| n-Propylbenzene | 17 |
| o-Xylene | 370 |
| Tetrachloroethene | 9,200 |
| Toluene | 2,100 |
| trans-1,2-Dichloroethene | 7 |
| Trichloroethene | 1,800 |
| Vinyl Chloride | 89 |
| SVOCs (µg/L) | |
| 2-Methylphenol (o-cresol) | 8.7 |
| Benz(a)anthracene | 0.69 |
| Benzo(a)pyrene | 0.21 |
| Benzo(b)fluoranthene | 0.57 |
| Benzo(k)fluoranthene | 0.43 |
| Bis(2-ethylhexyl) phthalate | 5.1 |
| Chrysene | 0.92 |
| Indeno(1,2,3-cd)pyrene | 0.29 |
| Naphthalene | 12 |
| PCBs (µg/L) | |
| PCB-1254 | 0.83 |
| Dissolved Metals (mg/L) | |
| Manganese | 4.75 |
| Selenium | 0.029 |
| Sodium | 95.8 |
| Emerging Contaminants (ng/L) | |
| PFOA and PFOS | 928 |

| MW1704 - 2/11/2019 | |
|---|---|
| VOCs (µg/L) | |
| 1,1,1-Trichloroethane | 100 |
| Carbon Tetrachloride | 21 |
| Chloroform | 7.2 |
| cis-1,2-Dichloroethene | 180 |
| Tetrachloroethene | 7,800 |
| Trichloroethene | 3,700 |
| Dissolved Metals (mg/L) | |
| Manganese | 2 |
| Sodium | 84.6 |
| Emerging Contaminants (ng/L) | |
| PFOA and PFOS | 292.7 |




KEY:

Property Boundary

Existing Building

2nd Floor Mezzanine

MW170x Monitoring Well Location

SCALE:

0 10 20

1 Inch = 20 feet

HALEY ALDRICH

8 WALWORTH STREET
BROOKLYN, NEW YORK

2019 RIR GROUNDWATER RESULTS SUMMARY MAP

AUGUST 2020

FIGURE 16

**NOTES:**

1. DATA COLLECTED JANUARY-FEBRUARY 2019 AND REPORTED IN SEPTEMBER 2019 REMEDIAL INVESTIGATION REPORT, PREPARED BY ENVIRONMENTAL BUSINESS CONSULTANTS

## APPENDIX A

## Supplemental Remedial Investigation Work Plan

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# SUPPLEMENTAL INVESTIGATION WORK PLAN
8 WALWORTH 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. 134860-002
April 2020

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

28 April 2020
File No. 134860-002

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

Attention: Mr. Aaron Fisher

Subject: Supplemental Remedial Investigation Work Plan
8 Walworth Street
Brooklyn, New York
NYSDEC Site C224239

Dear Mr. Fisher,

On behalf of Toldos Yehudah LLC (Toldos Yehudah), Haley & Aldrich of New York (Haley & Aldrich) is submitting for the review and approval of the New York State Department of Environmental Conservation (NYSDEC) this revised Supplemental Remedial Investigation Work Plan (SRIWP) for 8 Walworth Street located in the Bedford Stuyvesant neighborhood of Brooklyn, New York (Site). This SRIWP 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

Enclosures

c: Fischel Miller, Toldos Yehudah LLC
Heide Dudek, NYSDEC, Section Chief
Jane O'Connell, NYSDEC, RHWRE
Angela Martin, NYSDOH Project Manager
Scarlett McLaughlin, NYSDOH, Region 2 Chief

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## Table of Contents

**Table of Contents**

## List of Tables



## List of Figures

# 1. Introduction

On behalf of Toldos Yehudah LLC (Toldos Yehudah), Haley & Aldrich of New York (Haley & Aldrich) has prepared this Supplemental Remedial Investigation Work Plan (SRIWP) for 8 Walworth Street located in the Bedford Stuyvesant neighborhood of Brooklyn, New York (the Site). The Site, identified as Block 1715 Lot 33 on the New York City tax map, is 3,910-square feet (sf) and is bounded by a vacant lot to the north, a warehouse to the south, Walworth Street to the east, and a vacant lot to the west. The Site is currently a vacant one-story warehouse encompassing the entire lot and the land is currently zoned as manufacturing M1-2. The Site location is shown on Figure 1. Existing Site features are shown on Figure 2.

The Site is currently in the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) identified as NYSDEC Site Number C224239 with Toldos Yehudah listed as a participant. The Site was operated by Techtronics Ecological Corporation (Techtronics) from 1962 through the 1990s. The Site is also identified in the Resource Conservation and Recovery Act (RCRA) database as a Large Quantity Generator under RCRA ID NYD000824334.

## 1.1 PURPOSE

As part of the BCP requirements, a Remedial Investigation (RI) was conducted at the Site from November 2018 through February 2019. A Remedial Investigation Report (RIR), dated 9 September 2019, was submitted to NYSDEC by Environmental Business Consultants (EBC). On 12 November 2019, NYSDEC responded to EBC's submission noting the RIR indicated the presence of elevated chlorinated volatile organic compounds (CVOCs) in soil, groundwater and soil vapor at the Site. Based on the RIR findings, NYSDEC requested additional vertical delineation of the nature and extent of CVOC contamination both on and offsite.

This SRIWP addresses the comments discussed in the 12 November 2019 and the 27 January 2020 response letters from NYSDEC, the 17 January 2020 response letter from the New York State Department of Health (NYSDOH), as well as comments discussed during an onsite meeting attended by Haley & Aldrich, NYSDEC and NYSDOH on 26 February 2020. The proposed supplemental investigation activities

included herein will provide the additional delineation requested and confirm direction of groundwater flow beneath the Site. The request for an offsite vapor intrusion assessment will be addressed in an Offsite Vapor Intrusion Study Work Plan to be submitted to the NYSDEC in a separate addendum to this SRIWP in July-August 2020.

# 2. Background

## 2.1 CURRENT LAND USE

The Site is currently improved with a vacant one-story warehouse constructed in 1982 and accessed from Walworth Street to the east.

## 2.2 SITE HISTORY

The Site was developed as early as 1887 with a one-story residence and shed on the south side of the property, a two-story storefront building with single story garage in the middle of the Site along Walworth Street, and a three-story residence on the north side of the Site. The surrounding vicinity was primarily developed with residences, commercial buildings and industrial/manufacturing use facilities. The Site remained largely unchanged through the early 1900s.

By 1918 the adjoining property to the west was occupied by a junk yard and developed into an indoor parking garage by 1935. The Site remained developed with residences until 1950 when only the two-story residential structure and sheds remained present on the south side of the property. A one-story warehouse used for chemical drum storage was erected on the north side of the Site by 1965 and the northern and southern adjoining properties were used for paint storage and mixing in the mid-1960s. By 1977 the two-story residence to the north was no long present but the chemical drum warehouse remained. In 1982, the Site was redeveloped with the existing one-story warehouse building, occupied by Techtronics and utilized for the mixing and storage of paints and other coatings. The adjoining property to the north was partially included in the Techtronics facility and labeled as “Techtronics A” with the 8 Walworth Site reported as “Techtronics B.” Techtronics ceased operations in the 1990s. The Site and neighboring properties have remained largely unchanged through the present.

## 2.3 SURROUNDING LAND USE

The Site is located in a mixed use residential, commercial and light industrial area. The Site is bounded by a vacant lot to the north, a warehouse to the south, Walworth Street to the east beyond which are warehouse buildings and a vacant lot to the west. The vacant lot to the north, 480 Flushing Avenue, and the vacant lot to the west, 11 Spencer Street, are both currently enrolled in the NYSDEC BCP as Site Numbers C224259 and C224204, respectively, due to similar contaminants of concern. Eight schools or daycare facilities are located with one-quarter mile radius of the Site. The properties immediately surrounding the Site are zoned M1-2.

## 2.4 PREVIOUS INVESTIGATIONS

<u>*Phase II Environmental Site Assessment*, 26 December 2007, Prepared by P.W. Grosser Consulting</u>

P.W. Grosser Consulting (PWG) performed a Phase II Environmental Site Assessment (ESA) at the Site in December 2007. Investigation activities included collection of four soil samples, two groundwater samples from temporary groundwater sampling points and two groundwater samples from existing onsite monitoring wells. Analytical results indicated that soil and groundwater beneath the Site have been impacted with VOCs, including trichloroethylene (TCE), tetrachloroethylene (PCE), 1,1-

dichlroethene (1,1-DCE) and cis-1,2-dichlroethene (cis-1,2-DCE) and polycyclic aromatic hydrocarbons, including benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, naphthalene, and phenanthrene.

*Soil Vapor Intrusion Report*, 15 May 2017, Prepared by Environmental Business Consultants

In accordance with the Soil Vapor Intrusion Work Plan submitted in March 2017, EBC performed a vapor intrusion sampling event at the Site in order to determine if the chlorinated solvents detected in shallow soil and groundwater on an adjacent property (BCP Site No. C224204) were off-gassing and migrating into the Site building. In March 2017, EBC installed two sub-slab soil vapor implants and collected one indoor air and one outdoor air sample. Results found CVOCs including PCE, TCE, carbon tetrachloride, 1,1-DCE, 1,1-dichloroethane (1,1-DCA), 1,1,1-trichloroethan (1,1,1-TCA), cis-1,2-DCE and vinyl chloride in both of the sub-slab soil gas samples. PCE and TCE were also detected in indoor air at concentrations above New York State Department of Health (NYSDOH) recommended action levels. Based on elevated concentrations of CVOCs in indoor air and sub-slab vapor, EBC concluded that sub-slab vapors were affecting indoor air quality of the Site. However, the source of the impact was not determined to be onsite or from the adjacent BCP site(s) where CVOC impacts were reported at concentrations an order of magnitude higher than at the Site.

*Phase I Environmental Site Assessment Screening,* May 2017, Prepared by EBC

EBC completed a partial Phase I Environmental Site Assessment in May 2017 in which historic Sanborn fire insurance maps, historic aerial photographs, historic topographic maps and city directory listings were reviewed. According to the review of these sources, the Site was formerly used by Techtronics, a manufacturer of paints and coatings. The Site was listed in the CORRACTS, RCRA and NY MANIFEST databases for handling and generation of hazardous materials have been handled at the Site dating back as early as 1980. Techtronics was also listed as a large quantity generator (LQG) for a few years in the early 1980s  (RCRA ID NYD000824334). Materials handled at the Site includes ignitable waste, CVOCs, chlorinated fluorocarbons, halogenated solvents, acetone and petroleum-based materials. The Site is also listed on the NYSPILLS database related to one open spill incident (Spill No. 0710116), which was reported on 21 December 2007 when chlorinated solvent contamination was identified in soil and groundwater by PWG during the Phase II Investigation. The contaminants identified were thought to be associated with the historic manufacturing of lacquer and paints at the Site.

*Remedial Investigation Report,* 9 September 2019, Prepared by EBC, Prepared for NYSDEC

As part of the BCP requirements, EBC performed an RI at the Site from November 2018 through February 2019 and submitted an RIR summarizing the findings to NYSDEC on 9 September 2019.  The RI included collection of soil, groundwater and soil vapor samples throughout the Site. A total of eight soil borings were advanced to 15 feet below ground surface (ft bgs). Four to six soil samples were collected from each boring from depth intervals including 0-6 inches, 6-12 inches, 0-24 inches and the depth of the soil groundwater interface (approximately 12 ft bgs) for a total of 39 soil samples. Five monitoring wells (MW1701 through MW1705) were installed at the Site to depths of 18-21 ft bgs with 10 ft of 0.010-inch PVC well screen at the base of the well. Groundwater samples were collected from each well using low-flow groundwater purging techniques in January and February 2019.

The RIR findings reported CVOC contamination in soil, specifically PCE, TCE and cis-1,2-DCE, across the Site with the highest concentrations identified in the borings installed on the northern portion of the property. The highest concentrations were found in SB1708 (located in the northeast corner of the site) with PCE detected at 3,200,000 µg/kg, TCE detected at 200,000 µg/kg and cis-1,2-DCE at 210,000 µg/kg. Elevated concentrations of CVOCs were also detected in the deeper intervals of SB1705 from 13-15 ft bgs (PCE 440,000 µg/kg, TCE 26,000 µg/kg and cis-1,2-DCE 38,000 µg/kg) and in SB1702 from 7-9 ft bgs (PCE 680,000 µg/kg, TCE 28,000 µg/kg). With the exception of SB1703, shallow soil samples found slightly elevated CVOC concentrations above Unrestricted Use Soil Cleanup Objectives (SCOs) but below Restricted Commercial SCOs. The soil sample collected from 6-12 inches bgs in SB1703 found elevated PCE at 370,000 µg/kg exceeding the Industrial Use SCO.

Elevated CVOCs in groundwater were found above NYSDEC Ambient Water Quality Standards (AWQS) throughout the Site with the areas of greatest impact correlating with the areas of greatest soil impact. PCE, TCE and cis-1,2-DCE were detected above the AWQS in each monitoring well with the highest concentrations of PCE and TCE found in the MW1702, located on the central western site boundary, and MW1701, located in the southwest corner. In MW1702, PCE was detected at 20,000 µg/L, TCE at 11,000 µg/L, and cis-1,2-DCE at 5,700 µg/L. In MW1701, PCE was detected at 11,000 µg/L, TCE at 6,200 µg/L and cis-1,2-DCE at 270 µg/L. The highest concentrations of cis-1,2-DCE were detected in MW1703, located in the northwest corner, at 11,000 µg/L and PCE at 9,400 µg/L and TCE at 4,300 µg/L. CVOC concentrations at MW1704 and MW1705, located in the southeast and northeast corners of the Site respectively, also showed elevated CVOCs in groundwater but at levels lower than observed on the northern and western portions of the Site.

Results of soil vapor sampling found elevated CVOCs in all soil vapor samples with total concentrations ranging from 825 µg/m$^3$ to 1,150,564 µg/m$^3$. The greatest concentrations were reported in SS1 near the western property line with PCE detected at 590,000 µg/m$^3$, TCE at 488,000 µg/m$^3$ and cis-1,2-DCE at 36,400 µg/m$^3$.

Additional contaminants of concern include metals, specifically copper, lead, zinc, barium, cadmium, selenium, mercury arsenic, chromium, manganese and nickel, which were found above Unrestricted Use SCOs in shallow soil samples reaching 2 ft bgs in multiple locations throughout the Site. Mercury, barium, lead and cadmium were also identified above Restricted Commercial SCOs in several shallow samples as well as arsenic found above Restricted Industrial SCOs in shallow soil at two locations. Semi-volatile organic compounds (SVOCs), including polycyclic aromatic hydrocarbons (PAHs) such as benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, indeno(1,2,3-cd)pyrene were also identified above Unrestricted Use SCOs in shallow soil samples reaching 2 ft bgs in multiple locations throughout the Site. Dibenzo(a,h)anthracene and benzo(a)anthracene were found above Restricted Commercial SCOs in the 0.5-1 ft bgs interval in three locations. Benzo(a)pyrene was found exceeding Restricted Industrial SCOs in shallow soils extending to 2 ft bgs in multiple locations. Evidence of metals and PAHs in shallow soils is consistent with urban fill found throughout the area.

## 2.5 REGULATORY STATUS SUMMARY

On 12 November 2019, NYSDEC responded to EBC regarding the September 2019 RIR. In response, NYSDEC noted that RIR indicated the presence of elevated CVOCs in soil, groundwater and soil vapor at the Site. Based on the RIR findings, NYSDEC required additional vertical delineation of the nature and extent of CVOC contamination both on and offsite.

EBC submitted a SRIWP to NYSDEC on 22 January 2020. NYSDEC responded on 27 January 2020 that the SRIWP was not in compliance with the RIR response letter dated 12 November 2019 or an in-person scope discussion meeting between representatives of NYSDEC and EBC conducted on 8 January 2020. Along with this response NYSDEC included formal comments on the SRIWP and requested revisions.

In February 2020, Haley & Aldrich was retained as the environmental consultant for the Site. On 26 February 2020 representatives from NYSDEC, NYSDOH and Haley & Aldrich met at the Site to review current Site status and the requirements for supplemental investigation.

## 2.6 ADJACENT SITE(S) SUMMARY

The vacant lot to the north, 480 Flushing Avenue, and the vacant lot to the west, 11 Spencer Street, are both currently enrolled in the NYSDEC BCP due to similar contaminants of concern.

### 2.6.1 11 Spencer Street (BCP Site C224204)

The property located adjoining the Site to the west, 11 Spencer Street, is enrolled in the BCP as Site C224204. In March 2015, ITF Corporation (former owner) filed an application with the NYSDEC, to admit the property into the BCP. The application accepted into the BCP with ITF Corporation classified as a "Participant". In May 2015, The W Group of Brooklyn LLC (the current Respondent), as the new owner of the property, filed an amendment to the Brownfield Cleanup Agreement (BCA) to replace ITF as Requestor. The amended BCA was executed by NYSDEC on 16 March 2015 and subsequently amended to reflect the new ownership on 20 May 2015.

A series of subsurface investigations were performed at the Site by a potential purchaser, the former owner, and the current owner from 2014-2016. Investigations were performed by EBC and Goldberg Zoino Associates (GZA) and identified contaminants of concern similar to the Site including CVOCs, petroleum related VOCs, PAHs, and metals. The results of the subsurface investigations indicated the potential presence of three separate chlorinated solvent plumes located to the west (presumably upgradient, of the 11 Spencer/8 Walworth Site), within the 11 Spencer Site and a commingled plume on the eastern portion of the 11 Spencer Site and western portion of the 8 Walworth Site. As part of the investigation, EBC installed temporary wells along Walworth Street, presumably downgradient of the 11 Spencer and 8 Walworth Street sites, and identified low levels of PCE, TCE and elevated levels of cis-1,2-DCE in TSP4. A copy of the plume maps and groundwater data presented by GZA from the 11 Spencer Investigation are shown in Appendix B.

In March 2017 NYSDEC requested a soil vapor extraction/air sparging (SVE/AS) Interim Remedial Measure (IRM) for the property. The Respondent submitted a IRM Work Plan (IRMWP) in June 2017 which was approved by the NYSDEC in August 2017. An updated IRMWP was submitted in November 2017 and approved in February 2018. As per the Consent Order from NYSDEC dated 12 December 2018, the activities proposed in the IRMWP were not completed in a timely manner due to delays in the foundation design process. Both IRM work plans were transmitted to the respective repositories.

On 7 May 2018, NYSDEC sent the Respondent correspondence indicating the Department's objection to the pace and progress of the remedial program at the property. A revised schedule was submitted to NYSDEC in June 2018. NYSDEC informed the Respondent the revised schedule was not acceptable and on 11 July 2018 the Respondent was notified that the BCA was terminated pursuant to 6 NYCRR § 375-3.5(c).

According to the Consent Order dated 12 December 2018, the Respondent was granted continuance of its participation in the BCP under the terms of the 2015 BCA and amendment. On 1 November 2019 a second amendment to the BCA was accepted by the NYSDEC (Amendment 2). Amendment 2 added two additional tax parcels to the agreement including 15 Spencer Street, located south of 11 Spencer Street, and 466 Flushing Avenue, located north of 11 Spencer Street.

#### 2.6.2 480 Flushing Avenue (BCP Site C224259)

The property located adjoining the Site to the north, 480 Flushing Avenue, is enrolled in the BCP as Site C224259. The southern portion of the property was formerly part of the Techtronics facility which operated from between 1962 to the 1990s. In 2011, a portion of the Site (Lot 33) was transferred to 480 Flushing Avenue (Lot 30).

An Environmental Phase II Investigation was conducted by Alpha-Hydro Environmental Services in 2014 to investigate historic uses of the property for vehicle repairs. Results indicated impact to groundwater below the property including PCE and PCE breakdown products TCE and cis-1,2-DCE, as well as chloroform detected at concentrations exceeding the NYSDEC Class GA groundwater standards.

An Order on Consent and Administrative Settlement Index No. CO 2-20171106-379 ("Order on Consent") was executed on 1 February 2018, between the NYSDEC and 480 Flushing LLC. Sampling conducted in accordance with this Order on Consent as well as a Site Characterization Work Plan, submitted by Laurel Environmental Associates, Ltd. in May 2018, was completed in June 2018. Findings of this Site Characterization found elevated concentrations of VOCs, SVOCs, PCBs and metals in surface and subsurface soil samples that exceeded both the NYSDEC Part 375 Unrestricted and Restricted Use SCOs. Groundwater analytical results found concentrations of VOCs, SVOCs and metals exceeding the NYSDEC Class GA groundwater standards. Specifically, contaminants in groundwater included petroleum-related and CVOCs. Several petroleum related and CVOCs were also detected in soil vapor in one or more of the samples. Consultants AMC Engineering PLLC (AMC) and EBC were retained and submitted a Means & Methods for Excavation, Soil Handling and Disposal in November 2018 outlining procedures to be included in the remedy.

The property was entered into the BCP and an executed BCA was completed on 2 April 2019. The NYSDEC requested a SRIWP for the property. Comments on the SRIWP were provided by NYSDEC and NYSDOH in January 2020 requesting an offsite vapor intrusion study at several nearby offsite parcels. Additional comments included installation of monitoring wells to 35 ft bgs, addition of a community air monitoring plan and updates to the Quality Assurance Project Plan (QAPP). A revised Supplemental Work Plan was submitted by EBC in February 2020. NYSDEC is currently reviewing the work plan and will provide comment.

### 2.6.3 Spencer Street Groundwater Plume Trackdown

The NYSDEC is currently working on a detailed environmental study of the Spencer Street Plume Trackdown located in the Spencer Street area of Brooklyn, NY. NYSDEC is continuing to perform an investigation of the plume trackdown study area which will assess the area's conditions and identify sources of chlorinated solvent contamination within the study area. Documentation of the results from this study have not been made available at this time.

# 3. Remedial Investigation

This section describes the field activities to be conducted during the SRI 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 1 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

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/or private vendors will be contacted for assistance with markout of utilities. Once the utilities are marked, field equipment and personnel will be mobilized to the Site.

## 3.2 SOIL SAMPLING

Based on the previous data, the source area appears to originate in the northern half of the property. The inferred extent of the plume is shown on Figure 4. To further characterize surface soil conditions, additional onsite soil samples will be collected to meet NYSDEC DER-10 requirements for remedial investigations.

Soil samples representative of Site conditions will be collected at the five proposed onsite locations. The sampling and analysis plan is summarized in Table 1 and shown in Figure 3. A minimum of two soil samples will be collected from each location at the 30-35 ft bgs interval and 40-45 ft bgs interval and additional samples will be collected from any interval exhibiting elevated photoionization detector (PID) readings and/or visual and olfactory impacts. Soil will be logged continuously during boring installation and logs will be submitted in a Supplemental Remedial Investigation Report (SRIR). Soil samples will be collected from acetate liners using a stainless-steel trowel or sampling spoon. Samples will be collected using laboratory provided clean bottleware. VOC grab samples will be collected using terra cores or equivalent.

If physical evidence of contamination is observed at 45 ft bgs soil samples will be collected in 5-foot increments until physical contamination is no longer observed. Soil samples will be placed on hold at the laboratory facility and analyzed pending results of the 40-45 ft bgs soil sample.

Soils will be logged continuously by a geologist or engineer using the Unified Soil Classification System. The presence of staining, odors and PID response will be noted in soil boring logs which will be included in a SRIR.

All samples will be analyzed by a New York State Environmental Laboratory Approval Program (ELAP) certified laboratory. Sampling methods are described in the Field Sampling Plan (FSP) provided as Appendix B. A QAPP is provided as Appendix C. Laboratory data will be reported in ASP Category B deliverable format. As further detailed in Section 5.1, sampling results will be validated and submitted to the NYSDEC as an electronic database deliverable (EDD) package.

Soil samples will be analyzed for:

- Target Compound List (TCL) VOCs using EPA method 8260B
- PCBs using EPA method 8082
- TAL / Part 375 List metals (including cyanide and hexavalent and trivalent chromium) by USEPA Methods 6010C/7471B/9010C/7196A

Additionally, soil samples will be collected from 10-12 ft bgs (approximately two feet above the groundwater interface encountered at 12 ft bgs) at one location within the source area (B05) and one location outside of the source area (B01) and will be analyzed for the following emerging contaminants:

- NYSDEC and Per- and Polyfluoroalkyl Substances (PFAS) List (21 compounds) by USEPA Method 537; and
- 1,4-dioxane by USEPA Method 8270

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 DECs Part 375 Remedial Programs," respectively. While PFAS were identified in groundwater during the previous investigation, the historic Site operations are unlikely to have contributed significantly to the concentrations. Historic Site use at the surrounding properties is more likely to have contributed to PFAS concentrations. Specifically, the property directly to the west was a manufacturer with industrial activities that included metal etching/plating, wire manufacturing and semiconductor manufacturing. Additionally, properties to the east and southeast include an adhesive manufacturer (still in operation), a tannery, a foundry and a casting cleaning and grinding operation.

### 3.3 GROUNDWATER SAMPLING

The purpose of the groundwater sampling is to vertically delineate the CVOC contamination and evaluate the direction of groundwater flow.

Two-inch nested permanent monitoring wells will be installed in five locations onsite Monitoring well clusters will include a shallow well to 20 ft bgs, intermediate well to 35 ft bgs and a deep well to 50 ft bgs. Wells will be installed with a minimum of 2-inch annular space, with flush mount manhole covers and concrete pad and will be screened with 0.010-inch slotted PVC from 12-17 ft, 30-35 ft and 45-50 ft, respectively. Wells will be installed with #00 Morie or equivalent placed to a minimum of 2 feet above the screen and a bentonite seal to be placed directly above the filter pack. Well locations are provided on Figure 3 and a proposed well construction log is provided in Appendix G. The previously installed monitoring wells by a former consultant will be decommissioned at the most appropriate time.

Monitoring wells will be developed 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 10 well volumes are removed, if possible. If 50 NTUs is not achieved and stabilized within the removal of the first 10 well volumes, NTUs and remaining parameters of the development water must be stabilized for three consecutive readings. Well development logs will be submitted in the SRIR. The well casings will be surveyed by a New York State licensed surveyor to facilitate preparation of a groundwater contour map and determine the direction of groundwater flow.

Groundwater samples from the shallow, intermediate and deep groundwater zones will be collected from each location and analyzed for the following parameters:

- TCL VOCs using EPA method 8260; and
- PCBs using EPA method 8082A.

Additionally, groundwater samples in the shallow, intermediate and deep groundwater zones will be collected from one location within the source area (MW05) and at one location outside of the source area (MW01) and will be analyzed for the following emerging contaminants:

- NYSDEC and PFAS List (21 compounds) by USEPA Method 537; and
- 1,4-dioxane by USEPA Method 8270.

As stated previously in Section 3.2, while PFAS were identified in groundwater during the previous investigation, the historic Site operations are unlikely to have contributed significantly to the concentrations comparatively to the Site operations of the surrounding properties. As further detailed in Section 5.1, sampling results will be validated and submitted to the NYSDEC EQuIS database as an EDD package.

Groundwater samples in the shallow, intermediate and deep groundwater zones will be collected from one location within the source area (MW-05) and will be analyzed for the following parameters:

- Biogeochemical parameters; and
- Microbial array.

Biogeochemical analysis will include field measurements for Dissolved Oxygen (DO), Oxygen Reducing Potential (ORP), pH, temperature and specific conductance and field testing or laboratory analysis of carbon dioxide, nitrate, sulfate, ferrous iron, divalent manganese, total organic carbon and alkalinity. A sample will be collected from the source area for a microbial array to identify the composition of the microbial community to evaluate if sufficient dechlorinators are present to support continued degradation after source removal.

Groundwater monitoring wells will be sampled using low-flow sampling methods as described in the FSP. Following the low-flow purge, samples will be collected from monitoring wells for analysis of the analytes mentioned above. The sampling and analysis plan is summarized in Table 1 and Figure 3.

Due to the lack of certainty regarding groundwater flow direction, the scope of an offsite groundwater investigation will be fulfilled through an addendum to the SRIWP based on confirmation of groundwater flow direction determined during the SRI.

The FSP presented in Appendix B details field procedures and protocols that will be followed during field activities. The QAPP presented in Appendix C details the analytical methods and procedures that will be used to analyze samples collected during field activities.

### 3.4 SOIL VAPOR INTRUSION SURVEY

Onsite soil vapor sampling will not be performed as part of the SRI. As per the RIR response letter from NYSDEC dated 12 November 2019, the Supplemental RIWP response letter from NYSDEC dated 27 January 2020 and the Off-Site Soil Vapor Intrusion Investigation Recommendations request from the NYSDOH dated 17 January 2020, an Offsite Vapor Intrusion Study will be completed for the following properties:

1) Block 1716, Lot 18
2) Block 1717, Lot 26
3) Block 1717, Lot 29
4) Block 1717, Lot 6
5) Block 1717, Lot 31
6) Block 1717, Lot 34

Upon approval of this workplan a formal access request will be sent to the owners of the above referenced properties via certified mail. Access attempts will be documented and provided in the SRIR, further detailed in Section 8. A template of the access request is included in Appendix H.

The offsite soil vapor intrusion survey scope will coincide with the offsite groundwater investigation discussed in Section 3.3 and will be completed prior the end of the coming heating season (October 1, 2020 – March 31, 2021), pending property access.

### 3.5 INVESTIGATION DERIVED WASTE

Soil cuttings generated during monitoring well installation 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 sampling will be placed into a DOT approved 55-gallon drum pending offsite disposal. Investigation derived waste will be properly characterized and disposed of within 90 days of generation. Documentation and proof of disposal of will be submitted to NYSDEC in the SRIR.

# 4. Quality Assurance and Quality Control

Quality Assurance/Quality Control (QA/QC) procedures will be used to provide performance information with regard to 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 QAPP 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 EQuIS database in an EDD package.

## 5.2 DATA VALIDATION

Data packages will be sent to a qualified data validation specialist for evaluation of 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 usability of the data for project related decisions. Data validation will be completed in accordance with the DUSR guidelines from NYSDEC Division of Environmental Remediation. DUSRs will be included with the submittal of a Remedial Investigation Report (RIR), 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 successful completion of the project.

James Bellew will be the Qualified Environmental Professional and Principal in Charge for this work. 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 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.

Zachary Simmel will be the field engineer responsible for implementing the field effort for this work. Mr. Simmel's responsibilities will include implementing the work plan activities and directing the subcontractors to ensure successful completion of all field activities.

The NYSDEC Case Manager is Mr. Aaron Fischer (Or designated Case Manager). 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 drilling subcontractor will be Coastal Environmental Solutions, Inc. (Coastal). Coastal will provide a drill rig operator to implement the scope of work in this SRIWP.

The analytical laboratory will be Alpha Analytical of Westborough, MA, a New York 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 HASP 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 general industry as applicable based on the nature of work being performed.

## 7.2 COMMUNITY AIR MONITORING PLAN

The remedial investigation activities will be conducted in accordance with a site specific Community Air Monitoring Plan (CAMP) provided in Appendix F. Any exceedance of the CAMP criteria will be reported to NYSDEC and NYSDOH via email. 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 SRIR. 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 completion of the SRI, a summary of the RI will be provided to NYSDEC in a SRIR to support implementation of proposed remedial action. The report will include:

- Summary of the RI activities;
- Figure showing sampling locations;
- Tables summarizing laboratory analytical results;
- Laboratory analytical data reports;
- Field sampling data sheets;
- DUSRs (validated data will be submitted to the NYSDEC EQuIS database in an EDD package)
- Findings regarding the nature and extent of contamination at the Site; and
- Conclusions and recommendations.

The SRIR may be combined with the Remedial Action Work Plan (RAWP) as a RIR/RAWP. The RIR/RAWP will include all data collected during the SRI and adhere to technical requirements of DER-10.

# 9. Schedule

The Site owner plans to implement this SRIWP promptly upon approval from the NYSDEC.

| Anticipated RI Schedule | | |
|---|---|---|
| SRIWP Submission | April 2020 | |
| NYSDEC Approval of SRIWP | April/May 2020 | |
| Site Mobilization for SRI | May/June 2020 | Approximately 2-3 weeks to schedule and complete the SRI |
| Submission of SRIR | June/July 2020 | |
| Offsite Groundwater and Vapor Intrusion Study Work Plan | July/August 2020 | Pending confirmation of groundwater flow direction |
| Offsite Groundwater and Vapor Intrusion Study | September/October 2020 | Pending property access |
| Submission of RAWP | October/November 2020 | RAWP will be submitted after completion of offsite investigation work |

# References

1. Phase II Environmental Site Assessment, 12-18 Walworth Street, December 2007, Prepared by P.W. Grosser Consulting, Prepared for AAA Group

2. Soil Vapor Intrusion Report – 8 Walworth Street, May 2017, Prepared by Environmental Business Consultants, Prepared for the New York State Department of Environmental Conservation

3. Brownfield Cleanup Program Application. 8 Walworth Street, Brooklyn, New York, June 2017, Prepared by Toldos Yehudah, LLC & Environmental Business Consultants, Prepared for the New York State Department of Environmental Conservation

4. Remedial Investigation Report - 8 Walworth Street Site, September 2019, Prepared by Environmental Business Consultants, Prepared for the New York State Department of Environmental Conservation

5. Program Policy DER-10, "Technical Guidance for Site Investigation and Remediation," May 2010, Prepared by New York State Department of Environmental Conservation

\\haleyaldrich.com\share\CF\Projects\134860\Deliverables\1. Supplemental Investigation Work Plan\2020-0427-8 Walworth_SIWP-Clean D6.docx

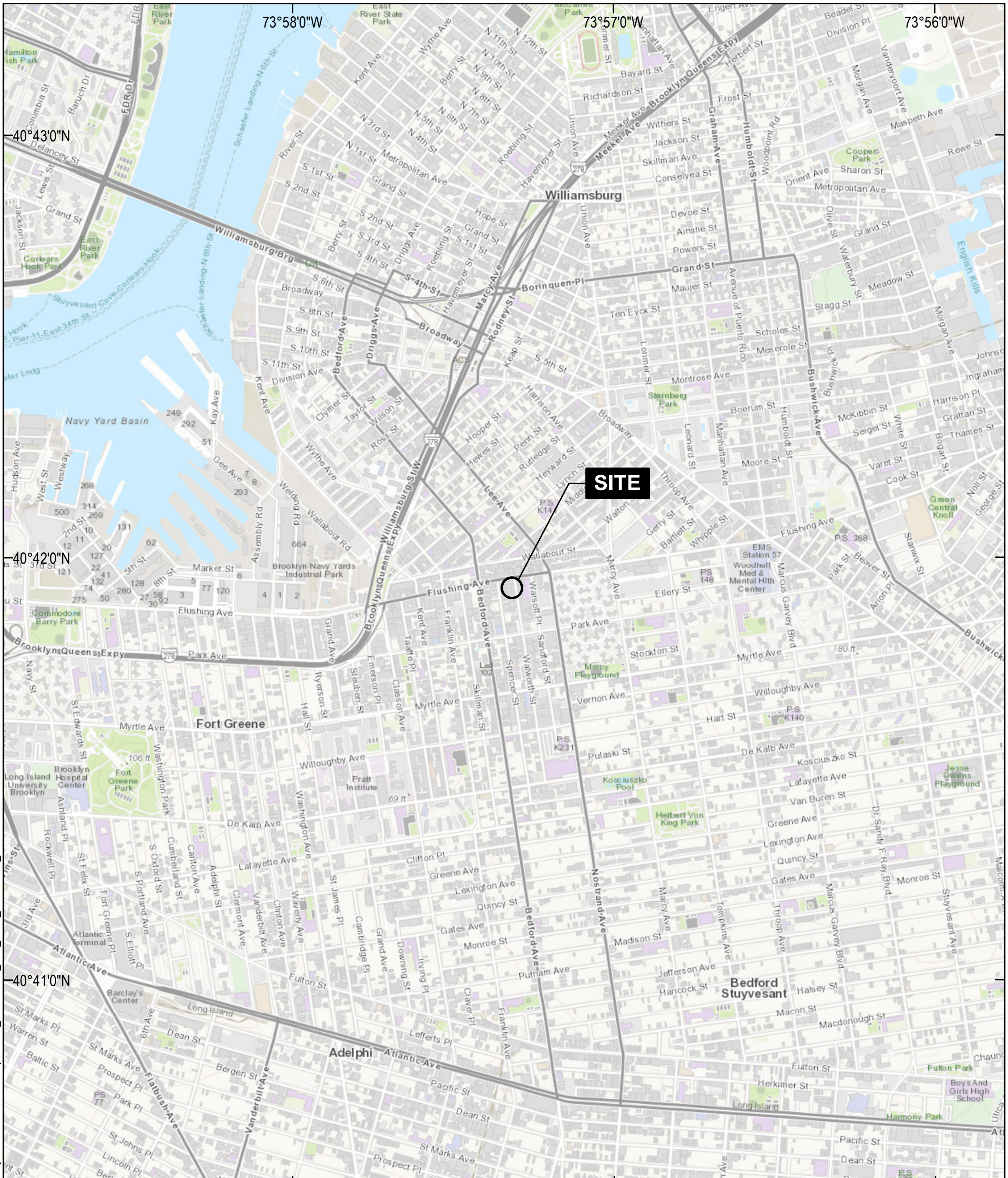
**TABLES**

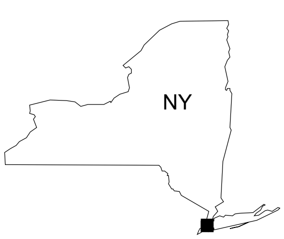
**Table 1. Sample and Analysis Plan**
8 Walworth Street, Brooklyn, NY

| Location | Soil Sample Depth | Target Compound List VOCs | Total Analyte List Metals | Cyanide, Hexavalent Chromium, Trivalent Chromium | PCBs | PFAS | 1,4-Dioxane | Biogeochemical Parameters | Microbial Array |
|---|---|---|---|---|---|---|---|---|---|
| **SOIL** | | | | | | | | | |
| B01 | 10-12' | | | | | X | X | | |
| | 30-35' | X | X | X | X | | | | |
| | 40-45' | X | X | X | X | | | | |
| B02 | 30-35' | X | X | X | X | | | | |
| | 40-45' | X | X | X | X | | | | |
| B03 | 30-35' | X | X | X | X | | | | |
| | 40-45' | X | X | X | X | | | | |
| B04 | 30-35' | X | X | X | X | | | | |
| | 40-45' | X | X | X | X | | | | |
| B05 | 10-12' | | | | | X | X | | |
| | 30-35' | X | X | X | X | | | | |
| | 40-45' | X | X | X | X | | | | |
| **GROUNDWATER** | | | | | | | | | |
| MW01 (SI/I/D) | - | X | | | X | X | X | | |
| MW02 (SI/I/D) | - | X | | | X | | | | |
| MW03 (SI/I/D) | - | X | | | X | | | | |
| MW04 (SI/I/D) | - | X | | | X | | | | |
| MW05 (SI/I/D) | - | X | | | X | X | X | X | X |

Notes:
VOCs - Volatile Organic Compounds
PCBs - Polychlorinated biphenyls
PFAS - Per- and Polyfluoroalkyl Substances
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**




N

MAP SOURCE: ESRI
SITE COORDINATES: 40°41'55"N,73°57'18"W

HALEY ALDRICH

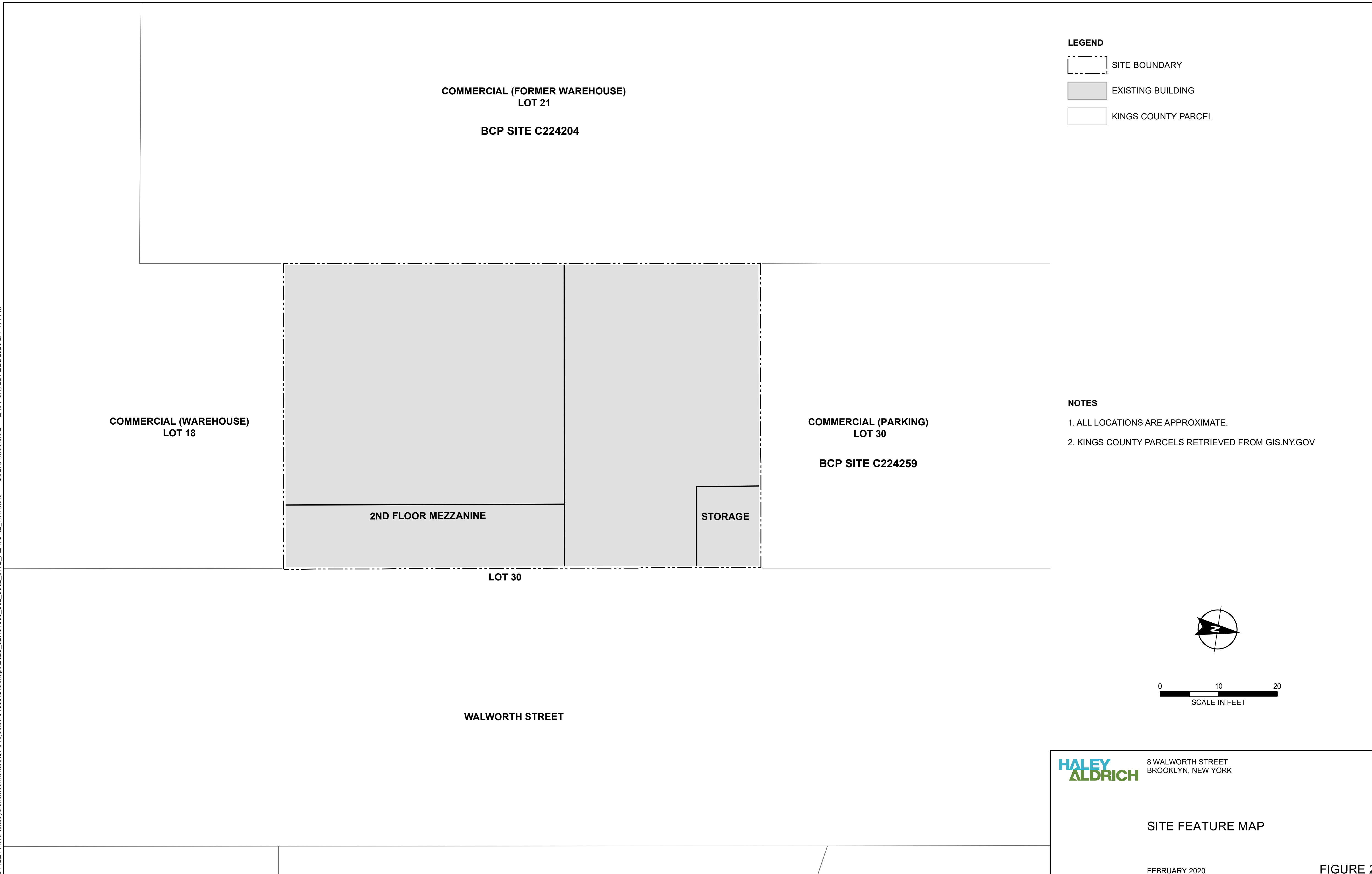
8 WALWORTH STREET
BROOKLYN, NEW YORK

PROJECT LOCUS

APPROXIMATE SCALE: 1 IN = 2000 FT
FEBRUARY 2020

FIGURE 1

GIS FILE PATH: \\haleyaldrich.com\share\CF\Projects\134860\GIS\Maps\2020_02\134860_002_0001_PROJECT_LOCUS.mxd — USER: hwachholz — LAST SAVED: 2/28/2020 4:33:58 PM

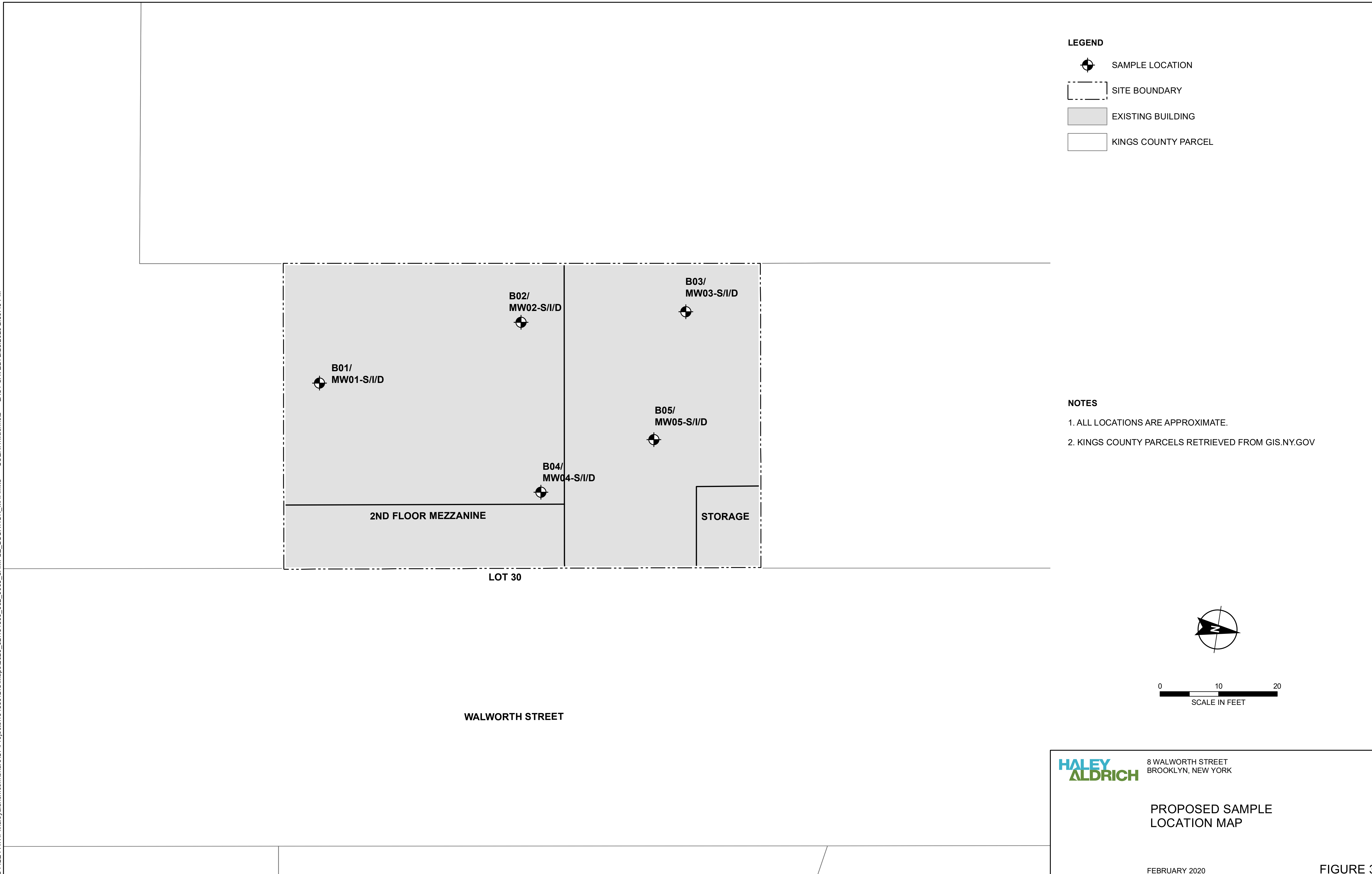



8 WALWORTH STREET
BROOKLYN, NEW YORK

SITE FEATURE MAP

FEBRUARY 2020

FIGURE 2




HALEY ALDRICH

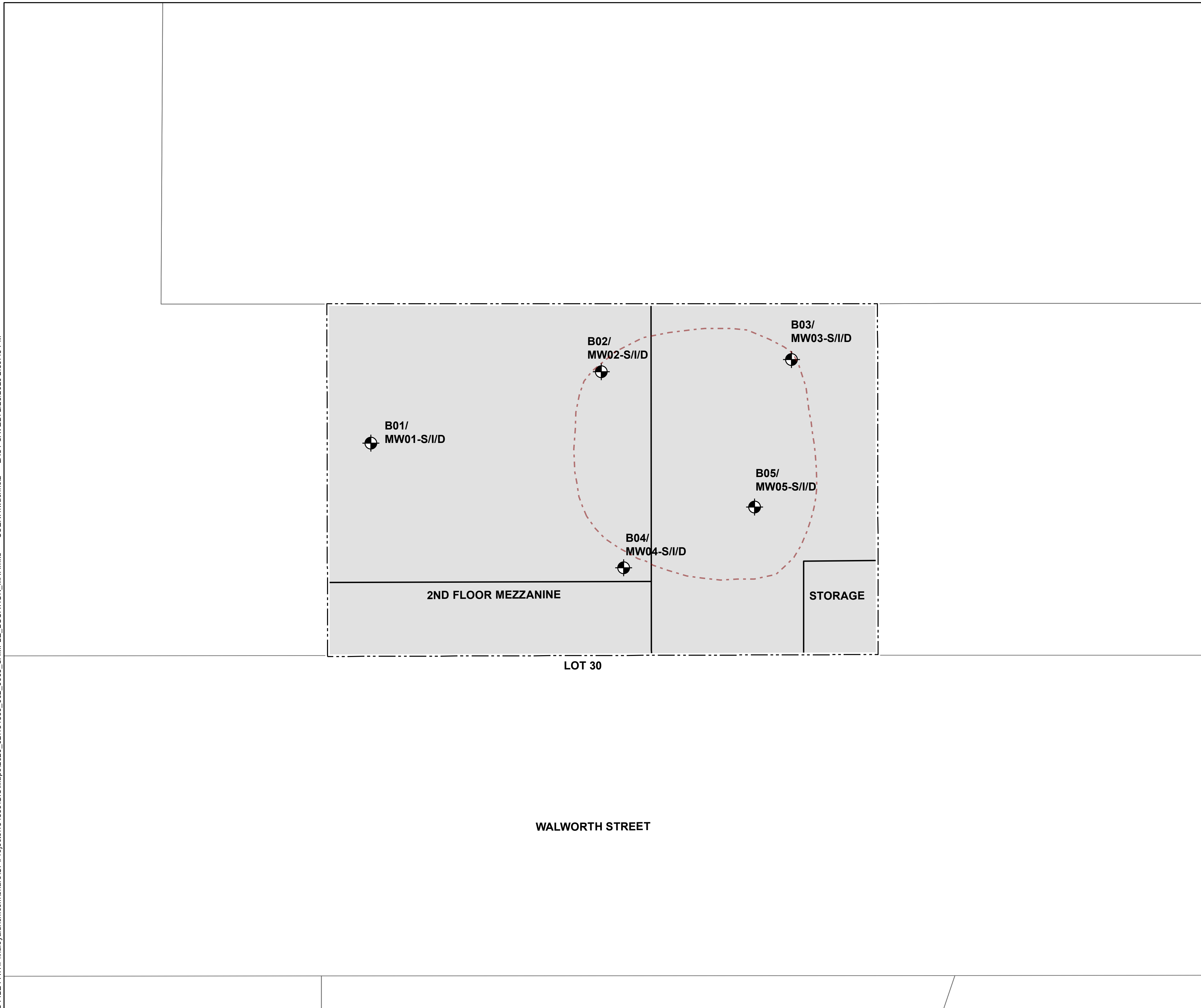
8 WALWORTH STREET
BROOKLYN, NEW YORK

PROPOSED SAMPLE LOCATION MAP

FEBRUARY 2020

FIGURE 3

GIS FILE PATH: \\haleyaldrich.com\share\CF\Projects\134860\GIS\Maps\2020_02\134860_002_0003_SAMPLE_LOCATION_MAP.mxd — USER: hwachholz — LAST SAVED: 2/28/2020 2:50:43 PM




**LEGEND**

- SAMPLE LOCATION
- SITE BOUNDARY
- EXISTING BUILDING
- KINGS COUNTY PARCEL
- INFERRED SOURCE AREA BOUNDARIES

**NOTES**

1. ALL LOCATIONS ARE APPROXIMATE.
2. KINGS COUNTY PARCELS RETRIEVED FROM GIS.NY.GOV

0 10 20
SCALE IN FEET

HALEY ALDRICH

8 WALWORTH STREET
BROOKLYN, NEW YORK

INFERRED SOURCE
AREA MAP

FEBRUARY 2020

FIGURE 4

GIS FILE PATH: \\haleyaldrich.com\share\CF\Projects\134860\GIS\Maps\2020_02\134860_002_0003_SAMPLE_LOCATION_MAP.mxd — USER: hwachholz — LAST SAVED: 2/28/2020 2:50:43 PM

# APPENDIX B

## Quality Assurance Project Plan

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# QUALITY ASSURANCE PROJECT PLAN
8 WALWORTH 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. 134860-002
March 2020

## 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 Remedial Investigation Work Plan (SRIWP) for the portion of 8 Walworth 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.

## Table of Contents

## Table of Contents

# Table of Contents

## List of Tables

# 1. Project Description

This Quality Assurance Project Plan (QAPP) has been prepared as a component of the RIWP for the 8 Walworth 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 impacts and confirm groundwater flow direction.

## 1.2 SITE DESCRIPTION AND HISTORY

The general Site description and Site history is provided in the SRIWP.

## 1.3 LABORATORY PARAMETERS

The laboratory parameters for groundwater include:

- Target Compound List volatile organic compounds (VOCs) using EPA method 8260B
- Biogeochemical parameters (SPECIFICS TBD)
- Microbial array (SPECIFICS TBD)

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 RIWP 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 RIWP 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 SRIWP 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 RIWP 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 SRIWP 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 RIWP 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 RIWP.

## 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.

# 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.

## 6.2 LABORATORY ANALYTICAL PROCEDURES

Laboratory analyses will be based on the U.S. EPA methodology requirements promulgated in:

- Method 8260B – Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)

### 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 SRIWP. 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.

$$\% \ Recovery = \frac{Spiked\ Sample - Background}{Known\ Value\ of\ Spike} x\,100\%$$

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 SRIWP 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 for groundwater and soil samples and the analysis of laboratory duplicate samples for air and soil vapor samples. Air and soil vapor laboratory duplicate sample analyses will be performed by analyzing the same SUMMA canister twice. The RPD criteria for the air/soil vapor laboratory duplicate samples will be +/- 35 % for parameters of analysis detected at concentrations greater than 5 times (5X) the laboratory reporting limit (RL).

## 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 within the Site-specific sample matrices. 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. Field completeness objective for this project will be greater than (>) 90%.

### 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. The completeness goal will be >90%.

## 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 per sample matrix.

(Note: Soil MS/MSD samples require triple sample volume for VOC only. Aqueous MS/MSD samples require triple the normal sample volume for VOC analysis and double the volume for the remaining parameters.)

# 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.

$$\frac{\text{Number of Valid Sample Results}}{\text{Total Number of Samples Planned}} X\ 100 = \%\ Complete$$



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## 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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3. United States Environmental Protection Agency, (1993). Data Quality Objectives Process for Superfund Interim Final Guidance. U.S. EPA/540/R-93-071, Office of Solid Waste and Emergency Response (OSWER), September 1993.

4. United States Environmental Protection Agency, (1992). Specifications and Guidance for Contaminant-Free Sample Containers. OSWER Directive 9240.0-05A, April 1992.

5. United States Environmental Protection Agency. U.S. EPA National Functional Guidelines for Organic Data Review. U.S. EPA 540/R-2017-002.

6. United States Environmental Protection Agency. U.S. EPA National Functional Guidelines for Organic Data Review. U.S. EPA 540/R-2017-001.

7. United States Environmental Protection Agency. Test Methods for Evaluating Solid Waste, Office of Solid Waste, U.S. EPA, SW-846, November 1986, with updates.

8. New York State Department of Environmental Conservation, NYSDEC Analytical Services Protocol (ASP), Bureau of Environmental Investigation, 1991 with updates.

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, AND SAMPLE CONTAINERS**
8 Walworth Street
Brooklyn, NY



| Analysis/Method | Sample Type | Preservation | Holding Time | Container |
|---|---|---|---|---|
| Volatile Organic Compounds/8260C | Soil | 1 - 1 Vial MeOH/2 Vial Water | 14 days | 3 - 40ml glass vials |
| Polychlorinated Biphenyls/8082A | Soil | Cool, 4 ± 2 °C | 14 days | 1 - 8 oz Glass |
| Metals/6010D | Soil | Cool, 4 ± 2 °C | 180 days | 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 | 3 - 40ml glass vials |
| Polychlorinated Biphenyls/8082A | Groundwater | Cool, 4 ± 2 °C | 14 days | 1 - 500 mL plastic bottle |
| 1,4-Dioxane/8270 SIM | Groundwater | Cool, 4 ± 2 °C | 7 days | 3 - 40ml glass vials |
| PFAS 537 | Groundwater | H2O Cool, 4 ± 2 °C | 14 days | 2 - teflon free 250 ml plastic containers |

**Notes:**
1. Refer to text for additional information.

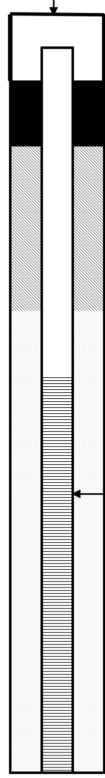
# APPENDIX C

## Well Construction Diagram

# OBSERVATION WELL INSTALLATION REPORT

| | |
|---|---|
| Well No. | SHALLOW |
| Boring No. | |

| | | | |
|---|---|---|---|
| **PROJECT** | 8 Walworth Street | **H&A FILE NO.** | 134860-002 |
| **LOCATION** | 8 Walworth Street, Brooklyn, NY | **PROJECT MGR.** | Mari Conlon |
| **CLIENT** | Toldos Yehudah, LLC | **FIELD REP.** | Zach Simmel |
| **CONTRACTOR** | Eastern Environmental Solutions | **DATE INSTALLED** | June-July 2020 |



**Type of protective cover/lock** Manhole Cover

**Ground Surface**

Grout
Bentonite Seal
#00 Morie or Equivalent

**Type of protective casing:** **Roadway box**
**Inside Diameter** 6.0 **in**

**Type of backfill around screen** #00 Morie or Equivalent (to 2 ft above screen)

**Top of well screen** 12.0 **ft**

**Type of riser pipe:** Schedule 40 PVC
**Inside diameter of riser pipe** 2.0 **in**

**Type of screen** Machine Slotted PVC
**Screen gauge or size of openings** 0.010 **in**
**Diameter of screen** 2.0 **in**

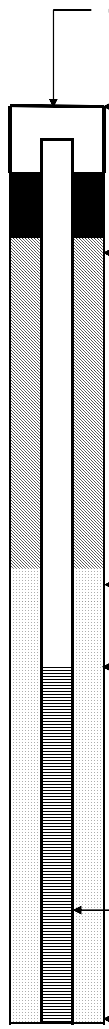
**Depth of bottom of well screen/borehole** 17-20 **ft**

**(Not to Scale)**

**COMMENTS:** General construction diagram of shallow groundwater monitoring wells.

| HALEY ALDRICH | # OBSERVATION WELL INSTALLATION REPORT | Well No. INTERMEDIATE<br>Boring No. |
|---|---|---|

| | | | |
|---|---|---|---|
| **PROJECT** | 8 Walworth Street | **H&A FILE NO.** | 134860-002 |
| **LOCATION** | 8 Walworth Street, Brooklyn, NY | **PROJECT MGR.** | Mari Conlon |
| **CLIENT** | Toldos Yehudah, LLC | **FIELD REP.** | Zach Simmel |
| **CONTRACTOR** | Eastern Environmental Solutions | **DATE INSTALLED** | June-July 2020 |



**Type of protective cover/lock** Manhole Cover

**Ground Surface**

Grout
Bentonite Seal
#00 Morie or Equivalent

**Type of protective casing:** **Roadway box**
**Inside Diameter** 6.0 **in**

**Type of backfill around screen** #00 Morie or Equivalent (to 2 ft above screen)

**Top of well screen** 26-30 **ft**

**Type of riser pipe:** Schedule 40 PVC
**Inside diameter of riser pipe** 2.0 **in**

**Type of screen** Machine Slotted PVC
**Screen gauge or size of openings** 0.010 **in**
**Diameter of screen** 2.0 **in**

**Depth of bottom of well screen/borehole** 31-35 **ft**

**(Not to Scale)**

**COMMENTS:** General construction diagram of intermediate groundwater monitoring wells.

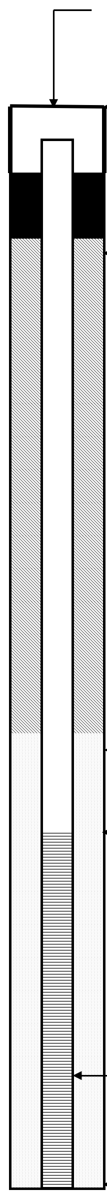
# OBSERVATION WELL INSTALLATION REPORT

| | | | |
|---|---|---|---|
| Well No. | DEEP | Boring No. | |
| PROJECT | 8 Walworth Street | H&A FILE NO. | 134860-002 |
| LOCATION | 8 Walworth Street, Brooklyn, NY | PROJECT MGR. | Mari Conlon |
| CLIENT | Toldos Yehudah, LLC | FIELD REP. | Zach Simmel |
| CONTRACTOR | Eastern Environmental Solutions | DATE INSTALLED | June-July 2020 |

**Type of protective cover/lock** Manhole Cover

**Ground Surface**

Grout
Bentonite Seal
#00 Morie or Equivalent



**Type of protective casing:** **Roadway box**

**Inside Diameter** 6.0 **in**

**Type of backfill around screen** #00 Morie or Equivalent (to 2 ft above screen)

**Top of well screen** 37.0 **ft**

**Type of riser pipe:** Schedule 40 PVC

**Inside diameter of riser pipe** 2.0 **in**

**Type of screen** Machine Slotted PVC

**Screen gauge or size of openings** 0.010 **in**

**Diameter of screen** 2.0 **in**

**Depth of bottom of well screen/borehole** 42.0 **ft**

**(Not to Scale)**

**COMMENTS:** General construction diagram of deep groundwater monitoring wells.

Form 2007

# APPENDIX D

# Well Development Logs

HALEY ALDRICH

# WELL DEVELOPMENT LOG

**Well No.** MW01-S

**Comments**
Used peristaltic and whale pumps

| | | | |
|---|---|---|---|
| **PROJECT** | 8 Walworth Street Environmental Services | **DEVELOPMENT DATE** | 6/26/2020 |
| **LOCATION** | 8 Walworth Street, Brooklyn, NY | **DEVELOPMENT START** | 640 |
| **CLIENT** | Toldos Yehudah LLC | **DEVELOPMENT END** | 705 |
| **H&A FILE NO.** | 134860-004 | **WELL DEPTH (FT)** | 20 |
| **PROJECT MANAGER** | Mari Conlon | **STATIC WATER LEVEL (FT)** | 15 |
| **FIELD REP.** | Zach Simmel | **WATER COLUMN HEIGHT (FT)** | 5 |
| **DATE INSTALLED** | 6/25/2020 | **WELL VOLUME (GAL)** | 0.815 |
| **DRILLER** | Eastern Environmental Solutions, Inc. | **TOTAL VOLUME PURGED (GAL)** | 10 |

| Time | Time Elapsed (min) | Volume (gal) | Color | Comments |
|---|---|---|---|---|
| 6:40 | 0 | 2.0 | Turbid | |
| 6:45 | 5 | 4.0 | Turbid | |
| 6:50 | 10 | 6.0 | Turbid | |
| 6:55 | 15 | 8.0 | Cloudy | |
| 7:00 | 20 | 9.0 | Slightly Cloudy | |
| 7:05 | 25 | 10.0 | Clear | Turbidity <50 NTU |

# WELL DEVELOPMENT LOG

| | |
|---|---|
| **Well No.** | **MW01-I** |
| **Comments** | Used whale pump |

| | | | |
|---|---|---|---|
| **PROJECT** | 8 Walworth Street Environmental Services | **DEVELOPMENT DATE** | 7/15/2020 |
| **LOCATION** | 8 Walworth Street, Brooklyn, NY | **DEVELOPMENT START** | 900 |
| **CLIENT** | Toldos Yehudah LLC | **DEVELOPMENT END** | 930 |
| **H&A FILE NO.** | 134860-004 | **WELL DEPTH (FT)** | 31 |
| **PROJECT MANAGER** | Mari Conlon | **STATIC WATER LEVEL (FT)** | 14.98 |
| **FIELD REP.** | Zach Simmel | **WATER COLUMN HEIGHT (FT)** | 16.02 |
| **DATE INSTALLED** | 7/9/2020 | **WELL VOLUME (GAL)** | 2.611 |
| **DRILLER** | Eastern Environmental Solutions, Inc. | **TOTAL VOLUME PURGED (GAL)** | 7 |

| Time | Time Elapsed (min) | Volume (gal) | Color | Comments |
|---|---|---|---|---|
| 9:00 | 0 | 0.5 | Cloudy | |
| 9:05 | 5 | 1.0 | Slightly Cloudy | |
| 9:10 | 10 | 1.75 | Slighlty Cloudy | |
| 9:15 | 15 | 2.25 | Clear | |
| 9:20 | 20 | 4.5 | Clear | |
| 9:25 | 25 | 5.75 | Clear | |
| 9:30 | 30 | 7.0 | Clear | Turbidity <50 NTU |

# WELL DEVELOPMENT LOG

| | |
|---|---|
| **Well No.** | MW02-S |
| **Comments** | Used peristaltic pump |

| | | | |
|---|---|---|---|
| **PROJECT** | 8 Walworth Street Environmental Services | **DEVELOPMENT DATE** | 6/30/2020 |
| **LOCATION** | 8 Walworth Street, Brooklyn, NY | **DEVELOPMENT START** | 900 |
| **CLIENT** | Toldos Yehudah LLC | **DEVELOPMENT END** | 930 |
| **H&A FILE NO.** | 134860-004 | **WELL DEPTH (FT)** | 17 |
| **PROJECT MANAGER** | Mari Conlon | **STATIC WATER LEVEL (FT)** | 15.92 |
| **FIELD REP.** | Zach Simmel | **WATER COLUMN HEIGHT (FT)** | 1.08 |
| **DATE INSTALLED** | 6/25/2020 | **WELL VOLUME (GAL)** | 0.176 |
| **DRILLER** | Eastern Environmental Solutions, Inc. | **TOTAL VOLUME PURGED (GAL)** | 3.5 |

| Time | Time Elapsed (min) | Volume (gal) | Color | Comments |
|---|---|---|---|---|
| 9:00 | 0 | 0.5 | Cloudy | |
| 9:05 | 5 | 1.0 | Cloudy | |
| 9:10 | 10 | 1.5 | Slightly Cloudy | |
| 9:15 | 15 | 2.0 | Slightly Cloudy | |
| 9:20 | 20 | 2.5 | Slightly Cloudy | |
| 9:25 | 25 | 3.0 | Clear | |
| 9:30 | 30 | 3.5 | Clear | Extracted 10 Well Vol., Turbidity <50NUT |

# WELL DEVELOPMENT LOG

**Well No.** MW02-I

**Comments**

| | | | |
|---|---|---|---|
| **PROJECT** | 8 Walworth Street Environmental Services | **DEVELOPMENT DATE** | 6/30/2020 |
| **LOCATION** | 8 Walworth Street, Brooklyn, NY | **DEVELOPMENT START** | 800 |
| **CLIENT** | Toldos Yehudah LLC | **DEVELOPMENT END** | 835 |
| **H&A FILE NO.** | 134860-004 | **WELL DEPTH (FT)** | 33 |
| **PROJECT MANAGER** | Mari Conlon | **STATIC WATER LEVEL (FT)** | 14.85 |
| **FIELD REP.** | Zach Simmel | **WATER COLUMN HEIGHT (FT)** | 18.15 |
| **DATE INSTALLED** | 6/26/2020 | **WELL VOLUME (GAL)** | 2.958 |
| **DRILLER** | Eastern Environmental Solutions, Inc. | **TOTAL VOLUME PURGED (GAL)** | 32 |

| Time | Time Elapsed (min) | Volume (gal) | Color | Comments |
|---|---|---|---|---|
| 8:00 | 0 | 2.0 | Turbid | |
| 8:05 | 5 | 6.0 | Turbid | |
| 8:10 | 10 | 10.0 | Turbid | |
| 8:15 | 15 | 14.0 | Cloudy | |
| 8:20 | 20 | 18.0 | Cloudy | |
| 8:25 | 25 | 22.0 | Slightly Cloudy | |
| 8:30 | 30 | 28.0 | Slightly Cloudy | |
| 8:35 | 35 | 32.0 | Clear | Extracted 10 Well Vol. |

# WELL DEVELOPMENT LOG

**Well No.** MW02-D

**Comments** Used whale pump and bailer.

| | | | |
|---|---|---|---|
| **PROJECT** | 8 Walworth Street Environmental Services | **DEVELOPMENT DATE** | 7/1/2020 |
| **LOCATION** | 8 Walworth Street, Brooklyn, NY | **DEVELOPMENT START** | 840 |
| **CLIENT** | Toldos Yehudah LLC | **DEVELOPMENT END** | 855 |
| **H&A FILE NO.** | 134860-004 | **WELL DEPTH (FT)** | 42 |
| **PROJECT MANAGER** | Mari Conlon | **STATIC WATER LEVEL (FT)** | 11.17 |
| **FIELD REP.** | Zach Simmel | **WATER COLUMN HEIGHT (FT)** | 30.83 |
| **DATE INSTALLED** | 6/29/2020 | **WELL VOLUME (GAL)** | 5.025 |
| **DRILLER** | Eastern Environmental Solutions, Inc. | **TOTAL VOLUME PURGED (GAL)** | 12 |

| Time | Time Elapsed (min) | Volume (gal) | Color | Comments |
|---|---|---|---|---|
| 8:40 | 0 | 2.0 | Turbid | |
| 8:45 | 5 | 4.0 | Turbid | |
| 8:50 | 10 | 6.0 | Cloudy | |
| 8:55 | 15 | 8.0 | Cloudy | Pump clogs, use bailer to purge additional 6 gallons; Turbidity <50 NTU |
| 9:00 | 20 | 10.0 | Slightly Cloudy | |
| 9:05 | 25 | 12.0 | Clear | |

HALEY ALDRICH

# WELL DEVELOPMENT LOG

| | |
|---|---|
| **Well No.** | MW03-S |
| **Comments** | Used whale pump |

| | | | |
|---|---|---|---|
| **PROJECT** | 8 Walworth Street Environmental Services | **DEVELOPMENT DATE** | 7/14/2020 |
| **LOCATION** | 8 Walworth Street, Brooklyn, NY | **DEVELOPMENT START** | 910 |
| **CLIENT** | Toldos Yehudah LLC | **DEVELOPMENT END** | 925 |
| **H&A FILE NO.** | 134860-004 | **WELL DEPTH (FT)** | 20 |
| **PROJECT MANAGER** | Mari Conlon | **STATIC WATER LEVEL (FT)** | 9.77 |
| **FIELD REP.** | Zach Simmel | **WATER COLUMN HEIGHT (FT)** | 10.23 |
| **DATE INSTALLED** | 7/9/2020 | **WELL VOLUME (GAL)** | 1.667 |
| **DRILLER** | Eastern Environmental Solutions, Inc. | **TOTAL VOLUME PURGED (GAL)** | 7 |

| Time | Time Elapsed (min) | Volume (gal) | Color | Comments |
|---|---|---|---|---|
| 9:10 | 0 | 1.0 | Cloudy | Slight Sweet Odor |
| 9:15 | 5 | 3.0 | Slightly Cloudy | Slight Sweet Odor |
| 9:20 | 10 | 5.0 | Clear | Slight Sweet Odor |
| 9:25 | 15 | 7.0 | Clear | Turbidity <50 NTU |

# WELL DEVELOPMENT LOG

HALEY ALDRICH

| | |
|---|---|
| Well No. | MW03-I |
| Comments | Used whale pump |

| | | | |
|---|---|---|---|
| **PROJECT** | 8 Walworth Street Environmental Services | **DEVELOPMENT DATE** | 7/14/2020 |
| **LOCATION** | 8 Walworth Street, Brooklyn, NY | **DEVELOPMENT START** | 945 |
| **CLIENT** | Toldos Yehudah LLC | **DEVELOPMENT END** | 1015 |
| **H&A FILE NO.** | 134860-004 | **WELL DEPTH (FT)** | 34 |
| **PROJECT MANAGER** | Mari Conlon | **STATIC WATER LEVEL (FT)** | 15.02 |
| **FIELD REP.** | Zach Simmel | **WATER COLUMN HEIGHT (FT)** | 18.98 |
| **DATE INSTALLED** | 7/10/2020 | **WELL VOLUME (GAL)** | 3.094 |
| **DRILLER** | Eastern Environmental Solutions, Inc. | **TOTAL VOLUME PURGED (GAL)** | 32 |

| Time | Time Elapsed (min) | Volume (gal) | Color | Comments |
|---|---|---|---|---|
| 9:45 | 0 | 2.0 | Turbid | Sweet Odor |
| 9:50 | 5 | 7.0 | Cloudy | Sweet Odor |
| 9:55 | 10 | 12.0 | Slightly Cloudy | Sweet Odor |
| 10:00 | 15 | 17.0 | Slightly Cloudy | Sweet Odor |
| 10:05 | 20 | 22.0 | Clear | Sweet Odor |
| 10:10 | 25 | 27.0 | Clear | Sweet Odor |
| 10:15 | 30 | 32.0 | Clear | Turbidity <50 NTU |

# WELL DEVELOPMENT LOG

| | |
|---|---|
| **Well No.** | MW03-D |
| **Comments** | Used whale pump |

| | | | |
|---|---|---|---|
| **PROJECT** | 8 Walworth Street Environmental Services | **DEVELOPMENT DATE** | 7/14/2020 |
| **LOCATION** | 8 Walworth Street, Brooklyn, NY | **DEVELOPMENT START** | 1045 |
| **CLIENT** | Toldos Yehudah LLC | **DEVELOPMENT END** | 1140 |
| **H&A FILE NO.** | 134860-004 | **WELL DEPTH (FT)** | 42 |
| **PROJECT MANAGER** | Mari Conlon | **STATIC WATER LEVEL (FT)** | 3.6 |
| **FIELD REP.** | Zach Simmel | **WATER COLUMN HEIGHT (FT)** | 38.4 |
| **DATE INSTALLED** | 7/8/2020 | **WELL VOLUME (GAL)** | 6.259 |
| **DRILLER** | Eastern Environmental Solutions, Inc. | **TOTAL VOLUME PURGED (GAL)** | 50 |

| Time | Time Elapsed (min) | Volume (gal) | Color | Comments |
|---|---|---|---|---|
| 10:45 | 0 | 4.0 | Turbid | |
| 10:50 | 5 | 8.0 | Turbid | |
| 10:55 | 10 | 12.0 | Turbid | |
| 11:00 | 15 | 16.0 | Cloudy | |
| 11:05 | 20 | 20.0 | Cloudy | |
| 11:10 | 25 | 24.0 | Slightly Cloudy | |
| 11:15 | 30 | 28.0 | Slightly Cloudy | |
| 11:20 | 35 | 32.0 | Slightly Cloudy | |
| 11:25 | 40 | 36.0 | Clear | |
| 11:30 | 45 | 40.0 | Clear | |
| 11:35 | 50 | 44.0 | Clear | |
| 11:40 | 55 | 50.0 | Clear | Turbidity <50 NTU |

HALEY ALDRICH

# WELL DEVELOPMENT LOG

**Well No.** MW04-S

**Comments**
Used peristaltic and whale pumps

| | | | |
|---|---|---|---|
| **PROJECT** | 8 Walworth Street Environmental Services | **DEVELOPMENT DATE** | 7/7/2020 |
| **LOCATION** | 8 Walworth Street, Brooklyn, NY | **DEVELOPMENT START** | 800 |
| **CLIENT** | Toldos Yehudah LLC | **DEVELOPMENT END** | 830 |
| **H&A FILE NO.** | 134860-004 | **WELL DEPTH (FT)** | 20 |
| **PROJECT MANAGER** | Mari Conlon | **STATIC WATER LEVEL (FT)** | 14.59 |
| **FIELD REP.** | Zach Simmel | **WATER COLUMN HEIGHT (FT)** | 5.41 |
| **DATE INSTALLED** | 6/30/2020 | **WELL VOLUME (GAL)** | 0.882 |
| **DRILLER** | Eastern Environmental Solutions, Inc. | **TOTAL VOLUME PURGED (GAL)** | 7 |

| Time | Time Elapsed (min) | Volume (gal) | Color | Comments |
|---|---|---|---|---|
| 8:00 | 0 | 1.0 | Turbid | |
| 8:05 | 5 | 2.0 | Cloudy | |
| 8:10 | 10 | 3.0 | Cloudy | |
| 8:15 | 15 | 4.0 | Slightly Cloudy | |
| 8:20 | 20 | 5.0 | Slightly Cloudy | |
| 8:25 | 25 | 6.0 | Clear | |
| 8:30 | 30 | 7.0 | Clear | Turbidity <50 NTU |

# WELL DEVELOPMENT LOG

**Well No.** MW04-I

**Comments** Used whale pump

| | | | |
|---|---|---|---|
| **PROJECT** | 8 Walworth Street Environmental Services | **DEVELOPMENT DATE** | 7/7/2020 |
| **LOCATION** | 8 Walworth Street, Brooklyn, NY | **DEVELOPMENT START** | 830 |
| **CLIENT** | Toldos Yehudah LLC | **DEVELOPMENT END** | 905 |
| **H&A FILE NO.** | 134860-004 | **WELL DEPTH (FT)** | 34 |
| **PROJECT MANAGER** | Mari Conlon | **STATIC WATER LEVEL (FT)** | 14.33 |
| **FIELD REP.** | Zach Simmel | **WATER COLUMN HEIGHT (FT)** | 19.67 |
| **DATE INSTALLED** | 7/6/2020 | **WELL VOLUME (GAL)** | 3.206 |
| **DRILLER** | Eastern Environmental Solutions, Inc. | **TOTAL VOLUME PURGED (GAL)** | 34 |

| Time | Time Elapsed (min) | Volume (gal) | Color | Comments |
|---|---|---|---|---|
| 8:30 | 0 | 0.0 | Turbid | |
| 8:35 | 5 | 5.0 | Turbid | |
| 8:40 | 10 | 10.0 | Cloudy | |
| 8:45 | 15 | 15.0 | Cloudy | |
| 8:50 | 20 | 20.0 | Slightly Cloudy | |
| 8:55 | 25 | 25.0 | Slightly Cloudy | |
| 9:00 | 30 | 30.0 | Slightly Cloudy | |
| 9:05 | 35 | 34.0 | Clear | Extracted 10 Well Vols. |

# WELL DEVELOPMENT LOG

| | |
|---|---|
| **Well No.** | MW04-D |
| **Comments** | Used whale pump |

| | | | |
|---|---|---|---|
| **PROJECT** | 8 Walworth Street Environmental Services | **DEVELOPMENT DATE** | 7/7/2020 |
| **LOCATION** | 8 Walworth Street, Brooklyn, NY | **DEVELOPMENT START** | 910 |
| **CLIENT** | Toldos Yehudah LLC | **DEVELOPMENT END** | 955 |
| **H&A FILE NO.** | 134860-004 | **WELL DEPTH (FT)** | 42 |
| **PROJECT MANAGER** | Mari Conlon | **STATIC WATER LEVEL (FT)** | 15.71 |
| **FIELD REP.** | Zach Simmel | **WATER COLUMN HEIGHT (FT)** | 26.29 |
| **DATE INSTALLED** | 7/1/2020 | **WELL VOLUME (GAL)** | 4.285 |
| **DRILLER** | Eastern Environmental Solutions, Inc. | **TOTAL VOLUME PURGED (GAL)** | 43 |

| Time | Time Elapsed (min) | Volume (gal) | Color | Comments |
|---|---|---|---|---|
| 9:10 | 0 | 2.0 | Turbid | |
| 9:15 | 5 | 5.0 | Turbid | |
| 9:20 | 10 | 10.0 | Cloudy | |
| 9:25 | 15 | 15.0 | Cloudy | |
| 9:30 | 20 | 20.0 | Slightly Cloudy | |
| 9:35 | 25 | 25.0 | Slightly Cloudy | |
| 9:40 | 30 | 30.0 | Slightly Cloudy | |
| 9:45 | 35 | 35.0 | Clear | |
| 9:50 | 40 | 40.0 | Clear | |
| 9:55 | 45 | 43.0 | Clear | Extracted 10 Well Vol. |

HALEY ALDRICH

# WELL DEVELOPMENT LOG

**Well No.** MW05-S

**Comments** Used peristaltic pump

| | | | |
|---|---|---|---|
| **PROJECT** | 8 Walworth Street Environmental Services | **DEVELOPMENT DATE** | 6/26/2020 |
| **LOCATION** | 8 Walworth Street, Brooklyn, NY | **DEVELOPMENT START** | 1300 |
| **CLIENT** | Toldos Yehudah LLC | **DEVELOPMENT END** | 1315 |
| **H&A FILE NO.** | 134860-004 | **WELL DEPTH (FT)** | 17 |
| **PROJECT MANAGER** | Mari Conlon | **STATIC WATER LEVEL (FT)** | 15.7 |
| **FIELD REP.** | Zach Simmel | **WATER COLUMN HEIGHT (FT)** | 1.3 |
| **DATE INSTALLED** | 6/23/2020 | **WELL VOLUME (GAL)** | 0.212 |
| **DRILLER** | Eastern Environmental Solutions, Inc. | **TOTAL VOLUME PURGED (GAL)** | 5 |

| Time | Time Elapsed (min) | Volume (gal) | Color | Comments |
|---|---|---|---|---|
| 13:30 | 0 | 0.50 | Turbid | |
| 13:35 | 5 | 1.00 | Turbid | |
| 13:40 | 10 | 1.50 | Turbid | |
| 13:45 | 15 | 2.0 | Cloudy | |
| 13:50 | 20 | 2.50 | Cloudy | |
| 13:55 | 25 | 3.00 | Cloudy | |
| 14:00 | 30 | 3.50 | Cloudy | |
| 14:05 | 35 | 4.00 | Slightly Cloudy | |
| 14:10 | 40 | 4.50 | Clear | |
| 14:15 | 45 | 5.00 | Clear | Turbidity <50 NTU |

# WELL DEVELOPMENT LOG

**Well No.** MW05-I

**Comments**
Used whale pump and bailer

| | | | |
|---|---|---|---|
| **PROJECT** | 8 Walworth Street Environmental Services | **DEVELOPMENT DATE** | 6/24/2020 and 7/2/2020 |
| **LOCATION** | 8 Walworth Street, Brooklyn, NY | **DEVELOPMENT START** | 1320 |
| **CLIENT** | Toldos Yehudah LLC | **DEVELOPMENT END** | 1335 |
| **H&A FILE NO.** | 134860-004 | **WELL DEPTH (FT)** | 34 |
| **PROJECT MANAGER** | Mari Conlon | **STATIC WATER LEVEL (FT)** | 15.63 |
| **FIELD REP.** | Zach Simmel | **WATER COLUMN HEIGHT (FT)** | 18.37 |
| **DATE INSTALLED** | 6/23/2020 | **WELL VOLUME (GAL)** | 2.994 |
| **DRILLER** | Eastern Environmental Solutions, Inc. | **TOTAL VOLUME PURGED (GAL)** | 10 |

| Time | Time Elapsed (min) | Volume (gal) | Color | Comments |
|---|---|---|---|---|
| 13:20 | 0 | 1.0 | Turbid | |
| 13:25 | 5 | 2.0 | Turbid | |
| 13:30 | 10 | 3.0 | Cloudy | |
| 13:35 | 15 | 5.0 | Cloudy | Pump clogs, use bailer to purge additional 5 gallons; Turbidity <50 NTU |
| 13:40 | 20 | 7.5 | Slightly Cloudy | |
| 13:45 | 25 | 10.0 | Clear | |

# WELL DEVELOPMENT LOG

| | |
|---|---|
| **Well No.** | MW05-D |
| **Comments** | Used whale pump |

| | | | |
|---|---|---|---|
| **PROJECT** | 8 Walworth Street Environmental Services | **DEVELOPMENT DATE** | 6/24/2020 |
| **LOCATION** | 8 Walworth Street, Brooklyn, NY | **DEVELOPMENT START** | 1400 |
| **CLIENT** | Toldos Yehudah LLC | **DEVELOPMENT END** | 1500 |
| **H&A FILE NO.** | 134860-004 | **WELL DEPTH (FT)** | 42 |
| **PROJECT MANAGER** | Mari Conlon | **STATIC WATER LEVEL (FT)** | 5.1 |
| **FIELD REP.** | Zach Simmel | **WATER COLUMN HEIGHT (FT)** | 36.9 |
| **DATE INSTALLED** | 6/25/2020 | **WELL VOLUME (GAL)** | 6.015 |
| **DRILLER** | Eastern Environmental Solutions, Inc. | **TOTAL VOLUME PURGED (GAL)** | 60 |

| Time | Time Elapsed (min) | Volume (gal) | Color | Comments |
|---|---|---|---|---|
| 14:00 | 0 | 2.0 | Turbid | |
| 14:05 | 5 | 5.0 | Turbid | |
| 14:10 | 10 | 10.0 | Turbid | |
| 14:15 | 15 | 15.0 | Turbid | |
| 14:20 | 20 | 20.0 | Cloudy | |
| 14:25 | 25 | 25.0 | Cloudy | |
| 14:30 | 30 | 30.0 | Slightly Cloudy | |
| 14:35 | 35 | 35.0 | Slightly Cloudy | |
| 14:40 | 40 | 40.0 | Slightly Cloudy | |
| 14:45 | 45 | 45.0 | Clear | |
| 14:50 | 50 | 50.0 | Clear | |
| 14:55 | 55 | 55.0 | Clear | |
| 15:00 | 60 | 60.0 | Clear | Extracted 10 Well Vol. |

# APPENDIX E

# Groundwater Sampling Logs

# LOW FLOW SAMPLING PURGE LOG

HALEY ALDRICH

**Well No.** MW01-S

**Comments** HDPE tubing, purged 4 gallons

| | | | |
|---|---|---|---|
| **PROJECT** | 8 Walworth Street Environmental Services | **DATE SAMPLED:** | 7/2/2020 |
| **LOCATION** | 8 Walworth Street, Brooklyn, NY | **START TIME:** | 0805 |
| **CLIENT** | Toldos Yehudah LLC | **SAMPLE TIME:** | 0850 |
| **H&A FILE NO.** | 133156-005 | **PUMP:** | Peristaltic |
| **PROJECT MANAGER** | Mari Conlon | **WELL DEPTH (FT)** | 20 |
| **FIELD REP.** | Zach Simmel | **STATIC WATER LEVEL (FT)** | 15.51 |
| **DATE INSTALLED** | 6/25/2020 | **WATER COLUMN HEIGHT (FT)** | 4.49 |
| **DRILLER** | Eastern Environmental Solutions, Inc. | **WELL VOLUME (GAL)** | 0.732 |

| Time (24 Hr) | Depth to Water (ft) | Purge Rate (mL/min) | Cumulative Purge Volumge (gal) | Temperature (degrees Celsius) | pH | Conductivity (µs/cm) | Dissolved Oxygen (mg/L) | Turbidity (NTU) | ORP (mv) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 0810 | 15.52 | 300 | 0.4 | 14.25 | 9.08 | 1.19 | 1.81 | 59.7 | 32 | Clear |
| 0815 | 15.53 | 300 | 0.925 | 14.0 | 7.93 | 1.21 | 0.99 | 27.3 | 36 | Clear |
| 0820 | 15.53 | 300 | 1.45 | 13.92 | 7.4 | 1.23 | 0.79 | 19.8 | 46 | Clear |
| 0825 | 15.54 | 300 | 1.975 | 13.86 | 7.06 | 1.25 | 1.09 | 15.3 | 61 | Clear |
| 0830 | 15.53 | 300 | 2.5 | 13.83 | 6.96 | 1.27 | 1.32 | 13.8 | 69 | Clear |
| 0835 | 15.53 | 300 | 3.025 | 13.85 | 6.89 | 1.28 | 1.50 | 13 | 75 | Clear |
| 0840 | 15.53 | 300 | 3.55 | 13.81 | 6.82 | 1.24 | 1.85 | 8.2 | 84 | Clear |
| 0845 | 15.53 | 300 | 4.075 | 13.83 | 6.80 | 1.25 | 1.9 | 7.2 | 89 | Clear |

# LOW FLOW SAMPLING PURGE LOG

HALEY ALDRICH

| | |
|---|---|
| Well No. | MW01-I |
| Comments | HDPE tubing, purged 5 gallons |

| | | | |
|---|---|---|---|
| PROJECT | 8 Walworth Street Environmental Services | DATE SAMPLED: | 7/15/2020 |
| LOCATION | 8 Walworth Street, Brooklyn, NY | START TIME: | 1315 |
| CLIENT | Toldos Yehudah LLC | SAMPLE TIME: | 1355 |
| H&A FILE NO. | 133156-005 | PUMP: | Bladder |
| PROJECT MANAGER | Mari Conlon | WELL DEPTH (FT) | 31 |
| FIELD REP. | Zach Simmel | STATIC WATER LEVEL (FT) | 14.97 |
| DATE INSTALLED | 7/9/2020 | WATER COLUMN HEIGHT (FT) | 16.03 |
| DRILLER | Eastern Environmental Solutions, Inc. | WELL VOLUME (GAL) | 2.613 |

| Time (24 Hr) | Depth to Water (ft) | Purge Rate (mL/min) | Cumulative Purge Volumge (gal) | Temperature (degrees Celsius) | pH | Conductivity (µs/cm) | Dissolved Oxygen (mg/L) | Turbidity (NTU) | ORP (mv) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 1325 | 14.45 | 600 | 0.79 | 15.34 | 7.67 | 1.20 | 1.43 | 19.6 | -26 | Slightly Cloudy |
| 1330 | 14.87 | 600 | 1.58 | 14.91 | 7.44 | 1.26 | 0.57 | 8.6 | -16 | Slightly Cloudy |
| 1335 | 14.67 | 600 | 2.37 | 14.82 | 7.37 | 1.31 | 0.29 | 5.2 | -200 | Slightly Cloudy |
| 1340 | 14.68 | 600 | 3.16 | 14.69 | 7.35 | 1.34 | 0.21 | 5.7 | -196 | Clear |
| 1345 | 14.69 | 600 | 3.95 | 14.65 | 7.32 | 1.37 | 0.19 | 5.1 | -191 | Clear |
| 1350 | 14.85 | 600 | 4.74 | 14.61 | 7.31 | 1.38 | 0.15 | 4.3 | -188 | Clear |

# LOW FLOW SAMPLING PURGE LOG

| | |
|---|---|
| **Well No.** | MW02-S |
| **Comments** | HDPE tubing, purged 3 gallons |

| | | | |
|---|---|---|---|
| **PROJECT** | 8 Walworth Street Environmental Services | **DATE SAMPLED:** | 7/1/2020 |
| **LOCATION** | 8 Walworth Street, Brooklyn, NY | **START TIME:** | 1015 |
| **CLIENT** | Toldos Yehudah LLC | **SAMPLE TIME:** | 1106 |
| **H&A FILE NO.** | 133156-005 | **PUMP:** | Peristaltic |
| **PROJECT MANAGER** | Mari Conlon | **WELL DEPTH (FT)** | 20 |
| **FIELD REP.** | Zach Simmel | **STATIC WATER LEVEL (FT)** | 15.59 |
| **DATE INSTALLED** | 6/25/2020 | **WATER COLUMN HEIGHT (FT)** | 4.41 |
| **DRILLER** | Eastern Environmental Solutions, Inc. | **WELL VOLUME (GAL)** | 0.719 |

| Time (24 Hr) | Depth to Water (ft) | Purge Rate (mL/min) | Cumulative Purge Volumge (gal) | Temperature (degrees Celsius) | pH | Conductivity (µs/cm) | Dissolved Oxygen (mg/L) | Turbidity (NTU) | ORP (mv) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 1025 | 15.60 | 250 | 0.33 | 17.86 | 7.78 | 0.962 | | 13.8 | -70 | Slight Cloudy, Strong Sweet Odor |
| 1030 | 15.64 | 250 | 0.855 | 17.25 | 7.07 | 0.951 | 1.52 | 3.7 | -79 | Slight Cloudy, Strong Sweet Odor |
| 1035 | 15.63 | 250 | 1.38 | 17.17 | 6.96 | 0.982 | 0.82 | 1.5 | -82 | Slight Cloudy, Strong Sweet Odor |
| 1040 | 15.63 | 250 | 1.905 | 17.2 | 6.90 | 1.0 | 0.53 | 1 | -83 | Slight Cloudy, Strong Sweet Odor |
| 1045 | 15.63 | 250 | 2.43 | 17.29 | 6.87 | 1.02 | 0.37 | 0.4 | -84 | Slight Cloudy, Strong Sweet Odor |
| 1050 | - | - | - | - | - | - | - | - | - | Battery dead, no readings |
| 1055 | 15.64 | 250 | 2.955 | 16.68 | 6.92 | 1.14 | 1.36 | 4.3 | -69 | Slight Cloudy, Strong Sweet Odor |
| 1100 | 15.63 | 250 | 3.48 | 16.28 | 6.80 | 1.08 | 0.29 | 1.4 | -73 | Slight Cloudy, Strong Sweet Odor |
| 1105 | 15.63 | 250 | 4.005 | 16.27 | 6.74 | 1.06 | 0.18 | 0.5 | -73 | Slight Cloudy, Strong Sweet Odor |

# LOW FLOW SAMPLING PURGE LOG

**Well No.** MW02-I

**Comments**
HDPE tubing, purged 4-4.5 gallons

| | | | |
|---|---|---|---|
| **PROJECT** | 8 Walworth Street Environmental Services | **DATE SAMPLED:** | 7/1/2020 |
| **LOCATION** | 8 Walworth Street, Brooklyn, NY | **START TIME:** | 0740 |
| **CLIENT** | Toldos Yehudah LLC | **SAMPLE TIME:** | 0853 |
| **H&A FILE NO.** | 133156-005 | **PUMP:** | Bladder |
| **PROJECT MANAGER** | Mari Conlon | **WELL DEPTH (FT)** | 33 |
| **FIELD REP.** | Zach Simmel | **STATIC WATER LEVEL (FT)** | 13.83 |
| **DATE INSTALLED** | 6/26/2020 | **WATER COLUMN HEIGHT (FT)** | 19.17 |
| **DRILLER** | Eastern Environmental Solutions, Inc. | **WELL VOLUME (GAL)** | 3.125 |

| Time (24 Hr) | Depth to Water (ft) | Purge Rate (mL/min) | Cumulative Purge Volumge (gal) | Temperature (degrees Celsius) | pH | Conductivity (µs/cm) | Dissolved Oxygen (mg/L) | Turbidity (NTU) | ORP (mv) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 0800 | 15.46 | 300 | 0.4 | 19.04 | 8.19 | 1.45 | 10.32 | 102 | -43 | Clear |
| 0805 | 15.52 | 300 | 0.8 | 18.53 | 8.15 | 1.44 | 8.26 | 90.5 | -46 | Clear |
| 0810 | 15.59 | 300 | 1.2 | 18.46 | 8.11 | 1.43 | 7.09 | 84.9 | -47 | Clear |
| 0815 | 15.62 | 300 | 1.6 | 18.34 | 8.10 | 1.43 | 6.51 | 81.1 | -40 | Clear |
| 0820 | 15.63 | 300 | 2 | 18.42 | 7.89 | 1.45 | 6.57 | 79.8 | -49 | Clear |
| 0825 | 15.63 | 300 | 2.4 | 18.16 | 6.45 | 1.44 | 6.37 | 71.8 | -47 | Clear |
| 0830 | 15.65 | 300 | 2.8 | 17.62 | 8.03 | 1.45 | 6.43 | 79.3 | -38 | Clear |
| 0835 | 15.68 | 300 | 3.2 | 17.76 | 8.07 | 1.45 | 6.45 | 70.7 | -45 | Clear |
| 0840 | 15.69 | 300 | 3.6 | 17.75 | 8.01 | 1.46 | 6.34 | 70.5 | -48 | Clear |
| 0845 | 15.67 | 300 | 4 | 17.7 | 8.06 | 1.45 | 6.21 | 63.7 | -47 | Clear |
| 0850 | 15.66 | 300 | 4.4 | 17.68 | 8.06 | 1.45 | 6.25 | 64.1 | -48 | Clear |

# LOW FLOW SAMPLING PURGE LOG

**Well No.** MW02-D

**Comments**
HDPE tubing, pump set at 35 PSI, 4 CFM, 10 second discharge, purged 5-6 gallons

| | | | |
|---|---|---|---|
| **PROJECT** | 8 Walworth Street Environmental Services | **DATE SAMPLED:** | 7/13/2020 |
| **LOCATION** | 8 Walworth Street, Brooklyn, NY | **START TIME:** | 0800 |
| **CLIENT** | Toldos Yehudah LLC | **SAMPLE TIME:** | 0900 |
| **H&A FILE NO.** | 133156-005 | **PUMP:** | Bladder |
| **PROJECT MANAGER** | Mari Conlon | **WELL DEPTH (FT)** | 42 |
| **FIELD REP.** | Zach Simmel | **STATIC WATER LEVEL (FT)** | 15 |
| **DATE INSTALLED** | 6/29/2020 | **WATER COLUMN HEIGHT (FT)** | 27 |
| **DRILLER** | Eastern Environmental Solutions, Inc. | **WELL VOLUME (GAL)** | 4.401 |

| Time (24 Hr) | Depth to Water (ft) | Purge Rate (mL/min) | Cumulative Purge Volumge (gal) | Temperature (degrees Celsius) | pH | Conductivity (µs/cm) | Dissolved Oxygen (mg/L) | Turbidity (NTU) | ORP (mv) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 0820 | 15.26 | 550 | 0.725 | 16.38 | 8.54 | 1.26 | 3.71 | 58.3 | -290 | Cloudy |
| 0825 | 15.24 | 550 | 1.45 | 16 | 8.19 | 1.24 | 1.17 | 67 | -307 | Cloudy |
| 0830 | 15.22 | 550 | 2.175 | 15.93 | 8.01 | 1.24 | 0.64 | 34.6 | -308 | Slightly Cloudy |
| 0835 | 15.23 | 550 | 2.9 | 15.94 | 7.94 | 1.25 | 0.4 | 18.4 | -310 | Clear |
| 0840 | 15.26 | 550 | 3.625 | 15.89 | 7.93 | 1.26 | 0.26 | 9.9 | -312 | Clear |
| 0845 | 15.2 | 550 | 4.35 | 15.86 | 7.84 | 1.25 | 0.17 | 6.1 | -306 | Clear |
| 0850 | 15.2 | 550 | 5.075 | 15.82 | 7.81 | 1.24 | 0.12 | 4.1 | -304 | Clear |
| 0855 | 15.19 | 550 | 5.8 | 15.81 | 7.83 | 1.25 | 0.04 | 3.5 | -305 | Clear |

# LOW FLOW SAMPLING PURGE LOG

HALEY ALDRICH

**Well No.** MW03-S

**Comments**
HDPE tubing, purged 4 gallons

| | | | |
|---|---|---|---|
| **PROJECT** | 8 Walworth Street Environmental Services | **DATE SAMPLED:** | 7/15/2020 |
| **LOCATION** | 8 Walworth Street, Brooklyn, NY | **START TIME:** | 1145 |
| **CLIENT** | Toldos Yehudah LLC | **SAMPLE TIME:** | 1235 |
| **H&A FILE NO.** | 133156-005 | **PUMP:** | Peristaltic |
| **PROJECT MANAGER** | Mari Conlon | **WELL DEPTH (FT)** | 20 |
| **FIELD REP.** | Zach Simmel | **STATIC WATER LEVEL (FT)** | 13.93 |
| **DATE INSTALLED** | 7/9/2020 | **WATER COLUMN HEIGHT (FT)** | 6.07 |
| **DRILLER** | Eastern Environmental Solutions, Inc. | **WELL VOLUME (GAL)** | 0.989 |

| Time (24 Hr) | Depth to Water (ft) | Purge Rate (mL/min) | Cumulative Purge Volumge (gal) | Temperature (degrees Celsius) | pH | Conductivity (μs/cm) | Dissolved Oxygen (mg/L) | Turbidity (NTU) | ORP (mv) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 1150 | 15.53 | 350 | 0.46 | 18.6 | 10.7 | 0.714 | 4.59 | 172 | 3 | Slightly Cloudy, Slight Sweet Odor |
| 1155 | 16.30 | 350 | 0.985 | 17.15 | 10.85 | 0.722 | 1.51 | 151 | -37 | Slightly Cloudy, Slight Sweet Odor |
| 1200 | 16.80 | 350 | 1.51 | 16.68 | 10.66 | 0.742 | 0.67 | 129 | -58 | Slightly Cloudy, Slight Sweet Odor |
| 1205 | 16.9 | 350 | 2.035 | 16.43 | 9.71 | 0.766 | 0.44 | 109 | -34 | Slightly Cloudy, Slight Sweet Odor |
| 1210 | 16.88 | 350 | 2.56 | 16.35 | 9.31 | 0.773 | 0.36 | 108 | -30 | Slightly Cloudy, Slight Sweet Odor |
| 1215 | 16.77 | 350 | 3.085 | 16.21 | 8.68 | 0.781 | 0.24 | 92.5 | -18 | Slightly Cloudy, Slight Sweet Odor |
| 1220 | 16.62 | 350 | 3.61 | 16.17 | 7.93 | 0.806 | 0.14 | 84.1 | -39 | Slightly Cloudy, Slight Sweet Odor |
| 1225 | 16.54 | 350 | 4.135 | 16.11 | 7.65 | 0.812 | 0.06 | 75.1 | -25 | Slightly Cloudy, Slight Sweet Odor |
| 1230 | 16.46 | 350 | 4.66 | 16.07 | 7.4 | 0.819 | 0.01 | 73.8 | -12 | Slightly Cloudy, Slight Sweet Odor |

| HALEY ALDRICH | # LOW FLOW SAMPLING PURGE LOG | **Well No.** MW03-I<br>**Comments**<br>HDPE tubing, Pump set at 20 PSI, 4 CPM, 10 second discharge, purged 5 gallons |
|---|---|---|

| | | | |
|---|---|---|---|
| **PROJECT** | 8 Walworth Street Environmental Services | **DATE SAMPLED:** | 7/14/2020 |
| **LOCATION** | 8 Walworth Street, Brooklyn, NY | **START TIME:** | 1135 |
| **CLIENT** | Toldos Yehudah LLC | **SAMPLE TIME:** | 1225 |
| **H&A FILE NO.** | 133156-005 | **PUMP:** | Bladder |
| **PROJECT MANAGER** | Mari Conlon | **WELL DEPTH (FT)** | 35 |
| **FIELD REP.** | Zach Simmel | **STATIC WATER LEVEL (FT)** | 15.06 |
| **DATE INSTALLED** | 7/10/2020 | **WATER COLUMN HEIGHT (FT)** | 19.94 |
| **DRILLER** | Eastern Environmental Solutions, Inc. | **WELL VOLUME (GAL)** | 3.250 |

| Time (24 Hr) | Depth to Water (ft) | Purge Rate (mL/min) | Cumulative Purge Volumge (gal) | Temperature (degrees Celsius) | pH | Conductivity (µs/cm) | Dissolved Oxygen (mg/L) | Turbidity (NTU) | ORP (mv) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 1145 | 14.97 | 425 | 0.56 | 17.85 | 8.12 | 1.29 | 3.46 | 296 | -76 | Slightly Cloudy, Slight Sweet Odor |
| 1150 | 14.97 | 425 | 1.12 | 16.84 | 7.77 | 1.31 | 1.50 | 182 | -126 | Slightly Cloudy, Slight Sweet Odor |
| 1155 | 15.07 | 425 | 1.68 | 16.57 | 7.57 | 1.36 | 0.61 | 120 | -148 | Clear |
| 1200 | 15.15 | 425 | 2.24 | 16.46 | 7.59 | 1.39 | 0.36 | 74.1 | -157 | Clear |
| 1205 | 15.16 | 425 | 2.8 | 16.37 | 7.57 | 1.41 | 0.19 | 47.2 | -166 | Clear |
| 1210 | 15.61 | 425 | 3.36 | 16.38 | 7.59 | 1.42 | 0.10 | 41.3 | -172 | Clear |
| 1215 | 15.62 | 425 | 3.92 | 16.35 | 7.59 | 1.43 | 0.07 | 27.2 | -179 | Clear |
| 1220 | 15.62 | 425 | 4.48 | 16.37 | 7.60 | 1.44 | 0.02 | 22.7 | -183 | Clear |

# LOW FLOW SAMPLING PURGE LOG

**Well No.** MW03-D

**Comments**
HDPE tubing, purged 3 gallons

| | | | |
|---|---|---|---|
| **PROJECT** | 8 Walworth Street Environmental Services | **DATE SAMPLED:** | 7/14/2020 |
| **LOCATION** | 8 Walworth Street, Brooklyn, NY | **START TIME:** | 1250 |
| **CLIENT** | Toldos Yehudah LLC | **SAMPLE TIME:** | 1335 |
| **H&A FILE NO.** | 133156-005 | **PUMP:** | Bladder |
| **PROJECT MANAGER** | Mari Conlon | **WELL DEPTH (FT)** | 42 |
| **FIELD REP.** | Zach Simmel | **STATIC WATER LEVEL (FT)** | 14.9 |
| **DATE INSTALLED** | 7/8/2020 | **WATER COLUMN HEIGHT (FT)** | 27.1 |
| **DRILLER** | Eastern Environmental Solutions, Inc. | **WELL VOLUME (GAL)** | 4.417 |

| Time (24 Hr) | Depth to Water (ft) | Purge Rate (mL/min) | Cumulative Purge Volumge (gal) | Temperature (degrees Celsius) | pH | Conductivity (µs/cm) | Dissolved Oxygen (mg/L) | Turbidity (NTU) | ORP (mv) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 1330 | 15.00 | 350 | 0.46 | 17.41 | 8.00 | 1.31 | 1.89 | 37.1 | -208 | Clear |
| 1305 | 15.00 | 350 | 0.92 | 17.14 | 7.87 | 1.31 | 1.38 | 36.2 | -224 | Clear |
| 1310 | 14.98 | 350 | 1.38 | 16.80 | 7.72 | 1.30 | 0.54 | 35.3 | -253 | Clear |
| 1315 | 14.94 | 350 | 1.84 | 16.74 | 7.68 | 1.30 | 0.41 | 33.8 | -259 | Clear |
| 1320 | 14.91 | 350 | 2.3 | 16.74 | 7.73 | 1.31 | 0.24 | 27.8 | -272 | Clear |
| 1325 | 14.89 | 350 | 2.76 | 16.63 | 7.78 | 1.32 | 0.13 | 23.5 | -280 | Clear |
| 1330 | 14.88 | 350 | 3.22 | 16.60 | 7.81 | 1.32 | 0.11 | 23.3 | -286 | Clear |

HALEY ALDRICH

# LOW FLOW SAMPLING PURGE LOG

**Well No.** MW04-S

**Comments** HDPE tubing, purged 4 gallons

| | | | |
|---|---|---|---|
| **PROJECT** | 8 Walworth Street Environmental Services | **DATE SAMPLED:** | 7/8/2020 |
| **LOCATION** | 8 Walworth Street, Brooklyn, NY | **START TIME:** | 0835 |
| **CLIENT** | Toldos Yehudah LLC | **SAMPLE TIME:** | 0932 |
| **H&A FILE NO.** | 133156-005 | **PUMP:** | Peristaltic |
| **PROJECT MANAGER** | Mari Conlon | **WELL DEPTH (FT)** | 20 |
| **FIELD REP.** | Zach Simmel | **STATIC WATER LEVEL (FT)** | 15.56 |
| **DATE INSTALLED** | 6/30/2020 | **WATER COLUMN HEIGHT (FT)** | 4.44 |
| **DRILLER** | Eastern Environmental Solutions, Inc. | **WELL VOLUME (GAL)** | 0.724 |

| Time (24 Hr) | Depth to Water (ft) | Purge Rate (mL/min) | Cumulative Purge Volumge (gal) | Temperature (degrees Celsius) | pH | Conductivity (µs/cm) | Dissolved Oxygen (mg/L) | Turbidity (NTU) | ORP (mv) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 0845 | 16.12 | 275 | 0.36 | 18.01 | 8.64 | 0.945 | 4.85 | 142 | 117 | Slightly Cloudy |
| 0850 | 16.26 | 275 | 0.72 | 17.32 | 8.9 | 0.902 | 1.98 | 116 | 96 | Slightly Cloudy |
| 0855 | 16.30 | 275 | 1.08 | 17.0 | 8.98 | 0.915 | 1.44 | 111 | 84 | Slightly Cloudy |
| 0900 | 16.4 | 275 | 1.44 | 16.85 | 9.16 | 0.898 | 1.3 | 102 | 65 | Slightly Cloudy |
| 0905 | 16.41 | 275 | 1.8 | 16.73 | 9.20 | 0.896 | 0.6 | 102 | 41 | Clear |
| 0910 | 16.41 | 275 | 2.16 | 16.52 | 9.09 | 0.914 | 0.35 | 107 | 3 | Clear |
| 0915 | 16.42 | 275 | 2.52 | 16.39 | 8.78 | 0.950 | 0.38 | 101.0 | -48 | Clear |
| 0920 | 16.39 | 275 | 2.88 | 16.36 | 8.62 | 0.992 | 0.28 | 97.3 | -79 | Clear |
| 0925 | 16.39 | 275 | 3.24 | 16.38 | 8.49 | 1.03 | 0.18 | 106 | -93 | Clear |
| 0930 | 16.39 | 275 | 3.6 | 16.32 | 8.28 | 1.06 | 0.11 | 107 | -94 | Clear |

# LOW FLOW SAMPLING PURGE LOG

**Well No.** MW04-I

**Comments**
HDPE tubing, pump set at 35 PSI, 4 CFM, 10 second discharge, purged 6 gallons

| | | | |
|---|---|---|---|
| **PROJECT** | 8 Walworth Street Environmental Services | **DATE SAMPLED:** | 7/10/2020 |
| **LOCATION** | 8 Walworth Street, Brooklyn, NY | **START TIME:** | 0930 |
| **CLIENT** | Toldos Yehudah LLC | **SAMPLE TIME:** | 1020 |
| **H&A FILE NO.** | 133156-005 | **PUMP:** | Bladder |
| **PROJECT MANAGER** | Mari Conlon | **WELL DEPTH (FT)** | 34 |
| **FIELD REP.** | Zach Simmel | **STATIC WATER LEVEL (FT)** | 15.39 |
| **DATE INSTALLED** | 7/6/2020 | **WATER COLUMN HEIGHT (FT)** | 18.61 |
| **DRILLER** | Eastern Environmental Solutions, Inc. | **WELL VOLUME (GAL)** | 3.033 |

| Time (24 Hr) | Depth to Water (ft) | Purge Rate (mL/min) | Cumulative Purge Volumge (gal) | Temperature (degrees Celsius) | pH | Conductivity (µs/cm) | Dissolved Oxygen (mg/L) | Turbidity (NTU) | ORP (mv) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 0945 | 15.43 | 600 | 0.79 | 16.30 | 7.97 | 1.18 | 0.94 | 158 | -139 | Slightly Cloudy |
| 0950 | 15.43 | 600 | 1.58 | 16.18 | 7.85 | 1.24 | 0.68 | 94.4 | -147 | Slightly Cloudy |
| 0955 | 15.43 | 600 | 2.37 | 15.98 | 7.82 | 1.3 | 0.52 | 71.5 | -148 | Clear |
| 1000 | 15.43 | 600 | 3.16 | 15.99 | 7.73 | 1.35 | 0.57 | 54.4 | -148 | Clear |
| 1005 | 15.44 | 600 | 3.95 | 15.96 | 7.67 | 1.38 | 0.27 | 48.7 | -147 | Clear |
| 1010 | 15.42 | 600 | 4.74 | 15.87 | 7.62 | 1.43 | 0.20 | 33.9 | -147 | Clear |
| 1015 | 15.42 | 600 | 5.53 | 15.83 | 7.68 | 1.45 | 0.13 | 29.9 | -149 | Clear |

# LOW FLOW SAMPLING PURGE LOG

**Well No.** MW04-D

**Comments**
HDPE tubing, pump set at 30 PSI, 4 CFM, 10 second discharge, purged 7 gallons

| | | | |
|---|---|---|---|
| **PROJECT** | 8 Walworth Street Environmental Services | **DATE SAMPLED:** | 7/9/2020 |
| **LOCATION** | 8 Walworth Street, Brooklyn, NY | **START TIME:** | 1130 |
| **CLIENT** | Toldos Yehudah LLC | **SAMPLE TIME:** | 1252 |
| **H&A FILE NO.** | 133156-005 | **PUMP:** | Bladder |
| **PROJECT MANAGER** | Mari Conlon | **WELL DEPTH (FT)** | 42 |
| **FIELD REP.** | Zach Simmel | **STATIC WATER LEVEL (FT)** | 15.45 |
| **DATE INSTALLED** | 7/1/2020 | **WATER COLUMN HEIGHT (FT)** | 26.55 |
| **DRILLER** | Eastern Environmental Solutions, Inc. | **WELL VOLUME (GAL)** | 4.328 |

| Time (24 Hr) | Depth to Water (ft) | Purge Rate (mL/min) | Cumulative Purge Volumge (gal) | Temperature (degrees Celsius) | pH | Conductivity (µs/cm) | Dissolved Oxygen (mg/L) | Turbidity (NTU) | ORP (mv) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 1204 | 15.42 | 550 | 0.725 | 17.67 | 8.01 | 1.07 | 3.18 | 65.7 | -103 | Slightly Cloudy |
| 1209 | 15.43 | 550 | 1.45 | 16.44 | 8.0 | 1.10 | 2.77 | 47.8 | -139 | Slightly Cloudy |
| 1214 | 15.44 | 550 | 2.175 | 17.31 | 7.85 | 1.11 | 2.31 | 39.3 | -141 | Slightly Cloudy |
| 1219 | 15.41 | 550 | 2.9 | 16.49 | 7.81 | 1.1 | 2.49 | 40.7 | -149 | Slightly Cloudy |
| 1224 | 15.39 | 550 | 3.625 | 16.20 | 7.91 | 1.11 | 2.43 | 32 | -149 | Clear |
| 1229 | 15.40 | 550 | 4.35 | 16.23 | 7.93 | 1.11 | 2.30 | 34.9 | -143 | Clear |
| 1234 | 15.38 | 550 | 5.075 | 16.20 | 7.80 | 1.12 | 2.50 | 30.0 | -141 | Clear |
| 1239 | 15.38 | 550 | 5.8 | 16.14 | 7.79 | 1.13 | 2.45 | 31.2 | -135 | Clear |
| 1244 | 15.37 | 550 | 6.525 | 16.26 | 7.77 | 1.13 | 2.26 | 39 | -139 | Clear |
| 1249 | 15.38 | 550 | 7.25 | 16.20 | 7.78 | 1.14 | 2.23 | 36.8 | -131 | Clear |

HALEY ALDRICH

# LOW FLOW SAMPLING PURGE LOG

**Well No.** MW05-S

**Comments**
HDPE tubing, purged 5 gallons

| | | | |
|---|---|---|---|
| **PROJECT** | 8 Walworth Street Environmental Services | **DATE SAMPLED:** | 7/13/2020 |
| **LOCATION** | 8 Walworth Street, Brooklyn, NY | **START TIME:** | 1025 |
| **CLIENT** | Toldos Yehudah LLC | **SAMPLE TIME:** | 1125 |
| **H&A FILE NO.** | 133156-005 | **PUMP:** | Peristaltic |
| **PROJECT MANAGER** | Mari Conlon | **WELL DEPTH (FT)** | 17 |
| **FIELD REP.** | Zach Simmel | **STATIC WATER LEVEL (FT)** | 15.01 |
| **DATE INSTALLED** | 6/23/2020 | **WATER COLUMN HEIGHT (FT)** | 1.99 |
| **DRILLER** | Eastern Environmental Solutions, Inc. | **WELL VOLUME (GAL)** | 0.324 |

| Time (24 Hr) | Depth to Water (ft) | Purge Rate (mL/min) | Cumulative Purge Volumge (gal) | Temperature (degrees Celsius) | pH | Conductivity (µs/cm) | Dissolved Oxygen (mg/L) | Turbidity (NTU) | ORP (mv) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 1035 | 15.40 | 250 | 0.33 | 21.46 | 8.21 | 1.15 | 4.17 | 46.2 | -30 | Slightly Cloudy, Strong Sweet Odor |
| 1040 | 15.41 | 250 | 0.855 | 17.39 | 7.59 | 1.18 | 0.98 | 44.5 | -108 | Slightly Cloudy, Strong Sweet Odor |
| 1045 | 15.42 | 250 | 1.38 | 16.91 | 7.69 | 1.23 | 0.46 | 32.5 | -137 | Slightly Cloudy, Strong Sweet Odor |
| 1050 | 15.43 | 250 | 1.905 | 16.78 | 7.56 | 1.3 | 0.28 | 29.9 | -140 | Slightly Cloudy, Strong Sweet Odor |
| 1055 | 15.43 | 250 | 2.43 | 16.70 | 7.43 | 1.42 | 0.16 | 28.8 | -140 | Slightly Cloudy, Strong Sweet Odor |
| 1100 | 15.45 | 250 | 2.955 | 16.66 | 7.3 | 1.56 | 0.10 | 29.3 | -139 | Slightly Cloudy, Strong Sweet Odor |
| 1105 | 15.45 | 250 | 3.48 | 16.59 | 7.31 | 1.66 | 0.12 | 28.8 | -137 | Slightly Cloudy, Strong Sweet Odor |
| 1110 | 15.44 | 250 | 4.005 | 16.6 | 7.15 | 1.73 | 0.02 | 27.3 | -136 | Slightly Cloudy, Strong Sweet Odor |

HALEY ALDRICH

# LOW FLOW SAMPLING PURGE LOG

**Well No.** MW05-I

**Comments**

HDPE tubing, pump set at 20 PSI, 4 CPM, 10 second discharge, purged 5-6 gallons

| | | | |
|---|---|---|---|
| **PROJECT** | 8 Walworth Street Environmental Services | **DATE SAMPLED:** | 7/14/2020 |
| **LOCATION** | 8 Walworth Street, Brooklyn, NY | **START TIME:** | 0755 |
| **CLIENT** | Toldos Yehudah LLC | **SAMPLE TIME:** | 0832 |
| **H&A FILE NO.** | 133156-005 | **PUMP:** | Bladder |
| **PROJECT MANAGER** | Mari Conlon | **WELL DEPTH (FT)** | 34 |
| **FIELD REP.** | Zach Simmel | **STATIC WATER LEVEL (FT)** | 18.74 |
| **DATE INSTALLED** | 6/23/2020 | **WATER COLUMN HEIGHT (FT)** | 15.26 |
| **DRILLER** | Eastern Environmental Solutions, Inc. | **WELL VOLUME (GAL)** | 2.487 |

| Time (24 Hr) | Depth to Water (ft) | Purge Rate (mL/min) | Cumulative Purge Volumge (gal) | Temperature (degrees Celsius) | pH | Conductivity (µs/cm) | Dissolved Oxygen (mg/L) | Turbidity (NTU) | ORP (mv) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 0805 | 15.42 | 750 | 0.99 | 17.75 | 8.84 | 1.59 | 5.15 | 101 | -51 | Slightly Cloudy, Strong Sweet Odor |
| 0810 | 15.45 | 750 | 1.98 | 16.44 | 9.17 | 1.55 | 7.72 | 92.2 | -95 | Slightly Cloudy, Strong Sweet Odor |
| 0815 | 15.47 | 750 | 2.97 | 16.66 | 9.22 | 1.53 | 7.18 | 120 | -89 | Slightly Cloudy, Strong Sweet Odor |
| 0820 | 15.55 | 750 | 3.96 | 16.62 | 9.22 | 1.51 | 7.26 | 113 | -75 | Slightly Cloudy, Strong Sweet Odor |
| 0825 | 15.54 | 750 | 4.95 | 16.68 | 9.16 | 1.52 | 7.31 | 120 | -69 | Slightly Cloudy, Strong Sweet Odor |

HALEY ALDRICH

# LOW FLOW SAMPLING PURGE LOG

**Well No.** MW05-D

**Comments**
Bladder pump, set at 35 PSI, 10 second discharge, purged 7 gallons

| | | | |
|---|---|---|---|
| **PROJECT** | 8 Walworth Street Environmental Services | **DATE SAMPLED:** | 7/13/2020 |
| **LOCATION** | 8 Walworth Street, Brooklyn, NY | **START TIME:** | 1215 |
| **CLIENT** | Toldos Yehudah LLC | **SAMPLE TIME:** | 1310 |
| **H&A FILE NO.** | 133156-005 | **PUMP:** | Bladder |
| **PROJECT MANAGER** | Mari Conlon | **WELL DEPTH (FT)** | 42 |
| **FIELD REP.** | Zach Simmel | **STATIC WATER LEVEL (FT)** | 15.04 |
| **DATE INSTALLED** | 6/25/2020 | **WATER COLUMN HEIGHT (FT)** | 26.96 |
| **DRILLER** | Eastern Environmental Solutions, Inc. | **WELL VOLUME (GAL)** | 4.394 |

| Time (24 Hr) | Depth to Water (ft) | Purge Rate (mL/min) | Cumulative Purge Volumge (gal) | Temperature (degrees Celsius) | pH | Conductivity (µs/cm) | Dissolved Oxygen (mg/L) | Turbidity (NTU) | ORP (mv) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 1220 | 15.10 | 600 | 0.79 | 16.31 | 8.26 | 1.14 | 1.14 | 36 | 42 | Clear, Strong Sweet Odor |
| 1225 | 15.11 | 600 | 1.58 | 16.14 | 8.19 | 1.14 | 0.58 | 14.8 | 35 | Clear, Strong Sweet Odor |
| 1230 | 15.10 | 600 | 2.37 | 16.06 | 8.16 | 1.15 | 0.41 | 50.3 | 20 | Clear, Strong Sweet Odor |
| 1235 | 15.10 | 600 | 3.16 | 15.99 | 7.95 | 1.21 | 0.19 | 163 | 18 | Clear, Strong Sweet Odor |
| 1240 | 15.10 | 600 | 3.95 | 16.04 | 7.71 | 1.41 | 0.25 | 554 | 24 | Slightly Cloudy, Strong Sweet Odor |
| 1245 | 15.11 | 600 | 4.74 | 16.05 | 7.63 | 1.46 | 0.08 | 416 | 26 | Slightly Cloudy, Strong Sweet Odor |
| 1250 | 15.13 | 600 | 5.53 | 16.06 | 7.56 | 1.50 | 0.09 | 204.0 | 26 | Clear, Strong Sweet Odor |
| 1255 | 15.13 | 600 | 6.32 | 16.08 | 7.51 | 1.52 | 0.01 | 119.0 | 27 | Clear, Strong Sweet Odor |
| 1300 | 15.10 | 600 | 7.11 | 16.05 | 7.49 | 1.53 | 0.00 | 90.7 | 28 | Clear, Strong Sweet Odor |

# APPENDIX F

## Soil Boring Logs

# TEST BORING REPORT

HALEY ALDRICH

| BORING NO. | B01 |
|---|---|
| Page | 1 of 1 |

| | | | |
|---|---|---|---|
| PROJECT | 8 Walworth Street | H&A FILE NO. | 134860-002 |
| LOCATION | 8 Walworth Street, Brooklyn, NY | PROJECT MGR. | Mari Conlon |
| CLIENT | Toldos Yehudah, LLC | FIELD REP. | Zach Simmel |
| CONTRACTOR | Coastal Environmental Solutions | DATE STARTED | 6/16/2020 |
| DRILLER | T. Fitzpatrick | DATE FINISHED | 6/16/2020 |

| Elevation | ft. | Datum | NAVD-88 | Boring Location | B01 | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Item | Casing | Sampler | Core Barrel | Rig Make & Model | 7822DT | | Hammer Type | Drilling Mud | Casing Advance |
| Type | - | | | ☐ Truck | ☐ Tripod | ☐ Cat-Head | ☐ Safety | ☐ Bentonite | Type Method Depth |
| Inside Diameter (in.) | 2 | | | ☐ ATV | ☑ Geoprobe | ☐ Winch | ☐ Doughnut | ☐ Polymer | - |
| Hammer Weight (lb.) | - | | | ☐ Track | ☐ Air Track | ☐ Roller Bit | ☐ Automatic | ☑ None | |
| Hammer Fall (in.) | - | | | ☐ Skid | ☐ _________ | ☐ Cutting Head | Drilling Notes: | | |

| Depth (ft.) | Recovery (ft.) | Sample ID | Sample Depth (ft) | Visual-Manual Identification & Description | PID (ppm) |
|---|---|---|---|---|---|
| 0 | | | | 0-3" Concrete fragments | 0.0 |
| | | | | 3"-5.5' Fill material including light brown to brown fine sand | 0.2 |
| | 3 | | | with asphalt fragments and concrete fragments, no odor | 1.4 |
| | | | | | 1.5 |
| | | | | | 1.2 |
| 5 | | | | 5.5-9' Brown silty sand, no odor | 10.7 |
| | | | | | 8.7 |
| | 2.5 | | | 9-14' Brown to dark brown fine sand with trace silt, moist at 12.5', | 10.8 |
| | | | | no odor | 14.5 |
| | | | | | 18.2 |
| 10 | | | | | 30.3 |
| | | | | | 48.9 |
| | 2.5 | B-01(10-12) | 10-12 | | 42.6 |
| | | | | | 33.7 |
| | | | | 14-15' - Brown to dark gray silt, moist, no odor | 39.5 |
| 15 | | | | | 20.3 |
| | | | | 15-17' - Brown fine sand with trace silt and gravel, moist, no odor | 13.4 |
| | 3 | | | | 9.7 |
| | | | | 17-25' - Brown coarse to medium sand and gravel, very moist, no | 4.2 |
| | | | | odor | 1.5 |
| 20 | | | | | 0.8 |
| | | | | | 1.9 |
| | 3 | | | | 2.3 |
| | | | | | 2.1 |
| | | | | | 0.8 |
| 25 | | | | 25-30' - Brown coarse to medium sand and gravel, trace pebbles, | 1.9 |
| | | | | up to 0.25" diameter, very moist, no odor | 2.4 |
| | 4 | | | | 1.8 |
| | | | | | 1.1 |
| | | | | | 0.3 |
| 30 | | | | 30-35' - Brown coarse to medium sand and gravel, trace pebbles, | 0.2 |
| | | | | up to 0.25" diameter, very moist, no odor | 0.8 |
| | 3.5 | B-01(30-35) | 30-35 | | 1.6 |
| | | | | | 2.7 |
| | | | | | 0.7 |
| 35 | | | | 35-40' - Brown coarse to medium sand and gravel, trace pebbles, | 1.1 |
| | | | | up to 0.5" diameter, very moist, no odor | 1.0 |
| | 3.5 | | | | 0.6 |
| | | | | | 0.5 |
| | | | | | 1.0 |
| 40 | | | | 40-45' - Dark Brown coarse to medium sand and gravel, trace | 0.9 |
| | | | | pebbles up to 0.75" diameter, very moist, no odor | 0.6 |
| | 4 | B-01(40-45) | 40-45 | | 0.2 |
| | | | | | 1.1 |
| | | | | | 0.6 |
| 45 | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr.) | Depth in feet to: Bottom of Boring | Depth in feet to: Water |
|---|---|---|---|---|
| 6/16/2020 | 950 | 1.25 | 45 ft | - |
| | | | | |
| | | | | |

**Sample ID**

| | |
|---|---|
| O | Open End Rod |
| T | Thin Wall Tube |
| U | Undisturbed Sample |
| S | Split Spoon Sample |
| G | Geoprobe |

**Summary**

| | |
|---|---|
| Overburden (Linear ft.) | 45 |
| Rock Cored (Linear ft.) | 0 |
| Number of Samples | 3 |
| BORING NO. | B01 |

*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.

# TEST BORING REPORT

**BORING NO.** B02

Page 1 of 1

| | | | |
|---|---|---|---|
| **PROJECT** | 8 Walworth Street | **H&A FILE NO.** | 134860-002 |
| **LOCATION** | 8 Walworth Street, Brooklyn, NY | **PROJECT MGR.** | Mari Conlon |
| **CLIENT** | Toldos Yehudah, LLC | **FIELD REP.** | Zach Simmel |
| **CONTRACTOR** | Coastal Environmental Solutions | **DATE STARTED** | 6/16/2020 |
| **DRILLER** | T. Fitzpatrick | **DATE FINISHED** | 6/16/2020 |

| **Elevation** | ft. | **Datum** | NAVD-88 | **Boring Location** | B02 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Item** | **Casing** | **Sampler** | **Core Barrel** | **Rig Make & Model** | 7822DT | | | **Hammer Type** | | **Drilling Mud** | | **Casing Advance** |
| **Type** | - | | | ☐ | Truck | ☐ | Tripod | ☐ Cat-Head | ☐ Safety | ☐ | Bentonite | **Type Method Depth** |
| **Inside Diameter (in.)** | 2 | | | ☐ | ATV | ☑ | Geoprobe | ☐ Winch | ☐ Doughnut | ☐ | Polymer | - |
| **Hammer Weight (lb.)** | - | | | ☐ | Track | ☐ | Air Track | ☐ Roller Bit | ☐ Automatic | ☑ | None | |
| **Hammer Fall (in.)** | - | | | ☐ | Skid | ☐ | ________ | ☐ Cutting Head | **Drilling Notes:** | | | |

| Depth (ft.) | Recovery (ft.) | Sample ID | Sample Depth (ft) | Visual-Manual Identification & Description | PID (ppm) |
|---|---|---|---|---|---|
| 0 | | | | 0-2" Concrete fragments | 1.2 |
| | | | | 2"-4.5' Fill material including brown fine sand with gravel, | 1.1 |
| | 2 | | | asphalt fragments and concrete fragments, no odor | 4.5 |
| | | | | | 10.7 |
| | | | | 4-9' Brown silty sand, slight sweet odor | 11.2 |
| 5 | | | | | 100.1 |
| | | | | | 149.8 |
| | 3.5 | | | 9-11' Brown to dark brown silty sand, slight sweet odor | 200.9 |
| | | | | | 458.7 |
| | | | | | 524.7 |
| 10 | | | | 11-15' - Brown fine sand with trace silty, moist at 12', slight sweet | 762.4 |
| | | | | odor | 677.9 |
| | 3 | | | | 567.8 |
| | | | | | 602.3 |
| | | | | | 200.6 |
| 15 | | | | 15-17' - Brown fine sand with trace gravel, moist, no odor | 144.5 |
| | | | | | 22.5 |
| | 3.5 | | | | 30.6 |
| | | | | 17-20' - Brown medium sand and gravel, very moist, no odor | 28.4 |
| | | | | | 18.5 |
| 20 | | | | 20-25' - Brown to light brown coarse sand and gravel, very moist, | 10.6 |
| | | | | no odor | 12.7 |
| | 3 | | | | 15.2 |
| | | | | | 7.8 |
| | | | | | 4.3 |
| 25 | | | | 25-30' - Brown coarse to medium sand and gravel, trace pebbles, | 1.4 |
| | | | | up to 0.1" diameter, very moist, no odor | 2.8 |
| | 2.5 | | | | 4.5 |
| | | | | | 1.7 |
| | | | | | 0.8 |
| 30 | | | | 30-35' - Brown coarse to medium sand and gravel, trace pebbles, | 0.4 |
| | | | | up to 0.5" diameter, very moist, no odor | 0.9 |
| | 4 | B-02(30-35) | 30-35 | | 1.6 |
| | | | | | 1.9 |
| | | | | | 2.1 |
| 35 | | | | 35-40' - Brown coarse to medium sand and gravel, very moist, no | 0.4 |
| | | | | odor | 0.9 |
| | 3.5 | | | | 1.1 |
| | | | | | 1.0 |
| | | | | | 1.5 |
| 40 | | | | 40-45' - Brown to light brown coarse sand and gravel, trace | 0.7 |
| | | | | pebbles up to 1" diameter, very moist, no odor | 0.5 |
| | 3 | B-02(40-45) | 40-45 | | 0.9 |
| | | | | | 0.2 |
| | | | | | 0.4 |
| 45 | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr.) | Depth in feet to: Bottom of Boring | Depth in feet to: Water |
|---|---|---|---|---|
| 6/16/2020 | 815 | 1.5 | 45 ft | - |

**Sample ID**

- **O** Open End Rod
- **T** Thin Wall Tube
- **U** Undisturbed Sample
- **S** Split Spoon Sample
- **G** Geoprobe

**Summary**

| | |
|---|---|
| Overburden (Linear ft.) | 45 |
| Rock Cored (Linear ft.) | 0 |
| Number of Samples | 2 |
| **BORING NO.** | B02 |

*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.

# TEST BORING REPORT

HALEY ALDRICH

**BORING NO.** B03

Page 1 of 1

| | | | |
|---|---|---|---|
| PROJECT | 8 Walworth Street | H&A FILE NO. | 134860-002 |
| LOCATION | 8 Walworth Street, Brooklyn, NY | PROJECT MGR. | Mari Conlon |
| CLIENT | Toldos Yehudah, LLC | FIELD REP. | Zach Simmel |
| CONTRACTOR | Eastern Environmental Solutions, Inc. | DATE STARTED | 6/22/2020 |
| DRILLER | Patrick | DATE FINISHED | 6/22/2020 |

Elevation ft. | Datum NAVD-88 | Boring Location B03

| Item | Casing | Sampler | Core Barrel | Rig Make & Model: 7822DT | | | Hammer Type | Drilling Mud | Casing Advance |
|---|---|---|---|---|---|---|---|---|---|
| Type | - | | | ☐ Truck | ☐ Tripod | ☐ Cat-Head | ☐ Safety | ☐ Bentonite | Type Method Depth |
| Inside Diameter (in.) | 2 | | | ☐ ATV | ☒ Geoprobe | ☐ Winch | ☐ Doughnut | ☐ Polymer | - |
| Hammer Weight (lb.) | - | | | ☐ Track | ☐ Air Track | ☐ Roller Bit | ☐ Automatic | ☒ None | |
| Hammer Fall (in.) | - | | | ☐ Skid | ☐ ________ | ☐ Cutting Head | Drilling Notes: | | |

| Depth (ft.) | Recovery (ft.) | Sample ID | Sample Depth (ft) | Visual-Manual Identification & Description | PID (ppm) |
|---|---|---|---|---|---|
| 0 | 3 | | | **0-2" Concrete fragments** | 0.0 |
| | | | | **2"-4.5' Fill material including light brown to brown medium to fine** | 0.5 |
| | | | | **sand with asphalt fragments and brick fragments, no odor** | 30.2 |
| | | | | | 28.7 |
| | | | | | 40.1 |
| 5 | 2.5 | | | **4.5-7' Brown fine sand with trace silt and brick fragments, no odor** | 82.6 |
| | | | | | 90.5 |
| | | | | | 201.4 |
| | | | | **7-11' Brown silty sand with trace gravel, slight sweet odor** | 256.6 |
| | | | | | 111.5 |
| 10 | 4 | | | **11-14' Brown fine sand with trace silt, moist at 12', slight sweet odor** | 98.7 |
| | | | | | 87.6 |
| | | | | | 80.2 |
| | | | | | 100.2 |
| | | | | **14-17' Brown coarse to medium sand and gravel, moist, no odor** | 98.9 |
| 15 | 2.5 | | | | 102.4 |
| | | | | | 88.3 |
| | | | | **17-20' - Brown coarse to medium sand and gravel, trace pebbles,** | 47.8 |
| | | | | **up to 0.1" diameter, very moist, no odor** | 39.6 |
| | | | | | 45.8 |
| 20 | 3.5 | | | **20-25' - Brown coarse to medium sand and gravel, trace pebbles,** | 20.2 |
| | | | | **up to 0.5" diameter, very moist, no odor** | 19.6 |
| | | | | | 20.5 |
| | | | | | 17.3 |
| | | | | | 6.7 |
| 25 | 2.5 | | | **25-30' - Brown coarse to medium sand and gravel, trace pebbles,** | 1.4 |
| | | | | **up to 0.3" diameter, very moist, no odor** | 1.8 |
| | | | | | 2.5 |
| | | | | | 3.1 |
| | | | | | 3.2 |
| 30 | 3 | B-03(30-35) | 30-35 | **30-35' - Brown coarse to medium sand and gravel, very moist, no** | 1.4 |
| | | | | **odor** | 0.9 |
| | | | | | 0.7 |
| | | | | | 0.5 |
| | | | | | 0.5 |
| 35 | 3 | | | **35-40' - Brown coarse to medium sand and gravel, trace pebbles,** | 0.2 |
| | | | | **up to 0.25" diameter, very moist, no odor** | 1.1 |
| | | | | | 1.0 |
| | | | | | 1.4 |
| | | | | | 0.8 |
| 40 | 3.5 | B-03(40-45) | 40-45 | **40-45' - Brown coarse to medium sand and gravel, trace pebbles** | 0.9 |
| | | | | **up to 0.5" diameter, very moist, no odor** | 0.5 |
| | | | | | 1.0 |
| | | | | | 0.2 |
| | | | | | 0.3 |
| 45 | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr.) | Depth in feet to: Bottom of Boring | Water |
|---|---|---|---|---|
| 6/22/2020 | 900 | 1.25 | 45 ft | - |
| | | | | |
| | | | | |

**Sample ID**

- O Open End Rod
- T Thin Wall Tube
- U Undisturbed Sample
- S Split Spoon Sample
- G Geoprobe

**Summary**

| | |
|---|---|
| Overburden (Linear ft.) | 45 |
| Rock Cored (Linear ft.) | 0 |
| Number of Samples | 2 |

BORING NO. B03

*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.

# TEST BORING REPORT

BORING NO. **B04**

Page 1 of 1

| | | | |
|---|---|---|---|
| PROJECT | 8 Walworth Street | H&A FILE NO. | 134860-002 |
| LOCATION | 8 Walworth Street, Brooklyn, NY | PROJECT MGR. | Mari Conlon |
| CLIENT | Toldos Yehudah, LLC | FIELD REP. | Zach Simmel |
| CONTRACTOR | Eastern Environmental Solutions, Inc. | DATE STARTED | 6/22/2020 |
| DRILLER | Patrick | DATE FINISHED | 6/22/2020 |

Elevation ft. | Datum NAVD-88 | Boring Location B04

| Item | Casing | Sampler | Core Barrel | Rig Make & Model | 7822DT | | Hammer Type | Drilling Mud | Casing Advance |
|---|---|---|---|---|---|---|---|---|---|
| Type | - | | | ☐ Truck | ☐ Tripod | ☐ Cat-Head | ☐ Safety | ☐ Bentonite | Type Method Depth |
| Inside Diameter (in.) | 2 | | | ☐ ATV | ☑ Geoprobe | ☐ Winch | ☐ Doughnut | ☐ Polymer | - |
| Hammer Weight (lb.) | - | | | ☐ Track | ☐ Air Track | ☐ Roller Bit | ☐ Automatic | ☑ None | |
| Hammer Fall (in.) | - | | | ☐ Skid | ☐ ________ | ☐ Cutting Head | Drilling Notes: | | |

| Depth (ft.) | Recovery (ft.) | Sample ID | Sample Depth (ft) | Visual-Manual Identification & Description | PID (ppm) |
|---|---|---|---|---|---|
| 0 | | | | **0-6" Concrete fragments** | 0.2 |
| | | | | **6"-5' Fill material including brown fine sand with concrete and** | 0.5 |
| | 3 | | | **brick fragments, no odor** | 1.7 |
| | | | | | 1.9 |
| | | | | | 0.8 |
| 5 | | | | **5-6' Brown fine sand with trace silt and brick fragments, no odor** | 1.9 |
| | | | | | 2.6 |
| | 3 | | | | 10.8 |
| | | | | **6-11' Brown silty sand with trace gravel, no odor** | 12.0 |
| | | | | | 11.5 |
| 10 | | | | **11-15' Brown silty sand with trace gravel, fine to medium sand lens** | 18.6 |
| | | | | **at 14-14.5', moist at 13.5', no odor** | 24.1 |
| | 2.5 | | | | 44.6 |
| | | | | | 38.2 |
| | | | | | 60.5 |
| 15 | | | | **15-16' Brown medium sand with trace gravel, moist, no odor** | 53.7 |
| | | | | **16-17' Light brown medium to coarse sand with gravel, moist, no odor** | 59.8 |
| | 3.5 | | | **17-20' - Brown coarse sand and gravel, trace pebbles up to 0.25"** | 45.4 |
| | | | | **diameter, very moist, no odor** | 42.6 |
| | | | | | 22.7 |
| 20 | | | | **20-25' - Brown coarse to medium sand and gravel, trace fine sand,** | 23.5 |
| | | | | **trace pebbles up to 0.3" diameter, very moist, no odor** | 21.1 |
| | 3.5 | | | | 11.4 |
| | | | | | 11.9 |
| | | | | | 8.1 |
| 25 | | | | **25-30' - Brown coarse to medium sand and gravel, trace fine sand,** | 7.3 |
| | | | | **very moist, no odor** | 3.4 |
| | 2.5 | | | | 4.7 |
| | | | | | 4.9 |
| | | | | | 3.2 |
| 30 | | | | **30-35' - Brown coarse to medium sand and gravel, trace pebbles up** | 3.4 |
| | | | | **to 0.25" diameter, very moist, no odor** | 0.6 |
| | 2 | B-04(30-35) | 30-35 | | 0.5 |
| | | | | | 1.8 |
| | | | | | 2.2 |
| 35 | | | | **35-40' - Brown coarse to medium sand and gravel, trace pebbles,** | 2.6 |
| | | | | **up to 0.5" diameter, very moist, no odor** | 1.4 |
| | 3 | | | | 0.4 |
| | | | | | 0.7 |
| | | | | | 1.1 |
| 40 | | | | **40-45' - Brown coarse to medium sand and gravel, trace fine sand** | 1.9 |
| | | | | **very moist, no odor** | 1.2 |
| | 3.5 | B-04(40-45) | 40-45 | | 0.8 |
| | | | | | 0.9 |
| | | | | | 1.0 |
| 45 | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr.) | Depth in feet to: Bottom of Boring | Water |
|---|---|---|---|---|
| 6/22/2020 | 1050 | 1.25 | 45 ft | - |
| | | | | |
| | | | | |

**Sample ID**

- **O** Open End Rod
- **T** Thin Wall Tube
- **U** Undisturbed Sample
- **S** Split Spoon Sample
- **G** Geoprobe

**Summary**

| | |
|---|---|
| Overburden (Linear ft.) | 45 |
| Rock Cored (Linear ft.) | 0 |
| Number of Samples | 2 |

BORING NO. B04

*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.

# TEST BORING REPORT

| BORING NO. | B05 |
|---|---|
| Page | 1 of 1 |

| | | | |
|---|---|---|---|
| PROJECT | 8 Walworth Street | H&A FILE NO. | 134860-002 |
| LOCATION | 8 Walworth Street, Brooklyn, NY | PROJECT MGR. | Mari Conlon |
| CLIENT | Toldos Yehudah, LLC | FIELD REP. | Mari Conlon |
| CONTRACTOR | Coastal Environmental Solutions | DATE STARTED | 6/15/2020 |
| DRILLER | T. Fitzpatrick | DATE FINISHED | 6/15/2020 |

| Elevation | ft. | Datum | NAVD-88 | Boring Location | B05 | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Item** | **Casing** | **Sampler** | **Core Barrel** | **Rig Make & Model** | 7822DT | | **Hammer Type** | **Drilling Mud** | **Casing Advance** |
| Type | - | | | ☐ Truck | ☐ Tripod | ☐ Cat-Head | ☐ Safety | ☐ Bentonite | Type Method Depth |
| Inside Diameter (in.) | 2 | | | ☐ ATV | ☑ Geoprobe | ☐ Winch | ☐ Doughnut | ☐ Polymer | - |
| Hammer Weight (lb.) | - | | | ☐ Track | ☐ Air Track | ☐ Roller Bit | ☐ Automatic | ☑ None | |
| Hammer Fall (in.) | - | | | ☐ Skid | ☐ _________ | ☐ Cutting Head | Drilling Notes: | | |

| Depth (ft.) | Recovery (ft.) | Sample ID | Sample Depth (ft) | Visual-Manual Identification & Description | PID (ppm) |
|---|---|---|---|---|---|
| 0 | | | | 0-6" Concrete fragments | 0.0 |
| | | | | 6"-5' Fill material including light tan to brown medium to fine sand | 0.0 |
| | 2.5 | | | with asphalt fragments, brick fragments and wood, no odor | 20.6 |
| | | | | | 6.9 |
| | | | | | 9.1 |
| 5 | | | | 5-6' Brown to dark brown silty sand with brick fragments, slight | 139.8 |
| | | | | sweet odor | 2908 |
| | 3.5 | B-05(10-12) | 10-12 | 6-10' Brown fine sand with trace gravel and concrete | 2080 |
| | | | | fragments, sweet odor | 679.9 |
| | | | | | 167.9 |
| 10 | | | | 10-13' Brown to dark brown medium to fine sand with trace gravel, | 362.5 |
| | | | | slight sweet odor, moist at 11' | 297.1 |
| | 5 | | | 13-14' Brown silty sand stained gray intermittently, slight sweet | 134.6 |
| | | | | odor, moist | 162.9 |
| | | | | 14-17' - Brown to dark gray fine sand, concrete fragments, | 126.4 |
| 15 | | | | slight sweet odor, moist | 153.5 |
| | | | | 17-20' - Brown coarse to medium sand, trace gravel, very moist, | 63.6 |
| | 2.5 | | | slight sweet odor | 24.8 |
| | | | | | 4.2 |
| | | | | | 1.7 |
| 20 | | | | 20-25' - Brown coarse to medium sand and gravel, trace pebbles, | 1.0 |
| | | | | up to 0.25" diameter, very moist, no odor | 0.0 |
| | 3 | | | | 1.2 |
| | | | | | 2.2 |
| | | | | | 4.1 |
| 25 | | | | 25-30' - Brown coarse to medium sand and gravel, trace pebbles, | 1.3 |
| | | | | up to 0.5" diameter, very moist, no odor | 1.2 |
| | 2.5 | | | | 1.1 |
| | | | | | 1.2 |
| | | | | | 1.1 |
| 30 | | | | 30-35' - Brown coarse to medium sand and gravel, trace pebbles, | 2.0 |
| | | | | up to 0.3" diameter, very moist, no odor | 1.4 |
| | 3.5 | B-05(30-35) | 30-35 | | 1.9 |
| | | | | | 2.2 |
| | | | | | 1.2 |
| 35 | | | | 35-40' - Brown coarse to medium sand and gravel, trace pebbles, | 1.2 |
| | | | | up to 0.25" diameter, very moist, no odor | 0.8 |
| | 4 | | | | 0.8 |
| | | | | | 0.5 |
| | | | | | 0.4 |
| 40 | | | | 40-45' - Brown coarse to medium sand and gravel, trace pebbles, | 0.7 |
| | | | | up to 0.75" diameter, very moist, no odor | 0.5 |
| | 3 | B-05(40-45) | 40-45 | | 0.4 |
| | | | | | 0.6 |
| | | | | | 0.4 |
| 45 | | | | | |

**Water Level Data**

| Date | Time | Elapsed Time (hr.) | Depth in feet to: Bottom of Boring | Depth in feet to: Water |
|---|---|---|---|---|
| 6/15/2020 | 800 | 1.5 | 45 ft | - |

**Sample ID**

| | |
|---|---|
| O | Open End Rod |
| T | Thin Wall Tube |
| U | Undisturbed Sample |
| S | Split Spoon Sample |
| G | Geoprobe |

**Summary**

| | |
|---|---|
| Overburden (Linear ft.) | 45 |
| Rock Cored (Linear ft.) | 0 |
| Number of Samples | 3 |
| BORING NO. | B05 |

*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.

# APPENDIX G

## Analytical Laboratory Reports

## (USB)

# APPENDIX H

## Groundwater Elevation Summary Log

# Synoptic Monitoring Well Gauging Log

| | |
|---|---|
| **PROJECT** | 8 Walworth Street Environmental Services |
| **LOCATION** | 8 Walworth Street, Brooklyn, NY |
| **CLIENT** | Toldos Yehudah, LLC |
| **H&A FILE NO.** | 134860-002 |
| **PROJECT MANAGER** | Mari Conlon |
| **FIELD REP.** | Zach Simmel and Sarah Commisso |
| **GAUGING DATE** | 7/23/2020 |
| **WEATHER** | 84°F, Sunny |

| MONITORING WELL ID | TIME | DEPTH TO WATER (FT BELOW TOC) | TOP OF CASING (FT) | GROUNDWATER ELEVATION (FT) |
|---|---|---|---|---|
| MW-01(S) | 1431 | 14.89 | 13.95 | -0.94 |
| MW-01(I) | 1430 | 14.71 | 13.99 | -0.72 |
| MW-02(S) | 1415 | 14.88 | 14.07 | -0.81 |
| MW-02(I) | 1413 | 14.90 | 14.05 | -0.85 |
| MW-02(D) | 1417 | 14.85 | 14.04 | -0.81 |
| MW-03(S) | 1428 | 14.72 | 13.97 | -0.75 |
| MW-03(I) | 1425 | 14.91 | 14.05 | -0.86 |
| MW-03(D) | 1426 | 14.72 | 14.04 | -0.68 |
| MW-04(S) | 1420 | 14.94 | 14.07 | -0.87 |
| MW-04(I) | 1418 | 14.94 | 14.08 | -0.86 |
| MW-04(D) | 1421 | 14.90 | 14.05 | -0.85 |
| MW-05(S) | 1423 | 14.89 | 14.06 | -0.83 |
| MW-05(I) | 1423 | 14.69 | 14.04 | -0.65 |
| MW-05(D) | 1422 | 14.92 | 14.07 | -0.85 |

Comments:

1. Monitoring wells were surveyed by NY Land Surveyors on 23 July 2020.

2. Elevation refers to the North American Vertical Datum of 1988 (NAVD88).

3. All dimensions are in US survey feet.

# APPENDIX I

# Microbial Array Results

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# SITE LOGIC Report

*QuantArray®-Chlor Study*

Contact: Mari Cate Conlon

Address: Haley & Aldrich, Inc.
237 W 35th Street
16th floor
New York, NY 10001

Phone: (646) 277-5685

Email: mconlon@haleyaldrich.com

**MI Identifier: 046RG**

Report Date: 07/27/2020

Project: 8 Walworth Street, 134860-002
Comments:

# The QuantArray®-Chlor Approach

Quantification of *Dehalococcoides*, the only known bacterial group capable of complete reductive dechlorination of PCE and TCE to ethene, has become an indispensable component of assessment, remedy selection, and performance monitoring at sites impacted by chlorinated solvents. While undeniably a key group of halorespiring bacteria, *Dehalococcoides* are not the only bacteria of interest in the subsurface because reductive dechlorination is not the only potential biodegradation pathway operative at contaminated sites, and chlorinated ethenes are not always the primary contaminants of concern. The QuantArray®-Chlor not only includes a variety of halorespiring bacteria (*Dehalococcoides*, *Dehalobacter*, *Dehalogenimonas*, etc.) to assess the potential for reductive dechlorination of chloroethenes, chloroethanes, chlorobenzenes, chlorophenols, and chloroform, but also provides quantification of functional genes involved in aerobic (co)metabolic pathways for biodegradation of chlorinated solvents and even competing biological processes. Thus, the QuantArray®-Chlor will give site managers the ability to simultaneously yet economically evaluate the potential for biodegradation of a spectrum of common chlorinated contaminants through a multitude of anaerobic and aerobic (co) metabolic pathways to give a much more clear and comprehensive view of contaminant biodegradation.

**The QuantArray®-Chlor is used to quantify specific microorganisms and functional genes to evaluate the following:**

| | |
|---|---|
| **Anaerobic Reductive Dechlorination** | Quantification of important halorespiring bacteria (e.g. *Dehalococcoides*, *Dehalobacter*, *Dehalogenimonas*, *Desulfitobacterium* spp.) and key functional genes (e.g. vinyl chloride reductases, TCE reductase, chloroform reductase) responsible for reductive dechlorination of a broad spectrum of chlorinated solvents. |
| **Aerobic Cometabolism** | Several different types of bacteria including methanotrophs and some toluene/phenol utilizing bacteria can co-oxidize TCE, DCE, and vinyl chloride. The QuantArray®-Chlor quantifies functional genes like soluble methane monooxygenase encoding enzymes capable of co-oxidation of chlorinated ethenes. |
| **Aerobic (Co)metabolism of Vinyl Chloride** | Ethene oxidizing bacteria are capable of cometabolism of vinyl chloride. In some cases, ethenotrophs can also utilize vinyl chloride as a growth supporting substrate. The QuantArray®-Chlor targets key functional genes in ethene metabolism. |

**How do QuantArrays® work?**

The QuantArray®-Chlor in many respects is a hybrid technology combining the highly parallel detection of microarrays with the accurate and precise quantification provided by qPCR into a single platform. The key to highly parallel qPCR reactions is the nanoliter fluidics platform for low volume, solution phase qPCR reactions.



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### How are QuantArray® results reported?

One of the primary advantages of the QuantArray®-Chlor is the simultaneous quantification of a broad spectrum of different microorganisms and key functional genes involved in a variety of pathways for chlorinated hydrocarbon biodegradation. However, highly parallel quantification combined with the various metabolic and cometabolic capabilities of different target organisms can complicate data presentation. Therefore, in addition to Summary Tables, QuantArray® results will be presented as Microbial Population Summary and Comparison Figures to aid in data interpretation and subsequent evaluation of site management activities.

### Types of Tables and Figures:

| | |
|---|---|
| **Microbial Population Summary** | Figure presenting the concentrations of QuantArray®-Chlor target populations (e.g. *Dehalococcoides*) and functional genes (e.g. vinyl chloride reductase) relative to typically observed values. |
| **Summary Tables** | Tables of target population concentrations grouped by biodegradation pathway and contaminant type. |
| **Comparison Figures** | Depending on the project, sample results can be presented to compare changes over time or examine differences in microbial populations along a transect of the dissolved plume. |



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microbialinsights

# Results

Table 1: Summary of the QuantArray®-Chlor results obtained for samples MW05-S, MW05-I, and MW05-D.

| Sample Name<br>Sample Date | MW05-S<br>07/13/2020 | MW05-I<br>07/13/2020 | MW05-D<br>07/13/2020 |
|---|---|---|---|
| *Reductive Dechlorination* | cells/mL | cells/mL | cells/mL |
| *Dehalococcoides* (DHC) | **6.36E+02** | **2.90E+00** | **2.60E+00** |
| tceA Reductase (TCE) | **8.36E+01** | **2.00E-01 (J)** | **3.00E-01 (J)** |
| BAV1 Vinyl Chloride Reductase (BVC) | **5.95E+01** | **7.00E-01** | **3.00E-01 (J)** |
| Vinyl Chloride Reductase (VCR) | **6.61E+01** | <5.00E-01 | **1.00E-01 (J)** |
| *Dehalobacter* spp. (DHBt) | **9.43E+03** | **2.36E+03** | **1.13E+02** |
| *Dehalobacter* DCM (DCM) | <4.80E+00 | <4.90E+00 | <5.20E+00 |
| *Dehalogenimonas* spp. (DHG) | <4.80E+00 | <4.90E+00 | <5.20E+00 |
| *cerA* Reductase (CER) | <4.80E+00 | <4.90E+00 | <5.20E+00 |
| *trans*-1,2-DCE Reductase (TDR) | <4.80E+00 | <4.90E+00 | <5.20E+00 |
| *Desulfitobacterium* spp. (DSB) | **6.55E+04** | **1.13E+03** | <5.20E+00 |
| *Dehalobium chlorocoercia* (DECO) | **4.63E+02** | **5.05E+02** | <5.20E+00 |
| *Desulfuromonas* spp. (DSM) | <4.80E+00 | **2.83E+02** | <5.20E+00 |
| PCE Reductase (PCE-1) | **2.14E+02** | <4.90E+00 | <5.20E+00 |
| PCE Reductase (PCE-2) | <4.80E+00 | <4.90E+00 | <5.20E+00 |
| Chloroform Reductase (CFR) | <4.80E+00 | <4.90E+00 | <5.20E+00 |
| 1,1 DCA Reductase (DCA) | <4.80E+00 | <4.90E+00 | <5.20E+00 |
| 1,2 DCA Reductase (DCAR) | <4.80E+00 | <4.90E+00 | <5.20E+00 |
| *Aerobic (Co)Metabolic* | | | |
| Soluble Methane Monooxygenase (SMMO) | **3.01E+02** | <4.90E+00 | <5.20E+00 |
| Toluene Dioxygenase (TOD) | <4.80E+00 | **7.30E+00** | <5.20E+00 |
| Phenol Hydroxylase (PHE) | **1.11E+04** | **2.29E+04** | **5.28E+03** |
| Trichlorobenzene Dioxygenase (TCBO) | <4.80E+00 | <4.90E+00 | <5.20E+00 |
| Toluene Monooxygenase 2 (RDEG) | **8.26E+03** | **2.23E+04** | **1.88E+03** |
| Toluene Monooxygenase (RMO) | <4.80E+00 | <4.90E+00 | **3.97E+02** |
| Ethene Monooxygenase (EtnC) | <4.80E+00 | <4.90E+00 | <5.20E+00 |
| Epoxyalkane Transferase (EtnE) | **3.16E+01** | <4.90E+00 | <5.20E+00 |
| Dichloromethane Dehalogenase (DCMA) | <4.80E+00 | <4.90E+00 | <5.20E+00 |
| *Other* | | | |
| Total Eubacteria (EBAC) | **1.08E+07** | **7.20E+07** | **3.23E+05** |
| Sulfate Reducing Bacteria (APS) | **4.05E+04** | **1.45E+03** | **8.01E+03** |
| Methanogens (MGN) | **2.50E+00 (J)** | <4.90E+00 | <5.20E+00 |

**Legend:**
NA = Not Analyzed
I = Inhibited
NS = Not Sampled
< = Result Not Detected
J = Estimated Gene Copies Below PQL but Above LQL


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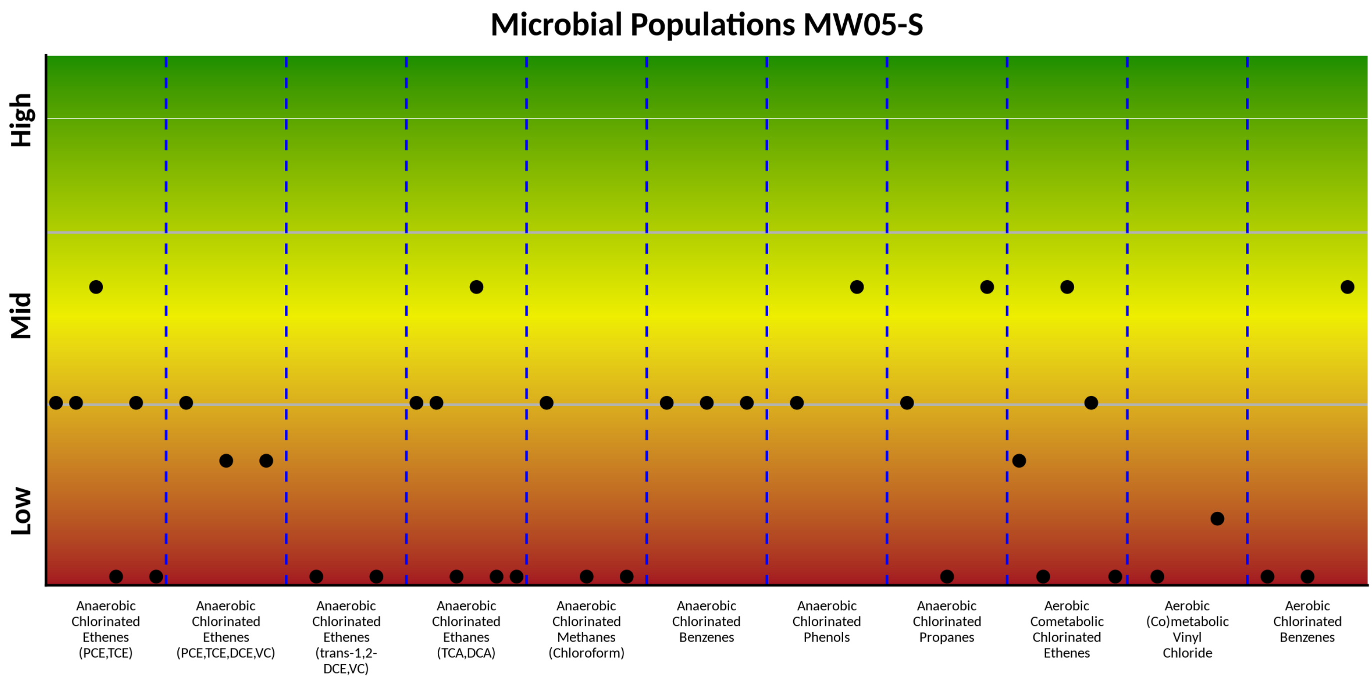


Figure 1: Microbial population summary to aid in evaluating potential pathways and biodegradation of specific contaminants.

| Anaerobic - Reductive Dechlorination or Dichloroelimination | | Aerobic - (Co)metabolism | |
|---|---|---|---|
| Chlorinated Ethenes (PCE, TCE) | DHC, DHBt, DSB, DSM, PCE-1, PCE-2 | Chlorinated Ethenes (TCE,DCE,VC) | sMMO, TOD, PHE, RDEG, RMO |
| Chlorinated Ethenes (PCE, TCE, DCE, VC) | DHC, BVC, VCR | (Co)metabolic Vinyl Chloride | etnC, etnE |
| Chlorinated Ethenes (trans-1,2-DCE, VC) | TDR, CER | Chlorinated Benzenes | TOD, TCBO, PHE |
| Chlorinated Ethanes (TCA and 1,2-DCA) | DHC, DHBt, DHG, DSB[1], DCA, DCAR | | |
| Chlorinated Methanes (Chloroform) | DHBt, DCM, CFR | | |
| Chlorinated Benzenes | DHC, DHBt[2], DECO | | |
| Chlorinated Phenols | DHC, DSB | | |
| Chlorinated Propanes | DHC, DHG, DSB[1] | | |

[1] *Desulfitobacterium dichloroeliminans* DCA1. [2] Implicated in reductive dechlorination of dichlorobenzene and potentially chlorobenzene.



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Microbial Populations MW05-I

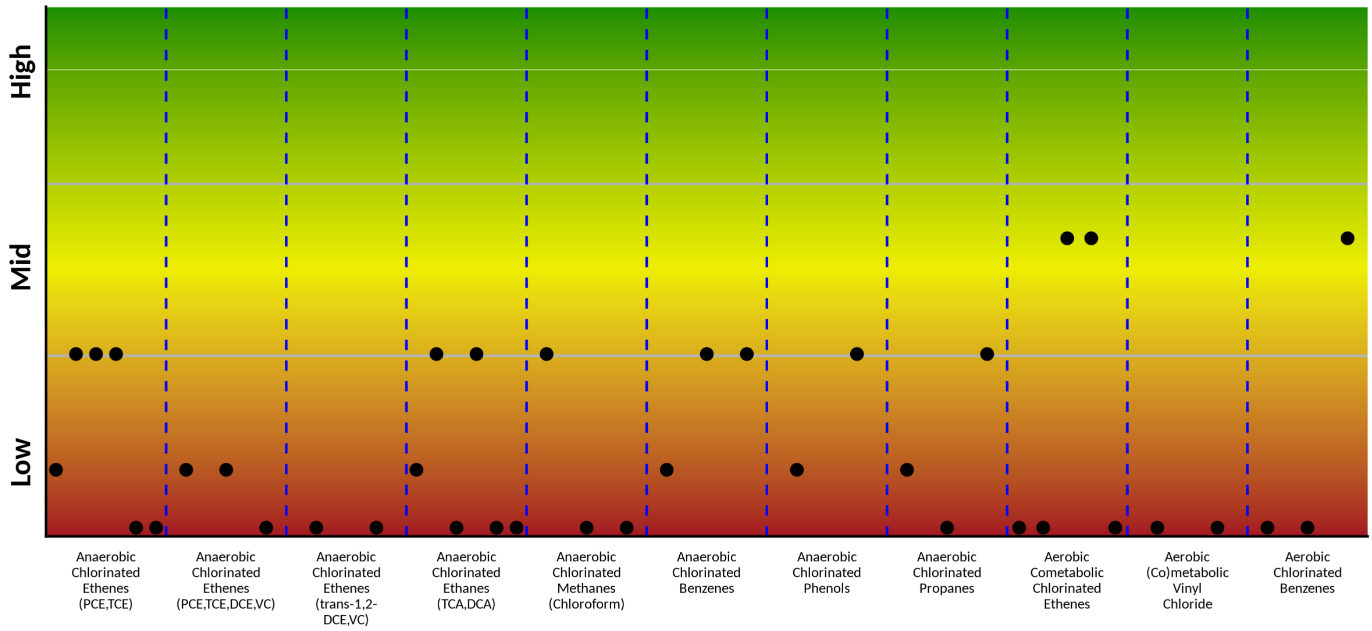


Figure 2: Microbial population summary to aid in evaluating potential pathways and biodegradation of specific contaminants.

| Anaerobic - Reductive Dechlorination or Dichloroelimination | | Aerobic - (Co)metabolism | |
|---|---|---|---|
| Chlorinated Ethenes (PCE, TCE) | DHC, DHBt, DSB, DSM, PCE-1, PCE-2 | Chlorinated Ethenes (TCE,DCE,VC) | sMMO, TOD, PHE, RDEG, RMO |
| Chlorinated Ethenes (PCE, TCE, DCE, VC) | DHC, BVC, VCR | (Co)metabolic Vinyl Chloride | etnC, etnE |
| Chlorinated Ethenes (trans-1,2-DCE, VC) | TDR, CER | Chlorinated Benzenes | TOD, TCBO, PHE |
| Chlorinated Ethanes (TCA and 1,2-DCA) | DHC, DHBt, DHG, DSB[1], DCA, DCAR | | |
| Chlorinated Methanes (Chloroform) | DHBt, DCM, CFR | | |
| Chlorinated Benzenes | DHC, DHBt[2], DECO | | |
| Chlorinated Phenols | DHC, DSB | | |
| Chlorinated Propanes | DHC, DHG, DSB[1] | | |

[1] *Desulfitobacterium dichloroeliminans* DCA1. [2] Implicated in reductive dechlorination of dichlorobenzene and potentially chlorobenzene.


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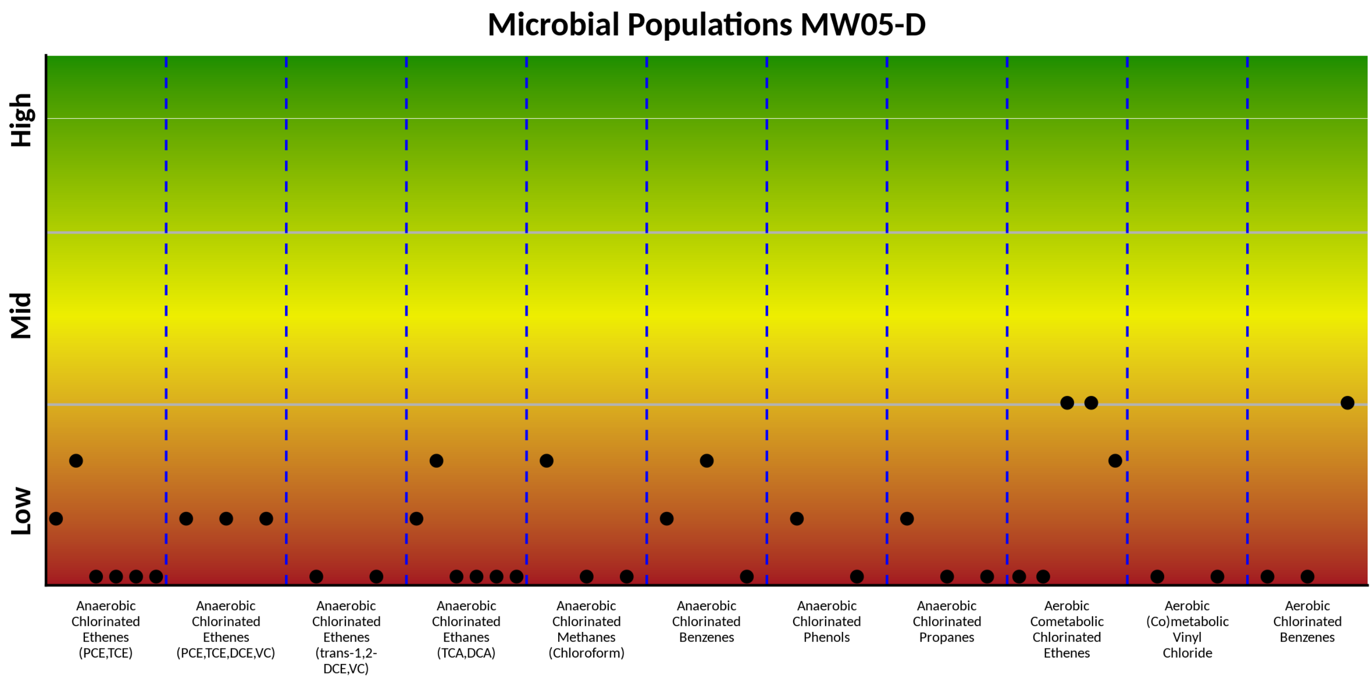


Figure 3: Microbial population summary to aid in evaluating potential pathways and biodegradation of specific contaminants.

| **Anaerobic - Reductive Dechlorination or Dichloroelimination** | | **Aerobic - (Co)metabolism** | |
|---|---|---|---|
| Chlorinated Ethenes (PCE, TCE) | DHC, DHBt, DSB, DSM, PCE-1, PCE-2 | Chlorinated Ethenes (TCE,DCE,VC) | sMMO, TOD, PHE, RDEG, RMO |
| Chlorinated Ethenes (PCE, TCE, DCE, VC) | DHC, BVC, VCR | (Co)metabolic Vinyl Chloride | etnC, etnE |
| Chlorinated Ethenes (trans-1,2-DCE, VC) | TDR, CER | Chlorinated Benzenes | TOD, TCBO, PHE |
| Chlorinated Ethanes (TCA and 1,2-DCA) | DHC, DHBt, DHG, DSB[1], DCA, DCAR | | |
| Chlorinated Methanes (Chloroform) | DHBt, DCM, CFR | | |
| Chlorinated Benzenes | DHC, DHBt[2], DECO | | |
| Chlorinated Phenols | DHC, DSB | | |
| Chlorinated Propanes | DHC, DHG, DSB[1] | | |

[1] *Desulfitobacterium dichloroeliminans* DCA1. [2] Implicated in reductive dechlorination of dichlorobenzene and potentially chlorobenzene.



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Table 2: Summary of the QuantArray®-Chlor results for microorganisms responsible for reductive dechlorination for samples MW05-S, MW05-I, and MW05-D.

| Sample Name<br>Sample Date | MW05-S<br>07/13/2020 | MW05-I<br>07/13/2020 | MW05-D<br>07/13/2020 |
|---|---|---|---|
| *Reductive Dechlorination* | cells/mL | cells/mL | cells/mL |
| *Dehalococcoides* (DHC) | **6.36E+02** | **2.90E+00** | **2.60E+00** |
| tceA Reductase (TCE) | **8.36E+01** | **2.00E-01 (J)** | **3.00E-01 (J)** |
| BAV1 Vinyl Chloride Reductase (BVC) | **5.95E+01** | **7.00E-01** | **3.00E-01 (J)** |
| Vinyl Chloride Reductase (VCR) | **6.61E+01** | <5.00E-01 | **1.00E-01 (J)** |
| *Dehalobacter* spp. (DHBt) | **9.43E+03** | **2.36E+03** | **1.13E+02** |
| *Dehalobacter* DCM (DCM) | <4.80E+00 | <4.90E+00 | <5.20E+00 |
| *Dehalogenimonas* spp. (DHG) | <4.80E+00 | <4.90E+00 | <5.20E+00 |
| *Desulfitobacterium* spp. (DSB) | **6.55E+04** | **1.13E+03** | <5.20E+00 |
| *Dehalobium chlorocoercia* (DECO) | **4.63E+02** | **5.05E+02** | <5.20E+00 |
| *Desulfuromonas* spp. (DSM) | <4.80E+00 | **2.83E+02** | <5.20E+00 |

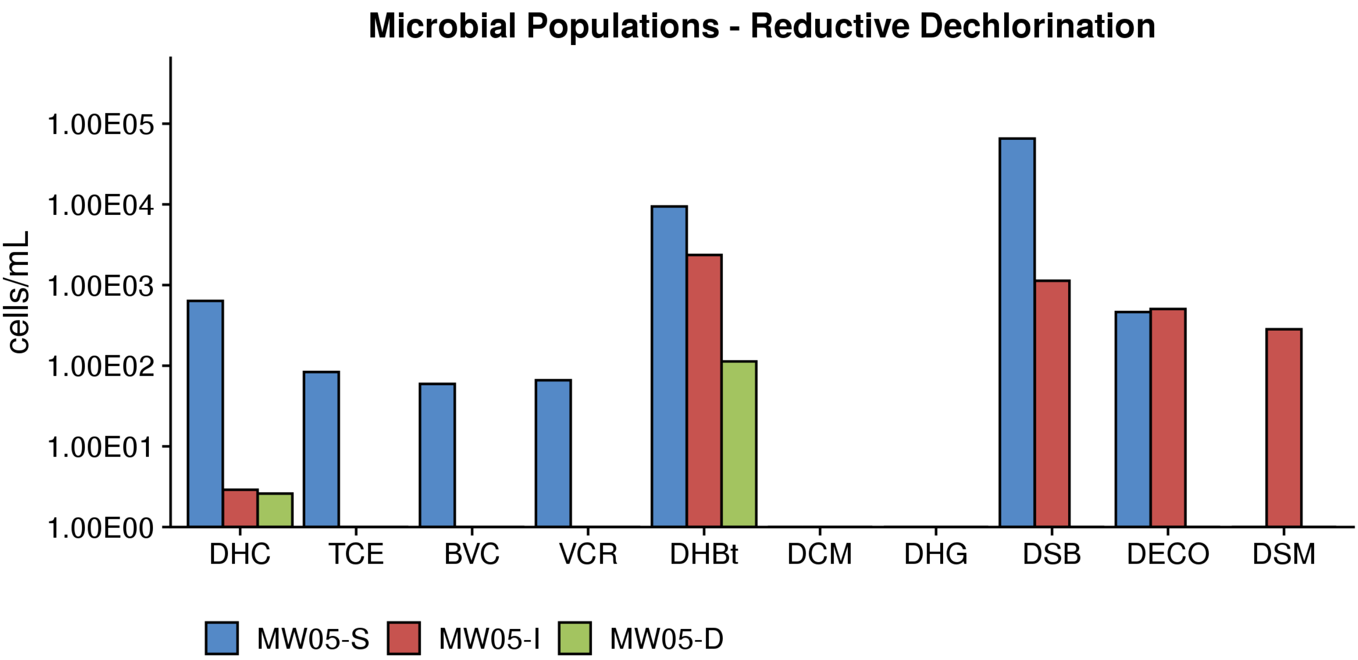


Figure 4: Comparison - microbial populations involved in reductive dechlorination.


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Table 3: Summary of the QuantArray®-Chlor results for microorganisms responsible for reductive dechlorination for samples MW05-S, MW05-I, and MW05-D.

| Sample Name<br>Sample Date | MW05-S<br>07/13/2020 | MW05-I<br>07/13/2020 | MW05-D<br>07/13/2020 |
|---|---|---|---|
| *Reductive Dechlorination* | cells/mL | cells/mL | cells/mL |
| Chloroform Reductase (CFR) | <4.80E+00 | <4.90E+00 | <5.20E+00 |
| 1,1 DCA Reductase (DCA) | <4.80E+00 | <4.90E+00 | <5.20E+00 |
| 1,2 DCA Reductase (DCAR) | <4.80E+00 | <4.90E+00 | <5.20E+00 |
| PCE Reductase (PCE-1) | **2.14E+02** | <4.90E+00 | <5.20E+00 |
| PCE Reductase (PCE-2) | <4.80E+00 | <4.90E+00 | <5.20E+00 |
| *Dehalogenimonas trans*-1,2-DCE Reductase (TDR) | <4.80E+00 | <4.90E+00 | <5.20E+00 |
| *Dehalogenimonas cerA* Reductase (CER) | <4.80E+00 | <4.90E+00 | <5.20E+00 |

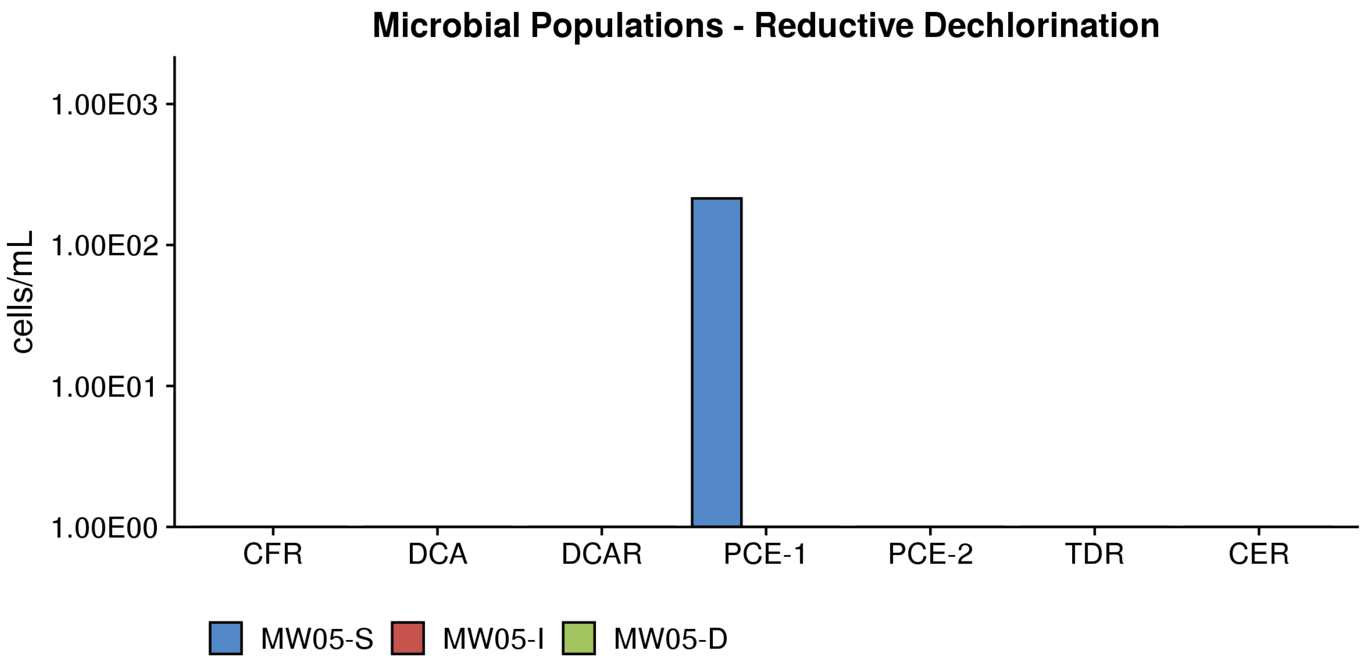


Figure 5: Comparison - microbial populations involved in reductive dechlorination.


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Table 4: Summary of the QuantArray®-Chlor results for microorganisms responsible for aerobic (co)metabolism for samples MW05-S, MW05-I, and MW05-D.

| Sample Name<br>Sample Date | MW05-S<br>07/13/2020 | MW05-I<br>07/13/2020 | MW05-D<br>07/13/2020 |
|---|---|---|---|
| *Aerobic (Co)Metabolic* | cells/mL | cells/mL | cells/mL |
| Soluble Methane Monooxygenase (SMMO) | **3.01E+02** | <4.90E+00 | <5.20E+00 |
| Toluene Dioxygenase (TOD) | <4.80E+00 | **7.30E+00** | <5.20E+00 |
| Phenol Hydroxylase (PHE) | **1.11E+04** | **2.29E+04** | **5.28E+03** |
| Trichlorobenzene Dioxygenase (TCBO) | <4.80E+00 | <4.90E+00 | <5.20E+00 |
| Toluene Monooxygenase 2 (RDEG) | **8.26E+03** | **2.23E+04** | **1.88E+03** |
| Toluene Monooxygenase (RMO) | <4.80E+00 | <4.90E+00 | **3.97E+02** |
| Ethene Monooxygenase (EtnC) | <4.80E+00 | <4.90E+00 | <5.20E+00 |
| Epoxyalkane Transferase (EtnE) | **3.16E+01** | <4.90E+00 | <5.20E+00 |
| Dichloromethane Dehalogenase (DCMA) | <4.80E+00 | <4.90E+00 | <5.20E+00 |

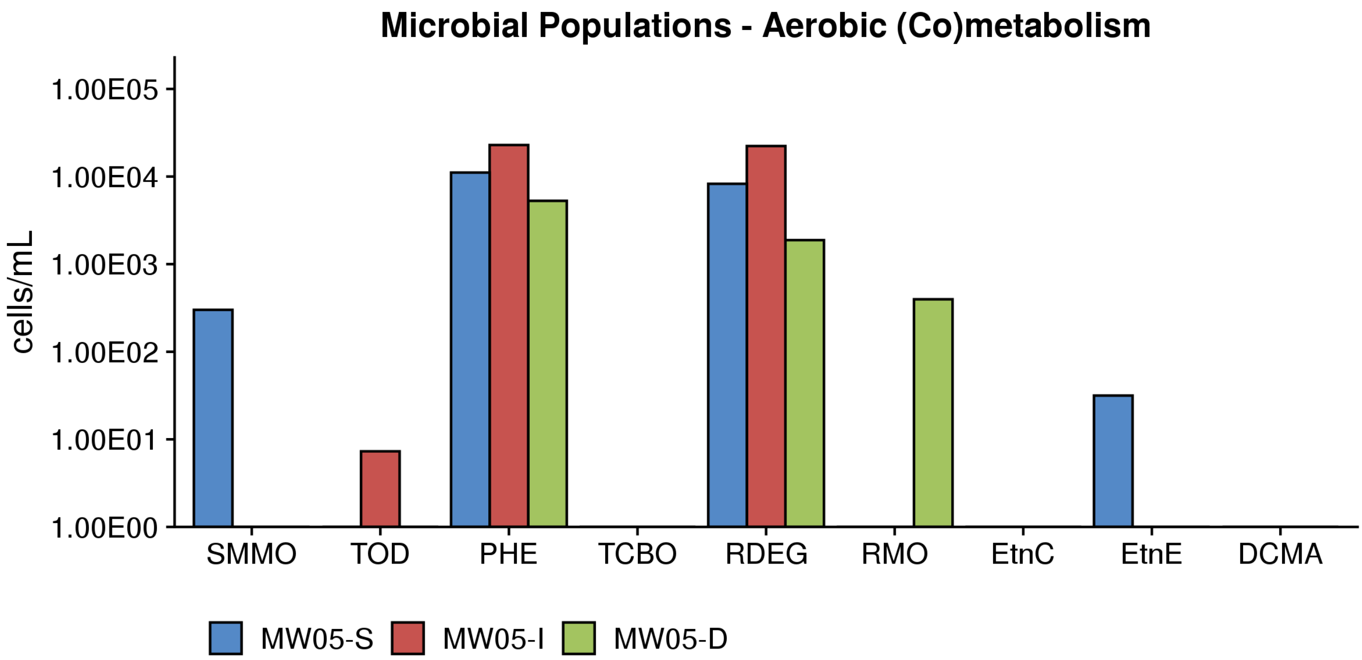


Figure 6: Comparison - microbial populations involved in aerobic (co)metabolism.


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Table 5: Summary of the QuantArray® results for total bacteria and other populations for samples MW05-S, MW05-I, and MW05-D.

| Sample Name<br>Sample Date | MW05-S<br>07/13/2020 | MW05-I<br>07/13/2020 | MW05-D<br>07/13/2020 |
|---|---|---|---|
| *Other* | cells/mL | cells/mL | cells/mL |
| Total Eubacteria (EBAC) | **1.08E+07** | **7.20E+07** | **3.23E+05** |
| Sulfate Reducing Bacteria (APS) | **4.05E+04** | **1.45E+03** | **8.01E+03** |
| Methanogens (MGN) | **2.50E+00 (J)** | <4.90E+00 | <5.20E+00 |

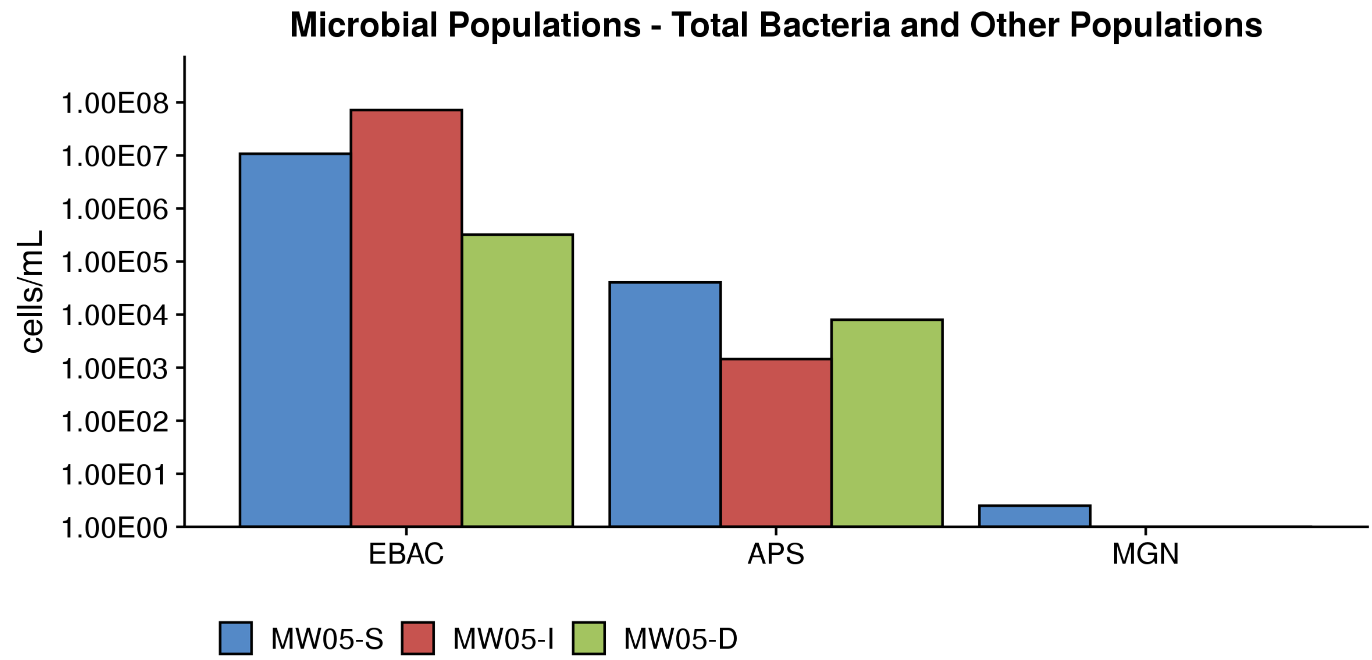


Figure 7: Comparison - microbial populations.


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# Interpretation

The overall purpose of the QuantArray®-Chlor is to give site managers the ability to simultaneously yet economically evaluate the potential for biodegradation of a spectrum of common chlorinated contaminants through a multitude of anaerobic and aerobic (co)metabolic pathways in order to provide a clearer and more comprehensive view of contaminant biodegradation. The following discussion describes the interpretation of results in general terms and is meant to serve as a guide.

**Reductive Dechlorination - Chlorinated Ethenes:** While a number of bacterial cultures including *Dehalococcoides*, *Dehalobacter*, *Desulfitobacterium*, and *Desulfuromonas* spp. capable of utilizing PCE and TCE as growth-supporting electron acceptors have been isolated [1–5], *Dehalococcoides* may be the most important because they are the only bacterial group that has been isolated to date which is capable of complete reductive dechlorination of PCE to ethene [6]. In fact, the presence of *Dehalococcoides* has been associated with complete reductive dechlorination to ethene at sites across North America and Europe [7], and Lu et al. [8] have proposed using a *Dehalococcoides* concentration of 1 x $10^4$ cells/mL as a screening criterion to identify sites where biological reductive dechlorination is predicted to proceed at "generally useful" rates.

At chlorinated ethene sites, any "stall" leading to the accumulation of daughter products, especially vinyl chloride, would be a substantial concern. While *Dehalococcoides* concentrations greater than 1 x $10^4$ cells/mL correspond to ethene production and useful rates of dechlorination, the range of chlorinated ethenes degraded varies by strain within the *Dehalococcoides* genus [6, 9], and the presence of co-contaminants and competitors can have complex impacts on the halorespiring microbial community [10–15]. Therefore, QuantArray®-Chlor also provides quantification of a suite of reductive dehalogenase genes (PCE, TCE, BVC, VCR, CER, and TDR) to more definitively confirm the potential for reductive dechlorination of all chlorinated ethene compounds including vinyl chloride.

Perhaps most importantly, QuantArray®-Chlor quantifies TCE reductase (TCE) and both known vinyl chloride reductase genes (BVC, VCR) from *Dehalococcoides* to conclusively evaluate the potential for complete reductive dechlorination of chlorinated ethenes to nontoxic ethene [16–18]. In addition, the analysis also includes quantification of reductive dehalogenase genes from *Dehalogenimonas* spp. capable of reductive dechlorination of chlorinated ethenes. More specifically, these are the trans-1,2-DCE dehalogenase gene (TDR) from strain WBC-2 [19] and the vinyl chloride reductase gene (CER) from GP, the only known organisms other than *Dehalococcoides* capable of vinyl chloride reduction [20]. Finally, PCE reductase genes responsible for sequential reductive dechlorination of PCE to *cis*-DCE by *Sulfurospirillum* and *Geobacter* spp. are also quantified. In mixed cultures, evidence increasingly suggests that partial dechlorinators like *Sulfurospirillum* and *Geobacter* may be responsible for the majority of reductive dechlorination of PCE to TCE and *cis*-DCE while *Dehalococcoides* functions more as *cis*-DCE and vinyl chloride reducing specialists [10, 21].

**Reductive Dechlorination - Chlorinated Ethanes:** Under anaerobic conditions, chlorinated ethanes are susceptible to reductive dechlorination by several groups of halorespiring bacteria including *Dehalobacter*, *Dehalogenimonas*, and *Dehalococcoides*. While the reported range of chlorinated ethanes utilized varies by genus, species, and sometimes at the strain level, several general observations can be made regarding biodegradation pathways and daughter product formation. *Dehalobacter* spp. have been isolated that are capable of sequential reductive dechlorination of 1,1,1-TCA through 1,1-DCA to chloroethane [13]. Biodegradation of 1,1,2-TCA by several halorespiring bacteria including *Dehalobacter* and *Dehalogenimonas* spp. proceeds via dichloroelimination producing vinyl chloride [22–24]. Similarly, 1,2-DCA biodegradation by *Dehalobacter*, *Dehalogenimonas*, and *Dehalococcoides* occurs via dichloroelimination producing ethene. While not utilized by many *Desulfitobacterium* isolates, at least one strain, *Desulfitobacterium dichloroeliminans* strain DCA1, is also capable of dichloroelimination of 1,2-DCA [25]. The 1,2-dichloroethane reductive dehalogenase gene (DCAR) from members of *Desulfitobacterium* and *Dehalobacter* is known to dechlorinate 1,2-DCA to ethene, while the 1,1-dichloroethane reductive dehalogenase (DCA) targets the gene responsible for 1,1-DCA dechlorination in some strains of *Dehalobacter*. In addition to chloroform,chloroform reductase (CFR) has also been shown to be responsible for reductivedechlorination of 1,1,1-TCA [26].

**Reductive Dechlorination - Chlorinated Methanes:** Chloroform is a common co-contaminant at chlorinated solvent sites and can inhibit reductive dechlorination of chlorinated ethenes. Grostern et al. demonstrated that a *Dehalobacter* population was capable of reductive dechlorination of chloroform to produce dichloromethane [27]. The *cfrA* gene encodes the reductase which catalyzes this initial step in chloroform biodegradation [26]. Justicia-Leon et al. have since shown that dichloromethane can support growth of a distinct group of *Dehalobacter* strains via fermentation [28]. The *Dehalobacter* DCM assay targets the 16S rRNA gene of these strains.

**Reductive Dechlorination - Chlorinated Benzenes:** Chlorinated benzenes are an important class of industrial solvents and chemical intermediates in the production of drugs, dyes, herbicides, and insecticides. The physical-chemical properties of chlorinated benzenes as well as susceptibility to biodegradation are functions of their degree of chlorination and the positions of chlorine substituents. Under anaerobic conditions, reductive dechlorination of higher chlorinated benzenes including hexachlorobenzene (HCB),


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pentachlorobenzene (PeCB), tetrachlorobenzene (TeCB) isomers, and trichlorobenzene (TCB) isomers has been well documented [29], although biodegradation of individual compounds and isomers varies between isolates. For example, *Dehalococcoides* strain CBDB1 reductively dechlorinats HCB, PeCB, all three TeCB isomers, 1,2,3-TCB, and 1,2,4-TCB [9, 30]. *Dehalobium chlorocoercia* DF-1 has been shown to be capable of reductive dechlorination of HCB, PeCB, and 1,2,3,5-TeCB [31]. The dichlorobenzene (DCB) isomers and chlorobenzene (CB) were considered relatively recalcitrant under anaerobic conditions. However, new evidence has demonstrated reductive dechlorination of DCBs to CB and CB to benzene [32] with corresponding increases in concentrations of *Dehalobacter* spp. [33].

**Reductive Dechlorination - Chlorinated Phenols:** Pentachlorophenol (PCP) was one of the most widely used biocides in the U.S. and despite residential use restrictions, is still extensively used industrially as a wood preservative. Along with PCP, the tetrachlorophenol and trichlorophenol isomers were also used as fungicides in wood preserving formulations. 2,4-Dichlorophenol and 2,4,5-TCP were used as chemical intermediates in herbicide production (e.g. 2,4-D) and chlorophenols are known byproducts of chlorine bleaching in the pulp and paper industry. While the range of compounds utilized varies by strain, some *Dehalococcoides* isolates are capable of reductive dechlorination of PCP and other chlorinated phenols. For example, *Dehalococcoides* strain CBDB1 is capable of utilizing PCP, all three tetrachlorophenol (TeCP) congeners, all six trichlorophenol (TCP) congeners, and 2,3-dichlorophenol (2,3-DCP). PCP dechlorination by strain CBDB1 produces a mixture of 3,5-DCP, 3,4-DCP, 2,4-DCP, 3-CP, and 4-CP [34]. In the same study, however, *Dehalococcoides* strain 195 dechlorinated a more narrow spectrum of chlorophenols which included 2,3-DCP, 2,3,4-TCP, and 2,3,6-TCP, but no other TCPs or PCP. Similar to *Dehalococcoides*, some species and strains of *Desulfitobacterium* are capable of utilizing PCP and other chlorinated phenols. *Desulfitobacterium hafniense* PCP-1 is capable of reductive dechlorination of PCP to 3-CP [35]. However, the ability to biodegrade PCP is not universal among *Desulfitobacterium* isolates. *Desulfitobacterium* sp. strain PCE1 and *D. chlororespirans* strain Co23, for example, can utilize some TCP and DCP isomers, but not PCP for growth [2, 36].

**Reductive Dechlorination - Chlorinated Propanes:** *Dehalogenimonas* is a recently described bacterial genus of the phylum Chloroflexi which also includes the well-known chloroethene-respiring *Dehalococcoides* [23]. The *Dehalogenimonas* isolates characterized to date are also halorespiring bacteria, but utilize a rather unique range of chlorinated compounds as electron acceptors including chlorinated propanes (1,2,3-TCP and 1,2-DCP) and a variety of other vicinally chlorinated alkanes including 1,1,2,2-tetrachloroethane, 1,1,2-trichloroethane, and 1,2-dichloroethane [23].

**Aerobic - Chlorinated Ethene Cometabolism:** Under aerobic conditions, several different types of bacteria including methane-oxidizing bacteria (methanotrophs), and many benzene, toluene, ethylbenzene, xylene, and (BTEX)-utilizing bacteria can cometabolize or co-oxidize TCE, DCE, and vinyl chloride [37]. In general, cometabolism of chlorinated ethenes is mediated by monooxygenase enzymes with "relaxed' specificity that oxidize a primary (growth supporting) substrate (*e.g.* methane) and co-oxidize the chlorinated compound (*e.g.*TCE). QuantArray®-Chlor provides quantification of a suite of genes encoding oxygenase enzymes capable of co-oxidation of chlorinated ethenes including soluble methane monooxygenase (sMMO). Soluble methane monooxygenases co-oxidize a broad range of chlorinated compounds [38–41] including TCE, *cis*-DCE, and vinyl chloride. Furthermore, soluble methane monooxygenases are generally believed to support greater rates of aerobic cometabolism [40]. QuantArray®-Chlor also quantifies aromatic oxygenase genes encoding ring hydroxylating toluene monooxygenase genes (RMO, RDEG), toluene dioxygenase (TOD) and phenol hydroxylases (PHE) capable of TCE co-oxidation [42–46]. TCE or a degradation product has been shown to induce expression of toluene monooxygenases in some laboratory studies [43, 47] raising the possibility of TCE cometabolism with an alternative (non-aromatic) growth substrate. Moreover, while a number of additional factors must be considered, recent research under ESTCP Project 201584 has shown positive correlations between concentrations of monooxygenase genes (soluble methane monooxygenase, ring hydroxylating monooxygenases, and phenol hydroxylase) and the rate of TCE degradation [48].

**Aerobic - Chlorinated Ethane Cometabolism:** While less widely studied than cometabolism of chlorinated ethenes, some chlorinated ethanes are also susceptible to co-oxidation. As mentioned previously, soluble methane monooxygenases (sMMO) exhibit very relaxed specificity. In laboratory studies, sMMO has been shown to co-oxidize a number of chlorinated ethanes including 1,1,1-TCA and 1,2-DCA [38, 40].

**Aerobic - Vinyl Chloride Cometabolism:** Beginning in the early 1990s, numerous microcosm studies demonstrated aerobic oxidation of vinyl chloride under MNA conditions without the addition of exogenous primary substrates. Since then, strains of



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*Mycobacterium*, *Nocardioides*, *Pseudomonas*, *Ochrobactrum*, and *Ralstonia* species have been isolated which are capable of aerobic growth on both ethene and vinyl chloride (see Mattes et al. [49] for a review). The initial steps in the pathway are the monooxygenase (*etn*ABCD) catalyzed conversion of ethene and vinyl chloride to their respective epoxyalkanes (epoxyethane and chlorooxirane), followed by epoxyalkane:CoM transferase (*etn*E) mediated conjugation and breaking of the epoxide [50].

**Aerobic - Chlorinated Benzenes:** In general, chlorobenzenes with four or less chlorine groups are susceptible to aerobic biodegradation and can serve as growth-supporting substrates. Toluene dioxygenase (TOD) has a relatively relaxed substrate specificity and mediates the incorporation of both atoms of oxygen into the aromatic ring of benzene and substituted benzenes (toluene and chlorobenzene). Comparison of TOD levels in background and source zone samples from a CB-impacted site suggested that CBs promoted growth of TOD-containing bacteria [51]. In addition, aerobic biodegradation of some trichlorobenzene and even tetrachlorobenzene isomers is initiated by a group of related trichlorobenzene dioxygenase genes (TCBO). Finally, phenol hydroxylases catalyze the continued oxidation and in some cases, the initial oxidation of a variety of monoaromatic compounds. In an independent study, significant increases in numbers of bacteria containing PHE genes corresponded to increases in biodegradation of DCB isomers [51].

**Aerobic - Chlorinated Methanes:** Many aerobic methylotrophic bacteria, belonging to diverse genera (*Hyphomicrobium*, *Methylobacterium*, *Methylophilus*, *Pseudomonas*, *Paracoccus*, and *Alibacter*) have been isolated which are capable of utilizing dichloromethane (DCM) as a growth substrate. The DCM metabolic pathway in methylotrophic bacteria is initiated by a dichloromethane dehalogenase (DCMA) gene. DCMA is responsible for aerobic biodegradation of dichloromethane by methylotrophs by first producing formaldehyde which is then further oxidized [52]. As discussed in previous sections, soluble methane monooxygenase (sMMO) exhibits relaxed specificity and co-oxidizes a broad spectrum of chlorinated hydrocarbons. In addition to chlorinated ethenes, sMMO has been shown to co-oxidize chloroform in laboratory studies [38, 41].



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# APPENDIX J

# Daily Reports

# DAILY FIELD REPORT



| | | | |
|---|---|---|---|
| Project | NYSDEC Site C224239 - 8 Walworth Street | Report No. | 1 |
| Location | 8 Walworth Street, Brooklyn, NY | Date | 6/15/2020 |
| Client | Toldos Yehuda, LLC | Page | 1 of 1 |
| Contractor | Coastal Environmental Solutions | File No. | 134860-002 |
| Weather | Sunny | Temperature | 65-70° F |

**0700 M Conlon and J Bellew of Haley & Aldrich and T Fitzpatrick and J Feldshuh of Coastal Environmental Solutions (Coastal) on site**
**0715 Health and safety tailgate and COVID-19 discussion**
**0730 Site walk and mobilize geoprobe (track mounted 7822 probe)**
**0745 Set up air monitoring equipment**
**0800 Begin soil boring at B05**
**0845 K Patel of NYSDEC on site, health and safety tailgate and COVID-19 discussion**
**0855 K Patel off site**
**0930 Continue installation of B05**
**1000 Complete soil boring B05, collect appropriate soil samples**
**1010 Mobilize augers and equipment for permanent monitoring well installation**
**1030 Begin installation of MW05 via hollow stem auger**
**1145 Refusal encountered at approximately 5 ft bgs at MW05, mobilize to MW03 and revisit MW05 at a later date**
**1200 Begin installation of MW03 via hollow stem auger**
**1215 Sweet smelling odor from MW03 0-5 ft bgs**
**1315 Continue installation of MW03**
**1330 Marc Morgenstern of Coastal on site, health and safety tailgate and COVID-19 discussion**
**1345 Refusal encountered at approximately 12 ft bgs, team evaluates alternate monitoring well installation procedure**
**1355 Mobilize geoprobe to collect soil boring from B03**
**1410 J Bellew off site**
**1415 M Morgenstern off site**
**1420 Refusal encountered at approximately 12 ft bgs, offset boring**
**1440 Refusal encountered at approximately 12 ft bgs, offset boring**
**1510 Refusal encountered at approximately 11.5 ft bgs**
**1520 Work ceases on site, sample and field document preparation**
**1525 Coastal off site**
**1540 Site cleanup and take down air monitoring equipment**
**1410 Relinquish samples to the laboratory courier**
**1415 All off site**

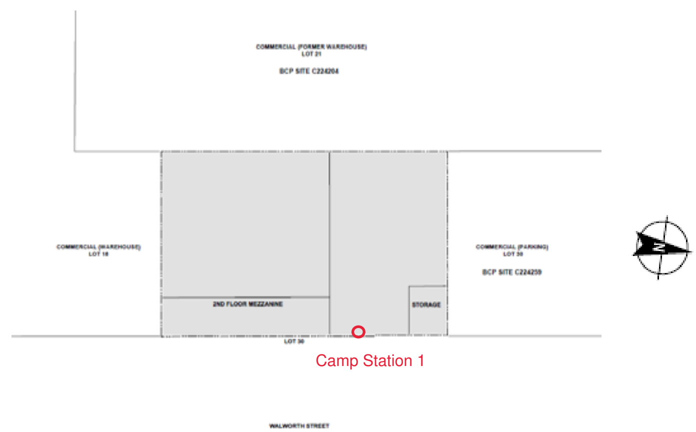
| Field Representative(s) | Time on site | Report/Travel/Other | Total hours |
|---|---|---|---|
| M Conlon | | | |
| J Bellew | | | |

8 Walworth Street, Brooklyn, NY
134860-002
Air Monitoring Log

Date: 6/15/2020
Personnel: M Conlon
Weather: Sunny
Humidity: 55%
Temperature: 65-70° F
Wind Direction: NE

Particulate Background: No visible dust
PID Background (ppm): 0.0

Site Map:




| Time | Dust Particulates | PID | | Notes |
|---|---|---|---|---|
| | Visual Dust (Y/N) | PID (ppm) | Odors (Y/N) | Activities/Additional Monitoring |
| 745 | N | 0.0 | N | No additional particulate monitoring necessary |
| 800 | N | 0.0 | N | No additional particulate monitoring necessary |
| 815 | N | 0.0 | N | No additional particulate monitoring necessary |
| 830 | N | 0.0 | N | No additional particulate monitoring necessary |
| 845 | N | 0.0 | N | No additional particulate monitoring necessary |
| 900 | N | 0.0 | N | No additional particulate monitoring necessary |
| 915 | N | 0.0 | N | No additional particulate monitoring necessary |
| 930 | N | 0.0 | N | No additional particulate monitoring necessary |
| 945 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1000 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1015 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1030 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1045 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1100 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1115 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1130 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1145 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1200 | N | 0.0 | N | No additional particulate monitoring necessary |

8 Walworth Street, Brooklyn, NY
134860-002
Air Monitoring Log

| Time | Dust Particulates | PID | | Notes |
|---|---|---|---|---|
| | Visual Dust (Y/N) | PID (ppm) | Odors (Y/N) | Activities/Additional Monitoring |
| 1215 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1230 | N | 0.0 | Slight sweet odor near B03MW03 | No additional particulate monitoring necessary |
| 1245 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1300 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1315 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1330 | N | 0.0 | Slight sweet odor near B03MW03 | No additional particulate monitoring necessary |
| 1345 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1400 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1415 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1430 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1445 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1500 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1515 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1530 | N | 0.0 | N | No additional particulate monitoring necessary |
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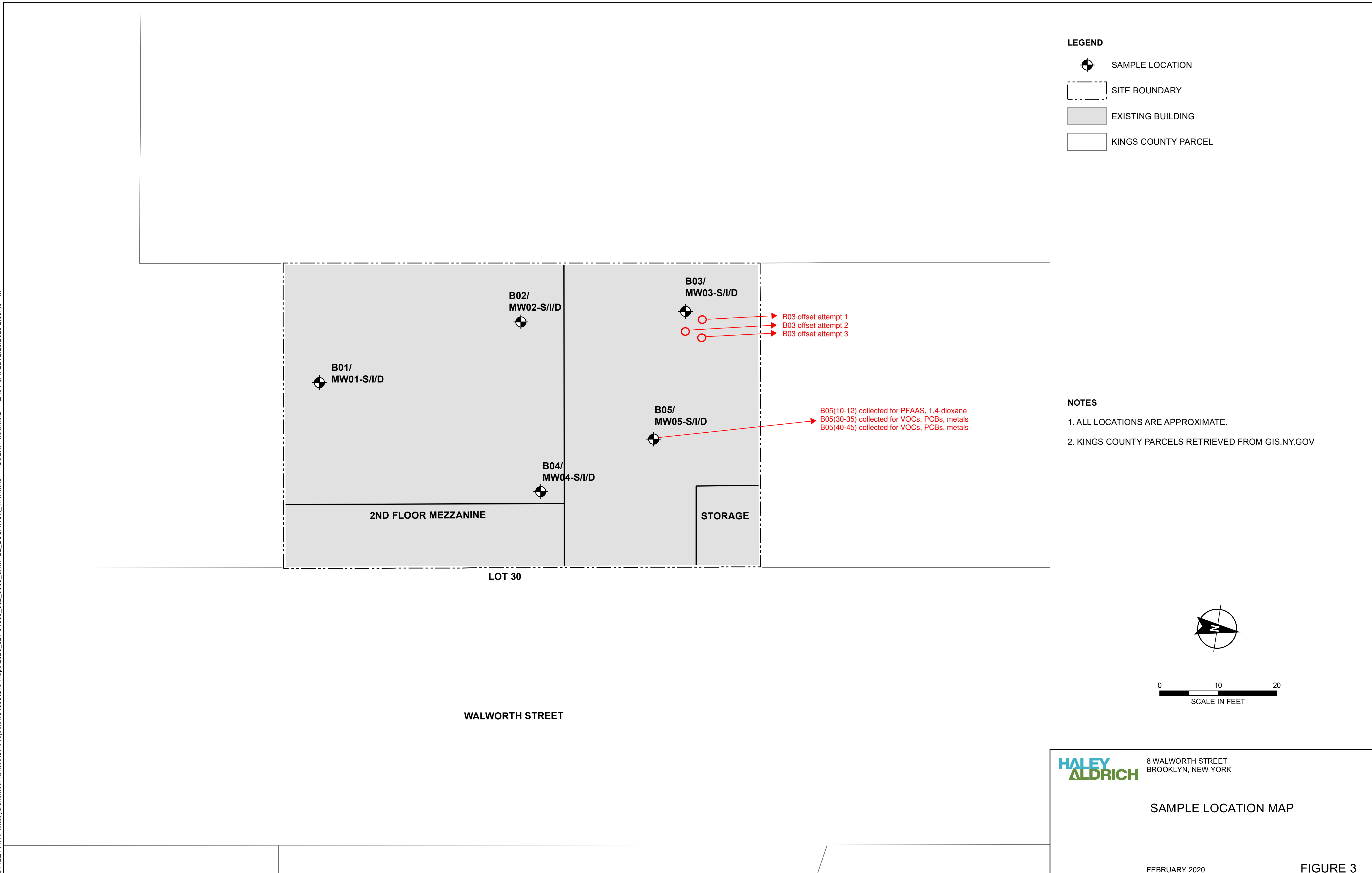


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*Photo 1: View of Geoprobe 7822DT mobilization.*

*Photo 2: View of attempted installation of MW05.*

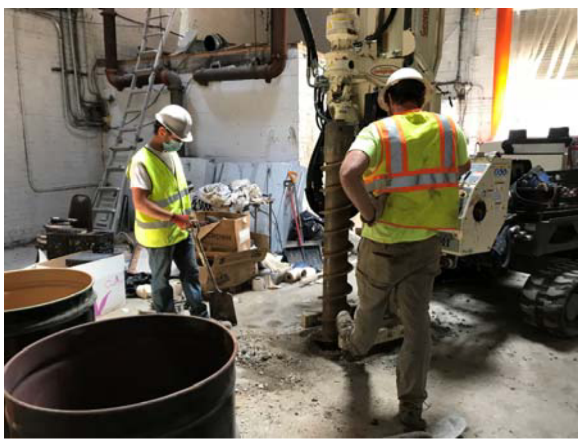


*Photo 3: View of refusal encountered at MW05.*

*Photo 4: View of soils (0-20 ft bgs) from B05.*

# DAILY FIELD REPORT



| | | | |
|---|---|---|---|
| **Project** | **NYSDEC Site C224239 - 8 Walworth Street** | **Report No.** | 2 |
| **Location** | **8 Walworth Street, Brooklyn, NY** | **Date** | **6/16/2020** |
| **Client** | **Toldos Yehuda, LLC** | **Page** | **1** of **1** |
| **Contractor** | **Coastal Environmental Solutions** | **File No.** | **134860-002** |
| **Weather** | **Sunny** | **Temperature** | **65-70° F** |

**0645 Z Simmel of Haley & Aldrich and T Fitzpatrick and J Feldshuh of Coastal Environmental Solutions (Coastal) on site**
**0700 M Conlon of Haley & Aldrich on site**
**0715 Review scope of work for day with Coastal**
**0720 Set up air monitoring equipment**
**0735 Begin soil boring at B03, refusal encountered at approximately 12 ft bgs**
**0800 Moving truck with trailer on Wallabout Street**
**0815 Moving Geoprobe to B02**
**0845 Continue installation of B02**
**0945 Complete soil boring B02, collect appropriate soil samples, M Conlon off site**
**0950 Moving Geoprobe to B01, begin installation**
**1015 Continue installation of B01**
**1105 Complete soil boring B01, collect appropriate soil samples**
**1120 Refusal encountered at approximately 5 ft bgs at B04**
**1120 Probe rod stuck in ground, T Fitzpatrick working to free it**
**1135 Clamp attachment on Geoprobe fails, Coastal attempting to fix**
**1155 Work ceases on site, sample and field document preparation**
**1215 Coastal cleaning up, demobilize onto trailer**
**1230 Coastal off site**
**1230 Site cleanup and take down air monitoring equipment**
**1253 Relinquish samples to the laboratory courier**
**1300 Z Simmel off site**

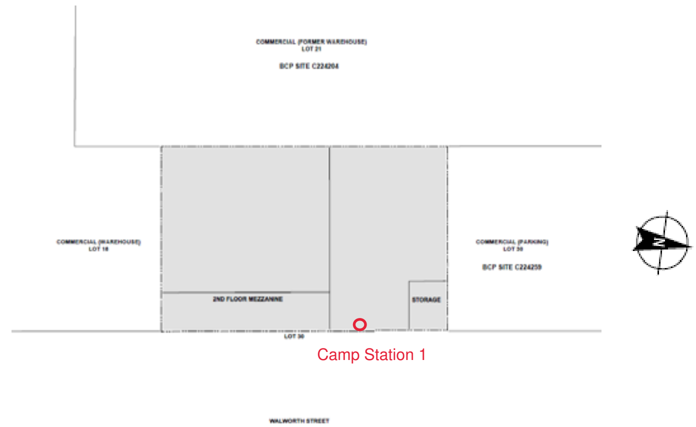
| Field Representative(s) | Time on site | Report/Travel/Other | Total hours |
|---|---|---|---|
| M Conlon | 2 hours | 1 hour | 3 |
| Z Simmel | 6.25 hours | 1 hour | 7.25 |

8 Walworth Street, Brooklyn, NY
134860-002
Air Monitoring Log

| | |
|---|---|
| Date: | 6/16/2020 |
| Personnel: | Z Simmel |
| Weather: | Sunny |
| Humidity: | 52% |
| Temperature: | 65-70° F |
| Wind Direction: | NE |

| | |
|---|---|
| Particulate Background: | No visible dust |
| PID Background (ppm): | 0.0 |

Site Map:




| Time | Dust Particulates | PID | | Notes |
|---|---|---|---|---|
| | Visual Dust (Y/N) | PID (ppm) | Odors (Y/N) | Activities/Additional Monitoring |
| 730 | N | 0.0 | N | No additional particulate monitoring necessary |
| 745 | N | 0.0 | N | No additional particulate monitoring necessary |
| 800 | N | 0.0 | N | No additional particulate monitoring necessary |
| 815 | N | 0.0 | N | No additional particulate monitoring necessary |
| 830 | N | 0.0 | N | No additional particulate monitoring necessary |
| 845 | N | 0.0 | N | No additional particulate monitoring necessary |
| 900 | N | 0.0 | N | No additional particulate monitoring necessary |
| 915 | N | 0.0 | N | No additional particulate monitoring necessary |
| 930 | N | 0.0 | N | No additional particulate monitoring necessary |
| 945 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1000 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1015 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1030 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1045 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1100 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1115 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1130 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1145 | N | 0.0 | N | No additional particulate monitoring necessary |

8 Walworth Street, Brooklyn, NY
134860-002
Air Monitoring Log

| Time | Dust Particulates | PID | | Notes |
|---|---|---|---|---|
| | Visual Dust (Y/N) | PID (ppm) | Odors (Y/N) | Activities/Additional Monitoring |
| 1200 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1215 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1230 | N | 0.0 | N | No additional particulate monitoring necessary |
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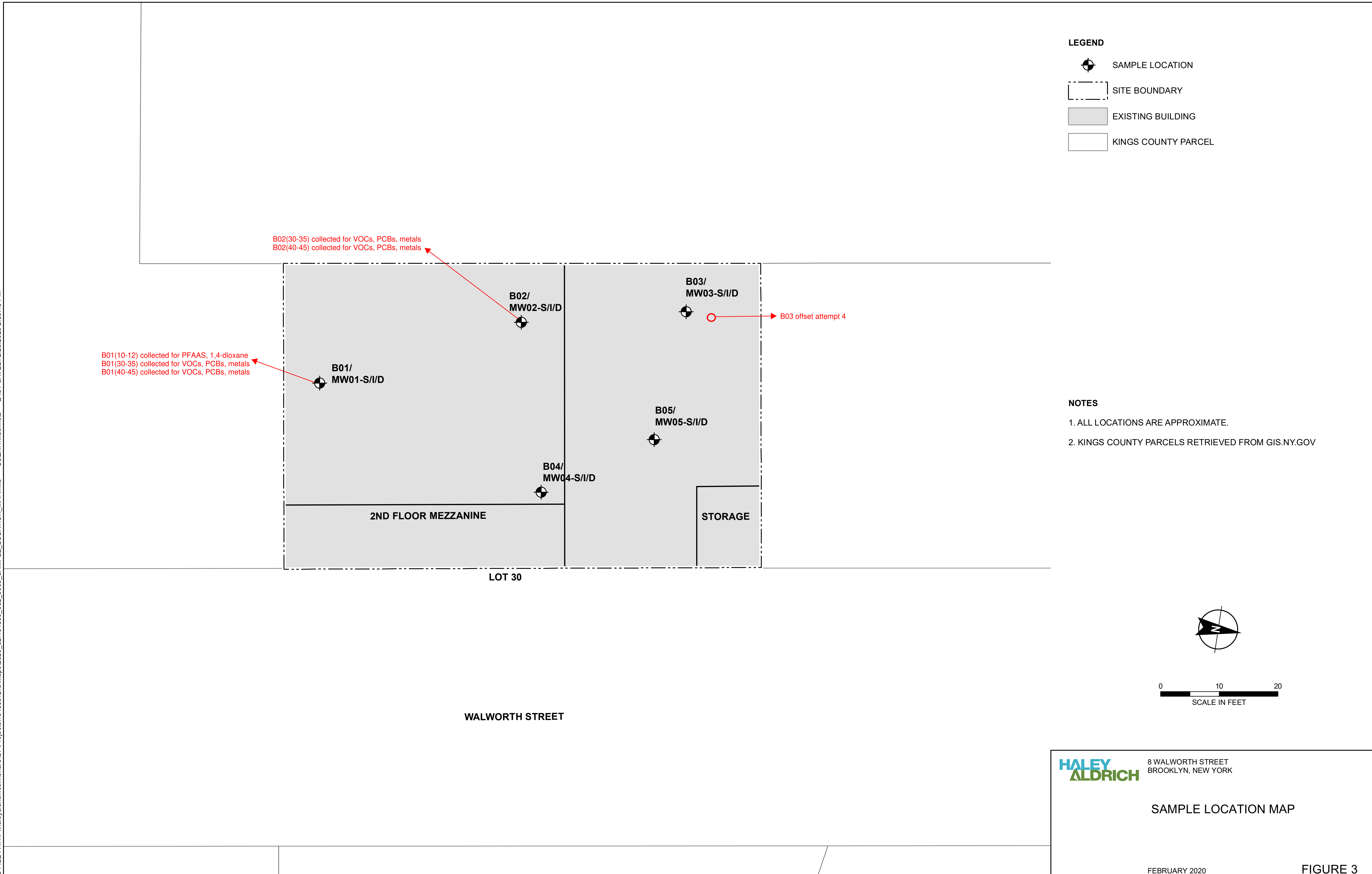



GIS FILE PATH: \\haleyaldrich.com\share\CF\Projects\134860\GIS\Maps\2020_02\134860_002_0003_SAMPLE_LOCATION_MAP.mxd — USER: hwachholz — LAST SAVED: 2/28/2020 2:50:43 PM

HALEY ALDRICH

8 WALWORTH STREET
BROOKLYN, NEW YORK

SAMPLE LOCATION MAP

FEBRUARY 2020

FIGURE 3

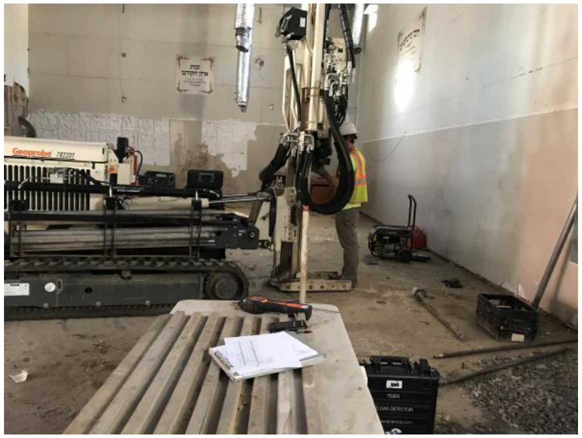


*Photo 1: View of Geoprobe 7822DT mobilization to B02.*

*Photo 2: View of installation of B02.*

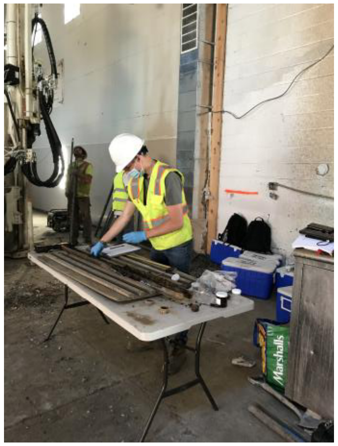


*Photo 3: View of soil logging.*

*Photo 4: View of soils (30-35 ft bgs) from B02.*

# DAILY FIELD REPORT



| | | | |
|---|---|---|---|
| **Project** | **NYSDEC Site C224239 - 8 Walworth Street** | **Report No.** | 3 |
| **Location** | **8 Walworth Street, Brooklyn, NY** | **Date** | **6/22/2020** |
| **Client** | **Toldos Yehuda, LLC** | **Page** | **1** of **1** |
| **Contractor** | **Eastern Environmental Solutions** | **File No.** | **134860-002** |
| **Weather** | **Sunny** | **Temperature** | **85-90° F** |

**0645 Z Simmel of Haley & Aldrich on site**
**0700 M Conlon of Haley & Aldrich and Pat of Eastern Environmental Solutions (Eastern) on site**
**0715 Health and safety tailgate and COVID discussion**
**0720 Mobilize Geoprobe (track mounted 7822DT), unload drilling equipment, set up air monitoring equipment**
**0800 Begin drilling of permanent monitoring well MW05 with hollow stem augers**
**0830 Continue drilling of MW05**
**0850 Refusal encountered at approximately 13 ft bgs**
**0900 Mobilize to B03 to collect soil samples, revisit MW05 at later date**
**0930 Continue drilling at B03**
**0945 Collect soil sample at B03 from interval 30-35 ft bgs**
**1005 Complete drilling at B03**
**1010 Collect soil sample at B03 from interval 40-45 ft bgs**
**1015 Eastern takes break**
**1050 Begin drilling at B04**
**1130 Continuing drilling at B04**
**1140 Collect soil sample at B04 from interval 30-35 ft bgs**
**1200 Complete drilling at B04**
**1205 Collect soil sample at B04 from interval 40-45 ft bgs**
**1215 Eastern bringing in equipment and supplies for preparation of mud rotary**
**1300 Eastern preparing for mud rotary, take down air monitoring equipment**
**1345 M. Conlon and Eastern off site**
**1420 Z. Simmel relinquishes soil samples to Alpha Analytical laboratory courier**
**1430 Z. Simmel off site**

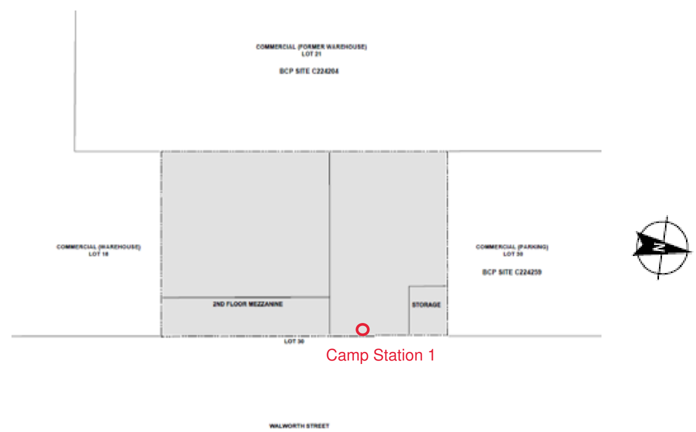
| Field Representative(s) | Time on site | Report/Travel/Other | Total hours |
|---|---|---|---|
| M Conlon | 6.75 | 1 hour | 7.75 |
| Z Simmel | 7.75 | 1 hour | 8.75 |

8 Walworth Street, Brooklyn, NY
134860-002
Air Monitoring Log

Date: 6/22/2020
Personnel: Z Simmel
Weather: Sunny
Humidity: 45%
Temperature: 85-90° F
Wind Direction: NE

Particulate Background: No visible dust
PID Background (ppm): 0.0

Site Map:




| Time | Dust Particulates | PID | | Notes |
|---|---|---|---|---|
| | Visual Dust (Y/N) | PID (ppm) | Odors (Y/N) | Activities/Additional Monitoring |
| 730 | N | 0.0 | N | No additional particulate monitoring necessary |
| 745 | N | 0.0 | N | No additional particulate monitoring necessary |
| 800 | N | 0.0 | Y | Faint, sweet odor |
| 815 | N | 0.0 | Y | Faint, sweet odor |
| 830 | N | 0.0 | N | Faint, sweet odor |
| 845 | N | 0.0 | N | Faint, sweet odor |
| 900 | N | 0.0 | N | No additional particulate monitoring necessary |
| 915 | N | 0.0 | N | No additional particulate monitoring necessary |
| 930 | N | 0.0 | N | No additional particulate monitoring necessary |
| 945 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1000 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1015 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1030 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1045 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1100 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1115 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1130 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1145 | N | 0.0 | N | No additional particulate monitoring necessary |

8 Walworth Street, Brooklyn, NY
134860-002
Air Monitoring Log

| | Dust Particulates | PID | | Notes |
|---|---|---|---|---|
| Time | Visual Dust (Y/N) | PID (ppm) | Odors (Y/N) | Activities/Additional Monitoring |
| 1200 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1215 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1230 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1245 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1300 | N | 0.0 | N | No additional particulate monitoring necessary |
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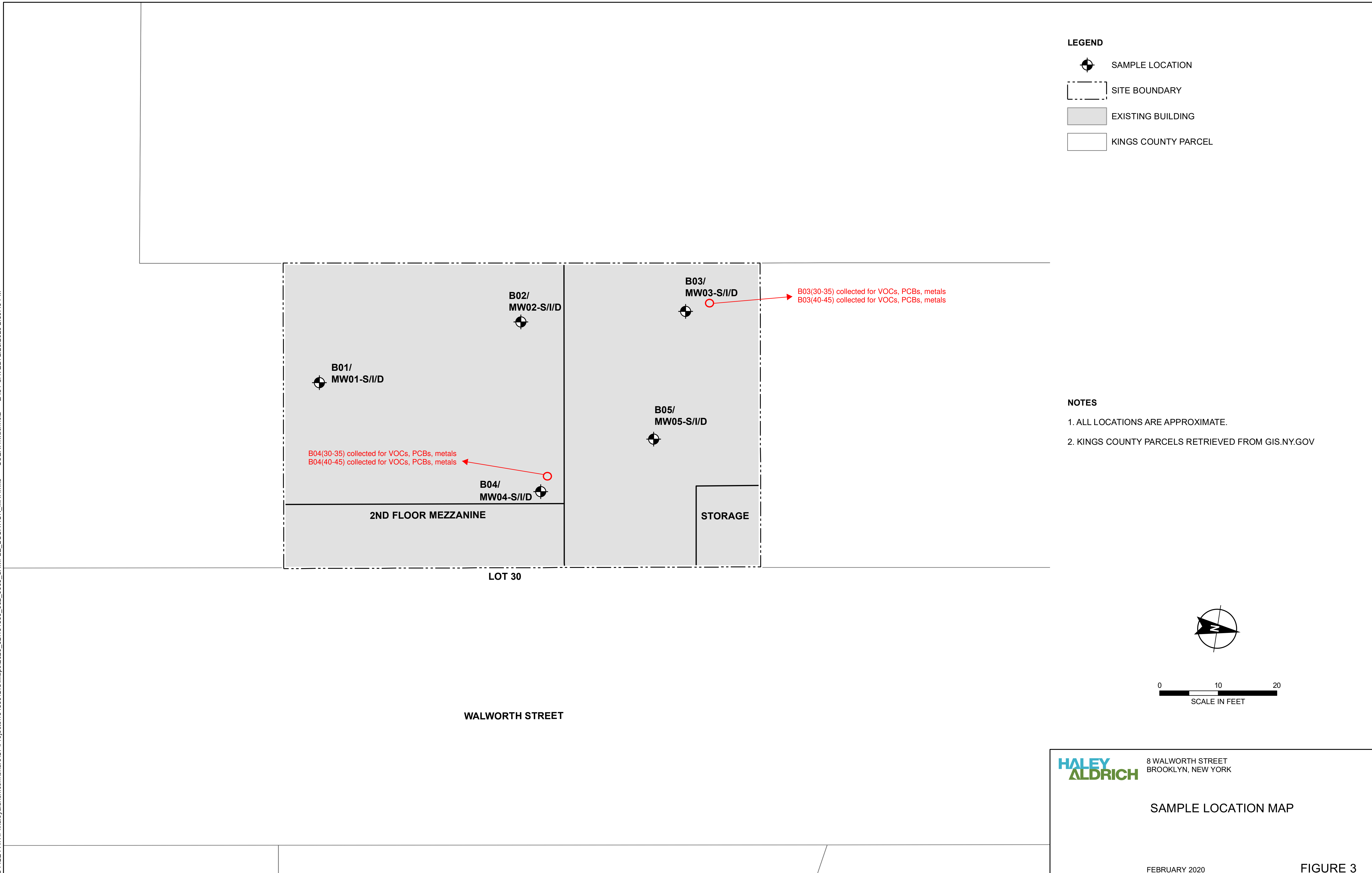



HALEY ALDRICH

8 WALWORTH STREET
BROOKLYN, NEW YORK

SAMPLE LOCATION MAP

FEBRUARY 2020

FIGURE 3

GIS FILE PATH: \\haleyaldrich.com\share\CF\Projects\134860\GIS\Maps\2020_02\134860_002_0003_SAMPLE_LOCATION_MAP.mxd — USER: hwachholz — LAST SAVED: 2/28/2020 2:50:43 PM

***Photo 1: View of Geoprobe 7822DT mobilization to B04.***

***Photo 2: View of installation of B03.***

***Photo 3: View of soil logging.***

***Photo 4: View of sample preparation.***

# DAILY FIELD REPORT



| | | | |
|---|---|---|---|
| **Project** | **NYSDEC Site C224239 - 8 Walworth Street** | **Report No.** | 3 |
| **Location** | **8 Walworth Street, Brooklyn, NY** | **Date** | **6/23/2020** |
| **Client** | **Toldos Yehuda, LLC** | **Page** | **1** of **1** |
| **Contractor** | **Eastern Environmental Solutions** | **File No.** | **134860-002** |
| **Weather** | **Sunny** | **Temperature** | **84-86° F** |

**0700 Z Simmel of Haley & Aldrich and Pat of Eastern Environmental Solutions (Eastern) on site**
**0710 Health and safety tailgate and COVID discussion**
**0715 Setting up equipment at MW-05**
**0730 Set up air monitoring equipment**
**0830 Begin installation of shallow monitoring well MW-05(S)**
**1000 Continue installation of MW-05(S), refusal encountered at 15 ft bgs, possibly a boulder**
**1020 Break through boulders using 5 and 7/8" Roller Bit**
**1115 Set shallow monitoring well at MW-05 to 17 ft bgs screened from 12-17 ft**
**1125 Begin installation of intermediate monitoring well MW-05(I)**
**1230 Continue installation of MW-05(I)**
**1330 Continue installation of MW-05(I)**
**1450 Clean out end of augers prior to setting well**
**1600 Remove augers from MW-05(I)**
**1630 Set intermediate monitoring well at MW-05 to 34 ft bgs screened from 29-34 ft**
**1645 Site preparation, take down air monitoring equipment**
**1700 All offsite**

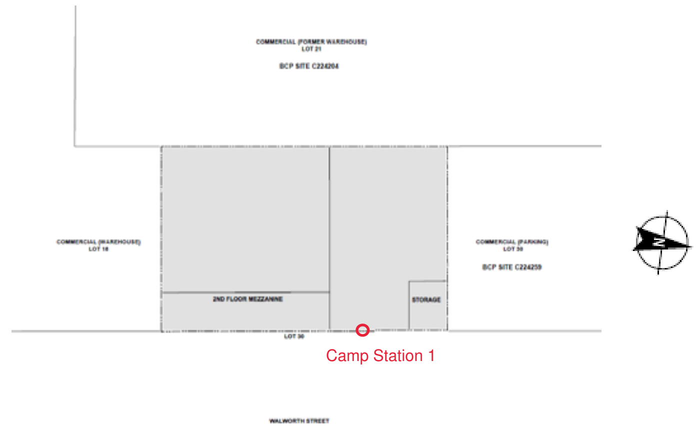
| Field Representative(s) | Time on site | Report/Travel/Other | Total hours |
|---|---|---|---|
| M Conlon | 6.75 | 1 hour | 7.75 |
| Z Simmel | 7.75 | 1 hour | 8.75 |

8 Walworth Street, Brooklyn, NY
134860-002
Air Monitoring Log

| | |
|---|---|
| Date: | 6/23/2020 |
| Personnel: | Z Simmel |
| Weather: | Sunny |
| Humidity: | 53% |
| Temperature: | 84-86° F |
| Wind Direction: | NE |

| | |
|---|---|
| Particulate Background: | No visible dust |
| PID Background (ppm): | 0.0 |

Site Map:




| Time | Dust Particulates | PID | | Notes |
|---|---|---|---|---|
| | Visual Dust (Y/N) | PID (ppm) | Odors (Y/N) | Activities/Additional Monitoring |
| 730 | N | 0.0 | N | No additional particulate monitoring necessary |
| 745 | N | 0.0 | N | No additional particulate monitoring necessary |
| 800 | N | 0.0 | N | No additional particulate monitoring necessary |
| 815 | N | 0.0 | N | No additional particulate monitoring necessary |
| 830 | N | 0.0 | N | No additional particulate monitoring necessary |
| 845 | N | 0.0 | N | No additional particulate monitoring necessary |
| 900 | N | 0.0 | N | No additional particulate monitoring necessary |
| 915 | N | 0.0 | N | No additional particulate monitoring necessary |
| 930 | N | 0.0 | N | No additional particulate monitoring necessary |
| 945 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1000 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1015 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1030 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1045 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1100 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1115 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1130 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1145 | N | 0.0 | N | No additional particulate monitoring necessary |

8 Walworth Street, Brooklyn, NY
134860-002
Air Monitoring Log

| | Dust Particulates | PID | | Notes |
|---|---|---|---|---|
| Time | Visual Dust (Y/N) | PID (ppm) | Odors (Y/N) | Activities/Additional Monitoring |
| 1200 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1215 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1230 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1245 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1300 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1315 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1330 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1345 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1400 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1415 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1430 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1445 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1500 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1515 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1530 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1545 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1600 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1615 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1630 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1645 | N | 0.0 | N | No additional particulate monitoring necessary |
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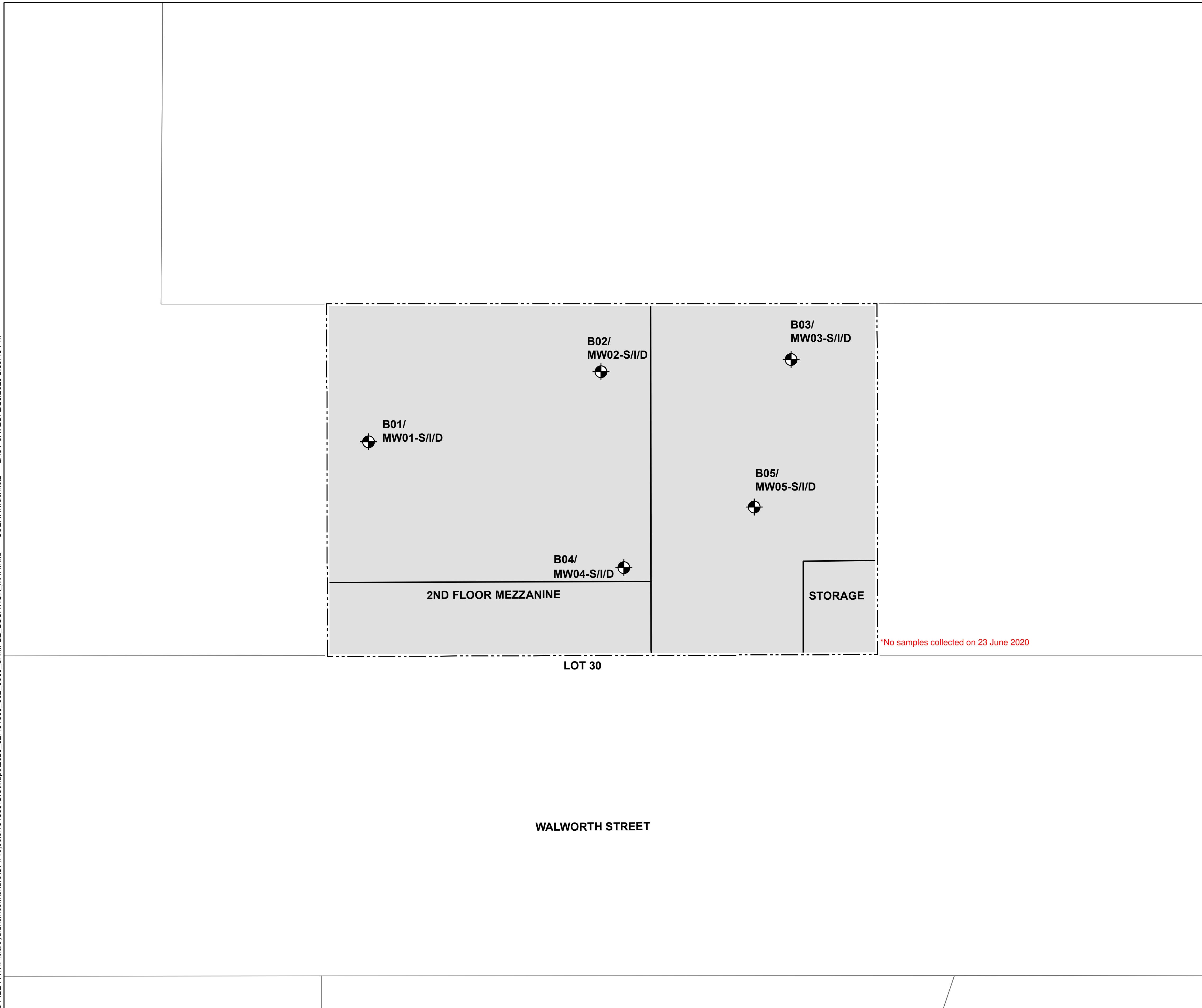



**LEGEND**

SAMPLE LOCATION

SITE BOUNDARY

EXISTING BUILDING

KINGS COUNTY PARCEL

**NOTES**

1. ALL LOCATIONS ARE APPROXIMATE.
2. KINGS COUNTY PARCELS RETRIEVED FROM GIS.NY.GOV

0 10 20
SCALE IN FEET

HALEY ALDRICH

8 WALWORTH STREET
BROOKLYN, NEW YORK

SAMPLE LOCATION MAP

FEBRUARY 2020

FIGURE 3

GIS FILE PATH: \\haleyaldrich.com\share\CF\Projects\134860\GIS\Maps\2020_02\134860_002_0003_SAMPLE_LOCATION_MAP.mxd — USER: hwachholz — LAST SAVED: 2/28/2020 2:50:43 PM

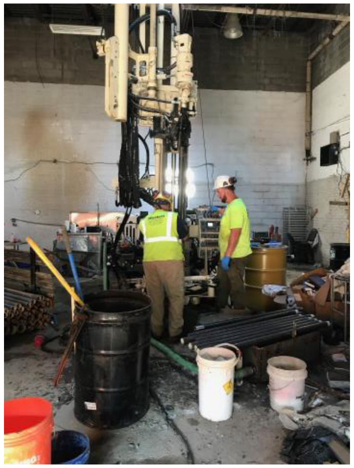


*Photo 1: View of Geoprobe 7822DT mobilization to MW-05.*

*Photo 2: View of installation of MW-05.*

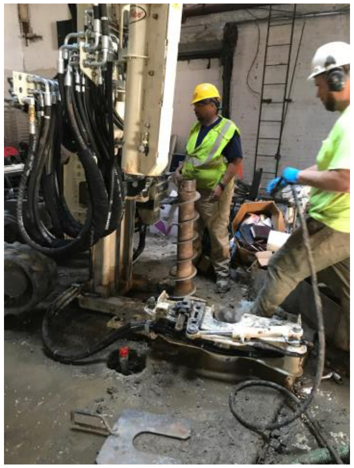


*Photo 3: View of setting MW-05(S).*

*Photo 4: View of setting MW-05(S) and MW-05(I).*

# DAILY FIELD REPORT



| | | | |
|---|---|---|---|
| Project | NYSDEC Site C224239 - 8 Walworth Street | Report No. | 4 |
| Location | 8 Walworth Street, Brooklyn, NY | Date | 6/24/2020 |
| Client | Toldos Yehuda, LLC | Page | 1 of 1 |
| Contractor | Eastern Environmental Solutions | File No. | 134860-002 |
| Weather | Sunny, humid | Temperature | 80-85° F |

**0620 Z Simmel and M Socci of Haley & Aldrich on site**
**0630 Eastern Environmental Solutions (Eastern) on site, health and safety tailgate and COVID discussion**
**0640 Preparation for mud rotary, set up air monitoring equipment**
**0710 Begin installation of MW-05(D)**
**0840 Continue installation of MW-05(D)**
**0905 Pump malfunction on geoprobe, troubleshooting**
**0920 Resume installation of MW-05(D)**
**1030 Continue installation of MW-05(D)**
**1130 Refusal encountered at 42 ft bgs, set well at 42 ft and screen 37-42 ft bgs**
**1215 Set MW-05(D)**
**1315 Mobilize to MW-01, being installation of MW-01(S)**
**1430 Continue installation of MW-01(S)**
**1530 Bolt on geprobe snaps, stop work, take down air monitoring equipment**
**1600 All off site**

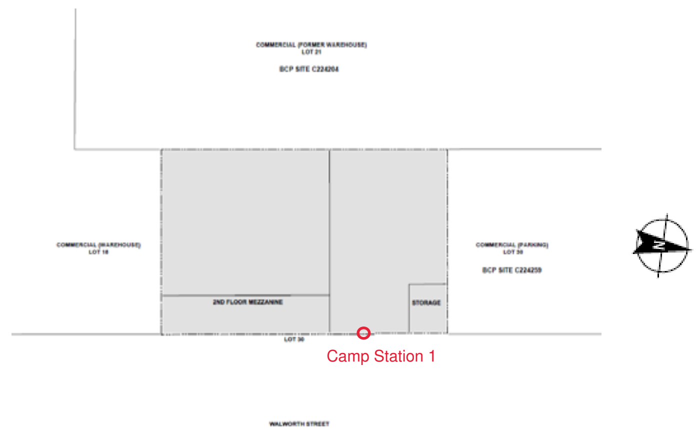
| Field Representative(s) | Time on site | Report/Travel/Other | Total hours |
|---|---|---|---|
| M Conlon | 6.75 | 1 hour | 7.75 |
| Z Simmel | 7.75 | 1 hour | 8.75 |

8 Walworth Street, Brooklyn, NY
134860-002
Air Monitoring Log

| | |
|---|---|
| Date: | 6/24/2020 |
| Personnel: | Z Simmel |
| Weather: | Sunny |
| Humidity: | 65% |
| Temperature: | 80-85° F |
| Wind Direction: | NE |

| | |
|---|---|
| Particulate Background: | No visible dust |
| PID Background (ppm): | 0.0 |

Site Map:




| Time | Dust Particulates | PID | | Notes |
|---|---|---|---|---|
| | Visual Dust (Y/N) | PID (ppm) | Odors (Y/N) | Activities/Additional Monitoring |
| 645 | N | 0.0 | N | No additional particulate monitoring necessary |
| 700 | N | 0.0 | N | No additional particulate monitoring necessary |
| 715 | N | 0.0 | N | No additional particulate monitoring necessary |
| 730 | N | 0.0 | N | No additional particulate monitoring necessary |
| 745 | N | 0.0 | N | No additional particulate monitoring necessary |
| 800 | N | 0.0 | N | No additional particulate monitoring necessary |
| 815 | N | 0.0 | N | No additional particulate monitoring necessary |
| 830 | N | 0.0 | N | No additional particulate monitoring necessary |
| 845 | N | 0.0 | N | No additional particulate monitoring necessary |
| 900 | N | 0.0 | N | No additional particulate monitoring necessary |
| 915 | N | 0.0 | N | No additional particulate monitoring necessary |
| 930 | N | 0.0 | N | No additional particulate monitoring necessary |
| 945 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1000 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1015 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1030 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1045 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1100 | N | 0.0 | N | No additional particulate monitoring necessary |

8 Walworth Street, Brooklyn, NY
134860-002
Air Monitoring Log

| Time | Dust Particulates | PID | | Notes |
|---|---|---|---|---|
| | Visual Dust (Y/N) | PID (ppm) | Odors (Y/N) | Activities/Additional Monitoring |
| 1115 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1130 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1145 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1200 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1215 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1230 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1245 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1300 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1315 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1330 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1345 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1400 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1415 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1430 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1445 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1500 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1515 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1530 | N | 0.0 | N | No additional particulate monitoring necessary |
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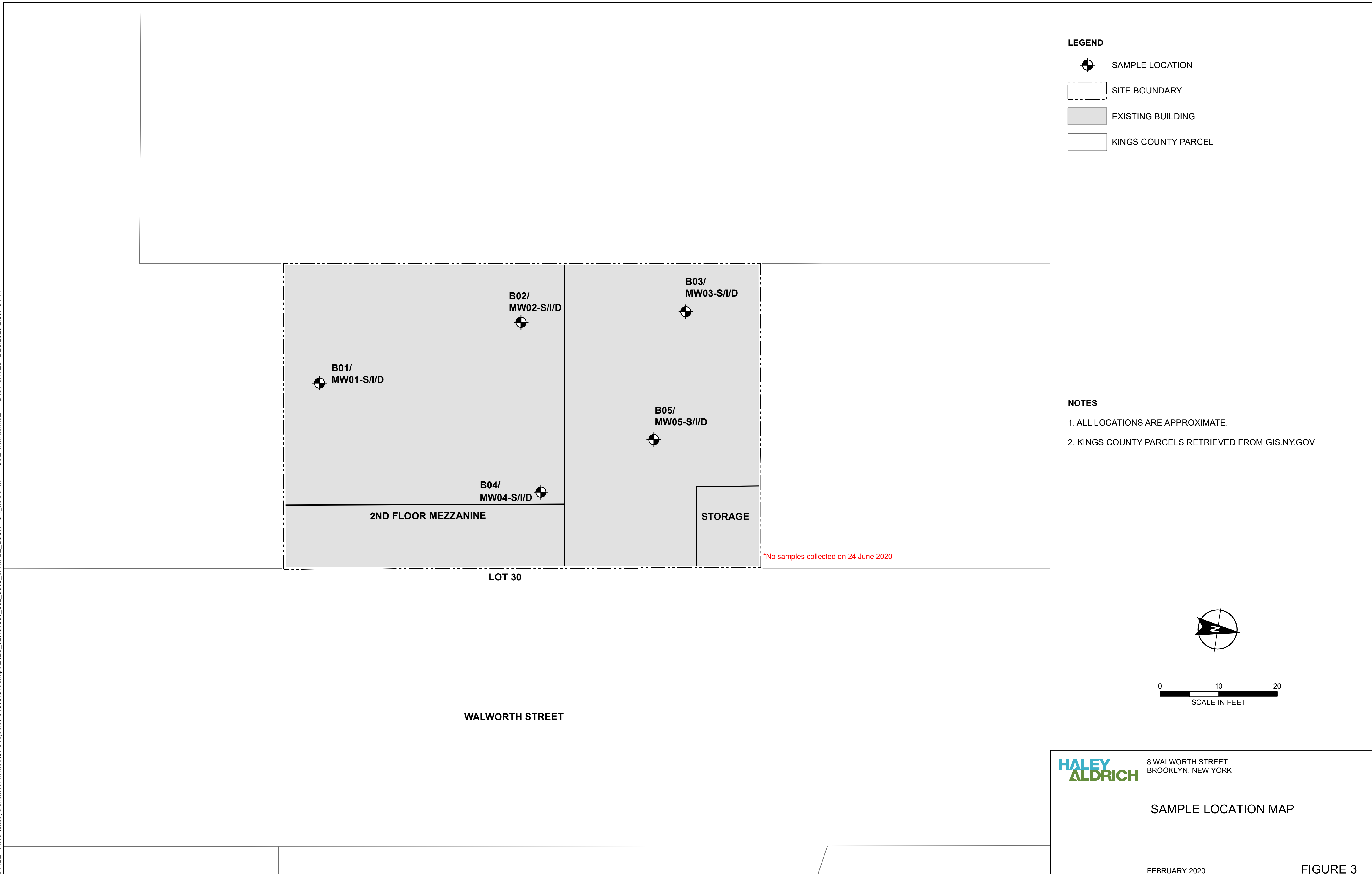

LEGEND
SAMPLE LOCATION
SITE BOUNDARY
EXISTING BUILDING
KINGS COUNTY PARCEL
B01/
MW01-S/I/D
B02/
MW02-S/I/D
B03/
MW03-S/I/D
B04/
MW04-S/I/D
B05/
MW05-S/I/D
2ND FLOOR MEZZANINE
STORAGE
*No samples collected on 24 June 2020
LOT 30
WALWORTH STREET
NOTES
1. ALL LOCATIONS ARE APPROXIMATE.
2. KINGS COUNTY PARCELS RETRIEVED FROM GIS.NY.GOV
0
10
20
SCALE IN FEET
HALEY ALDRICH
8 WALWORTH STREET
BROOKLYN, NEW YORK
SAMPLE LOCATION MAP
FEBRUARY 2020
FIGURE 3

***Photo 1: View of Geoprobe 7822DT mobilization to MW-01.***

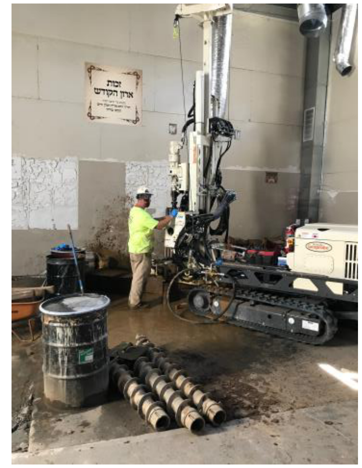


***Photo 2: View of installation of MW-01.***

***Photo 3: View of installation of MW-05(D)***

# DAILY FIELD REPORT



| | | | |
|---|---|---|---|
| **Project** | **NYSDEC Site C224239 - 8 Walworth Street** | **Report No.** | 5 |
| **Location** | **8 Walworth Street, Brooklyn, NY** | **Date** | **6/25/2020** |
| **Client** | **Toldos Yehuda, LLC** | **Page** | **1** of **1** |
| **Contractor** | **Eastern Environmental Solutions** | **File No.** | **134860-002** |
| **Weather** | **Sunny, humid** | **Temperature** | **80-85° F** |

**0600 M Socci of Haley & Aldrich on site**
**0615 Eastern Environmental Solutions (Eastern) on site**
**0615 Preparation for mud rotary, set up air monitoring equipment**
**0720 Geprobe malfunction, repair and troubleshooting**
**0740 Begin installation of MW-01(S)**
**0800 Continue installation of MW-01(S)**
**0940 Set MW-01(S) to 20 ft bgs screened 12-20 ft**
**1020 Begin installation of MW-01(I)**
**1100 Refusal at 12 ft bgs, continue on location with mud rotary**
**1230 Continue installation of MW-01(I)**
**1325 Refusal at 15 ft bgs, mobilize to MW-02 and will revisit MW-01(I) at later date**
**1355 Begin installation of MW-02(S)**
**1430 Continue installation of MW-02(S)**
**1500 Refusal encountered at 19 ft bgs, field decision to install well to 19 ft bgs**
**1520 Set MW-02(S) to 19 ft bgs screened 12-19 ft**
**1530 Site preparation, take down air monitoring equipment**
**1545 All off site**

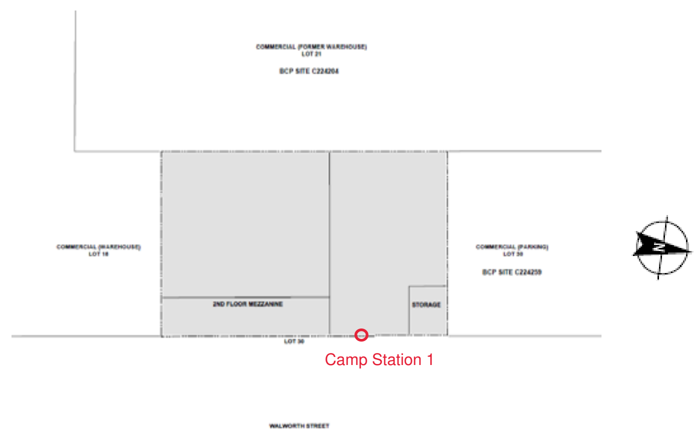
| Field Representative(s) | Time on site | Report/Travel/Other | Total hours |
|---|---|---|---|
| M Conlon | 6.75 | 1 hour | 7.75 |
| Z Simmel | 7.75 | 1 hour | 8.75 |

8 Walworth Street, Brooklyn, NY
134860-002
Air Monitoring Log

Date: 6/25/2020
Personnel: M Socci
Weather: Sunny, humid
Humidity: 46%
Temperature: 80-85° F
Wind Direction: N

Particulate Background: No visible dust
PID Background (ppm): 0.0

Site Map:




| | Dust Particulates | PID | | Notes |
|---|---|---|---|---|
| Time | Visual Dust (Y/N) | PID (ppm) | Odors (Y/N) | Activities/Additional Monitoring |
| 630 | N | 0.0 | N | No additional particulate monitoring necessary |
| 645 | N | 0.0 | N | No additional particulate monitoring necessary |
| 700 | N | 0.0 | N | No additional particulate monitoring necessary |
| 715 | N | 0.0 | N | No additional particulate monitoring necessary |
| 730 | N | 0.0 | N | No additional particulate monitoring necessary |
| 745 | N | 0.0 | N | No additional particulate monitoring necessary |
| 800 | N | 0.0 | N | No additional particulate monitoring necessary |
| 815 | N | 0.0 | N | No additional particulate monitoring necessary |
| 830 | N | 0.0 | N | No additional particulate monitoring necessary |
| 845 | N | 0.0 | N | No additional particulate monitoring necessary |
| 900 | N | 0.0 | N | No additional particulate monitoring necessary |
| 915 | N | 0.0 | N | No additional particulate monitoring necessary |
| 930 | N | 0.0 | N | No additional particulate monitoring necessary |
| 945 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1000 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1015 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1030 | N | 0.1 | N | No additional particulate monitoring necessary |
| 1045 | N | 0.0 | N | No additional particulate monitoring necessary |

8 Walworth Street, Brooklyn, NY
134860-002
Air Monitoring Log

| Time | Dust Particulates | PID | | Notes |
|---|---|---|---|---|
| | Visual Dust (Y/N) | PID (ppm) | Odors (Y/N) | Activities/Additional Monitoring |
| 1100 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1115 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1130 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1145 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1200 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1215 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1230 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1245 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1300 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1315 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1330 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1345 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1400 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1415 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1430 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1445 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1500 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1515 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1530 | N | 0.0 | N | No additional particulate monitoring necessary |
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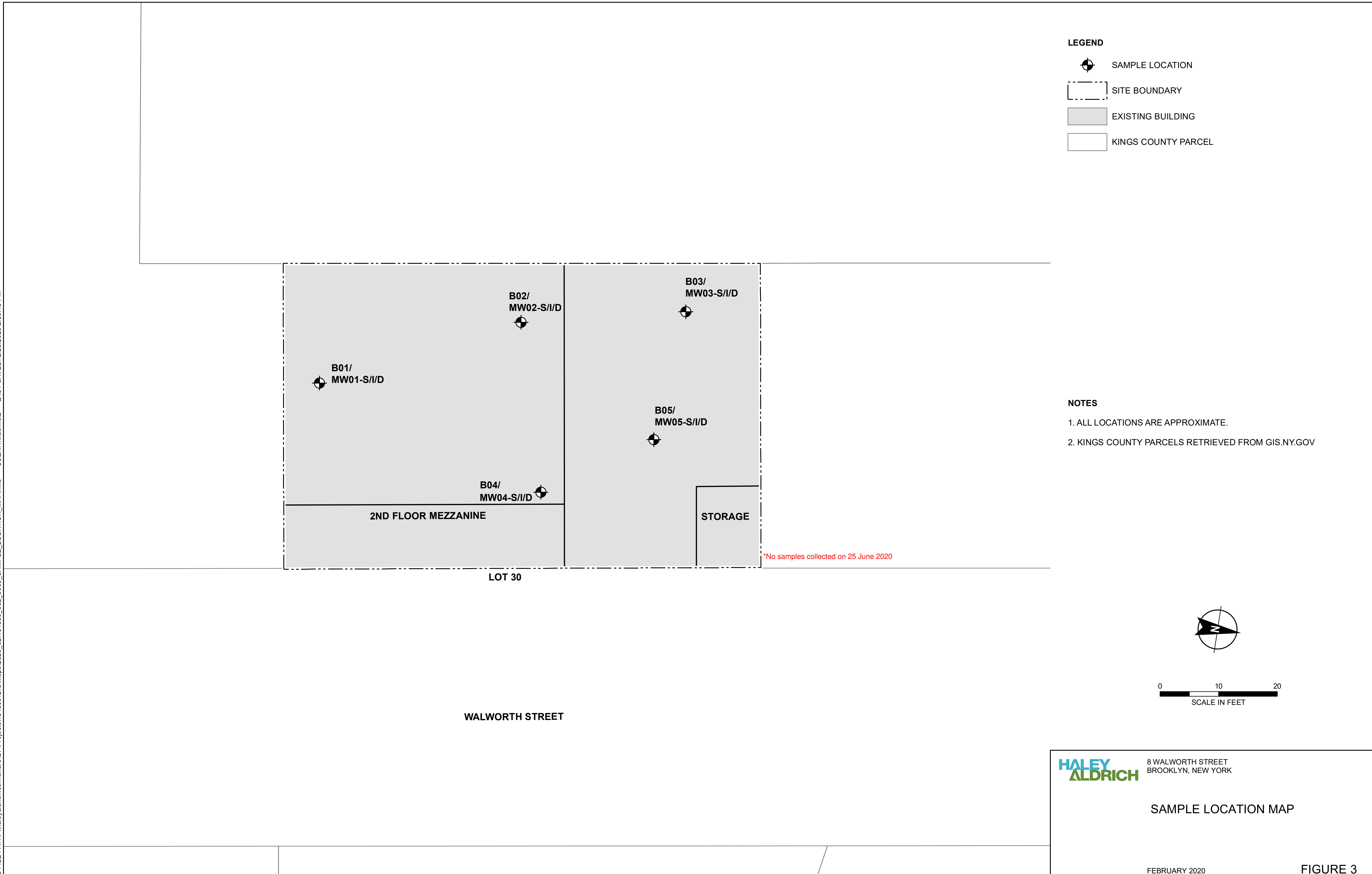



SAMPLE LOCATION MAP

FIGURE 3

*Photo 1: View of attempted installation of MW-01(I).*

*Photo 2: View of mobilization of Geoprobe 7822DT to MW-02.*

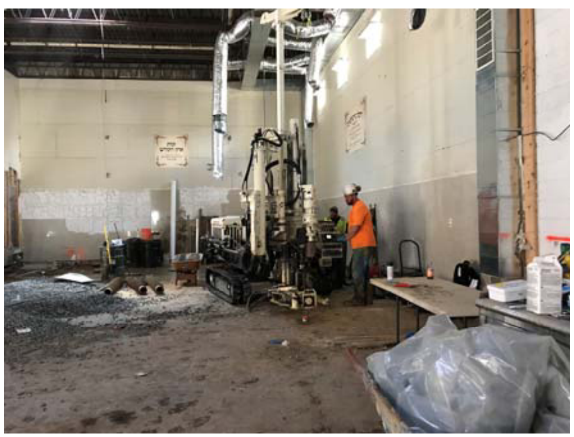


*Photo 3: View of installation of MW-02(S).*

# DAILY FIELD REPORT



| | | | |
|---|---|---|---|
| Project | NYSDEC Site C224239 - 8 Walworth Street | Report No. | 7 |
| Location | 8 Walworth Street, Brooklyn, NY | Date | 6/26/2020 |
| Client | Toldos Yehuda, LLC | Page | 1 of 1 |
| Contractor | Eastern Environmental Solutions | File No. | 134860-002 |
| Weather | Sunny, humid | Temperature | 82-86° F |

0600 M Socci of Haley & Aldrich and Eastern Environmental Solutions (Eastern) on site
0615 Preparation for mud rotary
0615 Set up air monitoring equipment
0715 Begin installation of MW-02(I)
0805 Refusal encountered at 8 ft bgs, continue drilling to move deeper
0900 Continue installation of MW-02(I) currently reaching 15 ft bgs
1010 Continue installation of MW-02(I) - currently reaching 20 ft bgs
1105 Refuel geoprobe
1240 Continue installation of MW-02(I) - currently reaching 25 ft bgs
1315 Continue installation of MW-02(I) - currently reaching 30 ft bgs
1400 Continue installation of MW-02(I) - currently reaching 35 ft bgs
1415 Attempting to set well MW-02(I)
1455 MW-02(I) set to 34 ft bgs screened 29-34 ft bgs
1510 Site preparation and take down air monitoring equipment
1515 All off site

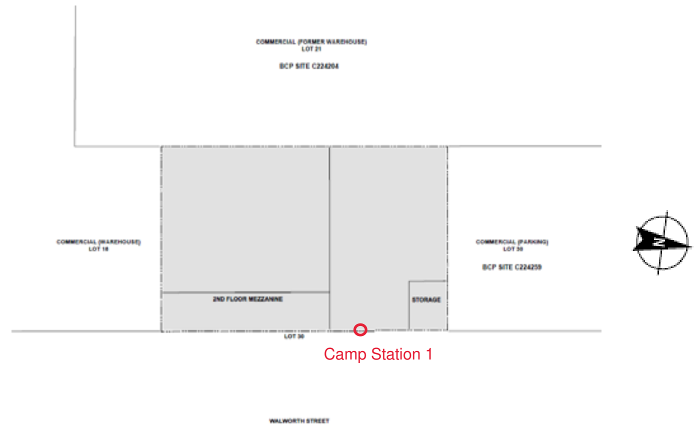
| Field Representative(s) | Time on site | Report/Travel/Other | Total hours |
|---|---|---|---|
| M. Socci | 9 | 1 | 10 |

8 Walworth Street, Brooklyn, NY
134860-002
Air Monitoring Log

| | |
|---|---|
| Date: | 6/26/2020 |
| Personnel: | M Socci |
| Weather: | Sunny, humid |
| Humidity: | 53% |
| Temperature: | 82-86° F |
| Wind Direction: | N |

| | |
|---|---|
| Particulate Background: | No visible dust |
| PID Background (ppm): | 0.0 |

Site Map:




| Time | Dust Particulates | PID | | Notes |
|---|---|---|---|---|
| | Visual Dust (Y/N) | PID (ppm) | Odors (Y/N) | Activities/Additional Monitoring |
| 630 | N | 0.0 | N | No additional particulate monitoring necessary |
| 645 | N | 0.0 | N | No additional particulate monitoring necessary |
| 700 | N | 0.0 | N | No additional particulate monitoring necessary |
| 715 | N | 0.0 | N | No additional particulate monitoring necessary |
| 730 | N | 0.0 | N | No additional particulate monitoring necessary |
| 745 | N | 0.0 | N | No additional particulate monitoring necessary |
| 800 | N | 0.0 | N | No additional particulate monitoring necessary |
| 815 | N | 0.0 | N | No additional particulate monitoring necessary |
| 830 | N | 0.0 | N | No additional particulate monitoring necessary |
| 845 | N | 0.0 | N | No additional particulate monitoring necessary |
| 900 | N | 0.0 | N | No additional particulate monitoring necessary |
| 915 | N | 0.0 | N | No additional particulate monitoring necessary |
| 930 | N | 0.0 | N | No additional particulate monitoring necessary |
| 945 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1000 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1015 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1030 | N | 0.1 | N | No additional particulate monitoring necessary |
| 1045 | N | 0.0 | N | No additional particulate monitoring necessary |

8 Walworth Street, Brooklyn, NY
134860-002
Air Monitoring Log

| | Dust Particulates | PID | | Notes |
|---|---|---|---|---|
| Time | Visual Dust (Y/N) | PID (ppm) | Odors (Y/N) | Activities/Additional Monitoring |
| 1100 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1115 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1130 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1145 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1200 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1215 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1230 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1245 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1300 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1315 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1330 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1345 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1400 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1415 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1430 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1445 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1500 | N | 0.0 | N | No additional particulate monitoring necessary |
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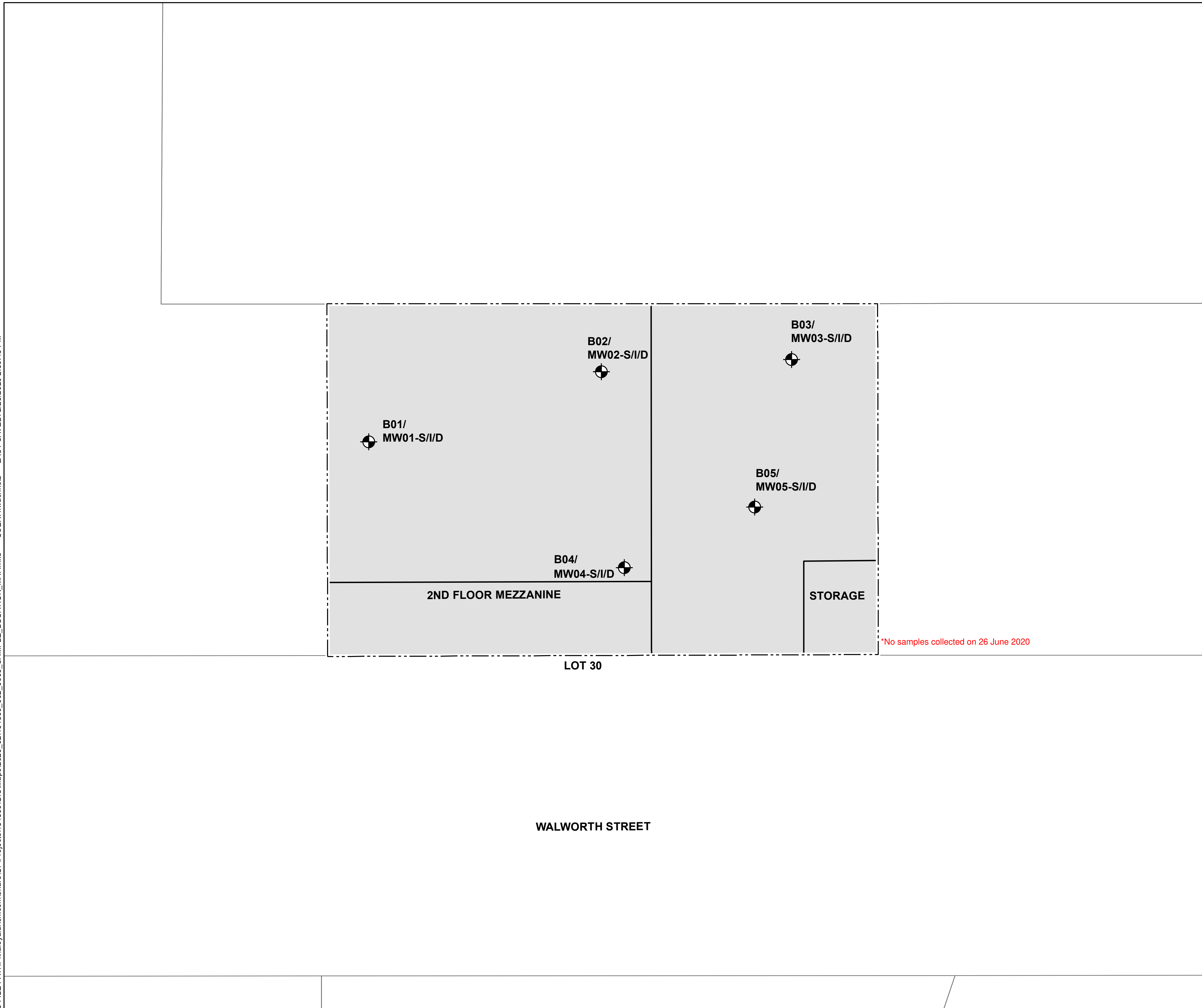



HALEY ALDRICH

8 WALWORTH STREET
BROOKLYN, NEW YORK

SAMPLE LOCATION MAP

FEBRUARY 2020

FIGURE 3

GIS FILE PATH: \\haleyaldrich.com\share\CF\Projects\134860\GIS\Maps\2020_02\134860_002_0003_SAMPLE_LOCATION_MAP.mxd — USER: hwachholz — LAST SAVED: 2/28/2020 2:50:43 PM

*Photo 1:  View of MW-05(S) set.*

*Photo 2:  View of mobilization of Geoprobe 7822DT.*

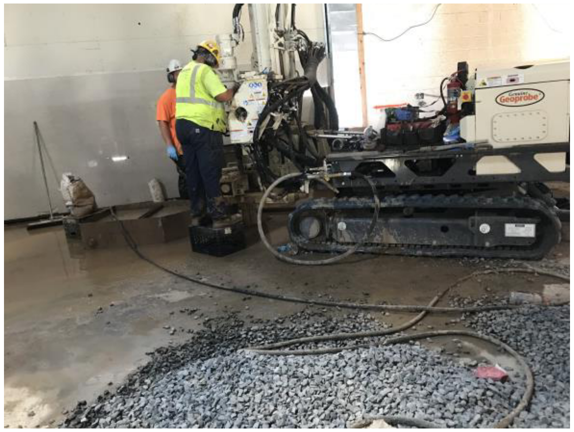



*Photo 3:  View of installation of MW-02(I).*

# DAILY FIELD REPORT



| | | | |
|---|---|---|---|
| **Project** | **NYSDEC Site C224239 - 8 Walworth Street** | **Report No.** | 8 |
| **Location** | **8 Walworth Street, Brooklyn, NY** | **Date** | **6/29/2020** |
| **Client** | **Toldos Yehuda, LLC** | **Page** | **1** of **1** |
| **Contractor** | **Eastern Environmental Solutions** | **File No.** | **134860-002** |
| **Weather** | **Sunny, humid** | **Temperature** | **75-85° F** |

**0630 Z Simmel of Haley & Aldrich and Eastern Environmental Solutions (Eastern) on site**
**0640 Preparation for mud rotary**
**0700 Set up air monitoring equipment**
**0705 Begin installation of MW-02(D)**
**0815 Hose malfunction, troubleshooting**
**0830 Hose fixed, well installation resumed**
**0930 Continue installation of MW-02(D) - currently reaching 15 ft bgs**
**1000 Continue installation of MW-02(D) - currently reaching 22 ft bgs**
**1100 Continue installation of MW-02(D) - currently reaching 30 ft bgs**
**1230 Continue installation of MW-02(D) - currently reaching 32 ft bgs**
**1330 Continue installation of MW-02(D) - currently reaching 36 ft bgs**
**1400 Continue installation of MW-02(D) - currently reaching 38 ft bgs**
**1445 Continue installation of MW-02(D) - currently reaching 39 ft bgs**
**1515 Continue installation of MW-02(D) - currently reaching 42 ft bgs**
**1600 Continue installation of MW-02(D) - currently reaching 42 ft bgs**
**1620 Refusal encountered MW-02(D) set to 42 ft bgs screened 37-42 ft bgs**
**1630 Take down air monitoring equipment**
**1700 All off site**

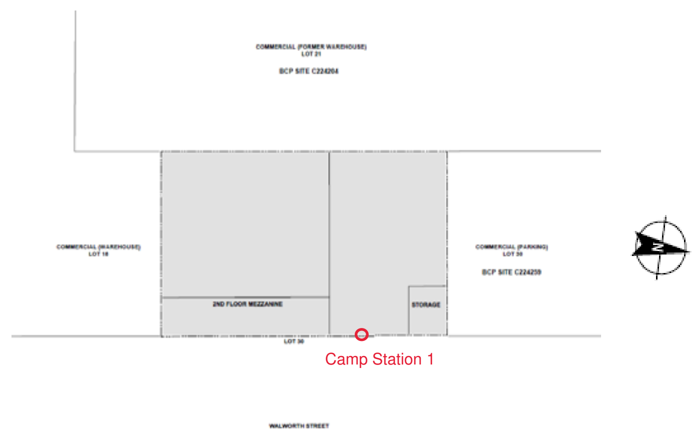
| Field Representative(s) | Time on site | Report/Travel/Other | Total hours |
|---|---|---|---|
| Z Simmel | 10.5 | 1 | 11.5 |

8 Walworth Street, Brooklyn, NY
134860-002
Air Monitoring Log

| | |
|---|---|
| Date: | 6/29/2020 |
| Personnel: | Z. Simmel |
| Weather: | Sunny, humid |
| Humidity: | 66% |
| Temperature: | 75-85° F |
| Wind Direction: | N |

| | |
|---|---|
| Particulate Background: | No visible dust |
| PID Background (ppm): | 0.0 |

Site Map:




| Time | Dust Particulates | PID | | Notes |
|---|---|---|---|---|
| | Visual Dust (Y/N) | PID (ppm) | Odors (Y/N) | Activities/Additional Monitoring |
| 700 | N | 0.0 | N | No additional particulate monitoring necessary |
| 715 | N | 0.0 | N | No additional particulate monitoring necessary |
| 730 | N | 0.0 | N | No additional particulate monitoring necessary |
| 745 | N | 0.0 | N | No additional particulate monitoring necessary |
| 800 | N | 0.0 | N | No additional particulate monitoring necessary |
| 815 | N | 0.0 | N | No additional particulate monitoring necessary |
| 830 | N | 0.0 | N | No additional particulate monitoring necessary |
| 845 | N | 0.0 | N | No additional particulate monitoring necessary |
| 900 | N | 0.0 | N | No additional particulate monitoring necessary |
| 915 | N | 0.0 | N | No additional particulate monitoring necessary |
| 930 | N | 0.0 | N | No additional particulate monitoring necessary |
| 945 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1000 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1015 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1030 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1045 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1100 | N | 0.1 | N | No additional particulate monitoring necessary |
| 1115 | N | 0.0 | N | No additional particulate monitoring necessary |

8 Walworth Street, Brooklyn, NY
134860-002
Air Monitoring Log

| Time | Dust Particulates | PID | | Notes |
|---|---|---|---|---|
| | Visual Dust (Y/N) | PID (ppm) | Odors (Y/N) | Activities/Additional Monitoring |
| 1130 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1145 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1200 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1215 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1230 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1245 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1300 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1315 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1330 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1345 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1400 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1415 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1430 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1445 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1500 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1515 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1530 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1545 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1600 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1615 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1630 | N | 0.0 | N | No additional particulate monitoring necessary |
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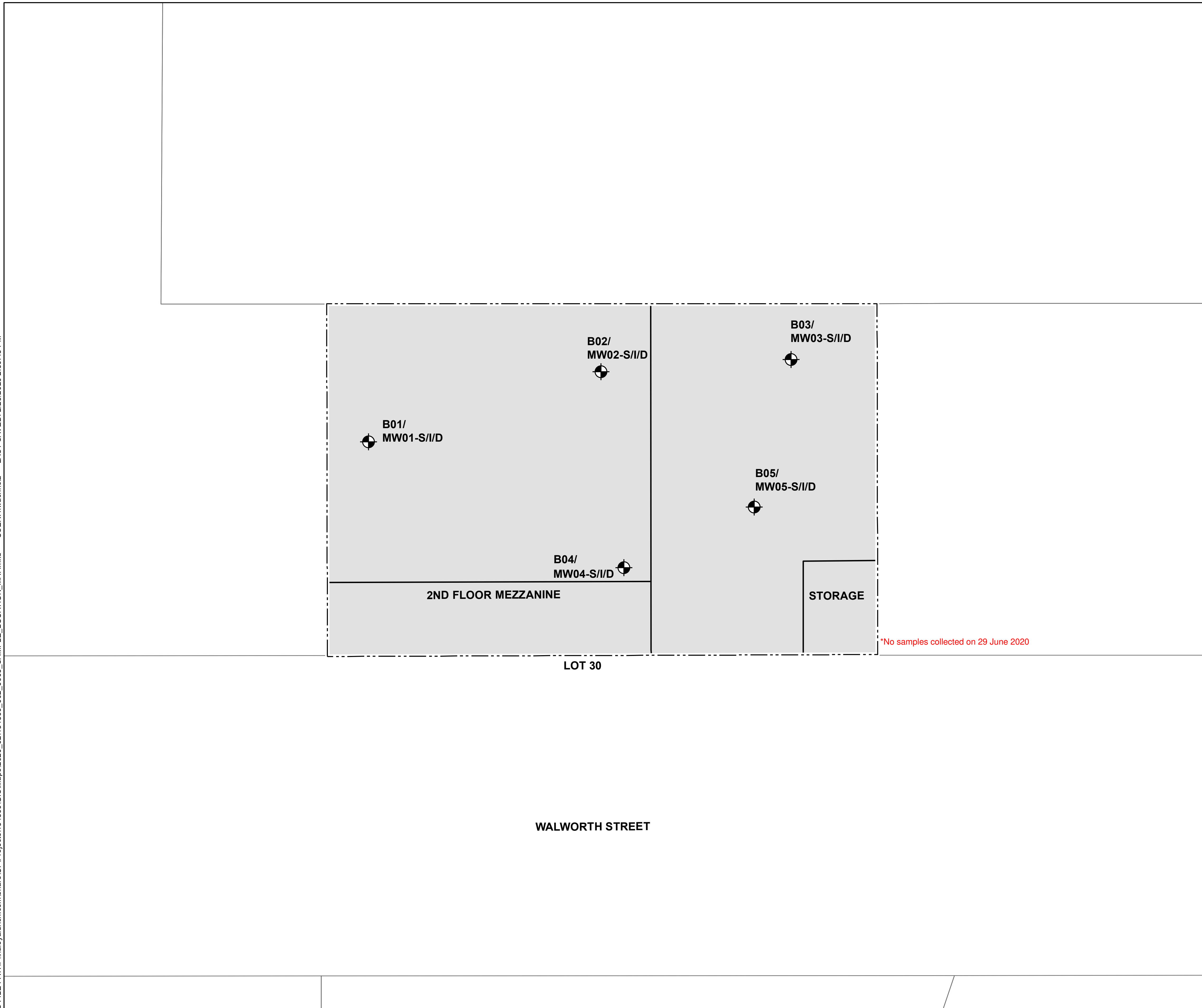



**LEGEND**

- SAMPLE LOCATION
- SITE BOUNDARY
- EXISTING BUILDING
- KINGS COUNTY PARCEL

**NOTES**

1. ALL LOCATIONS ARE APPROXIMATE.
2. KINGS COUNTY PARCELS RETRIEVED FROM GIS.NY.GOV

0 10 20
SCALE IN FEET

HALEY ALDRICH

8 WALWORTH STREET
BROOKLYN, NEW YORK

SAMPLE LOCATION MAP

FEBRUARY 2020

FIGURE 3

GIS FILE PATH: \\haleyaldrich.com\share\CF\Projects\134860\GIS\Maps\2020_02\134860_002_0003_SAMPLE_LOCATION_MAP.mxd — USER: hwachholz — LAST SAVED: 2/28/2020 2:50:43 PM

***Photo 1: View of MW-02(D) installation.***

***Photo 2: Alternate view of MW-02(D) installation.***

***Photo 3: View of air monitoring equipment.***

# DAILY FIELD REPORT



| | | | |
|---|---|---|---|
| Project | NYSDEC Site C224239 - 8 Walworth Street | Report No. | 9 |
| Location | 8 Walworth Street, Brooklyn, NY | Date | 6/30/2020 |
| Client | Toldos Yehuda, LLC | Page | 1 of 1 |
| Contractor | Eastern Environmental Solutions | File No. | 134860-002 |
| Weather | Mostly sunny, humid | Temperature | 70-80° F |

0630 Z Simmel of Haley & Aldrich and Eastern Environmental Solutions (Eastern) on site
0640 Site preparation and waiting for new roller bit delivery
0730 Set up air monitoring equipment
0755 Begin augering at MW-04(S)
0800 Well development and general housekeeping
0845 New roller bit delivered
0900 Begin mud rotary at MW-04(S)
1000 Continue installation of MW-04(S) - currently reaching 12 ft bgs
1100 Continue installation of MW-04(S) - currently reaching 14 ft bgs
1140 Set MW-04(S) to 20 ft bgs - screened 12-20 ft bgs
1215 Auger to 10 ft bgs in preparation for MW-04(I) and MW-04(D)
1300 Well development and housekeeping
1345 Set manhole covers for wells installed to date, take down air monitoring equipment
1430 All of site

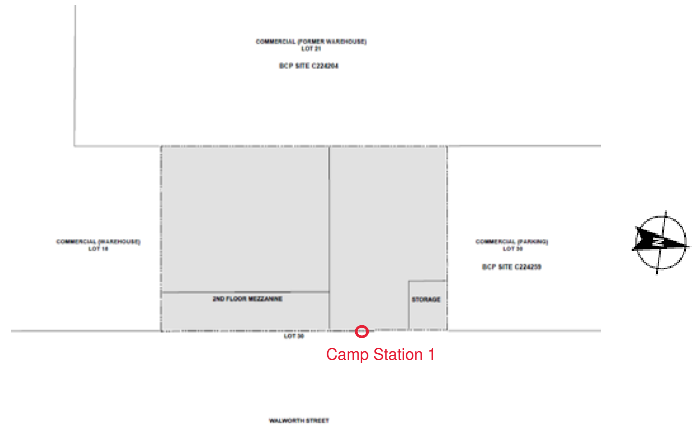
| Field Representative(s) | Time on site | Report/Travel/Other | Total hours |
|---|---|---|---|
| Z Simmel | 8 | 1 | 9 |

8 Walworth Street, Brooklyn, NY
134860-002
Air Monitoring Log

| | |
|---|---|
| Date: | 6/30/2020 |
| Personnel: | Z. Simmel |
| Weather: | Mostly Sunny, humid |
| Humidity: | 78% |
| Temperature: | 70-80° F |
| Wind Direction: | N |

| | |
|---|---|
| Particulate Background: | No visible dust |
| PID Background (ppm): | 0.0 |

Site Map:




| Time | Dust Particulates | PID | | Notes |
|---|---|---|---|---|
| | Visual Dust (Y/N) | PID (ppm) | Odors (Y/N) | Activities/Additional Monitoring |
| 730 | N | 0.0 | N | No additional particulate monitoring necessary |
| 745 | N | 0.0 | N | No additional particulate monitoring necessary |
| 800 | N | 0.0 | N | No additional particulate monitoring necessary |
| 815 | N | 0.0 | N | No additional particulate monitoring necessary |
| 830 | N | 0.0 | N | No additional particulate monitoring necessary |
| 845 | N | 0.0 | N | No additional particulate monitoring necessary |
| 900 | N | 0.0 | N | No additional particulate monitoring necessary |
| 915 | N | 0.0 | N | No additional particulate monitoring necessary |
| 930 | N | 0.0 | N | No additional particulate monitoring necessary |
| 945 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1000 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1015 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1030 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1045 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1100 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1115 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1130 | N | 0.1 | N | No additional particulate monitoring necessary |
| 1145 | N | 0.0 | N | No additional particulate monitoring necessary |

8 Walworth Street, Brooklyn, NY
134860-002
Air Monitoring Log

| | Dust Particulates | PID | | Notes |
|---|---|---|---|---|
| Time | Visual Dust (Y/N) | PID (ppm) | Odors (Y/N) | Activities/Additional Monitoring |
| 1200 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1215 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1230 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1245 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1300 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1315 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1330 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1345 | N | 0.0 | N | No additional particulate monitoring necessary |
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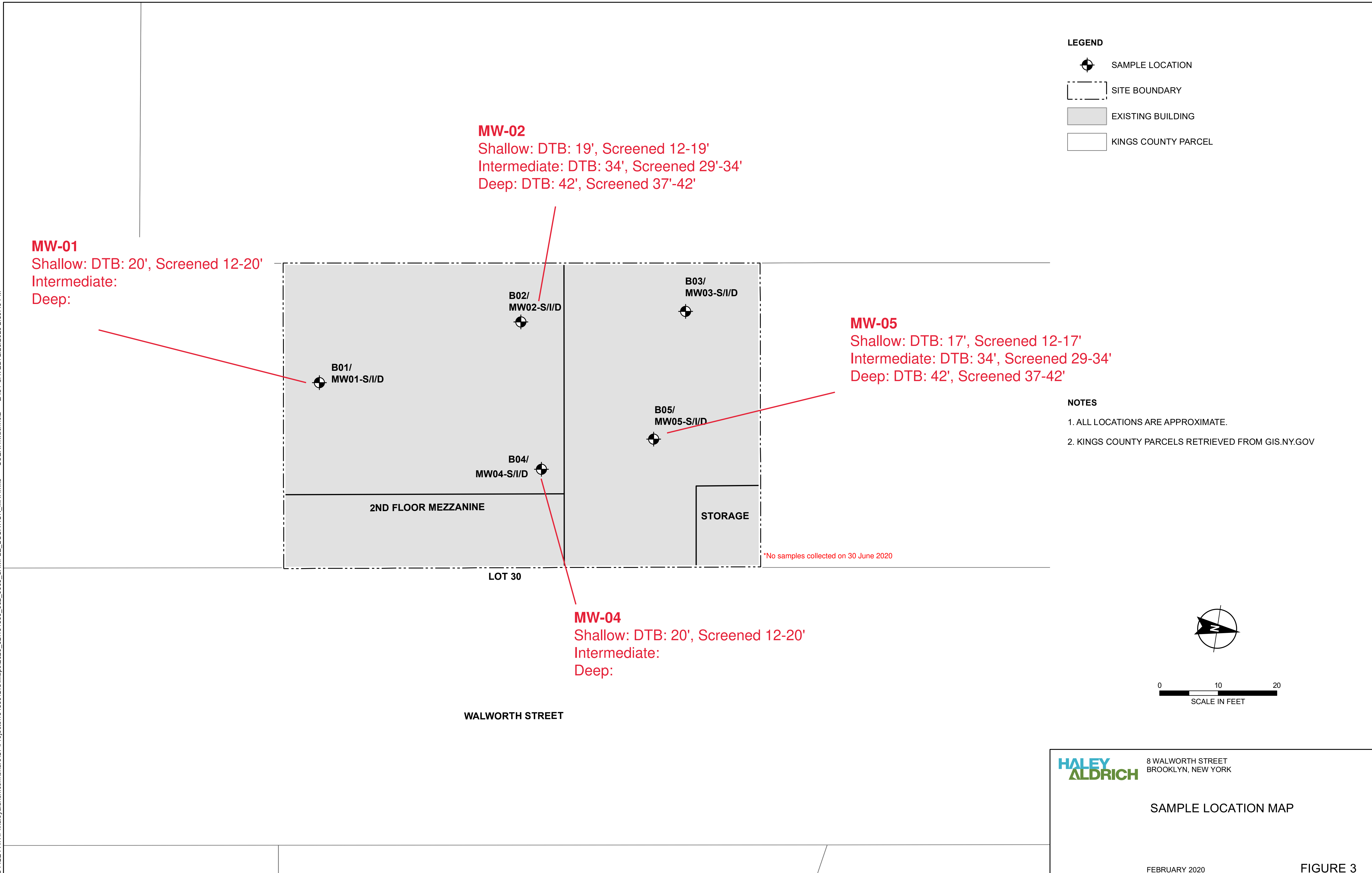


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***Photo 1: View of finished MW-05 cluster.***

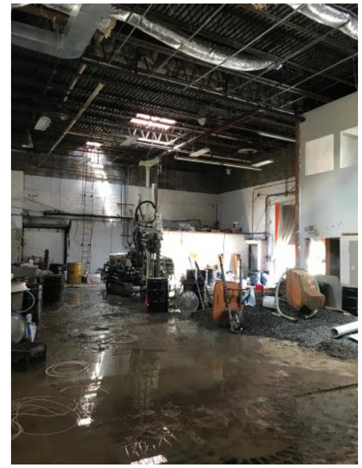


***Photo 2: Mobilization of Geoprobe 7822DT.***

***Photo 3: View of finished MW-01(S)***

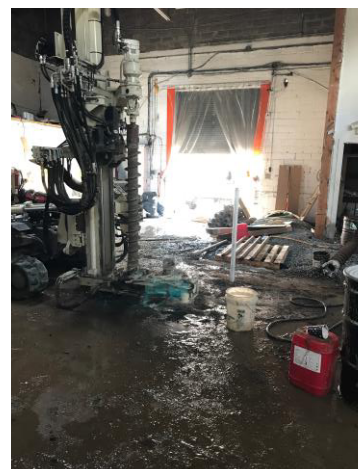


***Photo 4: View during installation of MW-04(S)***

# DAILY FIELD REPORT



| | | | |
|---|---|---|---|
| Project | NYSDEC Site C224239 - 8 Walworth Street | Report No. | 10 |
| Location | 8 Walworth Street, Brooklyn, NY | Date | 7/1/2020 |
| Client | Toldos Yehuda, LLC | Page | 1 of 1 |
| Contractor | Eastern Environmental Solutions | File No. | 134860-002 |
| Weather | Mostly sunny, humid | Temperature | 70-80° F |

0630 Z Simmel of Haley & Aldrich and Eastern Environmental Solutions (Eastern) on site
0640 Site preparation
0650 Set up air monitoring equipment
0700 M Conlon of Haley & Aldrich on site
0705 Begin installation of MW-04(D)
0740 Begin low flow sampling of MW-02(I)
0820 M Conlon off site
0855 Finish low flow sampling at MW-02(I) (including field duplicate)
0900 Continue installation of MW-04(D) - currently at 20 ft bgs
0945 Refuel geoprobe
0950 Continue installation of MW-04(D) - currently at 26 ft bgs
1015 Begin low flow sampling of MW-02(S)
1110 Finish low flow sampling of MW-02(S)
1200 Continue installation of MW-04(D) - currently at 33 ft bgs
1230 Well develop ment and housekeeping
1300 Continue well installation - currently at 42 ft bgs
1400 Set MW-04(D) to 42 ft bgs screened 37-42 ft bgs
1430 Prepare MW-04(I) area
1500 Housekeeping and take down air monitoring equipment, relinquish samples to Alpha Laboratories Courier
1530 All off site

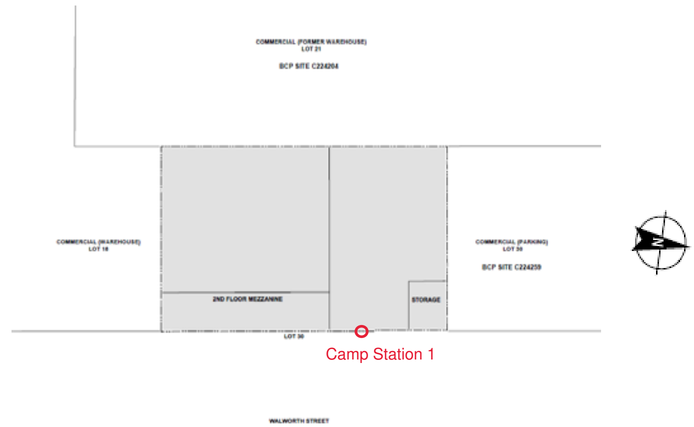
| Field Representative(s) | Time on site | Report/Travel/Other | Total hours |
|---|---|---|---|
| Z Simmel | 9 | 1 | 10 |

8 Walworth Street, Brooklyn, NY
134860-002
Air Monitoring Log

| | |
|---|---|
| Date: | 7/1/2020 |
| Personnel: | Z. Simmel |
| Weather: | Mostly Sunny, humid |
| Humidity: | 87% |
| Temperature: | 70-80° F |
| Wind Direction: | E-NE |

| | |
|---|---|
| Particulate Background: | No visible dust |
| PID Background (ppm): | 0.0 |

Site Map:




| Time | Dust Particulates | PID | | Notes |
|---|---|---|---|---|
| | Visual Dust (Y/N) | PID (ppm) | Odors (Y/N) | Activities/Additional Monitoring |
| 700 | N | 0.0 | N | No additional particulate monitoring necessary |
| 715 | N | 0.0 | N | No additional particulate monitoring necessary |
| 730 | N | 0.0 | N | No additional particulate monitoring necessary |
| 745 | N | 0.0 | N | No additional particulate monitoring necessary |
| 800 | N | 0.0 | N | No additional particulate monitoring necessary |
| 815 | N | 0.0 | N | No additional particulate monitoring necessary |
| 830 | N | 0.0 | N | No additional particulate monitoring necessary |
| 845 | N | 0.0 | N | No additional particulate monitoring necessary |
| 900 | N | 0.0 | N | No additional particulate monitoring necessary |
| 915 | N | 0.0 | N | No additional particulate monitoring necessary |
| 930 | N | 0.0 | N | No additional particulate monitoring necessary |
| 945 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1000 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1015 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1030 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1045 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1100 | N | 0.1 | N | No additional particulate monitoring necessary |
| 1115 | N | 0.0 | N | No additional particulate monitoring necessary |

8 Walworth Street, Brooklyn, NY
134860-002
Air Monitoring Log

| | Dust Particulates | PID | | Notes |
|---|---|---|---|---|
| Time | Visual Dust (Y/N) | PID (ppm) | Odors (Y/N) | Activities/Additional Monitoring |
| 1130 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1145 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1200 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1215 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1230 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1245 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1300 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1315 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1330 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1345 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1400 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1415 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1430 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1445 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1500 | N | 0.0 | N | No additional particulate monitoring necessary |
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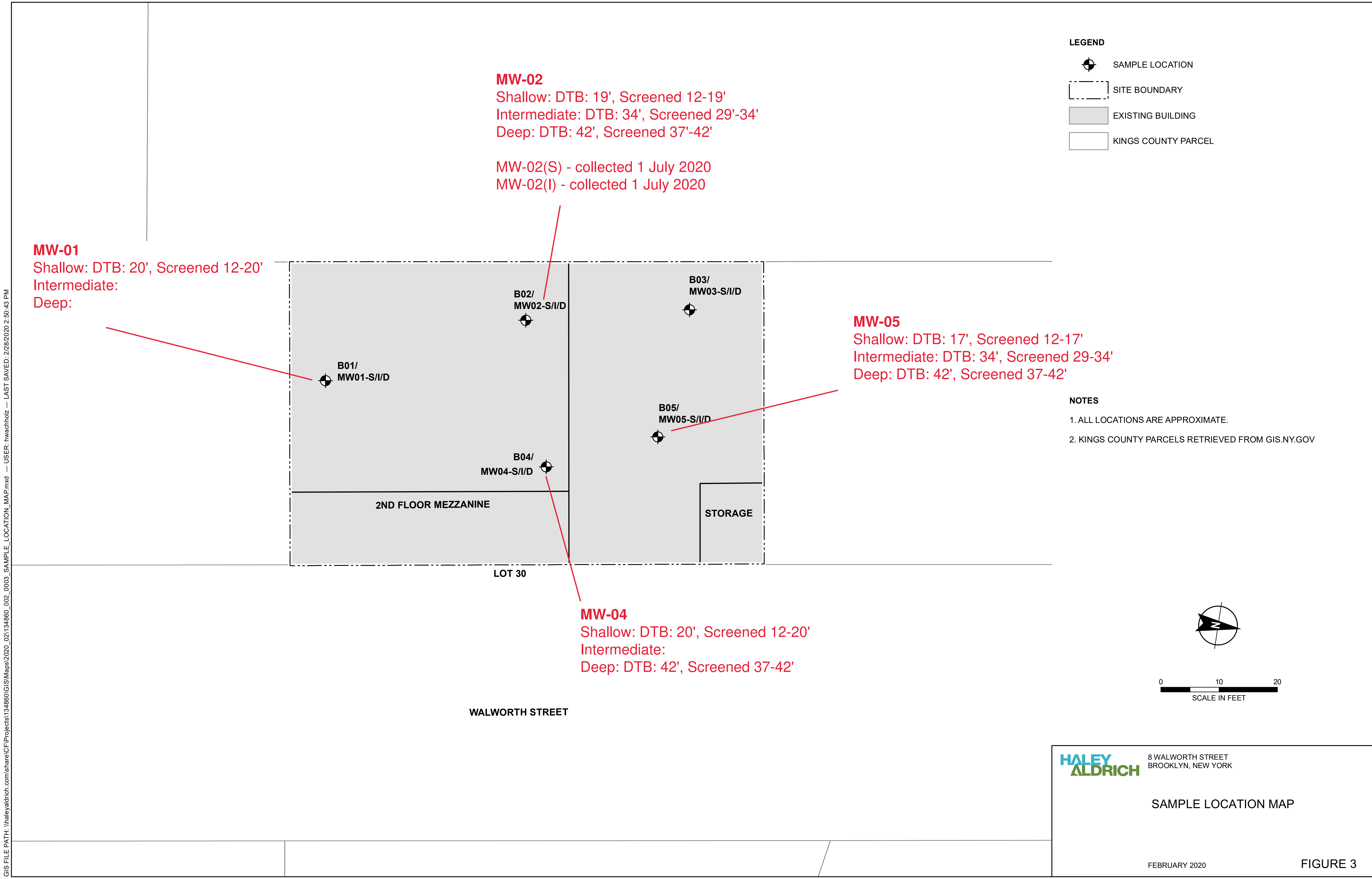

LEGEND
SAMPLE LOCATION
SITE BOUNDARY
EXISTING BUILDING
KINGS COUNTY PARCEL
MW-02
Shallow: DTB: 19', Screened 12-19'
Intermediate: DTB: 34', Screened 29'-34'
Deep: DTB: 42', Screened 37'-42'
MW-02(S) - collected 1 July 2020
MW-02(I) - collected 1 July 2020
MW-01
Shallow: DTB: 20', Screened 12-20'
Intermediate:
Deep:
B02/
MW02-S/I/D
B03/
MW03-S/I/D
B01/
MW01-S/I/D
MW-05
Shallow: DTB: 17', Screened 12-17'
Intermediate: DTB: 34', Screened 29-34'
Deep: DTB: 42', Screened 37-42'
B05/
MW05-S/I/D
B04/
MW04-S/I/D
2ND FLOOR MEZZANINE
STORAGE
LOT 30
MW-04
Shallow: DTB: 20', Screened 12-20'
Intermediate:
Deep: DTB: 42', Screened 37-42'
NOTES
1. ALL LOCATIONS ARE APPROXIMATE.
2. KINGS COUNTY PARCELS RETRIEVED FROM GIS.NY.GOV
N
0
10
20
SCALE IN FEET
WALWORTH STREET
HALEY ALDRICH
8 WALWORTH STREET
BROOKLYN, NEW YORK
SAMPLE LOCATION MAP
FEBRUARY 2020
FIGURE 3
GIS FILE PATH: \\haleyaldrich.com\share\CF\Projects\134860\GIS\Maps\2020_02\134860_002_0003_SAMPLE_LOCATION_MAP.mxd — USER: hwachholz — LAST SAVED: 2/28/2020 2:50:43 PM

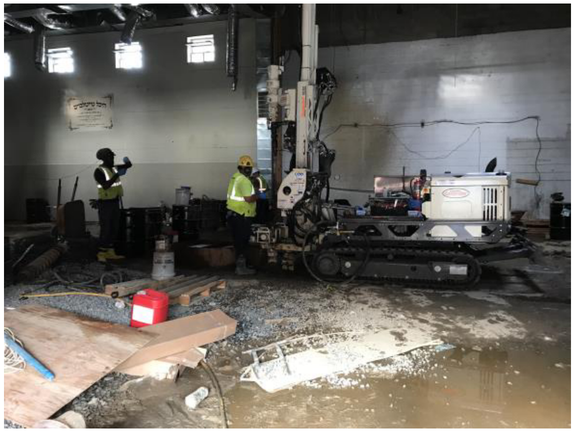


*Photo 1: Mobilization of Geoprobe 7822DT.*

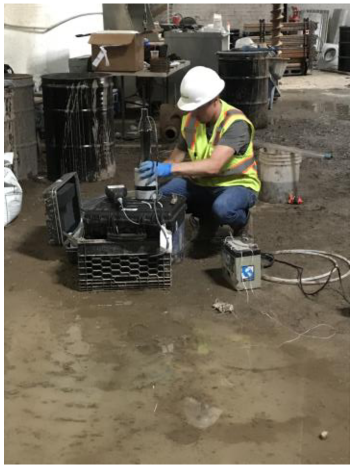


*Photo 2: Preparation for low flow groundwater sampling.*

*Photo 3: View of groundwater sampling setup.*

# DAILY FIELD REPORT



| | | | |
|---|---|---|---|
| Project | NYSDEC Site C224239 - 8 Walworth Street | Report No. | 11 |
| Location | 8 Walworth Street, Brooklyn, NY | Date | 7/2/2020 |
| Client | Toldos Yehuda, LLC | Page | 1 of 1 |
| Contractor | Eastern Environmental Solutions | File No. | 134860-002 |
| Weather | Mostly sunny, humid | Temperature | 80-85° F |

0630 Z Simmel of Haley & Aldrich and Eastern Environmental Solutions (Eastern) on site
0645 Site preparation, safety discussion and set up air monitoring equipment
0720 Begin installation of MW-04(I)
0805 Begin low flow sampling of MW-01(S)
0900 Complete low flow sampling of MW-01(S)
0915 Geoprobe O-Ring on spindle breaks, work stops, troubleshooting
0945 Well development and housekeeping
1115 Eastern offsite to hardware store for tools and replacement pieces
1200 Eastern back on site
1210 Resume installation of MW-04(I)
1240 Refusal at 15 ft bgs while installing MW-04(I), offset
1320 Attempt installation of MW-04(I)
1345 Eastern installing manhole cover for existing wells
1415 Housekeeping and preparation of location MW-03
1430 Take down air monitoring equipment
1500 Relinquish samples to Alpha Laboratories, all off site

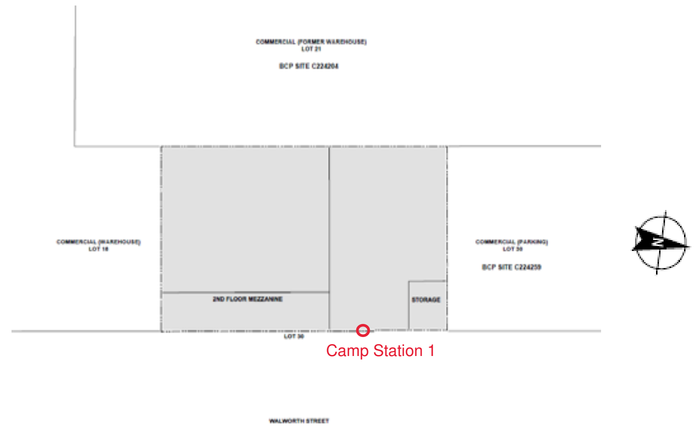
| Field Representative(s) | Time on site | Report/Travel/Other | Total hours |
|---|---|---|---|
| Z Simmel | 8.5 | 1 | 9.5 |

8 Walworth Street, Brooklyn, NY
134860-002
Air Monitoring Log

| | |
|---|---|
| Date: | 7/2/2020 |
| Personnel: | Z. Simmel |
| Weather: | Mostly Sunny, humid |
| Humidity: | 80% |
| Temperature: | 80-85° F |
| Wind Direction: | NW |

| | |
|---|---|
| Particulate Background: | No visible dust |
| PID Background (ppm): | 0.0 |

Site Map:




| Time | Dust Particulates | PID | | Notes |
|---|---|---|---|---|
| | Visual Dust (Y/N) | PID (ppm) | Odors (Y/N) | Activities/Additional Monitoring |
| 645 | N | 0.0 | N | No additional particulate monitoring necessary |
| 700 | N | 0.0 | N | No additional particulate monitoring necessary |
| 715 | N | 0.0 | N | No additional particulate monitoring necessary |
| 730 | N | 0.0 | N | No additional particulate monitoring necessary |
| 745 | N | 0.0 | N | No additional particulate monitoring necessary |
| 800 | N | 0.0 | N | No additional particulate monitoring necessary |
| 815 | N | 0.0 | N | No additional particulate monitoring necessary |
| 830 | N | 0.0 | N | No additional particulate monitoring necessary |
| 845 | N | 0.0 | N | No additional particulate monitoring necessary |
| 900 | N | 0.0 | N | No additional particulate monitoring necessary |
| 915 | N | 0.0 | N | No additional particulate monitoring necessary |
| 930 | N | 0.0 | N | No additional particulate monitoring necessary |
| 945 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1000 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1015 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1030 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1045 | N | 0.1 | N | No additional particulate monitoring necessary |
| 1100 | N | 0.0 | N | No additional particulate monitoring necessary |

8 Walworth Street, Brooklyn, NY
134860-002
Air Monitoring Log

| | Dust Particulates | PID | | Notes |
|---|---|---|---|---|
| Time | Visual Dust (Y/N) | PID (ppm) | Odors (Y/N) | Activities/Additional Monitoring |
| 1115 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1130 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1145 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1200 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1215 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1230 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1245 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1300 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1315 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1330 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1345 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1400 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1415 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1430 | N | 0.0 | N | No additional particulate monitoring necessary |
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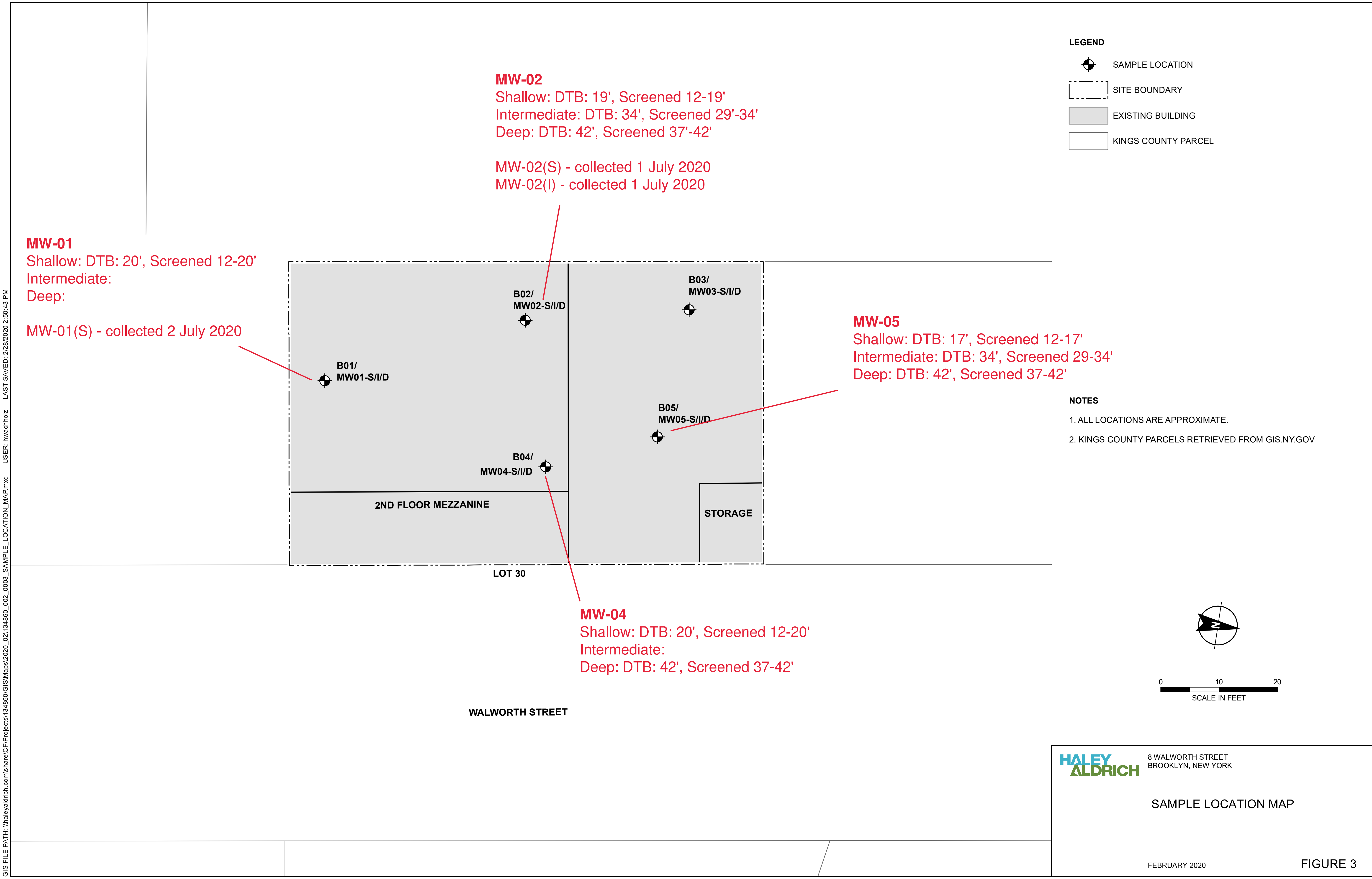


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***Photo 1: Low flow groundwater monitoring set up.***

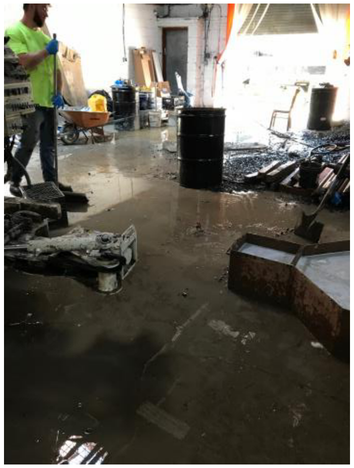


***Photo 2: Mobilization of Geoprobe 7822DT and preparation for mud rotary.***

***Photo 3: View of manhole cover installation.***

# DAILY FIELD REPORT



| | | | |
|---|---|---|---|
| Project | NYSDEC Site C224239 - 8 Walworth Street | Report No. | 12 |
| Location | 8 Walworth Street, Brooklyn, NY | Date | 7/6/2020 |
| Client | Toldos Yehuda, LLC | Page | 1 of 1 |
| Contractor | Eastern Environmental Solutions | File No. | 134860-002 |
| Weather | Sunny, humid | Temperature | 75-90° F |

0630 Z Simmel of Haley & Aldrich and Eastern Environmental Solutions (Eastern) on site
0645 Preparation for mud rotary and set up air monitoring equipment
0730 Begin installation of MW-04(I)
0830 Refusal at 6 ft, offset
0900 Continue installation of MW-04(I)
1000 Continue installation of MW-04(I) - currently at 12 ft bgs
1030 Continue installation of MW-04(I) - currently at 15 ft bgs
1115 Continue installation of MW-04(I) - currently at 16 ft bgs
1200 Continue installation of MW-04(I) - currently at 21 ft bgs
1300 Continue installation of MW-04(I) - currently at 22 ft bgs
1400 Continue installation of MW-04(I) - currently at 26 ft bgs
1430 Continue installation of MW-04(I) - currently at 31 ft bgs
1510 Install MW-04(I) to 34 ft bgs screened 29-34 ft bgs
1530 Site preparation, housekeeping and take down air monitoring equipment
1600 All off site

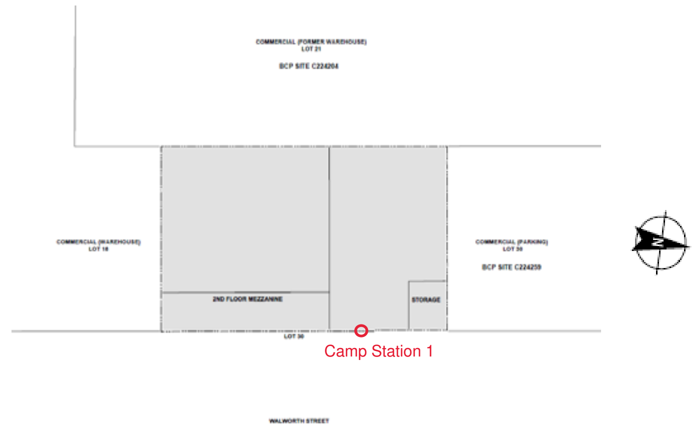
| Field Representative(s) | Time on site | Report/Travel/Other | Total hours |
|---|---|---|---|
| Z Simmel | 9.5 | 1 | 10.5 |

8 Walworth Street, Brooklyn, NY
134860-002
Air Monitoring Log

| | |
|---|---|
| Date: | 7/6/2020 |
| Personnel: | Z. Simmel |
| Weather: | Sunny, humid |
| Humidity: | 73% |
| Temperature: | 75-90° F |
| Wind Direction: | N |

| | |
|---|---|
| Particulate Background: | No visible dust |
| PID Background (ppm): | 0.0 |

Site Map:




| Time | Dust Particulates | PID | | Notes |
|---|---|---|---|---|
| | Visual Dust (Y/N) | PID (ppm) | Odors (Y/N) | Activities/Additional Monitoring |
| 645 | N | 0.0 | N | No additional particulate monitoring necessary |
| 700 | N | 0.0 | N | No additional particulate monitoring necessary |
| 715 | N | 0.0 | N | No additional particulate monitoring necessary |
| 730 | N | 0.0 | N | No additional particulate monitoring necessary |
| 745 | N | 0.0 | N | No additional particulate monitoring necessary |
| 800 | N | 0.0 | N | No additional particulate monitoring necessary |
| 815 | N | 0.0 | N | No additional particulate monitoring necessary |
| 830 | N | 0.0 | N | No additional particulate monitoring necessary |
| 845 | N | 0.0 | N | No additional particulate monitoring necessary |
| 900 | N | 0.0 | N | No additional particulate monitoring necessary |
| 915 | N | 0.0 | N | No additional particulate monitoring necessary |
| 930 | N | 0.0 | N | No additional particulate monitoring necessary |
| 945 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1000 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1015 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1030 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1045 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1100 | N | 0.0 | N | No additional particulate monitoring necessary |

8 Walworth Street, Brooklyn, NY
134860-002
Air Monitoring Log

| | Dust Particulates | PID | | Notes |
|---|---|---|---|---|
| Time | Visual Dust (Y/N) | PID (ppm) | Odors (Y/N) | Activities/Additional Monitoring |
| 1115 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1130 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1145 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1200 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1215 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1230 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1245 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1300 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1315 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1330 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1345 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1400 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1415 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1430 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1445 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1500 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1515 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1530 | N | 0.0 | N | No additional particulate monitoring necessary |
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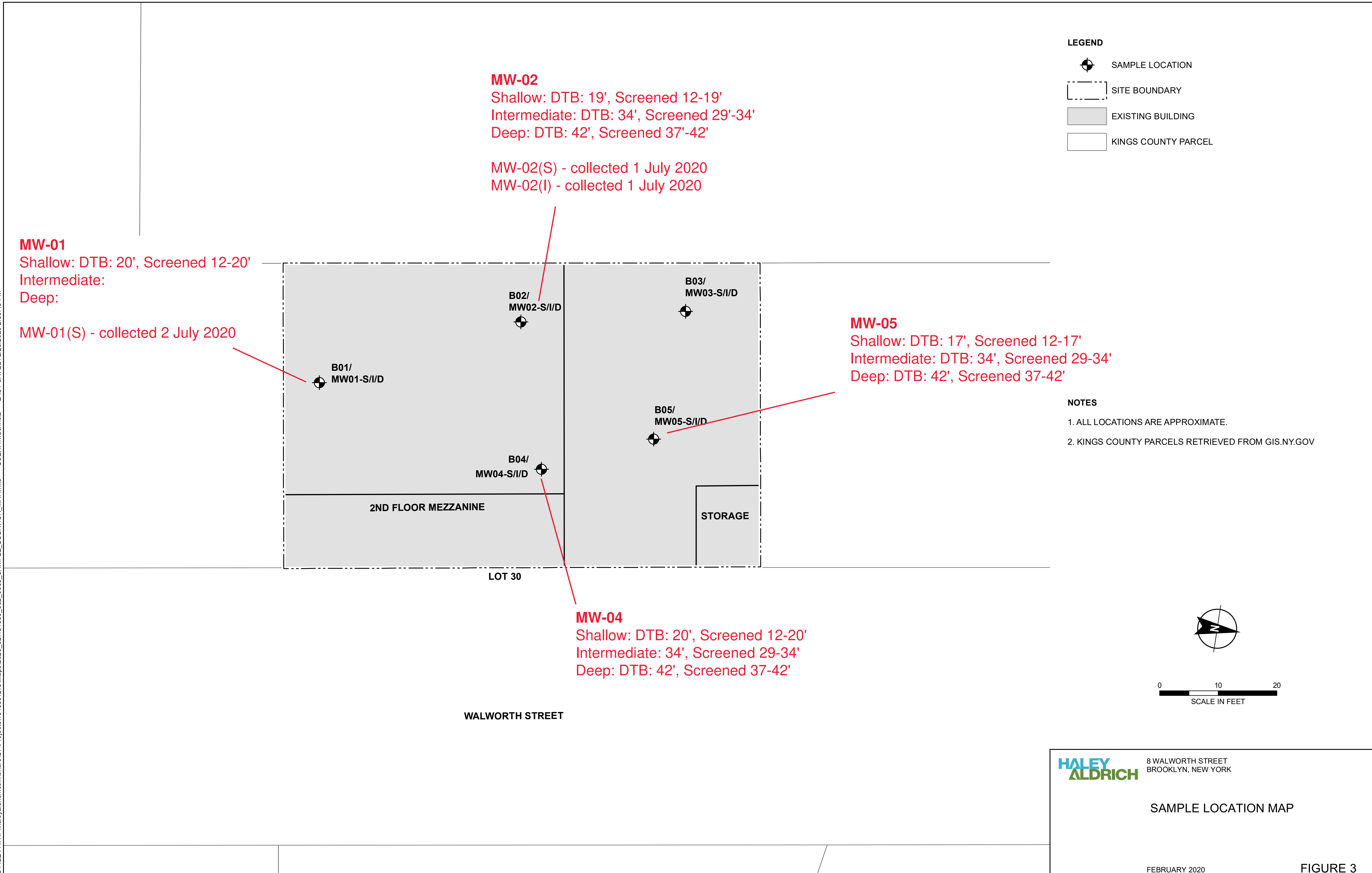


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***Photo 1: Mud rotary set up.***

***Photo 2: Alternate view of mud rotary setup.***

***Photo 3: Installation of MW-04(I).***

# DAILY FIELD REPORT



| | | | |
|---|---|---|---|
| Project | NYSDEC Site C224239 - 8 Walworth Street | Report No. | 13 |
| Location | 8 Walworth Street, Brooklyn, NY | Date | 7/7/2020 |
| Client | Toldos Yehuda, LLC | Page | 1 of 1 |
| Contractor | Eastern Environmental Solutions | File No. | 134860-002 |
| Weather | Mostly sunny, humid | Temperature | 75-80° F |

0630 Z Simmel of Haley & Aldrich and Eastern Environmental Solutions (Eastern) on site
0645 Preparation for mud rotary and set up air monitoring equipment
0700 Begin installation of MW-01(I)
0800 Well development and housekeeping
0830 Stop installation of MW-01; drill mud and water rapidly dissipating into hole at 15-16 ft bgs; call project manager; offset
0850 Begin installation at offset MW-01(I) location
1010 Stop installation of MW-01; mud and water rapidly dissipating into hole at 15 ft bgs; call project manager
1020 Offset to the east of MW-01(S) and attempt installation of MW-01(I)
1150 Stop installation of MW-01(I); mud and water rapidly dissipating into hole at 15-16 ft bgs; move to MW-03 area
1220 Begin installation at MW-03(D)
1400 Continue installation of MW-03(D) - currently at 12 ft bgs
1445 Continue installation of MW-03(D) - currently at 13 ft bgs
1550 Continue installation of MW-03(D) - currently at 16 ft bgs
1600 Decide to continue installation following day; take down air monitoring equipment; housekeeping
1615 All off site

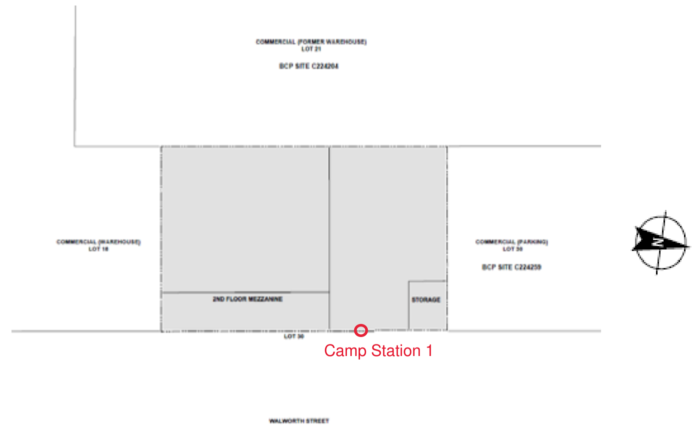
| Field Representative(s) | Time on site | Report/Travel/Other | Total hours |
|---|---|---|---|
| Z Simmel | 9.5 | 1 | 10.5 |
| | | | |

8 Walworth Street, Brooklyn, NY
134860-002
Air Monitoring Log

| | |
|---|---|
| Date: | 7/7/2020 |
| Personnel: | Z. Simmel |
| Weather: | Mostly sunny, humid |
| Humidity: | 71% |
| Temperature: | 75-80° F |
| Wind Direction: | E |

| | |
|---|---|
| Particulate Background: | No visible dust |
| PID Background (ppm): | 0.0 |

Site Map:




| | Dust Particulates | PID | | Notes |
|---|---|---|---|---|
| Time | Visual Dust (Y/N) | PID (ppm) | Odors (Y/N) | Activities/Additional Monitoring |
| 645 | N | 0.0 | N | No additional particulate monitoring necessary |
| 700 | N | 0.0 | N | No additional particulate monitoring necessary |
| 715 | N | 0.0 | N | No additional particulate monitoring necessary |
| 730 | N | 0.0 | N | No additional particulate monitoring necessary |
| 745 | N | 0.0 | N | No additional particulate monitoring necessary |
| 800 | N | 0.0 | N | No additional particulate monitoring necessary |
| 815 | N | 0.0 | N | No additional particulate monitoring necessary |
| 830 | N | 0.0 | N | No additional particulate monitoring necessary |
| 845 | N | 0.0 | N | No additional particulate monitoring necessary |
| 900 | N | 0.0 | N | No additional particulate monitoring necessary |
| 915 | N | 0.0 | N | No additional particulate monitoring necessary |
| 930 | N | 0.0 | N | No additional particulate monitoring necessary |
| 945 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1000 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1015 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1030 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1045 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1100 | N | 0.0 | N | No additional particulate monitoring necessary |

8 Walworth Street, Brooklyn, NY
134860-002
Air Monitoring Log

| | Dust Particulates | PID | | Notes |
|---|---|---|---|---|
| Time | Visual Dust (Y/N) | PID (ppm) | Odors (Y/N) | Activities/Additional Monitoring |
| 1115 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1130 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1145 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1200 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1215 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1230 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1245 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1300 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1315 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1330 | N | 0.1 | N | No additional particulate monitoring necessary |
| 1345 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1400 | N | 0.1 | N | No additional particulate monitoring necessary |
| 1415 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1430 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1445 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1500 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1515 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1530 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1545 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1600 | N | 0.0 | N | No additional particulate monitoring necessary |
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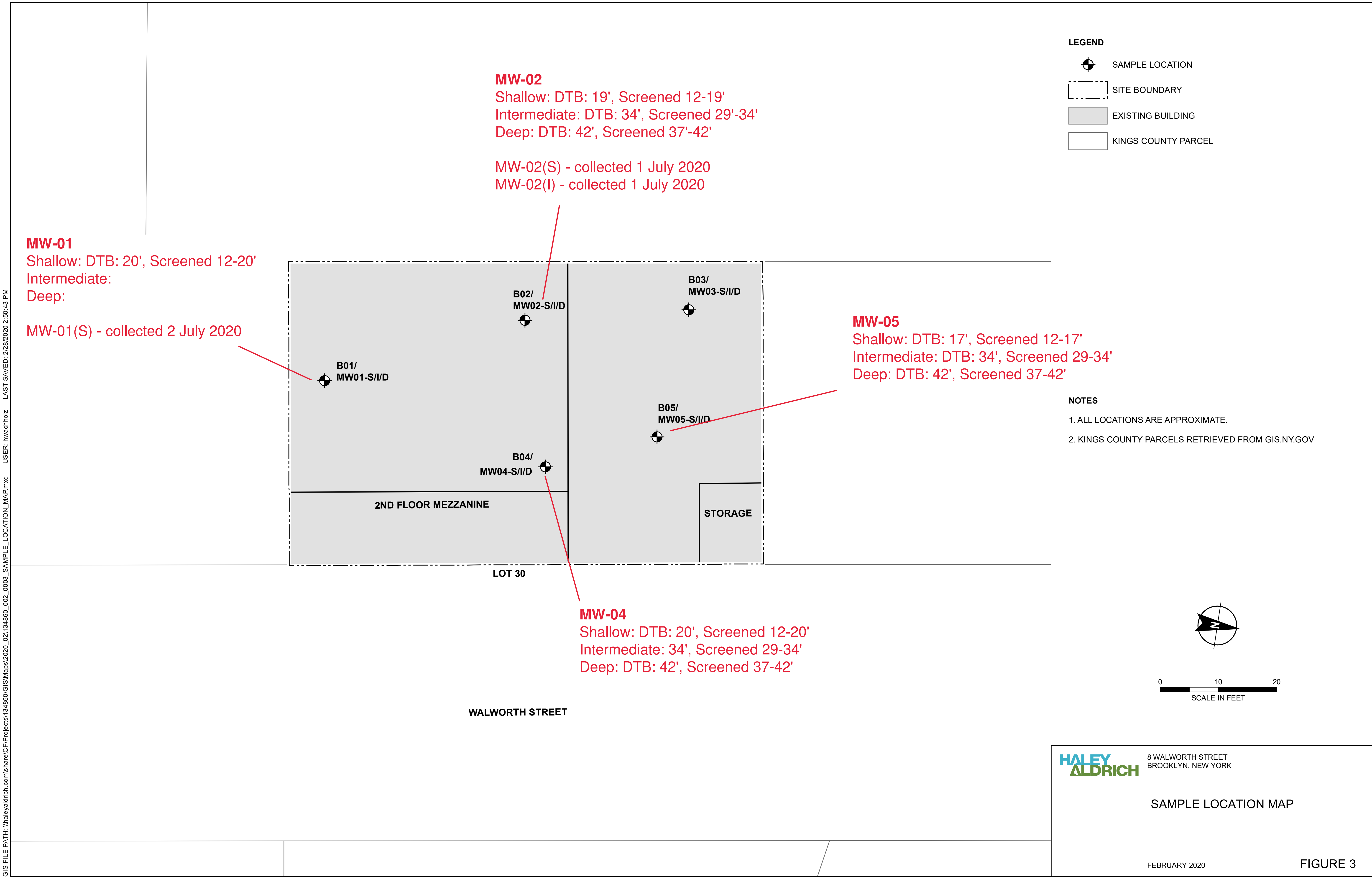
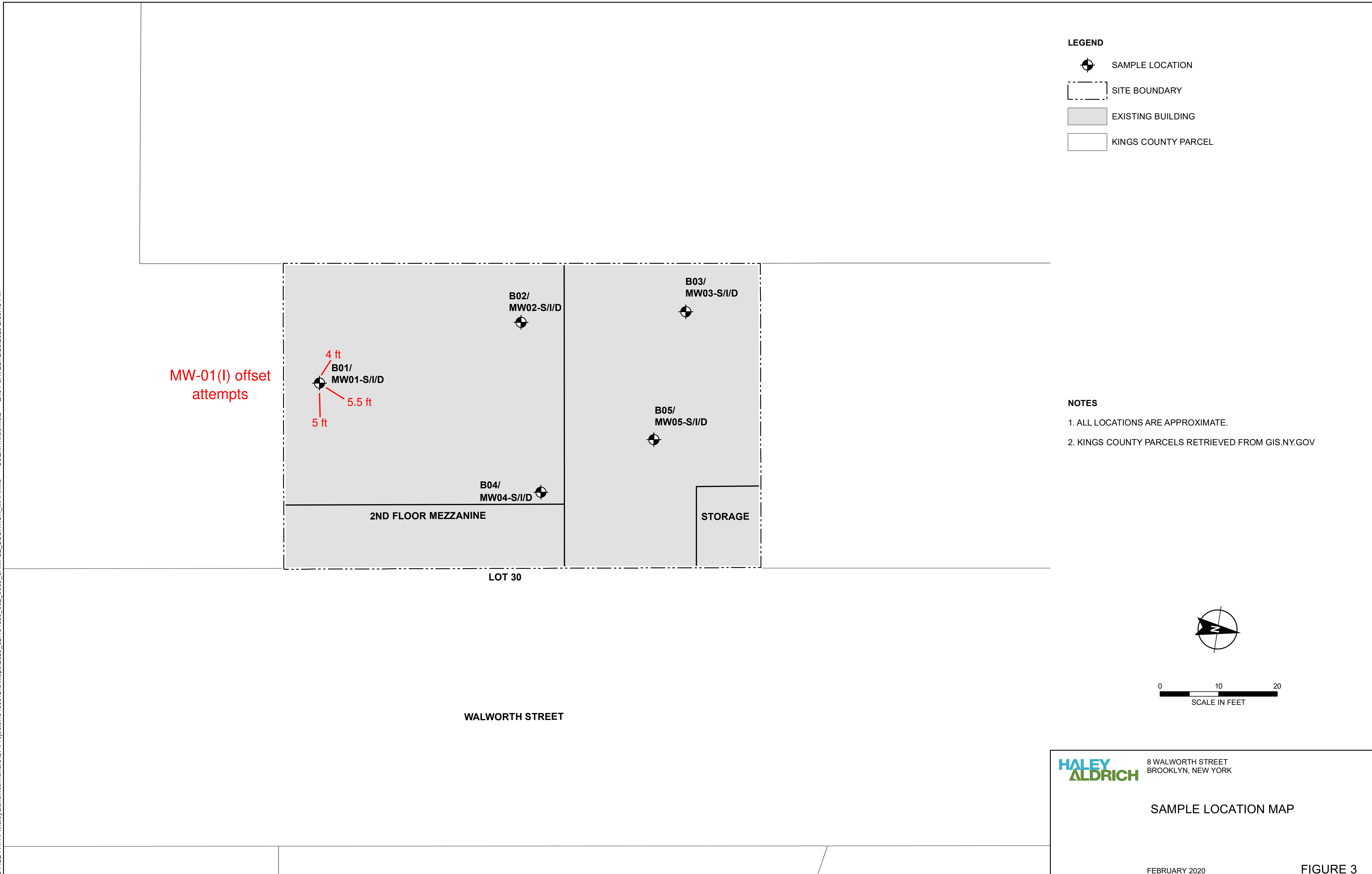



GIS FILE PATH: \\haleyaldrich.com\share\CF\Projects\134860\GIS\Maps\2020_02\134860_002_0003_SAMPLE_LOCATION_MAP.mxd — USER: hwachholz — LAST SAVED: 2/28/2020 2:50:43 PM




GIS FILE PATH: \\haleyaldrich.com\share\CF\Projects\134860\GIS\Maps\2020_02\134860_002_0003_SAMPLE_LOCATION_MAP.mxd — USER: hwachholz — LAST SAVED: 2/28/2020 2:50:43 PM

***Photo 1: Offset attempt at MW-01(I).***

***Photo 2: Alternate offset attempt at MW-01(I).***

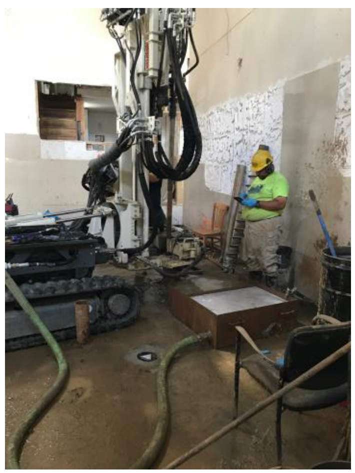


***Photo 3: Attempted installation of MW-01(I).***

# DAILY FIELD REPORT



| | | | |
|---|---|---|---|
| Project | NYSDEC Site C224239 - 8 Walworth Street | Report No. | 14 |
| Location | 8 Walworth Street, Brooklyn, NY | Date | 7/8/2020 |
| Client | Toldos Yehuda, LLC | Page | 1 of 1 |
| Contractor | Eastern Environmental Solutions | File No. | 134860-002 |
| Weather | Cloudy, humid | Temperature | 75-85° F |

0630 Z Simmel of Haley & Aldrich and Eastern Environmental Solutions (Eastern) on site
0640 Preparation for mud rotary and set up air monitoring equipment
0645 Begin installation of MW-03(D)
0745 Continue installation of MW-03(D) - currently at 21 ft bgs
0800 Begin low flow sampling at MW-04(S)
0900 Continue installation of MW-03(D) - currently at 25 ft bgs
0930 Continue installation of MW-03(D) - currently at 28 ft bgs
1000 Continue installation of MW-03(D) - currently at 30 ft bgs; finish low flow sampling at MW-04(S)
1045 Continue installation of MW-03(D) - currently at 32 ft bgs; refuel geoprobe
1130 Continue installation of MW-03(D) - currently at 35 ft bgs
1140 Begin low flow sampling at MW-04(D); compressor malfunction; call project manager
1240 Call for replacement compressor
1245 Continue installation of MW-03(D) - currently at 40 ft bgs
1335 Continue installation of MW-03(D) - currently at 42 ft bgs
1425 Refusal at 42 ft bgs at MW-03(D); set to 42 ft bgs screened 37-42 ft bgs
1500 Set MW-03(D); housekeeping; relinquish samples to Alpha Laboratories
1515 Take down air monitoring equipment
1530 All off site

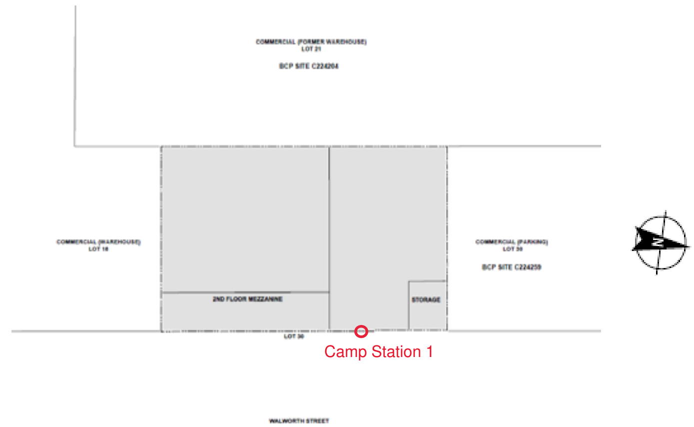
| Field Representative(s) | Time on site | Report/Travel/Other | Total hours |
|---|---|---|---|
| Z Simmel | 9 | 1 | 10 |

8 Walworth Street, Brooklyn, NY
134860-002
Air Monitoring Log

| | |
|---|---|
| Date: | 7/8/2020 |
| Personnel: | Z. Simmel |
| Weather: | Cloudy, humid |
| Humidity: | 87% |
| Temperature: | 75-85° F |
| Wind Direction: | SW |

| | |
|---|---|
| Particulate Background: | No visible dust |
| PID Background (ppm): | 0.0 |

Site Map:




| Time | Dust Particulates | PID | | Notes |
|---|---|---|---|---|
| | Visual Dust (Y/N) | PID (ppm) | Odors (Y/N) | Activities/Additional Monitoring |
| 645 | N | 0.0 | N | No additional particulate monitoring necessary |
| 700 | N | 0.0 | N | No additional particulate monitoring necessary |
| 715 | N | 0.0 | N | No additional particulate monitoring necessary |
| 730 | N | 0.0 | N | No additional particulate monitoring necessary |
| 745 | N | 0.0 | N | No additional particulate monitoring necessary |
| 800 | N | 0.0 | N | No additional particulate monitoring necessary |
| 815 | N | 0.0 | N | No additional particulate monitoring necessary |
| 830 | N | 0.0 | N | No additional particulate monitoring necessary |
| 845 | N | 0.1 | N | No additional particulate monitoring necessary |
| 900 | N | 0.0 | N | No additional particulate monitoring necessary |
| 915 | N | 0.2 | N | No additional particulate monitoring necessary |
| 930 | N | 0.0 | N | No additional particulate monitoring necessary |
| 945 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1000 | N | 0.1 | N | No additional particulate monitoring necessary |
| 1015 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1030 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1045 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1100 | N | 0.0 | N | No additional particulate monitoring necessary |

8 Walworth Street, Brooklyn, NY
134860-002
Air Monitoring Log

| Time | Dust Particulates | PID | | Notes |
|---|---|---|---|---|
| | Visual Dust (Y/N) | PID (ppm) | Odors (Y/N) | Activities/Additional Monitoring |
| 1115 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1130 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1145 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1200 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1215 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1230 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1245 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1300 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1315 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1330 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1345 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1400 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1415 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1430 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1445 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1500 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1515 | N | 0.0 | N | No additional particulate monitoring necessary |
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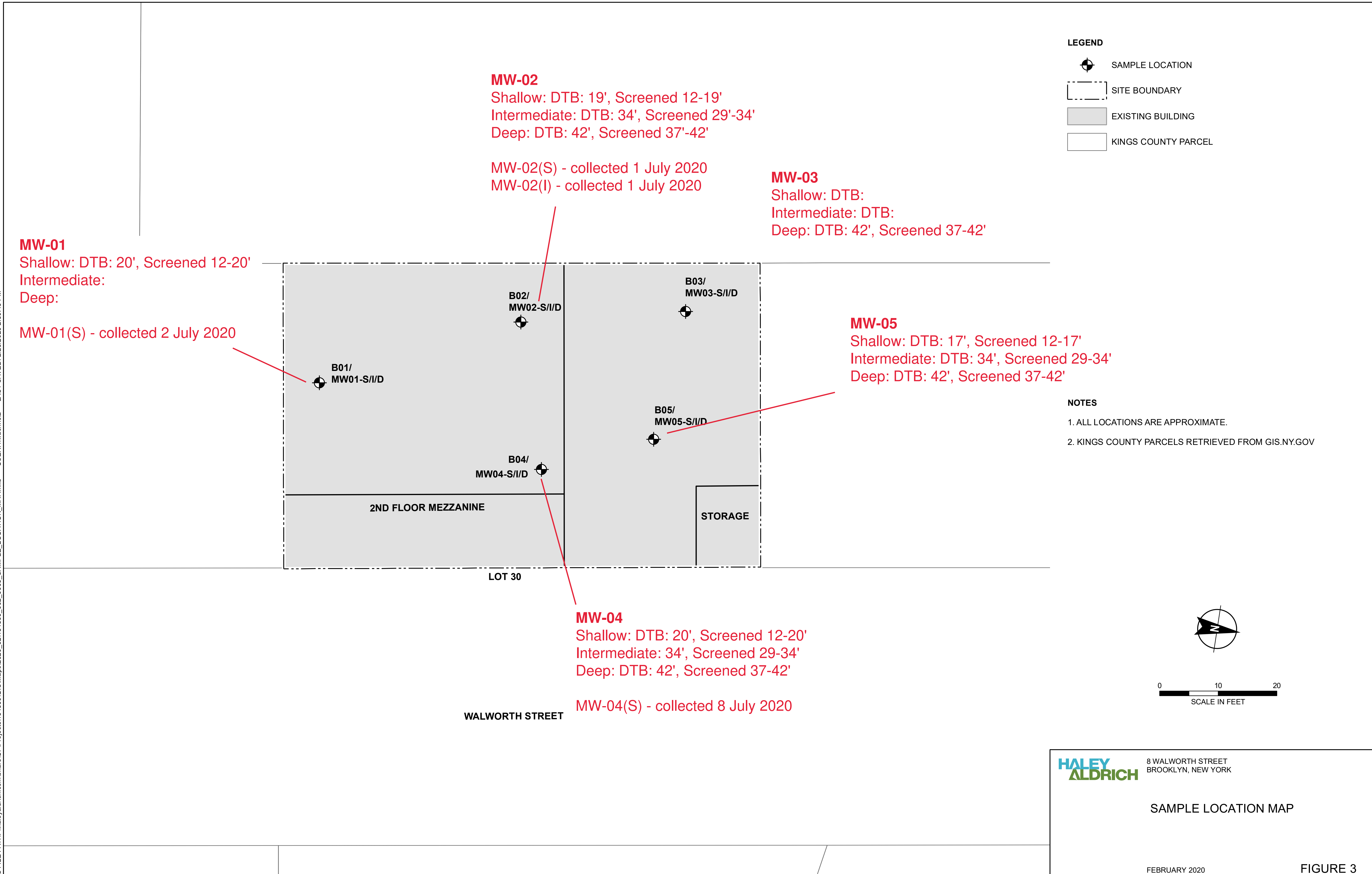



GIS FILE PATH: \\haleyaldrich.com\share\CF\Projects\134860\GIS\Maps\2020_02\134860_002_0003_SAMPLE_LOCATION_MAP.mxd — USER: hwachholz — LAST SAVED: 2/28/2020 2:50:43 PM

***Photo 1: View of groundwater sampling setup.***

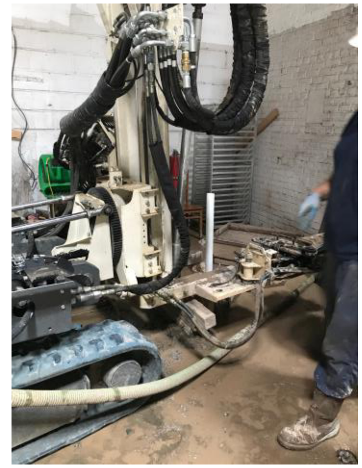


***Photo 2: Installation of MW-03(D)***

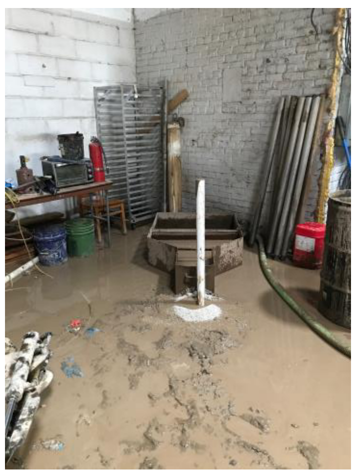


***Photo 3: View of MW-03(D).***

# DAILY FIELD REPORT



| | | | |
|---|---|---|---|
| Project | NYSDEC Site C224239 - 8 Walworth Street | Report No. | 15 |
| Location | 8 Walworth Street, Brooklyn, NY | Date | 7/9/2020 |
| Client | Toldos Yehuda, LLC | Page | 1 of 1 |
| Contractor | Eastern Environmental Solutions | File No. | 134860-002 |
| Weather | Mostly sunny, humid | Temperature | 75-85° F |

**0630 Z Simmel of Haley & Aldrich and Eastern Environmental Solutions (Eastern) on site**
**0640 Site preparation and housekeeping**
**0700 Set up air monitoring equipment**
**0720 Begin installation of MW-03(S)**
**0830 Continue installation of MW-03(S) - currently reaching 10 ft bgs**
**0900 Continue installation of MW-03(S) - currently reaching 18 ft bgs**
**1045 Set MW-03(S) to 20 ft bgs screened 12-20 ft bgs**
**1100 Begin installation of MW-03(I)**
**1130 Begin low flow sampling at MW-04(D)**
**1235 Continue installation of MW-03(I) - currently reaching 11 ft bgs; roller bit damaged and can't advance further; call project manager**
**1245 New roller bit required for work tomorrow; mobilize to MW-01 area for direct push wells**
**1300 Begin installation of MW-01(I); complete low flow sampling at MW-04(D)**
**1330 Continue installation of MW-01(I) - currently reaching 25 ft bgs**
**1400 Continue installation of MW-01(I) - currently reaching 31 ft bgs**
**1440 Refusal at 31 ft bgs; set MW-01(I) to 31 ft bgs screened 26-31 ft bgs**
**1500 Move equipment back to MW-03; site preparation and housekeeping**
**1530 Take down air monitoring equipment**
**1620 Relinquish samples to Alpha Laboratories; all off site**

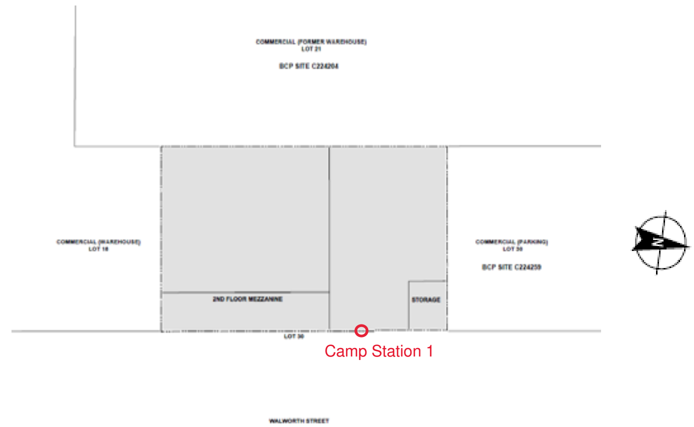
| Field Representative(s) | Time on site | Report/Travel/Other | Total hours |
|---|---|---|---|
| Z Simmel | 9 | 1 | 10 |

8 Walworth Street, Brooklyn, NY
134860-002
Air Monitoring Log

| | |
|---|---|
| Date: | 7/9/2020 |
| Personnel: | Z. Simmel |
| Weather: | Mostly sunny, humid |
| Humidity: | 87% |
| Temperature: | 75-85° F |
| Wind Direction: | SSW |

| | |
|---|---|
| Particulate Background: | No visible dust |
| PID Background (ppm): | 0.0 |

Site Map:




| Time | Dust Particulates | PID | | Notes |
|---|---|---|---|---|
| | Visual Dust (Y/N) | PID (ppm) | Odors (Y/N) | Activities/Additional Monitoring |
| 700 | N | 0.0 | N | No additional particulate monitoring necessary |
| 715 | N | 0.0 | N | No additional particulate monitoring necessary |
| 730 | N | 0.0 | N | No additional particulate monitoring necessary |
| 745 | N | 0.1 | N | No additional particulate monitoring necessary |
| 800 | N | 0.0 | N | No additional particulate monitoring necessary |
| 815 | N | 0.0 | N | No additional particulate monitoring necessary |
| 830 | N | 0.0 | N | No additional particulate monitoring necessary |
| 845 | N | 0.0 | N | No additional particulate monitoring necessary |
| 900 | N | 0.0 | N | No additional particulate monitoring necessary |
| 915 | N | 0.0 | N | No additional particulate monitoring necessary |
| 930 | N | 0.0 | N | No additional particulate monitoring necessary |
| 945 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1000 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1015 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1030 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1045 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1100 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1115 | N | 0.1 | N | No additional particulate monitoring necessary |

8 Walworth Street, Brooklyn, NY
134860-002
Air Monitoring Log

| Time | Dust Particulates | PID | | Notes |
|---|---|---|---|---|
| | Visual Dust (Y/N) | PID (ppm) | Odors (Y/N) | Activities/Additional Monitoring |
| 1130 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1145 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1200 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1215 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1230 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1245 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1300 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1315 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1330 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1345 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1400 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1415 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1430 | N | 0.2 | N | No additional particulate monitoring necessary |
| 1445 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1500 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1515 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1530 | N | 0.0 | N | No additional particulate monitoring necessary |
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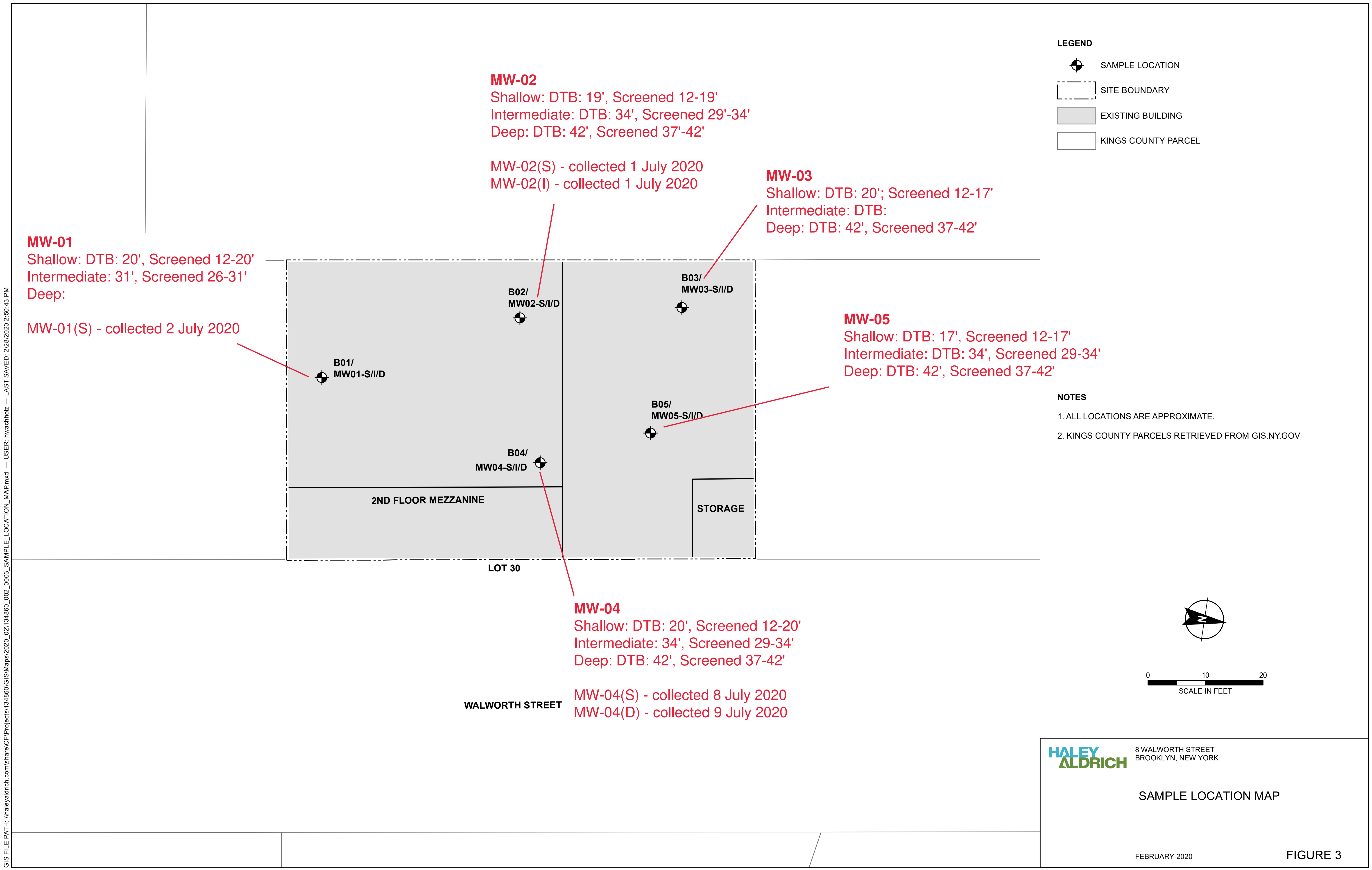

MW-02
Shallow: DTB: 19', Screened 12-19'
Intermediate: DTB: 34', Screened 29'-34'
Deep: DTB: 42', Screened 37'-42'
MW-02(S) - collected 1 July 2020
MW-02(I) - collected 1 July 2020
MW-03
Shallow: DTB: 20'; Screened 12-17'
Intermediate: DTB:
Deep: DTB: 42', Screened 37-42'
MW-01
Shallow: DTB: 20', Screened 12-20'
Intermediate: 31', Screened 26-31'
Deep:
MW-01(S) - collected 2 July 2020
MW-05
Shallow: DTB: 17', Screened 12-17'
Intermediate: DTB: 34', Screened 29-34'
Deep: DTB: 42', Screened 37-42'
B01/
MW01-S/I/D
B02/
MW02-S/I/D
B03/
MW03-S/I/D
B04/
MW04-S/I/D
B05/
MW05-S/I/D
2ND FLOOR MEZZANINE
STORAGE
LOT 30
MW-04
Shallow: DTB: 20', Screened 12-20'
Intermediate: 34', Screened 29-34'
Deep: DTB: 42', Screened 37-42'
MW-04(S) - collected 8 July 2020
MW-04(D) - collected 9 July 2020
WALWORTH STREET
LEGEND
SAMPLE LOCATION
SITE BOUNDARY
EXISTING BUILDING
KINGS COUNTY PARCEL
NOTES
1. ALL LOCATIONS ARE APPROXIMATE.
2. KINGS COUNTY PARCELS RETRIEVED FROM GIS.NY.GOV
N
0
10
20
SCALE IN FEET
HALEY ALDRICH
8 WALWORTH STREET
BROOKLYN, NEW YORK
SAMPLE LOCATION MAP
FEBRUARY 2020
FIGURE 3
GIS FILE PATH: \\haleyaldrich.com\share\CF\Projects\134860\GIS\Maps\2020_02\134860_002_0003_SAMPLE_LOCATION_MAP.mxd — USER: hwachholz — LAST SAVED: 2/28/2020 2:50:43 PM

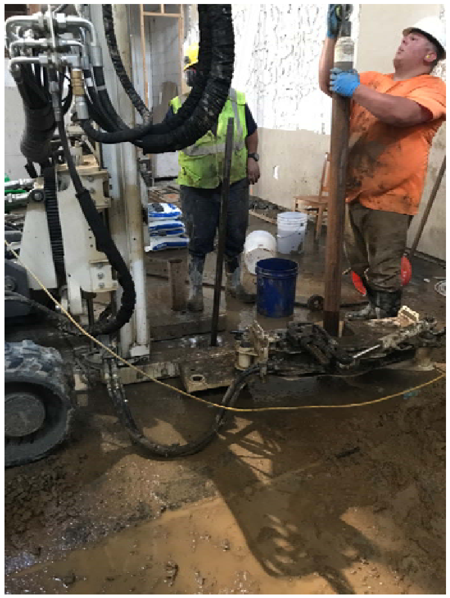


*Photo 1: View of MW-01(I) installation.*

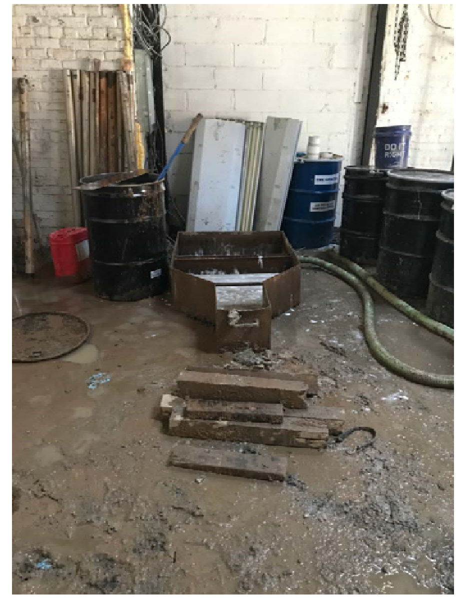


*Photo 2: View of MW-03(S) installation setup.*

# DAILY FIELD REPORT



| | | | |
|---|---|---|---|
| Project | NYSDEC Site C224239 - 8 Walworth Street | Report No. | 16 |
| Location | 8 Walworth Street, Brooklyn, NY | Date | 7/10/2020 |
| Client | Toldos Yehuda, LLC | Page | 1 of 1 |
| Contractor | Eastern Environmental Solutions | File No. | 134860-002 |
| Weather | Cloudy, heavy rain | Temperature | 75-80° F |

0630 Z Simmel of Haley & Aldrich and Eastern Environmental Solutions (Eastern) on site

0640 Site preparation and housekeeping

0700 Set up air monitoring equipment

0730 Begin installation of MW-03(I)

0800 Continue installation of MW-03(I) - currently reaching 20 ft bgs

0900 Continue installation of MW-03(I) - currently reaching 30 ft bgs

0930 Begin low flow sampling at MW-04(I)

1020 Complete low flow sampling at MW-04(I)

1030 Set MW-03(I) to 35 ft bgs screened 30-35 ft bgs

1200 Begin installation of MW-01(D)

1225 Refusal encountered at 31 ft bgs, offset

1320 Refusal encountered at 26 ft bgs, offset

1410 Refusal encountered at 31 ft bgs, offset and call project manager

1418 Relinquish samples to Alpha Laboratories

1445 Begin installation fourth attempt at MW-01(D)

1530 Refusal encountered ta 31 ft bgs; evidence of damage to drill rig noted by Eastern

1535 Discussion with Eastern on next steps

1545 Demobilize equipment; housekeeping; take down air monitoring equipment

1630 All off site

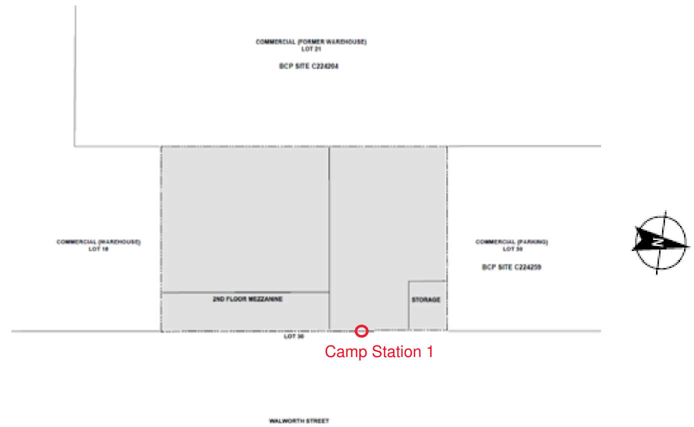
| Field Representative(s) | Time on site | Report/Travel/Other | Total hours |
|---|---|---|---|
| Z Simmel | 10 | 1 | 11 |

8 Walworth Street, Brooklyn, NY
134860-002
Air Monitoring Log

| | |
|---|---|
| Date: | 7/10/2020 |
| Personnel: | Z. Simmel |
| Weather: | Cloudy, heavy rain |
| Humidity: | 88% |
| Temperature: | 75-80° F |
| Wind Direction: | NE |

| | |
|---|---|
| Particulate Background: | No visible dust |
| PID Background (ppm): | 0.0 |

Site Map:




| Time | Dust Particulates | PID | | Notes |
|---|---|---|---|---|
| | Visual Dust (Y/N) | PID (ppm) | Odors (Y/N) | Activities/Additional Monitoring |
| 700 | N | 0.0 | N | No additional particulate monitoring necessary |
| 715 | N | 0.0 | N | No additional particulate monitoring necessary |
| 730 | N | 0.0 | N | No additional particulate monitoring necessary |
| 745 | N | 0.0 | N | No additional particulate monitoring necessary |
| 800 | N | 0.0 | N | No additional particulate monitoring necessary |
| 815 | N | 0.0 | N | No additional particulate monitoring necessary |
| 830 | N | 0.0 | N | No additional particulate monitoring necessary |
| 845 | N | 0.0 | N | No additional particulate monitoring necessary |
| 900 | N | 0.0 | N | No additional particulate monitoring necessary |
| 915 | N | 0.1 | N | No additional particulate monitoring necessary |
| 930 | N | 0.0 | N | No additional particulate monitoring necessary |
| 945 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1000 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1015 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1030 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1045 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1100 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1115 | N | 0.0 | N | No additional particulate monitoring necessary |

8 Walworth Street, Brooklyn, NY
134860-002
Air Monitoring Log

| | Dust Particulates | PID | | Notes |
|---|---|---|---|---|
| Time | Visual Dust (Y/N) | PID (ppm) | Odors (Y/N) | Activities/Additional Monitoring |
| 1130 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1145 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1200 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1215 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1230 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1245 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1300 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1315 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1330 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1345 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1400 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1415 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1430 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1445 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1500 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1515 | N | 0.0 | N | No additional particulate monitoring necessary |
| 1530 | N | 0.1 | N | No additional particulate monitoring necessary |
| 1545 | N | 0.0 | N | No additional particulate monitoring necessary |
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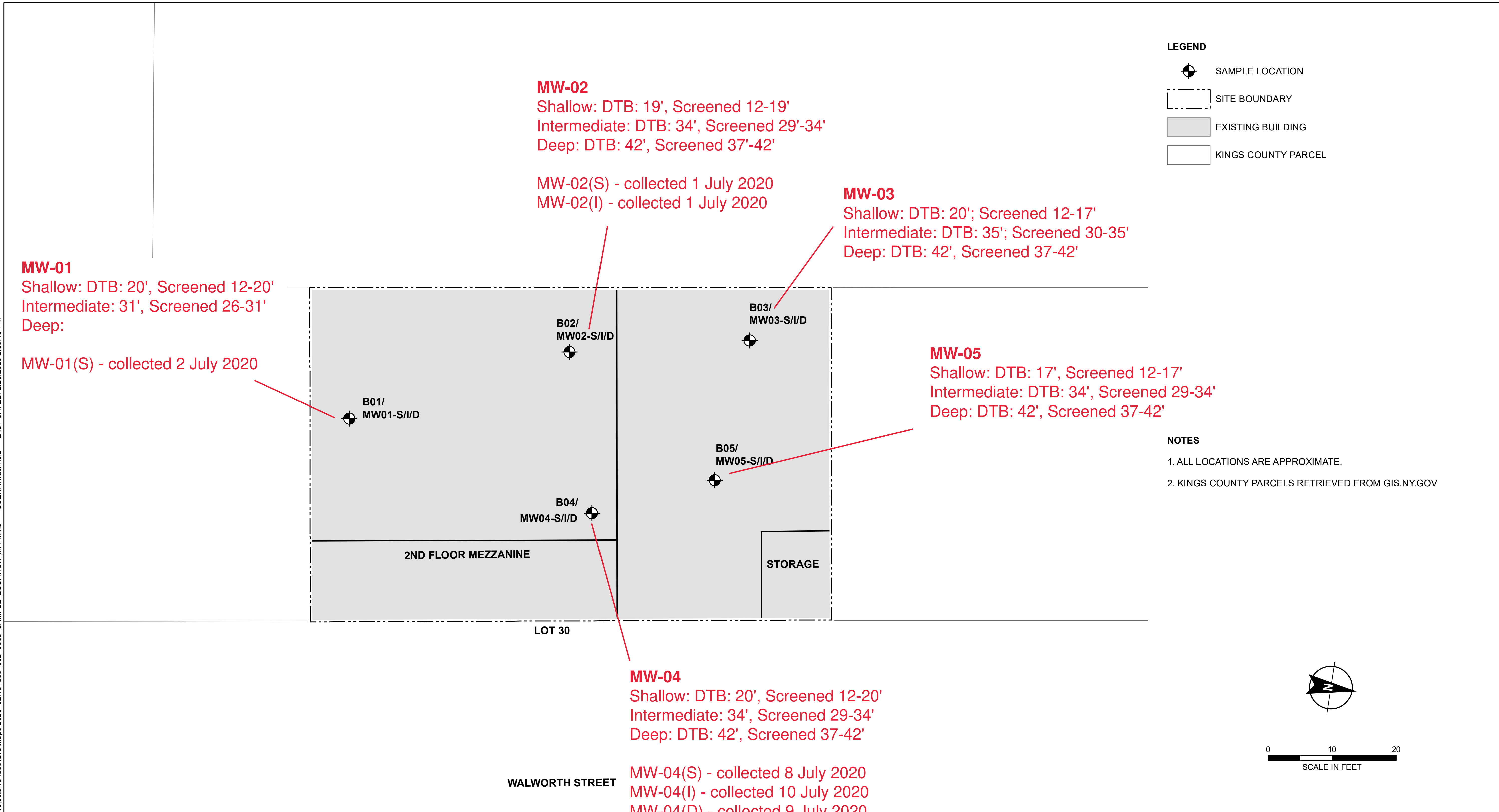


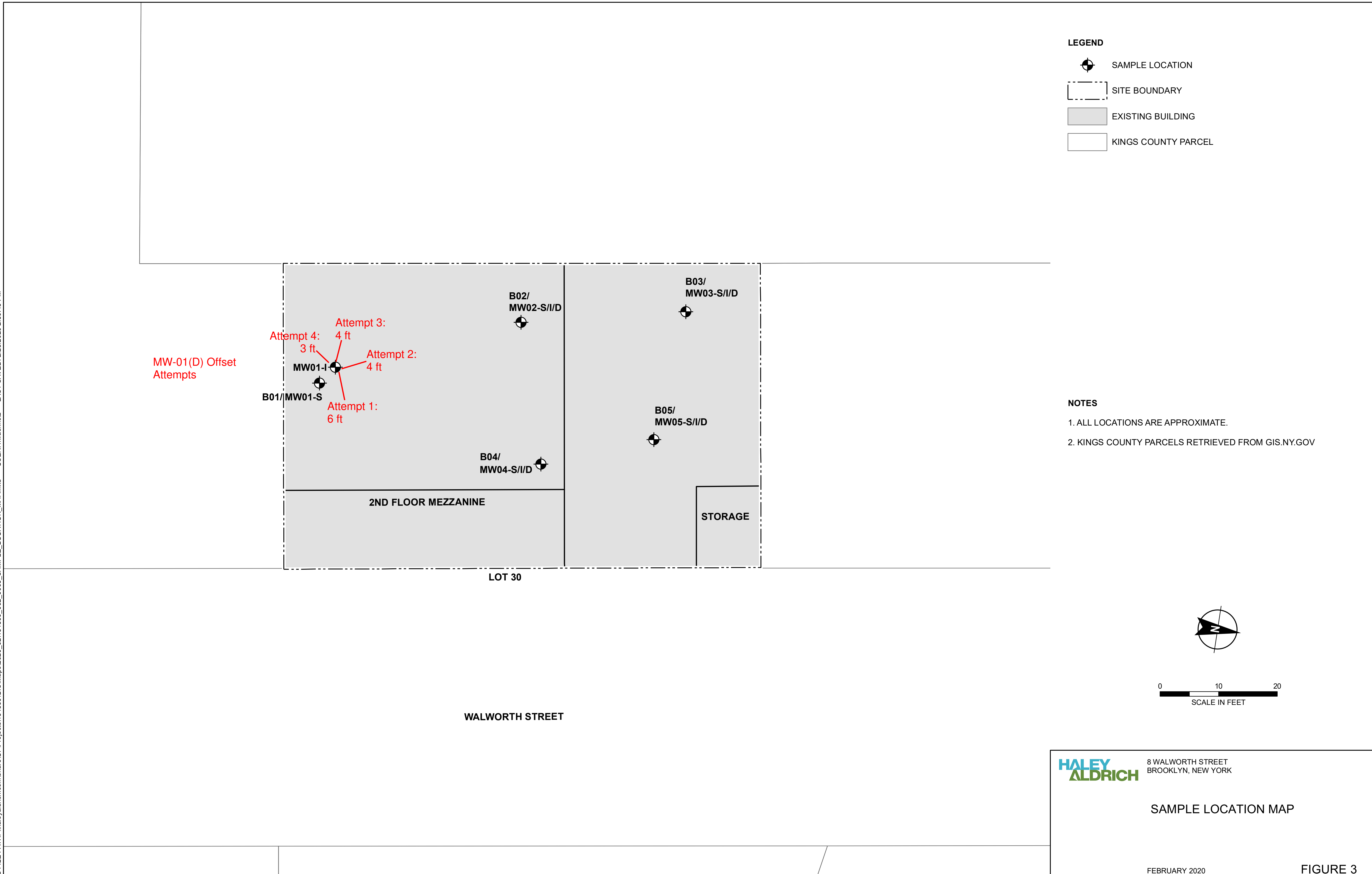

HALEY ALDRICH

8 WALWORTH STREET
BROOKLYN, NEW YORK

SAMPLE LOCATION MAP

FEBRUARY 2020

FIGURE 3




HALEY ALDRICH

8 WALWORTH STREET
BROOKLYN, NEW YORK

SAMPLE LOCATION MAP

FEBRUARY 2020

FIGURE 3

GIS FILE PATH: \\haleyaldrich.com\share\CF\Projects\134860\GIS\Maps\2020_02\134860_002_0003_SAMPLE_LOCATION_MAP.mxd — USER: hwachholz — LAST SAVED: 2/28/2020 2:50:43 PM

*Photo 1: View of MW-03 installation.*

*Photo 2: View of MW-01 cluster area.*

*Photo 3: View of MW-03 cluster area.*

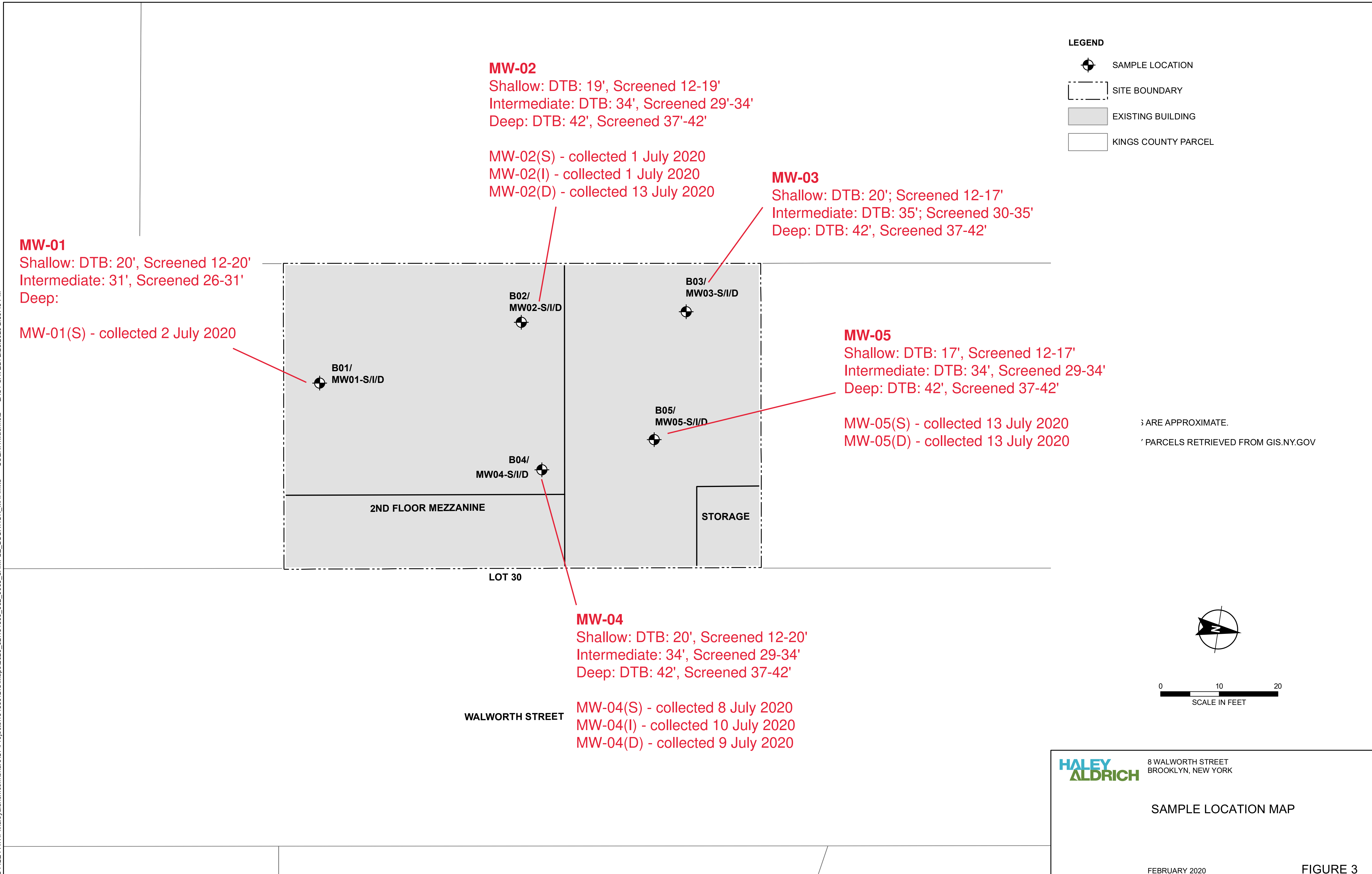
# DAILY FIELD REPORT



| | | | |
|---|---|---|---|
| **Project** | **NYSDEC Site C224239 - 8 Walworth Street** | **Report No.** | 17 |
| **Location** | **8 Walworth Street, Brooklyn, NY** | **Date** | **7/13/2020** |
| **Client** | **Toldos Yehuda, LLC** | **Page** | **1** of **1** |
| **Contractor** | **Eastern Environmental Solutions** | **File No.** | **134860-002** |
| **Weather** | **Mostly Sunny** | **Temperature** | **75-83° F** |

**0745 Z Simmel of Haley & Aldrich on site**
**0800 Housekeeping**
**0810 Set up low flow sampling equipment**
**0820 Begin low flow sampling at MW-02(D)**
**0905 Complete low flow sampling at MW-02(D)**
**1020 Begin low flow sampling a MW-05(S)**
**1145 Complete low flow sampling at MW-05(S)**
**1215 Begin low flow sampling at MW-05(D)**
**1320 Complete low flow sampling at MW-05(D)**
**1400 Housekeeping**
**1500 Relinquish samples to Alpha Laboratories; all offsite**

| Field Representative(s) | Time on site | Report/Travel/Other | Total hours |
|---|---|---|---|
| Z Simmel | 7.5 | 1 | 8.5 |




HALEY ALDRICH

8 WALWORTH STREET
BROOKLYN, NEW YORK

SAMPLE LOCATION MAP

FEBRUARY 2020

FIGURE 3

***Photo 1: View of groundwater sampling at MW-05.***

***Photo 2: View of MW-01 cluster area.***

# DAILY FIELD REPORT



| | | | |
|---|---|---|---|
| Project | NYSDEC Site C224239 - 8 Walworth Street | Report No. | 18 |
| Location | 8 Walworth Street, Brooklyn, NY | Date | 7/14/2020 |
| Client | Toldos Yehuda, LLC | Page | 1 of 1 |
| Contractor | Eastern Environmental Solutions | File No. | 134860-002 |
| Weather | Mostly Sunny | Temperature | 80-85° F |

0730 Z Simmel of Haley & Aldrich on site
0755 Begin low flow sampling at MW-05(I)
0815 Housekeeping and well development
0850 Complete low flow sampling at MW-05(I)
1000 Continue well development
1115 Prepare equipment for low flow sampling at MW-03
1135 Begin low flow sampling at MW-03(I)
1230 Complete low flow sampling at MW-03(I)
1250 Begin low flow sampling at MW-03(D)
1345 Complete low flow sampling at MW-03(D)
1400 Housekeeping
1445 Relinquish samples to Alpha Laboratories; all offsite

| Field Representative(s) | Time on site | Report/Travel/Other | Total hours |
|---|---|---|---|
| Z Simmel | 7.25 | 1 | 8.25 |

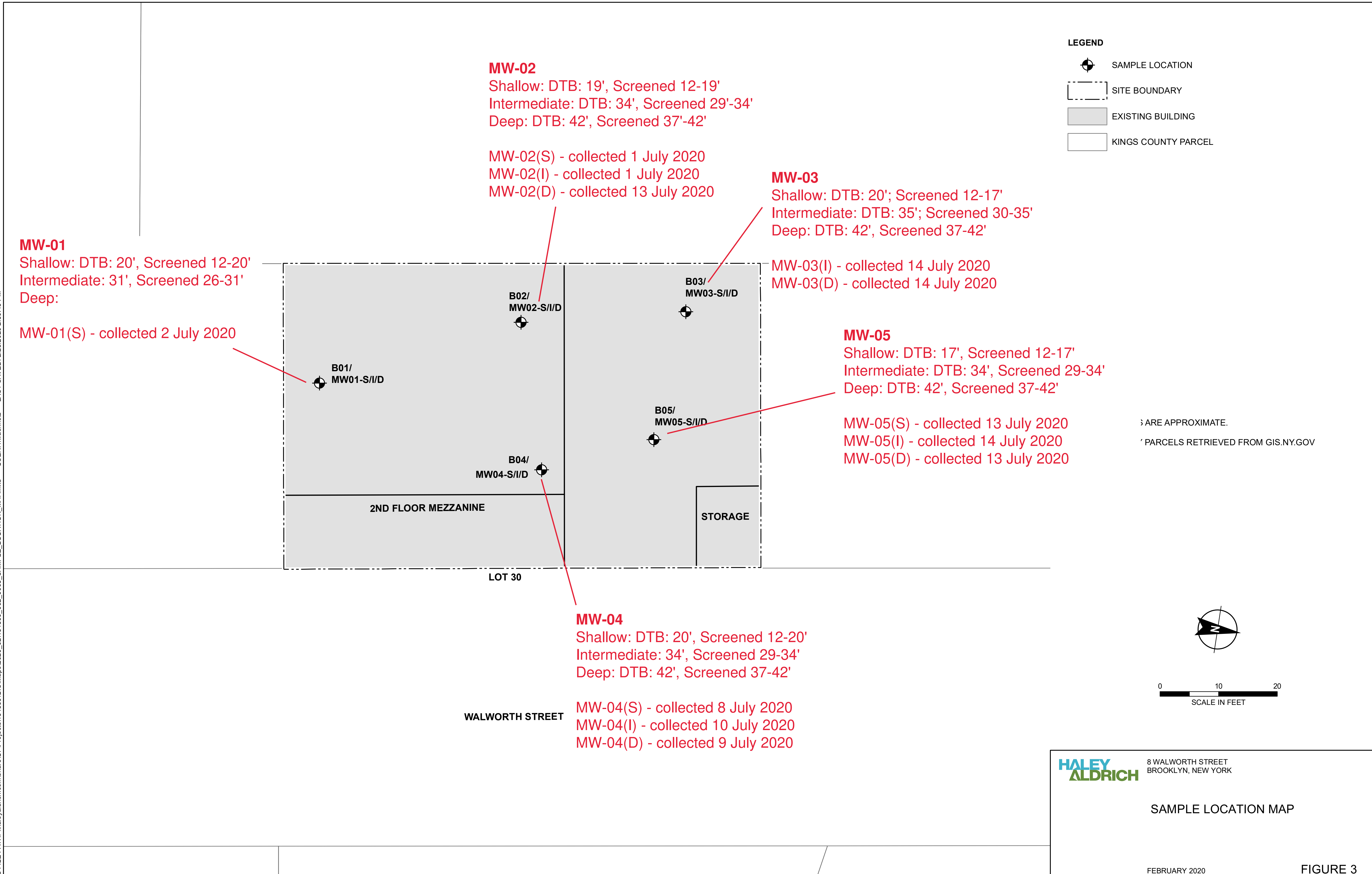



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*Photo 1: View of groundwater sampling setup at MW-03.*

*Photo 2: View of MW-05 cluster area.*

# DAILY FIELD REPORT



| | | | |
|---|---|---|---|
| Project | NYSDEC Site C224239 - 8 Walworth Street | Report No. | 19 |
| Location | 8 Walworth Street, Brooklyn, NY | Date | 7/15/2020 |
| Client | Toldos Yehuda, LLC | Page | 1 of 1 |
| Contractor | Eastern Environmental Solutions | File No. | 134860-002 |
| Weather | Mostly Sunny | Temperature | 75-80° F |

**1115 Z Simmel and S Commisso of Haley & Aldrich on site**
**1130 Set up low flow sampling equipment**
**1145 Begin low flow sampling at MW-03(S)**
**1240 Complete low flow sampling at MW-03(S)**
**1315 Begin low flow sampling at MW-01(I)**
**1415 Complete low flow sampling at MW-01(I)**
**1425 Collect Field Blank**
**1430 Housekeeping**
**1530 Relinquish samples to Alpha Analytical Laboratories; all off site**

| Field Representative(s) | Time on site | Report/Travel/Other | Total hours |
|---|---|---|---|
| Z Simmel | 4.25 | 1 | 5.25 |
| S Commisso | 4.25 | 1 | 5.25 |

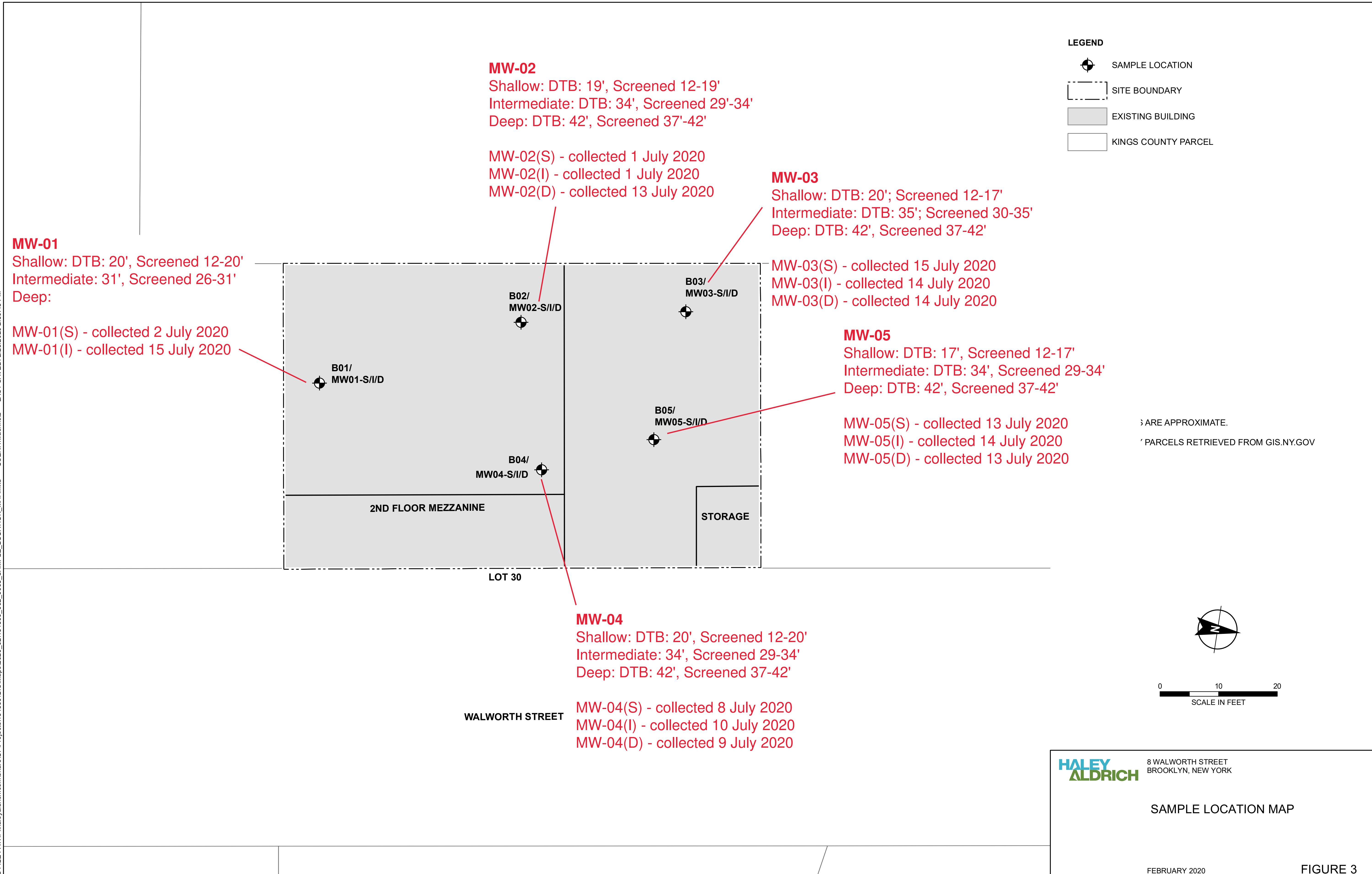


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***Photo 1: View of site facing south.***

***Photo 2: View of site facing north.***

# APPENDIX K

# Data Usability Summary Reports

Haley & Aldrich, Inc.
600 South Meyer Ave
Suite 100
Tucson, AZ 85701
520.289.8621

# Data Usability Summary Report

**Project Name: 8 Walworth St, Brooklyn NY**

**Analytical Laboratory: Alpha Analytical – Westborough, MA**

**Validation Performed by: Santa McKenna**

**Validation Reviewed by: Katherine Miller**

**Validation Date: September 8, 2020**

Haley & Aldrich, Inc., prepared this Data Usability Summary Report (DUSR) to summarize the review and validation of the 8 Walworth St soil samples collected on 15 June 2020 and submitted to Alpha Analytical – Westborough, MA. The analytical results for Sample Delivery Group(s) (SDG) listed below were reviewed to determine the data usability.

This data validation and usability assessment was performed per the guidance and requirements established by the U.S. Environmental Protection Agency's (EPA) *National Functional Guidelines (NFG) for Inorganic Data Review* and *National Functional Guidelines (NFG) for Organic Data Review* and the project-specific Quality Assurance Project Plan (QAPP), herein referred to as the specified limits. Written in 2020, the QAPP referenced the NFG written at the time. Data in this report has been reviewed against the most recent NFG. The following quality assurance/quality control (QA/QC) criteria from the analysis of the project samples were reviewed as applicable:

1. Sample Delivery Group Number L2024999 (Alpha Analytical)
2. Sample Delivery Group Number L2025143 (Alpha Analytical)
3. Sample Delivery Group Number L2026129 (Alpha Analytical)

- Holding Times/Preservation
- Reporting Limits & Sample Dilutions
- Reporting Basis (Wet/Dry)
- Surrogate Recovery Compliance
- Extracted Internal Standard Recovery Compliance
- Blank Sample Analysis
- Calibration Blanks
- Laboratory Control Samples
- Matrix Spike Samples
- Laboratory and Field Duplicate Sample Analysis
- Gas Chromatograph/Mass Spectrometer Instrument Performance Checks
- Interference Check Samples and Inductively Coupled Plasma/Mass Spectrometry Tune
- Initial Calibration
- Initial and Continuing Calibration Verification
- Internal Standards
- Target Analyte Identification
- Serial Dilutions
- System Performance and Overall Assessment

Analytical precision and accuracy were evaluated based on the laboratory control, matrix spike, or laboratory duplicate analysis analyses performed concurrently with the project samples

Data reported in this sampling event were reported to the laboratory method detection limit (MDL). Results found between the MDL and reporting limit (RL) are flagged “J” as estimated.

Sample data were qualified in accordance with laboratory’s standard operating procedures (SOPs). 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.

# 1. Sample Delivery Group Number L2024999 (Alpha Analytical)

## 1.1 SAMPLE MANAGEMENT

This DUSR summarizes the review of SDG number L2024999, dated 15 June 2020. 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 chain of custody. Chains of custody were appropriately signed and dated by the field and/or laboratory personnel.

Analyses were performed on the following samples:

| Sample ID | Sample Type | Lab ID | Sample Collection Date | Matrix | Methods |
|---|---|---|---|---|---|
| B05 (10-12) | N | L2024999-01 | 6/15/2020 | SO | E, F |
| B05 (30-35) | N | L2024999-02 | 6/15/2020 | SO | A, B, C, D |
| B05 (40-45) | N | L2024999-03 | 6/15/2020 | SO | A, B, C, D |

| Method Holding Time | | | |
|---|---|---|---|
| A. | Volatile Organic Compounds | EPA 8260C | 14 days |
| B. | Total Analyte List Metals | EPA 6010D | 180 days |
| C. | Hexavalent Chromium | EPA 7196 | 180 days |
| D. | Polychlorinated Biphenyls | EPA 8082A | 14 days |
| E. | 1,4-Dioxane | EPA 8270 SIM | 7 days |
| F. | PFAS | Alpha 143,LCMSMS-ID | 14 days/28 days* |

**# days/# days notation indicates the holding time is 14 days for extraction and then an additional 28 days for analysis.*

## 1.2 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

Cooler temperature on arrival to the laboratory was: 3.1 degrees Celsius.

## 1.3 REPORTING LIMITS AND SAMPLE DILUTIONS

All dilutions were reviewed and found to be justified.

## 1.4 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. Per the QAPP requirements, data in this SDG were reported on a dry weight basis.

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 ≥ 30% solids to be appropriately quantified. Percent solid results were reviewed and found to within limits.

## 1.5 SURROGATE RECOVERY COMPLIANCE

Surrogates, also known as system monitoring compounds, are compounds added to each sample prior to sample preparation to determining the efficiency of the extraction procedure by evaluating the percent recovery (%R) of the compounds. The %R for each surrogate compound added to each project samples were determined to be within the laboratory specified QC limits.

## 1.6 EXTRACTED INTERNAL STANDARD RECOVERY COMPLIANCE

Analysis of Per- and Polyfluoroalkyl Substances (PFAS) using isotope dilution analysis includes the use of internal standards (IS), 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 IS will affect the calculated target compound concentrations. Recoveries were reviewed and found to be within the limits of 50-150% of the ICAL midpoint standard/initial CCV, with the following exceptions:

| Method | Sample ID | Lab ID | Surrogate | Recovery | Qualification |
|---|---|---|---|---|---|
| Alpha 143,LCMSMS-ID | B05 (10-12) | L2024999-01 | Perfluoro[13C5]pentanoic acid (M5PFPEA) | 157% | J- detect/None ND PFPeA |
| | | | Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS) | 174% | None, sample is ND |
| | | | Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA) | 151% | J- detect/None ND PFHpA |
| | | | Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS) | 175% | None, sample is ND |
| | | | Perfluoro[13C8]Octanesulfonic Acid (M8PFOS) | 182% | J- detect/None ND PFHpS, PFNA, PFOS |
| | | | Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA) | 157% | None, sample is ND |
| | | | Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA) | 158% | None, sample is ND |
| | | | Perfluoro[13C8]octanesulfonamide (M8FOSA) | 12% | J+/UJ FOSA |

## 1.7 BLANK SAMPLE ANALYSIS

Method blanks are prepared by the analytical laboratory and analyzed concurrently with the project samples to assess possible laboratory contamination. 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 (ug/kg) | Qualifier | Affected Samples |
|---|---|---|---|---|---|
| Method Blank | WG1384350-5 WG1384355-10 | Naphthalene | 1.1 J/ 57 J | NA | None, samples are ND |
| | WG1382012-1 | Perfluorohexanoic Acid (PFHxA) | 0.054 J | RL U | L2024999-01 |
| | WG1382720-1 | Iron | 0.900 J | None | Samples>10x blank |
| | WG1382720-1 | Copper | 3.84 J | J+ | L2024999-02, -03 |

## 1.8 CALIBRATION BLANKS

Calibration blanks help determine the validity of the analytical results by determining the existence and magnitude of contamination resulting from laboratory activities or baseline drift during analysis. Initial Calibration Blanks (ICBs) are analyzed after the standards and prior to the Initial Calibration Verification (ICV) sample. Continuing Calibration Blanks (CCBs) are analyzed immediately after every Continuing Calibration Verification (CCV) sample. Calibration blanks had no detections that affected the sample data with the following exceptions:

| Blank Type | Date of Blank | Time | Analyte Detected in Blank | Concentration | Qualifier | Affected Samples |
|---|---|---|---|---|---|---|
| ICB/CCB | 6/22/20 | 12:24 | Antimony | 0.00630 J, 0.00450 J mg/L | RL U | B05 (40-45) |

## 1.9 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. Compounds associated with the LCS/LCSD analyses exhibited recoveries and relative percent differences (RPDs) within the specified limits.

- An LCSD was not reported for EPA 6010D. Because a site-specific matrix spike duplicate, was analyzed, this data is supported by site-specific precision quality control information.

## 1.10 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.

The MS/MSD recoveries and the RPD between the MS and MSD results were within the specified limits with the following exceptions:

| Sample Type | Method | Batch Sample Number | Analyte | %R/RPD | Qualifier | Affected Samples |
|---|---|---|---|---|---|---|
| MS/MSD | EPA 6010D | WG1382720-3 WG1382720-4 | Total Aluminum | 0%/0% | None | None, sample>4x spike level |
| MSD | EPA 6010D | WG1382720-3 WG1382720-4 | Barium | 24 RPD | None | Precision measured with LCS |
| MS/MSD | EPA 6010D | WG1382720-3 WG1382720-4 | Calcium | 0%/354%/74RPD | None | None, sample>4x spike level |
| MS/MSD | EPA 6010D | WG1382720-3 WG1382720-4 | Chromium | 68%/71% | J/UJ | L204999-02, -03 |
| MS/MSD | EPA 6010D | WG1382720-3 WG1382720-4 | Copper | 36%/17% | J/UJ | L204999-02, -03 |
| MS/MSD | EPA 6010D | WG1382720-3 WG1382720-4 | Iron | 0%/0% | None | None, sample>4x spike level |
| MS/MSD | EPA 6010D | WG1382720-3 WG1382720-4 | Magnesium | 0%/0% | None | None, sample>4x spike level |
| MS/MSD | EPA 6010D | WG1382720-3 WG1382720-4 | Manganese | 10%/42% | None | None, sample>4x spike level |
| MS | EPA 6010D | WG1382720-3 WG1382720-4 | Potassium | 69% | J/UJ | L204999-02, -03 |
| MS | EPA 6010D | WG1382720-3 WG1382720-4 | Thallium | 72% | J/UJ | L204999-02, -03 |

## 1.11 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 laboratory did not analyze any laboratory duplicates in this SDG.

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. No field duplicates were collected in this data set.

## 1.12 GAS CHROMATOGRAPH/MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECKS

When analyzing organic compounds, the instrument performance check solution known as Bromofluorobenzene (BFB) for volatiles or Decafluorotriphenylphosphine (DFTPP) 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. Ion abundance criteria were within the specified limits.

## 1.13 INTERFERENCE CHECK SAMPLES AND ICP/MS TUNE

Inorganic analysis requires an interference check sample (ICS) 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 to 120%. Percent recoveries were within the specified limits.

## 1.14 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. Percent Relative Standard Deviation (%RSD) and Relative Response Factors (RRF) are reported and must be within the specified limits. The following instruments were calibrated:

| Analyses | Instrument | Analysis Date |
|---|---|---|
| VOCs by EPA 8260C | VOA127 | 6/9/2020 |
| 1,4-Dioxane by EPA 8270 | gcms5 | 4/2/2020 |
| Polychlorinated Biphenyls by EPA 8082A | PEST21 | 11/25/2020 |

Proper concentrations for standards were used for the instruments and Relative Response Factors (RRFs) and %RSDs were within the specified limits.

PFAS methods require an Initial Calibration to ensure the instrument is capable of producing acceptable qualitative and quantitative data. Instruments should be calibrated at instrument set-up and after ICV or CCV failure, prior to sample analysis. Calibration curves using linear regression should consist of at least five standards and calibration curves using quadratic regression should consist of at least six standards. Recovery of each analyte and concentration level must be within 70-130% of their true value and linear or non-linear calibrations must have a correlation coefficient of ≥0.99 for each analyte. The following instrument was calibrated for PFAS analysis:

| Analyses | Instrument | Analysis Date |
|---|---|---|
| Alpha 143,LCMSMS-ID | LCMS02 | 6/15/2020 |

Recovery of each analyte and $r^2$ values were within the specified limits with the following exceptions:

| Instrument | Analyte | %R or $r^2$ | Action |
|---|---|---|---|
| LCMS02 | PFUnA | $r^2$=0.98 | J/UJ PFUnA |
| | br-PFHxS | STD0.5 %R=66.8 | J detect/R ND PFHxS results below lowest acceptable calibration curve point (1 ng/mL raw on-column concentration) |
| | br-NMeFOSAA | STD0.5 %R=19.9 | J detect/R ND NMeFOSAA results below lowest acceptable calibration curve point (1 ng/mL raw on-column concentration) |
| | br-NEtFOSAA | STD0.5 %R=32.1 | J detect/R ND NEtFOSAA results below lowest acceptable calibration curve point (1 ng/mL raw on-column concentration) |
| | L-NEtFOSAA | STD0.5 %R=52.1 | J detect/R ND NEtFOSAA results below lowest acceptable calibration curve point (1 ng/mL raw on-column concentration) |
| | NMeFOSAA | NA | Highest concentration calibration curve point (STD250.0) was dropped; J detect/R ND NMeFOSAA results above highest acceptable calibration curve point (150 ng/mL raw on-column concentration) |

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 reporting limit (RL) but above the method detection limit (MDL). The curve must have a correlation coefficient of ≥0.995 and the calculated percent differences (%Ds) for all non-zero standards must be within ±30% of the true value. The initial calibration curves were reviewed for all reported parameters and were found to be within limits.

## 1.15 INITIAL AND CONTINUING CALIBRATION VERIFICATION

Organic methods require an additional Initial Calibration Verification (ICV) and Continuing Calibration Verification (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. Values within the National Functional Guidelines but outside the laboratory limits are not listed. Relative Response Factors (RRFs) and the Percent Difference (%D) and %R for PFAS were within the specified limits with the following exceptions:

| Type | Instrument | Date | Time | Analyte | %D/RRF/%R | Action |
|---|---|---|---|---|---|---|
| CCV | LCMS02 | 6/21/2020 | 09:31 | br-NEtFOSAA | 66.6%R | NA, result rejected due to initial calibration |
| | | | | PFTrDA | 144.6%R | Qualify L2024999-01 J+/UJ PFTrDA |
| | | | | PFTA | 131.6%R | Qualify L2024999-01 J+/UJ PFTA |
| | | | | PFDoA | 145.6%R | Qualify L2024999-01 J+/UJ PFDoA |
| | | 06/21/2020 | 09:29 | PFTrDA | 147.9%R | Qualify L2024999-01 J+/UJ PFTrDA |
| | | | | PFTA | 134.6%R | Qualify L2024999-01 J+/UJ PFTA |
| | | 6/21/2020 | 11:31 | L-NMeFOSAA | 66.8%R | NA, result rejected due to initial calibration |
| | | | | br-NMeFOSAA | 28.2%R | NA, result rejected due to initial calibration |
| | | | | PFDoA | 150.9%R | Qualify L2024999-01 J+/UJ PFDoA |

Inorganic methods require an Initial Calibration Verification (ICV) and Continuing Calibration Verification (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. Percent Recovery (%R) are reported and must be within the specified limits. Percent Recovery (%R) were reviewed and were found to be within limits.

## 1.16 INTERNAL STANDARDS

Internal standards are compounds added to each sample by the laboratory prior to volatile sample analysis to ensure that instrument sensitivity and response are stable during each analysis. Area response and retention time were reviewed and found to be within the specified limits.

## 1.17 TARGET ANALYTE IDENTIFICATION

A review of the sample chromatographs and retention times for all organic compounds indicated no problems with target compound identification.

Identification of PFAS 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. Peaks were reviewed and the reviewer confirmed that, when applicable, the laboratory summed the branched and linear peaks.

## 1.18 SAMPLE RESULT VERIFICATION

A few sample results 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.

## 1.19 SYSTEM PERFORMANCE AND OVERALL ASSESSMENT

The results presented in this report were found to comply with the data quality objects for the project and the guidelines specified by the analytical method. Based on the review of this report, the data are 100% useable except for rejected data noted below. A summary of qualifiers applied to this SDG are shown below.

| Sample ID | Analyte | Reported Result | Validated Result | Reason for Qualifier |
|---|---|---|---|---|
| B05 (40-45) | Antimony | 0.546 J | 4.47 U | Continuing calibration blank contamination |
| B05 (10-12) | Perfluoropentanoic acid (PFPeA) | 0.076 J | 0.076 J- | Extracted internal standard out of limits |
| | Perfluoroheptanoic acid (PFHpA) | 0.214 J | 0.214 J- | Surrogate out of limits |
| | Perfluorooctane sulfonamide (FOSA) | 2.16 | 2.16 J+ | Surrogate out of limits |
| | Perfluorooctane sulfonic acid (PFOS) | 26.8 | 26.8 J- | Surrogate out of limits |
| B05 (10-12) | Perfluorohexanoic Acid (PFHxA) | 0.165 J | 0.520 U | Method Blank Contamination |
| B05 (30-35)<br>B05 (40-45) | Copper | 20.5/22.0 | 20.5 J+/22.0 J+ | Method Blank Contamination, Matrix Spike% Recovery Low |
| | Chromium | Detect | Detect J | Matrix Spike% Recovery Low |
| | Potassium | Detect | Detect J | |
| | Thallium | Non-detect U | Non-detect UJ | |
| B05 (10-12) | Perfluorohexanesulfonic acid (PFHxS) | ND U | ND R | Initial calibration recovery out of limits |
| | N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA) | ND U | ND R | |
| | N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA) | ND U | ND R | |
| | Perfluoroundecanoic acid (PFUnA) | ND U | ND UJ | Initial calibration correlation coefficient low |
| | Perfluorotridecanoic acid (PFTrDA) | ND U | ND UJ | Continuing calibration verification recovery out of limits |
| | Perfluorotetradecanoic acid (PFTA) | ND U | ND UJ | |
| | Perfluorododecanoic acid (PFDoA) | ND U | ND UJ | |

## 2. Sample Delivery Group Number L2025143 (Alpha Analytical)

### 2.1 SAMPLE MANAGEMENT

This DUSR summarizes the review of SDG number L2025143, dated 29 June 2020. 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 chain of custody. Chains of custody were appropriately signed and dated by the field and/or laboratory personnel.

Analyses were performed on the following samples:

| Sample ID | Sample Type | Lab ID | Sample Collection Date | Matrix | Methods |
|---|---|---|---|---|---|
| B02 (30-35) | N | L2025143-01 | 6/23/2020 | SO | G, H, I, J |
| B02 (40-45) | N | L2025143-02 | 6/23/2020 | SO | G, H, I, J |
| B01 (10-12) | N | L2025143-03 | 6/23/2020 | SO | K, L |
| B01 (30-35) | N | L2025143-04 | 6/23/2020 | SO | G, H, I, J |
| B01 (40-45) | N | L2025143-05 | 6/23/2020 | SO | G, H, I, J |
| DUP-061620 | FD | L2025143-06 | 6/23/2020 | SO | G, H, I, J |

| Method Holding Time | | | |
|---|---|---|---|
| G | Volatile Organic Compounds | EPA 8260C | 14 days |
| H | Total Analyte List Metals | EPA 6010D | 180 days |
| I. | Hexavalent Chromium | EPA 7196A | 180 days |
| J. | Polychlorinated Biphenyls | EPA 8082A | 14 days |
| K. | 1,4-Dioxane | EPA 8270 SIM | 7 days |
| L. | PFAS | Alpha 143,LCMSMS-ID | 14 days/28 days* |

**# days/# days notation indicates the holding time is 14 days for extraction and then an additional 28 days for analysis.*

### 2.2 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.

Cooler temperature on arrival to the laboratory was: 3.1 degrees Celsius.

### 2.3 REPORTING LIMITS AND SAMPLE DILUTIONS

All dilutions were reviewed and found to be justified.

In cases when multiple dilutions were reported per sample, the reviewer chose the lowest dilution with results still within the calibration range and rejected the alternative result.

### 2.4 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. Per the QAPP requirements, data in this SDG were reported on a dry weight basis

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 ≥ 30% solids to be appropriately quantified. Percent solid results were reviewed and found to within limits.

## 2.5 SURROGATE RECOVERY COMPLIANCE

Surrogates, also known as system monitoring compounds, are compounds added to each sample prior to sample preparation to determining the efficiency of the extraction procedure by evaluating the percent recovery (%R) of the compounds. The %R for each surrogate compound added to each project samples were determined to be within the laboratory specified QC limits.

## 2.6 EXTRACTED INTERNAL STANDARD RECOVERY COMPLIANCE

Analysis of Per- and Polyfluoroalkyl Substances (PFAS) using isotope dilution analysis includes the use of internal standards (IS), 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 IS will affect the calculated target compound concentrations. Recoveries were reviewed and found to be within the limits of 50-150% of the ICAL midpoint standard/initial CCV, with the following exceptions:

| Method | Sample ID | Lab ID | Surrogate | Recovery | Qualification |
|---|---|---|---|---|---|
| Alpha 143,LCMSMS-ID | B01 (10-12) | L2025143-03 | 1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS) | 24% | J+/UJ 6:2 FTS |
| | | | Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA) | 47% | J+/UJ PFDA |
| | | | 1H,1H,2H,2H-perfluoro[1,2-13C2]decanesulfonic acid (M2-8:2FTS) | 49% | J+/UJ 8:2 FTS |
| | | | N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA) | 18% | J+/UJ NMeFOSAA |
| | | | Perfluoro[13C8]octanesulfonamide (M8FOSA) | 1% | R FOSA |
| | | | N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA) | 15% | J+/UJ NEtFOSAA |
| | | | Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA) | 49% | J+/UJ PFDoA, PFTrDA |
| | | | Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA) | 21% | J+/UJ PFTA |

## 2.7 BLANK SAMPLE ANALYSIS

Method blanks are prepared by the analytical laboratory and analyzed concurrently with the project samples to assess possible laboratory contamination. 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 (ug/kg for organics, mg/kg for inorganics | Qualifier | Affected Samples |
|---|---|---|---|---|---|
| Method Blank | WG1384350-5 WG1384355-10 | Naphthalene | 1.1 J/ 57 J | NA | None, samples are ND |
| | WG1383282-1 | Iron | 0.844 J | NA | Samples>10X the blank |
| | | Manganese | 0.092 J | NA | Samples>10X the blank |
| | | Thallium | 0.192 J | NA | None, samples are ND |

### 2.8 CALIBRATION BLANKS

Calibration blanks help determine the validity of the analytical results by determining the existence and magnitude of contamination resulting from laboratory activities or baseline drift during analysis. Initial Calibration Blanks (ICBs) are analyzed after the standards and prior to the Initial Calibration Verification (ICV) sample. Continuing Calibration Blanks (CCBs) are analyzed immediately after every Continuing Calibration Verification (CCV) sample. Calibration blanks had no detections that affected the sample data.

### 2.9 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. Compounds associated with the LCS/LCSD analyses exhibited recoveries and relative percent differences (RPDs) within the specified limits with the following exceptions:

| Sample Type | Method | Batch ID | Analyte | %R | Qualifier | Affected Samples |
|---|---|---|---|---|---|---|
| LCS/LCSD LCS/LCSD | 8270D | WG1383557-2/3 | Perfluorononanoic Acid (PFNA) | 150%/157% | J/None ND | None, Sample is ND |
| | | | 1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS) | 156%/194% | | |
| | | | Perfluorododecanoic Acid (PFDoA) | 202%220% | | |
| | | | Perfluorotridecanoic Acid (PFTrDA) | 145%/147% | | |
| | | | Perfluorotetradecanoic Acid (PFTA) | 164%/169% | | |

### 2.10 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. No client samples were used for MS/MSD analysis in this SDG.

### 2.11 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. RPDs were all below 20% for soil.

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. The RPD comparison for detections in either the parent or duplicate sample(s) is shown below. RPDs were all below 50% 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) |
|---|---|---|
| B02 (30-35') | DUP-061620 | 8260B |

**Field Duplicate RPD Calculations:**

| Method | Analyte | Units | Primary Sample ID | Duplicate Sample ID | % RPD | Qualification |
|---|---|---|---|---|---|---|
| | | | B02 (30-35') | DUP-061620 | | |
| 8260B | Tetrachloroethene | ug/kg | 1800 | 11000 | 144 | J/UJ, RPD > 50% |
| 8260B | 1,1,1-Trichloroethane | ug/kg | 5.7 U | 17 | NA | J/UJ, Abs Diff > RL |
| 8260B | Toluene | ug/kg | 19 U | 43 | NA | J/UJ, Abs Diff > RL |
| 8260B | Ethylbenzene | ug/kg | 4.8 U | 45 | NA | J/UJ, Abs Diff > RL |
| 8260B | p/m-Xylene | ug/kg | 19 U | 110 | NA | J/UJ, Abs Diff > RL |
| 8260B | o -Xylene | ug/kg | 41 | 180 | NA | J/UJ, Abs Diff > RL |
| 8260B | Total Xylene | ug/kg | 41 | 290 | NA | J/UJ, Abs Diff > RL |
| 8260B | p-Diethylbenzene | ug/kg | 6.1 U | 13 U | NA | J/UJ, Abs Diff > RL |
| 8082A | Aroclor 1254 | ug/kg | 77.3 | 3.82 U | 74 | J/UJ, RPD > 50% |
| 6010D | Arsenic | mg/kg | 1.24 | 0.752 J | NA | J/UJ, Abs Diff > RL |
| 6010D | Chromium | mg/kg | 9.46 | 5.57 | 52 | J/UJ, RPD > 50% |
| 6010D | Nickel | mg/kg | 21.1 | 37.2 | 55 | J/UJ, RPD > 50% |
| 6010D | Potassium | mg/kg | 862 | 455 | 62 | J/UJ, RPD > 50% |

## 2.12 GAS CHROMATOGRAPH/MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECKS

When analyzing organic compounds, the instrument performance check solution known as Bromofluorobenzene (BFB) for volatiles or Decafluorotriphenylphosphine (DFTPP) 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. Ion abundance criteria were within the specified limits.

## 2.13 INTERFERENCE CHECK SAMPLES AND ICP/MS TUNE

Inorganic analysis requires an interference check sample (ICS) 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 to 120%. Percent recoveries were within the specified limits.

## 2.14 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. Percent Relative Standard Deviation (%RSD) and Relative Response Factors (RRF) are reported and must be within the specified limits.

Proper concentrations for standards were used for the instruments and Relative Response Factors (RRFs) and %RSDs were within the specified limits.

PFAS methods require an Initial Calibration to ensure the instrument is capable of producing acceptable qualitative and quantitative data. Instruments should be calibrated at instrument set-up and after ICV or CCV failure, prior to sample analysis. Calibration curves using linear regression should consist of at least five standards and calibration curves using quadratic regression should consist of at least six standards. Recovery of each analyte and concentration level must be within 70-130% of their true value and linear or non-linear calibrations must have a correlation coefficient of ≥0.99 for each analyte. The following instrument was calibrated for PFAS analysis:

| Analyses | Instrument | Analysis Date |
|---|---|---|
| Alpha 143,LCMSMS-ID | LCMS01 | 6/1/2020 |

Recovery of each analyte and $r^2$ values were within the specified limits with the following exceptions:

| Instrument | Analyte | %R or $r^2$ | Action |
|---|---|---|---|
| LCMS01 | 6:2 FTS | NA | Highest concentration calibration curve point (STD250.0) was dropped; result is within acceptable calibration curve concentration range, no qualification necessary |
| | PFHpS | STD0.5 %R=50.8 | J detect/R ND PFHpS results below lowest acceptable calibration curve point (1 ng/mL raw on-column concentration) |
| | 8:2 FTS | NA | Highest concentration calibration curve point (STD250.0) was dropped; result is within acceptable calibration curve concentration range, no qualification necessary |
| | br-NEtFOSAA | STD1.0 %R=172.7 | NA, result is within acceptable calibration curve concentration range |

## 2.15 INITIAL AND CONTINUING CALIBRATION VERIFICATION

Organic methods require an additional Initial Calibration Verification (ICV) and Continuing Calibration Verification (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. Values within the National Functional Guidelines but outside the laboratory limits are not listed. Relative Response Factors (RRFs) and the Percent Difference (%D) and %R for PFAS were within the specified limits with the following exceptions:

| Type | Instrument | Date | Time | Analyte | %D/RRF/%R | Action |
|---|---|---|---|---|---|---|
| CCV | LCMSMS01 | 6/21/2020 | 16:13 | 6:2 FTS | 153.4%R | Qualify L2025143-03 J+/UJ 6:2 FTS |
| | | | | PFHpS | 67.5%R | NA, result rejected due to initial calibration |
| | | | | 8:2 FTS | 34.1%R | Qualify L2025143-03 J-/UJ 8:2 FTS |
| | | | | br-NEtFOSAA | 43.9%R | Qualify L2025143-03 J-/UJ NEtFOSAA |
| | | | | PFTrDA | 145.9% | Qualify L2025143-03 J+/UJ PFTrDA |
| | | 6/21/2020 | 19:02 | 6:2 FTS | 155.1%R | Qualify L2025143-03 J+/UJ 6:2 FTS |
| | | | | 8:2 FTS | 49.8%R | Qualify L2025143-03 J-/UJ 8:2 FTS |
| | | | | PFDoA | 139.4%R | Qualify L2025143-03 J+/UJ PFDoA |
| | | | | PFTrDA | 151.8%R | Qualify L2025143-03 J+/UJ PFTrDA |

Inorganic methods require an Initial Calibration Verification (ICV) and Continuing Calibration Verification (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. Percent Recovery (%R) are reported and must be within the specified limits. Percent Recovery (%R) were reviewed and were found to be within limits.

### 2.16 INTERNAL STANDARDS

Internal standards are compounds added to each sample by the laboratory prior to volatile sample analysis to ensure that instrument sensitivity and response are stable during each analysis. Area response and retention time were reviewed and found to be within the specified limits.

### 2.17 TARGET ANALYTE IDENTIFICATION

A review of the sample chromatographs and retention times for all organic compounds indicated no problems with target compound identification.

Identification of PFAS 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. Peaks were reviewed and the reviewer confirmed that, when applicable, the laboratory summed the branched and linear peaks.

### 2.18 SAMPLE RESULT VERIFICATION

A few sample results 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.

### 2.19 SYSTEM PERFORMANCE AND OVERALL ASSESSMENT

The results presented in this report were found to comply with the data quality objects for the project and the guidelines specified by the analytical method. Based on the review of this report, the data are 100% useable. A summary of qualifiers applied to this SDG are shown below.

| Sample ID | Analyte | Reported Result | Validated Result | Reason for Qualifier |
|---|---|---|---|---|
| B01 (10-12) | Perfluorodecanoic acid (PFDA) | ND U | ND UJ | Extracted internal standard out of limits |
| | N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA) | ND U | ND UJ | |
| | Perfluorotetradecanoic acid (PFTA) | ND U | ND UJ | |
| | Perfluorooctanesulfonamide (FOSA) | ND U | R | |
| | 6:2 fluorotelomer sulfonate (6:2 FTS) | ND U | ND UJ | |
| | 8:2 fluorotelomer sulfonate (8:2 FTS) | ND U | ND UJ | |
| | Perfluorotridecanoic acid (PFTrDA) | ND U | ND UJ | |
| | Perfluorododecanoic acid (PFDoA) | ND U | ND UJ | |
| | N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA) | 3.51 | 3.51 J | |
| | Perfluoroheptanesulfonic acid (PFHpS) | ND U | ND R | Initial calibration recovery out of limits |
| | 6:2 fluorotelomer sulfonate (6:2 FTS) | ND U | ND UJ | Continuing calibration verification out of limits |
| | 8:2 fluorotelomer sulfonate (8:2 FTS) | ND U | ND UJ | |
| | Perfluorotridecanoic acid (PFTrDA) | ND U | ND UJ | |
| | Perfluorododecanoic acid (PFDoA) | ND U | ND UJ | |
| | N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA) | 3.51 | 3.51 J | |
| B02 (30-35) | 1,1,1-TRICHLOROETHANE | Non-detect | Non-detect UJ | Field duplicate RPD outside acceptance limits |
| DUP-061620 | 1,1,1-TRICHLOROETHANE | Detect | Detect J | |
| B02 (30-35) | 1,4-DIETHYLBENZENE | Non-detect | Non-detect UJ | |

| Sample ID | Analyte | Reported Result | Validated Result | Reason for Qualifier |
|---|---|---|---|---|
| DUP-061620 | 1,4-DIETHYLBENZENE | Detect | Detect J | |
| B02 (30-35) | AROCLOR 1254 | Detect | Detect J | |
| DUP-061620 | AROCLOR 1254 | Non-detect | Non-detect UJ | |
| B02 (30-35) | ARSENIC, TOTAL | Detect | Detect J | |
| DUP-061620 | ARSENIC, TOTAL | Detect | Detect J | |
| B02 (30-35) | CHROMIUM, TOTAL | Detect | Detect J | |
| DUP-061620 | CHROMIUM, TOTAL | Detect | Detect J | |
| B02 (30-35) | ETHYLBENZENE | Non-detect | Non-detect UJ | |
| DUP-061620 | ETHYLBENZENE | Detect | Detect J | |
| B02 (30-35) | NICKEL, TOTAL | Detect | Detect J | |
| DUP-061620 | NICKEL, TOTAL | Detect | Detect J | |
| B02 (30-35) | O-XYLENE | Detect | Detect J | |
| DUP-061620 | O-XYLENE | Detect | Detect J | |
| B02 (30-35) | P/M-XYLENE | Non-detect | Non-detect UJ | |
| DUP-061620 | P/M-XYLENE | Detect | Detect J | |
| B02 (30-35) | POTASSIUM, TOTAL | Detect | Detect J | |
| DUP-061620 | POTASSIUM, TOTAL | Detect | Detect J | |
| B02 (40-45) | TETRACHLOROETHENE | Non-detect | Non-detect R | Exceed calibration curve |
| B02 (30-35) | TETRACHLOROETHENE | Detect | Detect J | Field duplicate RPD outside acceptance limits |
| DUP-061620 | TETRACHLOROETHENE | Detect | Detect J | |
| DUP-061620 | TETRACHLOROETHENE | Non-detect | Non-detect R | Exceed calibration curve |
| B02 (30-35) | TOLUENE | Non-detect | Non-detect UJ | Field duplicate RPD outside acceptance limits |
| DUP-061620 | TOLUENE | Detect | Detect J | |
| B02 (30-35) | XYLENE (TOTAL) | Detect | Detect J | |
| DUP-061620 | XYLENE (TOTAL) | Detect | Detect J | |

# 3. Sample Delivery Group Number L2026129 (Alpha Analytical)

## 3.1 SAMPLE MANAGEMENT

This DUSR summarizes the review of SDG number L2026129, dated 29 June 2020. 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 chain of custody. Chains of custody were appropriately signed and dated by the field and/or laboratory personnel.

Analyses were performed on the following samples:

| Sample ID | Sample Type | Lab ID | Sample Collection Date | Matrix | Methods |
|---|---|---|---|---|---|
| B03 (30-35') | N | L2026129-1 | 6/22/2020 | SO | M, N, O, P |
| B03 (40-45') | N | L2026129-2 | 6/22/2020 | SO | M, N, O, P |
| B04 (30-35') | N | L2026129-3 | 6/22/2020 | SO | M, N, O, P |
| B04 (40-45') | N | L2026129-4 | 6/22/2020 | SO | M, N, O, P |

| **Method Holding Time** | | | |
|---|---|---|---|
| M | Volatile Organic Compounds | EPA 8260C | 14 days |
| N | Total Analyte List Metals | EPA 6010D | 180 days |
| O | Hexavalent Chromium | EPA 7196A | 180 days |
| P | Polychlorinated Biphenyls | EPA 8082A | 14 days |

## 3.2 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

Cooler temperature on arrival to the laboratory was: 5.5 degrees Celsius.

## 3.3 REPORTING LIMITS AND SAMPLE DILUTIONS

All dilutions were reviewed and found to be justified.

In cases when multiple dilutions were reported per sample, the reviewer chose the lowest dilution with results still within the calibration range and rejected the alternative result.

## 3.4 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. Per the QAPP requirements, data in this SDG were reported on a dry weight basis.

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 ≥ 30% solids to be appropriately quantified. Percent solid results were reviewed and found to within limits.

## 3.5 SURROGATE RECOVERY COMPLIANCE

Surrogates, also known as system monitoring compounds, are compounds added to each sample prior to sample preparation to determining the efficiency of the extraction procedure by evaluating the percent recovery (%R) of the compounds. The %R for each surrogate compound added to each project samples were determined to be within the laboratory specified QC limits.

## 3.6 BLANK SAMPLE ANALYSIS

Method blanks are prepared by the analytical laboratory and analyzed concurrently with the project samples to assess possible laboratory contamination. 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 (mg/kg) | Qualifier | Affected Samples |
|---|---|---|---|---|---|
| Method Blank | WG1386872-5 | Naphthalene | 1.1 J | RL U | L2026129-01, -03 |
| | WG1384956-1 | Iron | 0.892 J | None | Samples>10x blank |

## 3.7 CALIBRATION BLANKS

Calibration blanks help determine the validity of the analytical results by determining the existence and magnitude of contamination resulting from laboratory activities or baseline drift during analysis. Initial Calibration Blanks (ICBs) are analyzed after the standards and prior to the Initial Calibration Verification (ICV) sample. Continuing Calibration Blanks (CCBs) are analyzed immediately after every Continuing Calibration Verification (CCV) sample. Calibration blanks had no detections that affected the sample data with the following exceptions:

| Blank Type | Date of Blank | Time | Analyte Detected in Blank | Concentration | Qualifier | Affected Samples |
|---|---|---|---|---|---|---|
| CCB | 6/26/20 | 14:08 | Arsenic | 0.00270 J ug/L | RL U | B03 (30-35)<br>B04 (40-45) |
| | | | | 0.45 J ug/L | J+ | B03 (40-45)<br>B04 (30-35) |

## 3.8 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. Compounds associated with the LCS/LCSD analyses exhibited recoveries and relative percent differences (RPDs) within the specified limits with the following exceptions:

- An LCSD was not reported for 6010D. Because a site-specific matrix spike duplicate, field duplicate, or laboratory duplicate was analyzed, this data set is supported by precision quality control information.

| Sample Type | Method | Batch ID | Analyte | %R | Qualifier | Affected Samples |
|---|---|---|---|---|---|---|
| LCS/LCSD | 8260C | WG1386446-3/4 | Chloroethane | 170%/160% | NA | None, samples are ND |
| LCS/LCSD | 8260C | WG1386446-3/4 | Ethyl ether | 156%/152% | NA | None, samples are ND |

## 3.9 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. No client samples were used for MS/MSD analysis in this SDG.

The MS/MSD recoveries and the RPD between the MS and MSD results were within the specified limits with the following exceptions:

- An MSD was not reported for 6010D. Because a laboratory control duplicate, field duplicate, or laboratory duplicate was also not analyzed, this data set does not include site-specific precision quality control information.

<table>
<tr><th>Sample Type</th><th>Method</th><th>Parent Sample Number</th><th>Analyte</th><th>%R/RPD</th><th>Qualifier</th><th>Affected Samples</th></tr>
<tr><td>MS</td><td>EPA 6010D</td><td>WG1384956-3</td><td>Aluminum</td><td>868%</td><td rowspan="6">None</td><td rowspan="6">None, sample>4x spike level</td></tr>
<tr><td>MS</td><td>EPA 6010D</td><td>WG1384956-3</td><td>Calcium</td><td>520%</td></tr>
<tr><td>MS</td><td>EPA 6010D</td><td>WG1384956-3</td><td>Iron</td><td>2450%</td></tr>
<tr><td>MS</td><td>EPA 6010D</td><td>WG1384956-3</td><td>Lead</td><td>0%</td></tr>
<tr><td>MS</td><td>EPA 6010D</td><td>WG1384956-3</td><td>Magnesium</td><td>191%</td></tr>
<tr><td>MS</td><td>EPA 6010D</td><td>WG1384956-3</td><td>Manganese</td><td>208%</td></tr>
<tr><td>MS</td><td>EPA 6010D</td><td>WG1384956-3</td><td>Zinc</td><td>126%</td><td>J</td><td>All samples</td></tr>
<tr><td>MS</td><td>EPA 6010D</td><td>WG1384956-3</td><td>Mercury</td><td>134%</td><td>NA</td><td>None, samples ND</td></tr>
</table>

## 3.10 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. No client samples were used for laboratory duplicate analysis in this SDG. No field duplicates were analyzed in this SDG.

## 3.11 GAS CHROMATOGRAPH/MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECKS

When analyzing organic compounds, the instrument performance check solution known as Bromofluorobenzene (BFB) for volatiles or Decafluorotriphenylphosphine (DFTPP) 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. Ion abundance criteria were within the specified limits.

## 3.12 INTERFERENCE CHECK SAMPLES AND ICP/MS TUNE

Inorganic analysis requires an interference check sample (ICS) 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 to 120%. Percent recoveries were within the specified limits.

## 3.13 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. Percent Relative Standard Deviation (%RSD) and Relative Response Factors (RRF) are reported and must be within the specified limits.

Proper concentrations for standards were used for the instruments and Relative Response Factors (RRFs) and %RSDs were within the specified limits.

## 3.14 INITIAL AND CONTINUING CALIBRATION VERIFICATION

Organic methods require an additional Initial Calibration Verification (ICV) and Continuing Calibration Verification (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. Values within the National Functional Guidelines but outside the laboratory limits are not listed. Relative Response Factors (RRFs) and the Percent Difference (%D) were within the specified limits.

Inorganic methods require an Initial Calibration Verification (ICV) and Continuing Calibration Verification (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. Percent Recovery (%R) are reported and must be within the specified limits. Percent Recovery (%R) were reviewed and were found to be within limits.

## 3.15 INTERNAL STANDARDS

Internal standards are compounds added to each sample by the laboratory prior to volatile sample analysis to ensure that instrument sensitivity and response are stable during each analysis. Area response and retention time were reviewed and found to be within the specified limits.

## 3.16 TARGET ANALYTE IDENTIFICATION

A review of the sample chromatographs and retention times for all organic compounds indicated no problems with target compound identification.

### 3.17 SAMPLE RESULT VERIFICATION

A few sample results 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.

### 3.18 SYSTEM PERFORMANCE AND OVERALL ASSESSMENT

The results presented in this report were found to comply with the data quality objects for the project and the guidelines specified by the analytical method. Based on the review of this report, the data are 100% useable. A summary of qualifiers applied to this SDG are shown below.

| Sample ID | Analyte | Reported Result | Validated Result | Reason for Qualifier |
|---|---|---|---|---|
| B03 (30-35) | TETRACHLOROETHENE | 290 E | 290 R | Exceed calibration curve |
| B03 (30-35) | ARSENIC, TOTAL | 0.301 J | 0.912 U | Continuing calibration blank contamination |
| B03 (40-45) | ARSENIC, TOTAL | 1.47 | 1.47 J+ | |
| B04 (30-35) | ARSENIC, TOTAL | 1.02 | 1.02 J+ | |
| B04 (40-45) | ARSENIC, TOTAL | 0.604 J | 0.851 U | |
| B03 (30-35) | Naphthalene | 0.66 J | 3.2 U | Method Blank Contamination |
| B04 (30-35) | Naphthalene | 0.52 J | 2.6 U | |
| B03 (30-35) | Zinc | 32.6 | 32.6 J | %R and or RPD higher than control limits |
| B03 (40-45) | Zinc | 66.1 | 66.1 J | |
| B04 (30-35) | Zinc | 25.8 | 25.8 J | |
| B04 (40-45) | Zinc | 25.3 | 25.3 J | |

## Glossary

- Sample Types:
  - N — Primary Sample
  - FD — Field Duplicate Sample
  - FB — Field Blank Sample
  - EB — Equipment Blank Sample
  - TB — Trip Blank Sample
- Units:
  - µg/kg or ug/kg — microgram per kilogram
  - µg/L or ug/L — microgram per liter
  - mg/kg — milligram per kilogram
  - mg/L — milligram per liter
- Matrices:
  - SO — Soil
  - WG — Groundwater
  - SE — Sediment
- Table Footnotes
  - NA — Not applicable
  - ND — Non-detect
  - NR — Not reported
- Abbreviations
  - DUSR — Data Usability Summary Report
  - SDG — Sample Delivery Group
  - EPA — Environmental Protection Agency
  - NFG — National Functional Guidelines
  - QAPP — Quality Assurance Project Plan
  - QA/QC — Quality Assurance/Quality Control
  - RL — Laboratory Reporting Limit
  - MDL — Laboratory Method Detection Limit
  - SOP — Laboratory Standard Operating Procedures
  - COC — Chain of Custody
  - %R — Percent Recovery
  - RPD — Relative Percent Difference
  - %RSD — Percent Relative Standard Deviation
  - RRF — Relative Response Factors
  - %D — Percent Difference
  - EMPC — Estimated Maximum Possible Concentration
  - ICB — Initial Calibration Blank
  - CCB — Continuing Calibration Blank
  - ICV — Initial Calibration Verification
  - CCV — Continuing Calibration Verification
  - ICVL — Initial Calibration Verification Low
  - CCVL — Continuing Calibration Verification Low
  - LCS/LCSD — Laboratory Control Sample/Laboratory Control Sample Duplicate
  - MS/MSD — Matrix Spike/Matrix Spike Duplicate
  - ICS — Interference Check Sample
  - ICAL — Initial Calibration
  - IS — Internal Standard

- ICP/MS Inductively Coupled Plasma/ Mass Spectrometry

## Qualifiers

Results are qualified with the following codes in accordance with EPA National Functional Guidelines:

- 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.

## References


1. United States Environmental Protection Agency, 2014. R10 Data Validation and Review Guidelines for Polychlorinated Dibenzo-p-Dioxin and Polychlorinated Dibenzofuran Data (PCDD/PCDF) Using Method 1613B, and SW846 Method 8290A. EPA-910-R-14-003. May.

2. United States Environmental Protection Agency, 2017a. National Functional Guidelines for Inorganic Superfund Methods Data Review. EPA-540-R-2017-001. January.

3. United States Environmental Protection Agency, 2017b. National Functional Guidelines for Organic Superfund Methods Data Review. EPA-540-R-2017-002. January.

4. Haley & Aldrich, Inc 2020. Quality Assurance Project Plan. 8 Walworth Street Brooklyn, NY. October.